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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/801,773	09/24/2013	8542111	3781/1010	7047

2101 7590 09/04/2013

Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Eveline Wesby-van Swaay, Stratford-upon-Avon, UNITED KINGDOM;
M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/801,773	03/13/2013	Eveline Wesby-van Swaay	3781/1010	7047

2101 7590 08/14/2013

Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

EXAMINER	
NGUYEN, NAM V	

ART UNIT	PAPER NUMBER
2682	

NOTIFICATION DATE	DELIVERY MODE
08/14/2013	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@sunsteinlaw.com

Supplemental Notice of Allowability	Application No. 13/801,773	Applicant(s) WESBY-VAN SWAAY, EVELINE	
	Examiner NAM V. NGUYEN	Art Unit 2682	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *7/12/13*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *21-50*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☒ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 7/12/13
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/NAM V NGUYEN/
Primary Examiner, Art Unit 2682

Practitioner's Docket No. 3781/1010 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.:	13/801,773	Art Unit/Group No.:	2682
Filing Date:	March 13, 2013	Examiner:	Nguyen, Nam V.
		Conf. No.:	7047

For: PROGRAMMABLE COMMUNICATOR

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

List of Sections Forming Part of This Supplemental Information Disclosure Statement

The following sections are being submitted for this Supplemental Information Disclosure Statement:

1. [x] Preliminary Statements
2. [x] Forms PTO/SB/08A and 08B (substitute for Form PTO-1449)
3. [ ] Statement as to Information Not Found in Patents or Publications
4. [ ] Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted
5. [ ] Cumulative Patents or Publications
6. [x] Copies of Listed Information Items Accompanying This Statement
7. [ ] Concise Explanation of Non-English Language Listed Information Items
   - 7A. [ ] EPO Search Report
   - 7B. [ ] English Language Version of EPO Search Report
8. [ ] Translation(s) of Non-English Language Documents
9. [ ] Concise Explanation of English Language Listed Information Items (Optional)
10. [x] Identification of Person(s) Making This Supplemental Information Disclosure Statement

Section 1. Preliminary Statements

Applicants submit herewith patents, publications or other information, of which they are aware that they believe may be material to the examination of this application, and in respect of which, there may be a duty to disclose.

The filing of this supplemental information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

The filing of this supplemental information disclosure statement shall not be construed as an admission against interest in any manner. *Notice of January 9, 1992, 1135 O.G. 13-25, at 25.*

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Eveline Wesby-van Swaay	Attorney Docket:	3781/1010
Serial No:	13/801,773	Art Unit/Group No.:	2682
Filing Date:	March 13, 2013	Examiner Name:	Nguyen, Nam V.
		Conf. No.:	7047
Invention:	PROGRAMMABLE COMMUNICATOR		

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
/N.N./	**HN**	U.S.D.C. for the District of Delaware	Defendant's Answering Brief, 39 pages (served on June 21, 2013)

Examiner Signature: /Nam Nguyen/

Date Considered: 08/08/2013

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation *if not* in conformance and not considered. Include copy of this form with next communication to applicant.

Section 6. Copies of Listed Information Items Accompanying This Statement

Legible copies of all items listed in Forms PTO/SB/08A and 08B (substitute for Form PTO-1449) accompany this information statement.

[x] Exception(s) to above:

U.S. patent citations are not included pursuant to the United States Patent and Trademark Office's September 21, 2004 waiver of the copy requirement in 37 CFR 1.98 for cited pending U.S. patent citations when the patent citations are available in the USPTO's IFW system.

[ ] Items in prior application, from which an earlier filing date is claimed for this application, as identified in Section 4.

[ ] Cumulative patents or publications identified in Section 5.

Section 10. Identification of Person Making This Supplemental Information Disclosure Statement

The person making this certification is the practitioner of record.

Dated: July 12, 2013

/Jonathan C. Lovely, #60,821/
SIGNATURE OF PRACTITIONER

Reg. No. 60,821

Jonathan C. Lovely
(type or print name of practitioner)

Tel. No.: (617) 443-9292

Sunstein Kann Murphy & Timbers LLP
125 Summer Street, 11th Floor
Firm/Street Address

Customer No.: 002101

Boston, MA 02110-1618
City/State/Zip Code

03781/01010 1922781.1

Practitioner's Docket No. 3781/1010 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.:	13/801,773	Art Unit/Group No.:	2682
Filing Date:	March 13, 2013	Examiner:	Nguyen, Nam V.
		Conf. No.:	7047

For: PROGRAMMABLE COMMUNICATOR

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

STATEMENT FOR INFORMATION DISCLOSURE UNDER 37 C.F.R. SECTION 1.97(e)

NOTE: A statement must state either: "(1) that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement, or (2) that no item of information contained in the information disclosure statement was cited in any communication from a foreign patent office in a counterpart foreign application and to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in Section 1.56(c) more than three months prior to the filing of the information disclosure statement." 37 C.F.R. Section 1.97(e).

NOTE: "Section 1.97(e) makes it clear that a certification could contain either of two statements. One statement is that each item of information in an information disclosure statement was cited in a search report from a patent office outside the U.S. not more than three months prior to the filing date of the statement. Under this certification, it would not matter whether any individual with a duty actually knew about any of the information cited before receiving the search report. In the alternative, the certification could state that no item of information contained in the information disclosure statement was cited in any communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual having a duty to disclose more than three months prior to the filing of the statement." Notice of January 9, 1992, 1135 O.G. 13-25, at 13. (emphasis added). Thus: "If an item of information is submitted within three months of being cited in any communication from a foreign patent office in a counterpart foreign application, the certification can be properly made regardless of any individual's previous knowledge of the information." Id., 1135 O.G. at 19.

NOTE: "The certification can be based on present, good faith knowledge about when information became known without a search of files being made." Thus, for example, the certification of Section 1.97(e) does not preclude the use of the certification in an application by corporations whose practitioners have over the years reviewed thousands of patents and technical publications, even though they are unaware of the relevance of any one thereof to the application. Notice of January 9, 1992, 1135 O.G. 13-15, at 19.

NOTE: A copy of the foreign search report need not be submitted with the certification. Notice of April 20, 1992 (1138 O.G. 37-41, 40).

NOTE: "The phrase 'after making reasonable inquiry' makes it clear that the individual making the certification has a duty to make reasonable inquiry regarding the facts that are being certified. The certification can be made by a registered practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A registered practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry. For example, if an inventor gave a publication to the attorney prosecuting an application with the intent that it be cited to the Office, the attorney should inquire as to when that inventor became aware of the publication and should not submit a certification under 37 C.F.R. 1.97(e)(2) to the Office until a satisfactory response is received. The certification can be based on present, good faith knowledge about when information became known without a search of files being made." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

NOTE: "Although it is recognized that an individual actually becomes aware of the information in the communication from a foreign patent office sometime after it was mailed, the mailing date of such a communication, if it occurs prior to a first awareness of the same information, would determine the date for filing of an information disclosure statement without a fee" in a certification procedure under Section 1.97(e). Notice of January 9, 1992, 1135 O.G. 13-25, at 19 (emphasis added).

NOTE: The mere absence of an item of information for a foreign patent office communication is not intended to represent an opportunity to delay the submission of a item known more than three months prior to the filing of an information disclosure statement to an individual having the duty of disclosure under Section 1.56. 62 Fed. Reg. 53,131, 53,150 (Oct. 10, 1997).

NOTE: "The certification under Section 1.97(e) should be made by a person who has knowledge of the facts being certified. The certification can be made by a practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry." Notice of January 9, 1992, 1135 O.G. 13-25 at 19.

NOTE: "The term counterpart foreign patent application means that a claim for priority has been made in either the U.S. application or a foreign application based on the other, or that the disclosures of the U.S. and foreign patent applications are substantively identical (e.g., an application filed in the European Patent Office claiming the same U.K. priority as claimed in the U.S. application)." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

NOTE: "Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent or inventor." 37 C.F.R. Section 1.56(d) and

"Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:
(1) each inventor named in the application:
(2) each attorney or agent who prepares or prosecutes the application; and
(3) every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application." 37 C.F.R. Section 1.56(c).

IDENTIFICATION OF INFORMATION DISCLOSURE STATEMENT FOR WHICH THIS STATEMENT IS BEING MADE

1. This statement is being made for the Information Disclosure Statement
   [x] accompanying this statement.
   [ ] filed _____.
   Date

STATEMENT

2. I, the person(s) signing below state:

[ ] that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. 37 C.F.R. Section 1.97(e)(1).

NOTE: The three month period starts from the mailing date of the foreign patent office communication. Notice of January 9, 1992, 1135 O.G. 13-25 at 19. The mailing date is the "date on the communication by the foreign patent office." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

OR

[x] that no item of information contained in the information disclosure statement was cited in any communication from a foreign patent office in a counterpart foreign application and to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in Section 1.56(c) more than three months prior to the filing of the information disclosure statement. 37 C.F.R. Section 1.97(e)(2).

NOTE: "The time at which information 'was known to any individual designated in 37 C.F.R. 1.56(c)' is the time when the information was discovered in association with the application even if awareness of the materiality came later." Notice of April 20, 1992 (1138 O.G. 37-41, 40).

IDENTIFICATION OF PERSON(S) MAKING THIS STATEMENT

3. The person making this statement is

(check each applicable item)

(a) [ ] the inventor(s) who signs below

_____

SIGNATURE OF INVENTOR

_____

(type name of inventor who is signing)

(b) [ ] a person who is substantively involved in the preparation or prosecution of the application, and who is associated with the inventor, with the assignee, or with anyone to whom there is an obligation to assign the application (37 C.F.R. Section 1.56(c)) and who signs below.

SIGNATURE OF PERSON MAKING STATEMENT

(type name of person who is signing)

Address of person who is signing

(c) [x] the practitioner who signs below on the basis of the information:

(check each applicable item)

[ ] supplied by the inventor(s).
[ ] supplied by an individual designated in Section 1.56(c).
[x] in the practitioner's file.

/Jonathan C. Lovely, #60,821/
SIGNATURE OF PRACTITIONER

Reg. No. 60,821

Jonathan C. Lovely
(type or print name of practitioner)

Tel. No. (617) 443-9292

125 Summer Street, 11th Floor
Firm/Address

Customer No.: 002101

Boston, MA 02110-1618
Address

03781/01010 1922800.1

Practitioner's Docket No. 3781/1010 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Wesby-van Swaay
Application No.: 13/801,773 Group No.: 2682
Filed: March 13, 2013 Examiner: Nam V. Nguyen
For: Programmable Communicator

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF PAYMENT OF ISSUE FEE (37 C.F.R. § 1.311)

1. Applicant hereby pays the issue fee for the attached Issue Fee Transmittal PTOL-85.

2. Applicant

A. Asserted small entity status in this application on March 13, 2013 by submission of a written assertion of small entity status (37 C.F.R. § 1.27(c)(1)

It is confirmed that small entity status for this application has been checked and it is still in effect and is being asserted.

3. Fee (Issue):

Application status is a small entity with a utility fee of $890.00.

4. Fees (Publication)

The publication fee has already been paid on March 13, 2013.

5. Total Fees Due

The total amount of fee due is:

issue fee		$890.00
TOTAL FEE(S) DUE	$890.00	

6. Assignee's Name and Address To Be Printed On Patent is as follows (37 C.F.R. § 3.81):

Name of Assignee:	M2M Solutions LLC
Address:	Camden House, School Lane
Residence (City and State or Country):	Tiddington, Stratford-upon-Avon, United Kingdom

Assignee category or categories (not printed on patent): Corporation or other private group entity

7. Payment of total fee due:

Authorization is hereby made to charge the amount of $890.00 to Deposit Account No. 19-4972.

Charge any additional fees required by this paper or credit any overpayment in the manner authorized above.

Date: August 14, 2013

/Jonathan C. Lovely, #60,821/
Jonathan C. Lovely
Registration No. 60,821
Sunstein Kann Murphy & Timbers LLP
125 Summer Street
Boston, MA 02110-1618
617-443-9292
Customer No. 02101

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

2101 7590 06/14/2013
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/801,773	03/13/2013	Eveline Wesby van-Swaay	3781/1010	7047

TITLE OF INVENTION: Programmable Communicator

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$890	$0	$0	$890	09/16/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, NAM V	2682	340-539120

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Sunstein Kann Murphy & Timbers LLP
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: M2M Solutions LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Tiddington, Stratford-upon-Avon, United Kingdom

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 19-4972 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29	NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27	NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.	NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Jonathan C. Lovely, #60,821/ Date August 14, 2013

Typed or printed name Jonathan C. Lovely Registration No. 60,821

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Electronic Patent Application Fee Transmittal

Application Number:	13801773
Filing Date:	13-Mar-2013
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby-van Swaay
Filer:	Jonathan Lovely
Attorney Docket Number:	3781/1010

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	890	890
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**890**

Electronic Acknowledgement Receipt

EFS ID:	16589349
Application Number:	13801773
International Application Number:	
Confirmation Number:	7047
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby-van Swaay
Customer Number:	2101
Filer:	Jonathan Lovely
Filer Authorized By:	
Attorney Docket Number:	3781/1010
Receipt Date:	14-AUG-2013
Filing Date:	13-MAR-2013
Time Stamp:	16:18:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$890
RAM confirmation Number	3384
Deposit Account	194972
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	ram3781_1010_IssueFeePayment.pdf	238143 d06a77b08b02c0c98ae104a410be1d07a82f682a	no	4
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	29994 442a92b5c29bf80e89c33521cc156aa7e01defb1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	268137		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/801,773	03/13/2013	Eveline Wesby-van Swaay	3781/1010

CONFIRMATION NO. 7047

2101
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

PUBLICATION NOTICE

OC000000062967896

Title: Programmable Communicator

Publication No.US-2013-0196633-A1
Publication Date:08/01/2013

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/801,773	03/13/2013	2682	1233	3781/1010	20	1

CONFIRMATION NO. 7047

CORRECTED FILING RECEIPT

2101
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

Date Mailed: 07/19/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Eveline Wesby-van Swaay, Stratford-upon-Avon, UNITED KINGDOM;

Applicant(s)

M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

Assignment For Published Patent Application

M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

Power of Attorney: The patent practitioners associated with Customer Number 02101

Domestic Priority data as claimed by applicant

This application is a CON of 13/328,095 12/16/2011
which is a CON of 12/538,603 08/10/2009 PAT 8094010
which is a CON of 11/329,212 01/10/2006 PAT 7583197
which is a CON of 10/296,571 01/21/2003 ABN
which is a 371 of PCT/EP01/05738 05/18/2001

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
FINLAND 20001239 05/23/2000 No Access Code Provided

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 04/16/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/801,773**

Projected Publication Date: 08/01/2013

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

Programmable Communicator

Preliminary Class

340

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

Practitioner's Docket No. 3781/1010 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.:	13/801,773	Art Unit/Group No.:	2682
Filing Date:	March 13, 2013	Examiner:	Nguyen, Nam V.
		Conf. No.:	7047

For: PROGRAMMABLE COMMUNICATOR

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

List of Sections Forming Part of This Supplemental Information Disclosure Statement

The following sections are being submitted for this Supplemental Information Disclosure Statement:

1. [x] Preliminary Statements
2. [x] Forms PTO/SB/08A and 08B (substitute for Form PTO-1449)
3. [ ] Statement as to Information Not Found in Patents or Publications
4. [ ] Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted
5. [ ] Cumulative Patents or Publications
6. [x] Copies of Listed Information Items Accompanying This Statement
7. [ ] Concise Explanation of Non-English Language Listed Information Items
   - 7A. [ ] EPO Search Report
   - 7B. [ ] English Language Version of EPO Search Report
8. [ ] Translation(s) of Non-English Language Documents
9. [ ] Concise Explanation of English Language Listed Information Items (Optional)
10. [x] Identification of Person(s) Making This Supplemental Information Disclosure Statement

Section 1. Preliminary Statements

Applicants submit herewith patents, publications or other information, of which they are aware that they believe may be material to the examination of this application, and in respect of which, there may be a duty to disclose.

The filing of this supplemental information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

The filing of this supplemental information disclosure statement shall not be construed as an admission against interest in any manner. *Notice of January 9, 1992, 1135 O.G. 13-25, at 25.*

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Eveline Wesby-van Swaay	Attorney Docket:	3781/1010
Serial No:	13/801,773	Art Unit/Group No.:	2682
Filing Date:	March 13, 2013	Examiner Name:	Nguyen, Nam V.
		Conf. No.:	7047
Invention:	PROGRAMMABLE COMMUNICATOR		

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
	HN	U.S.D.C. for the District of Delaware	Defendant's Answering Brief, 39 pages (served on June 21, 2013)

Examiner Signature: _____

Date Considered: _____

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation *if not* in conformance and not considered. Include copy of this form with next communication to applicant.

Section 6. Copies of Listed Information Items Accompanying This Statement

Legible copies of all items listed in Forms PTO/SB/08A and 08B (substitute for Form PTO-1449) accompany this information statement.

[x] Exception(s) to above:

U.S. patent citations are not included pursuant to the United States Patent and Trademark Office's September 21, 2004 waiver of the copy requirement in 37 CFR 1.98 for cited pending U.S. patent citations when the patent citations are available in the USPTO's IFW system.

[ ] Items in prior application, from which an earlier filing date is claimed for this application, as identified in Section 4.

[ ] Cumulative patents or publications identified in Section 5.

Section 10. Identification of Person Making This Supplemental Information Disclosure Statement

The person making this certification is the practitioner of record.

Dated: July 12, 2013

/Jonathan C. Lovely, #60,821/
SIGNATURE OF PRACTITIONER

Reg. No. 60,821

Jonathan C. Lovely
(type or print name of practitioner)

Tel. No.: (617) 443-9292

Sunstein Kann Murphy & Timbers LLP
125 Summer Street, 11th Floor
Firm/Street Address

Customer No.: 002101

Boston, MA 02110-1618
City/State/Zip Code

03781/01010 1922781.1

Practitioner's Docket No. 3781/1010 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.:	13/801,773	Art Unit/Group No.:	2682
Filing Date:	March 13, 2013	Examiner:	Nguyen, Nam V.
		Conf. No.:	7047

For: PROGRAMMABLE COMMUNICATOR

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

STATEMENT FOR INFORMATION DISCLOSURE UNDER 37 C.F.R. SECTION 1.97(e)

NOTE: A statement must state either: "(1) that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement, or (2) that no item of information contained in the information disclosure statement was cited in any communication from a foreign patent office in a counterpart foreign application and to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in Section 1.56(c) more than three months prior to the filing of the information disclosure statement." 37 C.F.R. Section 1.97(e).

NOTE: "Section 1.97(e) makes it clear that a certification could contain either of two statements. One statement is that each item of information in an information disclosure statement was cited in a search report from a patent office outside the U.S. not more than three months prior to the filing date of the statement. Under this certification, it would not matter whether any individual with a duty actually knew about any of the information cited before receiving the search report. In the alternative, the certification could state that no item of information contained in the information disclosure statement was cited in any communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual having a duty to disclose more than three months prior to the filing of the statement." Notice of January 9, 1992, 1135 O.G. 13-25, at 13. (emphasis added). Thus: "If an item of information is submitted within three months of being cited in any communication from a foreign patent office in a counterpart foreign application, the certification can be properly made regardless of any individual's previous knowledge of the information." Id., 1135 O.G. at 19.

NOTE: "The certification can be based on present, good faith knowledge about when information became known without a search of files being made." Thus, for example, the certification of Section 1.97(e) does not preclude the use of the certification in an application by corporations whose practitioners have over the years reviewed thousands of patents and technical publications, even though they are unaware of the relevance of any one thereof to the application. Notice of January 9, 1992, 1135 O.G. 13-15, at 19.

NOTE: A copy of the foreign search report need not be submitted with the certification. Notice of April 20, 1992 (1138 O.G. 37-41, 40).

NOTE: "The phrase 'after making reasonable inquiry' makes it clear that the individual making the certification has a duty to make reasonable inquiry regarding the facts that are being certified. The certification can be made by a registered practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A registered practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry. For example, if an inventor gave a publication to the attorney prosecuting an application with the intent that it be cited to the Office, the attorney should inquire as to when that inventor became aware of the publication and should not submit a certification under 37 C.F.R. 1.97(e)(2) to the Office until a satisfactory response is received. The certification can be based on present, good faith knowledge about when information became known without a search of files being made." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

NOTE: "Although it is recognized that an individual actually becomes aware of the information in the communication from a foreign patent office sometime after it was mailed, the mailing date of such a communication, if it occurs prior to a first awareness of the same information, would determine the date for filing of an information disclosure statement without a fee" in a certification procedure under Section 1.97(e). Notice of January 9, 1992, 1135 O.G. 13-25, at 19 (emphasis added).

NOTE: The mere absence of an item of information for a foreign patent office communication is not intended to represent an opportunity to delay the submission of a item known more than three months prior to the filing of an information disclosure statement to an individual having the duty of disclosure under Section 1.56. 62 Fed. Reg. 53,131, 53,150 (Oct. 10, 1997).

NOTE: "The certification under Section 1.97(e) should be made by a person who has knowledge of the facts being certified. The certification can be made by a practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry." Notice of January 9, 1992, 1135 O.G. 13-25 at 19.

NOTE: "The term counterpart foreign patent application means that a claim for priority has been made in either the U.S. application or a foreign application based on the other, or that the disclosures of the U.S. and foreign patent applications are substantively identical (e.g., an application filed in the European Patent Office claiming the same U.K. priority as claimed in the U.S. application)." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

NOTE: "Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent or inventor." 37 C.F.R. Section 1.56(d) and

"Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:
(1) each inventor named in the application:
(2) each attorney or agent who prepares or prosecutes the application; and
(3) every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application." 37 C.F.R. Section 1.56(c).

IDENTIFICATION OF INFORMATION DISCLOSURE STATEMENT FOR WHICH THIS STATEMENT IS BEING MADE

1. This statement is being made for the Information Disclosure Statement
   [x] accompanying this statement.
   [ ] filed _____.
   Date

STATEMENT

2. I, the person(s) signing below state:

[ ] that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. 37 C.F.R. Section 1.97(e)(1).

NOTE: The three month period starts from the mailing date of the foreign patent office communication. Notice of January 9, 1992, 1135 O.G. 13-25 at 19. The mailing date is the "date on the communication by the foreign patent office." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

OR

[x] that no item of information contained in the information disclosure statement was cited in any communication from a foreign patent office in a counterpart foreign application and to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in Section 1.56(c) more than three months prior to the filing of the information disclosure statement. 37 C.F.R. Section 1.97(e)(2).

NOTE: "The time at which information 'was known to any individual designated in 37 C.F.R. 1.56(c)' is the time when the information was discovered in association with the application even if awareness of the materiality came later." Notice of April 20, 1992 (1138 O.G. 37-41, 40).

IDENTIFICATION OF PERSON(S) MAKING THIS STATEMENT

3. The person making this statement is

(check each applicable item)

(a) [ ] the inventor(s) who signs below

_____

SIGNATURE OF INVENTOR

_____

(type name of inventor who is signing)

(b) [ ] a person who is substantively involved in the preparation or prosecution of the application, and who is associated with the inventor, with the assignee, or with anyone to whom there is an obligation to assign the application (37 C.F.R. Section 1.56(c)) and who signs below.

SIGNATURE OF PERSON MAKING STATEMENT

(type name of person who is signing)

Address of person who is signing

(c) [x] the practitioner who signs below on the basis of the information:

(check each applicable item)

[ ] supplied by the inventor(s).
[ ] supplied by an individual designated in Section 1.56(c).
[x] in the practitioner's file.

/Jonathan C. Lovely, #60,821/
SIGNATURE OF PRACTITIONER

Reg. No. 60,821

Jonathan C. Lovely
(type or print name of practitioner)

Tel. No. (617) 443-9292

125 Summer Street, 11th Floor
Firm/Address

Customer No.: 002101

Boston, MA 02110-1618
Address

03781/01010 1922800.1

Electronic Patent Application Fee Transmittal

Application Number:	13801773
Filing Date:	13-Mar-2013
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Filer:	Jonathan Lovely
Attorney Docket Number:	3781/1010

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	2806	1	90	90
		Total in USD ($)		**90**

Electronic Acknowledgement Receipt

EFS ID:	16303209
Application Number:	13801773
International Application Number:	
Confirmation Number:	7047
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Customer Number:	2101
Filer:	Jonathan Lovely
Filer Authorized By:	
Attorney Docket Number:	3781/1010
Receipt Date:	12-JUL-2013
Filing Date:	13-MAR-2013
Time Stamp:	15:42:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$90
RAM confirmation Number	2401
Deposit Account	194972
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Supplemental_Information_Disclosure_Statement.pdf	158378 1d93dfdd6d2eb0d9f296dc1f955c8950b380b739	yes	11
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	11	
Warnings:					
Information:					
2	Other Reference-Patent/App/Search documents	Ref_HN.pdf	584757 25c6c89cda7f7b087ca7b2fb0c96f50aacb09b78	no	39
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	29805 7c8b40a51a9a14312789fc662639b560d2b63039	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	772940		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
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Practitioner's Docket No. 3781/1010 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.:	13/801,773	Art Unit/Group No.:	2682
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For: PROGRAMMABLE COMMUNICATOR

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT AFTER MAILING DATE OF FINAL ACTION, NOTICE OF ALLOWANCE OR ACTION THAT CLOSES PROSECUTION BUT BEFORE PAYMENT OF ISSUE FEE (37 C.F.R. § 1.97(d)) TIME OF TRANSMITTAL OF ACCOMPANYING INFORMATION DISCLOSURE STATEMENT

1. The information disclosure statement transmitted herewith is being filed ***after*** a final action under § 1.113, or a notice of allowance under § 1.311, whichever occurs first, but before, or simultaneously with, the payment of the issue fee.

STATEMENT AND FEE

2. In accordance with the requirements of 37 C.F.R. § 1.97(d):

   A. Accompanying this transmittal is a statement, as specified in 37 C.F.R. § 1.97(e).
   B. Applicant submits the fee set forth in § 1.17(p) ($90.00, at the small entity rate)

FEE DUE

3. Fee due (§ 1.17(p)): $90.00

METHOD OF PAYMENT OF FEE

4. Authorization is hereby made to charge the amount of $90.00 to Deposit Account No. 19-4972.

Charge any additional fees required by this paper or credit any overpayment to Deposit Account No. 19-4972.

Date: July 12, 2013

/Jonathan C. Lovely, #60,821/

Jonathan C. Lovely
Registration No. 60,821
SUNSTEIN KANN MURPHY & TIMBERS LLP
Customer Number 02101
125 Summer Street
Boston, MA 02110-1618
UNITED STATES

03781/01010 1922797.1

Practitioner's Docket No. 3781/1010 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.: 13/801,773
Filed: 03/13/2013
For: Programmable Communicator

Group No.: 2682
Examiner: Nguyen, Nam V.

MAIL STOP MISSING PARTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CORRECTED FILING RECEIPT

1. Attached is a copy of the official filing receipt received from the PTO in the above application for which issuance of a corrected filing receipt is respectfully requested.

2. There is an error with respect to the following, which was incorrectly entered onto the Application Data Sheet at the time of filing.

3. Also attached is a Supplemental Application Data Sheet.

Error in	*Correct data*
1. Inventor's name	1. Wesby-van Swaay, Eveline

Date: July 9, 2013

/Jonathan C. Lovely, #60,821/
Jonathan C. Lovely
Registration No. 60,821
SUNSTEIN KANN MURPHY & TIMBERS LLP
125 Summer Street
Boston, MA 02110-1618
617-443-9292
Customer No. 02101

03781/01010 1920790.1

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/801,773	03/13/2013	2642	833	3781/1010	20	1

CONFIRMATION NO. 7047

2101
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

FILING RECEIPT

OC000000060486354

Date Mailed: 04/22/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Eveline Wesby van-Swaay, Stratford-upon-Avon, UNITED KINGDOM;

Applicant(s)

M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

Assignment For Published Patent Application

M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

Power of Attorney: The patent practitioners associated with Customer Number 02101

Domestic Priority data as claimed by applicant

This application is a CON of 13/328,095 12/16/2011
which is a CON of 12/538,603 08/10/2009 PAT 8094010
which is a CON of 11/329,212 01/10/2006 PAT 7583197
which is a CON of 10/296,571 01/21/2003 ABN
which is a 371 of PCT/EP01/05738 05/18/2001

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
FINLAND 20001239 05/23/2000 No Access Code Provided

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 04/16/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/801,773**

Projected Publication Date: 08/01/2013

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

Programmable Communicator

Preliminary Class

455

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Eveline		~~Wesby van Swaay~~ Wesby-van Swaay	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Stratford-upon-Avon	Country of Residence i	GB

Mailing Address of Inventor:

Address 1	Camden House, School Lane		
Address 2	Tiddington		
City	Stratford-upon-Avon	**State/Province**	
Postal Code	CV37 7AJ	**Country** i	GB

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	02101		
Email Address	patents@sunsteinlaw.com	Add Email	Remove Email

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

Application Information:

Title of the Invention	Programmable Communicator		
Attorney Docket Number	3781/1010	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	3	**Suggested Figure for Publication (if any)**	

Publication Information:

☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	**Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	02101		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	13/328095	2011-12-16
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13/328095	Continuation of	12/538603	2009-08-10	8094010	2012-01-10

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12/538603	Continuation of	11/329212	2006-01-10	7583197	2009-09-01

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11/329212	Continuation of	10/296571	2003-01-21

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
10/296571	a 371 of international	PCT/EP01/05738	2001-05-18

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Priority Claimed
20001239	FI	2000-05-23	◉ Yes ○ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name	M2M Solutions LLC		
Mailing Address Information:			
Address 1	Camden House, School Lane		
Address 2	Tiddington		
City	Stratford-upon-Avon	**State/Province**	
Country	GB	Postal Code	CV37 7AJ
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1			
Address 2			
City		**State/Province**	
Country [i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/Jonathan C. Lovely, #60,821/			Date (YYYY-MM-DD)	2013-03-13 -07-09
First Name	Jonathan C.	Last Name	Lovely	Registration Number	60821

Additional Signature may be generated within this form by selecting the Add button.

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	16266157
Application Number:	13801773
International Application Number:	
Confirmation Number:	7047
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Customer Number:	2101
Filer:	Jonathan Lovely
Filer Authorized By:	
Attorney Docket Number:	3781/1010
Receipt Date:	09-JUL-2013
Filing Date:	13-MAR-2013
Time Stamp:	16:13:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Corrected Filing Receipt	klw3781_1010_ReqCorrFilingRcpt.pdf	109791 e75d4a3c349c9028a672ba0f5886d061d1ff3dfd	no	4

Warnings:	
Information:	

2	Application Data Sheet	klw3781_1010_newADS.pdf	2392414 db98c1bfe4cd425e9e8e7fb20e239e02d3cedd02	no	6

Warnings:	
Information:	
This is not an USPTO supplied ADS fillable form	
Total Files Size (in bytes):	2502205

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/801,773	WESBY VAN-SWAAY ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 6/5/13	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

ANDRE ROBINSON

2 TDS WERE APPRVD.

U.S. Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

2101 7590 06/14/2013
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

EXAMINER
NGUYEN, NAM V

ART UNIT	PAPER NUMBER
2682	

DATE MAILED: 06/14/2013

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/801,773	03/13/2013	Eveline Wesby van-Swaay	3781/1010	7047

TITLE OF INVENTION: Programmable Communicator

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$890	$0	$0	$890	09/16/2013

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

2101 7590 06/14/2013
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/801,773	03/13/2013	Eveline Wesby van-Swaay	3781/1010	7047

TITLE OF INVENTION: Programmable Communicator

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$890	$0	$0	$890	09/16/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, NAM V	2682	340-539120

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29	NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27	NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.	NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/801,773	03/13/2013	Eveline Wesby van-Swaay	3781/1010	7047

2101 7590 06/14/2013

Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

EXAMINER	
NGUYEN, NAM V	

ART UNIT	PAPER NUMBER
2682	

DATE MAILED: 06/14/2013

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/801,773	Applicant(s) WESBY VAN-SWAAY ET AL.	
	Examiner NAM V. NGUYEN	Art Unit 2682	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *6/5/13*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *21-50*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☒ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

   Interim copies:

   a) ☐ All b) ☐ Some c) ☐ None of the: Interim copies of the priority documents have been received.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☒ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/NAM V NGUYEN/
Primary Examiner, Art Unit 2682

Allowable Subject Matter

This communication is in response to applicant's amendment which is filed June 5, 2013 in the application of Van Swaay for a "programmable communicator" filed May 10, 2013.

Applicant submits a Terminal Disclaimer to overcome the rejection of the Claims 21-50 Under the Doctrine of Double Patenting. The Terminal Disclaimer is approved. Therefore, examiner withdraws the Double Patenting rejection.

Claims 21-50 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nam V Nguyen whose telephone number is 571-272-3061. The examiner can normally be reached on Mon-Fri, 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Bugg can be reached on 571- 272-2998. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/NAM V NGUYEN/
Primary Examiner, Art Unit 2682

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13801773	WESBY VAN-SWAAY ET AL.
	Examiner	Art Unit
	NAM V NGUYEN	2682

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
340	539.12; 573.4; 693.5; 7.29; 7.33; 7.52	6/8/13	NN
455	456; 456.2; 418; 419; 425	6/8/13	NN
379	142; 373; 375	6/8/13	NN

SEARCH NOTES		
Search Notes	Date	Examiner
Search EAST: USPAT; USPUB; EPO; JPO; and Derwent.	6/8/13	NN
Search Terms: authorized list in cellular hone with monitoring device; external device monitoring; monitor central station; monitor module with address; code number/id address and/or number;	6/8/13	NN
Updated from 11/329,212	6/8/13	NN
Updated from 12/538,603	6/8/13	NN
updated from 13/328,095	6/8/13	NN

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
SAME AS	ABOVE	6/8/13	NN

	/N.V.N./ Primary Examiner.Art Unit 2682

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 7047

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/801,773	03/13/2013	340	2682	3781/1010

APPLICANTS

Eveline Wesby van-Swaay, Stratford-upon-Avon, UNITED KINGDOM;
M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

**** CONTINUING DATA ***************************

This application is a CON of 13/328,095 12/16/2011 Yes /NN/
which is a CON of 12/538,603 08/10/2009 PAT 8094010
which is a CON of 11/329,212 01/10/2006 PAT 7583197
which is a CON of 10/296,571 01/21/2003 ABN
which is a 371 of PCT/EP01/05738 05/18/2001

**** FOREIGN APPLICATIONS *************************** Yes /NN/

FINLAND 20001239 05/23/2000

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
04/16/2013

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /NAM V NGUYEN/ Examiner's Signature	☐ Met after Allowance NN Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		UNITED KINGDOM	3	20	1

ADDRESS

Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618
UNITED STATES

TITLE

Programmable Communicator

FILING FEE RECEIVED		
1233	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13801773	WESBY VAN-SWAAY ET AL.
	Examiner	Art Unit
	NAM V NGUYEN	2682

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/23/2013	06/08/2013							
	1	-	-							
	2	-	-							
	3	-	-							
	4	-	-							
	5	-	-							
	6	-	-							
	7	-	-							
	8	-	-							
	9	-	-							
	10	-	-							
	11	-	-							
	12	-	-							
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	14	-	-							
	15	-	-							
	16	-	-							
	17	-	-							
	18	-	-							
	19	-	-							
	20	-	-							
1	21	✓	=							
2	22	✓	=							
3	23	✓	=							
4	24	✓	=							
5	25	✓	=							
6	26	✓	=							
7	27	✓	=							
8	28	✓	=							
9	29	✓	=							
10	30	✓	=							
11	31	✓	=							
12	32	✓	=							
13	33	✓	=							
14	34	✓	=							
15	35	✓	=							
16	36	✓	=							

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13801773	WESBY VAN-SWAAY ET AL.
	Examiner	**Art Unit**
	NAM V NGUYEN	2682

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/23/2013	06/08/2013							
17	37	✓	=							
18	38	✓	=							
19	39	✓	=							
20	40	✓	=							
21	41	✓	=							
22	42	✓	=							
23	43	✓	=							
24	44	✓	=							
25	45	✓	=							
26	46	✓	=							
27	47	✓	=							
28	48	✓	=							
29	49	✓	=							
30	50	✓	=							

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13801773	WESBY VAN-SWAAY ET AL.
	Examiner	**Art Unit**
	NAM V NGUYEN	2682

CPC

Symbol				Type	Version
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CPC Combination Sets

Symbol				Type	Set	Ranking	Version
			/				
			/				

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
340	539.12

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
340	573.4	7.29	7.32	7.52	

INTERNATIONAL CLASSIFICATION

CLAIMED					NON-CLAIMED				
G	0	8	B	23 / 00 (2006.01.01)					
G	0	8	B	5 / 22 (2006.01.01)					
H	0	4	Q	1 / 30 (2006.01.01)					

NONE (Assistant Examiner)	(Date)	Total Claims Allowed: 30	
/NAM V NGUYEN/ Primary Examiner.Art Unit 2682 (Primary Examiner)	6/8/13 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3

U.S. Patent and Trademark Office — Part of Paper No. 20130608

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13801773	WESBY VAN-SWAAY ET AL.
	Examiner	**Art Unit**
	NAM V NGUYEN	2682

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	30	
/NAM V NGUYEN/ Primary Examiner.Art Unit 2682	6/8/13	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13801773	WESBY VAN-SWAAY ET AL.
	Examiner	**Art Unit**
	NAM V NGUYEN	2682

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17	13	33	29	49								
	2		18	14	34	30	50								
	3		19	15	35										
	4		20	16	36										
	5	1	21	17	37										
	6	2	22	18	38										
	7	3	23	19	39										
	8	4	24	20	40										
	9	5	25	21	41										
	10	6	26	22	42										
	11	7	27	23	43										
	12	8	28	24	44										
	13	9	29	25	45										
	14	10	30	26	46										
	15	11	31	27	47										
	16	12	32	28	48										

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	30	
/NAM V NGUYEN/ Primary Examiner.Art Unit 2682	6/8/13	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

U.S. Patent and Trademark Office Part of Paper No. 20130608

Practitioner's Docket No. 3781/1010 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.: 13/801,773
Filed: 03/13/2013
For: Programmable Communicator

Group No.: 2682
Examiner: Nguyen, Nam V.

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT TRANSMITTAL

1. Transmitted herewith is an amendment for this application. Also attached are two Terminal Disclaimers.

STATUS

2. Applicant is a small entity. A statement was already filed.

EXTENSION OF TERM

3. The proceedings herein are for a patent application and the provisions of 37 C.F.R. 1.136 apply. Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

FEE PAYMENT

4. Authorization is hereby made to charge the amount of $320.00 for two Terminal Disclaimers to Deposit Account No. 19-4972.

Charge any additional fees required by this paper or credit any overpayment in the manner authorized above.

FEE DEFICIENCY

5. If an additional extension and/or fee is required, charge Account No. 19-4972.

If an additional fee for claims is required, charge Account No. 19-4972.

Date: June 5, 2013

/Jonathan C. Lovely, #60,821/
Jonathan C. Lovely
Registration No. 60,821
SUNSTEIN KANN MURPHY & TIMBERS LLP
125 Summer Street
Boston, MA 02110-1618
617-443-9292
Customer No. 02101

03781/01010 1901307.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Wesby van-Swaay	Att'y Docket:	3781/1010
Appln. No.:	13/801,773	Filing Date:	March 13, 2013
Customer No.:	02101	Conf. No.:	7047
Examiner:	Nguyen, Nam V.	Art Unit:	2682
Invention:	PROGRAMMABLE COMMUNICATOR		

FILED BY USPTO ELECTRONIC FILING SYSTEM

Mail Stop RESPONSE
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Response

Dear Sir:

Applicants respectfully submit this response to the Office Action dated May 30, 2013 and request that the following remarks be considered.

Listing of the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

LISTING OF THE CLAIMS

1 – 20 (Cancelled)

21. (Previously Presented) A programmable communicator device comprising:

a wireless communications circuit for communicating through an antenna over a communications network;

a programmable interface for establishing a communication link with at least one monitored technical device, wherein the programmable interface is programmable by wireless packet switched data messages;

a processing module configured to authenticate one or more wireless transmissions sent from a programming transmitter and received by the programmable communicator device by determining if at least one transmission contains a coded number;

wherein the programmable communicator device is configured to use a memory to store at least one telephone number or IP address included within at least one of the transmissions as one of one or more permitted callers if the processing module authenticates the at least one of the transmissions including the at least one telephone number or IP address and the coded number by determining that the at least one of the transmissions includes the coded number;

wherein the programmable communicator device is configured to use an identity module for storing a unique identifier that is unique to the programmable communicator device;

and wherein the one or more wireless transmissions from the programming transmitter comprises a General Packet Radio Service (GPRS) or other wireless packet switched data message;

and wherein the programmable communicator device is configured to process data received through the programmable interface from the at least one monitored technical device.

22. (Previously Presented) A programmable communicator device according to claim 21,

wherein the processing module is configured to process data received through the programmable interface from the at least one monitored technical device in response to programming instructions received in an incoming wireless packet switched data message.

23. (Previously Presented) A programmable communicator device according to claim 21, wherein the programmable communicator device comprises the identity module.

24. (Previously Presented) A programmable communicator device according to claim 21 wherein the wireless communications circuit is configured to receive wireless transmissions compliant with Bluetooth wireless air interface standards.

25. (Previously Presented) A programmable communicator device according to claim 21 wherein each permitted caller has a corresponding stored telephone number or IP address from which the programmable communicator device is permitted to receive incoming wireless transmissions for processing.

26. (Previously Presented) A programmable communicator device according to claim 21 wherein each permitted caller has a corresponding stored telephone number or IP address to which the wireless communications circuit is permitted to send outgoing wireless transmissions.

27. (Previously Presented) A programmable communicator device according to claim 21 wherein each permitted caller has a corresponding stored telephone number or IP address from which the programmable communicator device is permitted to receive incoming wireless transmissions for processing, and to which the wireless communications circuit is permitted to send outgoing wireless transmissions.

28. (Previously Presented) A programmable communicator device according to claim 21 further configured to request that an at least one monitored technical device send data

through the programmable interface for processing by the programmable communicator device.

29. (Previously Presented) A programmable communicator device according to claim 21 further configured to transmit the processed data to an at least one monitoring device either periodically or in response to a data request initiated by the monitoring device.

30. (Previously Presented) A programmable communicator device according to claim 29, wherein the processing module is configured to cause the processed data to be transmitted to the at least one monitoring device.

31. (Previously Presented) A programmable communicator device according to claim 29 further configured to determine whether the data request initiated by the monitoring device includes a required access code.

32. (Previously Presented) A programmable communicator device according to claim 31, wherein the processing module is configured to determine whether the data request includes the required access code.

33. (Previously Presented) A programmable communicator device according to claim 21 further configured to determine whether the processed received data indicates a change in status of the at least one monitored technical device that crosses a threshold parameter, or that otherwise indicates an alarm condition.

34. (Previously Presented) A programmable communicator device according to claim 33 further configured to send an at least one transmission for alerting an at least one monitoring device of said change in status or other alarm condition.

35. (Previously Presented) A programmable communicator device according to claim 21 further configured to request that an at least one monitored technical device send data

through the programmable interface for receipt by the programmable communicator device.

36. (Previously Presented) A programmable communicator device according to claim 21 further configured to transmit the received data to an at least one monitoring device either periodically or in response to a data request initiated by the monitoring device.

37. (Previously Presented) A programmable communicator device according to claim 36, wherein the processing module is configured to cause the received data to be transmitted to the at least one monitoring device in response to programming instructions received in an incoming wireless packet switched data message.

38. (Previously Presented) A programmable communicator device according to claim 36, wherein the processing module is configured to cause the received data to be transmitted to the at least one monitoring device.

39. (Previously Presented) A programmable communicator device according to claim 21 further configured to transmit the received data to an at least one monitoring device either periodically or in response to a data request initiated by the monitoring device in response to programming instructions received in an incoming wireless packet switched data message.

40. (Previously Presented) A programmable communicator device according to claim 21 configured to process an at least one data monitoring or data collection request contained in an at least one transmission received from an at least one monitoring device.

41. (Previously Presented) A programmable communicator device according to claim 21 further comprising a location processing module configured to determine an at least one location of the programmable communicator device, and wherein the programmable communicator device is configured to respond to an at least one transmission initiated by

an at least one monitoring device requesting that said location data be sent to the monitoring device.

42. (Previously Presented) A programmable communicator device according to claim 21 further comprising a location processing module configured to determine an at least one location of the programmable communicator device, and wherein the programmable communicator device is configured to respond to an at least one transmission initiated by an at least one monitoring device requesting that said location data be sent to the monitoring device in response to programming instructions received in an incoming wireless packet switched data message.

43. (Previously Presented) A programmable communicator device according to claim 42 wherein the location processing module comprises a Global Positioning System (GPS) module.

44. (Previously Presented) A programmable communicator device according to claim 21 wherein the monitored technical device is a sensor device.

45. (Previously Presented) A programmable communicator device according to claim 21 wherein the monitored technical device is a health monitoring system.

46. (Previously Presented) A programmable communicator device according to claim 45 wherein the programmable communicator device is configured to receive data from the health monitoring system through the programmable interface representing at least one of body temperature, blood pressure, periodic or continuous electrocardiogram heart rhythm, blood glucose concentration, blood electrolyte concentration, kidney function, liver function, and labor contractions.

47. (Previously Presented) A programmable communicator device according to claim 46 wherein the programmable communicator device is configured to receive data from the

health monitoring system through the programmable interface in response to programming instructions received in an incoming wireless packet switched data message.

48. (Previously Presented) A programmable communicator device according to claim 21 wherein the monitored technical device is a vending machine.

49. (Previously Presented) A programmable communicator device according to claim 21 wherein the monitored technical device is a home or domestic appliance.

50. (Previously Presented) A programmable communicator device according to claim 21 wherein the monitored technical device is at least one of a door status monitoring device, a window status monitoring device, a proximity detector device, and a fire alarm device.

REMARKS

Applicants would like to thank the examiner for the review of the present application and prior art. Applicants request reconsideration of the pending claims in view of the following remarks. Applicants previously cancelled claims 1-20 and added claims 21-50. Accordingly, claims 21-50 are currently under consideration in this application. No new matter has been added.

Double Patenting

The office action rejects claims 21-50 on the grounds of nonstatutory obviousness-type double patenting. In particular, the office action suggests that claims 21-50 of the present application are unpatentable over claims 1-134 of U.S. Patent No. 7,583,197. The office action also suggests that claims 21-50 of the present application are unpatentable over claims 1-197 of U.S. Patent No. 8,094,010. To expedite prosecution, Applicant submits herewith terminal disclaimers with respect to U.S. Patent Nos. 7,583,197 and 8,094,010.

The office action also provisionally rejects claims 21-50 as being unpatentable over claims 21-51 of copending application no. 13/328,095. Applicants would like to note that Application No. 13/328,095 currently stands rejected and is not expected to issue as a patent before the present application, which is in condition for allowance. Therefore, Applicants do not believe that a terminal disclaimer with respect to U.S. Application No. 13/328,095 is required in the present application.

Accordingly, in view of the above, Applicants believe that the double patenting rejections made within the office action are now moot.

It is believed that the application is in condition for allowance and Applicant respectfully requests that a notice of allowance be issued. Applicant does not believe any extension of time is required. However, if an extension of time is required, please charge the associated fee and any additional fees required by this paper or credit any overpayment to deposit account number 19-4972. Applicant also requests that the

examiner contact applicant's attorney, Jonathan Lovely, if it will assist in processing this application through issuance.

DATE: June 5, 2013

Respectfully submitted,

/Jonathan C. Lovely, #60,821/

Jonathan C. Lovely
Registration No. 60,821
Attorney for Applicant
Sunstein Kann Murphy & Timbers LLP
125 Summer Street
Boston, MA 02110-1618
(617) 443-9292
03781/01010 1900927.1

PTO/SB/26 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 3781/1010

In re Application of: Eveline Wesby-van Swaay

Application No.: 13/801,773

Filed: March 13, 2013

For: Programmable Communicator

The owner*, M2M Solutions LLC, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term **prior patent** No. 7,583,197 as the term of said prior patent is defined in 35 U.S.C. 154 and 173, and as the term of said **prior patent** is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 60,821

/Jonathan C. Lovely, #60,821/ — Signature
June 5, 2013 — Date

Jonathan C. Lovely — Typed or printed name

(617) 443-9292 — Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

PTO/SB/26 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 3781/1010

In re Application of: Eveline Wesby-van Swaay

Application No.: 13/801,773

Filed: March 13, 2013

For: Programmable Communicator

The owner*, M2M Solutions LLC, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term **prior patent** No. 8,094,010 as the term of said prior patent is defined in 35 U.S.C. 154 and 173, and as the term of said **prior patent** is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 60,821

/Jonathan C. Lovely, #60,821/ — Signature
June 5, 2013 — Date

Jonathan C. Lovely
Typed or printed name

(617) 443-9292
Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	13801773
Filing Date:	13-Mar-2013
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Filer:	Jonathan Lovely
Attorney Docket Number:	3781/1010

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Statutory or Terminal Disclaimer	1814	2	160	320
		Total in USD ($)		**320**

Electronic Acknowledgement Receipt

EFS ID:	15954252
Application Number:	13801773
International Application Number:	
Confirmation Number:	7047
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Customer Number:	2101
Filer:	Jonathan Lovely
Filer Authorized By:	
Attorney Docket Number:	3781/1010
Receipt Date:	05-JUN-2013
Filing Date:	13-MAR-2013
Time Stamp:	13:37:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$320
RAM confirmation Number	11614
Deposit Account	194972
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	klw3781_1010_Amendment.pdf	152649 82d4a372b5ee9763a5f799dfb716b11f6bef351d	no	11
Warnings:					
Information:					
2	Statutory disclaimers per MPEP 1490.	klw3781_1010_TermDisclaimer1.pdf	170142 ff1a1782ac810fe38f5fa974129a207b69adbd0e	no	1
Warnings:					
Information:					
3	Statutory disclaimers per MPEP 1490.	klw3781_1010_TermDisclaimer2.pdf	170142 6acf521f0391a79ce257cf7c89f242a06e828ce7	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	29638 896f4c8a3e1d8a2850fc237522b7bf34d8cc113c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	522571		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/801,773	Filing Date 03/13/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	06/05/2013	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 30	Minus	** 20	= 10	X $40 =	400
	Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**400**

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/TAMMY L. ACREE/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/801,773	03/13/2013	Eveline Wesby van-Swaay	3781/1010	7047

2101 7590 05/30/2013

Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

EXAMINER	
NGUYEN, NAM V	
ART UNIT	PAPER NUMBER
2682	

NOTIFICATION DATE	DELIVERY MODE
05/30/2013	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@sunsteinlaw.com

Office Action Summary	Application No. 13/801,773	Applicant(s) WESBY VAN-SWAAY ET AL.	
	Examiner NAM V. NGUYEN	Art Unit 2682	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *5/10/13*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *21-50* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *21-50* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *13 March 2013* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some * c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Interim copies:

a)☐ All b)☐ Some c)☐ None of the: Interim copies of the priority documents have been received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/14/13*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

The application of Van Swaay for a "programmable communicator" filed May 10, 2013 has been examined.

This application claims foreign priority based on the application 20001239 filed May 23, 2000 in Finland. Receipt is acknowledged of papers submitted under 35 U.S.C 119(a) – (d), which papers have been placed of record in the file.

This application is a CON of 13/328,095 filed December 16, 2011, which is a CON of 12,538,603 filed August 10, 2009 which is now US PAT No. 8,094,010, which is a CON of 11/329,212 filed January 10, 2006 which is now US PAT No. 7,583,197, which is a CON of 10/296,571 filed January 21, 2003 which is abandoned, which is a 371 of PCT/EP01/05738 filed May 18, 2001.

A preliminary amendment to the claims 1-20 has been entered and made of record. Claims 1-20 are cancelled. The new set of claims 21-50 are introduced.

Claims 21-50 are now pending.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 21-50 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-134 of U.S. Patent No. 7,583,197. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Referring to independent Claim 21 of the application, the programmable communicator device includes a wireless communications circuit, a programmable interface, a processing module, and a memory module The different is that the independent Claim 21 of the application recites wherein the one or more wireless transmissions from the programming transmitter comprises GPRS or other wireless packet switched data message which would be obvious to one skilled in the art to use for wireless transmissions in the independent claims 1, 29, 40, 68, 79 and 107 of the U.S. Patent No. 7,583,197.

The following claims are patentably similar from each other:

Application	Patent No. 7,583,197
21	1, 29, 40, 68, 79 and 107

2. Claims 21-50 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-197 of U.S. Patent No. 8,094,010. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Referring to independent Claim 21 of the application, the programmable communicator device includes a wireless communications circuit, a programmable interface, a processing module, and a memory module. The different is that the independent Claim 21 of the application use alternative languages for the similar limitations as the independent claims 1, 52, 104 and 151 of the U.S. Patent No. 8,094,010.

The following claims are patentably similar from each other:

Application	Patent No. 8,094,010
21	1, 52, 104 and 151

3. Claims 21-50 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 21-51 of copending Application No

13/328,095. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Referring to independent Claim 21 of the application, the programmable communicator device includes a wireless communications circuit, a programmable interface, a processing module, and a memory module. The different is that the independent Claim 21 of the application use alternative languages for the similar limitations as the independent claim 21 of the copending Application No 13/328,095.

The following claims are patentably similar from each other:

Application	Copending Application No 13/328,095
21	21

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nam V. Nguyen whose telephone number is 571-272-3061. The examiner can normally be reached on Mon-Fri, 8:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Brian Zimmerman can be reached on 571- 272-3059. The fax phone numbers for the

organization where this application or proceeding is assigned are 571-273-8300 for regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/NAM V NGUYEN/
Primary Examiner, Art Unit 2682

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	2	"20100052864"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/02/20 14:19
S2	2	"7297044"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/02/20 15:15
S3	18	("20020077021" | "20020155783" | "20020187722" | "3846603" | "4169335" | "4913676" | "5446236" | "5452901" | "5587545" | "5873765" | "6037679" | "6075195" | "6110000" | "6246927" | "6264523" | "6491566" | "6682392" | "6822154").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2012/02/20 15:18
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S9	15	"6729934"	US-PGPUB; USPAT; USOCR	OR	ON	2012/02/20 15:58
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S28	25	("6380844").URPN.	USPAT	OR	ON	2012/07/06 15:54
S29	11	("6551165").URPN.	USPAT	OR	ON	2012/07/06 22:50
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S38	10991	transmit$4 same message same identifier	USPAT	OR	ON	2012/07/07 14:47
S39	1700	transmit$4 same message adj2 identifier	USPAT	OR	ON	2012/07/07 14:48
S40	177	S39 and "340"/$.ccls.	USPAT	OR	ON	2012/07/07 14:48
S41	2899	transmit$4 same message adj2 code	USPAT	OR	ON	2012/07/07 15:04
S42	478	S41 and "340"/$.ccls.	USPAT	OR	ON	2012/07/07 15:04
S43	0	S42 and program same toy	USPAT	OR	ON	2012/07/07 15:04
S44	7	S42 and program and toy	USPAT	OR	ON	2012/07/07 15:04
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S55	5	event adj2 identifier and source adj2 identifier and (program$4 adj2 block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/12/02 10:36
S56	5	event adj2 identifier and source adj2 identifier and (program$4 adj2 block$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/12/02 10:37
S57	75	event adj2 identifier and (program$4 adj2 block$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/12/02 10:38
S58	36	("20020013802" | "20020088926" | "20030008684" | "20030129944" | "20030135533" | "20030149741" | "20030161327" | "20030174731" | "20030177275" | "20030178273" | "20030233485" | "20040142682" | "20040174855" | "20040199613" | "20040266480" | "20050057370" | "20050060704" | "20060005132" | "20060181406" | "20070180436" | "20080112313" | "4843606" | "5245608" | "5774461" | "5892769" | "6195760" | "6266781" | "6295447" | "6366826" | "6411991" | "6437692" | "6522628" | "6611834" | "7020501" | "7069027" | "7076211").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2012/12/02 10:42
S59	171	identifier and (program$4 adj2 block$4) and toy$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/12/02 10:47
S60	3	S59 and (source adj2 identifier)	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2012/12/02 10:48

			EPO; JPO; DERWENT; IBM_TDB			

5/ 23/ 2013 7:50:23 PM
C:\ Users\ nnguyen2\ Documents\ EAST\ Workspaces\ 13801773-programmable communicator dev.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13801773	WESBY VAN-SWAAY ET AL.
	Examiner	Art Unit
	NAM V NGUYEN	2682

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
340	539.12; 573.4; 693.5; 7.29; 7.33; 7.52	5/22/13	NN
455	456; 456.2; 418; 419; 425	5/22/13	NN
379	142; 373; 375	5/22/13	NN

SEARCH NOTES		
Search Notes	Date	Examiner
Search EAST: USPAT; USPUB; EPO; JPO; and Derwent.	5/22/13	NN
Search Terms: authorized list in cellular hone with monitoring device; external device monitoring; monitor central station; monitor module with address; code number/id address and/or number;	5/22/13	NN
Updated from 11/329,212	5/22/13	NN
Updated from 12/538,603	5/22/13	NN
updated from 13/328,095	5/22/13	NN

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/N.V.N./ Primary Examiner.Art Unit 2682

Practitioner's Docket No. 3781/1010 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Wesby van-Swaay

Application No.:	13/801,773	Art Unit/Group No.:	2642
Filing Date:	March 13, 2013	Examiner:	Not yet assigned
		Conf. No.:	7047 Nam Nguyen

For: PROGRAMMABLE COMMUNICATOR

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

List of Sections Forming Part of This Information Disclosure Statement

The following sections are being submitted for this Information Disclosure Statement:

1. [x] Preliminary Statements
2. [x] Forms PTO/SB/08A and 08B (substitute for Form PTO-1449)
3. [ ] Statement as to Information Not Found in Patents or Publications
4. [x] Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted
5. [ ] Cumulative Patents or Publications
6. [x] Copies of Listed Information Items Accompanying This Statement
7. [ ] Concise Explanation of Non-English Language Listed Information Items
   - 7A. [ ] EPO Search Report
   - 7B. [ ] English Language Version of EPO Search Report
8. [x] Translation(s) of Non-English Language Documents
9. [ ] Concise Explanation of English Language Listed Information Items (Optional)
10. [x] Identification of Person(s) Making This Information Disclosure Statement

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 1. Preliminary Statements

Applicants submit herewith patents, publications or other information, of which they are aware that they believe may be material to the examination of this application, and in respect of which, there may be a duty to disclose.

The filing of this information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

The filing of this information disclosure statement shall not be construed as an admission against interest in any manner. *Notice of January 9, 1992, 1135 O.G. 13-25, at 25.*

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Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby van-Swaay	Attorney Docket:	3781/1010
Serial No:	13/801,773	Art Unit/Group No.:	2642
Filing Date:	March 13, 2013	Examiner Name:	Not yet assigned
		Conf. No.:	7047

Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

U.S. PATENT DOCUMENTS					
Examiner Initials	**Reference Number**	**Document Number**	**Issue Date**	**Inventor**	**Class/Subclass**
	AA	US 4,465,904	Aug. 14, 1984	Gottsegen et al.	179/5 R
	AB	US 4,658,096	Apr.14, 1987	West, Jr. et al.	3379/59
	AC	US 4,855,713	Aug. 8, 1989	Brunius	340/506
	AD	US 4,908,853	Mar. 13, 1990	Matsumoto	379/355
	AE	US 4,951,029	Aug. 21, 1990	Severson	340/506
	AF	US 5,012,234	Apr. 30, 1991	Dulaney et al.	340/825.44
	AG	US 5,276,729	Jan. 4, 1994	Higuchi et al.	379/58
	AH	US 5,293,418	Mar. 8, 1994	Fukawa	379/58
	AI	US 5,348,008 A	Sep. 20, 1994	Bornn et al.	128/642
	AJ	US 5,381,138	Jan. 10, 1995	Stair et al.	340/825.44
	AK	US 5,396,264	Mar. 7, 1995	Falcone et al.	345/146
	AL	US 5,544,661 A	Aug. 13, 1996	Davis et al.	128/700
	AM	US 5,548,271	Aug. 20, 1996	Tsuchiyama et al.	340/311.1
	AN	US 5,581,599	Dec. 3, 1996	Tsuji et al.	379/63
	AO	US 5,581,803	Dec. 3, 1996	Grube et al.	455/54.1
	AP	US 5,623,533	Apr. 22, 1997	Kikuchi et al.	379/58
	AQ	US 5,689,442	Nov. 18, 1997	Swanson et al.	364/550
	AR	US 5,689,563	Nov. 18, 1997	Brown et al.	380/23
	AS	US 5,742,233 A	Apr. 21, 1998	Hoffman et al.	340/573
	AT	US 5,742,666	Apr. 21, 1998	Alpert	379/58
	AU	US 5,745,049	Apr. 28, 1998	Akiyama et al.	340/870.17
	AV	US 5,752,976	May 19, 1998	Duffin et al.	607/32
	AW	US 5,771,455	Jun. 23, 1998	Kennedy III et al.	455/456
	AX	US 5,774,804	Jun. 30, 1998	Williams	455/419
	AY	US 5,802,460	Sep. 1, 1998	Parvulescu et al.	455/92
	AZ	US 5,831,545	Nov. 3, 1998	Murray et al.	340/825.49
	BA	US 5,878,339	Mar. 2, 1999	Zicker et al.	455/419
	BB	US 5,884,161	Mar. 16, 1999	Hegeman	455/414
	BC	US 5,903,634	May 11, 1999	Wakabayashi et al.	379/127
	BD	US 5,940,752	Aug. 17, 1999	Henrick	455/419
	BE	US 5,946,636	Aug. 31, 1999	Uyeno et al.	455/566

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

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Examiner Initials	**Reference Number**	**Document Number**	**Issue Date**	**Inventor**	**Class/Subclass**
	BF	US 5,948,064	Sep. 7, 1999	Bertram et al.	709/225
	BG	US 5,960,366	Sep. 28, 1999	Duwaer	455/556
	BH	US 5,974,312	Oct. 26, 1999	Hayes, Jr. et al.	455/419
	BI	US 5,995,603	Nov. 30, 1999	Anderson	379/142
	BJ	US 5,997,476 A	Dec. 7, 1999	Brown	600/300
	BK	US 5,999,990	Dec. 7, 1999	Sharrit et al.	710/8
	BL	US 6,026,293	Feb. 15, 2000	Osborn	455/411
	BM	US 6,031,828	Feb. 29, 2000	Koro et al.	370/336
	BN	US 6,038,491 A	Mar. 14, 2000	McGarry et al.	700/231
	BO	US 6,041,229	Mar. 21, 2000	Turner	455/420
	BP	US 6,072,396	Jun. 6, 2000	Gaukel	340/573.4
	BQ	US 6,075,451	Jun. 13, 2000	Lebowitz et al.	340/825.06
	BR	US 6,078,948	Jun. 20, 2000	Podgorny et al.	709/204
	BS	US 6,108,521	Aug. 22, 2000	Foladore et al.	455/31.3
	BT	US 6,125,273	Sep. 26, 2000	Yamagishi	455/411
	BU	US 6,144,859	Nov. 7, 2000	LaDue	455/511
	BV	US 6,148,197	Nov. 14, 2000	Bridges et al.	455/432
	BW	US 6,157,318	Dec. 5, 2000	Minata	340/825.44
	BX	US 6,172,616	Jan. 9, 2001	Johnson et al.	340/870.12
	BY	US 6,198,390 B1	Mar. 6, 2001	Schlager et al.	340/540
	BZ	US 6,208,039	Mar. 27, 2001	Mendelsohn et al.	307/52
	CA	US 6,208,839	Mar. 27, 2001	Davani	455/31.3
	CB	US 6,208,854	Mar. 27, 2001	Roberts et al.	455/417
	CC	US 6,215,994	Apr. 10, 2001	Schmidt et al.	455/419
	CD	US 6,230,002	May 8, 2001	Flodén et al.	455/411
	CE	US 6,275,143	Aug. 14, 2001	Stobbe	340/10.34
	CF	US 6,288,641	Sep. 11, 2001	Casais	340/539
	CG	US 6,289,084	Sep. 11, 2001	Bushnell	379/67.1
	CH	US 6,295,449	Sep. 25, 2001	Westerlage et al.	455/422
	CI	US 6,308,083	Oct. 23, 2001	King	455/556
	CJ	US 6,314,270	Nov. 6, 2001	Uchida	455/67.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby van-Swaay	Attorney Docket:	3781/1010
Serial No:	13/801,773	Art Unit/Group No.:	2642
Filing Date:	March 13, 2013	Examiner Name:	Not yet assigned
		Conf. No.:	7047

Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

U.S. PATENT DOCUMENTS					
Examiner Initials	**Reference Number**	**Document Number**	**Issue Date**	**Inventor**	**Class/Subclass**
	CK	US 6,377,161	Apr. 23, 2002	Gromelski et al.	340/7.45
	CL	US 6,411,198	Jun. 25, 2002	Hirai et al.	340/7.6
	CM	US 6,424,623	Jul. 23, 2002	Borgstahl et al.	370/230
	CN	US 6,442,432	Aug. 27, 2002	Lee	607/59
	CO	US 6,487,478	Nov. 26, 2002	Azzaro et al.	701/24
	CP	US 6,496,777	Dec. 17, 2002	Tennison et al.	701/213
	CQ	US 6,519,242 B1	Feb. 11, 2003	Emery et al.	370/338
	CR	US 6,553,418	Apr. 22, 2003	Collins et al.	709/224
	CS	US 6,567,671 B2	May 20, 2003	Amin	455/550
	CT	US 6,573,825	Jun. 3, 2003	Okano	340/7.51
	CU	US 6,577,881	Jun. 10, 2003	Ehara	455/563
	CV	US 6,606,508	Aug. 12, 2003	Becker et al.	455/567
	CW	US 6,611,755	Aug. 26, 2003	Coffee et al.	701/213
	CX	US 6,633,784	Oct. 14, 2003	Lovelace II et al.	700/65
	CY	US 6,658,586	Dec. 2, 2003	Levi	714/4
	CZ	US 6,759,956	Jul. 6, 2004	Menard et al.	340/539.19
	DA	US 6,832,102	Dec. 14, 2004	I'Anson	455/556.1
	DB	US 6,833,787	Dec. 21, 2004	Levi	340/539.13
	DC	US 6,873,842	Mar. 29, 2005	Elayda et al.	455/418
	DD	US 6,900,737 B1	May 31, 2005	Ardalan et al	340/870.02
	DE	US 6,922,547	Jul. 26, 2005	O'Neill et al.	455/17
	DF	US 6,970,917	Nov. 29, 2005	Kushwaha et al.	709/217
	DG	US 6,985,742 B1	Jan. 10, 2006	Giniger et al.	455/456.1
	DH	US 6,988,989	Jan. 24, 2006	Weiner et al.	600/300
	DI	US 7,027,808	Apr. 11, 2006	Wesby	455/419
	DJ	US 7,084,771 B2	Aug. 1 2006	Gonzalez	340/573.1
	DK	US 7,254,601	Aug. 7, 2007	Baller et al.	709/200
	DL	US 7,558,564	Jul. 7, 2009	Wesby	455/419
	DM	US 7,583,197	Sep. 1, 2009	Wesby Van Swaay	340/573.4
	DN	US 7,599,681	Oct. 6, 2009	Link II et al.	455/411
	DO	US 8,094,010	Jan. 10, 2012	Wesby-van Swaay	340/539.12

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby van-Swaay	Attorney Docket:	3781/1010
Serial No:	13/801,773	Art Unit/Group No.:	2642
Filing Date:	March 13, 2013	Examiner Name:	Not yet assigned
		Conf. No.:	7047

Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

U.S. PATENT PUBLICATION DOCUMENTS					
Examiner Initials	**Reference Number**	**Document Number**	**Publication Date**	**Inventor**	**Class/ Subclass**
	DP	US 2001/0001234	May 17, 2001	Addy et al.	340/531
	DQ	US 2002/0046353	Apr. 18, 2002	Kishimoto	713/202
	DR	US 2002/0080938	Jun. 27, 2002	Alexander III et al.	379/106.01
	DS	US 2002/0198997	Dec. 26, 2002	Linthicum et al.	709/227
	DT	US 2003/0176952	Sep. 18, 2003	Collins et al.	700/286
	DU	US 2010/0035580	Feb. 11, 2010	Wesby - Van Swaay	455/411
	DV	US 2012/0088474 A1	Apr. 12, 2012	Wesby-van Swaay	455/411

FOREIGN PATENT DOCUMENTS						
Examiner Initials	**Reference Number**	**Country Code**	**Document Number**	**Publication Date**	**Patentee or Applicant**	**Class/Subclass**
	DW	EP	0 432 746 A2	Jun. 19, 1991	Siemens Nixdorf Inf Syst	H04M 1/57
	DX	EP	0 432 746 A2 **[English Abstract]**	Jun. 19, 1991	Siemens Nixdorf Inf Syst	H04M 1/57
	DY	EP	0 524 652 A2	Jan. 27, 1993	Ransome Industries Ltd	H04M 1/274
	DZ	WO	95/05609 A2	Feb. 23, 1995	Real Time Data	G01R 27/14
	EA	JP	07-087211 A	Mar. 31, 1995	Fuji Facom Corp	H04M 11/00
	EB	JP	07-087211 A **[English Abstract]**	Mar. 31, 1995	Fuji Facom Corp	H04M 11/00
	EC	JP	09-64950	Mar. 7, 1997	Hitachi Ltd	H04M 1/02
	ED	JP	09-64950 **[English Abstract]**	Mar. 7, 1997	Hitachi Ltd	H04M 1/02

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

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LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

FOREIGN PATENT DOCUMENTS						
Examiner Initials	**Reference Number**	**Country Code**	**Document Number**	**Publication Date**	**Patentee or Applicant**	**Class/Subclass**
	EE	EP	0 772 336 A2	May 7, 1997	Straeuli et al.	H04M 9/00
	EF	EP	0 772 336 A2 **[English Abstract]**	May 7, 1997	Straeuli et al.	H04M 9/00
	EG	WO	97/23104 A1	Jun. 26, 1997	Ericsson Inc	H04Q 7/22
	EH	DE	196 25 581 A1	Dec. 18, 1997	Plaas-Link	G08B 25/10
	EI	DE	196 25 581 A1 **[English Abstract]**	Dec. 18, 1997	Plaas-Link	G08B 25/10
	EJ	DE	197 07 681 C1	May 7, 1998	Erbel et al.	H04M 1/00
	EK	DE	197 07 681 C1 **[English Abstract]**	May 7, 1998	Erbel et al.	H04M 1/00
	EL	WO	98/51059 A2	Nov. 12, 1998	Easy-Phone GmbH	H04M 1/72
	EM	WO	98/56197 A1	Dec. 10, 1998	Telia AB	H04Q 7/22
	EN	CA	2 293 393 A1	Dec. 23, 1998	Swisscom AG	H04Q 007/32
	EO	WO	99/13629 A1	Mar. 18, 1999	Wesby et al.	H04M 1/72
	EP	WO	99/34339 A2	Jul. 8, 1999	Ameritech Corp	G08B 29/00
	EQ	WO	99/49680 A1	Sep. 30, 1999	Bellsouth Intellectual Property Corp.	H04Q 7/22
	ER	WO	99/56262 A1	Nov. 4, 1999	1st International Security Technology OY	G08B 21/100
	ES	WO	00/18175 A2	Mar. 30, 2000	Urbanija et	H04Q 9/00

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Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

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	ET	JP	2000-115859 A	Apr. 21, 2000	Ericsson Inc.	H04Q 7/38
	EU	JP	2000-115859 A **[English Abstract]**	Apr. 21, 2000	Ericsson Inc.	H04Q 7/38
	EV	EP	0 996 302 A1	Apr. 26, 2000	Compagnie Financiere Alcatel	H04Q 7/32
	EW	EP	0 996 302 A1 **[English Abstract]**	Apr. 26, 2000	Compagnie Financiere Alcatel	H04Q 7/32
	EX	JP	2000-135384 A	May 16, 2000	Fujitsu Ltd	A63H 3/33
	EY	JP	2000-135384 A **[English Abstract]**	May 16, 2000	Fujitsu Ltd	A63H 3/33
	EZ	WO	00/56016 A1	Sep. 21, 2000	Siemens AG Österreich	H04L 12/28
	FA	WO	00/70889 A1	Nov. 23, 2000	Medtronic Physio-Control Manufacturing Corp	H04Q 7/08
	FB	WO	01/03414 A1	Jan. 11, 2001	Musco Corp	H04M 11/00
	FC	JP	2001-177668 A	Jun. 29, 2001	Toshiba Corp	H04M 11/00
	FD	JP	2001-177668 A **[English Abstract]**	Jun. 29, 2001	Toshiba Corp	H04M 11/00
	FE	JP	2001-249860 A	Sep. 14, 2001	Kenwood Corp	G06F 13/00

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Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

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	FF	JP	2001-249860 A **[English Abstract]**	Sep. 14, 2001	Kenwood Corp	G06F 13/00
	FG	JP	2002-077438 A	Mar. 15, 2002	Sony Corp	H04M 11/00
	FH	JP	2002-077438 A **[English Abstract]**	Mar. 15, 2002	Sony Corp	H04M 11/00
	FI	EP	1 013 055 B1	Apr. 27, 2005	Wesby et al.	H04M 1/72

OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
	FJ	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+)*; Network architecture (GSM 03.02, version 5.0.0), TS/SMG-030302Q, 20 pages (March, 1996)
	FK	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface* (GSM 11.11, version 5.3.0), TS/SMG-091111QR1, 113 pages (July, 1996)
	FL	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface* (GSM 11.14, version 5.1.0), TS/SMG-091114Q, 54 pages (August, 1996)
	FM	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment*

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OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			(SIM - ME) interface„ GSM 11.14, version 5.4.0), TS/SMG-091114Q, 56 pages (July, 1997)
	FN	ETSI European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME)* (GSM 07.07, version 5.5.0), RE/SMG-040707QR3, 97 pages (February, 1998)
	FO	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface* (GSM 11.11, version 7.2.0, Release 1998), SMG version only, not for publication, 133 pages (March, 1999)
	FP	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Use of Data Terminal Equipment - Data Circuit terminating; Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service* (CBS) (GSM 07.05, version 7.0.0, Release 1998), Available SMG only, 66 pages (March, 1999)
	FQ	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module – Mobile Equipment (SIM-ME) interface,* (GSM 11.11, version 7.4.0, Release 1998), 134 pages (December, 1999)
	FR	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Specification of the SIM application toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface*(GSM 11.14, version 6.2.0, Release 1997), 82 pages (November, 1998)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby van-Swaay	Attorney Docket:	3781/1010
Serial No:	13/801,773	Art Unit/Group No.:	2642
Filing Date:	March 13, 2013	Examiner Name:	Not yet assigned
		Conf. No.:	7047

Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
	FS	GEMPLUS	*Gemplus' start SIM card for advanced GSM services*, Microprocessor Cards, GemXplore98 Product Sheet, 2 pages (May, 1999)
	FT	Novatel Wireless	*Novatel CDPD (Cellular Digital Packet Data) Software*, 42 pages (1999)
	FU	Phonetics, Inc.	*Sensaphone 2000 User's* Manual, Version 3.0, 118 pages (January, 1998)
	FV	Phonetics, Inc.	*Sensaphone 1104, Sensaphone 1108 Potential Disasters*, Science/Health/Labs archived website page (http://www.sensaphone.com/pages/HealthPage.html), 2 pages (December, 1998)
	FW	Siemens	*Siemens Private Communication Systems, Technical Description of the Siemens A1* , Edition 5, 53 pages (January, 1998)
	FX	Siemens	*Siemens GSM Module M1 User Guide*, 76 pages (1996)
	FY	Siemens	*Cellular Engine Siemens M20 / M20 Terminal, Technical Description* ,Version 4, 198 pages (December, 1998)
	FZ	Siemens	*Cellular Engine Siemens M20 / M20 Terminal, Technical Description*, Version 5, 209 pages (March, 1999)
	GA	Siemens	*Cellular Engine Siemens M20 / M20 Terminal, Technical Description* , Version 7, 221 pages (October, 1999)
	GB	Sierra Wireless	*Dart 200 CDPD Modem, For CDPD Versions 1.0 and 1.1, User's Guide*, 206 pages (January, 1998)
	GC	Sine Systems, Inc.	*Model RFC-1/B, Remote Facilities Controller, archived website page*

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby van-Swaay	Attorney Docket:	3781/1010
Serial No:	13/801,773	Art Unit/Group No.:	2642
Filing Date:	March 13, 2013	Examiner Name:	Not yet assigned
		Conf. No.:	7047

Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			(http://www.sinesys.com/html/rfcl.html) 4 Pages (February, 1998)
	GD	Sine Systems, Inc.	*Remote Facilities Controller, Model RFC-1/B, Relay Panel, Model RP-8, Installation and Operation,* 97 pages (1999)
	GE	Sine Systems, Inc.	*Model RFC-1/B Remote Facilities Controller: Dial-up/Automated Transmitter Control System,* Press Release, 2 pages (July, 1999)
	GF	Telital	*GSM Datablock Product Specification,* Revision 2, 30 pages (November, 1997)
	GG	Telital	Technologies archived website page (http://www.telital.com/technologE.html) 2 pages (April, 2000)
	GH	Telital Automotive	*Telltal Automotive GM360, Technical Specification,* 36 pages (February, 1999)
	GI	Telital Automotive	*Telefono GSM Datablock II con funzioni Voce/Dati/Fax/SMS,* 91 pages (February, 1999)
	GJ	Telular Corporation	*Annual Report,* 48 pages (1998)
	GK	WAVECOM	*Wavecom GSM Modem,* Wavecom *WM01-G900,* Version 7.3, Reference WCOM/GSM/WMO1-G900/modATcmd, 67 pages (December, 1997)
	GL	WAVECOM	*WISMO Wireless Standard Module, WM1B-G1900 PCS Module Specifications driven by AT commands,* Version 1.2, Reference WCOM/PCS/8001 45 pages (September, 1998)
	GM	WAVECOM	*WM02 Modem Series GSM 900 /1800 /1900 User*

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

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Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			Manual, 23 pages (April, 1999)
	GN	WAVECOM	*WISMO Wireless Standard Module, WM2C-G900/G1800 EGSM/DCS DUAL BAND Module Specifications,* Verion 0.7, Reference:WCOM/GSM/WM2C_07, 51 pages (September, 1999)
	GO	Azzaro et al.	Provisional Application – 60/162,249, dated October 28, 1999 (21 pages)
	GP	3GPP (3rd Generation Partnership Project)	*3rd Generation Partnership Project; Technical Specification Group Terminals; Characteristics of the USIM Application* (3G TS 31.102, version 3.0.), 104 pages (January, 2000)
	GQ	3GPP (3rd Generation Partnership Project)	*3rd Generation Partnership Project; Technical Specification Group Terminals; AT command set for 3GPP User Equipment* (UE) (3G TS 27.007, version 3.4.0, Release 1999), 154 pages (March, 2000)
	GR	3GPP (3rd Generation Partnership Project)	*3rd Generation Partnership Project; Technical Specification Group Terminals;* USIM Application Toolkit (USAT) (3G TS 31.111, version 3.0.0, Release 1999), 138 pages (April, 2000)
	GS	Akselsen et al.	*Telemedicine and ISD,* IEEE Communications Magazine, pp. 46-51 (January, 1993)
	GT	Bettstetter et al.	*GSM Phase 2+ General Packet Radio Service GPRS: Architecture, Protocols, and Air Interface,* IEEE Communications Surveys, http://www.comsoc.org/pubs/surveys Vol. 2, No.3, pp. 2-14 (1999)
	GU	Bult et al.	*Low Power Systems for Wireless Microsensors,* UCLA

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

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Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

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Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			Electrical Engineering Department, Los Angeles, CA and Rockwell Science Center, Thousand Oaks, CA, 5 pages (1996)
	GV	Carman et al / NAI Labs	*A Communications Security Architecture and Cryptographic Mechanisms for Distributed Sensor Networks,* DARPA/ITO Sensor IT Workshop, 24 pages (October, 1999)
	GW	Chandrakasan et al.	*Design Considerations for Distributed Microsensor Systems,* Department of EECS, Massachusetts Institute of Technology, Cambridge, MA, IEEE 1999, Custom Intergrated Circuits Conference, 8 Pages (1999)
	GX	Godfrey	*A Comparison of Security Protocols in a Wireless Network Environment,* A thesis presented to the University of Waterloo, Ontario, Canada, 87 pages (1995)
	GY	Hodes et al.	*Composable ad hoc location-based services for heterogeneous mobile clients,* Wireless Networks 5, pp. 411-427 (1999)
	GZ	Istepanian et al.	*Design of mobile telemedicine systems using GSM and IS-54 cellular telephone standards,* Journal of Telemedicine and Telecare, Vol. 4, Supplement 1, pp. 80-82 (1999)
	HA	Istepanian	*Modelling of GSM-based Mobile Telemedical System,* Proceedings of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Vol. 20, No. 3, pp. 1166-

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Serial No:	13/801,773	Art Unit/Group No.:	2642
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Invention: PROGRAMMABLE COMMUNICATOR

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Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			1169 (1998)
	HB	Kahn et al.	*Next Century Challenges: Mobile Networking for "Smart Dust"*, Department of Electrical Engineering and Computer Science, 8 pages (1999)
	HC	Miles	*System Monitoring, Messaging and Notification,* Proceedings of SAGE-AU, 15 pages (June, 1999)
	HD	Pavlopoulos et al.	*A Novel Emergency Telemedicine System Based on Wireless Communication Technology - "Ambulance",* IEEE Transactions on Information in Biomedicine, Vol. 2, No.4, pp. 261-267 (1998)
	HE	Prasad et al.	*Security Architecture for Wireless LANs: Corporate & Public Environment,* IEEE VTC, pp. 283-287 (2000)
	HF	Redl et al.	*GSM and Personal Communications Handbook,*ISBN 0-89006-957-3, 80 pages (1998)
	HG	Schlumberger	*Schlumberger Java SIMs and Over-the-Air Server Allow Sunday to Evolve Phones Into Multi-Service Terminals,* 3 pages (July, 1999)
	HH	Steiner et al.	*Kerberos: An Authentication Service for Open Network Systems,* Project Athena, Massachusetts Institute of Technology, 15 pages (1988)
	HI	Taylor et al.	*Internetwork Mobility: The CDPD Approach,* 334 pages (June, 1996)
	HJ	Wu et al.	*A Mobile System for Real-Time Patient- Monitoring with Integrated Physiological Signal Processing* Proceedings of the First Joint BMES/EMBS Conference Serving Humanity, Advancing

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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		Conf. No.:	7047

Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			Technology, Atlanta, GA (October, 1999)
	HK	U.S.D.C. for the District of Delaware	Defendant's Initial Invalidity Contentions, including Appendix A-Z, AA and DD, 1046 pages (served on March 8, 2013)
	HL	U.S.D.C. for the District of Delaware	Defendant's Kowatec's Initial Invalidity Contentions, 3 pages (served April 15, 2013)
	HM	U.S.D.C. for the District of Delaware	Appendices DD-EE for Defendant's Kowatec's Initial Invalidity Contentions, 126 pages (served on April 15, 2013)

Examiner Signature: /Nam Nguyen/

Date Considered: 05/23/2013

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation *if not* in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 4. Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted

This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior application Serial Number: 13/328,095, filed December 16, 2013.

[X] This application also relies, under 35 U.S.C. section 120, on the earlier filing date of prior application Serial Number: 12/538,603, filed August 10, 2009.

[X] This application also relies, under 35 U.S.C. section 120, on the earlier filing date of prior application Serial Number: 11/329,212, filed January 10, 2006.

[X] This application also relies, under 35 U.S.C. section 120, on the earlier filing date of prior application Serial Number: 10/296,571, filed, May 18, 2001.

The following references were submitted to, and/or cited by, the Office in the prior application(s) and, therefore, are not required to be provided in this application:

References: **AA, AC-AE, AG-AH, AJ-AK, AM-AR, AT-BI, BK-BM, BO-CP, CR, CT-DC, DE-DU, DW-DY, EA-EL, EO-EP, ET-FI, FM, FQ, GO**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 6. Copies of Listed Information Items Accompanying This Statement

Legible copies of all items listed in Forms PTO/SB/08A and 08B (substitute for Form PTO-1449) accompany this information statement.

[x] Exception(s) to above:

U.S. patent citations are not included pursuant to the United States Patent and Trademark Office's September 21, 2004 waiver of the copy requirement in 37 CFR 1.98 for cited pending U.S. patent citations when the patent citations are available in the USPTO's IFW system.

[ ] Items in prior application, from which an earlier filing date is claimed for this application, as identified in Section 4.

[ ] Cumulative patents or publications identified in Section 5.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 8. Translation(s) of Non-English Language Documents

Submitted herewith is an English translation of the following foreign language patents, publications or information or of those portions of those patents, publications or information considered to be material:

Reference **DX** is believed to be the English abstract of Reference **DW**
Reference **EB** is believed to be the English abstract of Reference **EA**
Reference **ED** is believed to be the English abstract of Reference **EC**
Reference **EF** is believed to be the English abstract of Reference **EE**
Reference **EI** is believed to be the English abstract of Reference **EH**
Reference **EK** is believed to be the English abstract of Reference **EJ**
Reference **EJ** is believed to be the English abstract of Reference **EI**
Reference **EU** is believed to be the English abstract of Reference **ET**
Reference **EW** is believed to be the English abstract of Reference **EV**
Reference **EY** is believed to be the English abstract of Reference **EX**
Reference **FD** is believed to be the English abstract of Reference **FC**
Reference **FF** is believed to be the English abstract of Reference **FE**
Reference **FH** is believed to be the English abstract of Reference **FG**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 10. Identification of Person Making This Information Disclosure Statement

The person making this certification is the practitioner of record.

Dated: May 14, 2013

/Jonathan C. Lovely, #60,821/
SIGNATURE OF PRACTITIONER

Reg. No. 60,821

Jonathan C. Lovely
(type or print name of practitioner)

Tel. No.: (617) 443-9292

Sunstein Kann Murphy & Timbers LLP
125 Summer Street, 11th Floor
Firm/Street Address

Customer No.: 002101

Boston, MA 02110-1618
City/State/Zip Code

03781/01010 1885579.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13801773	WESBY VAN-SWAAY ET AL.
	Examiner	Art Unit
	NAM V NGUYEN	2682

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/23/2013								
	1	-								
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	34	✓								
	35	✓								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
	NAM V NGUYEN	2682

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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/23/2013								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
	41	✓								
	42	✓								
	43	✓								
	44	✓								
	45	✓								
	46	✓								
	47	✓								
	48	✓								
	49	✓								
	50	✓								

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BIB DATA SHEET

CONFIRMATION NO. 7047

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/801,773	03/13/2013	340	2682	3781/1010

APPLICANTS

Eveline Wesby van-Swaay, Stratford-upon-Avon, UNITED KINGDOM;
M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

**** CONTINUING DATA **************************** Yes /NN/

This application is a CON of 13/328,095 12/16/2011
which is a CON of 12/538,603 08/10/2009 PAT 8094010
which is a CON of 11/329,212 01/10/2006 PAT 7583197
which is a CON of 10/296,571 01/21/2003 ABN
which is a 371 of PCT/EP01/05738 05/18/2001

**** FOREIGN APPLICATIONS *************************** None /NN/

FINLAND 20001239 05/23/2000

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
04/16/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /NAM V NGUYEN/ Examiner's Signature	☐ Met after Allowance NN Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		UNITED KINGDOM	3	20	1

ADDRESS

Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618
UNITED STATES

TITLE

Programmable Communicator

FILING FEE RECEIVED		
1233	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Electronic Acknowledgement Receipt

EFS ID:	15767128
Application Number:	13801773
International Application Number:	
Confirmation Number:	7047
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Customer Number:	2101
Filer:	Jonathan Lovely
Filer Authorized By:	
Attorney Docket Number:	3781/1010
Receipt Date:	14-MAY-2013
Filing Date:	13-MAR-2013
Time Stamp:	11:39:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	HK_1.pdf	10448492 1a04bafdba7e4451c6d97a3c5cfed43a8d4bfc7f	no	248

Warnings:	
Information:	

2	Non Patent Literature	HK_2.pdf	10461021 987f4eeeaff7e5f00387c961a0c5541a5408a98f	no	157
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Information:					
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Information:					
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6	Non Patent Literature	HK_6.pdf	10329518 d5925227cc110a11751fe0e892b106f4facaa76f	no	187
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Information:					
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8	Non Patent Literature	HL.pdf	78836 66faf917c341c6fce1c0b0419f292d7250419fd7	no	3
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9	Non Patent Literature	HM.pdf	3756602 0fe4e4a77fe366166f5c95ad3d11b6a65ebf5f43	no	126
Warnings:					
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			Total Files Size (in bytes):	71220671	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Practitioner's Docket No. 3781/1010 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Wesby van-Swaay

Application No.:	13/801,773	Art Unit/Group No.:	2642
Filing Date:	March 13, 2013	Examiner:	Not yet assigned
		Conf. No.:	7047

For: PROGRAMMABLE COMMUNICATOR

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

List of Sections Forming Part of This Information Disclosure Statement

The following sections are being submitted for this Information Disclosure Statement:

1. [x] Preliminary Statements
2. [x] Forms PTO/SB/08A and 08B (substitute for Form PTO-1449)
3. [ ] Statement as to Information Not Found in Patents or Publications
4. [x] Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted
5. [ ] Cumulative Patents or Publications
6. [x] Copies of Listed Information Items Accompanying This Statement
7. [ ] Concise Explanation of Non-English Language Listed Information Items
   - 7A. [ ] EPO Search Report
   - 7B. [ ] English Language Version of EPO Search Report
8. [x] Translation(s) of Non-English Language Documents
9. [ ] Concise Explanation of English Language Listed Information Items (Optional)
10. [x] Identification of Person(s) Making This Information Disclosure Statement

Section 1. Preliminary Statements

Applicants submit herewith patents, publications or other information, of which they are aware that they believe may be material to the examination of this application, and in respect of which, there may be a duty to disclose.

The filing of this information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

The filing of this information disclosure statement shall not be construed as an admission against interest in any manner. *Notice of January 9, 1992, 1135 O.G. 13-25, at 25.*

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

U.S. PATENT DOCUMENTS					
Examiner Initials	**Reference Number**	**Document Number**	**Issue Date**	**Inventor**	**Class/Subclass**
	AA	US 4,465,904	Aug. 14, 1984	Gottsegen et al.	179/5 R
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	FK	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface* (GSM 11.11, version 5.3.0), TS/SMG-091111QR1, 113 pages (July, 1996)
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	FO	European Telecommunications Standards Institute (ETSI)	*Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface* (GSM 11.11, version 7.2.0, Release 1998), SMG version only, not for publication, 133 pages (March, 1999)
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	GJ	Telular Corporation	*Annual Report,* 48 pages (1998)
	GK	WAVECOM	*Wavecom GSM Modem,* Wavecom *WM01-G900,* Version 7.3, Reference WCOM/GSM/WMO1-G900/modATcmd, 67 pages (December, 1997)
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	GT	Bettstetter et al.	*GSM Phase 2+ General Packet Radio Service GPRS: Architecture, Protocols, and Air Interface,* IEEE Communications Surveys, http://www.comsoc.org/pubs/surveys Vol. 2, No.3, pp. 2-14 (1999)
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Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby van-Swaay	Attorney Docket:	3781/1010
Serial No:	13/801,773	Art Unit/Group No.:	2642
Filing Date:	March 13, 2013	Examiner Name:	Not yet assigned
		Conf. No.:	7047

Invention: PROGRAMMABLE COMMUNICATOR

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT

OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			Electrical Engineering Department, Los Angeles, CA and Rockwell Science Center, Thousand Oaks, CA, 5 pages (1996)
	GV	Carman et al / NAI Labs	*A Communications Security Architecture and Cryptographic Mechanisms for Distributed Sensor Networks,* DARPA/ITO Sensor IT Workshop, 24 pages (October, 1999)
	GW	Chandrakasan et al.	*Design Considerations for Distributed Microsensor Systems,* Department of EECS, Massachusetts Institute of Technology, Cambridge, MA, IEEE 1999, Custom Intergrated Circuits Conference, 8 Pages (1999)
	GX	Godfrey	*A Comparison of Security Protocols in a Wireless Network Environment,* A thesis presented to the University of Waterloo, Ontario, Canada, 87 pages (1995)
	GY	Hodes et al.	*Composable ad hoc location-based services for heterogeneous mobile clients,* Wireless Networks 5, pp. 411-427 (1999)
	GZ	Istepanian et al.	*Design of mobile telemedicine systems using GSM and IS-54 cellular telephone standards,* Journal of Telemedicine and Telecare, Vol. 4, Supplement 1, pp. 80-82 (1999)
	HA	Istepanian	*Modelling of GSM-based Mobile Telemedical System,* Proceedings of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Vol. 20, No. 3, pp. 1166-

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Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			1169 (1998)
	HB	Kahn et al.	*Next Century Challenges: Mobile Networking for "Smart Dust"*, Department of Electrical Engineering and Computer Science, 8 pages (1999)
	HC	Miles	*System Monitoring, Messaging and Notification,* Proceedings of SAGE-AU, 15 pages (June, 1999)
	HD	Pavlopoulos et al.	*A Novel Emergency Telemedicine System Based on Wireless Communication Technology - "Ambulance",* IEEE Transactions on Information in Biomedicine, Vol. 2, No.4, pp. 261-267 (1998)
	HE	Prasad et al.	*Security Architecture for Wireless LANs: Corporate & Public Environment*, IEEE VTC, pp. 283-287 (2000)
	HF	Redl et al.	*GSM and Personal Communications Handbook*,ISBN 0-89006-957-3, 80 pages (1998)
	HG	Schlumberger	*Schlumberger Java SIMs and Over-the-Air Server Allow Sunday to Evolve Phones Into Multi-Service Terminals*, 3 pages (July, 1999)
	HH	Steiner et al.	*Kerberos: An Authentication Service for Open Network Systems,* Project Athena, Massachusetts Institute of Technology, 15 pages (1988)
	HI	Taylor et al.	*Internetwork Mobility: The CDPD Approach,* 334 pages (June, 1996)
	HJ	Wu et al.	*A Mobile System for Real-Time Patient- Monitoring with Integrated Physiological Signal Processing* Proceedings of the First Joint BMES/EMBS Conference Serving Humanity, Advancing

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OTHER DOCUMENTS			
Examiner Initials	**Reference Number**	**Author**	**Title of Article, Title of Journal, Volume Number, Page Numbers, Date**
			Technology, Atlanta, GA (October, 1999)
	HK	U.S.D.C. for the District of Delaware	Defendant's Initial Invalidity Contentions, including Appendix A-Z, AA and DD, 1046 pages (served on March 8, 2013)
	HL	U.S.D.C. for the District of Delaware	Defendant's Kowatec's Initial Invalidity Contentions, 3 pages (served April 15, 2013)
	HM	U.S.D.C. for the District of Delaware	Appendices DD-EE for Defendant's Kowatec's Initial Invalidity Contentions, 126 pages (served on April 15, 2013)

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Date Considered: _____

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation *if not* in conformance and not considered. Include copy of this form with next communication to applicant.

Section 4. Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted

This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior application Serial Number: 13/328,095, filed December 16, 2013.

[X] This application also relies, under 35 U.S.C. section 120, on the earlier filing date of prior application Serial Number: 12/538,603, filed August 10, 2009.

[X] This application also relies, under 35 U.S.C. section 120, on the earlier filing date of prior application Serial Number: 11/329,212, filed January 10, 2006.

[X] This application also relies, under 35 U.S.C. section 120, on the earlier filing date of prior application Serial Number: 10/296,571, filed, May 18, 2001.

The following references were submitted to, and/or cited by, the Office in the prior application(s) and, therefore, are not required to be provided in this application:

References: **AA, AC-AE, AG-AH, AJ-AK, AM-AR, AT-BI, BK-BM, BO-CP, CR, CT-DC, DE-DU, DW-DY, EA-EL, EO-EP, ET-FI, FM, FQ, GO**

Section 6. Copies of Listed Information Items Accompanying This Statement

Legible copies of all items listed in Forms PTO/SB/08A and 08B (substitute for Form PTO-1449) accompany this information statement.

[x] Exception(s) to above:

U.S. patent citations are not included pursuant to the United States Patent and Trademark Office's September 21, 2004 waiver of the copy requirement in 37 CFR 1.98 for cited pending U.S. patent citations when the patent citations are available in the USPTO's IFW system.

[ ] Items in prior application, from which an earlier filing date is claimed for this application, as identified in Section 4.

[ ] Cumulative patents or publications identified in Section 5.

Section 8. Translation(s) of Non-English Language Documents

Submitted herewith is an English translation of the following foreign language patents, publications or information or of those portions of those patents, publications or information considered to be material:

Reference **DX** is believed to be the English abstract of Reference **DW**
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Reference **FH** is believed to be the English abstract of Reference **FG**

Section 10. Identification of Person Making This Information Disclosure Statement

The person making this certification is the practitioner of record.

Dated: May 14, 2013

/Jonathan C. Lovely, #60,821/
SIGNATURE OF PRACTITIONER

Reg. No. 60,821

Jonathan C. Lovely
(type or print name of practitioner)

Tel. No.: (617) 443-9292

Sunstein Kann Murphy & Timbers LLP
125 Summer Street, 11th Floor
Firm/Street Address

Customer No.: 002101

Boston, MA 02110-1618
City/State/Zip Code

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(71) Applicant: REAL TIME DATA [US/US]; 1756 114th Avenue S.E. #255, Bellevue, WA 98004 (US).

(72) Inventors: ELDREDGE, Christopher; 22242 N.E. 31st, Redmond, WA 98053 (US). HERN, Steven; 16113 70th N.E., Bothell, WA 98011 (US). ROBINSON, Ian; 5835 South Fish, Freeland, WA 98249 (US).

(74) Agent: LIGHTBODY, William; 2121 East Ohio Building, 1717 East Ninth Street, Cleveland, OH 44114 (US).

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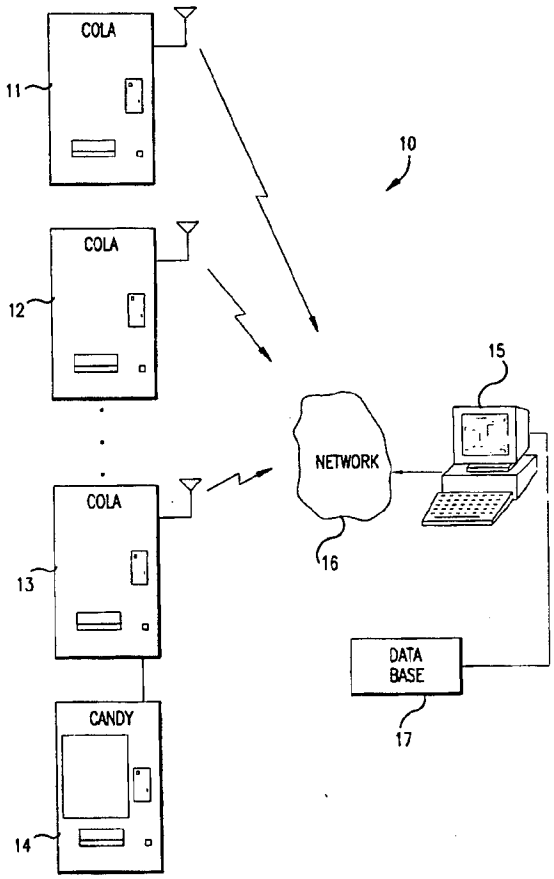
(57) Abstract

A system for remotely monitoring a plurality of vending machines from a central computer. The system includes a sensing and communication circuit that monitors the operation of the vending machine, translates the monitored operation into a common signal form whatever the machine, and transmits data packets including pertinent information back to the central computer. The sensing and communication circuit includes a plurality of sensors disposed throughout the vending machine. A microprocessor reads the output signals produced by the sensors and generates a data packet that is indicative of the sensor values and the operation of the vending machine. This microprocessor is coupled to a modem that transmits the data packet over a network to the central computer system. The central computer is similarly equipped with a modem to receive the data packets. Information regarding the operation of the vending machines is displayed in a graphical format or printed in reports to allow a user to quickly determine the status of a remote vending machine. Further the data on the machines can be historically processed so as to provide status over time information.



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SYSTEM FOR MONITORING REMOTE VENDING MACHINES

Technical Field

The present invention relates to communications systems in general and, in particular, to systems for monitoring the operation of one or more remote vending machines and transmitting data from the remote vending machines to a central computer system.

Background Art

This application is a continuation in part of Application U.S. Serial No. 08/108,815 filed August 18, 1993, System For Monitoring Remote Vending Machines.

Vending machines, once provided by bottlers or shopkeepers solely as a secondary source of advertising or as a convenience to customers, are now viewed as significant sources of income. However, in order to operate a series of vending machines at a profit, an efficient system must be provided for adequately insuring security, maintaining, filling and removing money collected at the machines. Typically, a route of a number of vending machines employs service technicians who restock the machines, empty money and perform minor repairs on-site. These technicians often have a schedule to visit each vending machine at a predetermined time interval. The particular time interval used is often based on prior experience concerning when the machine will need refilling or when the change box will become full. If the service visits are too infrequent, the machine can remain empty for a period of time, thereby missing sales opportunities. Alternatively, if the service visits are too frequent, then the service technician's services are not being efficiently used. Also, visits are typically scheduled over a route of machines grouped together by geography no matter a particular machine's service needs.

In order to help vending machine operators become more efficient, prior systems for monitoring remote

vending machines have been proposed. For example, Sedam U.S. Patent 4,412,292 discloses a system that monitors the status of a vending machine and transmits data to a central computer via a dedicated phone line. Cedrone U.S. Patent 4,766,548 discloses a system for monitoring the operation of a machine and periodically reporting data from the machine to a central computer via a non-dedicated telephone line.

While such prior art systems have been available for several years, they have not achieved widespread use in the marketplace. One reason for this is that these systems require each remote vending machine to be connected to its own telephone line. Providing each vending machine with a telephone line presents numerous problems including the fact that the telephone company must be called to install a line for each machine. The telephone line extending from the machine is subject to vandalism or unauthorized use and the fact that once a vending machine is coupled to a telephone line, it is inconvenient to move the machine to another location.

An alternative communications system between a vending machine and central computer is disclosed in Jackson U.S. Patent 5,142,694. Jackson discloses a system whereby a dedicated, special purpose radio communication system is used to transmit information from the remote vending machines to the central computer. The problem with this type of radio frequency communication system is that a vending machine operator must purchase specific radio communications equipment for which the operator may not have the skill or support staff to maintain. Also, the operator may have to lease space throughout a given geographic area at which to place numerous radio transceivers or repeaters. Finally, such a radio communication system occupies space on the radio frequency spectrum that may be prohibitively expensive to purchase or utilize.

In addition to the above, most vending machine manufacturers have proprietary wiring and internal communication systems within their vending machines, wiring and communication systems which may even vary between successive machines of the same model type. This presents problems for any monitoring of the operation of remote vending machines by typically requiring a system to be useable with only a single type of machine. This necessitates a uniquely designed and built monitoring and communication system for each type of machine. The uniqueness of individual machines also presents problems in developing correct monitoring system reports due to the difference between the information available machine to machine.

In light of the problems with the prior art systems for monitoring and communicating with a remote vending machine, there is a need for a new type of vending machine monitoring system. The system should not require a dedicated telephone line to be connected to each vending machine or the use of specialized radio frequency communication equipment. The system should allow the owner or operator of one or more vending machines to automatically keep count of the product delivered by the machine, the money collected, maintenance problems, and/or alarm conditions experienced at a remote vending machine. The information should be presented to an operator in an intuitive fashion, thereby allowing the user to readily determine the status of a remotely located vending machine. The information should be retained and/or organized so as to communicate meaningful data about the user's business, and then be summarized in reports on conditions.

In addition, the information should be presented to the operator in a common way for all vending machines so as to allow the operator to more easily comprehend and act on such information.

Disclosure Of Invention

The present invention is a system for monitoring the operation of a remotely located vending machine. A plurality of sensors are disposed in the vending machine to sense the operation of the machine, as well as machine malfunctions. Preferably these sensors are tied in directly but not invasively to the machines wiring harness. The sensors are coupled to a microprocessor circuit, which reads the set of output signals produced by the sensors. The microprocessor creates data packets that are indicative of the output signals to be transmitted to a central computer system. The data packets of many units may be combined for unitary transmission. A modem is used to transmit the data packets to the central computer system over a network. The data packets are received by a second modem coupled to the central computer system and the information regarding the output signals of the sensors are stored in a database.

The central computer displays the information received from the vending machine in alternate formats, including graphically so that a user is able to easily determine the operating condition of the vending machine. In addition, the central computer is optionally able to transmit data packets to the remote vending machine in order to read the memory of the microprocessor in the vending machine, rewrite the memory of the microprocessor, set operating conditions of the vending machine that constitute an alarm condition, and define what alarm conditions are critical.

The central computer optionally can also transmit data to the remote vending machine that sets a password for a service technician to be entered upon servicing the vending machine as well as transmitting message data to be read by the service technician during a service call. The present invention may also include a handheld data entry terminal that is used by a service technician to inform the microprocessor of the amount of

product added, the money removed from the machine, the amount of change left in the change counter, etc. if the system utilizes such at the machines location. The handheld terminal can communicate with the microprocessor using an infrared optical link or through a lead, which is attachable to a serial plug in the vending machine. The data is retained and can be manipulated in the central computer so as to enable the operator to utilize the data meaningfully over time on a comprehensive basis.

Brief Description Of The Drawings

The foregoing aspects and many of the attendant advantages of items in the invention will become more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a block diagram of a system for remotely monitoring a plurality of vending machines according to the present invention;

FIGURE 2 is a representational block diagram of the system for monitoring a plurality of vending machines as shown in figure 1;

FIGURE 3 is a representational block diagram of a tap in adaptor assembly for use in adapting individual unique machines to the sensing and communication circuit of the present invention;

FIGURE 4 is a block diagram of a sensing and communication circuit according to the present invention that is disposed in a remote vending machine;

FIGURE 5 is a state diagram showing the operation of the sensing and communication circuit disposed in a remote vending machine;

FIGURE 6 is a flow chart showing the operation of the sensing and communication circuit in a control mode;

FIGURE 7 is a flow chart showing the operation of the sensing and communication circuit in a communications mode;

FIGURE 8 is a flow chart showing the operation of the sensing and communication circuit in a service mode;

FIGURE 9 is a flow chart showing operation of the sensing and communication circuit in an analyze mode;

FIGURE 10 is a flow chart showing the operation of the sensing and communication circuit in an alarm mode;

FIGURE 11 is a diagram showing the structure of a data packet transmitted between a remote vending machine and a central computer system;

FIGURE 12 shows a handheld data entry terminal that is used to enter data directly to the sensing and communication circuit shown in FIGURE 4;

FIGURE 13 is a block diagram of the handheld data entry terminal;

FIGURE 14 shows a graphical representation of a remote vending machine that is produced by the central computer system; and,

FIGURE 15 shows a graphical representation of a route of remote vending machines that are monitored by the present invention.

Modes For Carrying Out The Invention

FIGURE 1 is a block diagram of a system 10 for remotely monitoring a plurality of vending machines according to the present invention. The system 10 monitors the operation of a plurality of remote vending machines 11, 12, 13, 14 and transmits data indicative of the operation of the vending machines to a central computer system 15. Each vending machine is equipped with a plurality of sensors (not shown) that monitor the operation of the machine to determine the amount of product dispensed, whether there has been any unauthorized entry, if there has been power failure, as well as other

operating conditions as will be described in further detail below. The sensors may be directly tapped into the wiring harness or otherwise present. Each vending machine further includes a modem (not shown) that is used to transmit data to the central computer system 15 over a link 16 that is provided by a network.

As will be further described below, each vending machine is equipped with a sensing and communication circuit that reads the data from a plurality of sensors and transmits one or more data packets to the central computer 15. The central computer 15 includes a suitable modem, which is coupled to the network in order to receive the data packets. The central computer system includes a database system 17 that stores the information received from each remote vending machine as well as produces written reports. The central computer 15 can read from the database to inform a user of the operating status of any vending machine that is or was in contact with the central computer.

Although the present invention is described with respect to vending machines and in particular to soft drink dispensing machines, those skilled in the art will realize that the present invention can be used with other types of vending machine, such as cigarette and candy machines, telephones, copiers, as well as numerous other types of machines where it is desirable to remotely monitor the operation of the machine.

FIGURE 2 is a block diagram of an example electronic system for remotely monitoring a plurality of vending machines according to the present invention.

The invention begins with the vending machines. The vending machines are devices which provide the consumer with goods and/or services dependent upon receipt of some kind of payment. Most goods type vending machines are similar in that they typically contain an inventory of a variety of items for acquisition by the consumer. Each of these items is individually present in a certain

quantity, with payment for varying items typically being different for different types of goods and/or services. The vending machines also typically contain a coin slot or dollar bill receptor and occasionally a credit card or other identifying card for consumer payment for the goods and/or services. Some vending machines further contain some sort of temperature altering means such as a refrigerator cooling mechanism or a heating/cooling system. In addition to the above, vending machines typically have some sort of secure method for allowing service personnel to physically open the vending machine box in order to replenish the inventory and otherwise maintain the machine. Typical vending machines thus have a great deal in common with each other no matter what the particular goods or services they may be providing and no matter whom the manufacturer.

In spite of the above commonality, the actual physical mechanical and electrical parts of each vending machine vary dramatically between types of vending machines and also vary between the many individual manufacturers of such vending machines. Further, it is not uncommon for even a set type of a particular vending machine manufactured by a single company to have differing internal components, albeit a more subtle difference than the ones previously set forth.

In order to compensate for these vast electrical and mechanical differences between vending machines, the present invention uses data acquisition units 20 so as to interconnect varying types of vending machines to a single universal system while also providing a relatively uniform signal content, this recognizes the common elements of virtually all vending machines. The data acquisition units 20 themselves can be hard wired into location, otherwise connected and/or it may be a system designed to interconnect partially or totally directly with the manufacturers wiring harness in the vending machines. This latter is preferred. It may differ between machines

and/or contain custom electronics and/or smart chip type programming individualized for a given machine or otherwise differing locations within the remote monitoring system. Its various functions can also be separated and located at differing places across the remote monitoring system. In any instance, the purpose of the data acquisition unit is to provide for a single type of output with a relatively constant signal format no matter what the particular vending machine may be. The data acquisition unit thus provides a common type of signal for representing or indicating the available inventory of any particular item, the operational parameters of the machine, and other operational elements present in most vending machines. By reducing the varying nature of the elements of the vending machines no matter what the manufacture to common elements at the vending machine, the remainder of the system 10 can be the substantially the same for any installation, this even though the system may be utilized with many differing types of vending machines.

An example data acquisition unit system is shown in figure 3. In this figure, the example vending machine has a wiring harness containing three connectors 22, 23, 24. This recognizes the varying systems that may exist in any particular vending machine. Connector 22 of these particular connectors is matrix coded in order to provide a multiplicity of functions far in excess of the number of wires (matrix coding is fairly typical)(see for example Giacomo U.S. Patent 4,598,378). The nature and operation of these wires and their functioning are familiar to any one skilled in the art.

The particular data acquisition unit 20 shown in FIGURE 3 has some forty inputs (12 for row information, 12 for column information, 8 for alarm, and 8 for other information like signal duration). The alarm inputs may be set for automatic immediate or delayed transmission. The particular data acquisition unit 20 shown is a

universal data acquisition unit for interconnection to many differing type of systems. It thus has a number of inputs which allows interconnection to most types of vending machines (in the example shown 40 contacts in number) even though for a given machine not all contacts might be utilized. With this number of incoming matrix contacts, the data acquisition unit 20 can output a common signal representative of 144 vending choices in addition to any other operational element sensors to the later described remote link unit 30. Note that it is not necessary for the decoding or processing of signals, matrix or otherwise, to occur at the data acquisition unit 20. In specific, the data acquisition unit 20 could as shown in FIGURE 3 merely record the signal content on the various wires and/or sensors in the vending machine, signal content including the occurrence of simultaneous events. This signal content could then be passed over the later described network with a computer at the remote monitoring location utilizing a specific sub-routine to decode and utilize the signal content. While this would increase the complexity of the software at the computer, it could lower the cost of the data acquisition unit 20. In the event of this type of splitting of the functions of the data acquisition unit 20, the common signal output would preferably be a specific number of possible data information signals (for example 40 for all machines in a system) together with a simultaneous occurrence coding for at least some of such signals. By decoding the common signal at the later described computer 15, the length of the common signal is reduced relative to a decoded signal. If desired, the date acquisition unit 20 could decode the signal content of the inputs to reflect the actual information thereon. The output would still be in a common signal form, albeit decoded. It is preferred that no matter what the common signal form is, any information that has not changed between transmissions should be ignored. This could be accomplished by the transmission

of a short no-data code for such inputs, an end data code at the end of a row after the last active vend cycle in that row, or otherwise. This reduces the length of the common signal for a particular machine to that necessary to accurately reflect the status of that particular machine. For example in a three column machine, 141 of the described matrix coded vend indicators are irrelevant. They can thus be omitted for this particular machine without compromise to the overall system. This processing preferably occurs at the later described remote link unit 30.

Preferably the common signals are converted into serial form by the data acquisition unit 20.

The contacts of the data acquisition unit 20 shown are interconnected to the connectors 22, 23, 24 in the vending machine through a custom made tap cable assembly 25. This assembly 25 would be custom made for each basic type of vending machine so as to allow easy plug in type interconnection to the various vending machines. Thus for a multiplicity of machines a single data acquisition unit could be utilized merely by changing the tap cable assembly. The tap cable assembly shown would preferably be connected to the machine recognizing the nature of the data acquisition unit 20. In the example shown, row signals to row inputs, column signals to column inputs, etc. This provides for a common output for all machines.

The data acquisition unit 20 itself converts the specific signals on the wiring harness 22, 23, 24 into a common type of output signals for use with a later system. Note that in addition to the electrical and mechanical parts already in the vending machine, additional sensors may be provided, which sensors were not included in the original vending machine. Examples of this would be a compressor status sensor, temperature, door switch sensor, and a display malfunction sensor. These sensors would be provided by the remote sensing company, and individually

run 27 into the system. This can be directly (as in respect to machine 13) or indirectly through the data acquisition unit 20 (as shown in respect to machine 14). This latter is preferred in that it reduces the number of wires interconnecting with the later described universal bus. Certain sensors could be located on the data acquisition unit's circuit board so as to minimize the necessity of individual placement thereof. An example of this would be use of a photo electric eye sensor for door opening instead of a direct door sensor.

The output signals from the data acquisition unit 20 may include vend events typically identified by row and column to the later described remote link unit 30. This is typically an intermittent signal. The data acquisition unit 20 also provides information relative to the other operational elements of the vending machine. Examples include temperature, compressor status, change out, intrusion alarm, and other parameters. These typically are on/off steady state or longer length signals. In the preferred embodiment shown, these latter are fed into special alarm inputs on the data acquisition unit 20, thus recognizing their special status.

In the preferred embodiment disclosed, the common communication standard includes utilizing the same signal content for every vending machine no matter what its type, preferably a standard based on the most complex machine typical to a particular vending operator. For example, for each machine, the information could contain location identification code, machine identification code, inventory by row and column (for example 12x12), entry status, compressor status, temperature status, coin changer status, power status, and unit link status. This would be true even if a specific particular machine had lesser capabilities, for example, no rows, three columns, and no compressor, temperature, or coin changer status sensors. Programming, a specific no signal bit, and/or lack of signal content would inform the later described

computer of the particular machines actual capabilities. Again, the decoding and/or processing of the signals could occur at a differing location. In the preferred embodiment shown, the decoding occurs at the later described computer.

The amount of inventory, especially for certain vendors where it is difficult to physically determine, would preferably be updated indirectly based on some indirect parameter, for example based on the number of coffee cups or snacks of a particular type dispensed (i.e., vend events). While approximate, this would avoid the necessity of direct measurement via a separate sensor. This inventory can be maintained at the vending machine or at the remote monitoring location as later set forth. The latter is preferred.

Note also that although this matrix data acquisition unit 20 is shown by way of example, other data acquisition units could be utilized. Indeed a given system might produce the common signal content with a variety of data acquisition units. This might include the set forth matrix coded unit 20 of figure 3, a universal column only unit, and/or specifically designed unique machine specific units. For further example, an individual hard-wired data acquisition unit could be provided by reverse engineering the signals on the cables, for example 22, 23, 24, so as to have the data acquisition unit 20 detect the respective operations of the various parts of the machine and to provide a signal indicative of these conditions in a common form on the universal bus 21. Appropriate diodes, transistors, smart chip PROM based devices, and/or integrated circuits could be utilized in the data acquisition units. This latter technique would be particularly appropriate under circumstances where a given manufacturer utilizes a common wiring technique in many given machines across its product line or where certain machines follow certain universal techniques. In addition as previously set forth, the mere existence of

signals could be passed along the universal bus with the intelligent decoding and utilization of such signals occurring at a differing location, for example the later described remote link unit 30 or computer 16. Although much more time consuming, during installation the data acquisition unit 20 could also be hard wired directly to the various sensed components in the particular vending machine, such connections preferably being made in the same manner no matter what the type or manufacture of the vending machine.

The universal bus 21 interconnects the data acquisition units to the remote link unit 30. The nature of the bus 21 is not important. The bus could be over the power lines (as with an X-10 bus), short range radio, hard wired, or otherwise. While technically nothing prevents this bus 21 from being a parallel bus, due to present communications technology serial communication across the later described network is preferred. For this reason at someplace in the system it is preferred that the signals representative of vending machine conditions be present in serial form. In the embodiment shown and described this conversion occurs at the location of the data acquisition unit 20, either integral or closely associated therewith. This simplifies the bus 21 while allowing also for serial communication between the described slave units and the master communications unit as well.

The bus 21 is preferably bidirectional so as to allow the remote link unit 30 to sequentially contact each machine connected thereto for singular processing. The bus 21 disclosed is a hard wired RS-485 bus.

The remote link unit 30 is designed to control the communication of a particular location of vending machines through the network 16. Normally, the same type of remote link unit 30 would be utilized for any particular vendor's operations. This lowers cost and simplifies the installation. Preferably this remote link unit 30 utilizes common memory and communication standard

commands so as to lower the costs of the later described network 16. Note that since there is only normally one remote link unit 30 per location, the remote link unit 30 can include some processing capacity (for example decoding of signals across the bus 21 from the data acquisition units 20 or keeping track of things such as inventory) in addition to its communications capacity without unduly increasing the cost per vending machine of the system.

The particular remote link unit 30 disclosed includes a central processing unit link controller and a machine status memory.

The link controller operates the network 16 depending on status of the signals coming down the universal bus 21 or, optionally, as instructed by the computer 15. An example of the former would be if one of the various alarm circuits for the vending machines 13, 14 are triggered or if the system was set up for automatic transmittal at a certain time in the day. An example of the latter would be the computer 15 actively polling the particular location in order to ascertain the status of the various vending machines.

As the status of the vending machines changes, the signals over the universal bus 21 shown are stored in the vend event and status memory. It is preferred that this memory be non-volatile in order to maintain its information under power loss and other abusive conditions. In respect to routine information, for example, status of vend events, the information is stored in the memory subject to forwarding to the computer 15 at an acceptable time. In the case of other, for example alarm information, this information is normally in addition automatically passed from the remote link unit 30 to the network 16, and thus to the computer 15, automatically at a time when the computer 15 is first able to receive such information. This allows for the vending machine operator to be informed of problems with the machine even though the operator is not then in interconnection with the

particular vending machine. A simple way to provide for this automatic transmission could be based on alarm determinative factors, for example based on the specific input to a data acquisition unit 20 or on the length or nature of the signals output from the various sensors. In respect to the former, the remote link unit 30 can be programmed to pass along automatically any signal that is fed into an alarm input (or perhaps only specific ones) of this data acquisition units 20. Optionally the data acquisition units 20 could have critical alarm inputs for immediate transmitting and non-critical alarm inputs for routine transmission. In respect to the latter, routine information (for example a vend cycle of a particular item or change deposit) are short signals while non-routine information (for example door open or temperature malfunction) are longer length typically constant signals. One could therefore easily provide an automatic transmission means to pass the latter automatically across the network while storing shorten length signals for regular transmission. In the case a signal might be of longer length while being considered non-critical, an addition device, for example a one shot and short length hold circuit, could allow sensing but not automatic transmittal of the signal. An example of a long length non-critical signal might come from a column inventory depletion sensor. Additional example, if the remote link unit 30 was programmable, it could be programmed to only send certain alarm signals automatically, waiting for normal transmission for non-critical alarms. Further example automatic transmission of alarms could occur at this remote link unit with the computer at the remote monitoring location programmed to recognize and display as alarms only those specifically enabled by the operator, preferably storing others for later recognition.

In addition to the above, it is preferred that the operator using the system be notified of a critical alarm status. For this reason, virtually every later

described screen the operator views has a green dot that turns red on an enabled alarm condition. By clicking on this red dot, the operator is directly connected to the screen showing the alarm together with its nature. If there are multiple alarms, they are presented sequentially.

As previously set forth, in the preferred embodiment disclosed, the common communication standard includes utilizing the same signal content for every vending machine no matter what its type, preferably a standard based on the most complex machine typical to a particular vending operator. Programming a no signal bit and/or lack of signal content would inform the later described computer of the particular machines actual capabilities.

Normally there is one remote link unit per location, this whether the vending machine is a stand alone or is banked with other machines. In the latter preferably everything after the universal bus 21 is located in a single vending machine, the communicating master unit, with the other banked vending machines, slave units, interconnected thereto. This master/slave adaptation lowers the cost of the system by allowing one communicating remote link unit 30 per bank of vending machines. It is also possible with appropriate connections (for example short range ratio, power line X-10, or hard-wired) between various banks at a given location, only one remote link unit 30 per location. This significantly lowers the cost and complexity of the overall system.

The remote link unit 30 normally has its own unique address so as to allow individual access thereto. Further, normally there is some additional security, such as a password or encryption system, in order to maintain the unit safe from outside intervention.

It is preferred that a local interface 31 be provided in respect to the remote link unit 30 so as to

allow service and maintenance personnel to determine and correct any problems with the system. The local interface 31 is typically a handheld key pad with display. Such an interface 31 allows the personnel to operate the remote link unit locally.

It is preferred for cost reasons that the remote link 30 act primarily as a store and forward device, transmitting a common signal showing the number of vend cycles by row and column and, as appropriate, the status of the other operational elements of the particular machine. (This information preferably would be provided by no signal if conditions were unchanged.) Again the common signals could be signal existence including simultaneous coding with this information utilized and decoded at the later described computer or it could be actual data such as vend cycle and alarm status. For cost considerations, the remote link 30 can be a transmit only unit programmed to transmit its vend data along the later described network at a particular time. This vend data could be transmitted a number of times at spaced periods to insure reception at the computer by redundancy. Differing remote units would be programmed to send their respective information at differing times so as to avoid overlap if a single channel is utilized. An in use sensor and delay would prevent simultaneous transmission in the event of overlap. The delay would be preferably be preset to a period of known no transmission occurrence, even in the event multiple remote units are delayed. (After transmittal, if desired, the vend data could be stored in a memory as inactive information so as to provide a fail safe backup. However, since the same information can be ascertained by physical examination of the machine, this is optional.) Again for cost considerations, any alarms could be set to trigger immediate transmittal without record into memory. (Since alarms normally have steady state, they will maintain themselves until the indicated condition is taken care of.)

The remote link unit 30 optionally can have its own processing unit programmed with various types of information and also to auto reset to predefined defaults at the end of a service cycle (with or without auto-reset code input). In respect to inventory, these defaults preferably are the maximum number of items set as present in any particular vending slot. The defaults also may include the various thresholds, temperatures, and/or conditions for alarms and/or particular indications in the later described computer 15. With the local interface 31, the service personnel can update the inventory if there is a discrepancy in any particular individual slot as well as redefining the other various attributes of the link controller and/or memory.

The remote link unit 30 communicates with the computer 15 over a network 16. The network 16 is any sort of communication system which will allow data from the remote link unit 30 to be provided to the computer 15. This includes radio, cellular phone, and other known communication systems. Wireless systems are preferred. Note that due to the limited data which has to be transferred on the network 16, the requirement for the speed, clarity, and lack of noise for the network is minimal. Redundant and relatively slow transmittal is acceptable.

The network 16 can be bidirectional, allowing communication as well from the computer 15 to the remote link unit 30 as well. This would also allow the computer 15 to verify that all the information has in fact been received from the remote link unit 30. It would also allow the computer 15 to initiate transmission of data from the remote link unit 30, to modify the operation of the link controller and/or contents of the remote link unit 30 memory, and to otherwise remotely operate the system 10.

With more sophisticated electronic indication vending machines, the bidirectional network 16 could also

be utilized to alter the pricing of various commodities. An example of this would be lowering the cost of coffee at a particular time as an employee benefit or in order to get rid of stale inventory. A further example of this would be to increase the cost of particular items during periods of high demand and/or low inventory.

A controller 32 is located between the network 16 and the computer 15. The purpose of this controller 32 is to allow the computer 15 to control the network 16. In the particular embodiment disclosed, the controller 32 also converts the incoming and outgoing data into a form transmittable over the network. This currently would be serial digital data.

The controller 32 in addition is interconnected to a separate alarm indicator 33. This alarm indicator provides a direct indication of the nature and location of an incoming alarm. This allows the operator to utilize the computer 15 for other types of independent processing. It also provides an alarm indication under circumstances when the computer 15 is off line for whatever reason. Note in the case of multiple tasking computer, the alarm indication could be provided also by a load and stay resident program that constantly analyzes the incoming signal for an alarm indication, becoming active upon the receipt thereof. This would also allow for the generation of a red alarm dot on any screen of the display (for example a word processing program).

The computer 15 communicates with the controller 32 in order to operate the network 16. The particular computer 15 disclosed communicates with the controller 32 over an RS-232 serial cable. In addition, the computer 15 analyzes the incoming data in order to provide a readout of the status of the various vending machines which are interconnected thereto. If the common signals are coded, decoding would preferably occur before data processing.

Normally, the computer 15 obtains the data by polling the remote communicating master units for vending

information. As each individual communicating master unit has its own ID code, it is possible for a single computer 15 to extract this information from multiple vending locations without confusion. The computer 15 would normally actively poll or automatically receive data from the various communicating master units under its control sequentially at certain set times. Since all of the incoming data is in a uniform condition due to the data acquisition unit 20, a single database with uniform parameters can be utilized no matter what the make or model of the polled vending machine.

For cost considerations, the computer 15 could keep track of the inventory located in a particular machine by the number of vend cycles for a particular item (for example instead of the remote link unit 30 doing so). These vend cycles would be cumulatively added within the computer with the result subtracted from the number programmed into the machine (normally the maximum number of that item the machine can contain). This programming could occur automatically (for example upon entering a particular machine make and model) and/or manually. The computer would preferably reset to the number programmed into the machine on indication of a service call. The service person would be under instructions to fill each item to this amount. The computer would thus track inventory theoretically. Minor deviances would be accepted as a cost of this simpler system. Optionally these deviances could be tracked, for example by using the local interface. One could also use computer or bar coded inventory control to automatically update the number programmed into the machine to the actual amount of inventory actually used by service personnel. Under this system since the computer generates the inventory requirements, the computer would update its memory based on the inventory actually ordered by the machine. With such a system, it would be possible to have the computer generate an inventory requirement by normal container

multiples (for example 24 in the case of pop cans) with the inventory reflected in the computer updated by such container multiples.

Ideally, the computer 15 contains a long term memory into which it archives historical data. This long term memory allows the operator to track what is occurring in the vending machines over a period of time. This allows the operator to determine what is selling and what is not, where it is selling, when he must rotate the stock, the maintenance condition of the vending machine, the problems that any particular vending machine may have had, and other historical attributes of the vending machine and its operation.

The particular system disclosed, in addition to the above, includes a data records system 34 and a paging system 35.

The data records system 34 directly archives data from the controller 32 into a record system independently from the computer 15. This automatically backs up the vending machine status data in the event of damage to the computer and/or vandalism. It also provides for third party acquisition of the data from the vending machines, for example for a university study on the purchasing habits of the American public.

The paging system 35 directly contacts an individual at remote locations with the status of the vending machines, most particularly if an alarm occurs. This allows an individual who is not on-site of the computer 15 to be made aware of an alarm condition so that it may be handled. Preferably, the pager system 35 automatically provides the individual with the location of the vending machine together with the type of alarm. This latter allows the individual to selectively ignore a low inventory alarm while advising him of the seriousness of an intrusion alarm. This prevents the inconvenience to the operator of what might otherwise be considered to be nuisance alarms. The pager transmitter is preferably

located at the computer 15. This allows a single paging transmitter to be utilized for an entire vending route.

The above block figure is given by way of example and it is to be understood that the positioning of the parts may be changed and/or combined without deviating from the overall operation disclosed.

FIGURE 4 is an example block diagram of a hard wired sensing and communication circuit 50 representative of a complex remote link unit 30 according to the present invention. Each remote vending machine shown is equipped with a sensing and communication circuit 50 in order to monitor the operation of the vending machine and transmit data packets to the central computer system over a network.

The sensing and communication circuit 50 shown includes a plurality of optocouplers 52, which detect the presence of a 120 volt AC or other power signal within the vending machine. For example, a typical signal could be a vend event for one item within the machine. Each optocoupler has five leads 54, 56, 58, 60 and 62. In this case, the first lead 54 is coupled to the element within the vending machine at which the application of power is to be sensed. The second input lead 56 is connected to a neutral line. An output lead 58 is coupled to an I/O point 80. The lead 58 shown carries a digital logic level signal that indicates the presence or absence of the 120 volt AC signal on the input lead 54. The optocoupler 52 itself is powered by a DC voltage supplied on the lead 60 and is coupled to ground by the lead 62. In a typical vending machine, all of the motors, the compressor and indication lights are powered with the power signal, in this case 120 volts AC. Therefore, a plurality of optocouplers 52 are used to monitor the operation of these elements.

The sensing and communication circuit 50 also includes one or more switches 70. These switches typically are DC. A typical example would be an out of

units temperature sensor. In the example given, each switch includes a lead 72 that is pulled to a logic high voltage (i.e., +5 volts) by a resistor 74 that is coupled to the voltage supply (i.e., +V). Closing the switch 70 connects the lead 72 to a ground potential through a lead 76. The lead 72 is coupled to the I/O point 80. The example sensing and communication circuit 50 further includes other sensors, in this case a temperature sensor circuit 77, which monitors the temperature of the vending machine. The temperature sensor 77 provides an output signal on a lead 78 that is coupled to an input of the I/O port 80. This temperature circuit 77 provides a logic high level signal if the temperature within the vending machine exceeds a predetermined maximum. A logic low level signal is produced on the lead 78 if the temperature is below the predetermined maximum.

The example I/O port 80 is coupled to a microprocessor 84 by a conventional set of bus and control leads 82. The I/O point 80 shown includes at least three 8-bit registers (not separately shown) that can be coupled to the output signals provided by up to 24 sensors. The status of these sensors is thus determined by reading one bit of one of the 8-bit registers. For example, assume bit two of a register is coupled to an optocoupler sensor that detects when a power 120 volt AC signal is applied to an "exact change required" light in the vending machine. By reading bit two, the microprocessor can tell if exact change is required. This type of long term or length signal is easily detected at a single time. Other parameters in the vending machine can only be detected by keeping track of the sensor inputs over time. For example, assume bit three of a register in the I/O port is coupled to an optocoupler that senses when power is applied to a compressor in the vending machine. By reading bit three and keeping track of when it is a logic and when it is a logic zero over a period of time, the

microprocessor can determine how many times the compressor cycles. Excessive cycling indicates a faulty compressor.

Also coupled to the example microprocessor shown, through the set of bus and control leads 82 is a nonvolatile random access memory (RAM) 86 and a read only memory (ROM) 88. The ROM 88 shown has encoded thereon a suitable computer program that causes the microprocessor to read the signals produced by the plurality of sensors and transmit the status of the sensors to the central computer 20 as will be described.

The example sensing and communication circuit also preferably includes a universal asynchronous receiver/transmitter (UART) 90 and a modem 94. The UART 90 converts parallel data transmitted on the bus 82 to asynchronous serial data that is in turn transmitted on a lead 92 to the modem 94 as well as converting serial data received by the modem 94 to parallel data that can be read by the microprocessor 84. The modem 94 shown is a 1200 baud modem that is designed to transmit and receive digital signals using a modulated analog carrier signal that is transmitted over a network. Other transmission standards could also be utilized. Coupled to the example modem 94 is a suitable antenna 96 that transmits and receives signals oven the network. For ease of programming and compatibility, the modem 94 shown is a Hayes compatible and transmits and receives digital data using a well defined protocol. Other modems and speeds could also be utilized as well as other communication techniques. Programming such a modem will be readily apparent to one of ordinary skill in the computer communications art.

The sensing and communication circuit 50 shown includes an infrared serial port 100 which is coupled by a lead 102 to an infrared transmitter 104 and an infrared receiver 106. The infrared serial point is used to transmit and receive data from a handheld data entry terminal carried by a service technician.

Additionally, in this unit a serial jack 108 is coupled to the lead 102 in order to transmit and receive data from a handheld data entry terminal that is plugged directly into the serial jack.

Finally, a battery backup circuit 110 can be used to operate a communication circuit if power to the vending machine is interrupted.

FIGURE 5 is an example state diagram 150 showing a plurality of modes in which the example microprocessor that runs the sensing and communication circuit 50 could operate. The example microprocessor has at least five distinct modes: a control mode 160, a communications mode 190, a service mode 250, an analyze mode 290 and an alarm mode 340.

Upon powering up of the sensing and communication circuit, the example microprocessor immediately enters the control mode 160. Here the microprocessor polls the modem for a connect signal received from the central computer system. Once a connect signal is received, the microprocessor leaves the control mode and enters the communication mode 190 in order to transmit and receive data packets to and from the central computer system. If there is excessive noise on the communication link or the modem detects a disconnect signal, the microprocessor leaves the communication mode 190 and returns to the control mode 160.

If no signal is received, the example microprocessor shown polls the I/O point 80 shown in FIGURE 4 to determine the status of the plurality of sensors disposed in the vending machine. If one of the sensor inputs indicates an alarm condition, the microprocessor leaves the control mode and enters an alarm mode 340.

In the example alarm mode, it is determined if the alarm condition is critical. If the alarm is not critical, the microprocessor returns to the control mode and will inform the central computer system of the alarm

condition the next time the central computer system shown contacts by a call to the remote vending machine. If the alarm is critical, the remote vending machine initiates a call to the central computer system and immediately informs it of the alarm condition.

Another condition the example microprocessor looks for (by reading the sensor inputs) is a service call made by a service technician. Upon detecting that a switch disposed in the door of the vending machine has been activated by someone opening the door, the microprocessor shown waits for a code or predetermined amount of time for a service technician to enter a predetermined Personal Identification Number (PIN). If this is entered within the predetermined time, the microprocessor leaves the control mode 160 and enters a sensor mode 250. In the service mode, the service technician could typically enter data regarding the amount of product added to the machine, the amount of money removed from the machine and the amount of change placed in the change maker. Once the example microprocessor detects that the service call is complete, a check is preferably made whether the remote vending machine should initiate a call to or otherwise contact the central computer system immediately or should wait until the central computer system calls the remote vending machine in order to inform the central computer that a service call has been completed. If the remote vending machine is instructed to contact the central computer system upon completion of the service call, the microprocessor leaves the service mode 250 and enters the communications mode 190. Otherwise, the microprocessor leaves the service mode 250 and returns to the control mode 160.

In the example communication mode 190, the example microprocessor transmits and receives data packets to and from the central computer system over the network 16. After all the data packets have been sent from the remote vending machine to the central computer system, the

vending machine might query the central computer system to see if the central computer needs to transmit any data to the remote vending machine. If a data packet is received from the central computer system, the microprocessor leaves the communication mode 190 and enters an analyze mode 290.

In the example analyze mode, the data packet shown received is tested to determine the appropriate type of action the microprocessor should take. Possible actions include transmitting the contents of the microprocessor's memory, reprogramming the microprocessor's memory, testing the alarm system, reprogramming the communications to the central computer system, and resetting the alarm criteria and/or a set of alarm response bits that define which alarm conditions are critical. Once the received data packet is analyzed and the example microprocessor has performed the task required by the data packet, the microprocessor shown leaves the analyze mode and returns to the communications mode in order to wait for an additional data packet to be transmitted. If the microprocessor was instructed by the received data packet to test the alarm system, the microprocessor leaves the analyze mode 290 and enters the alarm mode 340.

FIGURE 6 is an example flow chart showing in greater detail the steps that might be taken by the example microprocessor as it is operating in the control mode 160 described above. Starting at a step 162, the microprocessor proceeds to set up the modem in a standard protocol at step 164, a Hayes 1200 baud protocol shown. In the example, the data transmitted by the modem is transmitted using a modulated analog carrier signal over an ordinary communications medium. As will be described in this example in further detail below, this is possible because the amount of data transmitted between the remote vending machine and the central computer system is relatively small and the data is retransmitted if it is

not received correctly. Thus, the present invention is able to withstand errors that may occur during transmission and does not require the use of a modem that is specifically designed for transmitting high speed digital data.

Once the example modem has been set up, the microprocessor shown then polls the modem for a connect signal to be generated by a call received from the central computer over the network at a step 166. If the connect signal has been received, the modem is instructed to go "off hook" at a step 170 and the microprocessor enters the communications mode at a step 172. If no connect signal is received, the example microprocessor reads the I/O port 80 to determine the status of the plurality of sensor inputs at a step 174. At a step 176, it is determined if an alert condition exists. In some cases this is accomplished simply by reading the status of the sensor output signals. For example, if the output signal of the temperature sensor is a logic 1, then a temperature alarm exists. Other alarm conditions can be determined by following the changes in the sensor output signals over time such as the compressor cycles example described above. If an alarm condition exists, the microprocessor leaves the control mode and enters the alarm mode at a step 178.

If no alarm condition is present, the example microprocessor reads the status of a switch connected to the door of the vending machine at step 180 in order to determine whether the door of the vending machine has been opened. If the door has been opened, the microprocessor shown enters a service mode at a step 182. If the door is not open, the microprocessor loops back to step 166 where the modem is again polled to determine if a connect signal has been received.

FIGURE 7 is an example flow chart showing the steps taken by the microprocessor shown when operating in the communications mode 190. Upon entering the

communications mode from the control mode, the microprocessor polls the modem to determine if there is excessive noise or if a carrier is no longer present over the network at a step 192. If the answer at step 192 is yes, the microprocessor returns to the control mode at a step 194. Assuming that the noise on the communications link is not excessive and the carrier signal is still present, the microprocessor polls the modem to determine if a recognizable signal, a "not acknowledge" (NAK) signal shown has been received at step 196. Under the communications protocol followed by the remote vending machines and the central computer system, the central computer system indicates to the remote vending machines that any data packets are to be transmitted by first sending the NAK signal. If no NAK signal is received, the microprocessor returns to the control mode at a step 198.

Each data packet to be sent to the central computer is maintained on a queue within the example microprocessor's RAM. Each data packet has generally the same structure. Data packets are differentiated by a "packet type" byte in the data packet.

FIGURE 11 shows an example structure of the data packets transmitted between the central computer system and the remote vending machines in the above example system of figure 4. Each data packet 360 preferably begins with a marker byte 362. The ASCII symbol for a colon is used for the marker byte shown. Following the marker byte shown, is a packet length byte 364 indicating the entire length of the data packet excluding the marker byte. A pair of bytes 366 indicate the unit ID. Each vending machine within the monitoring and communication system has a unique unit ID. Following the unit ID bytes shown is a sequence number byte 368. This byte is incremental each time a unit transmits a data packet to the central computer system. By keeping track of the sequence number, the central computer is able to determine if a data packet has been missed. Following the sequence

number shown is a packet type byte 370, which indicates the type of data to be transmitted. It is the packet type which informs either the central computer or the vending machine how to interpret the data which follows in a series of bytes 372. Following the data, the data packet shown includes a pair of checksum bytes 374 that allow the receiving microprocessor to determine if an error occurred during transmission of the data packet. The following illustrates the sequence of bytes that are inserted into a specific data section of five types of data packets transmitted between the vending machine and the central computer. The type of data packet shown is specified in the packet type bytes as described above. The following example packet types can be used to transmit information regarding a soft drink vending machine having eight columns filled with cans of product. Those skilled in the art will recognize that the data packet types can be easily modified depending on the particular type of machine being monitored. Note that although the example system utilizes only eight columns, it technically has 23 sensor inputs. It thus is able to provide data for inventory items in excess of the eight columns shown.

DATA PACKETS TRANSMITTED FROM THE VENDING MACHINE TO CENTRAL COMPUTER SYSTEM

TYPE 1

(Illustrates Status of Vending Machine)

Byte Name	Description
B1	value of sensor inputs 0-7
B2	value of sensor inputs 8-15
B3	value of sensor inputs 16-23
C1	total product in column 1
C2	total product in column 2
C3	total product in column 3
C4	total product in column 4

C5	total product in column 5
C6	total product in column 6
C7	total product in column 7
C8	total product in column 8
CP	number of compressor cycles

TYPE 2

(Service Packet)

Byte Name	Description
C1	column 1 product added
C2	column 2 product added
C3	column 3 product added
C4	column 4 product added
C5	column 5 product added
C6	column 6 product added
C7	column 7 product added
C8	column 8 product added
CARM	cash removed
CHLF	change left

TYPE 3

(Alarm Bits)

0x0001	total product level below criterion
0x0002	column product level below criterion
0x0004	change depleted
0x0008	temperature limit exceeded
0x0010	intrusion alarm
0x0020	compressor cycles exceed criterion
0x0040	checksum RAM program area bad

0x0080	link test
0x0100	service completed
0x0200	call for machine repair
0x0400	repair completed

TYPE 4

(RAM Data Dump)

Byte Name	Description
ADDR	starting address
D0	data byte 0
D1	data byte 1
D2	data byte 2
D3	data byte 3
D4	data byte 4
D5	data byte 5
D6	data byte 6
D7	data byte 7
D8	data byte 8
D9	data byte 9
DA	data byte A
DB	data byte B
DC	data byte C
DD	data byte D
DE	data byte E
DF	data byte F

This data packet is given by example, while with other data systems other data packets may be utilized.

Referring now to the example FIGURE 7, once a NAK signal has been received at step 196, the microprocessor begins transmitting a data packet to the central computer by first getting a data packet first on the queue at a step 206. The data packet is then transmitted at a step 208. Following transmission, the

microprocessor shown again polls the modem to determine if another NAK signal has been received at step 210. If the central computer transmits another recognizable signal, a NAK signal shown, the microprocessor knows that the transmission did not arrive correctly. Therefore, the microprocessor loops back to step 208 and the data packet is again transmitted. If no NAK signal is received in step 210, the microprocessor proceeds to a step 212 wherein the modem is polled to see if an acknowledge a second recognizable signal ("ACK") shown, has been received. If no ACK signal has been received, the program returns to the control mode at a step 214. If an ACK signal is received, the microprocessor knows the central computer system has received the data packet correctly and the data packet transmitted is removed from the queue at step 216.

After removing the data packet from the queue, the example microprocessor determines if the queue is empty at a step 218. If the queue is not empty, the microprocessor loops back to step 206 and the next data packet is transmitted as described above.

Once the queue of data packets to be transmitted is empty, the microprocessor shown proceeds to a step 220 wherein an ACK signal is transmitted to the central computer system. This ACK signal indicates to the central computer system that the remote vending machine is ready to accept data packets transmitted from the central computer to the remote vending machine. The data packets transmitted from the central computer to the remote vending machine. In the specific example shown these data packets are defined by packet type as follows:

DATA PACKETS TRANSMITTED FROM CENTRAL COMPUTER TO THE REMOTE VENDING MACHINE

TYPE 101

(Transmit 16 Bytes of Microprocessor's Memory from Starting Address)

Byte Name	Description
ADDR	starting address (2 bytes)

TYPE 102

(Rewrite N Bytes of Microprocessor's Memory from Starting Address)

Byte Name	Description
ADDR	starting address (2 bytes)
D0...DN	n data bytes (n = packet length minus 9)

TYPE 103

(Rewrite Phone Number of Central Computer)

Byte Name	Description
PH1...PH36	36 bytes phone number (blank-no outbound alarm)

TYPE 104

(Set Vending Machine's Alarm Criteria)

Byte Name	Description
CA	compressor cycles per day max
CI	compressor cycles per day min
UNID	rewrite unit ID of vending machine
CB	checksum bad alarm enabled - 1

CC	compressor cycles alarm enabled - 1
IN	intrusion alarm enabled - 1
TE	temperature exceeded alarm enabled - 1
CD	change depleted alarm enabled - 1
CP	column product alarm criterion - 1 byte
TPBC	total product alarm criterion - 2 bytes
SV	send service packet upon servicing complete alarm enabled - 1

TYPE 105

(Reset Vending Machine's Alarm Bits)

Byte Name	Description
BPBP	set alarm bit pattern - 2 bytes

TYPE 106

(Set PIN for Service Technician)

Byte Name	Description
PWI...PW7	7 bytes of numeric data define PIN

TYPE 107

(Record Message for Service Technician)

Byte Name	Description
ME1...ME16	16 bytes of alphanumeric data for service technician

In a step 222, the example microprocessor determines if an ASCII representation of a colon symbol as previously set forth has been transmitted. As shown in FIGURE 11, this recognizable symbol marks the beginning of all of the data packets transmitted between the vending machine and the central computer. If no colon symbol is transmitted, the microprocessor returns to the control mode at a step 224. Once a colon symbol has been transmitted, the microprocessor shown determines if the entire data packet has been received correctly at a step 226. If the data packet has not been received correctly, the microprocessor causes the modem to transmit a NAK signal at a step 220 to indicate the data packet was not received correctly. The example microprocessor then loops back to step 222 and looks for the beginning of the same data packet to be retransmitted.

If the data packet was received correctly, the program branches to the analyze mode 290 to perform the task indicated by the data packet as will be described in further detail below. Upon returning from the analyze mode, the microprocessor shown causes the modem to transmit an ACK signal at a step 232 that indicates to the central computer that the data packet has been received and acted upon, and that the vending machine is waiting for another data packet to be transmitted. This process continues until the central computer fails to transmit another data packet whereupon the microprocessor returns to the control mode at the step 224.

In some cases (i.e., when a critical alarm condition exists or if the microprocessor is programmed to alert the central computer system immediately after a

service call is completed), the example microprocessor will initiate a call to the central computer system. At a step 200, the microprocessor instructs the modem to connect the central computer. The microprocessor then polls the modem to determine if a carrier is present in a step 202. If no carrier is present, the microprocessor loops back to step 200 and dials again. Upon establishing a connection with the central computer system, the microprocessor transmits an alarm or data service complete packet that has been previously placed on the queue. Transmission of the data packet to the central computer takes place as described above.

FIGURE 8 is a flow chart showing the steps taken by the example microprocessor when operating in the service mode 250. Upon entering the service mode from the control mode when the microprocessor shown detects the door to the vending machine has been opened, the microprocessor determines if the service technician enters a PIN or recognizable signal within a predetermined amount of time (for example ten seconds). The particular PIN is stored in the microprocessor's RAM and can be modified at any time by the central computer system. If the PIN is not entered within this predetermined amount of time, the microprocessor sets an intrusion alarm bit at step 254 and returns to the control mode at step 256. The microprocessor then detects the intrusion alarm bit as being set and enters the alarm mode.

Assuming the PIN has been entered in the predetermined amount of time, the example microprocessor then asks the service technician to enter information regarding the service to be completed. In step 258, the microprocessor queries the technician for the total amount of product added in each column of the vending machine. In a step 260, the microprocessor asks the service technician to enter the total amount of cash removed from the machine. In a step 262, the microprocessor asks for the amount of change left in the coin changer. After the

service is complete, the microprocessor generates a service data packet and places the packet on the queue at a step 264.

Once the service call is complete, the example microprocessor reads the status of a service packet bit in a pair of alarm response code bytes in a step 266. This bit indicates whether the vending machine is to contact the central computer upon completion of the service call should wait to inform the central computer of the information obtained from the service technician the next time the central computer calls the vending machine. If the service packet bit indicates the central computer is to be called at the completion of the service, the microprocessor data packet proceeds to the communications mode at a step 268. If the status of the service packet bit indicates the microprocessor is not to call the central computer upon completion of the service call, then the microprocessor returns to the control mode at a step 270.

FIGURE 9 is an example flow chart showing the steps that might be taken by the microprocessor when operating in the analyze mode 290. Upon entering the analyze mode from the communications mode, the microprocessor reads the packet type of data indicated by byte 4 of the received data packet as shown in FIGURE 11. Byte 4 shown informs the microprocessor what type of action is to be taken. At a step 294 it is determined whether the data packet is of type 101. If the data packet is of type 101, the microprocessor transmits the contents of its RAM memory beginning at a starting address which is read from the received data packet in step 296. At step 298, the example microprocessor causes the modem to transmit 16 bytes of data beginning at the starting address. Once the data has been transmitted, the program returns to the communications mode at step 334.

In step 300 shown, it is determined the data packet is of type 102. Data packet type 102 indicates to

the example microprocessor that it is to rewrite portions of its RAM memory with data values transmitted from the central computer system. At step 102, the microprocessor reads the starting address and determines the number of bytes to be rewritten. The number of bytes is determined by the value of the packet length byte minus nine. In step 304 shown, the new memory values are read and the RAM memory is rewritten starting at the starting address determined in step 302. Upon rewriting the RAM memory, the microprocessor returns to the communications mode.

In step 306 shown, it is determined if the data packet is of type 103. This data packet type causes the microprocessor to modify the communication parameters to the central computer. In step 308, the microprocessor reads 36 bytes of data. These 36 bytes are stored at the central computer in step 310. After rewriting, the microprocessor returns to the communications mode.

In step 102 shown, it is determined if the data packet is of type 104. This data packet type causes the microprocessor to rewrite its alarm response data which sets the alarm conditions for the vending machine. In step 314, the microprocessor reads the new alarm response data and in step 316, the microprocessor overrides the previous alarm response data. After the alarm response data has been rewritten, the microprocessor returns to the communications mode.

In step 318 shown, the example microprocessor determines if the data packet is of type 105. Type 105 packets cause the microprocessor to artificially set the bits in a pair of bytes which define the alarm conditions of the vending machine as described above. After the alarm bytes have been set, the microprocessor goes to the alarm mode in step 122 wherein the alarm bytes are transmitted to the central computer system.

If the example data packet is not of type 105, the microprocessor determines if the message is of type 106 at step 124. Data packet type 106 causes the

microprocessor to read seven bytes of PIN's for the service technician. The old PIN is overwritten at a step 328 before returning to the communications mode.

Finally, the example microprocessor determines if the received data packet is of type 107 at a step 330. Data packet type 107 records 16 bytes of alphanumeric data that is recorded for the service technician to be read during the next service call. The message bytes are stored in memory at a step 332 before the microprocessor returns to the communications mode.

FIGURE 10 is an example of a flow chart showing the steps taken by the microprocessor shown in the alarm mode 340. Upon entering the alarm mode from the control mode, the microprocessor reads the alarm response bytes in step 342. In step 346, the microprocessor compares the alarm bytes described above and compares them to the alarm response bytes in order to determine if the alarm condition is critical. If the alarm is set as critical, the microprocessor generates an alarm data packet and places it on the queue in a step 348 before going to the communications mode in step 350. If the alarm is not critical, the microprocessor simply returns to the control mode at step 352.

FIGURE 12 is an example of a diagram of a handheld data entry terminal 400 that might be used by a service technician to enter data into the shown microprocessor. With this system, the service technician can inform the system of the amount of product added to the machine, the amount of money removed, the content of the change counter, as well as other data. The handheld terminal 400 disclosed has a case 402 that includes a series of keys 406 and an enter button 408. The keys 406 are used to type alphanumeric data on a display 404, which is transmitted to the microprocessor upon hitting an enter key 408. Communication preferably takes place between the microprocessor and the handheld terminal using either a conventional infrared transmitter/receiver indicated at

410 or via mechanical connection such as a stereo plug 412. In the stereo plug one channel is used to transmit from the handheld unit while the other channel is used to receive prompts from the vending machine.

FIGURE 13 is an example block diagram of the handheld data entry terminal 400 described above. This specific handheld terminal includes its own microprocessor 420, a read only memory 424 and a random access memory 426 which are coupled to the microprocessor on a set of bus and control leads 422. Additionally, the keys 406 and display 404 are also connected to the microprocessor on the bus 422. The microprocessor shown communicates with the sensing and communication circuit in the vending machine via a serial point 430. The port shown is a serial port connected to drive an infrared transmitter 432. Additionally, the infrared receiver 434 is used to receive infrared signals transmitted from the sensing and communication circuit to the handheld unit. If a mechanical plug is used, the transmit and receive signals are coupled to a conventional plug, which is inserted by the service technician and allows an appropriate connector to the vending machine. The handheld terminal 400 shown is powered by a battery 428. It could also be powered by the vending machine.

Upon receipt of the information relative to the vending machine from the remote link unit 30 over the network 16, the information shown is then available at the computer for selective presentation and manipulation.

In the invention of the present application, due to the data acquisition units, virtually all of the information needed in respect to the vending machines can be located in a single database, can be processed with the same programming, and can be visually presented with a limited number of easily understood video screens.

In respect to the single database, all of the data for every machine in a single system is preferably stored in a single database having a number of fields and

name identity matching that of the maximum capabilities of the common signal. This allows the data for every machine to be present for analysis and presentation in a unified manner. This includes the generation of graphic representations of vending machines as well as the development of reports and other matters. It is noted that there will be empty fields in this type of system. These empty fields as present in the database preferably are ignored in developing the graphic representations and/or reports generated by this system. This can be accomplished by a sub-routine in the processing software blanking empty fields.

It is noted that in the event that the common signals are decoded (as in the described FIGURE 3 matrix system) and/or otherwise processed by the computer preferably this occurs prior to storage in the database.

In respect to the same programming, this programming would develop the graphic representations and reports in a common manner from the database. This common manner would preferably include a data inhibition or blanking sub-routine set to recognize empty fields in the processing of the data and automatically act accordingly.

In respect to the graphic representation, this could include automatically developing the representations to present only the active field information, and modifying the display appropriately. For example, if a particular machine had five columns of inventory, a compressor that cycles, a temperature alarm, and an entry alarm, once utilized or preset, these items would be presented on the screen; this even though the temperature alarm icon and entry alarm icon may be inactive (i.e., normal) at the time of presentation. Further, although the programming may be capable of generating an image having 15 columns, only the active five columns would appear. This could be spread out over the entire column area or could appear as one third the available area as set by an operator. However, since there is no for

example change empty sensor or field, the change icon would never appear on the screen.

In respect to the limited screens due to the use of a common signal content, one screen could technically be utilized for all machines, preferably as set forth with software programmed to ignore and not display non-data parameters. For example, with a machine having only 12 columns of inventory and an intrusion door open switch, no temperature sensor, no compressor sensor, and no other sensor, only the active information (12 columns of inventory plus the door open switch) would be presented: The missing sensors would never appear for this machine (although they would if applicable for a different machine). The software thus preferably has the ability to present a very complex screen while the system itself tracks the available data presenting on the screen and processing only the available data. Non-information, empty fields, are ignored. Further, the data can be manipulated by a limited number of computer sub-routines to provide uniform information for the vending machines. This could allow a single graphic representation to be utilized for all vending machines; presenting the common elements of the vending machines in a single manner no matter what the type or nature of the particular machine.

Note that although there are over many hundreds of specific vending machines (over 200), due to the basic commonality between machines, the basic and important date can be presented with a lesser number of screens. For example, it has been ascertained that about 20 basic screen images of vending machines will allow the presentation of most vending machines on the market today.

It is preferred that there be a central data base having the display information for these basic screens. Thus upon the specification of an appropriate screen either manual or automatic, the computer 15 would generate the appropriate image of a vending machine

accurately representative of the machine then being presented.

Other parts of the screen, for example the various condition icons, can be similarly generated.

It is noted that when an inventory of an item is developed on the screen, it is preferred that the items comprising this inventory be developed with images representative thereof. For example, if a pop can machine has columns of inventory, the circular end sections of pop cans would be shown in such columns. Additional example if change status is shown, a flat rectangle representative of the edges of the coins would be shown in the change area.

Due to the common signal content, technically a single graphic display could be utilized for all vending machines; Specifically displaying the common information regardless of the type of machine. The reason for this is that the operator does not care about what any given machine is, only what its status, and this status is primarily dependent on the common operational elements. Also some operators will rely primarily on the reports generated by the system.

For operator intuitive convenience, it is preferred that a number of screens be utilized representing types of machines. For example, seven screens: 1) pop/container; 2) candy; 3) snacks; 4) frozen ice cream/popsicles; 5) coffee/cocoa/tea; 6) pop/liquid, and 7) service utilized would enable a vendor to cognitively ascertain the nature of most common food type vending machines (as set forth above, 20 screens would allow an accurate representation of most machines). A further set of screens, for example a communications screen and a route screen, would allow access to the system.

Preferably, a screen would be designed to be able to display the optimum number of pieces of information for the majority of all vending machines, with

machines having lesser capabilities being presented in a modified form as previously set forth. For example, there are some very large pop/container vending machines which have nine column selections in a single row, each holding approximately 75 cans. There are also pop/container type vending machines which have but three columns, each holding 25 cans. The basic screen program under these circumstances would be designed to have the capability of presenting the larger machine data. This would be the default condition of the screen. However, upon entering of the smaller machine's type or capabilities, the screen would be automatically modified so as to present but the needed information (i.e., three columns with a 25 can maximum capability instead of nine columns each having 75 can capability of which only three are used and then only 1/3 full). This usage allows a particular vendor to use a limited number of common screens, even one, to obtain all of the information which is necessary to understand the operating status of a vast number of vending machines, each of which may be of a different type and each of which may be manufactured by a different company.

In addition to presenting the information to the operator visibly on a screen in a uniform manner, the system is able to store data and generate common reports for each machine, again totally independent of the exact nature and/or manufacture of any particular machine. This again is due to the use of the data acquisition unit to provide for common signal information for all machines. Due to this, the report information which can be developed can be supplier specific irrespective of the exact nature of the goods. For example, the need for a given quantity of pop/containers, candy, and coffee for a given location can be printed out in the same list independent of the actual machines needing such inventory. For additional example, the number and type of alarms in a wide geographic area could be printed out. Further example the specific inventory needs and optimal route assignments for

a particular vendor operator. Similarly as previously set forth, a single database can be used for all incoming information, such database amenable for manipulation by software in any manner desired by the operator. This allows the use of value added services without the necessity of developing a unique program for each particular manufacturer's particular type of machine. Further, common summaries can be developed across the entire database by the operator.

It is preferred that the database have sufficient names and fields to handle information from the most complex vending machine in a given system. Due to the use of common signals for every vending machine, these fields would be automatically filled with data from the system. Additional fields could include for example the type and nature of the specific vending machine, its physical location by street address, and physical placement, the communication standards for such machine including route, link name, identification and number, the nature and pricing of the varied items of inventory, the various alarms available together with their triggering points (upper and/or lower), and importance (i.e., automatic transmission on occurrence enablement), together with other programmed elements.

It is preferred that the data processing, for example the graphic display on the screen and the processing software, be programmed to ignore non-active names and fields. For example for a three column pop machine, a 49 inventory item capable system would preferably ignore the 46 empty fields in producing the screen images and any reports for this machine. For additional example no compressor or temperature icon would be utilized for a dry snack machine. A separate database having information that can be called up by the identity of a particular machine could be utilized to initially set up the data processing standards for that machine.

In all systems, it is possible that reports be generated and inventory replaced in multiple unit container multiples (for example the archtypical 24 can pop box). This reduces odd lots while maximizing operator convenience.

Turning now to FIGURE 14, a diagram of a typical user interface produced by the central computer system is shown.

The central computer system provides a display of each vending machine being monitored (pop/container machine shown). With other types of vending machines (phone, snacks, cigarettes, etc.) it is preferred the display reflect the type of vending machine. Typically a limited number of universal displays will provide the required information as set forth previously. Indeed, due to the common signal content, a single screen could be utilized (preferably as set forth automatically adapted by available data so as to present only pertinent information).

The display 450 disclosed includes various icons and images that are representative of the elements of vending machines. Preferably these icons have an appearance intuitively similar to the items that they represent (example later given). Due to the common elements in vending machines, a minimum number of icons need be utilized. The particular icons utilized can be automatically generated by software based on database information or can be separately entered.

The particular display 450 disclosed includes a vending machine icon 452, which looks like the vending machine itself. This enables even the most unskilled operator to appreciate the status of that particular machine. The specific icon 452 discussed includes a series of columns each having a column count box 456 that indicates the number of product in the column, as well as a bar graph 458, which visually indicates how the number of cans in the column compares to the length of the

column. Preferably, the number of columns and/or rows displayed for a given machine are equal in number to the actual number of columns and/or rows, with the bar graph at 100% when any particular column at the machine is full. This type of presentation is easily developed from the generic type of machine, the number of columns, and/or the total maximum number of containers per column and/or as entered on initial set up of the computer. For example, in a pop/container machine, the selection of the pop/container machine would initially develop a display having a default number of columns (and no rows) each with a certain default maximum number of containers. The entering of the actual number of columns and/or rows would alter the default display to the actual number of columns and/or rows (for example from 12 columns down to 6 columns). The entering of the actual number of maximum containers would likewise alter the default display respectively (for example from 75 down to 50). The bar graphs per item would remain at 100% until further manual or automatic (i.e., in use) input modified the number of cans per column. This use of defaults is preferred because it provides the operator with a usable (albeit not optimized) system with a minimum of inputs. Alternate schemes could be used including not presenting any columns and/or rows and/or any number of containers until the proper data is available. In any event, it is preferred that the display be automatically generated from a single subroutine having variable inputs. It could also be developed automatically from a pre-installed database by the entering of a specific make and model vending machine.

With altering input of other generic types of machines, other initial displays will be developed, displays that could be different than a column type display. For example, a generic type snack machine might have many options developed in an X by Y column/row matrix (for example 7x7), with the display having 3d type bar protruding out of the screen in a step manner (number of

snacks at the end of each bar) while a generic type cigarette machine might use only columns like the example pop/container machine. In addition, the displays could have either or both decreasing or increasing indicators. As an example of the latter, a hotel might as a courtesy extend to a guest a credit of $50.00 worth of services or supplies on the guests room card key before room payment. As the guest bought pop or used the phone, this initial $50.00 credit could appear as an increasing bar, indicating the total usage. The charges could also be billed directly to the room (possibly subject to an upper limit). In addition, in this case, warning indicators might appear at the top of the bar not bottom. Thus the displays, although of a few generic types, might differ in actual presentation.

In general, columns are preferred subject to screen resolution limitations.

Note that historical type information can be presented in the display. This could occur by presenting multiple graphic displays showing vend cycles over time on a single screen (in narrow columns), by requiring an operator to click on a particular column to display multiple columns showing historical data in respect to that particular item, or otherwise.

The icons that are developed in the graphic representation are preferably accomplished dependent on the available active data and/or the programming of the machine. These include as follows:

The particular display 452 shown includes a power icon 460 that represents a power connection to the vending machine. If power is interrupted, the icon 460 will flash to the user thereby informing the user that the remote vending machine is without power. This type of sensor and indication and others would be common to most electrically powered machines.

The particular machine disclosed is a pop/container vending machine. Other types of machines,

vending goods, and/or services could be utilized. This type of pop/container machine normally includes a compressor. Abnormal cycling of a compressor, either low or high, is an indication of either a refrigeration loop or general machine malfunction. In addition, the cost of electricity for operation increases. For this reason, preferably a compressor cycling sensor and indicator is included in devices utilizing temperature altering mechanisms (i.e., cold or hot). A compressor icon 460 that represents a compressor is graphically illustrated in the display and has located below it a compressor cycles box 464 indicating the number of compressor cycles completed in a 24-hour period. Should the number of compressor cycles exceed or be less than predefined limits as set by the alarm response bytes described above, the compressor icon 460 will light.

In the particular machine disclosed, loss of refrigeration will not potentially cause injury. However, most people prefer cold pop to warm pop. For this reason, a temperature sensor and indicator is preferably included in the system 10. This type of sensor would be utilized with most machines containing temperature changing devices.

A thermometer icon 466 is provided to indicate when the temperature is out of a predefined range. Again, if the temperature range is abnormal, the thermometer icon 466 will flash.

Other types of universal sensors could also be utilized with many differing types of vending machines. Examples of these in the preferred embodiment disclosed include: A coin icon 468 represents when exact change is needed. If the coin icon 468 flashes, a user knows that the change counter is out of change. A key icon 470 representing an unauthorized entry flashes when the door to the vending machine is opened and either no PIN or an incorrect PIN was entered. A communications icon 472 represents the communications link between the remote

vending machine and the central computer. If the icon 472 flashes, a user knows that there is some problem with the communications link.

In all instances it is preferred that the operator be able to set the levels a respective alarm activates as well as whether the alarm is automatically sent or merely stored for routine transmission at the regular time. This allows an operator to custom design his system to his own specifications. (The alarms could also be ignored at the computer 15 subject to display on calling up the particular vending machine. For example one operator might not be concerned with low inventory of a particular item as long as the machine itself had something to sell, while another operator might be very concerned with low column inventory. For another example ambient temperature in a pop machine causes no damage to the items therein. Thus one operator may choose to not have automatic transmission or recognition of a temperature alarm (although may choose to have a below Y or above X compressor alarm so activated).

The above graphic interface is given by example. Others may be utilized by the invention.

With this type of graphic interface, an operator can rapidly step through a vast multiple of individual displays, each representing a particular vending machine, with the information necessary to establish a condition needing immediate attention (an alarm such as door open) or a condition needing eventual attention (low inventory of an item as indicated by a yellow short bar). The operator can do this intuitively without the necessity of appreciating let alone taking the time to read and interpret an alphabetic/numeric presentation of the same data. Further, due to the common signal and/or universal displays per generic machine, the graphic information will be presented in a non-confusing manner. The operator can subsequently leisurely go through the displays for additional more specific information.

The display 450 shown includes this additional more specific information in a plurality of smaller window areas. An example of more specific information present in this additional area would be an identity of the products in the machine, the location of the products within the machine, the location of the display within the machine, the communication parameters for the displayed machine, and physical location of the displayed machine. A further example additional information might include the date and time of last service, the servicer's name and pager number, listing of the most recent alarms, and other detailed information.

In the specific embodiment shown, an area 474 shown describes the particular product maintained in each column of the vending machine. This identifies to the operator the items represented by the various columns, preferably together with brand names. This information typically has to be manually entered. This allows an operator to better comprehend the graphic display. For example, if one column contained a red bar indicating a critically low inventory of Diet Pepsi, while two other columns contained green bars indicating an adequate inventory, the operator and system would know that the red bar alarm could be ignored with relative impunity. Also, the operator could order the required product items to fill the various columns from the display alone if desired. In this respect, it is noted that most items are shipped and/or packed in multiple item containers (for example 24 cans of pop per box). It is possible for the inventory to be managed in multiples of these multiple item containers so as to avoid odd lot inventory. This would be typically done for pop.

A window 476 shown defines where the particular vending machine is located together with other information. In the embodiment shown, the information includes the identity of the service route of which the machine is a part (the link name), the method to contact

this machine (the link ID), the exact type of machine (manufacturer and model number), and the physical location of the machine (street address and location thereat). This information allows the operator to handle any problem with the machine.

The window 478 keeps track of the most recent alarms experienced by the particular vending machine shown in the display 450. This allows the operator to verify that the problems represented thereby have been handled appropriately. This information is generated automatically.

This is an example of further information that can be provided by this additional area of the display.

The information which produces the display 450 is stored in the database 22 which is maintained by the central computer system. Each time a data packet is received from the remote vending machine, the database is updated and used to change the configuration of the display 450 next time displayed. Therefore, a user can easily identify any problems which may exist in a particular vending machine by viewing the display 450. The old data is preferably stored in a separate database for use in creating additional value based information. Examples include product trend analysis, eminent machine breakdown, aging of inventory, and other conditions over time based information.

For cost considerations, it is preferred that all of the displays be generated at the computer, this to simplify data transmission. In specific, once initial programming has taken place, normally only the number of vend cycles per item would be communicated across the network: The rest of the data would preferably be deemed to remain stagnant (i.e., no signal, programmed condition to remain).

In addition to the specific machine displays, it is preferred that there also be a master alarm display of all machines on a particular route and/or vending

territory. An example of this type of graphical display provided by the central computer is shown in FIGURE 15. This display 500 indicates to a user all the vending machines contained on a particular route. These routes may be assigned to one or more service technicians. On the display is shown a window 502 which shows the particular route number and the number of each vending machine contained on that particular route. Next to the number of each particular vending machine is a dot 504 which is color coded to indicate an alarm condition within the vending machine. If the dot is green, no alarm exists. An alarm condition is displayed as a red dot. This provides the operator with an instant full route status report as to any critical conditions. Therefore, when the user opens a window 502, it is easy to detect which vending machines have alarm conditions. The display 500 also contains smaller icons 506 at the bottom which represent each route maintained on the database. By selecting one of the smaller icons 506, the window 502 is produced showing each vending machine on the route selected.

In the upper left-hand portion of the display 500 is a dot 510. The dot indicates to the user whether an alarm packet has been received for any vending machine in contact with the central computer system. The dot 510 is red and can be accompanied by an audible alarm if a vending machine transmits an alarm data packet. The user can see which vending machine has activated the alarm by opening the window 502 and looking for the dot 504 next to the number of the vending machine that transmitted the alarm data packet.

As can be seen, the present invention allows a user to monitor the operation of a plurality of vending machines from a central computer system. Each vending machine is periodically interrogated by the central computer and the pertinent information regarding the amount of money in the machine, the amount of product left

in the machine and any alarm conditions which may have occurred in the machine is graphically illustrated to the user. Thus, the present invention can allow a user to efficiently schedule service visits, to repair problems and make sure the machine is fully stocked. Furthermore, the use of the modem provides a level of convenience and simplicity which was not previously available in remote monitoring systems.

While the preferred embodiment of the invention has been illustrated and described, it will be appreciated that various changes can be made therein without deviating from the spirit and scope of the invention. The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

Claims

Claim 1. A system for monitoring one or more machines and transmitting data from the machines to a remote computer comprising:

a plurality of sensors disposed in the machine, each sensor producing a data signal that is indicative of an operation of the machine;

a controller circuit coupled to each of the plurality of sensors including means for reading the data signals produced by the sensors; and,

a communications circuit coupled to the controller circuit that transmits the data signals produced by the sensors to the remote computer over a network.

Claim 2. The system as in Claim 1 wherein the remote computer further comprises:

means for producing a graphical display that represents the machine, the graphical display including one or more icons that correspond to a data signal produced by the sensors in the machine; and,

means disposed in the remote computer for updating the icons to correspond to changes in the data signals produced by the sensors.

Claim 3. The system as in Claim 2 further comprising:

means disposed in the machine for formatting the data signals produced by the sensors into one or more digital data packets; and,

means for causing the communications circuit to transmit the digital data packets over a network.

Claim 4. The system as in Claim 2 wherein the machine is a vending machine and the one or more icons produced on the remote computer include:

a representation of a vending machine having a plurality of columns; and,

each column being represented as a bar graph having a height that varies in proportion to a data signal received from the vending machine.

Claim 5. The system as in Claim 4 wherein the one or more icons include:

a representation of a power outlet; and,

said representation being displayed by the central computer as a flashing icon if a data signal received from the vending machine indicates that the vending machine has lost electrical power.

Claim 6. The system as in Claim 4 wherein the one or more icons include:

a representation of a compressor; and,

said representation being displayed by the central computer as a flashing icon if a data signal received from the vending machine indicates that the compressor has cycled too few or too many times in a predefined time period.

Claim 7. The system as in Claim 4 wherein the one or more icons include:

a representation of a coin; and,

said presentation being displayed by the central computer as a flashing icon if a data signal received from the vending machine indicates the vending machine requires exact change.

Claim 8. The system as in Claim 4 wherein the one or more icons include:

a representation of a key; and,

said representation being displayed by the central computer as a flashing icon if a data signal

received from the vending machine indicates a door of the vending machine has been opened by an unauthorized person.

Claim 9. The system as in Claim 1 further comprising:

a first serial port coupled to the controller circuit; and,

a handheld data entry terminal including a second serial port for communicating with the controller circuit through the first serial port wherein said handheld data entry terminal further includes means for entering service data into the controller circuit that is indicative of a service operation performed by a service technician.

Claim 10. The system as in Claim 9 further comprising:

means for detecting when a door to the machine is opened;

means disposed in the controller circuit for determining if an identification code is received from the data entry terminal; and,

means for getting an internal alarm if an identification code is not received in a predefined period after a door is opened.

Claim 11. The system of Claim 9 wherein said data entry is accomplished through infrared communications signals between said data entry terminal and said controller circuit.

Claim 12. The system of Claim 9 further including a data cable removably connected to said first and second serial ports so as to transfer data between said handheld data entry terminal and said controller circuit.

Claim 13. In a system for monitoring two or more vending machines at one location and transmitting data from the machines to a remote computer,

the improvement of means for one master machine to communicate data to the remote computer and means for the other slave machine to communicate to said master machine.

Claim 14. The system of claim 13 characterized in that said means for said other slave machine to communicate with said master machine includes a dedicated wire.

Claim 15. The system of claim 13 characterized in that said means for said other slave machine to communicate with said master machine includes a dedicated serial bus.

Claim 16. The system of claim 13 characterized in that said means for said other slave machine to communicate with said master machine includes a short range radio.

Claim 17. The system of claim 13 characterized in that said means for said other slave machine to communicate with said master machine includes an X-10 power line signal transfer system.

Claim 18. The system of claim 13 characterized in that there are multiple locations and multiple master/slave units.

Claim 19. A system for remotely monitoring some operational elements of vending machines that have certain electrical signals;

said system including sensor means to produce a signal representative of the certain electrical signals,

network means to pass said signal to a remote monitoring location;

decoding means at said remote monitoring location to process said signal to decode same into meaningful operational element data; and,

remote monitoring means to process said data to allow remote monitoring of the operational elements of the vending machine.

Claim 20. The system of claim 19 wherein the vending machine has a wiring harness and characterized in that said sensor means includes a data acquisition unit;

a tap cable assembly, and said tap cable assembly connecting said data acquisition unit to the wiring harness.

Claim 21. The system of claim 19 wherein there are two vending machines, each with differing certain electrical signals, and characterized by the addition of said system further including second sensor means to produce a further signal representative of the certain electrical signals of the second vending machine;

said network means passing said further signal to said remote monitoring location;

second decoding means at said remote monitoring location to process said further signal to decode same into meaningful operational date for the second vending machine; and,

said remote monitoring means processing said data for said second vending machine to allow remote monitoring of the operational elements of said second vending machine.

Claim 22. The system of claim 21 characterized in that said decoding means and said second decoding means produce a common type signal.

Claim 23. The system of claim 21 characterized in that said sensor means and said second sensor means include a common type universal data acquisition unit.

Claim 24. The system of claim 21 wherein the vending machine and second vending machine each have wiring harnesses and characterized in that said sensor means includes a tap cable assembly;

said tap cable assembly connected to the wiring harness of the vending machine and said second sensor means includes a second tap cable assembly;

said second tap cable assembly connected to the wiring harness of the second vending machine, and said second tap cable assembly being different than said tap cable assembly.

Claim 25. In a vending machine monitoring system for a vending machine having a parameter, the monitoring occurring at a remote location;

the improvement of an alarm means, said alarm means being activated dependent on the parameter; and,

adjust means to adjust said alarm means in respect to the parameter at the remote location.

Claim 26. The system of claim 25 characterized in that said alarm means can be selectively disabled.

Claim 27. The system of claim 25 wherein the parameter has a varying value and characterized in that said adjust means varies the activation of said alarm means based on the value of the parameter.

Claim 28. The system of claim 27 characterized in that said alarm means has an upper limit value activation.

Claim 29. The system of claim 27 characterized in that said alarm means has a lower limit value.

Claim 30. The system of claim 27 characterized in that the parameter is a number.

Claim 31. The system of claim 27 characterized in that the parameter is a level.

Claim 32. A system for remotely monitoring some operation elements of varying types of vending machines that have electrical and mechanical differences;

said system including an acquisition means to produce a common type signal for the operational elements of a particular vending machine;

network means to pass said common type signal to a remote monitoring location; and,

remote monitoring means to process said common type signal to allow remote monitoring of the operational elements of the particular vending machine.

Claim 33. The system of Claim 32 wherein the vending machine has a wiring harness and characterized in that said acquisition means includes a data acquisition unit;

a tap cable assembly, and said tap cable assembly connecting said data acquisition unit to the wiring harness.

Claim 34. A system for remotely monitoring some operational elements of varying types of vending machines that have electrical and mechanical differences;

said system including an data acquisition unit, means to connect said data acquisition unit to a particular vending machine, means for said data acquisition unit to produce a common type signal for the operational elements of the particular vending machine;

network means to pass said common type signal to a remote monitoring location; and,

remote monitoring means to process said common type signal to allow remote monitoring of the operational elements of the particular vending machine.

Claim 35. The system as in Claim 34 characterized in that at least two types of vending machines are being remotely monitored; and,

each particular vending machine has a different data acquisition unit.

Claim 36. The system as in Claim 34 wherein at least two types of vending machines are being remotely monitored, each having its own differing circuitry;

and characterized by the addition of a first tap cable assembly, said data acquisition unit being a first data acquisition unit, said first tap cable assembly connecting the circuitry of one type of vending machine to said first data acquisition unit;

a second tap cable assembly, a second data acquisition unit, said second tap cable assembly connecting the circuitry of the second type of vending machine to said second data acquisition unit, and said second tap cable assembly being different than said first tap cable assembly.

Claim 37. The system as in Claim 36 characterized in that said second data acquisition unit is different than said first data acquisition unit.

Claim 38. The system as in Claim 34 characterized by the addition of a universal bus means to interconnect said data acquisition unit to said network means.

Claim 39. The system as in Claim 34 wherein the particular vending machine contains an item with an inventory; and,

characterized in that said remote monitoring means includes a graphic display indicating the relative amount of remaining inventory.

Claim 40. The system as in Claim 39 wherein the particular vending machine contains at least two items with inventories having a differing maximum; and,

characterized in that said remote monitoring means includes a graphic display indicating the relative amount of remaining inventory respectively, with such indication providing a similar relative indication of maximum inventory.

Claim 41. The system as in Claim 34 wherein said common type signal includes row and column information.

Claim 42. The system as in Claim 34 wherein said system includes a remote link unit, said remote link unit being connected between said data acquisition unit and said network means, said remote link unit having a memory, said memory storing data representative of the changing operational elements of the vending machine; and,

means for said remote link unit to pass the data to said network means.

Claim 43. The system of Claim 34 characterized in that said common type signal is the existence of a signal within the vending machines together with simultaneous occurrence coding for at least some of said signals with said remote monitoring means converting said common type signals into utilizable information.

Claim 44. The system of claim 43 characterized in that at least two types of vending machines are being remotely monitored and each particular vending machine having the same data acquisition unit.

Claim 45. In a system for remotely monitoring the operation elements of vending machines, said system comprising sensors;

said sensors having signal outputs respectively, said signal outputs representing differing types of machine conditions depending on the length of said signals;

network means to pass said signals to a remote location for monitoring, said network means including an automatic transmission means; and,

said automatic transmission means being activated by said length of said signals outputs.

Claim 46. The system of claim 45 characterized in that said signal outputs include short length vend cycle signals and longer length alarm signals, and said automatic transmission means being activated by said longer length alarm signals.

Claim 47. The system of claim 46 characterized by the addition of memory means and said memory means storing said short length vend cycle signals for subsequent transmission.

Claim 48. The system of claim 46 characterized by the addition of trigger means to trigger the transmission over said network of said short length vend cycle signals from said memory means.

Claim 49. In a system for remotely monitoring the operational elements of varying types of vending

machines including operational elements having identifiable characteristics;

said system including generation means to generate a graphic image on a screen, and control means to control said generation means to produce an image representing the operational element having identifiable characteristics.

Claim 50. The system of Claim 49 wherein the identifiable characteristics include the type of vending machine and the available inventory items;

and characterized in that said control means includes a storage area having a limited number of images representing vending machines; and,

image select means to select the image most similar to the type of vending machine including available inventory items.

Claim 51. The system of Claim 49 wherein the identifiable characteristics include certain operational elements;

and characterized in that said control means includes a storage area having a limited number of icon images representing the certain operational elements; and,

icon image select means to select the icon image most similar to the certain operational element.

Claim 52. The system of Claim 51 wherein the identifiable characteristic for a particular machine include a power supply and characterized in that said control means includes an icon representing a power supply, and icon select means to select the power icon for display.

Claim 53. The system of Claim 51 wherein the identifiable characteristic for a particular machine include a compressor and characterized in that said

control means includes an icon representing a compressor, and icon select means to select the compressor for display.

Claim 54. The system of Claim 51 wherein the identifiable characteristic for a particular machine include a change supply and characterized in that said control means includes an icon representing a coin, and icon select means to select the coin for display.

Claim 55. The system of Claim 51 wherein the identifiable characteristic for a particular machine include a door open signal and characterized in that said control means includes an icon representing a key, and icon select means to select the key for display.

Claim 56. The system of claim 49 wherein the operational elements include an inventory of a certain type of item and characterized by the addition of said control means includes an icon representing this item and item icon select means to select this icon representing this item for display.

Claim 57. The system of Claim 56 wherein the inventory is pop containers and characterized in that said item icon select means produces a circle.

Claim 58. The system of Claim 57 wherein the inventory of pop containers is a certain amount and characterized by stacking means to replicate said circles to a number reflecting the certain amount.

Claim 59. The system of Claim 56 wherein the inventory is a change and characterized in that said item icon select means produces a rectangle.

Claim 60. The system of Claim 59 wherein there is a certain amount of change in the machine and characterized by stacking means to replicate said rectangles to a number reflecting the certain amount of change.

Claim 61. In a remote vending machine monitoring system sending operational element information from a plurality of differing types of vending machines to a remotely located processor over a network, such machines including those using columns alone and not rows for inventory;

the improvement of the signal passing over the network being a common signal for differing machines; and,

said signal including row and column information.

Claim 62. The system as in Claim 61 wherein the system is utilized with vending machines having maximum number of rows columns along with machines having lesser numbers and characterized in that said signal includes the maximum number of rows and columns for machines having lesser numbers.

Claim 63. The system as in Claim 61 characterized in that said row and column information is vend events.

Claim 64. The system as in Claim 61 wherein the vending machines included matrix coded operative elements and characterized in that said row and column information are the matrix coded operative elements and acquisition at the vending machine to decode such row and column information.

Claim 65. The system as in Claim 61 wherein the system is utilized with vending machine having differing

sensors not inventory related, the system utilized with vending machines having a maximum number of such sensors along with machines having lesser numbers; and,

characterized in that said signal includes the maximum number of sensors for machines having lesser numbers.

Claim 66. The system as in Claim 61 wherein the system is utilized with vending machines having alarm conditions; and,

characterized in that said signal includes such alarm conditions.

Claim 67. The system as in Claim 61 wherein the vending machines include an inventory; and,

characterized by means to track the amount of such inventory at the remotely located processor.

Claim 68. The system as in Claim 67 characterized by the addition of means to track the historical changes of the amount of such inventory at the remotely located processor.

Claim 69. The system of claim 61 characterized in that said row and column information is matrix coded including simultaneous occurrence information, and the system additionally including decoding means to decode said information.

Claim 70. The system of claim 69 characterized in that said decoding means is at the remotely located processor.

Claim 71. In a remote vending machine monitoring system having sensor means relative to the operational elements of a vending machine and a

communication network for passing signals representative of the operation elements to a remote monitoring location;

the improvement of the remote monitoring location including a graphic display means; and,

said graphic display means including a graphic representation of at least one universal vending machine together with its operational elements.

Claim 72. The system as in Claim 71 wherein the operational elements include items with inventories; and,

the further improvement of said graphic representation including graph means disclosing such inventories.

Claim 73. The system as in Claim 72 wherein the inventories have acceptably and not acceptable levels; and,

characterized in that said graph means indicates the acceptable and not acceptable levels with varying colors.

Claim 74. The system as in Claim 72 wherein the inventories have differing maximums and said graph means displaying the same relative indicators for differing maximums.

Claim 75. The system as in Claim 71 characterized in that said graphic representation includes a plurality of a generic representations of a type of vending machine.

Claim 76. The system as in Claim 71 wherein a vending machine has certain operational conditions producing an alarm; and,

characterized by indication means to indicate the alarm condition on the graphic representation of a differing vending machine.

Claim 77. The system as in Claim 76 characterized by means to display the graphic representation of the vending machine with the alarm condition, such means utilizing said indication means.

Claim 78. The system as in Claim 71 characterized in that said graphic representation is a single generic representation for differing types of vending machines.

Claim 79. The system as in Claim 71 characterized by the addition of means for said graphic display means to provide historical trend type information relative to the operational elements.

Claim 80. The system as in Claim 71 wherein the system is utilized with varying capability vending machines having differing parameters and characterized in that said graphic display means includes means to modify said graphic representation in line with the differing parameters.

Claim 81. In a vending machine remote monitoring system to keep track of an inventory of an item in the vending machine; the improvement of a computer;

means to program the computer with a number representing the inventory in the vending machine;

means to transfer the number of actual vend cycles from the vending machine to the computer; and,

means to subtract the number of actual vend cycles from the programmed number to represent the inventory at the remote vending machine.

Claim 82. The system of claim 81 wherein the item is packed in certain multiples in bulk shipping containers and the inventory is depleted by a number in excess of the certain multiple; and,

characterized by means for said computer to generate a report disclosing the needed inventory by the certain multiples.

Claim 83. The system of claim 82 characterized by update means for said computer to update the number representing the inventory at the remote vending machine by the certain multiples of needed inventory.

Claim 84. The system of claim 83 characterized by the addition of indicate means to indicate that the new inventory has been added to vending machine and said update means operating automatically on said indicate means.

Claim 85. In a unit system for monitoring a vending machine including transmitting data from the machine to a remote computer, the improvement of the data being transmitted in a data packet, said data packet including a vending machine unit identification number signal, said vending machine unit identification signal being unique for every machine, a sequence number signal, said sequence number signal being an incremental number of the times data is sent by the link to the computer, and said data signal carrying the subsequent information about the status of the vending machine.

Claim 86. The improved data packet of Claim 85 characterized in that said data packet is preceded by a marker byte signal, and said marker byte signal indicating the beginning of said data packet.

Claim 87. The data packet of Claim 86 characterized in that said data packet includes a packet length signal, and said packet length signal indicating the length of said data packet minus said marker byte.

Claim 88. The data packet of Claim 87 characterized in that said packet length signal immediately follows said marker byte signal.

Claim 89. The data packet of Claim 86 characterized by the addition of a check sum signal, said check sum signal concluding said data packet, and said data check sum utilized to determine errors in transmission.

Claim 90. The data packet of Claim 85 characterized by a packet type signal, said packet type signal indicating the type of data transmitted and how to interpret it, and said packet type signal immediately preceding said data signal.

Claim 91. In a system for monitoring vending machines and transmitting data from the machines to a remote computer, an improved data packet, said data packet including a marker signal, said marker signal indicating the beginning of said data packet, a unit identification signal, said unit identification signal following said marker signal, said unit identification signal identifying the particular vending machine, a sequence number signal, said sequence number signal following said unit identification signal, said sequence number signal being incremented for each time a data packet is transmitted, and said sequence number signal indicating in incremental numbers the number of times data is sent by the links to the computer, a data signal, and said data signal carrying the information in respect to the status of the vending machine.

Claim 92. The data packet of Claim 91 characterized by the addition of a packet length signal, said packet length signal following said marker signal,

and said packet length signal indicating that the length of said data packet excluding said marker signal.

Claim 93. The data packet of Claim 92 characterized by check sum signals, said check sum signals following said data signals, and said check sum signals being utilized to determine if there is error in transmission.

Claim 94. A system for remotely monitoring the operations elements of varying types of vending machines that have mechanical and electrical differences,

said system including means to produce a common type signal for the operational elements of a particular vending machine, and

data means to store said common signal in a unitary database at a remote location.

Claim 95. The system of Claim 94 characterized by the addition of network means to pass said common type signal from the vending machines to the remote location.

Claim 96. The system of Claim 94 wherein the varying types of vending machines include one machine with a maximum number of individual inventory items and a maximum number of auxiliary functions and characterized in that said database has fields and said fields for all machines being equal in number to the maximum number of individual inventory items and auxiliary functions.

Claim 97. The system of Claim 96 wherein for other machines fields may be empty and characterized by the addition of means to blank the empty fields for the other machines.

Claim 98. The system of Claim 94 wherein the vending machines have alarms and characterized in that

said common type signal includes a signal representative of the alarm status for each machine respectively, said unitary data base having an alarm field, and means to enable or disable an indication of an alarm for each machine respectively.

Claim 99. The system of Claim 94 wherein the vending machines have vend cycles and an inventory for items and characterized in that said common type signal includes a signal representative of the vend cycles for each machine respectively, said data base has an inventory field, said inventory field including a number representative of the inventory in each machine respectively and means to modify said number by said vend cycles for each machine respectively.

Claim 100. The system of Claim 99 wherein the maximum inventory for the items has a value and characterized by the addition of means to generate an inventory requirements list for each machine respectively from the inventory field for such machine in said database.

Claim 101. The system of Claim 100 wherein the inventory items come in unitary containers having multiple items and characterized by the addition of means to modify said inventory requirement list for each machine to unitary contained multiples.

Claim 102. The system of Claim 100 wherein the vending machines are located in service areas and characterized by the addition of means to generate inventory requirements lists by vending machines in a service area.

Claim 103. The system of Claim 99 wherein the inventory items for each machine respectively have

critical values and characterized by the addition of means to generate a critical inventory report of all inventory items at the critical values.

Claim 104. The system of Claim 103 characterized by means to selectively alter the critical values for the inventory items for each machine respectively.

Claim 105. The system of Claim 94 wherein some vending machines have conditions with critical values and characterized by the addition of means to generate an alarm indication for a vending machine based on the critical values respectively.

Claim 106. The system of Claim 105 characterized by the addition of means to selectively alter the critical values for the conditions for each machine respectively.

Claim 107. The system of Claim 99 characterized by the addition of means to store historical data representative of the inventory and means to analyze said historical data.

Claim 108. In a system for monitoring one or more vending machines from a remote computer, such machines having operational elements memory based on data, a remote link unit, network means for said remote link unit to acquire data from the remote computer and program means for said remote link unit to alter the data in the memory of the machines.

Claim 109. The system of Claim 108 characterized in that the vending machines have alarms automatically sent if enabled and said program means enabling or disabling said alarms.

Claim 110. The system of Claim 108 wherein the operational elements include the pricing of individual vend units and characterized in that said program means alters the pricing of such units.

Claim 111. The system of Claim 109 wherein the operational elements include a door intrusion override by identification code and characterized in that said program means alters the identification code.

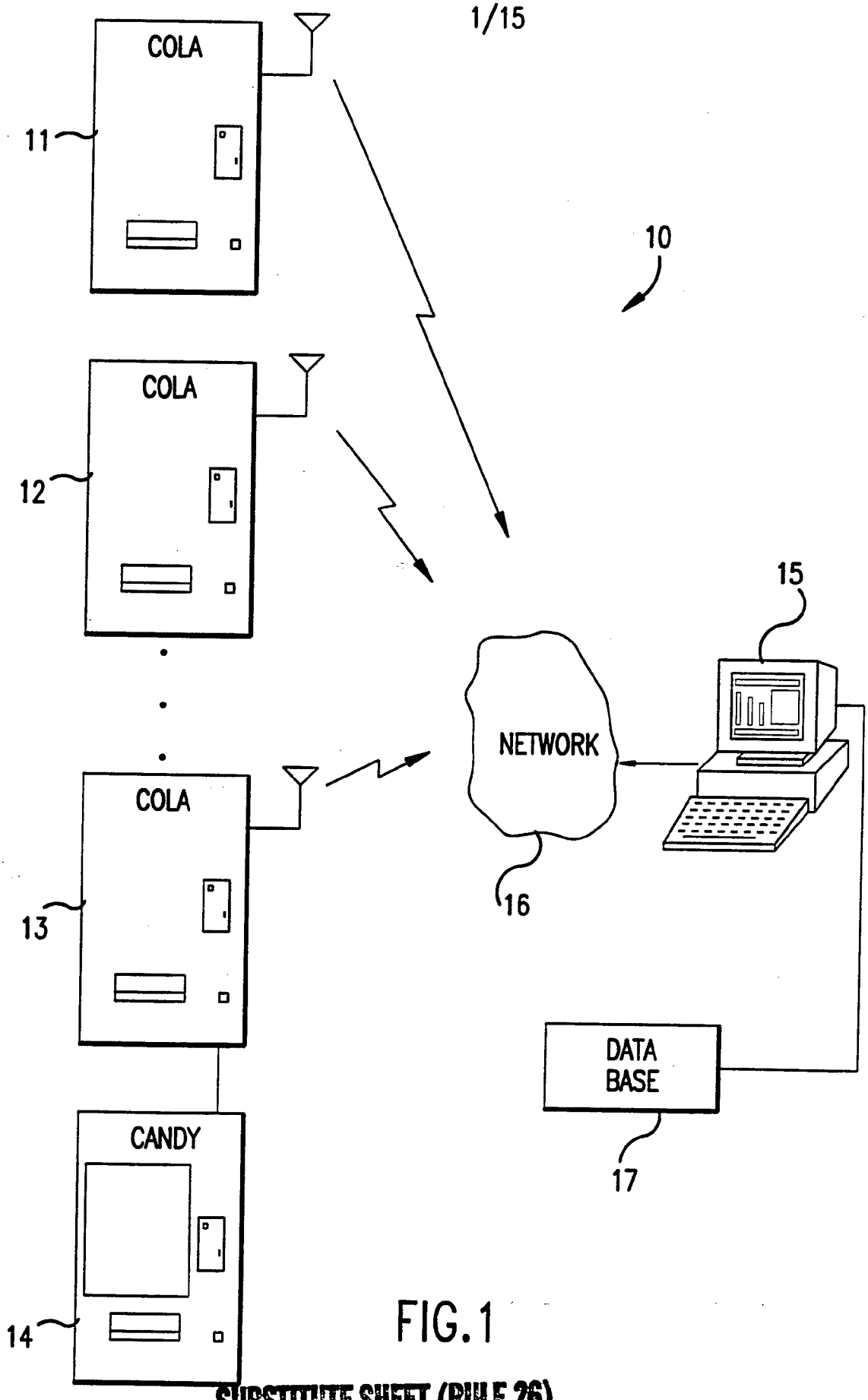


FIG. 1

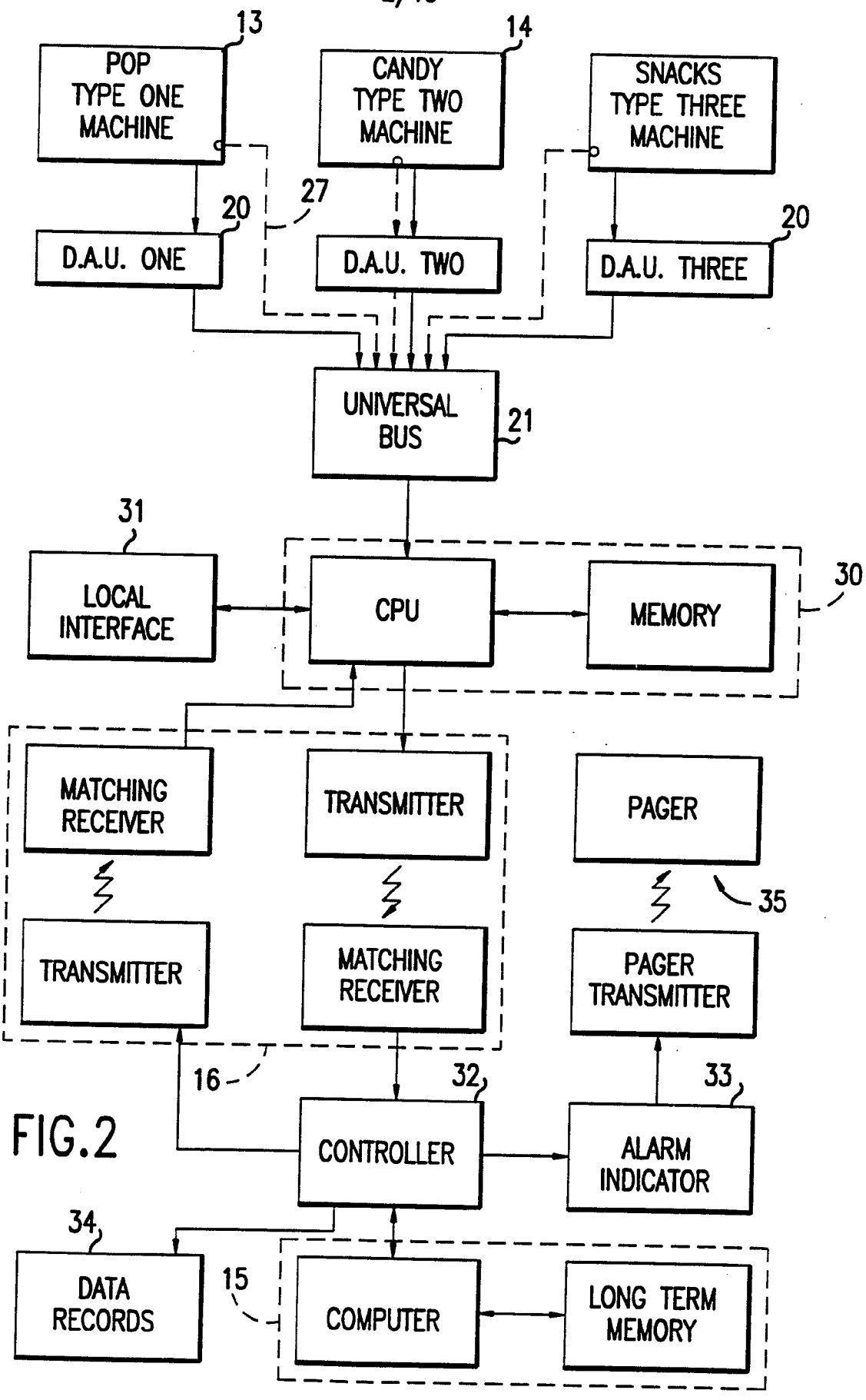

13
POP
TYPE ONE
MACHINE
14
CANDY
TYPE TWO
MACHINE
SNACKS
TYPE THREE
MACHINE
27
20
D.A.U. ONE
D.A.U. TWO
20
D.A.U. THREE
UNIVERSAL
BUS
21
31
LOCAL
INTERFACE
CPU
MEMORY
30
MATCHING
RECEIVER
TRANSMITTER
PAGER
35
TRANSMITTER
MATCHING
RECEIVER
PAGER
TRANSMITTER
16
32
33
CONTROLLER
ALARM
INDICATOR
34
DATA
RECORDS
15
COMPUTER
LONG TERM
MEMORY

FIG.2

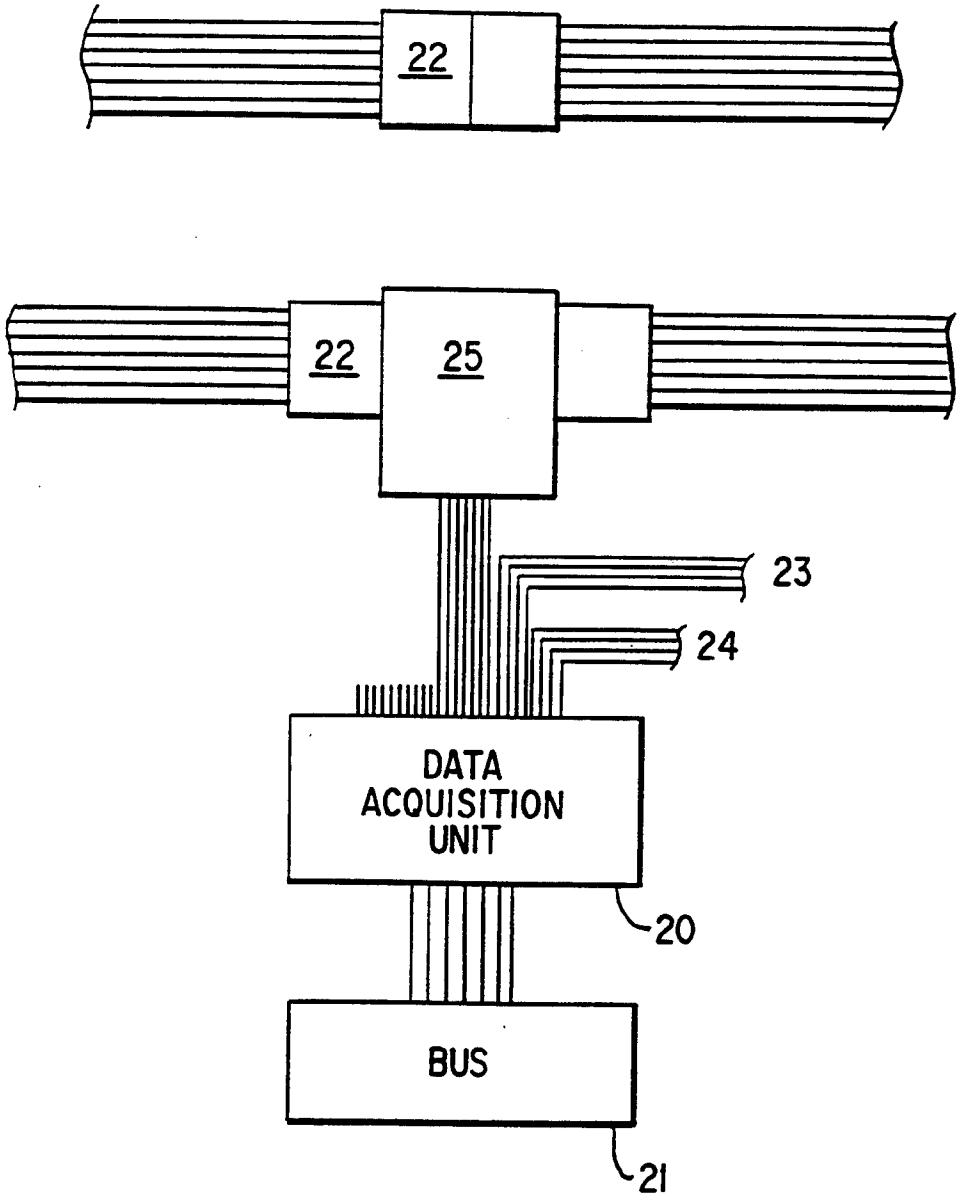


FIG. 3

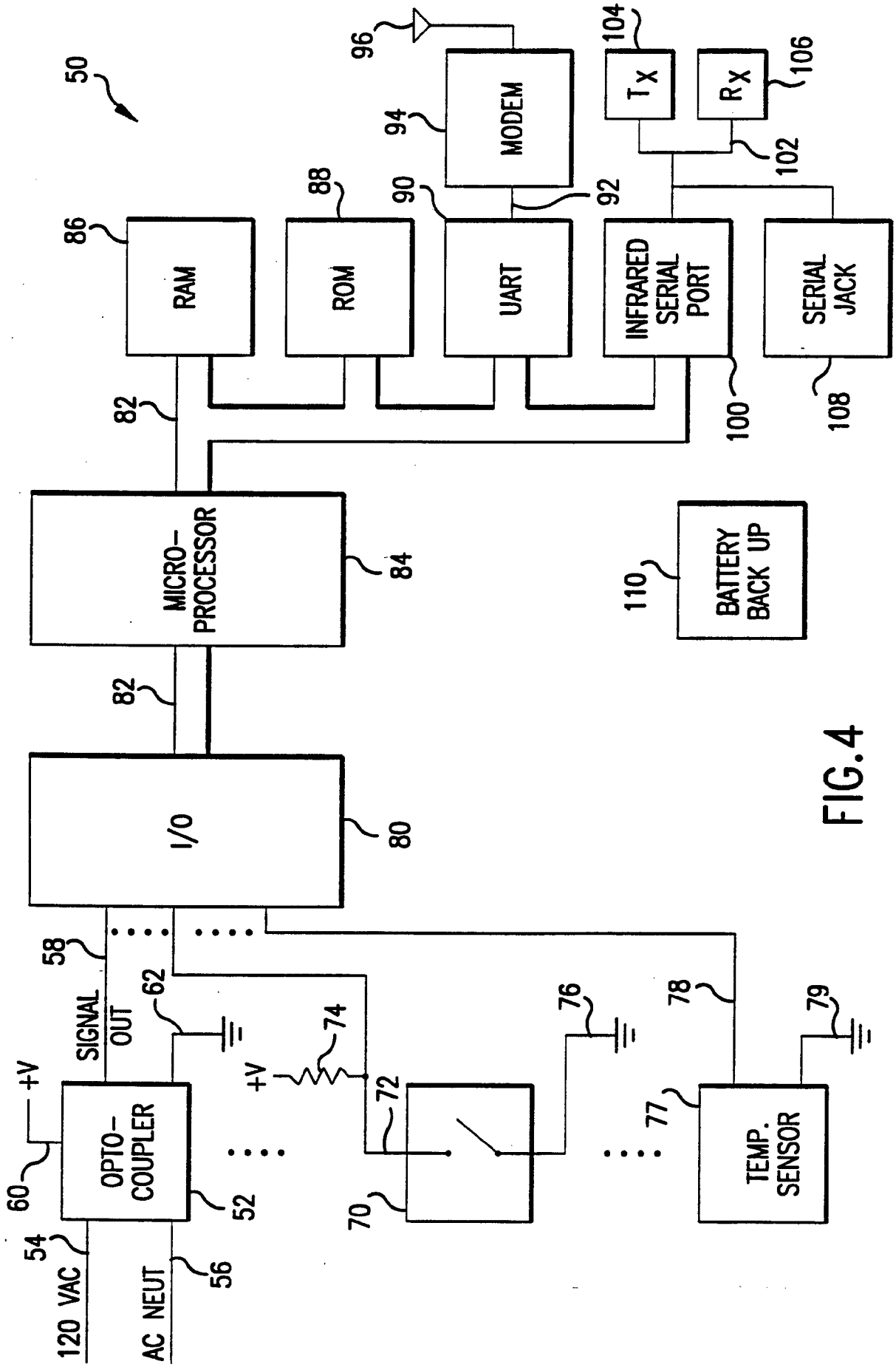

50
96
MODEM
94
104
Tx
Rx
106
102
88
90
92
86
RAM
ROM
UART
INFRARED SERIAL PORT
SERIAL JACK
82
100
108
MICRO-PROCESSOR
84
110
BATTERY BACK UP
82
I/O
80
58
62
SIGNAL OUT
+V
74
+V
76
78
79
72
77
60
OPTO-COUPLER
52
70
TEMP. SENSOR
54
120 VAC
56
AC NEUT

FIG.4

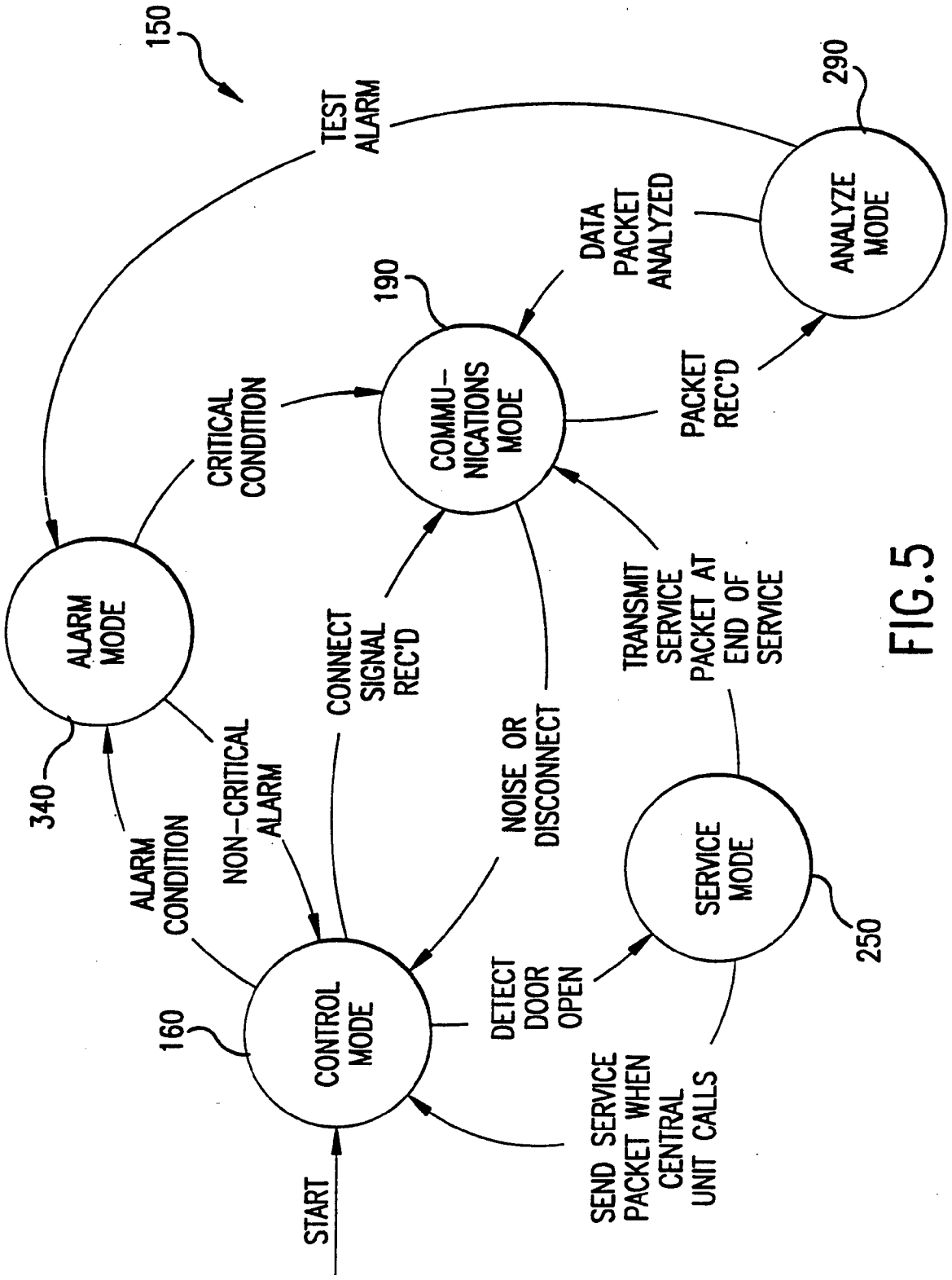

150
TEST ALARM
290
ANALYZE MODE
DATA PACKET ANALYZED
190
COMMU-NICATIONS MODE
PACKET REC'D
CRITICAL CONDITION
ALARM MODE
CONNECT SIGNAL REC'D
TRANSMIT SERVICE PACKET AT END OF SERVICE
340
ALARM CONDITION
NON-CRITICAL ALARM
NOISE OR DISCONNECT
SERVICE MODE
250
160
CONTROL MODE
DETECT DOOR OPEN
SEND SERVICE PACKET WHEN CENTRAL UNIT CALLS
START

FIG.5

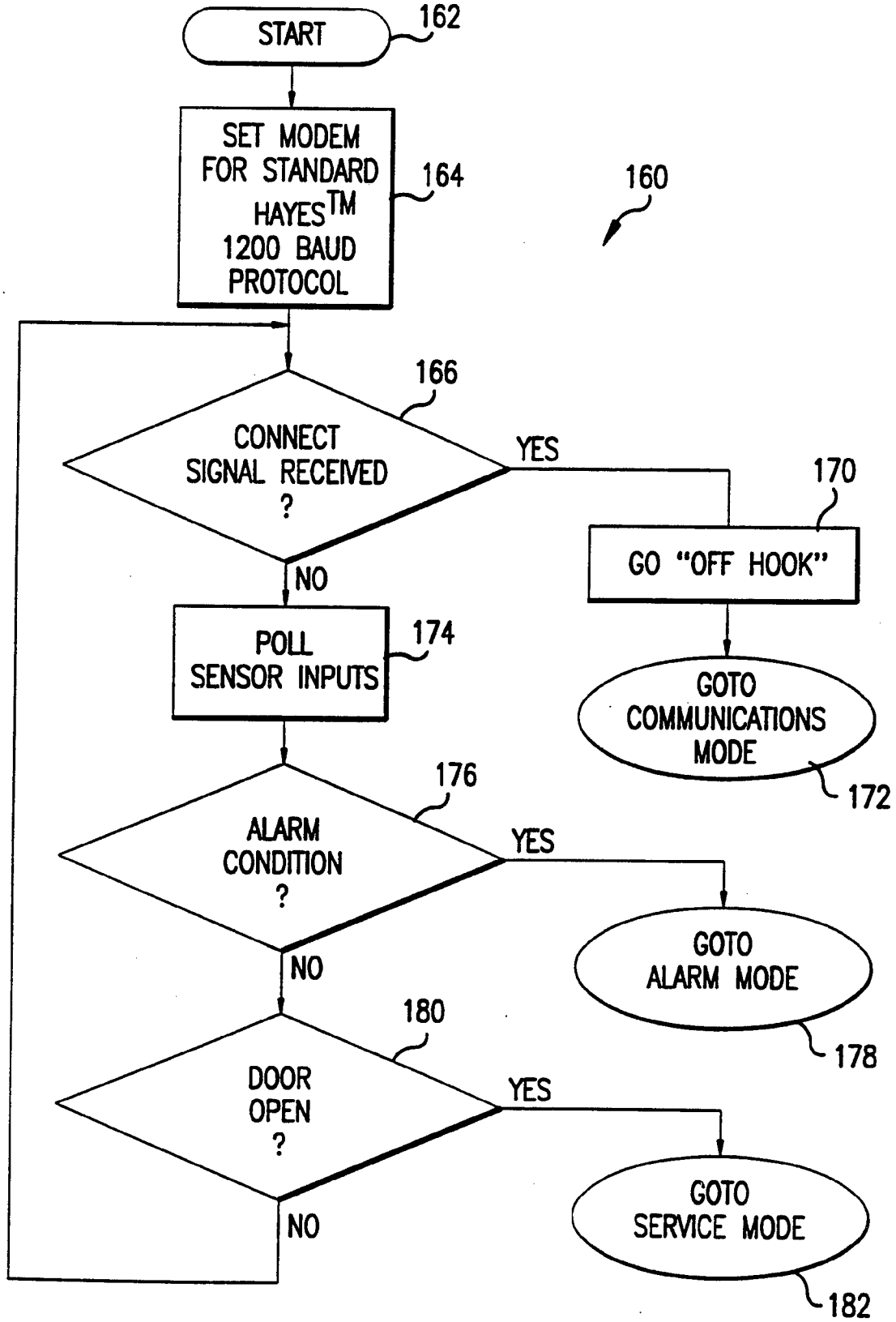

START
162
SET MODEM FOR STANDARD HAYES™ 1200 BAUD PROTOCOL
164
160
166
CONNECT SIGNAL RECEIVED ?
YES
170
GO "OFF HOOK"
NO
POLL SENSOR INPUTS
174
GOTO COMMUNICATIONS MODE
172
176
ALARM CONDITION ?
YES
GOTO ALARM MODE
178
NO
180
DOOR OPEN ?
YES
GOTO SERVICE MODE
182
NO

FIG.6

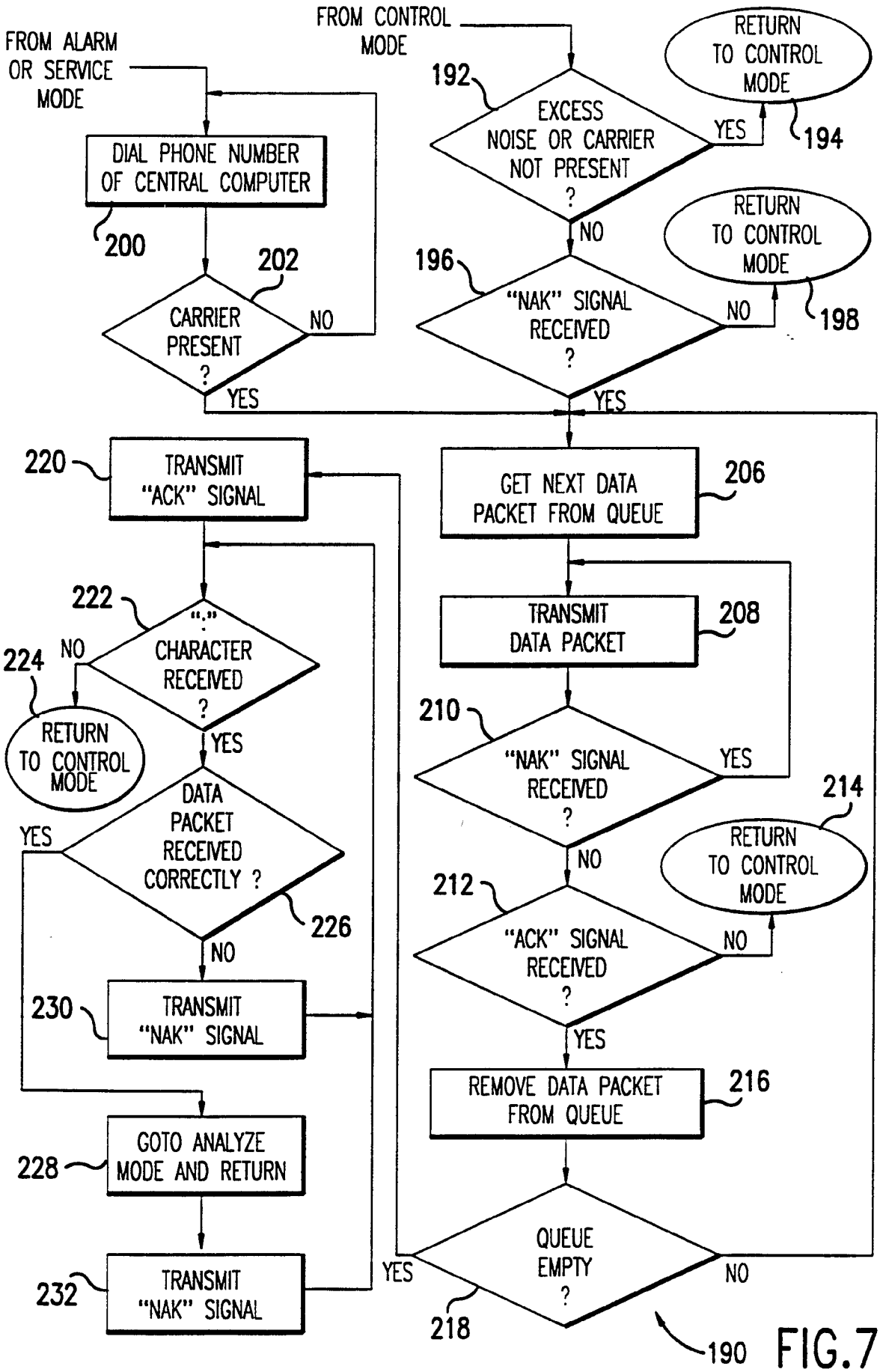

FROM ALARM OR SERVICE MODE
FROM CONTROL MODE
DIAL PHONE NUMBER OF CENTRAL COMPUTER
200
202
CARRIER PRESENT ?
NO
YES
192
EXCESS NOISE OR CARRIER NOT PRESENT ?
YES
RETURN TO CONTROL MODE
194
NO
196
"NAK" SIGNAL RECEIVED ?
NO
RETURN TO CONTROL MODE
198
YES
220
TRANSMIT "ACK" SIGNAL
206
GET NEXT DATA PACKET FROM QUEUE
222
":" CHARACTER RECEIVED ?
NO
224
RETURN TO CONTROL MODE
YES
208
TRANSMIT DATA PACKET
210
"NAK" SIGNAL RECEIVED ?
YES
214
RETURN TO CONTROL MODE
DATA PACKET RECEIVED CORRECTLY ?
YES
226
NO
NO
212
"ACK" SIGNAL RECEIVED ?
NO
230
TRANSMIT "NAK" SIGNAL
YES
216
REMOVE DATA PACKET FROM QUEUE
228
GOTO ANALYZE MODE AND RETURN
QUEUE EMPTY ?
YES
NO
232
TRANSMIT "NAK" SIGNAL
218
190

FIG.7

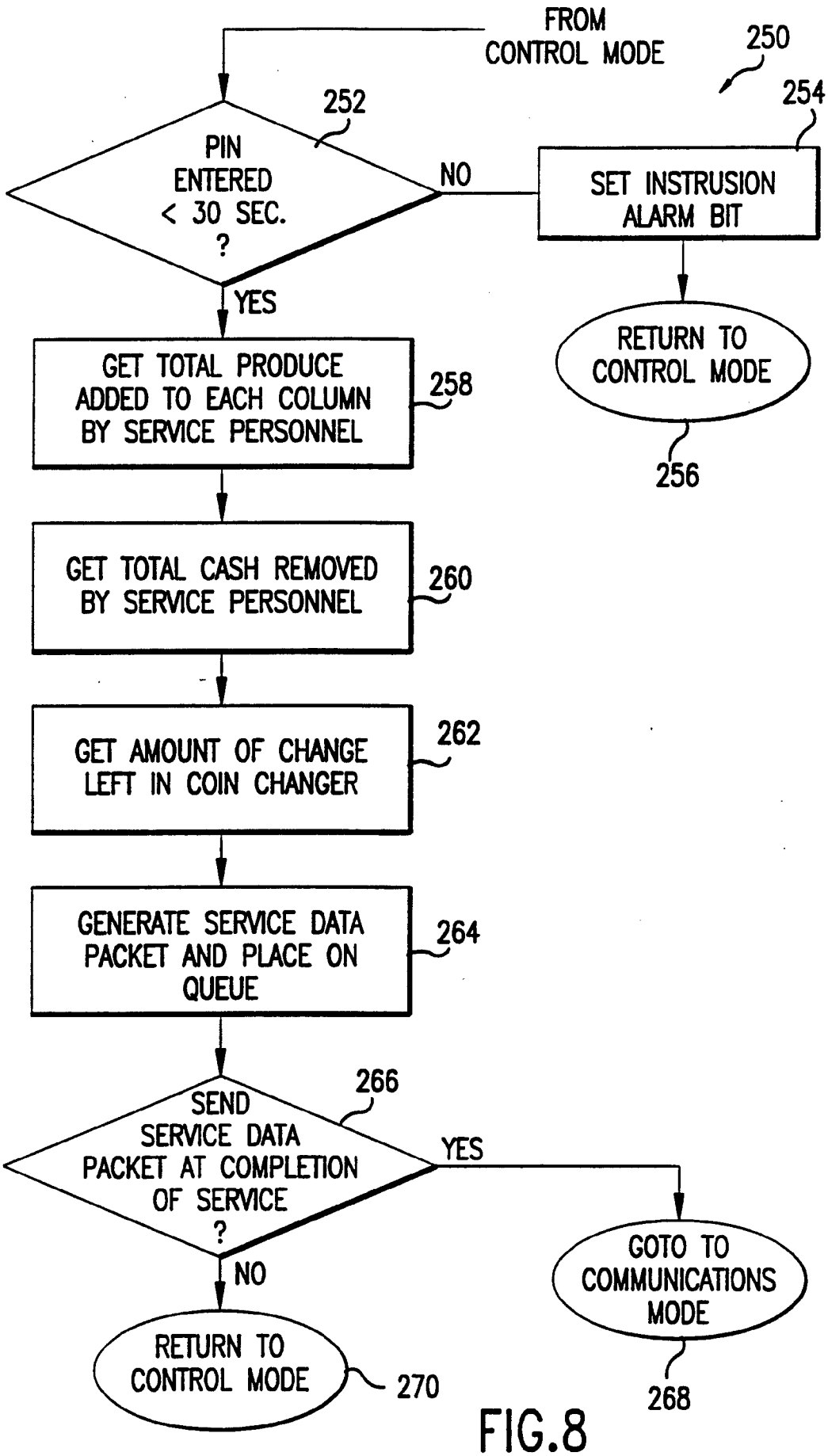

FROM CONTROL MODE
250
252
PIN ENTERED < 30 SEC. ?
NO
254
SET INSTRUSION ALARM BIT
YES
RETURN TO CONTROL MODE
256
GET TOTAL PRODUCE ADDED TO EACH COLUMN BY SERVICE PERSONNEL
258
GET TOTAL CASH REMOVED BY SERVICE PERSONNEL
260
GET AMOUNT OF CHANGE LEFT IN COIN CHANGER
262
GENERATE SERVICE DATA PACKET AND PLACE ON QUEUE
264
266
SEND SERVICE DATA PACKET AT COMPLETION OF SERVICE ?
YES
NO
GOTO TO COMMUNICATIONS MODE
268
RETURN TO CONTROL MODE
270

FIG.8

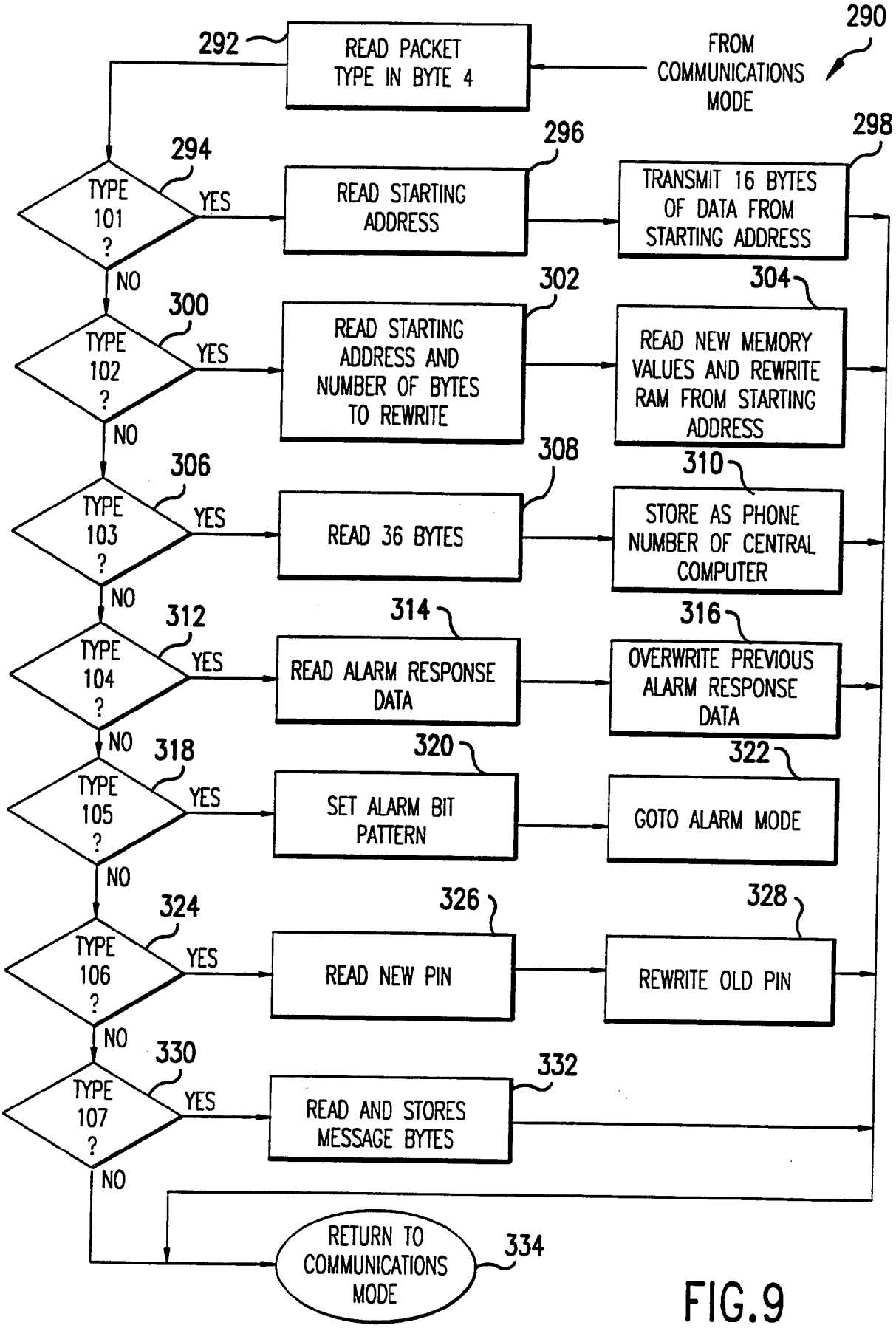

290
FROM COMMUNICATIONS MODE
292
READ PACKET TYPE IN BYTE 4
294
TYPE 101 ?
YES
296
READ STARTING ADDRESS
298
TRANSMIT 16 BYTES OF DATA FROM STARTING ADDRESS
NO
300
TYPE 102 ?
YES
302
READ STARTING ADDRESS AND NUMBER OF BYTES TO REWRITE
304
READ NEW MEMORY VALUES AND REWRITE RAM FROM STARTING ADDRESS
NO
306
TYPE 103 ?
YES
308
READ 36 BYTES
310
STORE AS PHONE NUMBER OF CENTRAL COMPUTER
NO
312
TYPE 104 ?
YES
314
READ ALARM RESPONSE DATA
316
OVERWRITE PREVIOUS ALARM RESPONSE DATA
NO
318
TYPE 105 ?
YES
320
SET ALARM BIT PATTERN
322
GOTO ALARM MODE
NO
324
TYPE 106 ?
YES
326
READ NEW PIN
328
REWRITE OLD PIN
NO
330
TYPE 107 ?
YES
332
READ AND STORES MESSAGE BYTES
NO
RETURN TO COMMUNICATIONS MODE
334

FIG.9

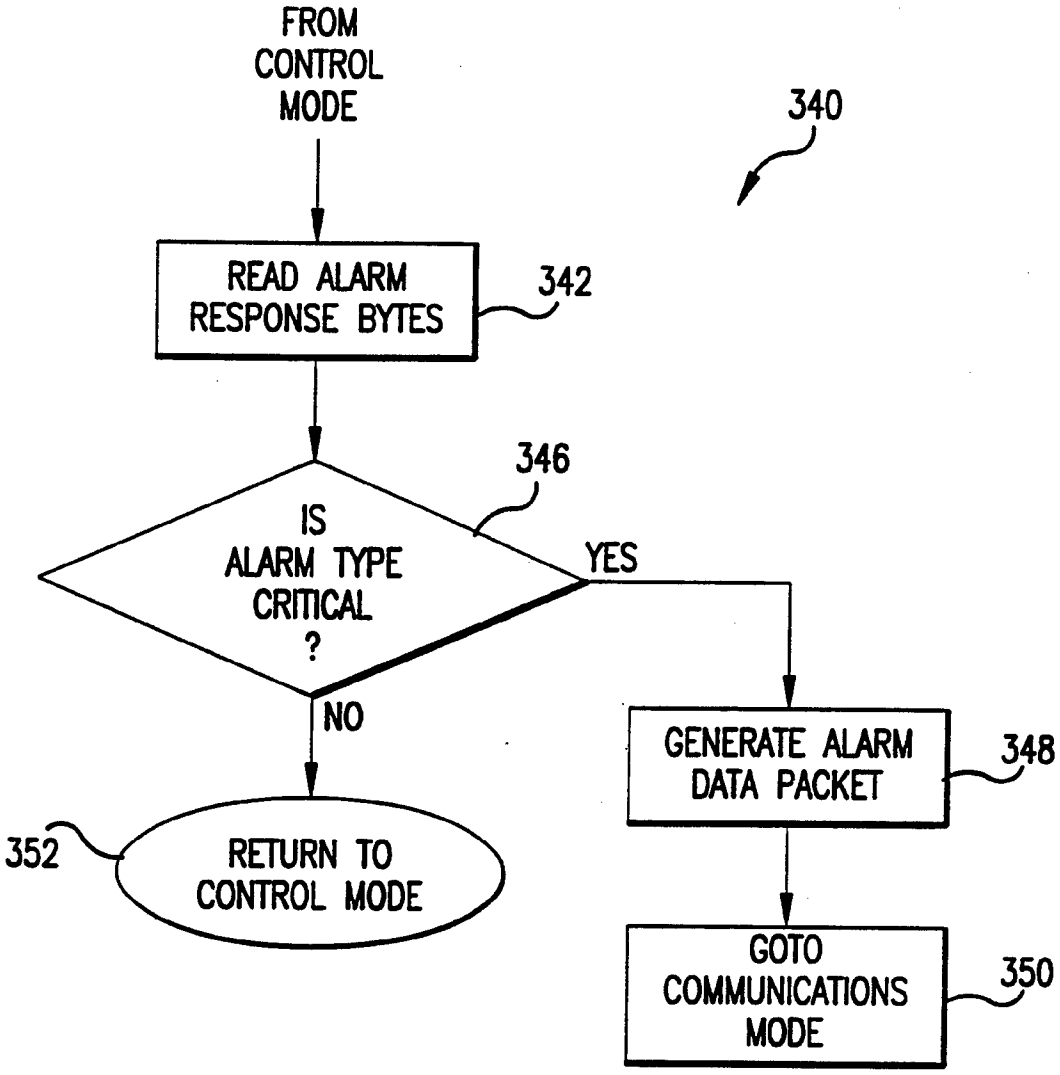

FROM CONTROL MODE
340
READ ALARM RESPONSE BYTES
342
346
IS ALARM TYPE CRITICAL ?
YES
NO
GENERATE ALARM DATA PACKET
348
352
RETURN TO CONTROL MODE
GOTO COMMUNICATIONS MODE
350

FIG.10

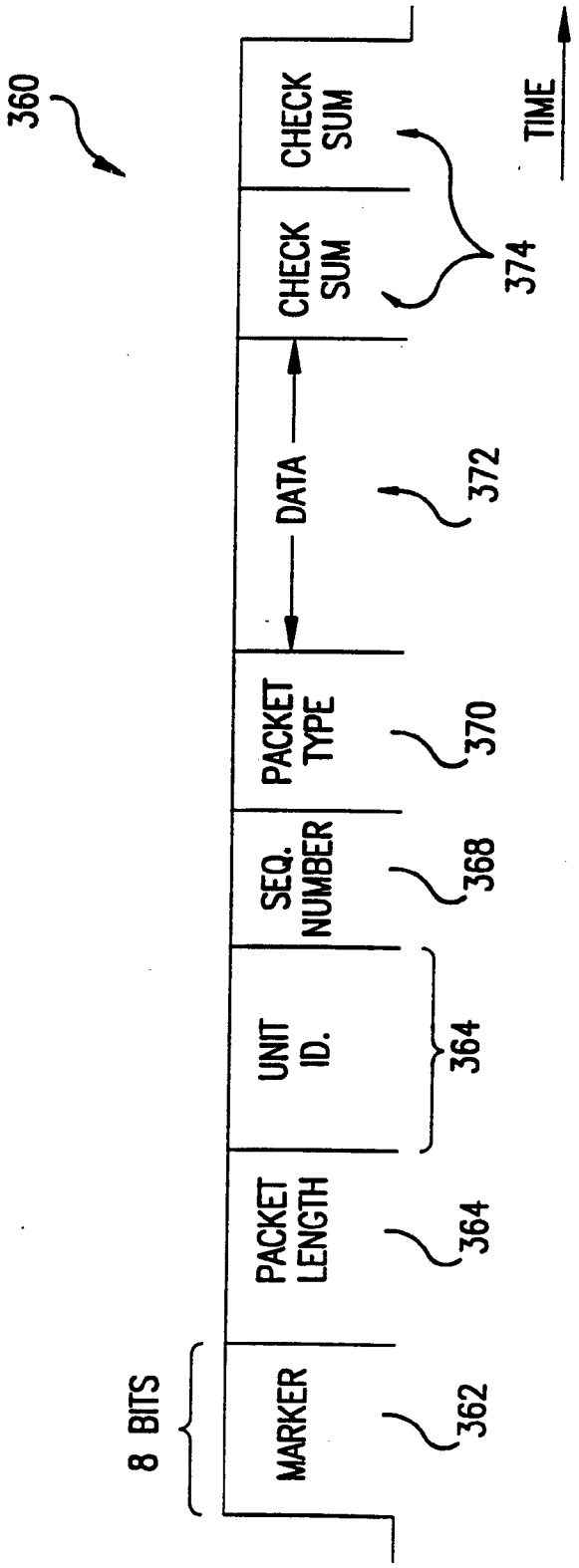

360
8 BITS
MARKER
362
PACKET LENGTH
364
UNIT ID.
364
SEQ. NUMBER
368
PACKET TYPE
370
DATA
372
CHECK SUM
CHECK SUM
374
TIME

FIG.11

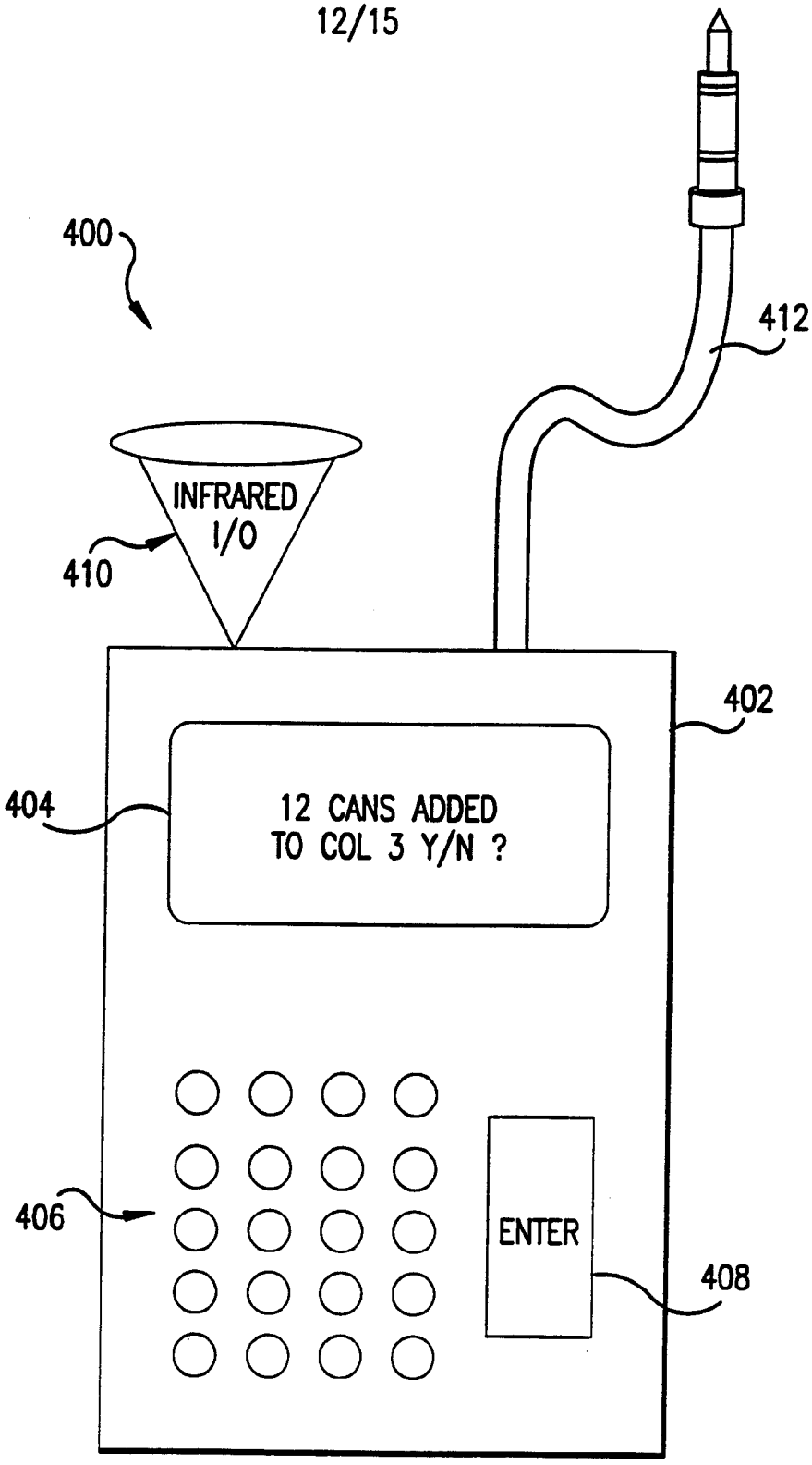

400
412
INFRARED
I/O
410
402
404
12 CANS ADDED
TO COL 3 Y/N ?
406
ENTER
408

FIG.12

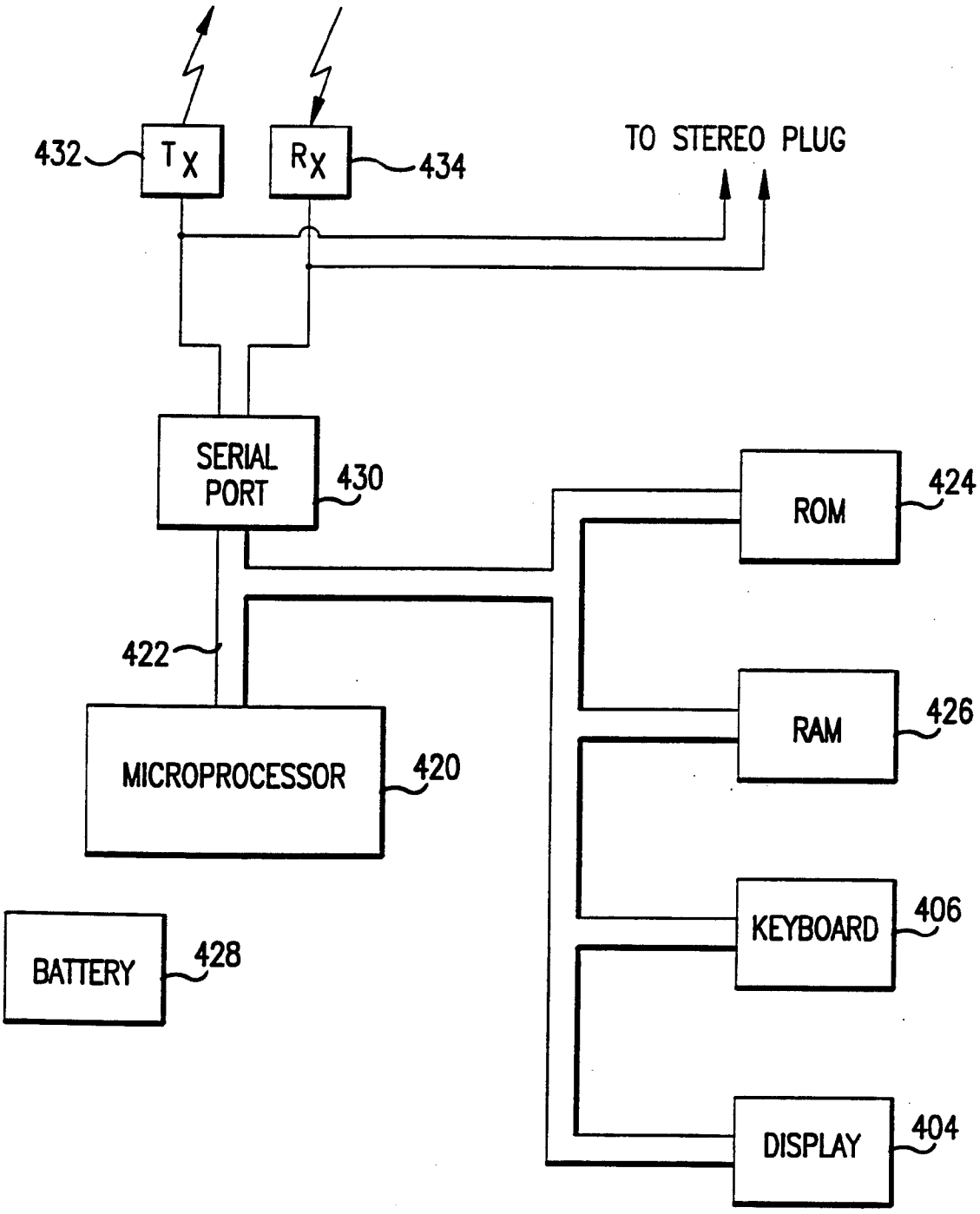

TO STEREO PLUG
432
Tx
Rx
434
SERIAL PORT
430
ROM
424
422
RAM
426
MICROPROCESSOR
420
KEYBOARD
406
BATTERY
428
DISPLAY
404

FIG.13

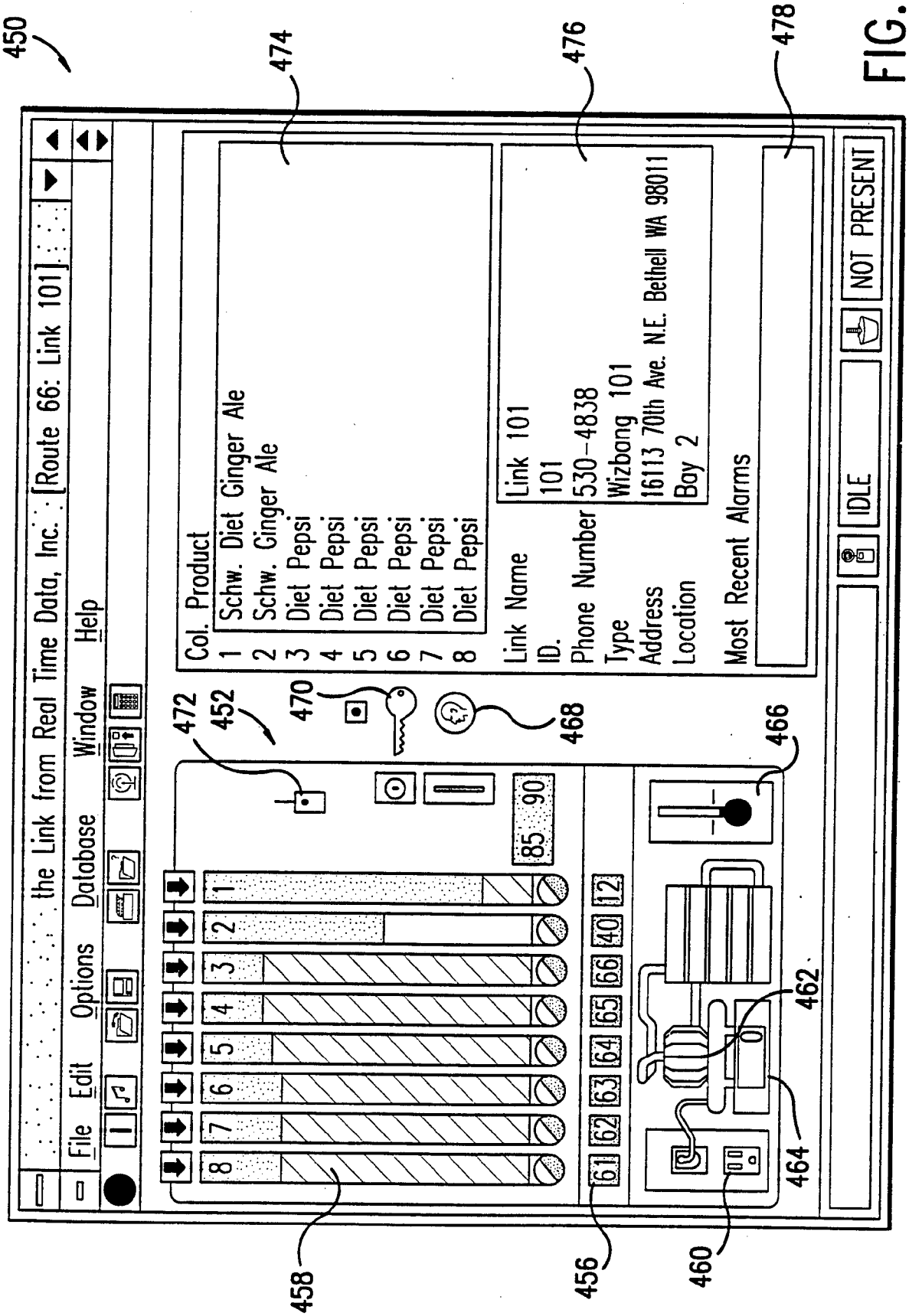
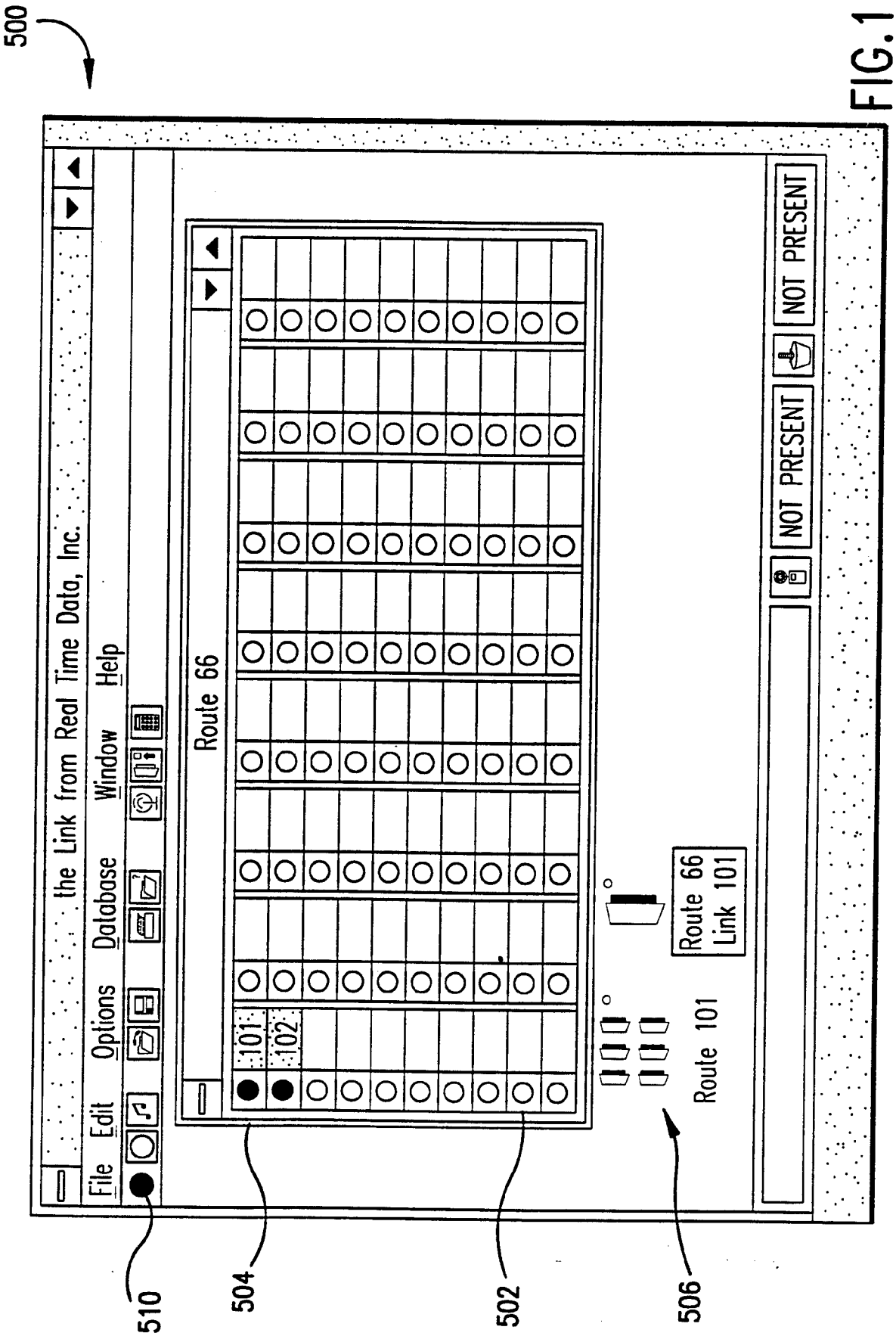

450
474
476
478
472
452
470
468
466
462
464
460
458
456
the Link from Real Time Data, Inc. [Route 66: Link 101]
File Edit Options Database Window Help
Col. Product
1 Schw. Diet Ginger Ale
2 Schw. Ginger Ale
3 Diet Pepsi
4 Diet Pepsi
5 Diet Pepsi
6 Diet Pepsi
7 Diet Pepsi
8 Diet Pepsi
Link Name
ID.
Phone Number
Type
Address
Location
Link 101
101
530-4838
Wizbang 101
16113 70th Ave. N.E. Bothell WA 98011
Bay 2
Most Recent Alarms
IDLE
NOT PRESENT
1 2 3 4 5 6 7 8
85 90
61 62 63 64 65 66 40 12

FIG.14

FIG.15


500
the Link from Real Time Data, Inc.
File Edit Options Database Window Help
Route 66
101
102
NOT PRESENT
NOT PRESENT
Route 66
Link 101
Route 101
510
504
502
506

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(71) Applicant: TELIA AB [SE/SE]; Mårbackagatan 11, S-123 86 Farsta (SE).

(72) Inventors: URBY, Göran; S. Domarevägen 10, S-663 33 Skoghall (SE). EMILSSON, Stellan; Gränv 31, S-655 94 Karlstad (SE).

(74) Agent: PRAGSTEN, Rolf; Telia Research AB, Vitsandsgatan 9, S-123 86 Farsta (SE).

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(57) Abstract

A cellular radio communication system including a cellular radio communication network, such as GSM, adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations. The system includes at least one portable graphic display unit, for example, a portable personal computer (PPC), such as a laptop computer, adapted to communicate with the network, via a mobile station, using SMS and, in response to receipt of SMS messages, to selectively display stored graphic images and to selectively superpose stored geographically related information symbols on a displayed image. The information symbols, superposed on a displayed map image, are continually updated with current information by the SMS messages. The graphic images and symbols are preferably stored by the PPC, for example, on a CD-ROM and/or hard disc.

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IMPROVEMENTS IN, OR RELATING TO, CELLULAR RADIO COMMUNICATION SYSTEMS

The invention relates to a cellular radio communication system, including cellular radio communication network, such as a Global System for Mobile Communication (GSM) network, that is adapted to present geographically related information to system users and, in particular, to such systems that offer a 'short message service' (SMS) for updating the geographically related information. The invention also relates to a method for distributing and displaying geographically related information using SMS messages.

The mobile cellular radio communication network, known as GSM, which is covered by standards developed and promulgated by the European Telecommunications Standards Institute (ETSI), offers a variety of services to users, other than voice, including, inter alia, data services, short message services, and broadcast services. The ETSI GSM Standards specify. in addition to the radio interface, a complete telecommunications network with radio access by the user. Since the architecture, and operational aspects, of GSM are well known to persons skilled in the art, only those aspects of GSM which are of direct relevance to the present invention will be covered by this patent specification.

SMS is a feature which is incorporated into digital mobile telephone networks, and can be divided into two types, point-to-point services (SMS-PP), and broadcast services (SMS-CB).

SMS-PP allows a brief message (up to 160 characters) to be sent between a mobile telephone and a Service Centre (SC). Larger messages can optionally be created by concatenating multiple massages (the protocol allows up to 10 messages to be concatenated in this way). The SC operates in a store

and forward manner. being able to send, or receive, messages from a wide variety of sources. in addition to a GSM mobile telephone, for example, fax, normal telephone, dial up modems, public, or private data networks etc.. This means that the service is not limited to sending messages between GSM mobile telephones, but can be used to send, or receive, messages from the wider telecommunications network.

Messages are handled in the SC in a store and forward manner. This means that when a message is received in the SC, it will be stored in the SC and will be forwarded onto the ultimate destination when the destination is able to receive it. Therefore, a message can be sent to a telephone which is currently switched off. and the SC will store the message until such time as the telephone is switched on again. Mechanisms exist throughout the GSM infrastructure for informing the SC that a telephone, for which it has a pending message, is now available. Options also exist for informing the originator that the message has been received at the destination.

The telephone messages can be stored either in non-volatile memory in the telephone, or in the SIM card. These can be messages created by the user, or can be messages received from the SC. Normally, when a message is received, it will be stored either in the telephone, or the SIM, and an indication given to the user that a new message has been received. The user can then retrieve the message from the telephone and display it. As an option, the message can also be coded by the originator so that it is immediately displayed rather than stored.

SMS-CB allows the network to broadcast messages to any interested user. A message is simply broadcast repeatedly at intervals until such time as it is no longer valid. Messages can consist of up to 15 pages, and the same message may be broadcast in multiple languages. Each message has a

sequence number, meaning that when a message is updated the telephone can tell when an updated message is being received. The messages can also be tagged showing the geographical scope of their validity. For example, they can be tagged as being valid over the entire network (e.g. news flashes), over one region within the network (e.g. traffic information), or over just a single cell (e.g. cell identity information).

It is very important, when travelling, i.e. in mobile situations, for the person concerned to have access to current information relating to the place where he/she is presently located and to be able to present the information in a very easily understandable manner. An ideal method of achieving this would be to superpose information consisting of symbols on a graphic map image. For effective operation of this method, provision must be made for the information to be distributed, i.e. updated, on an on-going basis and as speedily as possible. An ideal medium for effecting distribution/updating of the information would be a radio-based information distribution system having a required geographical coverage. However, the problem with systems of this type is that they only offer a very limited bandwidth. There is, therefore, a need for a technical solution to this problem that uses a bandwidth which does not encroach on the space available for speech traffic but which can cope with the updating of the graphic map image in an effective manner. Furthermore, the technical solution to the problem needs to be based on standard components in order to make it attractive to a wide range of consumers.

It is an object of the present invention to provide a solution to the technical problem, outlined above, through the use of a cellular radio communication system, such as a GSM system, that is adapted to present geographically related information to system users, for example, on a display screen of a portable personal computer (PPC). In particular, the displayed information is updated through use of a 'short message service' (SMS) provided

by the radio-based system.

It is another object of the present invention to provide a method for distributing and displaying geographically related information using a cellular radio communication system that offers a SMS service.

According to a first aspect of the present invention, there is provided, a cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, characterised in that said system includes at least one portable graphic display unit adapted to communicate with said network, via a mobile station, using said short message service (SMS) and, in response to receipt of SMS messages, to selectively display stored graphic images and to selectively superpose stored geographically related information symbols on a displayed image. The said at least one graphic display unit may form part a portable personal computer (PPC), in which case, the PPC is adapted to communicate with said network, via a mobile station, using the short message service (SMS). The graphic map images and symbols are preferably stored by the PPC.

According to a second aspect of the present invention, there is provided, a cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, characterised in that said system includes at least one portable personal computer (PPC) adapted to communicate with a mobile station using said short message service (SMS),

said PPC including a display screen; storage means having stored therein a series of graphic map images and a number of geographically related information symbols for selective display on said display screen, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and selection means, responsive to receipt of SMS messages, for selectively retrieving a map image and symbols from said storage means for display on said display screen.

Preferably, the information symbols, superposed on a displayed map image, are continually updated with current information by the SMS messages.

The graphic map images and information symbols may be stored in a CD-ROM and/or a hard disc, which may form part of a PPC.

Preferably, the stored information symbols are predefined and adapted for various applications, and the SMS message define at least one symbol required to be displayed, together with its geographic coordinates. The PPC is preferably adapted, on receipt of the SMS message, to superpose the said at least one symbol on a graphic map image of the geographic area concerned, at a position defined by said geographic coordinates.

A SMS cell broadcast facility may be used to distribute messages defining geographically related information considered to be of general application by a network operator. With this facility, SMS messages are used to continually updated information symbols, superposed on a displayed graphic map image, with current information. The SMS cell broadcast facility may be adapted to limit the volume of distributed information by transmitting a number of SMS messages, for different applications, over different geographic locations. In addition, the SMS messages may be repeatedly broadcast, at intervals for a period of time during which a message is valid. Furthermore, the SMS

messages may include an indication, identifiable by a mobile station, that previously transmitted information is being updated.

The SMS cell broadcast facility may be used for the distribution of messages concerning the current weather situation, in different geographic areas; local tourist information; road information; traffic information; the geographic locations of petrol filling stations of different companies, bank, retail outlets and the like; the availability of hotel vacancies; and, in a sailing boat race, the relative positions of the boats in the race.

Alternatively, the SMS messages may be addressed to unique users, or groups of users, and the SMS messages may define geographic related information selected by a network user. This geographically related information may be in respect of a limited geographic area. The limited geographic area may be local to a user, or group of users, for whom the information has been requested, the geographic limits being indicated either manually, or through use of a mobile station position-fixing facility. The manual indication may be given by an area marked on a synoptical map by said user, or group of users.

The limited geographic area may be local to a user, or group of users, for whom the information has been requested, and a mobile station of said user, or each member of said group of users, may be provided with a GPS receiver for determining said mobile station's geographic location. With this arrangement, each mobile station is adapted to transmit the respective location information to a service provider using the SMS message facility.

The SMS messages addressed to unique users, or groups of users, may be adapted for use during military exercise, or by police forces on reconnaissance, fire-fighters fighting a fire, such as a forest fire, or a taxis driver to determine the location of other taxis in the same taxi fleet.

According to a third aspect of the present invention, there is provided, in a cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS), in which said network includes a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, a method for distributing and displaying geographically related information using SMS messages, characterised by the steps of storing a series of graphic map images and a number of geographically related information symbols for selective display on a portable display unit, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and, in response to receipt of SMS messages from said network, retrieving and displaying a stored map image and symbols defined by said SMS messages. The method may be further characterised by the step of continually updating the information symbols, superposed on a displayed map image, with current information defined by said SMS messages. The storage of said graphic map images and information symbols may effected by a CD-ROM and/or a hard disc, which may form part of a PPC.

In a preferred method, the stored information symbols are predefined and adapted for various applications, in which case a SMS message defines at least one symbol required to be displayed, together with its geographic coordinates, and, on receipt of said SMS message, said at least one symbol is superposed on a displayed graphic map image at a position defined by said geographic coordinates.

The information symbols may include text information and an arrow adapted to be pointed at geographic coordinates of a map image defined by an SMS message.

The method may be further characterised by distributing SMS messages using a SMS cell broadcast facility of said network, said distribute messages defining geographically related information considered to be of general application by a network operator. This method may include the step of using said SMS messages to continually update information symbols, superposed on a displayed graphic map image, with current information. The method may also include the step transmitting a number of SMS messages, for different applications, over different geographic locations, in order to limit the volume of distributed information by each of said SMS messages. The method may also include the step of repeatedly broadcasting said SMS messages, at intervals, for a period of time during which a message is valid.

Preferably, the method includes, in said SMS messages, an indication, identifiable by a mobile station, that previously transmitted information is being updated.

In a preferred method, the SMS cell broadcast facility is used for the distribution of messages concerning the current weather situation, in different geographic areas: local tourist information; road information; traffic information; the geographic locations of petrol filling stations of different companies; the availability of hotel vacancies; and, in a sailing boat race, the relative positions of the boats in the race.

The method may be further characterised by the step of addressing said SMS messages to unique users, or groups of users, and the SMS messages may define geographic related information selected by a network user. The geographically related information may be for a limited geographic area, the limited geographic area may be local to a users, for whom the information has been requested, and the geographic limits may be indicated either manually, or through use of a mobile station position fixing facility. The manual indication

may be given by marking an area on a synoptical map.

When the limited geographic area is local to a user, or group of users, for whom the information has been requested, a mobile station of said user, or each member of said group of users, may be provided with a GPS receiver, in which case, the method may include the steps of determining a geographical location of a mobile station using said GPS receiver, and transmitting said location information to a service provider using said SMS message facility.

The method of addressing SMS messages to unique users, or groups of users, is preferably used during military exercise, or by police forces on reconnaissance, fire-fighters fighting a fire, such as a forest fire, or a taxis driver to determine the location of other taxis in the same taxi fleet.

The cellular radio communication network is preferably a GSM network.

According to a fourth aspect of the present invention, there is provided, an arrangement for distributing and displaying geographically related information using a SMS message facility of a cellular mobile radio communication network, characterised in that said arrangement is adapted to operate in accordance with a method as outlined in preceding paragraphs, or uses a system as outlined in preceding paragraphs

According to a fifth aspect of the present invention, there is provided a receiver for use with a system as outlined in preceding paragraphs, characterised in that said receiver includes a transceiver; storage means for storing a series of graphic map images and a number of geographically related information symbols for selective display, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and display means for displaying said

graphic map images and said symbols, responsive to communication with said transceiver. The transceiver is preferably a GSM transceiver adapted to receive and transmit SMS messages defining geographically related information. The transceiver may include a GPS receiver.

The foregoing and other features of the present invention will be better understood from the following description of specific embodiments of the present invention.

It will be seen from the subsequent description that the present invention provides a solution to the technical problem, outlined in preceding paragraphs, through the use of a cellular mobile radio communication system including a cellular mobile radio communication network, such as GSM, in association with at least one portable personal computer (PPC), for example, a laptop computer, adapted for communication with a subscriber's cellular mobile telephone handset. It will be seen from the subsequent description that the mobile telephone handset is used to transfer geographically related information, received from the cellular mobile radio communication network, to the PPC for display.

The PPC of the present invention includes storage means for storing graphic map images and symbols, adapted for various applications, to convey geographically related information to a user of the PPC, means for retrieving the map images and symbols from the storage means, and a display screen for displaying a retrieved symbol, or symbols, superimposed on a retrieved graphic map image. The storage means may, for example, be a CD-ROM and/or a hard disc. Thus, in addition to the permanent/semi-permanent data storage in a CD-ROM, variable data could be stored on a hard disc, with the contents of both of these storage arrangements being selectively accessible for display.

The various applications for which the symbols may be used include, inter alia, weather, traffic information, tourist information, and information on a wide range of facilities, such as filling stations, banks, retail outlets, and other facilities that are likely to be of interest to individuals, when travelling. The symbols may also include textual information and an arrow adapted to be pointed at geographic coordinates of a map image, i.e. for pointing at, and giving information in respect of, a selected region of a displayed map to which the received information relates.

Thus, the PPC's software is adapted, on receipt of details concerning map references, i.e. map coordinates, and geographically related information required by, or of interest to, a user of the PPC, via a mobile telephone connected thereto, to:

- identify and retrieve, from the storage means, a graphic map image for the geographic area where the user of the PPC is currently located and to which the received information relates;

- display the retrieved image on the PPC's display screen;

- identify and retrieve, from the storage means, a symbol, or symbols, representative of the geographically related information required by, or of interest to, the user of the PPC; and

- arrange (superpose) the retrieved symbol(s) on the displayed map image at an appropriate geographic location, or locations.

In order to enable the graphic map images to be continuously updated with current information, in a simple and effective manner, the present invention is adapted to distribute details of the symbols and their geographic coordinates

by means of a cellular mobile communication network, such as GSM, having a SMS facility. Thus, the geographically related information is transmitted to a PPC, via a mobile telephone handset, for display.

Distribution of the updating information to a user's PC can, for example, be effected in either of the following ways:

- a SMS cell broadcast service; or

- SMS messages addressed to unique users, or groups of users.

The SMS cell broadcast service is adapted to distribute symbol information considered by a network operator to be of general application. With this distribution method, the volume of distributed information can be limited through the transmission of a number of SMS messages, for various information, over different geographic areas (LAI base stations). As stated above, the broadcasting message service, SMS-CB, allows messages to be repeatedly broadcast, to users of the cellular mobile communication system, for example, mobile telephone users, at intervals, for a period of time during which the message is valid. Furthermore, the messages can be broadcast in multiple languages and/or can include an indication, identifiable by a mobile telephone, that it has been updated, and/or as to its geographic scope, for, example, the entire cellular network, or a specific region(s) within the cellular network, or a single cell of the network.

It will be directly evident to persons skilled in the art that a subscriber service based on SMS cell broadcasting is well-suited to applications intended to reach many users/subscribers, without unduly loading a cellular radio communication system, such as GSM. This service may, for example, be advantageously used for the following public applications:

(a) The current weather situation, in different geographic areas (obtainable from an appropriate weather forecasting centre).

(b) Local tourist information.

(c) Road information (obtainable from a National Road Transport Department).

(d) Traffic information (obtainable from the police, or a motoring organisation).

(e) The geographic locations of petrol filling stations, banks, retail outlets and the like (obtainable from different organisations/companies operating such facilities).

(f) The availability of hotel vacancies.

(g) In a sailing boat race, the positions of all participating boats can be distributed.

As for the distribution method in which messages are addressed to unique users, or groups of users, a user can send a SMS message to a service provider informing the service provider that a specific type of information is required and that only information for a limited geographic area, i.e. local information, should be distributed. The geographic limits of the local area can be indicated either manually, i.e. by the user marking an area on a synoptical map, or through use of a mobile telephone position-fixing facility, for example, the mobile telephone position-fixing options of a GSM network. As an alternative, a mobile telephone can be provide with a GPS receiver that is adapted to determine the geographic coordinates of the mobile telephone which

can then be transmitted, via SMS, to the service provider.

The sending of geographically related SMS messages to various users, or groups of users, may, for example, be advantageously used for the following applications:

(a) During military exercises. This will provide an ideal means of obtaining a general overview of the current situation in the field.

(b) Police forces on reconnaissance. This would enable the police to obtain an overview of where other police cars are located in the vicinity.

(c) Fire-fighters fighting a forest fire. A graphic map image could provide an updated picture of the fire's extent and where other fire-fighters are located.

(d) A taxi driver could use the service to determine where his/her company's other cars are located.

It will be seen from the forgoing description that the present invention enables general map images and corresponding information stored, for example, in a portable personal computer (PPC), such as a laptop computer, to be kept updated by using GSM-SMS technology. In other words, the invention uses locally (PPC) stored graphical information, i.e. maps and geographically related information symbols, which can be controlled by a service provider linked to a mobile telephone network, such as a GSM network, by means of a GSM-SMS cell broadcast facility.

Since the graphic map images and symbols are already held by a PPC connected to a network user's mobile telephone station, a particular advantage

of the present invention is that a relatively large amount of information can be transmitted on a single narrow-band channel. The reason for this is that the symbols can be arranged (superposed) on a graphical map image by sending only symbol references, i.e. types and coordinates, to a user's PPC. via a mobile telephone handset.

It will be directly evident to persons skilled in the art that present invention can be used for many, particularly, narrow-band multimedia applications.

CLAIMS

1. A cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, characterised in that said system includes at least one portable graphic display unit adapted to communicate with said network, via a mobile station, using said short message service (SMS) and, in response to receipt of SMS messages, to selectively display stored graphic images and to selectively superpose stored geographically related information symbols on a displayed image.

2. A system as claimed in claim 1, characterised in that said at least one graphic display unit forms part a portable personal computer (PPC), and in that said PPC is adapted to communicate with said network, via a mobile station, using said short message service (SMS).

3. A system as claimed in claim 2, characterised in that said graphic map images and symbols are stored by said PPC.

4. A cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, characterised in that said system includes at least one portable personal computer (PPC) adapted to communicate with a mobile station using said short message service (SMS), said PPC including a display screen; storage means having stored therein a series of graphic map images and a number of geographically related

information symbols for selective display on said display screen, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and selection means, responsive to receipt of SMS messages, for selectively retrieving a map image and symbols from said storage means for display on said display screen.

5. A system as claimed in any preceding claim characterised in that said information symbols. superposed on a displayed map image, are continually updated with current information by said SMS messages.

6. A system as claimed in any preceding claim, characterised in that said graphic map images and information symbols are stored in a CD-ROM and/or a hard disc.

7. A system as claimed in claim 6, when appended to any of claims 2 to 5, characterised in that said CD-ROM and/or a hard disc forms part of said PPC.

8. A system as claimed in any preceding claim, characterised in that said stored information symbols are predefined and adapted for various applications, and in that an SMS message defines at least one symbol required to be displayed, together with its geographic coordinates.

9. A system as claimed in claim 7, when appended to any of claims 2 to 7, characterised in that said PPC is adapted, on receipt of said SMS message, to superpose said at least one symbol on a graphic map image of the geographic area concerned. at a position defined by said geographic coordinates.

10. A system as claimed in any preceding claims, characterised in that said information symbols include text information and an arrow adapted to be pointed at geographic coordinates of a map image defined by an SMS message.

11. A system as claimed in any preceding claim, characterised in that a SMS cell broadcast facility is used to distribute messages defining geographically related information considered to be of general application by a network operator.

12. A system as claimed in claim 11, characterised in that said SMS messages are used to continually updated information symbols, superposed on a displayed graphic map image, with current information.

13. A system as claimed in claim 11, or claim 12, characterised in that said SMS cell broadcast facility is adapted to limit the volume of distributed information by transmitting a number of SMS messages. for different applications, over different geographic locations.

14. A system as claimed in any of claims 11 to 13, characterised in that said SMS messages are repeatedly broadcast, at intervals, for a period of time during which a message is valid.

15. A system as claimed in any of claims 11 to 14, characterised in that said SMS messages include an indication, identifiable by a mobile station, that previously transmitted information is being updated.

16. A system as claimed in any of claims 11 to 15, characterised in that said SMS cell broadcast facility is used for the distribution of messages concerning the current weather situation, in different geographic areas; local tourist information; road information; traffic information; the geographic locations of petrol filling stations of different companies, bank, retail outlets and the like; the availability of hotel vacancies; and, in a sailing boat race, the relative positions of the boats in the race.

17. A system as claimed in any of claims 1 to 10, characterised in that SMS messages are addressed to unique users, or groups of users.

18. A system as claimed in claim 17, characterised in that said SMS messages define geographic related information selected by a network user.

19. A system as claimed in claim 18, characterised in that said geographically related information is for a limited geographic area.

20. A system as claimed in claim 19, characterised in that said limited geographic area is local to a user, or group of users, for whom the information has been requested, and in that the geographic limits are indicated either manually, or through use of a mobile station position-fixing facility.

21. A system as claimed in claim 20, characterised in that said manual indication is given by an area marked on a synoptical map by said user, or group of users.

22. A system as claimed in claim 19, characterised in that said limited geographic area is local to a user, or group of users, for whom the information has been requested, in that a mobile station of said user, or each member of said group of users, is provided with a GPS receiver for determining said mobile station's geographic location, and in that said mobile station is adapted to transmit said location information to a service provider using said SMS message facility.

23. A system as claimed in any of claims 17 to 22, characterised in that said SMS messages addressed to unique users, or groups of users, are adapted for use during military exercise, or by police forces on reconnaissance, fire-fighters fighting a fire, such as a forest fire, or a taxis driver to determine the location of

other taxis in the same taxi fleet.

24. A system as claimed in any preceding claim characterised in that said cellular radio communication network is a GSM network.

25. In a cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS), in which said network includes a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, a method for distributing and displaying geographically related information using SMS messages, characterised by the steps of:

- storing a series of graphic map images and a number of geographically related information symbols for selective display on a portable display unit, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and

- in response to receipt of SMS messages from said network, retrieving and displaying a stored map image and symbols defined by said SMS messages.

26. A method as claimed in claim 25, characterised by the step of continually updating the information symbols, superposed on a displayed map image, with current information defined by said SMS messages.

27. A method as claimed in claim 25, or claim 26, characterised by storing said graphic map images and information symbols in a CD-ROM and/or a hard disc.

28. A method as claimed in claim 27, characterised in that said CD-ROM and/or a hard disc forms part of a PPC.

29. A method as claimed in any of claims 25 to 28, characterised in that said stored information symbols are predefined and adapted for various applications, and in that an SMS message defines at least one symbol required to be displayed, together with its geographic coordinates.

30. A method as claimed in claim 29, characterised in that, on receipt of said SMS message, said at least one symbol is superposed on a displayed graphic map image at a position defined by said geographic coordinates.

31. A method as claimed in any of claims 25 to 30, characterised in that said information symbols include text information and an arrow adapted to be pointed at geographic coordinates of a map image defined by an SMS message.

32. A method as claimed in any of claims 25 to 31, characterised by distributing SMS messages using a SMS cell broadcast facility of said network, said distribute messages defining geographically related information considered to be of general application by a network operator.

33. A method as claimed in claim 32, characterised by the step of using said SMS messages to continually update information symbols, superposed on a displayed graphic map image, with current information.

34. A method as claimed in claim 32, or claim 33, characterised by the step transmitting a number of SMS messages, for different applications, over different geographic locations. in order to limit the volume of distributed information by each of said SMS messages.

35. A method as claimed in any of claims 32 to 34, characterised by the step of repeatedly broadcasting said SMS messages, at intervals, for a period of time during which a message is valid.

36. A method as claimed in any of claims 32 to 35, characterised by the step of including, in said SMS messages, an indication, identifiable by a mobile station, that previously transmitted information is being updated.

37. A method as claimed in any of claims 32 to 36, characterised by the step of using said SMS cell broadcast facility for the distribution of messages concerning the current weather situation, in different geographic areas; local tourist information; road information; traffic information; the geographic locations of petrol filling stations of different companies; the availability of hotel vacancies; and, in a sailing boat race, the relative positions of the boats in the race.

38. A method as claimed in any of claims 25 to 31, characterised by the step of addressing said SMS messages to unique users, or groups of users.

39. A method as claimed in claim 38, characterised in that said SMS messages define geographic related information selected by a network user.

40. A method as claimed in claim 39, characterised in that said geographically related information is for a limited geographic area.

41. A method as claimed in claim 40, characterised in that said limited geographic area is local to a users, for whom the information has been requested, and in that the geographic limits are indicated either manually, or through use of a mobile station position fixing facility.

42. A method as claimed in claim 41, characterised by the step of said user, or group of users, giving said manual indication by marking an area on a synoptical map.

43. A method as claimed in claim 41, characterised in that said limited geographic area is local to a user, or group of users, for whom the information has been requested, in that a mobile station of said user, or each member of said group of users, is provided with a GPS receiver, and in that said method includes the steps of determining a geographical location of a mobile station using said GPS receiver, and transmitting said location information to a service provider using said SMS message facility.

44. A method as claimed in any of claims 38 to 43, characterised in that said SMS messages addressed to unique users, or groups of users, are used during military exercise, or by police forces on reconnaissance, fire-fighters fighting a fire, such as a forest fire, or a taxis driver to determine the location of other taxis in the same taxi fleet.

45. A method as claimed in any of claim 25 to 44, characterised in that said cellular radio communication network is a GSM network.

46. An arrangement for distributing and displaying geographically related information using a SMS message facility of a cellular mobile radio communication network, characterised in that said arrangement is adapted to operate in accordance with a method as claimed in any of claims 25 to 45, or uses a system as claimed in any of claims 1 to 24.

47 A receiver for use with a system as claimed in any of claims 1 to 24, characterised in that said receiver includes a transceiver; storage means for storing a series of graphic map images and a number of geographically related

information symbols for selective display, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and display means for displaying said graphic map images and said symbols, responsive to communication with said transceiver.

48. A receiver as claimed in claim 47, characterised in that said transceiver is a GSM transceiver adapted to receive and transmit SMS messages defining geographically related information.

49. A receiver as claimed in claim 47, or claim 48, characterised in that said transceiver includes a GPS receiver.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 98/00950

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04Q 7/22
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPAT, WPI, JAPIO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0748139 A2 (NOKIA MOBILE PHONES LTD.), 11 December 1996 (11.12.96), column 8, line 10 - column 9, line 43; column 16, line 1 - line 11, figure 4 --	1-49
Y	EP 0647076 A1 (COMPAGNIE FINANCIERE POUR LE RADIOTELEPHONE, (COFIRA) S.A.), 5 April 1995 (05.04.95), column 1, line 51 - column 7, line 3, abstract --	1-49
A	EP 0752793 A2 (NOKIA MOBILE PHONES LTD.), 8 January 1997 (08.01.97) --	1-49

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" erlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 August 1998	12 -08- 1998
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Benny Andersson Telephone No. +46 8 782 25 00

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 98/00950

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9535636 A1 (GTE LABORATORIES INCORPORATED), 28 December 1995 (28.12.95) --	1-49
A	WO 9521511 A1 (PACE, HAROLD), 10 August 1995 (10.08.95) --	1-49

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

30/06/98

International application No.
PCT/SE 98/00950

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0748139 A2	11/12/96	GB 2301987 A	18/12/96
		GB 9511337 D	00/00/00
EP 0647076 A1	05/04/95	FR 2711023 A,B	14/04/95
		FR 2711033 A,B	14/04/95
EP 0752793 A2	08/01/97	US 5604921 A	18/02/97
WO 9535636 A1	28/12/95	CA 2169955 A	28/12/95
		EP 0714589 A	05/06/96
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		US 5519760 A	21/05/96
WO 9521511 A1	10/08/95	AU 2114895 A	21/08/95
		CA 2170737 A	10/08/95
		CN 1126539 A	10/07/96
		US 5712899 A	27/01/98

Form PCT/ISA/210 (patent family annex) (July 1992)

(19) Canadian Intellectual Property Office
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(30) PCT/CH97/00237 WO 16.06.1997
2673/97 CH 19.11.1997

(71) SWISSCOM AG,
Viktoriastrasse 21, BERNE, XX (CH).

(72) RITTER, RUDOLF (CH).

(74) MACRAE & CO.

(54) APPAREIL MOBILE, CARTE A PUCE ET PROCEDE DE COMMUNICATION
(54) MOBILE DEVICE, CHIP CARD AND METHOD OF COMMUNICATION

(57)

According to the invention, a mobile device comprises a removable SIM chip card (2) with data processing means (20) for storing identification data relating to a subscriber in a GSM mobile communications network (4) for example. Said mobile device also has at least one wireless interface (14; 15), said interface being integrated in the housing. The interface can be infrared or inductive and enables the SIM card to communicate directly with an external device (3; 3), in both directions, without using the mobile communications network (4). The chip card also contains a communication controller in order to encode data and transmit said data across the interface. The contactless interface can be supplied preferably independently of the mobile device.

OPIC
Office de la propriété intellectuelle du Canada

CIPO
Canadian Intellectual Property Office

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(72) RITTER, RUDOLF, CH
(71) SWISSCOM AG, CH

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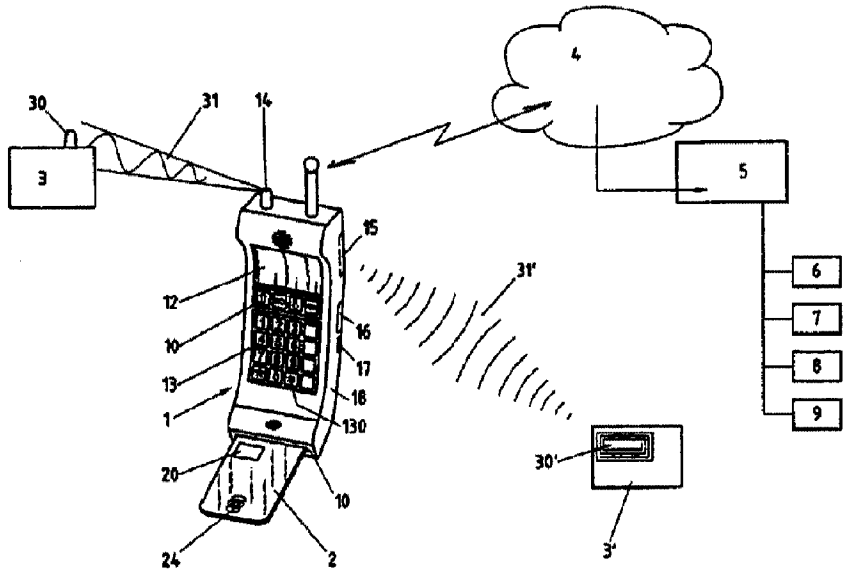
(30) 1997/11/19 (2673/97) CH

(54) **APPAREIL MOBILE, CARTE A PUCE ET PROCEDE DE COMMUNICATION**

(54) **MOBILE DEVICE, CHIP CARD AND METHOD OF COMMUNICATION**



(57) Cet appareil mobile (1) comprend une carte à puce amovible (2) faisant partie d'un module d'identification d'abonné avec des moyens de traitement de données (20) destinés, parmi d'autres, à mémoriser les données d'identification d'un abonné à un réseau radiotéléphonique mobile (4) de type GSM. L'appareil mobile comprend en outre au moins une interface sans fil (14; 15) intégrée dans le boîtier. L'interface peut fonctionner aux infrarouges ou par induction. Cette interface permet à la carte du module d'identification d'abonné de communiquer directement et dans les deux directions, sans faire appel au réseau radiotéléphonique mobile (4), avec un dispositif externe (3; 3'). La carte à puce contient en outre une commande des communications qui code les données et les transmet par ladite interface. L'interface sans contact peut de préférence être alimentée indépendamment de l'appareil mobile.

(57) According to the invention, a mobile device comprises a removable SIM chip card (2) with data processing means (20) for storing identification data relating to a subscriber in a GSM mobile communications network (4) for example. Said mobile device also has at least one wireless interface (14; 15), said interface being integrated in the housing. The interface can be infrared or inductive and enables the SIM card to communicate directly with an external device (3; 3), in both directions, without using the mobile communications network (4). The chip card also contains a communication controller in order to encode data and transmit said data across the interface. The contactless interface can be supplied preferably independently of the mobile device.

PCT WELTORGANISATION FÜR GEISTIGES EIGENTUM
Internationales Büro

INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

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2673/97	19. November 1997 (19.11.97)	CH

(71) Anmelder *(für alle Bestimmungsstaaten ausser US)*: SWISSCOM AG [CH/CH]; Viktoriastrasse 21, CH-3050 Bern (CH).

(72) Erfinder; und
(75) Erfinder/Anmelder *(nur für US)*: RITTER, Rudolf [CH/CH]; Rossweidweg 8, CH-3052 Zollikofen (CH).

(74) Anwalt: BOVARD AG; Optingenstrasse 16, CH-3000 Bern 25 (CH).

(81) Bestimmungsstaaten: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO Patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

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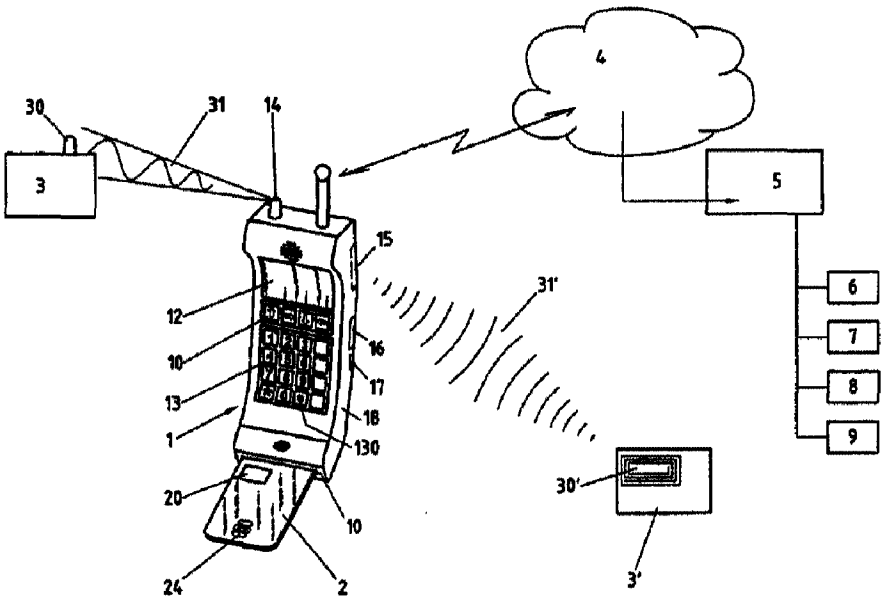
(54) Title: MOBILE DEVICE, CHIP CARD AND METHOD OF COMMUNICATION

(54) Bezeichnung: MOBILGERÄT, CHIPKARTE UND KOMMUNIKATIONSVERFAHREN

(57) Abstract

According to the invention, a mobile device comprises a removable SIM chip card (2) with data processing means (20) for storing identification data relating to a subscriber in a GSM mobile communications network (4) for example. Said mobile device also has at least one wireless interface (14; 15), said interface being integrated in the housing. The interface can be infrared or inductive and enables the SIM card to communicate directly with an external device (3; 3), in both directions, without using the mobile communications network (4). The chip card also contains a communication controller in order to encode data and transmit said data across the interface. The contactless interface can be supplied preferably independently of the mobile device.



Mobile Apparatus, Chip Card, and Communication Method

The present invention relates to a mobile apparatus according to the characterizing clause of patent claim 1. In particular, the present invention relates to a mobile apparatus, for example a radio telephone or a computer, having expanded communication possibilities.

In mobile telephone networks, as for example in the GSM network (Global System for Mobile Communication) or in a UMTS network (Universal Mobile Telecommunication System), the identity of the subscriber is stored in a chip card, which is often called a SIM card (Subscriber Identity Module), inserted in the mobile apparatus. The SIM card is removable so that the user can receive the calls intended for him on the mobile apparatus of his choice by transferring the SIM card from one apparatus to another. Moreover, methods are known for loading the SIM card with a sum of money in various ways, as well as for charging the telephone communication fees to that sum.

The SIM cards exist today in two standardized formats.

The "full-size" format corresponds to the size of a credit card, while the "plug-in" format, which is specially adapted to the miniaturized portable telephones, is about 25 mm x 10 mm in size. The functionalities of the cards having these two formats are identical.

The SIM cards generally contain data-processing means, usually a GSM microcontroller integrated in a chip. These processing means contain, on the one hand, a zone having a read-write area and a secured memory area which allows the storing of programs and/or files, especially the identification data of the subscriber who possesses the card, as well as calculating and processing means capable of executing various algorithms, especially algorithms which permit the carrying-out of the subscriber identification and of the communication encryption.

This architecture of the SIM cards is very "open" since various enhanced services (VAS, Value-Added Services) have been considered which

can take full advantage of the functionalities of these cards. In particular, numerous services have been considered which use the memory available on the SIM cards and/or the processing possibilities of the microcontroller on the card for expanding the functionalities of the contactless telephones.

New data or new programs which are necessary for carrying out these new value-added services may generally be loaded on the card in one of the following three ways:

1) by inserting the card in a suitable read-write device for chip cards. The data originally loaded, i.e., before the card is delivered to the customer, are generally loaded in this way. Since suitable read-write devices are not available everywhere, this method is applicable only to a limited extent for the update or completion of the information already stored on the card. Moreover, the SIM card must be withdrawn from the mobile apparatus in order to insert it in another device, which is not very practical, especially with the very small "plug-in" cards which are not very practical to handle.

2) by keying in data directly on the keypad of the mobile apparatus. By reason of the greatly reduced size of the keypads normally used for mobile telephones, as well as the limited number of keys, this solution is suitable only for entering very brief data, for example for a password, a sum of money, or an answer of the yes/no type during the running of the program by the microcontroller of the card, but on no account for entering complete programs on the SIM card.

3) The data and/or programs may be downloaded on the mobile apparatus, for example with SMS (Short Message System) or USSD (Unstructured Supplementary Service Data) short messages. Patent document EP689368 in the name of the applicant describes technology which makes possible the transmission of data and programs to a mobile apparatus in a transparent manner and in both directions. However, this type of transmission can take place only from another apparatus connected to the mobile radio network, for example from another mobile telephone. Data and programs can also be downloaded as a component of JAVA applets.

Patent application WO 98/28900 in the name of the applicant describes a method of ordering products or information by means of a mobile station. A code designating the product and its supplier must be entered in the mobile station and is then transmitted to the product supplier together with the subscriber's identification data in the form of short messages over the mobile radio network. The product code must comprise a large number of alphanumerical characters so that the product and the product supplier are unambiguously designated. Moreover, parity characters are necessary in order to recognize or correct possible errors in the product code. None of the above-mentioned loading method proves to be really suitable for entering these codes comfortably in the mobile apparatus.

Conversely, a certain number of new value-added services require that access may be had to the data or programs stored on a SIM card from an outside device, for example from another telephone.

In patent application WO 96/25828, a method and a mobile apparatus are described by means of which various types of applications can be run, one application of a first type being a passive application, while an application of a second type can control the master control unit of the mobile apparatus. The mobile apparatus described in WO 96/25828 comprises, in addition to the master control unit, a user interface, a radio module, an audio module, a feed module, and a connection unit for application modules which are executed as a chip card, which can also contain a SIM module, also a contactless interface, for instance an infrared interface or an inductive interface, via which the mobile apparatus can exchange data, which may in particular also be stored in an application module, with an outside device, for instance another mobile apparatus. The feed part described in WO 96/25828 comprises batteries, the charge status of which is monitored by the feed part, the feed part informing the user of the mobile apparatus when the charge status of the batteries drops below a certain value. If the batteries of the mobile apparatus described in WO 96/25828 are discharged, however, no data transmission via the contactless inteface can be carried out with an outside device.

It is consequently an object of the invention to propose a device and a method for communication which are suitable for the two-way transmission of data and programs to or from a chip card in a mobile apparatus.

It is a further object of the invention to propose a telecommunication system which does not exhibit the inadequacies of the systems of the prior art.

According to the invention, these objects are achieved particularly with the aid of a mobile apparatus having the elements of the characterizing clause of patent claim 1.

In particular, the objects of the invention are achieved with the aid of a mobile apparatus, for example with a GSM mobile radio telephone, which has at least one contactless interface making it possible for the processing means of the card inserted in the apparatus to communicate directly with an external device situated outside the mobile apparatus.

By means of this invention, mobile telecommunication networks can be linked with other networks or systems.

In a first embodiment of the invention, the contactless interface has at least one infrared transceiver disposed on the housing of the mobile apparatus. Direct communication between the chip card and an outside device then consequently takes place via this infrared interface.

In one embodiment of the invention, the contactless interface has at least one coil integrated in the housing of the mobile apparatus. Direct communication between the chip card and an outside device then consequently takes place via electromagnetic waves.

A communication controller disposed on the SIM card or in the housing makes it possible to store data transmitted through this interface directly on the SIM card.

Thus, data may be written on the chip card or read out from the card through an outside device, for example another contactless telephone or any desired data-processing device.

The present invention likewise relates to various methods and services which may be applied by means of a mobile apparatus according to the present invention.

The present invention is better understood with the aid of the description given by way of example and is illustrated by the enclosed figures, which show the following:

Figure 1 a diagrammatic and perspective view of a first embodiment of the system of the invention.

Figure 2 a diagrammatic and perspective view of a second embodiment of the system of the invention.

Represented by reference numeral 1 is a mobile apparatus, for example a GSM mobile radio telephone or a portable computer having communication possibilities in a mobile radio network. The mobile apparatus has a housing 18, a keypad 13, and a display 12. Besides normal number keys, the keypad 13 preferably contains at least one confirmation key 130 as well as cursor control means 10.

The mobile apparatus 1 may be utilized in a conventional mobile radio network 4, for example a GSM network, in order to transmit languages and data. The mobile apparatus 1 has a conventional receiving location for the insertion of a removable identification card 2, for example a SIM card 2 (Subscriber Identity Module) which identifies the user in the telecommunication network 4. SIM cards are already utilized now in GSM, DCS, or PCS mobile apparatus, among other things, or also in future fixed networks having subscriber identification by chip cards. The SIM card may be either a full-size card or a plug-in card; it is connected to the end apparatus 1 by a contact region 24 on the surface of the card. Other card formats, as well as contactless

SIM cards, may, however, likewise be used within the scope of this invention. The SIM card 2 contains data-processing means, for example a known GSM-SIM microcontroller 20. SIM cards are described, for example, in the technical specification GSM 11.11 and GSM 11.14, which has been obtainable since 1995 and 1996, respectively, from the Secretariat of the European Telecommunications Standards Institute, F-06921 Sophia Antipolis. Other identification cards, for example multi-purpose cards known by the term Opencard, may also be utilized in this invention.

The data-processing means 20 are intended among other things for storing identification data of a subscriber of the said mobile radio network. As identification data, the IMSI (International Mobile Subscriber Identity), the MSISDN (Mobile Station Identity Number), and/or the IDUI (International Debit User Identification) of the user of the telecommunication network 4 may, for example, be used.

According to the invention, the mobile apparatus 1 contains at least one additional two-way interface such as, for example, an infrared interface having an infrared transceiver 14 on the housing 18. By means of this interface, the mobile apparatus and an outside device 3 can exchange data and programs with each other contactlessly and without making use of the mobile radio network 4.

The interface contains additionally an integrated communication controller 16 to control the infrared LED diode 14 and to send and receive data by means of this diode. The communication controller is responsible, among other things, for the serial transmission protocol, for example RS232, over the interface 31. Moreover, the communication controller has communication means for exchanging data with the GSM controller 20 on the chip card via the contact region 24. These communication means may, for example, comprise registers or memory areas which the GSM microcontroller 20 can access with special software by means of the contacts 24. Conversely, the communication means may also comprise software applications for reading and writing data in the memory area of the GSM controller 20. Data or programs can thereby easily be transmitted between an outside device 3 and a memory area

accessible to the GSM controller 20. Data from the outside device 3 may, for example, be downloaded on the chip card, and conversely, the outside device 3 can directly use or access the data stored on the chip card 2 without thereby having to use the mobile radio network 4.

The interface 14, 16 is preferably fed by an independent power storage 17, for example by a storage battery or a capacitor. The interface can thereby also be used if the batteries of the mobile apparatus 1 are discharged or if the mobile apparatus is switched off. Preferably, however, the interface may also be electrically supplied from the main battery of the mobile apparatus if it suffices.

Instead of the infrared transceiver 14, or preferably in addition to this transceiver, the mobile apparatus in one modification contains another two-way interface, in this case an antenna 15 integrated at the back of the housing 18. By means of this interface, the mobile apparatus can likewise exchange data and programs inductively or electromagnetically directly with an outside device 3' without making use of the mobile radio network 4. As an antenna, a coil may for instance be used, which may, for example, be made by winding of a wire, by printing or etching of a conductor film, or with strip lines. Depending on the application, a transmission frequency of, for instance, 125 kHz, 13.56 MHz, 400 MHz, or 5.2 GHz is used, the applied frequency also being dependent on the data-transmission rate needed. A frequency of about 13.56 MHz is preferred, however, in order to ensure compatibility with bank applications. The antenna is integrated in the housing in such a way that the absorption is kept as small as possible and that a transmission with the chosen frequency is also possible.

The second interface 15 is preferably likewise controlled by the communication controller 16. If an infrared interface 14 and an inductive/electromagnetic interface 15 are both integrated in the same mobile apparatus 1, the same controller 16 is preferably responsible for both interfaces. Data or programs may thereby be transmitted in both directions between an outside device 3 or 3' and the processor 20 on the card either via the infrared interface 14-31 or via the inductive/electromagnetic interface 15-31', as will be explained in detail below.

If the mobile apparatus 1 according to the invention is used as an identification means for an outside system 3', for example as an electronic doorkey, a copy of the identification stored in the communication controller 16 is preferably loaded into the secured area of the SIM card 2, and an update mechanism is provided for updating the identification stored in the controller 16 with the identification from the SIM card if the mobile apparatus is utilized with another SIM card. Thus, the SIM card can also be utilized as an identification means in another apparatus after an update.

Figure 2 shows another modification of the system according to the invention, in which a communication controller 21 for the infrared and/or inductive/electromagnetic transceiver 14/15 is integrated in the chip card 2 instead of in the mobile apparatus 1. The communication controller may, as in the first modification, activate the transceiver 14/15 directly, this time via the contact region 24. An independent power storage 26 for the communication controller and for the transceiver 14/15 is preferably likewise integrated in the card 2 so that the communication controller 21 can work independently of the mobile apparatus 1 and of the GSM controller 20. The interface 15 and the communication controller 16 or 21, respectively, may also be supplied with power from the outside device through the inductive interface 31'. In this case, the inductively transmitted power is preferably stored in a storage capacitor 16/26 in the mobile apparatus or on the card.

The communication controller 21 preferably comprises only one integrated chip 21 which is connected directly to the conventional GSM microcontroller 20. This arrangement permits the use of standard microcontrollers 20, which are available at low prices, and to attach a specific communication module thereto. The specialist will realize, however, that it is just as possible to integrate the communication controller 21 in the same integrated circuit as the GSM microcontroller 20.

The communication controller 21 or 16, respectively, may comprise encryption and signing means to decrypt received data and to encrypt and sign sent data. Thus, the connections through the infrared interface 31 or 31', respectively, can be secured. The TTP method (Trusted Third Party) or a

point-to-point method (PTP) may, for instance, be utilized as an encryption method.

In a preferred modification, the encryption and signing means are utilized to secure SMS or USSD messages through the mobile radio network 4. In this case, these means are preferably integrated in the GSM processor 20 instead of in the communication controller 21/16.

As already mentioned, the SIM card 2 is connected to the mobile radio network 4, for example to a GSM network, when it is inserted in the mobile apparatus 1. A SIM server 5 for administering short messages (SSC, Short Message Service Center) is likewise connected to the network 4; the SIM server 5 is equipped in such a way that it can communicate with the SIM card 1 [sic] over the mobile radio network 4 by means of special SMS and/or USSD short messages. Known filter means in the SIM server and in the SIM cards permit carrying out special services, such as the exchange of files, instructions, and programs between the SIM server and a SIM card. The SIM server is operated by a SIM operator who, as a rule, also manages the communication network 4.

A TTP server 7 is likewise connected to the SIM server 5 for encrypting at least certain special short messages and thereby to guarantee that the confidentiality, authenticity of identity, authenticity of information, integrity, and undeniability of the origin are ensured. A point-to-point server 6 may also be utilized to encode or decode encrypted short messages with a point-to-point method.

The SIM server is furthermore preferably connected to an OpenCard platform 8 in order to be able to use the SIM card in an OpenCard system as well. The OpenCard system is a standardized system proposed by International Business Machines Corporation, Inc., Netscape, NCI, and Sun Microsystems Inc., which allows the interconnection of different chip cards on different hardware and software platforms. The mobile apparatus 1 according to the invention and the SIM card 2 according to the invention can thereby also be utilized in an OpenCard-compatible environment, for example in an NC

network (Network Computer). Java applets downloaded from a platform 8 and through the network 4 may then be run by the processing means 20, 21 or transmitted on by the latter through the interface 31, 31' to an outside device 3, 3'.

Various service providers and application servers 9 are additionally connected to the SIM server 5 for managing diverse value-added services (VAS, Value Added Services). For example, one or more application servers 9 may be managed by a financial institution in order to be able to carry out money transactions with the mobile apparatus 1.

The chip card 2 according to the invention preferably contains several private and public electronic keys which permit access to the OpenCard platform and to several services 8, 9. Electronic keys may also be provided for communicating with outside devices 3, 3'. These various keys are preferably stored in a secured memory area of the GSM controller 20 and/or of the communication controller 21. Thus, the user can reliably identify himself in several systems and for various services.

We shall now discuss six different functional modifications of the mobile apparatus according to the invention. A certain mobile apparatus 1 having a certain chip card 2 can, depending upon equipment and loaded application software, carry out either all or only some of these modes of function.

1) Independent feeding of the inductive interface, no functional linking to the GSM microcontroller 20.

In this case, the communication controller 16 or 21, respectively, is inductively fed by the outside device 3' or by means of the inside storage battery 17 or 26, respectively. It is not permanently logically linked to the GSM microcontroller 20. The outside device can feed the communication controller and the antenna 15 to read identification data or electronic keys in the memory area of the communication controller, for example. The infrared interface 14 is not used. This mode may be useful, for example, in order to make use of the

likewise switched-off mobile apparatus as an electronic key with an admittance-checking device.

If the GSM microcontroller 20 is again fed, logical data, for example user data or configuration data, can again be exchanged between the two controllers. An electronic key with a TTP-secured document, for example, can thereby be transmitted by the network 4 to the chip card 2, received and stored by the GSM controller 20, and used by the communication controller 16 or 21, even if the GSM functions of the mobile apparatus are not available during such use.

2) Independent feeding of the inductive interface, functional linking to the GSM microcontroller 20.

Similarly, in this case the communication controller 16 or 21 is also fed inductively by the outside device 3' or by means of the inside storage battery 17/26. The infrared interface is likewise not used. However, the communication controller is permanently logically connected to the GSM microcontroller 20. Through the interface 31', the transmission process can thereby also make use of the data in the memory area of the GSM controller 20 and the functions of this controller and of the mobile apparatus. For example, data elements can be received via the interface 31', the signature be checked, and these data elements be further processed by the GSM processor and/or be forwarded on.

3) Feeding of the inductive interface with the mobile apparatus.

The communication controller 16/21 and the inductive/electromagnetic interface 15 are fed by the main battery of the mobile apparatus 1. The infrared interface is not used. Data and programs can thereby be inductively transmitted over greater distances. There is preferably a permanent link between the GSM controller 20 and the communication controller 21.

If the feed inside the apparatus fails, for example if the batteries have run down or if the mobile apparatus is switched off, the first mode is preferably activated automatically.

4) Independent feeding of the inductive interface, infrared interface active.

The infrared transceiver 14 and the communication controller 16/21 are both fed by the main battery of the mobile apparatus 1. The inductive interface 15 is used only if it is fed by an outside device 3'. There is preferably a permanent link between the GSM controller 20 and the communication controller 21.

This mode is preferably activated by the user for communicating with outside infrared-capable devices 3. It is sensible, however, if this mode is not activated by default.

5) Feeding of the inductive interface by means of the mobile apparatus, infrared interface active.

This mode is a combination of modes 3 and 4. Data can be transmitted over longer distances between the mobile apparatus 1 and an outside device 3/3' either or simultaneously [sic] via the inductive and via the infrared interface. There is preferably a permanent link between the GSM controller 20 and the communication controller 21.

6) Transparent mode

The GSM controller 20 and the communication controller 21 are permanently logically connected. After a connection has been established with an outside device 3 or 3', either via the infrared interface 31 or via the inductive interface 31', the data are transmitted transparently over the mobile radio network 4. It is thereby possible to establish via the mobile apparatus 1 a transparent data flow in both directions between the SIM server 5 and an outside device 3, 3'.

The outside device 3 or 3', respectively, may be formed, depending on the application, by any desired apparatus provided with a transceiver 30 or 30', respectively, which permits communicating directly via infrared or inductively/over radio waves, respectively, with the mobile apparatus 1, without making use of the mobile radio network. In the simplest case, the outside device 3, 3' may consist of a further mobile apparatus according to the invention. Thus the invention allows any desired type of data or programs to be exchanged which are stored on the SIM cards of the two mobile apparatus. Depending upon the type of SIM card and depending upon the management programs of these two cards, it is for example possible to transmit or to copy programs and/or data from one card to the other. If the card contains a sum of money from which the communication fees are deducted, it is also possible with a suitable communication program to transmit some or all of the remainder from one card to the other and thus to load a chip card with the sums available on another card.

In one application modification of the invention, the outside device 3, 3' is formed by a computer or a terminal provided with a transceiver 30 or 30', respectively. In this case, the device 3, 3' is preferably provided with data-entry means, not shown, for example with a keyboard, and with data-display means, not shown, for example with a display (screen). The device 3, 3' may furthermore be connected to a communication network, not shown, for example via a modem, not shown, to an "Internet" or "Intranet" network, or to any type of fixed or mobile communication network. Data or programs entered in the device 3, 3' may then be copied to the chip card 2 via the interface 31, 31'; in the opposite direction, the data stored on the card may be transmitted to the display of the device 3, 3' and indicated there.

An interactive dialog, consisting of a sequence of communications in each direction, is likewise possible between the chip card 2 and a computer 3, 3'. A possible application of such a dialog relates to the choice of an option in a menu indicated on the display of an outside device 3, 3' with the aid of the mobile telephone. In this case, the display of the device 3, 3' displays a menu, for example a list of products proposed for sale or of information. The user of a mobile apparatus 1 according to the invention can control the position of a

cursor in this menu through actuation of the cursor-movement keys 13 on the keypad of his mobile telephone. The cursor-movement instructions are sent to the device 3, 3' with the aid of the interface according to the invention. The user actuates a confirmation key, for example the # key, on his keypad to declare the chosen menu option valid, for example to order a product. The confirmation command is transmitted in the same way to the device 3, 3', which then executes a routine corresponding to the chosen option. The routine executed may for example comprise the establishment of a communication with the supplier, as well as the transmission of the order to this supplier. In one modification, the routine executed upon confirmation of a menu option comprises the sending of a reply through the interface 31, 31' to the chip card 2, for example an identification code of the chosen product. At least some of the data contained in this reply, for example the identification code of the product ordered, are then stored on the chip card 2. The application program loaded on the chip card may then, for example, send the product supplier a communication, for example a short message (Short Message SMS or USSD message) containing this product identification code. Various other possibilities of product orders are described, among other things, in the above-mentioned patent application WO 98/28900.

The mobile apparatus according to the invention may naturally also be used not only to control the position of an object but also to control several properties, e.g., position, color, shape, function, visibility, etc., of one or more objects.

In the case where the menu on the display of the device 3 corresponds to an "Internet" or "Intranet" page which is displayed by a suitable "browser," for example, the communication between the chip card and the device 3 preferably contains instructions in the JAVA language (registered trademark of SUN MICROSYSTEM), which can be directly interpreted by the said "browser." Conversely, it is likewise desired that the processing means 20, 21 comprise a Java interpreter in order to be able to execute instructions in the JAVA language. Other preferably object-oriented languages, such as Corba or C++, for instance, might also be used.

The outside device 3, 3' may, for instance, also be a POS apparatus (Point of Sale), for example an automated teller machine or a cashier's desk in a shop. In this case, the direct communication can make it possible, for example, with the aid of the interface 14, 15, to reload the sum of money loaded on the chip card 2 from the POS. The advantage is that the SIM card can be reloaded without having to be extracted from the mobile apparatus 1 and without setting up a connection subject to charge through the mobile radio network 4. A financial transaction may likewise take place in the other direction, by charging the sum of money stored on the chip card 2 with a given amount and by direct transmission of the amount charged with the aid of the contactless interface according to the invention to the outside device 3, 3', for example to an automatic machine or to the POS apparatus in a department store. A transaction in a shop equipped with POS apparatus 3, 3' which are provided with interfaces 30 and/or 30' for communicating with the chip cards according to the invention may thus comprise the following steps:

- direct transmission of the amount to be paid via the POS apparatus 3/3' and via the interface 31/31' to the chip card 2,

- intermediate storage of this amount in the processor 20 of the SIM chip card,

- execution of a routine by the microcontroller 20 so that the amount to be paid is indicated on the display 12 of the mobile apparatus 1,

- upon agreement with the number displayed, confirmation of this amount by the customer, for example by pressing the # key.

- direct transmission of the confirmation command to the device 3, 3' with the aid of the interface 30, 30'.

The amount to be paid may, for example, be charged immediately to the sum of money stored on the chip card 2. If the sum of money on the card 2 suffices for settling the transaction, the transaction amount may be charged to the card and packed in a document which is transmitted via the contactless

interface to the device 3, 3'. These various connections preferably take place signed and encrypted by the above-mentioned TTP or PTP signing and encryption means.

In one modification, the transaction amount may be transferred by any banking or financial institution at which the subscriber is a customer to a bank account of the owner of the device 3. For this purpose, in case of the confirmation of the amount indicated on the display 12, the program loaded on the chip card 2 may contain an instruction for sending out by the mobile apparatus 1 or by the device 3, 3' to a server 9 of a financial institution an SMS or USSD short message containing a charge instruction.

The outside device 3, 3' may also take the form of an admittance-checking device which permits checking the coming and going at a protected location, for example in a factory or within the enclosure of an amusement park. For this application, the chip card 2 may be loaded with an electronic key stored in the memory. In order to obtain admittance to a protected zone, it is therefore necessary for a direct communication to be established between the chip card 2 and the device 3, 3' with the aid of the interface 31, 31'. Admittance to the protected location is then permitted only if it turns out after this communication that the electronic key stored in the card 2 is correct and gives its owner the right to penetrate into the protected zone. In this application, it is advantageous for the communication controller 16 or 21, respectively, be able to function electrically independently of the mobile apparatus 1 so that admittance then becomes possible even if the batteries of the mobile apparatus 1 are discharged.

The use of the resources variously carried out may be subordinated to the payment of a fee. A counter integrated in the SIM card may, for example, count the number of uses of one of the interfaces 14 or 15 and determine a fee from that number. The fee may also be dependent upon the duration of use if the chip card integrates a time-measuring device. The fee to be paid may then periodically either be charged to a money account of the card or packed in SMS or USSD billing documents which are transmitted signed and encrypted to

a server 9 of a financial institution and then charged to an account of the user at that institution.

Claims

1. Mobile apparatus (1) which can be utilized in a mobile radio network (4), containing:

- a housing (18),

- a keyboard (13) and a display (12),

- a receiving location (10) for insertion of a removable chip card (2) comprising data-processing means (20) which can store identification data of a subscriber of the said mobile radio network (4),

- at least one contactless interface (14; 15) integrated in the housing, through which interface the chip card (2) can communicate in both directions directly, without making use of the said mobile radio network (4), with, relative to the mobile apparatus, an outside device (3; 3'),

characterized in that the said contactless interface additionally comprises a communication controller (16; 21) which controls the contactless interface and can exchange data with the data-processing means (20) on the chip card (2), and that the said contactless interface additionally contains an inside power storage (17; 26) by means of which the interface can also be used independently of the batteries of the mobile apparatus.

2. Mobile apparatus according to the preceding claim, characterized in that the said contactless interface comprises at least one infrared transceiver (14) integrated in the said housing (18).

3. Mobile apparatus according to claim 1, characterized in that the said contactless interface comprises at least one antenna (15) in the said housing (18).

4. Mobile apparatus according to the preceding claim, characterized in that the said antenna is formed by a coil (23).

5. Mobile apparatus according to claim 2, characterized in that the said contactless interface further comprises an antenna (15) in the said housing (1) [sic] in addition to the infrared transceiver (14).

6. Mobile apparatus according to the preceding claim, characterized in that the said antenna is formed by a coil (23).

7. Mobile apparatus according to claim 1, characterized in that the said communication controller (16; 21) can activate a serial data transmission via the said contactless interface.

8. Mobile apparatus according to one of the claims 1 or 7, characterized in that the said communication controller (16) is mounted in the housing of the mobile apparatus (1).

9. Mobile apparatus according to one of the preceding claims, characterized in that a single communication controller (16, 21) controls the inductive as well as the infrared interface.

10. Mobile apparatus according to one of the preceding claims, characterized in that the said inside power storage (17; 26) can also be inductively reloaded from an outside device (3') via the contactless interface (31').

11. Mobile apparatus according to one of the preceding claims, characterized in that the communication controller (16, 21) allows a transparent data transmission between, relative to the mobile apparatus (1), an outside device (3, 3') and the mobile radio network (4).

12. Mobile apparatus according to one of the preceding claims, characterized in that the communication controller (16;21) contains an interpreter for executing instructions in an object-oriented language.

14. Mobile apparatus according to one of the preceding claims, characterized in that the said data-processing means (20) on the chip card (2)

contain an interpreter for executing instructions in an object-oriented JAVA language.

14. Mobile apparatus according to one of the preceding claims, characterized in that the communication controller (16;21) contains encryption means for encrypting and decrypting data transmitted via the said interface (31, 31').

15. Mobile apparatus according to one of the preceding claims, characterized in that the communication controller (16;21) contains signing means for signing data transmitted via the said interface (31, 31') and for verifying the signature thereof.

16. Mobile apparatus according to one of the preceding claims, characterized in that it further contains a confirmation key (130) and cursor control means (10).

17. Chip card (2) containing:

data-processing means (20) which make possible the storage of data containing at least identification data of a subscriber of a telecommunication network,

electrical contacts (24) on the surface of the chip card which make possible the exchange of data between the said processing means (20) and a mobile apparatus (1) into which the chip card (2) can be removably inserted,

a communication controller (21) for controlling the direct exchange of data via a contactless interface integrated in the mobile apparatus (1) between the chip card and, relative to the mobile apparatus (1), an outside device (3, 3'), without making use of the said mobile radio network during the data exchange,

characterized in that the chip card additionally contains a power storage (26) for feeding the said communication controller (21).

18. Chip card (2) according to the preceding claim, characterized in that the said communication controller (16;21) can activate a serial data transmission via the said contactless interface.

19. Chip card according to one of the claims 17 to 18, characterized in that the chip card further contains encryption means in order to make possible the transmission of encrypted data via the said contactless interface (31, 31').

20. Chip card according to one of the claims 17 to 19, characterized in that the chip card further contains signing means in order to make possible the transmission of signed data via the said contactless interface (31, 31').

21. Chip card according to one of the claims 17 to 20, characterized in that one or more private and public electronic keys are stored in a memory area of the card, by means of which keys the chip card can access secured applications (8; 9) through the telecommunication network (4).

22. Chip card according to one of the claims 17 to 21, characterized in that one or more private and public electronic keys are stored in a memory area of the card, by means of which keys the chip card can access secured, relative to the said mobile apparatus (1) outside devices (3, 3') through the said contactless interface.

23. Chip card according to one of the claims 17 to 22, characterized in that it further contains program means in order to make possible transparent data transmission between the said contactless interface (31, 31') and the telecommunication network (4).

24. Chip card according to one of the claims 17 to 23, characterized in that the communication controller (21) and/or the data-processing means (20) comprise a Java interpreter (20,21) for executing instructions in the JAVA language.

25. Communication method between a mobile apparatus (1) and, relative to the mobile apparatus (1), an outside device (3), which mobile apparatus (1) can be utilized in a mobile radio network and is provided with a removable chip card (2) which is intended for the storage of data containing at least identification data of a subscriber of the said mobile radio network, data being transmitted, without making use of the said mobile radio network (4), bidirectionally between the said outside device (3) and the mobile apparatus (1) via a contactless interface (14; 15) integrated in the housing (18) of the mobile apparatus (1),

characterized in that the method comprises the following: at least one step of the indication of a multiple-choice menu on a display of the said outside device, at least one step of the acceptance in the mobile apparatus (1) of a selection instruction entered by the user of the said mobile apparatus (1) by means of control elements (13) of the mobile apparatus (1),, at least one step of the communication of accepted selection instructions sent directly, without making use of the said mobile radio network (4), by the said mobile apparatus (1) via said contactless interface to the said outside device, at least one step of the execution of a process by the said outside device, which process corresponds to the choice made in the said menu, which choice is determined by the selection instruction sent to said outside device.

26. Method according to the preceding claim, characterized in that the said communication takes place via a coil (23) integrated in the said housing.

27. Method according to one of the claims 25 to 26, characterized in that at least one instruction in an object-oriented language, e.g., JAVA, is sent by the said outside device directly to the said mobile apparatus (1), without making use of the said mobile radio network (4).

28. Method according to one of the claims 25 to 27, characterized in that the said communication comprises the sending out of at least one instruction in an object-oriented language, for example in the JAVA language,

by the mobile apparatus (1), this instruction being intended for execution by processing means in the said outside device (3).

1/2

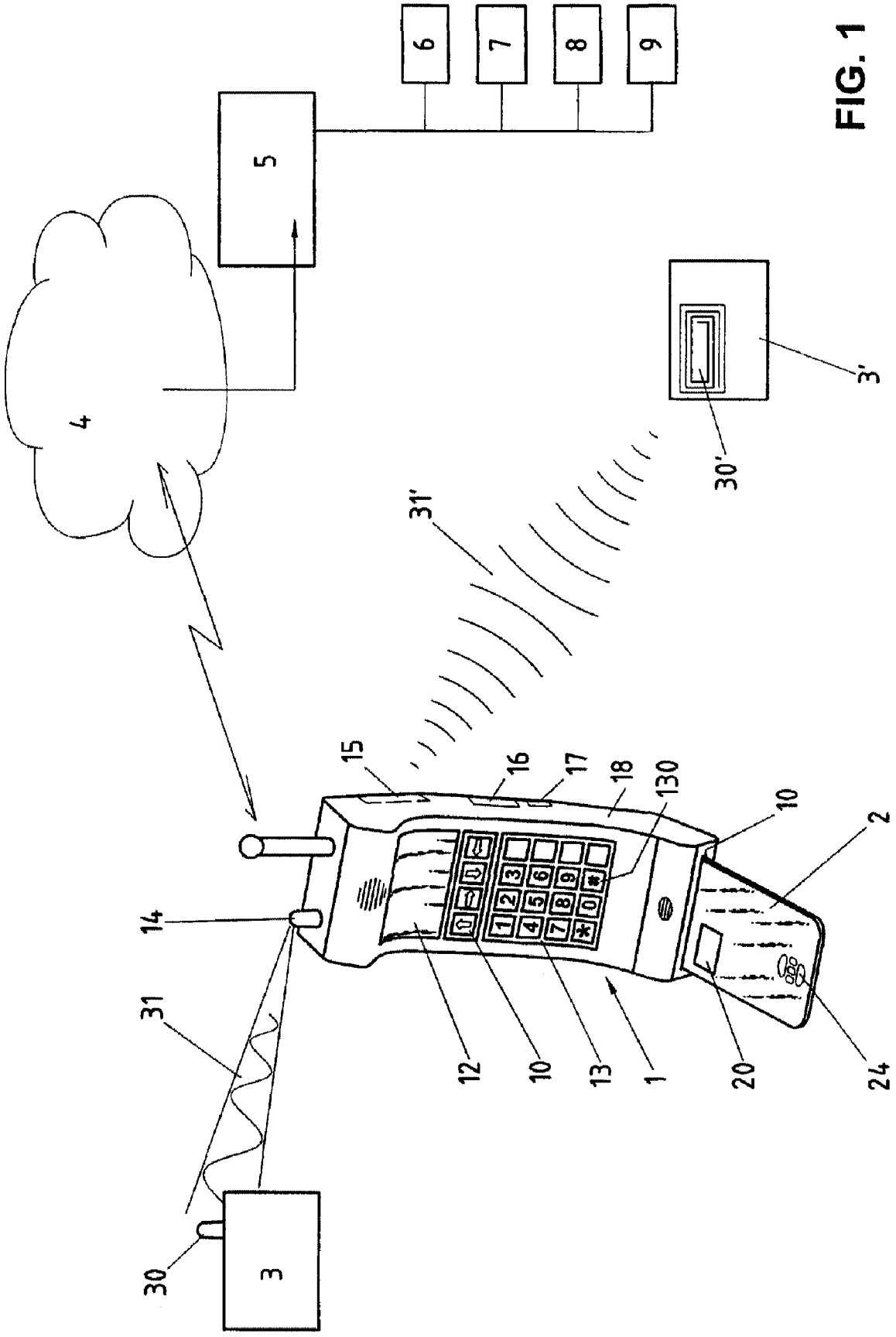


FIG. 1

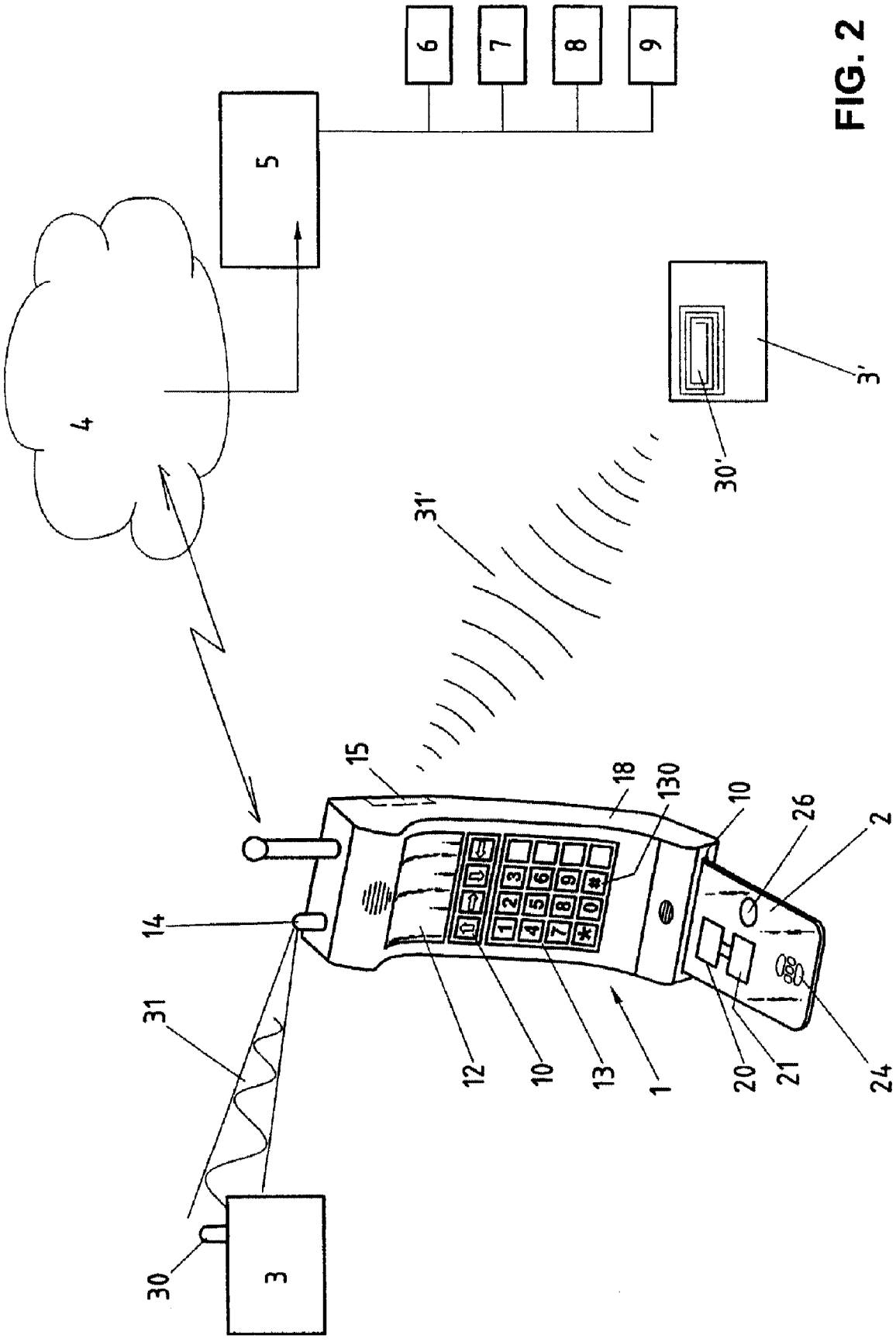


FIG. 2

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(71) Applicant *(for all designated States except US)*: BELLSOUTH INTELLECTUAL PROPERTY CORPORATION [US/US]; Suite 510, 824 Market Street, Wilmington, DE 19801 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: WHITLEY, Kevin, T. [US/US]; 5030 Oak Hollow Drive, Acworth, GA 30102 (US). WARFEL, Karl, B. [US/US]; 1296 Pinehurst Road, Greyson, GA 30017 (US). SHAND, Arthur, M. [US/US]; 10881 Big Canoe, Big Canoe, GA 30143 (US).

(74) Agents: PRATT, John, S. et al.; Kilpatrick Stockton LLP, Suite 2800, 1100 Peachtree Street, Atlanta, GA 30309–4530 (US).

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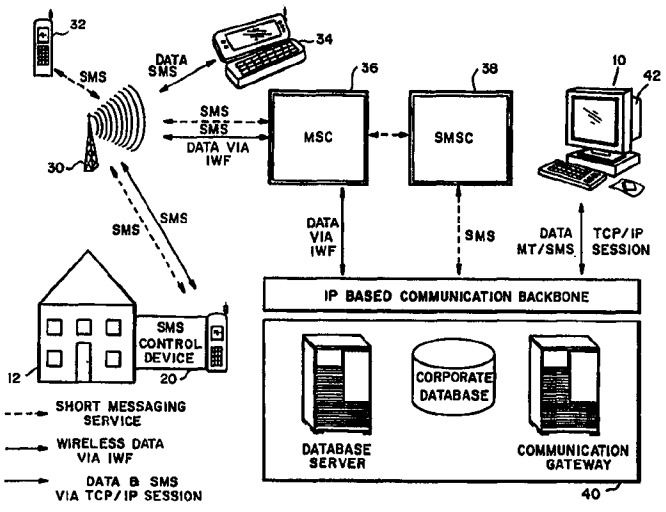
(57) Abstract

Methods and apparatus are disclosed for remotely monitoring and controlling via a wireless network various devices deployed in homes and businesses. The present invention allows for monitoring and control of various gateways distributed to remotely located facilities to be monitored and the devices coupled to those gateways to be controlled via a wireless communications network. Preferably, the network is a GSM network adapted to provide short messaging services or any type of wireless network adapted to operate a General Packet Radio System for delivering data over the network. Messages are packaged at each gateway for delivery via the network to a destination terminal, whether a fixed terminal or a mobile station. Likewise, customers may forward data and commands to a particular gateway either from a mobile station or by accessing a fixed terminal, such as through an Internet connection. Transporting messages or commands via the short messaging service of the GSM network or via the GPRS protocol avoids the prohibitive cost of setting up a call for each message and avoids the significant capital costs needed to set up a separate communication network for data delivery.



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WIRELESS TELEMETRY METHODS AND SYSTEMS FOR COMMUNICATING WITH OR CONTROLLING INTELLIGENT DEVICES

The present invention relates to methods and apparatus for remotely monitoring and controlling via a wireless network various devices deployed in homes and businesses.

RELATED APPLICATIONS

This application claims priority under U.S. law to United States provisional patent application 60/079,215, filed March 24, 1998, which application is hereby incorporated in its entirety by this reference.

BACKGROUND OF THE INVENTION

Numerous systems exist for automated, remote monitoring of various appliances, including electric utility meters and the like. For instance, systems exist that couple utility meters to remotely located databases via the wired Public Switched Telephone Network ("PSTN") so that the meters can be more efficiently and cheaply read remotely. Typically, such meter reading systems couple a database to a gateway that interfaces with the meter and, in many cases, other devices in a particular facility or portion thereof. These systems, however, are generally one way, sending data from the meter to the central processor.

Moreover, even when the system provides for two-way or duplex data communication that allows commands and other data to be down or up loaded to or from the gateway, a complete call must be made between the central processor and the gateway. Such calls are expensive, since they involve the full architecture of the PSTN in delivering the data, even when the amount of data delivered is relatively small. Also, the data or commands must be sent to or from a relatively intelligent central processor to which few persons will have access. This means, for instance, that customers at whose premises gateways are located cannot themselves send data (including commands for devices within the premises) to the gateway via the PSTN.

Systems exist that use short bursts of radio transmission to control and receive data from remote power distribution control terminals. For instance, a company called ITRON owns a U.S. Patent No. 5,475,867 to Blum on such a system, albeit a system that uses supplemental controllers for expanding the fairly limited geographical range of the basic system. This system, however, would be expensive to deploy and operate since an essentially new architecture would need to be deployed.

Several companies, such as CellNet Data, Greenland and possibly ITRON, are trialing meter reading systems that use two-way paging, which provides broader geographic coverage. While such a system eliminates the trouble and expense of setting up a separate call each time data must be up or downloaded, paging messages provide limited payload for data, thereby limiting the potential for controlling and updating the gateway. Also, it is unclear whether such systems will allow users to send data and commands to or receive data from the gateway directly and without the need to go through a central processor or control center, which limits the flexibility of the system for users wishing to receive data about their facilities and remotely control various devices at the facility.

SUMMARY OF THE INVENTION

The present invention overcomes the above problems by providing a system and method for gathering and sending data over an existing wireless network remotely to control and monitor various gateways and the devices coupled to those gateways. A system according to the present invention uses multiple gateways that communicate over a wireless communications network capable of carrying digital data. The wireless communications network allows the gateway to send data and receive commands directly from the customer, which could own or manage the facility in which the gateway is located. The customer can send and receive such data via a mobile station or a fixed terminal. Simultaneously or independently, data and commands may be up and down loaded to or from a control center coupled to the wireless network. Thus, the present invention provides a system and methods for providing customers a virtual direct

connection for routing messages to a gateway from a mobile station or fixed terminal, or vice versa.

The present invention uses multiple control and reporting gateways that are deployed in homes, businesses and other facilities. These gateways are configured to collect data, such as data describing use of electric power or other utilities by the particular facility at which they are located or data describing the status of various sensors after arming of a security system. Also, gateways may be coupled to various devices within the facility in order to control the devices. For instance, gateways may control the lights within a facility according to a pre-programmed pattern that the user may change by communicating new commands via the present invention. Or, gateways may be configured remotely to receive commands and data, which allows remote control over the devices (e.g., home appliances or electronics) with which the gateway may communicate. Each uniquely addressable gateway includes a transceiver capable of communicating over a wireless network.

In one embodiment of the present invention, a monitoring and control system may be provided that receives data from gateways on an essentially real time basis and can send data (including commands) to such gateways at any time over a wireless network. This allows for essentially real time monitoring of the facility at which the gateway is located. Preferably, the wireless network will be a GSM ("Global System for Mobile") communications network capable of providing Short Messaging Services ("SMS"). SMS messages allow users of the network and the gateways to send and receive packets of data (about 160 characters) without setting up an actual call connection. Receiving terminals, whether mobile stations, such as handsets or pagers, or fixed terminals, like computer workstations, reassemble one or multiple related SMS message packets into readable messages, such as an e-mail or page.

In another embodiment, the present invention provides a method for uploading a large data file via the wireless network. For such larger files, an actual circuit-switched call is made from the gateway to a central processor coupled to the wireless network's switch or MSC. The central processor includes a controller with a communications

processor and database server. The communications processor sets up a session with the gateway during which the gateway can upload the file via the wireless network. In a wireless network, large files of digital data from the gateway may be moved from the MSC to a destination via the Inter-Working Function ("IWF"). The central processor can be co-resident with the MSC or coupled to it via another network connection, such as the PSTN or a wireless connection.

An example use for this embodiment involves a program by which the gateway periodically polls the devices it connects to for energy usage rates. Each poll generates a message that is about 100 bytes long. Rather than forwarding each message via the wireless network to the customer or a database, the gateway aggregates all reads for a particular time period and then uploads the entire file to the central processor via the IWF.

A customer may access the central database in order to determine energy or device utilization at the customer's facility. The database can be coupled to a control system that regularly downloads data and commands to the gateways. In that event, the customer can also pass instructions to the control system to forward desired commands or new data to the gateway in order to control the devices coupled to it.

An alternative embodiment of the invention takes advantage of the architecture and protocols of the GPRS or General Packet Radio System to deliver data from and commands to gateways. The GPRS protocol provides an architecture and various interface layers (both hardware and software) for implementing a packet data system across existing wireless networks, regardless of the type of wireless protocol (e.g., TDMA, CDMA, GSM) used by those networks. Certain GPRS protocols for implementing this architecture are described in the following documents, each of which is incorporated in its entirety by this reference: (1) GPRS MS-SGSN LLC, GSM 04.64 (ETSI No. TS 101 351); (2) GPRS MS-SGSN SNDCP, GSM 04.65 (ETSI No. TS 101 297); (3) IW PLMN GPRS-PDN GSM 09.60 (ETSI No. EN 301 347); (4) GPRS PDN. GSM 09.61 (ETSI No. TS 101 348); and (5) Digital Cellular Telecommunications System (Phase 2+): GPRS Project scheduling and open issues, GSM 10.60.

The present invention implements a GPRS over a wireless network, such as a GSM network. Such a network uses base station controllers to route voice communications to the existing wireless system infrastructure, such as MSCs, HLRs and the like. In a GPRS capable network, however, the handshakes generated by wireless devices inform the base stations that a particular transaction is a packet data transaction; in turn, the base stations so inform their base station controller, which can then route the packet data to a support node rather than an MSC and its supporting infrastructure. The support node may communicate with other public wireless or wired networks or with an IP (internet protocol) network. By, for instance, repackaging the wireless data message into an internet packet, the support node interfaces more easily between the base stations and the IP network than existing wireless systems. This protocol may result in not only higher data transmission rates (i.e, larger data payloads than the limited SMS packets), but also in faster data delivery since data transfer does not require signalling to set up connections among network elements.

Whether using GSM short messaging services or GPRS messages to deliver data to and from multiple gateways located throughout a particular region, the present invention performs the following processes:

- Formatting messages for wireless delivery to and from particular or groups of gateways. In an SMS implementation, this may be accomplished at the gateway, which formulates messages to other terminals into a short message format, or, if the message is destined to a particular gateway, at the originating terminal. In a GPRS implementation, the support node places messages in varying formats depending on which network over which they will be transmitted and appropriate to that network. Additionally, as packet data messages are transferred among network elements in the GPRS, information is added or substracted from the message header depending on the particular stage of intra-network transfer.
- Transmitting the message from the gateway to a network element or vice versa. The Short Messaging Service Control center handles this functionality, since it

is programmed to identify and route SMS messages to their appropriate destination. In the GPRS implementation, transmission is accomplished by first having the base station controllers forward packet data messages to a support node router, which routes the messages to their desired destination.

- Delivering messages to the user directly or to a central processor for storing and processing. In either implementation, messages may be delivered via an IP network or other public or private communications network.
- Routing commands or data to one or groups of gateways. The commands or data can be formulated at and sent out by the central processor over either the GPRS or SMS implementation. However, because each gateway is uniquely addressable through, for instance, a phone number, IP address, or similar identifier, the customer can formulate messages or commands that will be routed directly from the customer's mobile station or fixed terminal to the gateway.

The present invention accordingly aims to achieve at least one, multiple or all of the following objectives:

To provide a system and method for monitoring in real time and for controlling remotely located gateways;

To provide a method for allowing customers to remotely monitor and control devices located in the customer's facility that communicate with a gateway;

To provide a method for allowing customers to receive monitoring information about activities at their facility via a mobile station or a fixed terminal;

To additionally provide a method that allows customers to control the gateway and devices coupled to the gateway from their mobile station or a fixed terminal communicating over the wireless network;

To provide a method for customers to forward commands and data to a central processor for delivery to the gateway;

To take advantage of the short messaging service capability of a deployed GSM network to more efficiently provide remote monitoring and control of multiple distributed gateways;

To provide a central processor for receiving monitoring messages from remotely located gateways and aggregating those messages to track activities at the facility associated with a particular gateway; and

To provide methods for customers to access data stored at the central processor.

Other objects, features and advantages of the present invention will become apparent upon reading the rest of this document.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a block diagram of a system according to the present invention that implements various methods for receiving and sending data from and to a selected gateway.

Figure 2 shows a simplified block diagram of the system shown in Figure 1, with labels indicating the functionality of various system components.

Figure 3 shows a block diagram of one embodiment of the system shown in Figure 1 detailing the method and system components used to route SMS messages.

Figure 4 shows a block diagram of an alternative embodiment of a wireless GSM system using the GPRS format and architecture to route data and commands to and from a gateway.

DETAILED DESCRIPTION OF THE DRAWINGS

System Overview: SMS Application

Figure 1 shows a system 10 for implementing the methods of the present invention. System 10 monitors and controls various devices deployed in multiple facilities 12, which could be a home, office building or industrial complex. Each facility 12, or portion thereof, has a gateway 20 that acts as a data collection and control device, as defined

below. Data received from various devices within and associated with facility 12 is packaged by gateway 20 for forwarding via a wireless digital communications network, which may be either a cellular network or a Personal Communication System ("PCS") network. The system 10 of the present invention aims to route messages from various gateways 20 to terminals. A terminal may be a fixed terminal, such as central processor 40, an ISDN terminal or a workstation 35 (shown in Figure 3), as well as a mobile station. The phrase "mobile station" means a device for sending and receiving data over a wireless network and includes, for instance, a pager 31, a handset 32 or an internet communicator 34 that may be a Nokia 9000 GSM communicator capable of accessing the internet via a GSM wireless network.

Such a network may have a number of cellular sites, each served by a tower 30 holding a base station and appropriate equipment for receiving and transmitting wireless voice and data messages. Those messages are routed to the appropriate terminal, such as a pager 31, cellular handset 32, cellular internet communicator 34, or workstation 35, by the mobile switching center ("MSC") 36 that may be a switch provided by Nortel, Lucent, Erricson or other switch makers. If the messages are Short Messaging Service ("SMS") messages, MSC 36 receives each SMS message, determines it is an SMS and switches the SMS message to a SMSC ("Short Message Service Center") 38, which may be a platform, such as one provided by Logica-Aldiscon, Inc., of Lexington Massachusetts, either co-located with the MSC 36 or coupled to it via a communication link. SMSC 38 listens on a socket for SMS messages in order to route received SMS messages to the appropriate destination. Additionally, SMSC 38 receives outgoing SMS messages and reformats those messages for transmission through the MSC 36. Typically, for instance, SMSC 38 may link to MSC 36 via a SS7 data communication link (as shown in Figure 3); SMSC 38 can then route SMS messages to subscribers roaming in other wireless networks via Signal Transfer Points within the SS7 network.

The term "gateway" includes any device that (a) provides a physical interface between internal devices associated with a particular facility 12 and external networks and, optionally, (b) may provide a platform for delivering various services to the facility

12. Thus, gateways 20 may couple to a remote facility 12 and may monitor, control or both monitor and control various devices within the facility 12, such as lights, security sensors, an answering machine, a home computer, etc. For instance, gateway 20 may be a set-top box, personal computer or other device provided with a processor, such as an Intel 386 or 486 processor, and communicates with various, optionally addressable, devices located throughout the facility. Gateway 20, which may be uniquely addressable, also has a wireless transceiver for sending and receiving communications via a digital wireless network.

Additionally, for the embodiment of the present invention that uses a GSM network, gateway 20 is an integrated GSM enabled communications device programmed to format and manage data packets sent and received via the short messaging service provided by a GSM network, as described further below. Gateway 20 sends and receives SMS messages via and as part of the architecture of a GSM network. For instance, gateway 20 may be a GSM device that allows transfer of data, facsimile or e-mail messages, but which does not have voice capability. These messages can be formulated and read by a SIM or "Subscriber Identity Module" card that can be plugged in or otherwise incorporated into gateway 20. Gateway 20 is programmed to generate text for an outgoing SMS message, place it in the SIM card of the gateway 20 and initiate the data transfer over the GSM network. Thus, gateway 20 may use bi-directional host computer to SMSC programming code to control the SIM card interface and the automatic SMS message routing application. The GSM network also delivers messages to the correct location and gateway 20 confirms the accuracy of any received message to the sender. When an SMS message is received at the gateway 20, the gateway 20 reads the SMS message from the SIM card and processes the contents of the SMS message as though it was entered directly from a command console.

Figure 3 shows the methods and components of system 10 used for formulating and reading SMS messages sent and received by and from SMSC 38 to and from a selected gateway 20. SMSC 38 may be provided with a SMS Application that facilitates sending and monitoring of short messages between an end user and the SMSC 38. The

messages can be generated by using a GUI based front end application or by delivering a message in a pre-defined format to the relational database tables used to store outgoing messages. The SMS Application queues outgoing messages and sends them one at a time to the SMSC 38 for distribution on the GSM network. In turn, the SMSC 38 returns a message indicating the delivery status of the outgoing message. SMSC 38 may communicate over an internet network with e-mail users or over a TNPP network with pagers; likewise, through those networks or the PSTN, users may communicate with the SMSC 38 to formulate and send messages for subscribers. Finally, Figure 3 shows the OSS/LAN support structure for supporting operations of an SMSC 38.

The SMS Application can be configured to receive an SMS message from the SMSC 38. In this configuration, the SMSC 38 will receive a message from the GSM network and forward it via a direct connection to the SMS Application rather than initiating a message transfer to another mobile station or terminal via the GSM network. Through the incorporation of a fully bi-directional message transfer system, a wireless end user may (a) receive messages and initiate responses via the GSM network to control devices attached to gateway 20 or (b) update the application database directly. Thus, as Figure 2 indicates, DCS Messaging software, developed by BellSouth Mobility, and deployed on the central processor 40 may be programmed to perform at least the following tasks:

- **Front End Client Application** - This task enables end users to input a text message, up to 190 bytes, and send the message directly to the SMSC 38 for distribution across the GSM network. A graphical user interface or GUI allows for flexible, intuitive input and output. After entry of messages, this application updates the Database (such as databases provided by the Oracle Corporation) Tables with the message data.
- **Database Tables** - This task stores outgoing text messages, message status for inquiry and resolution and routing information for the

message. The database tables can be populated by the front end client application or directly from another server process.

- **Message Server** - This task mediates between various Database Tables and the socket used for communicating with the SMSC 38. It will query Database Tables for new outgoing messages and query the SMSC 38 to check the status of existing messages, which are routed to central processor 40 for storage in the Database Tables.
- **Socket Layer** - This task performs the bi-directional communication between the Message Server and the SMSC.

An API on workstation 42 accesses the DCS Messaging software, which acts as a server to provide the GUI that allows input of new messages into the central processor 40.

Alternatively, by reconfiguring MSC 36 to route SMS messages and reconfiguring gateway 20 to listen for such messages, the system 10 could be configured so that SMS messages go directly to the gateway 20 without passing through a SMSC 38. Such distributed message delivery eliminates possible routing errors at SMSC 38. A central processor 40 may also receive or be copied on the messages from gateway 20 to handset 32 or communicator 34. On the other hand, this distributed architecture would be substantially more expensive and complex, requiring dedicated SS7 links between MSC 36 and each of gateways 20, which also would have to be provided with software to enable SMS routing throughout the network.

Methods for Delivering SMS Messages

In one embodiment of this invention, the wireless network is a GSM network represented by tower 30, pager 31, handset 32, communicator 34, and MSC 36, which may be a Nortel switch running GSM. This network provides integrated voice and enhanced digital services, including e-mail or SMS to the user's mobile station, which may also have integrated voice mail, caller ID functions, a fax mailbox, etc. The GSM standard defines a short messaging service, which allows users of the network to send and receive short data messages, usually in the form of alphanumeric text. Such messages can be sent and received even during an on-going communication session. SMS messages

may be configured for delivery to a particular identified terminal, such as handset 32, or they may be broadcast throughout a specific geographical area by using the SMS cell broadcast feature. This broadcasting function, described in the GSM 03.41 and GSM 04.11 that are incorporated herein by this reference, is useful for reprogramming multiple gateways 20 simultaneously or warning customers at various facilities 12 of particular events in their geographic area (e.g., a weather warning or the like).

A system 10 using a GSM network allows SMS messages with a payload of about 160 bytes or characters to be sent at 9600 Baud from a gateway 20 to a terminal via a GSM network and supporting sub-components. A GSM network supports multiple points of origin or destination of the SMS messages, allowing for two-way communication among terminals and gateways 20, each of which are provided with a unique identifier, such as a phone number or an IP address. Significantly, this architecture allows data communications among gateways 20 and mobile stations, like pager 31, handsets 32 and communicator 34, or fixed terminals, through virtual direct connections among all of those devices using the GSM network and supporting sub-components for transport. This provides a virtual point-to-point connection via the GSM network, and the SMS messages may or may not be sent to or through the central processor 40. By taking advantage of the SMS services provided in a GSM network, the network functionality required for forwarding short data messages to and from gateways 20 need not be developed from scratch.

By way of example, assume that gateway 20 monitors facility 12 for energy usage data or alarms indicating a security breach as well as communicates with various electronic devices, such as an electronic thermostat or lights. The digital GSM network allows gateway 20 to periodically upload a SMS message, providing essentially real time monitoring of energy usage at the particular facility 12. For instance, the GSM network may allow message uploading as frequently as every 5 minutes. Gateway 20 could be programmed to provide periodic (e.g., hourly) reports on energy usage. If a security sensor coupled to gateway 20 triggers, gateway 20 could be configured to package and transmit, usually on a priority basis, a SMS message indicating a breach in security, as

well as other data including the date and time, the location of the facilities, or the location of the sensor.

In another embodiment of this invention, a microcell may be provided for very large facilities 12, such as industrial complexes, manufacturing facilities, distribution facilities or the like. A microcell allows persons within a large facility 12 to communicate with one another and the gateway 20 for that facility 12 via handsets 32. Such communications may be routed via MSC 36. For instance, such a microcell would provide the facility 12 with a wireless PBX, wireless data connectivity to corporate databases or wireless internet access.

Methods for Delivering Data via the IWF

An alternative embodiment of the invention allows gateway 20 efficiently to upload a large file of information to the central processor 40. By way of example, gateway 20 could have been instructed to poll devices coupled to it throughout the day to determine their energy usage. Then, instead of immediately reporting the results of each poll, gateway 20 buffers the information within memory for uploading to central processor 40 on command or at a preselected time. If the file is fairly large, rather than forwarding the file by sending one or multiple SMS messages that would need to be reassembled, gateway 20 has the capability to upload the file via an Inter Working Function (IWF) protocol. To do so, gateway 20 sets up a call to central processor 40, during which call gateway 20 packages and forwards the file via the IWF protocol. Although uploading data via the IWF transfer process uses a more expensive voice channel rather than a data channel, it allows faster upload of large files.

Delivery of Data via GPRS

Figure 4 shows a wireless network 100 provided with GPRS functionality. Network 100 is a GSM network, but could utilize other protocols, including TDMA, CDMA or the like so long as those networks operate the General Packet Radio System ("GPRS") protocols. Network 100 has multiple towers 30 coupled to multiple base stations ("BTS") 52, each controlled by a base station controller ("BSC") 50. BSC 50 has been modified to route calls to MSC 36, communicating with a conventional HLR

database 37. Note that the gateway 20 in Figure 4 has the same functionality as the gateway 20 in Figures 1 through 3, but may be implemented differently. For instance, since a GPRS may be deployed in other than GSM networks, a SIM card need not be provided to gateway 20, which instead may simply be outfitted with a cellular transceiver appropriate to the type of cellular network 100 in which the gateway 20 will be transmitting messages.

BSC 50 identifies and routes data messages to a support node 60. BSC 50 identifies data messages in a GPRS system because handshake messages from the gateway 20 inform the base station 52 that the particular transaction is a packet data transaction. Other methods exist for identifying such transactions, including examining identifiers placed in the data message by the user toggling certain functions on the delivery device or by analyzing the message itself. In any event, data messages from gateway 20 are assembled by a PAD into packets per the GPRS protocol specification for delivery to the support node 60. Figure 4 shows Gb and other interfaces that specify header information and such for allowing various network elements to communicate with one another. Support node 60 is a SGSN/GGSN (Server GSM Support Node or Gateway GSM Support Node), such as a Passport carrier grade data platform system available from Nortel Networks or any other platform suitable for use as a router. Figure 4 shows that support node 60 packages data messages that arrive from facility 20's gateway 20 for delivery over one of many types of networks to a central processor 40 (shown in Figures 1 and 2). The delivery network may be an IP network, an X.25 network, or other public land/mobile networks 62. Network 100 may also deliver messages, queries or commands from a central processor 40 (or another terminal) to the facility 12 that couples via an over-the-air interface to the base station 30 shown in Figure 4.

To send a message to a particular gateway 20, a user accesses the network 100 through a mobile station or fixed terminal. The user enters the gateway 20's identifier and formulates a message. The message, whether sent over a public telephone, via a workstation 42 as e-mail, or through a mobile cellular handset 32, is sent by the network 100 to the support node 60. Support node 60 reads the identifier and associates the

identifier with the BSC 50 that is associated with the destination gateway 20 and routes the message to that BSC 50, which then broadcasts the message via BTS 30.

Note that as in the SMS implementation, a common message to multiple gateways 20 may be sent over network 100. This is feature may be used to alert gateways 20 to a particular condition (e.g., weather, etc.) common to the geographical area in which the gateways are deployed or to send instructions to multiple gateways 20 controlled by a single user. Messages may be broadcast, for instance, to all gateways 20 with a common NPN in their identifying phone number. Messages with that NPN may cause the support node 60 may to do a table look-up and determine the particular gateways associated with the NPN; thereafter, the support node 60 will route the same message to each such gateway 20 by instructing each BSC 50 to forward the message to each applicable destination. Of course, skilled persons will recognize other means than a common NPN for specifying a group of gateways 20 to which a common message may be broadcast.

By using GPRS to transport data messages to and from gateway 20, the network 100 is able to transport messages larger than the 160 bytes allowed in an SMS message. Also, GPRS enhances wireless services by emphasizing internet protocol (IP) technology to allow seamless operation with the internet, packet-oriented data services, and inter-working with legacy wireless systems. For instance, GPRS provides variable data rates for transmitting messages via the over-the-air interface between wireless device and base station that range from 11.2 to 22.8 kbps for a single slot allocation. Multi-slot configurations provide 22.4 to 182.4 kbps data throughput. Future enhancements to GPRS data rates are expected to provide 69+ kbps bit rate over the air interface, using a different modulation scheme. Data rates in packet mode are expected in the 45-550 kbps range.

Collating and Accessing Data at the Central Processor

As described and shown in Figures 1 and 2, central processor 40 receives data from multiple gateways 20. Central processor 40 has a database for storing information uploaded via SMS messages or the IWF protocol. The stored information may be collated and organized according to customers, facility, etc. Customers may access the database

via the communication gateway. For instance, customers may use a workstation 42 to set up a TCP/IP session via an Internet Protocol ("IP") communication network, such as provided by a local Internet Service Provider ("ISP"). Through the internet connection, customers can easily view data describing the energy usage of devices at facility 12, as well as check on the status of various other activities logged into the database at the central processor 40. Note that customers can set up a TCP/IP session either through a terminal connected to an ISP, such as workstation 35, or via the communicator 34 that connects to the internet via a wireless network.

Additionally, while viewing data describing activities at facility 12, the customer may also input commands to be forwarded to various devices at the facility 12. Central processor 40 packages those commands as an SMS message and downloads them to a particular gateway 20 through the SMSC 38. Although Figures 1 and 2 show central processor 40 coupled to MSC 36 and SMSC 38 via a PSTN connection, central processor 40 could be co-located with those platforms or communicate with them via a different communications link. Alternatively, central processor 40 may be provided as part of, or couple to, a support node 60 so that messages or commands entered by customers may be formatted as a GPRS packet for transmission over the network 100 that operates a GPRS, as shown in Figure 4.

An example use of the methods and systems of the present invention is described as follows. Gateway 20 is programmed to poll each device coupled to it to determine the device's energy use. For instance, gateway 20 can be connected to the thermostat, refrigerator, water heater, and washer/dryer in a particular residential facility as well as to the general meter for that facility. Gateway 20 polls those devices every hour to determine their energy use. Gateway 20 then forwards the poll results to the SIM card, which generates a SMS message containing the poll results as well as the date, time and location of gateway 20. The SMS message is then transferred from gateway 20 to central processor 40 via the MSC 36 and SMSC 38. Central processor 40 collates each hourly message from gateway 20 to form a visual graph depicting overall and individual device energy usage at facility 12. This allows a customer to access the database coupled to the

central processor 40 via the internet and determine the overall energy usage at a particular facility 12. The customer can then, based on the energy usage trends, input commands to adjust the thermostat, or turn off one of the devices (such as the washer/dryer or water heater) coupled to the gateway 20 in order to save energy. Likewise, the user can input other commands for delivery to the gateway 20. For instance, the user could instruct the gateway 20 to enable or disenable an alarm system at a particular facility 12 at a particular time and for a particular time period. The present invention also allows the gateway 20 to be programmed to copy messages on energy uses or alarm triggers at a particular facility 12 directly to a handset 32 associated with the owner of facility 12. Likewise, gateway 20 can have its normal routine interrupted by a priority data message. For instance, if gateway 20 couples to alarm sensors at the facility 12 and one sensor alerts to an intruder, gateway 20 can be programmed to send a message both to the handset 32 in order to alert the owner of the facility 12 and to the central processor 40, which processes the message in order to alert the authorities to the security breech. These are, of course, just two of many applications for which gateway 20 and the present invention can be used.

The foregoing is provided for purposes of explanation and disclosure of preferred embodiments of the present invention. For instance, a preferred embodiment of this invention involves using a GSM network with a short messaging service capability or a GPRS capable wireless system. It is expected that such capabilities or their equivalent will be provided in other standard types of wireless networks, in which case the preferred embodiment of this invention may be easily adapted for use in such networks. Further modifications and adaptations to the described embodiments will be apparent to those skilled in the art -- such as upgrades or modifications to the GSM or GPRS protocols -- and may be made without departing from the scope or spirit of the invention and the following claims.

What is claimed is:

1. A method for remotely monitoring or controlling activities within multiple facilities geographically dispersed within at least one wireless network adapted to transmit GSM short messages to allow the facilities to communicate with other terminals without making a wireless telephone call, the method comprising:

(a) providing the selected facility with a gateway comprising a processor, a transceiver and a SIM card adapted to transmit short messaging service messages;

(b) periodically causing the gateway to formulate a short message reporting on activities within the selected facility at which the gateway is located;

(c) transmitting the message over the GSM network via a Short Messaging Center coupled to a Mobile Switching Center within the GSM network; and

(d) receiving the message at a terminal selected from a group of devices consisting of a mobile station, a workstation and a central processor.

2. A method according to claim 1 further comprising the step of controlling devices located at a selected facility by formulating a control message and forwarding it via the GSM network to the selected facility, wherein the gateway at the facility processes the control message in order to control one or more devices coupled to the gateway.

3. A method according to claims 1 or 2 further comprising the step of collecting multiple messages from the selected facility, storing those messages in a database associated with a central processor and processing the stored messages at the central processor to display information concerning activities at the selected facility.

4. A method according to claim 2 in which the control message is formulated by a user on a communication device selected from the group consisting of a pager, a cellular handset, an internet wireless communicator or a workstation.

5. A method according to claim 4 further comprising the step of coupling the central processor to an internet protocol network to allow users to view the displayed information concerning activities at the selected facility.

6. A method according to claims 1 to 5 further comprising the step of monitoring energy uses within the selected facility by periodically polling at least one device therein.

7. A method according to claim 6 further comprising the step of aggregating the periodic polls and uploading the aggregated information to a user's terminal.

8. A system for transmitting data to and from multiple gateways deployed in homes or businesses and capable of collecting data concerning usage or operation of various devices located in the homes or businesses, the system comprising:

a) multiple gateways, each adapted to formulate or accept a wireless packet data transmission;

b) a base station controller adapted to route data forwarded to the base station controller via wireless transmission to a support node for formatting the message into a format selected from the group consisting of internet protocol, X.25 protocol and a data protocol for transmission over public land or mobile networks; and

c) a terminal for receiving the formatted messages.

9. A system according to claim 8 wherein the terminal is a central processor that collates the formatted messages to describe the conditions within the facility associated with a selected one of the multiple gateways.

10. A system according to claim 9 further comprising a workstation for accessing the formatted messages collated by the central processor.

11. A system according to claim 10 wherein the workstation allows entry of commands to be delivered via the support node to one or groups of the multiple gateways.

12. A system according to claims 8 to 10 further comprising a mobile station or a fixed terminal from which a user may formulate and send a message directly to one or groups of the multiple gateways.

13. A method for using a wireless network to deliver messages from or to each of multiple gateways that are deployed in geographically-dispersed facilities comprising:

a) formulating a message for wireless transmission according to an SMS or GPRS format;

b) transmitting the message to a network element for identifying that message; and

c) transferring the message from the network element to a central processor for collating the transferred messages with other messages or data related to a selected gateway.

14. A method according to claim 13 in which the network element is a Short Messaging Service Center ("SMSC").

15. A method according to claim 14 further comprising the step of communicating to the selected gateway by formulating a message and delivering it to the SMSC and causing the SMSC to forward the message to the selected gateway.

16. A method according to claim 13 in which the network element is a base station controller that determines that the message is a GPRS data transmission and routes the message to a second network element comprising a support node.

17. A method according to claim 16 further comprising the step of communicating to the selected gateway by formulating a message and delivering it to the support node and causing the support node to forward the message to the selected gateway.

5

18. A method according to any of claims 13 through 17 in which the transmitting step comprises the step of coupling the network element to an Internet Protocol network for forwarding the message to the central processor.

10 19. A method according to any of claims 13 through 18 in which the formulating step occurs when a user formulates the message from a mobile station.

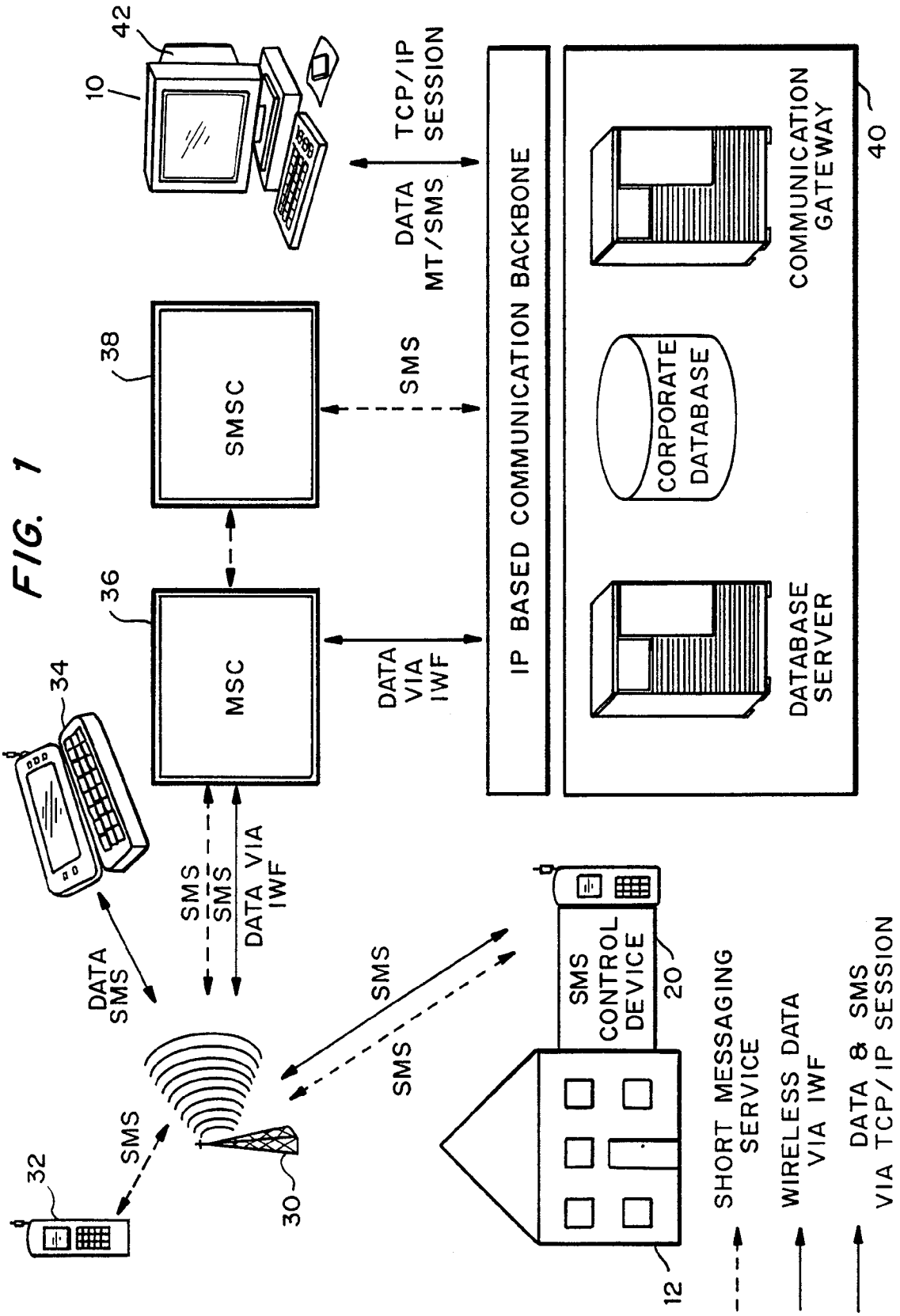
42
10
TCP/IP SESSION
DATA MT/SMS
IP BASED COMMUNICATION BACKBONE
COMMUNICATION GATEWAY
40
CORPORATE DATABASE
DATABASE SERVER
38
SMSC
SMS
36
MSC
DATA VIA IWF
34
SMS
SMS
DATA VIA IWF
DATA SMS
SMS
SMS
SMS CONTROL DEVICE
20
32
SMS
30
12
SHORT MESSAGING SERVICE
WIRELESS DATA VIA IWF
DATA & SMS VIA TCP/IP SESSION

FIG. 1

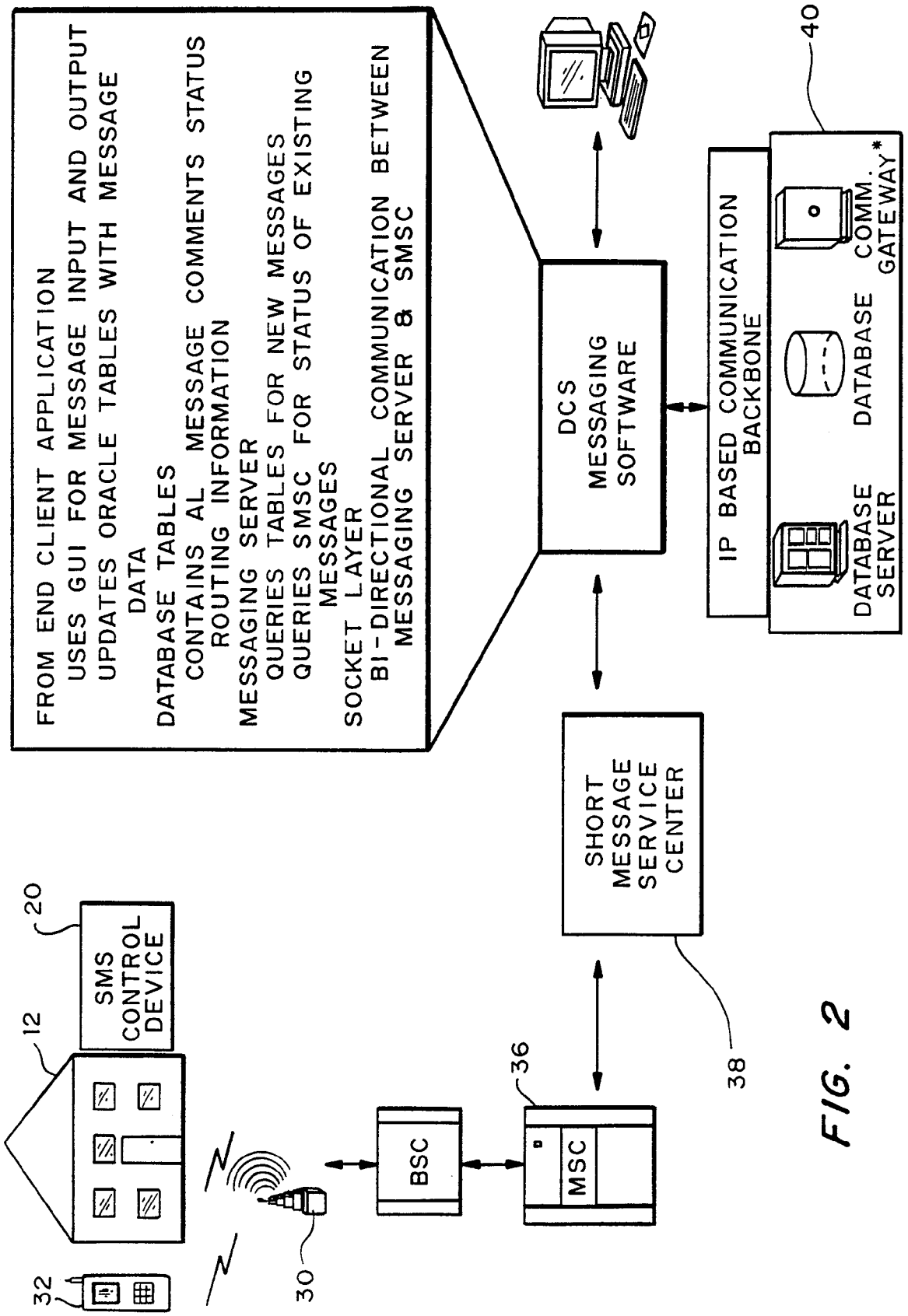
FROM END CLIENT APPLICATION
USES GUI FOR MESSAGE INPUT AND OUTPUT
UPDATES ORACLE TABLES WITH MESSAGE DATA
DATABASE TABLES
CONTAINS AL MESSAGE COMMENTS STATUS ROUTING INFORMATION
MESSAGING SERVER
QUERIES TABLES FOR NEW MESSAGES
QUERIES SMSC FOR STATUS OF EXISTING MESSAGES
SOCKET LAYER
BI-DIRECTIONAL COMMUNICATION BETWEEN MESSAGING SERVER & SMSC
DCS MESSAGING SOFTWARE
IP BASED COMMUNICATION BACKBONE
DATABASE SERVER
DATABASE
COMM. GATEWAY*
40
SHORT MESSAGE SERVICE CENTER
38
MSC
36
BSC
30
SMS CONTROL DEVICE
20
12
32

FIG. 2

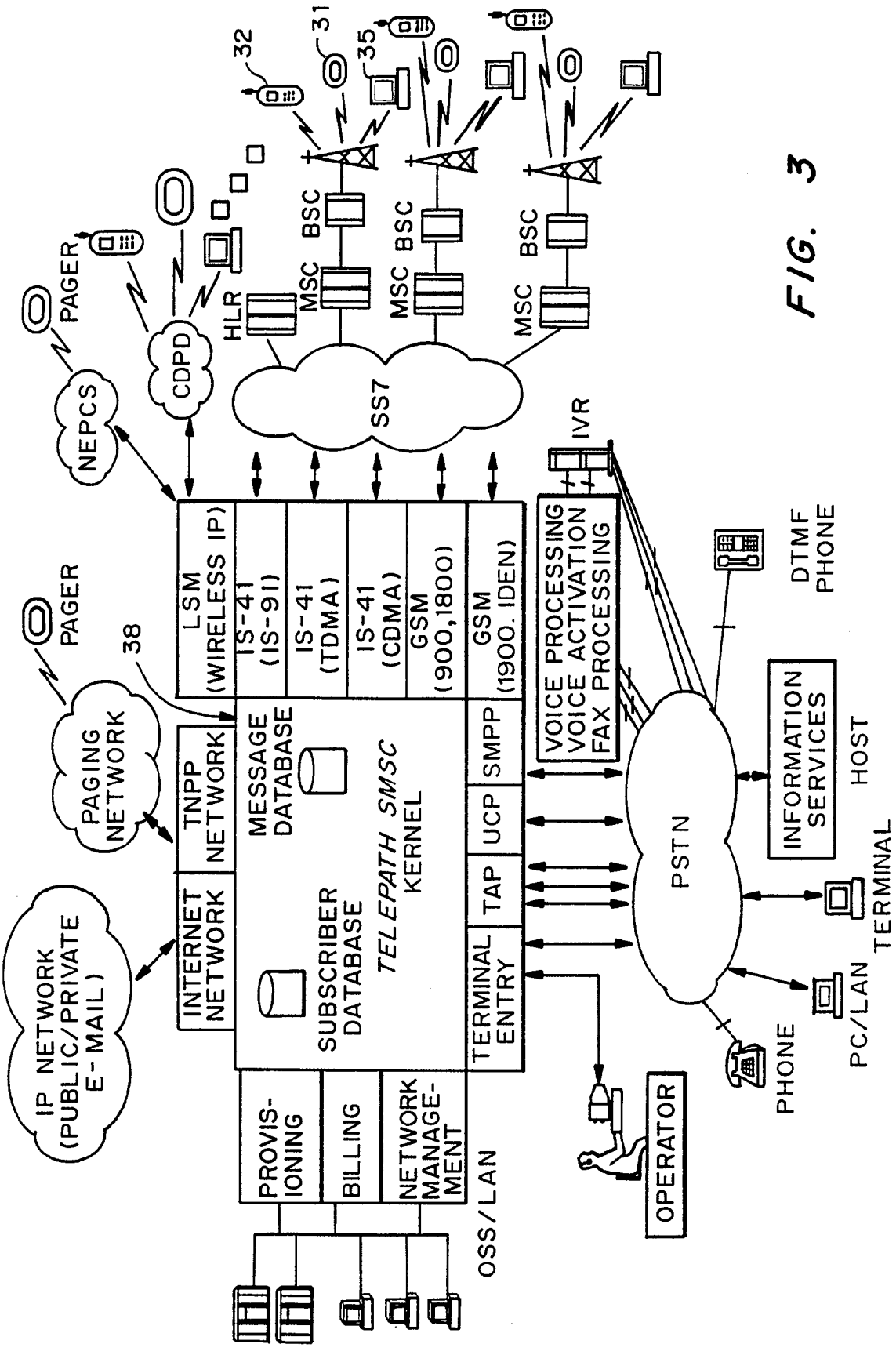
PAGER
PAGER
PAGER
NEPCS
CDPD
HLR
MSC
BSC
MSC
BSC
MSC
BSC
SS7
IVR
LSM (WIRELESS IP)
IS-41 (IS-91)
IS-41 (TDMA)
IS-41 (CDMA)
GSM (900,1800)
GSM (1900. IDEN)
VOICE PROCESSING
VOICE ACTIVATION
FAX PROCESSING
DTMF PHONE
38
PAGING NETWORK
TNPP NETWORK
MESSAGE DATABASE
SMPP
UCP
TAP
TERMINAL ENTRY
TELEPATH SMSC KERNEL
SUBSCRIBER DATABASE
INTERNET NETWORK
IP NETWORK (PUBLIC/PRIVATE E-MAIL)
PSTN
INFORMATION SERVICES
HOST
TERMINAL
PC/LAN
PHONE
OPERATOR
PROVIS-IONING
BILLING
NETWORK MANAGE-MENT
OSS/LAN
32
31
35

FIG. 3

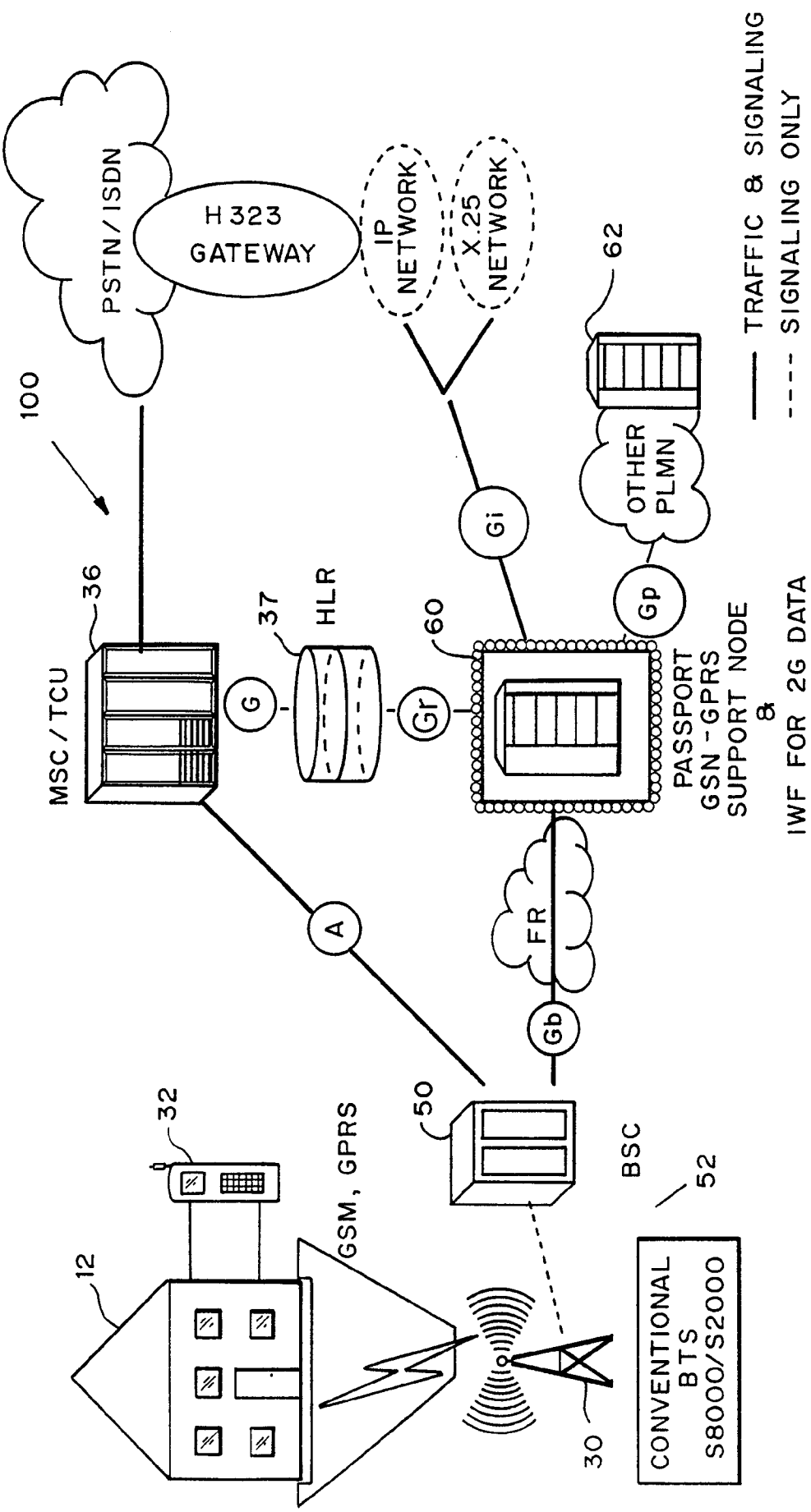
PSTN / ISDN
H 323 GATEWAY
IP NETWORK
X.25 NETWORK
62
OTHER PLMN
100
TRAFFIC & SIGNALING
SIGNALING ONLY
Gi
Gp
36
MSC / TCU
37
HLR
60
G
Gr
PASSPORT GSN - GPRS SUPPORT NODE & IWF FOR 2G DATA
A
FR
Gb
32
50
BSC
52
GSM, GPRS
12
30
CONVENTIONAL BTS S8000/S2000

FIG. 4

INTERNATIONAL SEARCH REPORT

Int. ional Application No
PCT/US 99/06429

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04Q7/22 G08C17/02 H04M11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04Q H04M G08C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 719 918 A (SERBETCIOUGLU BEKIR ET AL) 17 February 1998 (1998-02-17) column 5, line 57 - column 6, line 67 column 14, line 59 - column 15, line 48 ---	1-19
X	DE 297 17 504 U (HELICOM ENTWICKLUNGSGES) 11 December 1997 (1997-12-11)	1-4, 13-15
A	page 1, line 19 - page 2, line 39 ---	6,8-12, 19
A	EP 0 645 941 A (SEL ALCATEL AG ;ALCATEL NV (NL)) 29 March 1995 (1995-03-29) column 3, line 50 - column 5, line 56 ---	1-4, 8-17,19
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
14 July 1999	20/07/1999

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Form PCT/ISA/210 (second sheet) (July 1992)

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PCT/US 99/06429

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 95 24791 A (BELLSOUTH CORP) 14 September 1995 (1995-09-14) page 13, line 13 - page 16, line 34 page 34, line 32 - page 35, line 35	1-4, 6-11,13, 19

1

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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DE 29717504 U	11-12-1997	NONE	
EP 0645941 A	29-03-1995	DE 4332758 A	30-03-1995
WO 9524791 A	14-09-1995	US 5546444 A	13-08-1996
		AU 682208 B	25-09-1997
		AU 7555594 A	25-09-1995
		BR 9408553 A	19-08-1997
		CA 2185230 A	14-09-1995
		CN 1145711 A	19-03-1997
		EP 0753230 A	15-01-1997
		JP 10500262 T	06-01-1998
		NZ 271792 A	29-01-1997
		US 5526401 A	11-06-1996
		US 5794144 A	11-08-1998

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(71) Applicant *(for all designated States except US)*: IST INTERNATIONAL SECURITY TECHNOLOGY OY [FI/FI]; Melkonkatu 16 A, FIN–00210 Helsinki (FI).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: MYLLYMÄKI, Matti [FI/FI]; Sisämaantie 18 A, FIN–02780 Espoo (FI).

(74) Agent: LEITZINGER OY; Ruoholahdenkatu 8, FIN–00180 Helsinki (FI).

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Published
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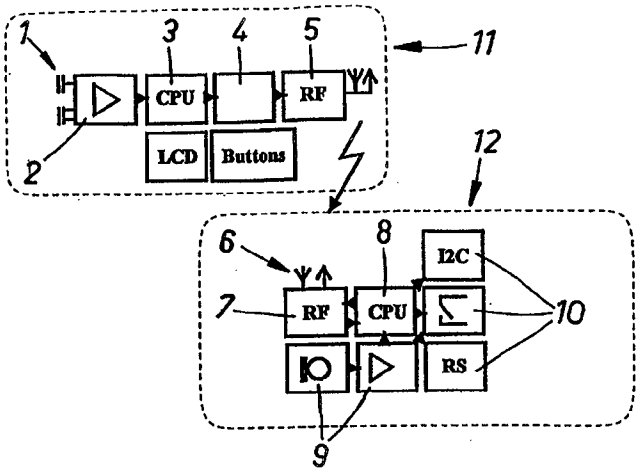
(54) Title: CONTROL SYSTEM FOR BUILDING AUTOMATION CONTROLLED BY HUMAN PHYSIOLOGICAL SIGNALS



(57) Abstract

An automatic control system for actuators and security devices in building automation. A wrist–held sensor and transmitter unit (11) transmits repeatedly, in the form of short telegrams, messages indicating the physiological condition of user to a receiver and control apparatus (12), which is placed in a monitored space either as a separate unit or a part of an appliance to be controlled. The receiver and control apparatus (12), or an information analyzer in data transfer communication therewith, uses the physiological condition of a user as a basis to conduct control selections and to control automatically the actuators and security devices in accordance with the physiological condition of a person who carries the transmitter unit (11). If necessary, the control selections can be influenced also by a piece of information indicating the location of a user. In addition to the automatic control of nearby equipment, the system is also applicable to monitoring the health of a user and to setting off alarms.

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Control system for building automation controlled by human physiological signals

The present invention relates to a control and security system for building automation controlled by human physiological signals, comprising one or more transmitter units, "Wrist nurses", and one or more receivers as well as a central unit. The receivers and the central unit are provided with sensors, processors along with software for processing received information, and control outputs as well as necessary communication links to the appliances being controlled.

Traditionally, the control of HPAE (Heating, Plumbing, Air conditioning, Electricity) equipment in buildings, such as homes and offices, is performed by monitoring the status of the environment as well as according to parameters programmed by a user for the control unit. The control is intended for monitoring human needs as effectively as possible. The security systems are also intended for creating an environment as safe as possible in accordance with human needs. Traditionally, the control of personal clearance, property, and health security systems is performed by means of a control keyboard and/or control switches under the self-acting control of a user. Personal clearance is generally carried out by using separate equipment and various clearance passes or cordless transmitters activated by external control. In property-related security systems, a keyboard is used e.g. for switching a burglar surveillance on and off. In health security systems, a control switch is used for controlling e.g. a passivity surveillance by means of a home/away switch. Referring especially to children and the elderly, the above control systems are too sophisticated and cause unnecessary alarms and restrict the use of security equipment. Also, false alarms in alarm systems are most commonly caused by operating errors, regarding both automobile alarms and buildings. In addition, security systems for a building and an automobile require their own operating equipment of the above type. In personal clearance equipment, the service is generally limited to controlling clearance passes as well as to monitoring working hours, but also these require a self-acting control by the user.

In general, separate systems have their own operating and control equipment, even if certain actions were linked together electrically for carrying out a joint operation. For example, the activation of burglar surveillance may shut down service water and drop room temperatures. What is typical is that all traditional systems require control actions from a user every time the requirements differ from set parameters, or if it is desirable to switch some function on or off. Attempts have been made to relieve the situation by means of so-called smart house solutions, wherein the intention is to make the equipment control as easy as possible. Nevertheless, such systems are too difficult to operate e.g. for children and the elderly, resulting in false alarms caused by operating errors as well as in dissatisfaction with the operation of equipment.

An object of the invention is to provide a control system for building automation, wherein the control is based on the location of people present in a space as well as the physiological condition thereof and the fact that a common control device is used for controlling the user terminals of all sub-systems either directly or through a local network (Lon, Instabus, etc.) automatically without a self-acting control by the user. The feedback for users, regarding automatically effected control functions, can also be delivered as voice messages.

This object is achieved on the basis of the characterizing features set forth in the appended claim 1.

Another novelty in the control system is that the users are able to control all pieces of equipment by means of a single wrist-held monitor device, which also enables the monitoring and surveillance of health condition both in and out of a building. When connected to a mobile phone, it provides a portable security system.

Also new is that the system enables e.g. an automatic switch-on and -off action of lights depending on where a person is moving, even in such a manner that, when going to bed, the system recognizes on the basis of physiological signals

that the location is used for sleeping and switches off the ceiling light automatically. In other words, it is possible for the system to learn a condition in which a person is resting in order to switch off the light in this condition, and another condition which implies active working in order not to switch off the lights even in nighttime. In similar fashion, the outdoor and indoor lights of a building can be switched on automatically in the dark as the user approaches his or her home.

Likewise, the air conditioning/heating of a space is controlled in accordance with the physiological condition of a person, e.g. if a person is perspiring, the temperature will be lowered and, respectively, raised if a person is feeling cold. Thus, the heating is controlled according to any given physiological need of a person, in real time and even per room, if so desired.

Furthermore, when knowing the location of a person in a space, it is possible to direct e.g. phone calls to where the person is at a given time. The position information can also be transmitted to a telephone operator for directing the paging precisely to where a sought-after person is moving. The control of entertainment equipment can also be implemented in such a manner that, as the user is moving from room to room, the TV or radio program that the user is following is switched on in the space he or she is entering.

By means of positioning, it is possible to achieve in personal clearance an automatic control for locking in such a manner that, as the user is coming home or moving about in an office, the door can be unlocked automatically as he or she approaches it.

The monitoring of personal clearance and working hours can also be accompanied, in addition to working hours, by information about where the user has spent his or her working hours (e.g. in conference room/own office), as well as by information about a cumulative alertness status/activity level.

The control system's infra and sound sensors, together with positioning, provide a perimeter protection in such a way that it allows the user to open a door or a window, but when done by an outsider, such opening triggers an alarm.

It is also novel that the above qualities provide for an elderly person, a demented person, and physically or mentally handicapped people an automatically controlled environment managing system, which is additionally able to learn the most important daily chores and seeks to anticipate the needs of a user. By virtue of positioning, the user can be reminded of matters relating to daily chores, like he or she can be reminded of adequate clothing when going out, or eating or taking medication when coming to kitchen. It is also possible to preheat an automobile at a usual departure time in winter.

The invention creates a whole new concept for the term smart house as the users are capable of controlling their environment through their own physiological signals.

The invention will now be described in more detail with reference made to the accompanying drawings, in which

fig. 1 shows basic units 11, 12 for a control system of the invention in a block diagram;

fig. 2 shows how the simplest receiver and control equipment included in the apparatus is connected to a mobile telephone system;

fig. 3 shows how a multi-function receiver 12'/6 and a relaying unit 8'/19 as well as a PC-based cental unit 26 included in the apparatus are connected to an HPAE system; and

fig. 4 shows a function for positioning a user 11 or an alarm source 24.

The system of the invention is first described in terms of its structure and operation with reference to fig. 1. A sensor and transmitter unit 11 is a portable unit carried by a user, which can be held in the user's wrist or elsewhere in body contact. A receiver and control assembly 12 can be a separate unit or an apparatus integrated in a controllable actuator or safety device. Examples of such units have been described in the Applicant's patent applications WO 93/16636 (A 61B 5/11) and WO 95/07652 (A 61B 5/0245). The wrist unit 11 is provided with an alarm button 1 and a number of sensors 2 in skin contact with a user (for the sake of simplicity, the figure only shows one sensor 2). The unit 11 is typically provided with the following sensors: a contact sensor, which indicates whether the device is in operation, a sensor measuring conductivity of the skin, which indicates whether the skin is dry or moist, a heart rate sensor, which indicates the strength of heartbeat and/or heart rate, and a motion sensor (e.g. an acceleration sensor), which indicates the motion activity of a user. On the basis of information provided by these sensors, a microprocessor 3 is capable of making conclusions regarding the alertness status of a user: asleep, awake but passive, moving actively, etc. On the basis of the sensor information, the microprocessor is also capable of making conclusions regarding the physical condition of a user, e.g. based on whether the heart rate is in accord with information indicating the alertness status of the user. The information regarding the alertness and health condition is delivered by way of a concealing unit 4 to a radio transmitter 5, which transmits this information repeatedly in the form of short telegrams to the receiver and control apparatus 12.

The receiver and control apparatus 12 includes a radio receiver 6, a transmitter 7, an infrasound detector 9, a microprocessor 8, and various terminals for a plurality of control outputs 10. The control outputs 10 are used to forward control messages to various communication and alarm systems. It is possible to program a number of wrist units 11 in a single receiver and control apparatus 12 for establishing a multiple-user control system. The processor 8 can be provided with a variety of programs for a variety of applications.

In terms of its operation, the receiver and control apparatus 12 included in the control system is based on messages transmitted by the wrist-held sensor and transmitter unit 11 and concealed by using per se known methods, e.g. encrypting 4 as well as a device-specific ID code. A transmission gap between the messages is controlled by changes in the physiological status of a user. Thus, the messages have a low risk of collision. For examples, as the motion activity increases, the transmission rate of messages increases as well. By means of the above-mentioned messages, the wrist unit or the sensor and transmitter unit 11 of the control system informs the receiver and control apparatus or unit 12 about the physiological condition and the presence of a user. The infrasound detector 9 detects a low-frequency sound produced by opening a door. The processor 8 is provided with software which uses the detector 9 to detect the opening of a building or automobile door and to compile, along with messages from the wrist unit 11, information as to whether the user is going out or coming in through the doorway. The wrist unit 12 has its contact sensor 2 to reveal whether the device is fitted around the user's wrist. Thus, taking it off the wrist switches the wrist unit 11 to a low-current state and the information is transmitted to the receiver 6 and, thus, can also be used as an alarm message.

For example, when the user steps out of an apartment or automobile, a message about the opening of a door is received from the infrasound detector 9 while the wrist unit 11 is simultaneously transmitting telegrams. When the telegrams run out as the user is leaving the operating range of the wrist unit, the microprocessor 8 has its software revealing that the user has left the monitored space.

Following the above, the software of the processor 8 switches on burglar surveillance and/or transmits to the personal clearance system a message about the exit of a user by effecting the data transfer either by a radio frequency or fixed terminal 10. The discussed function can also be used in safety systems for the elderly as a time-dependent personal clearance for a demented person,

which allows free daily movement but produces an alarm e.g. in nighttime, if the user leaves the monitored space.

When the user and the wrist unit 11 enter a monitored target area, the control apparatus 12 identifies an accepted ID and, if necessary, the opening of a door as well as switches off burglar surveillance and/or transmits a notification about the presence to a personal clearance or outpatient alarm centre 10. After this, the physiological signals transmitted by the wrist unit 11 control the required heating and ventilation as per target area.

Fig. 2 depicts an application of the invention, wherein the novel control system in connection with a mobile phone system provides, along with a wrist unit 11, a portable security system. The control system can be set in connection with the battery casing of a mobile phone 15 in such a way that the linkage is established by using terminal points 14 of batteries 13, the control system having its processor simulate the follow-up memory or temperature sensor of a battery as well as forward alarm messages to the software of a mobile phone in a desired form. The linkage can also be made by using a standard mobile telephone connection, the control unit being attached to the base of the mobile phone 15. In the case of a small cellular network, the wrist unit itself may communicate directly with a base station. The automatic control system connected with the mobile phone 15 can also be used for delivering automobile burglary and other such alarms, as well as messages required by a real-time monitoring of the linkage through a cellular phone network to a control facility.

When using an automatic control system of the invention in home, automobile, and office security systems as well as in connection with a mobile phone, it is possible to obtain an integrity whose automatic control can be effected by means of a single wrist unit 11. The system operates in such a way that the automatic control functions of the invention switch automatically a burglar surveillance on and off in various target areas as the user moves from one target area to another and, if necessary, deliver a message about current

whereabouts of the user and, if necessary, the physiological signals in association with an automatic alarm of the wrist unit 11 can be delivered to an alarm centre by using e.g. the short communication messages or direct connection of a GSM telephone to a base station.

As shown in fig. 3, the multi-function receiver 12'/6 can be fitted in connection with a ceiling light fixture 25, whereby a lighting control 19 and a paging function 20 as well as a power supply for the appliance are easily implemented. Likewise, a motion detector 16, a smoke detector 17 can be linked to the same unit, as well as a two-way communication 6, 7, by using prior known infrared and radio-frequency data transfer technology. The connection to a PC serving as a central unit 26 can be established either by a radio-frequency link 6, 7 or a local network 11. The two-way data transfer is used for transmitting health information from the wrist unit 11 to a PC, in which such information is analyzed and sent back to a display 22 of the wrist unit 11 for the user. The two-way link can also be used e.g. for displaying the caller of an incoming phone call or even for controlling nearby appliances, the menu of a relevant state being transmitted to the wrist unit 11 whose selector buttons 23 are used for manually switching e.g. lights on or off etc. The apartment can be provided with a number of multi-function receivers 12'/6 in connection with the light fixtures 25, whereby it is possible to implement openings of doors and windows occurring automatically as the user of the wrist unit 11 is moving (or to be performed by manual control) as well as to implement a localization of various smoke detectors. A localization of the wrist unit 11 is effected by using conventional radio tracking technology, a localization of doors and windows is carried out by using a measurement for the signal strength of infrasounds, such that each multi-function alarm 12' transmits the signal strength measured thereby to the PC 26 whose software calculates on the basis thereof the location of a sound source 11.

Fig. 4 illustrates the components for a tracking system associated with the control system disposed in a single room. The tracking or localization operates in such a way that the wrist unit 11 transmits continuously physiological

measuring signals from its user, which are received by tracking receivers 21 for measuring either the phase of a radio signal and/or the signal strength and for transmitting the information to the micro-computer 26 for an analysis. The micro-computer 26 uses the signal strength as a basis for calculating which door or window the sound came from. On the basis of received information, the micro-computer 26 is able to check whether a door was opened by the user of the wrist unit 11 or by somebody else. If the system is set in a surveillance mode and a door is opened by someone other than the user of the wrist unit 11, an alarm is set off. The corresponding equipment can be arranged in a larger apartment as well by placing the tracking receivers 21 in the extreme corners of the apartment or by using the multi-function receivers 12' linked in connection with the light fixtures 25 of the rooms furthest away from each other.

It is essential for a control system of the invention that a receiver or control apparatus 12, 12' or an information analyzer 26 in data transfer communication therewith is capable of performing selections between various control functions on the basis of the physiological condition of a user, the control of actuators and safety devices 12', 28 occurring automatically in accordance with the physiological condition of a person who carries the transmitter unit 11. This system will be particularly beneficial and versatile by virtue of the fact that the control can also be based on a combination of information indicating the alertness and health condition of a user and a piece of information indicating the location of a user.

Claims

1. An automatic control system for actuators and security devices relating to building automation, especially to HPAE (Heating, Plumbing, Air conditioning, Electricity) systems in homes and offices, comprising a portable sensor and transmitter unit (11) and a receiver and control apparatus (12), which is placed in a monitored space as a separate unit or as a part of an appliance (12') to be controlled and which comprises a receiver (6) for the signals of the sensor and transmitter unit (11), a processor (8, 8') for processing information contained in the received signals, and control outputs (7, 10, 15, 19, 20) for controlling actuators and security devices (12', 26, 28) and, if necessary, for setting off alarms, **characterized** in that the sensor and transmitter unit (11) is provided with measuring sensors (2) for monitoring the physiological condition of a user, that said signals contain information about the physiological condition of a user, on the basis of which the receiver and control apparatus (12, 12') or an information analyzer (26) in data transfer communication therewith performs continuously or at short intervals repeatedly and automatically control selections on the basis of the physiological condition of a user and, thus, performs actively the on-line control of said actuators and security devices (12', 28) in accordance with the physiological condition of a person who carries the sensor and transmitter unit (11).

2. A control system as set forth in claim 1, **characterized** in that the receiver and control apparatus includes a number of receivers (21) disposed in various parts of a monitored space to receive simultaneously a signal from the sensor and transmitter unit (11), and that, by comparing the signal strengths of various receivers (21), the receiver and control apparatus is adapted to track down a user, and that the control of the actuators and security devices (12', 28) and the transmission of possible alarms are based on a combination of information indicating the state of alertness or health of a user and a piece of information indicating the location of a user.

3. A control system as set forth in claim 1 or 2, **characterized** in that the sensor and transmitter unit (11) comprises a wrist-held unit and the receiver and control apparatus (12') is integrated as a part of a burglar alarm and smoke detector unit (12'), including a motion detector (16), a smoke detector (17), and an infrasound detector (9).

4. A control system as set forth in any of claims 1-3, **characterized** in that the sensor and transmitter unit transmits a signal indicating the physiological condition of a user as short messages repeated at short intervals.

5. A control system as set forth in any of claims 1-4, **characterized** in that, regarding the automatically performed control functions, the user is given a feedback therefrom in the form of voice messages.

6. A control system as set forth in any of claims 1-5, **characterized** in that the gap between transmissions of messages indicating a physiological condition and transmitted in a wireless fashion by way of radio is controlled on the basis of changes occurring in the physiological condition of a user.

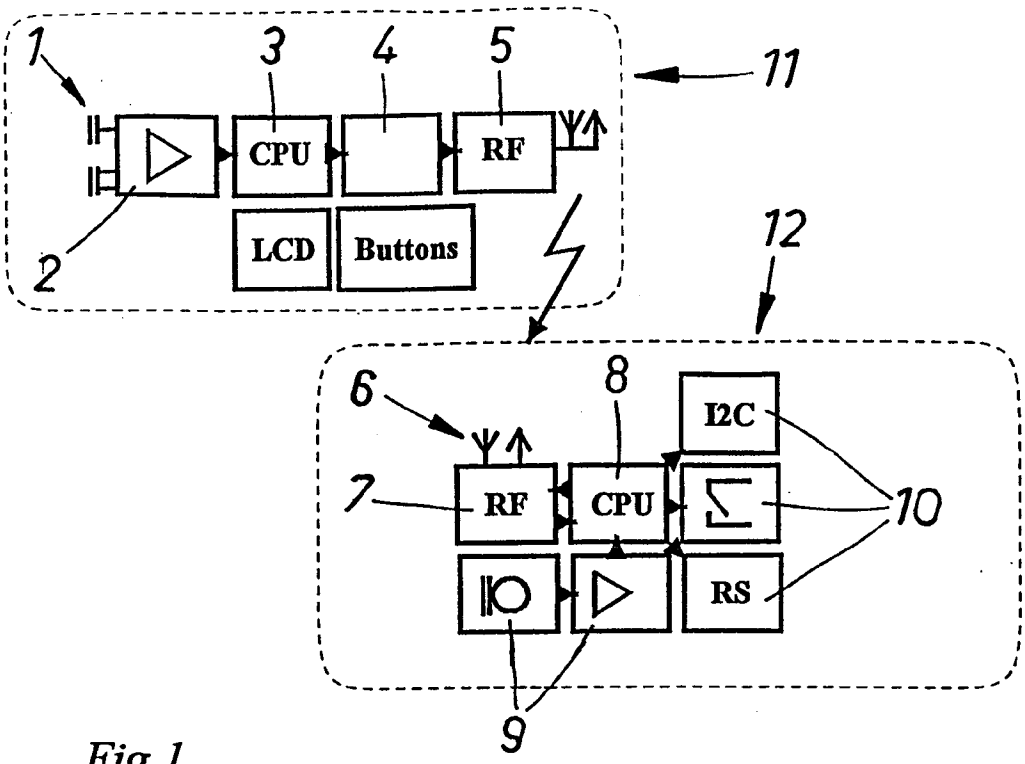
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Fig 1

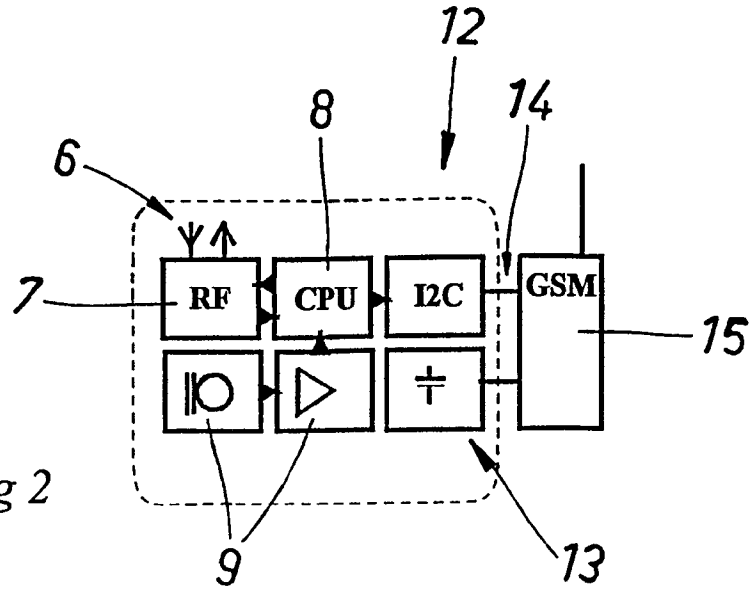
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Fig 2

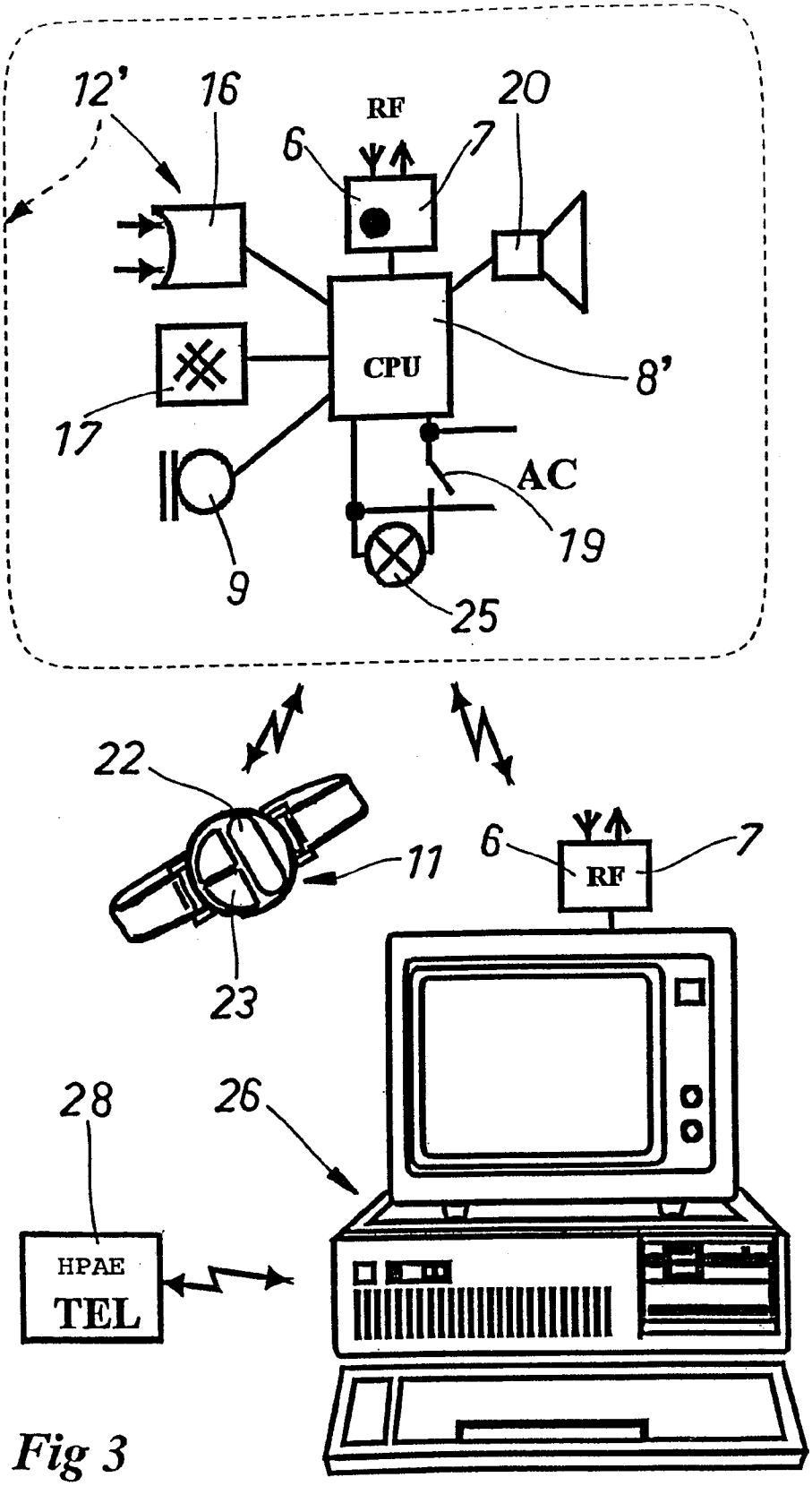

Fig 3

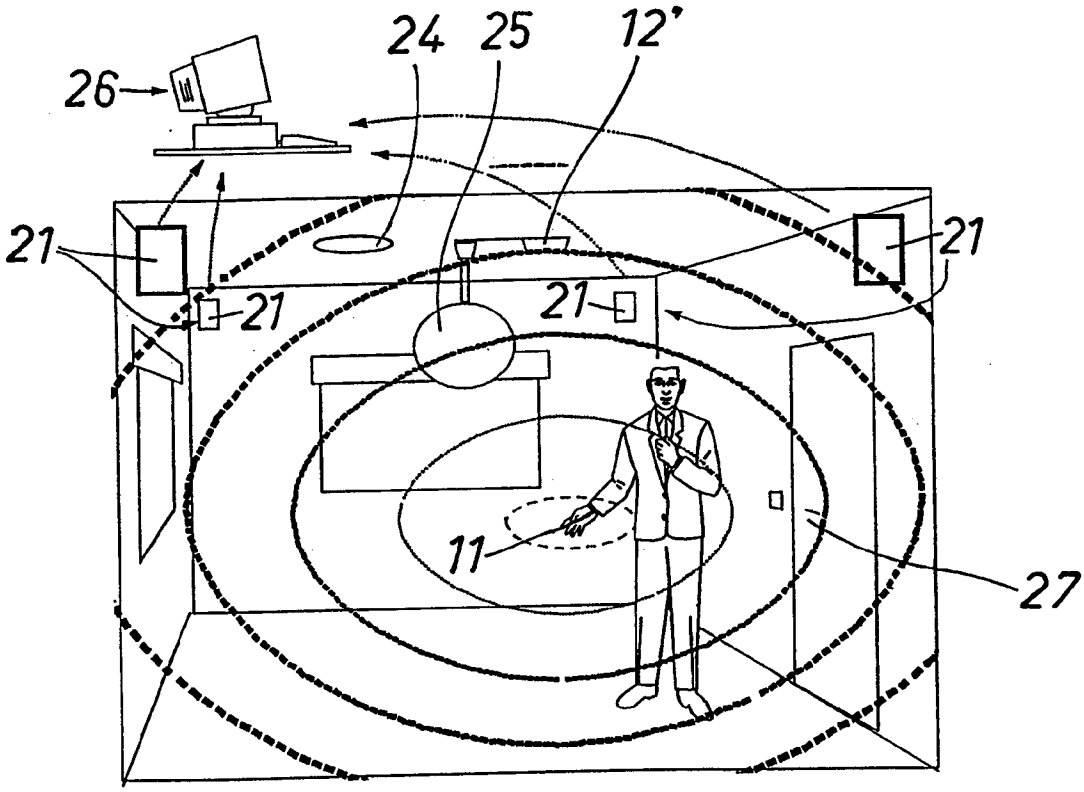

Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 99/00299

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G08B 21/00, A61B 5/00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: G08B, A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5692215 A (DAVID M. KUTZIK ET AL.), 25 November 1997 (25.11.97), column 2, line 30 - line 41; column 3, line 22 - column 6, line 8; column 7, line 8 - line 69, column 9, line 43 - column 11, line 42, column 19, line 34 - line 49, figures 1,2,6,7 and abstract --	1-6
X	US 5568126 A (STIG L. ANDERSEN ET AL.), 22 October 1996 (22.10.96), column 1, line 32 - column 2, line 8, figures 1-4, abstract --	1
A	GB 2312309 A (RICHARD IAN WOLMAN), 22 October 1997 (22.10.97), page 3, line 4 - page 7, line 2, abstract --	1-6

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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PCT/FI 99/00299

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5204670 A (VINCENT D. STINTON), 20 April 1993 (20.04.93), see the whole document -- --------	1-6

INTERNATIONAL SEARCH REPORT

Information on patent family members

30/08/99

International application No.
PCT/FI 99/00299

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		CA 2208594 A	04/07/96
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US 5568126 A	22/10/96	EP 0789897 A	20/08/97
		JP 10506490 T	23/06/98
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		WO 9703426 A	30/01/97
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		HK 1006886 A	00/00/00
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		US 5369699 A	29/11/94

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(71) Applicant *(for all designated States except US)*: ULTRA [SI/SI]; Proizvodnja elektronskih naprav d.o.o., C.O. Zupancica 23a, 1410 Zagorje (SI).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: URBANIJA, Miha [SI/SI]; Petelinkarjeva cesta 3, 1412 Kisovec (SI). PAVLIC, Bogdan [SI/SI]; Rove 4, 1410 Zagorje (SI).

(74) Agent: KURIG, Thomas; Becker Kurig Straus, Bavariastrasse 7, D–80336 München (DE).

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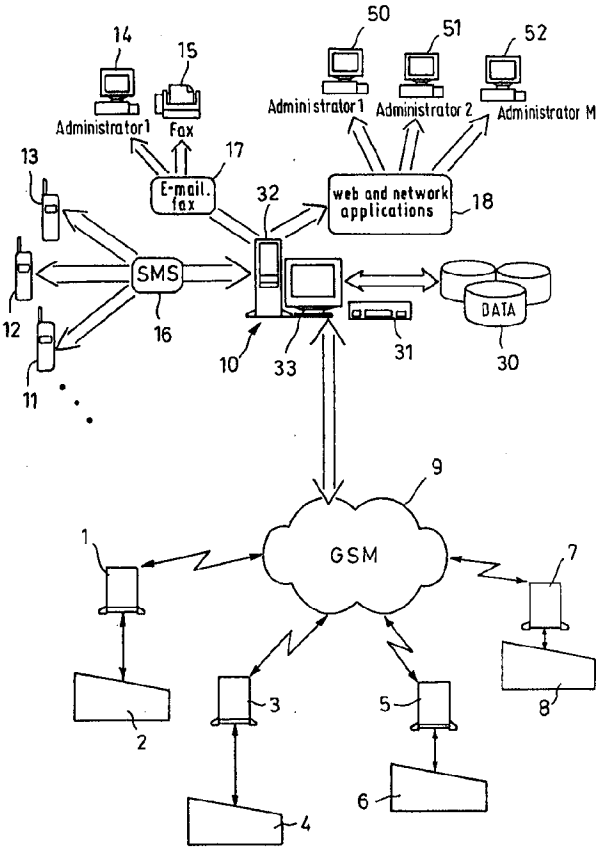
(54) Title: NETWORK SYSTEM WITH REMOTE DATA ACQUISITION

(57) Abstract

The present invention relates to a Network system for exchanging information between n peripheral computers (1, 3, 5, 7) and a central computer (10) for remote data acquisition, wherein each of the n peripheral computers comprises a communication interface (43) having automatic data transfer function, a processor unit and an output/input interface, wherein the central computer (10) comprises at least one communication interface (31) having automatic data transfer function, a processor unit (32) and an output/input interface (45), and the network further comprises: first coupling means (9) for coupling the communication interface of the central computer to the communication interface of one of the peripheral computers in order to exchange data between the central computer and said peripheral computer, sensor means for providing sensor information or data that relate to at least on characteristic to be detected or monitored, second coupling means (47) for coupling the input/output interface of the one peripheral computer to a sensor interface (22) in order to exchange information between the peripheral computer and the sensor means or vice versa, at least one peripheral user unit (11, 12, 13) comprising a user terminal (46), third coupling means (16) for coupling the user terminal (46) of the at least one user unit to the input/output interface or the communication interface of the central computer in order to exchange information between the central computer and the at least one user unit.



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5

Network system with remote data acquisition

The present invention relates to a network system for exchanging information between a number of remote, peripheral computers and a central computer for remote data
10 acquisition.

The present systems of the state of the art often suffer from insufficient quick reaction on a malfunction of the system to be serviced. This can lead to irreversible damage or expensive resumption of the serviced system. These drawbacks are often not only a
15 result of unreliable detection and transmission of the malfunction in the maintenance system but also at least sometimes a result of the "human factor" that leads under stressing circumstances often to wrong or delayed decisions in the procedure of recognising the malfunction and performing the right steps to eliminate the malfunction of the serviced system.

20

The object of the present invention therefore is to provide a network system for reliable and quick remote data acquisition from several peripheral computers to several peripheral user units, in order to ensure quick and reliable elimination of the malfunction or function of the system to be serviced.

25

This object is achieved by the network system of the present invention according to claim 1.

The network system of the present invention comprises a communication interface in
30 each of the remote, peripheral computers and also a communication interface in the central computer. Both communication interfaces have an automatic data transfer function, i.e. each communication is able to establish a connection upon a request or

instruction being generated by a processor unit operated by software program. Further messaging of the user units also is initiated by computer program for automatic messaging by means of automatic data transfer function of the communication interface or I/O input/output interface. Consequently, the inventive network system has the advantage that a person is no longer required to distribute messages, information or instructions in the system and therefore the human source of error and delay in the system is avoided.

Preferably, the first coupling means is the Public Switched Telephone Network PSTN (digital or analog), leased line or some other network with data transfer capability, such as mobile communication networks (PCS 1900, DCS 1800, GSM 900, NMT, TACS) satellite communication network (Iridium SDMA, and Iridium AMPS), radio wave data transmission systems. Using an existing communication network, such as GSM for connection of the remote peripheral computers or control units to the central computer or server provides a system with a very flexible and easy way to upgrade a changed communication structure which enables quick construction of the network system.

The communication interface of the central computer of the invention complies to the standards of the first coupling means for instance, can be a ISDN-modem, a GSM-modem or a RAS server (RAS = Remote Access Server), gateways or routers which have automatic data transfer function.

Preferably, the input/output interface of the at least one peripheral computer and the corresponding sensor interface of the sensor means are serial interfaces, particularly RS232, RS485 or USB interfaces, and the second coupling means is then a wire or optical cable for connecting the interfaces in order to get a reliable and inexpensive connection from the sensor means to respective peripheral computer. In alternative, the input/output-interface of the at least one peripheral computer and the corresponding sensor interface of the remote sensor means are radio transmission, electrical interfaces, infrared transmission interfaces.

Preferably, the user terminal of the at least one user unit is a mobile communication

interface in order to obtain and improve the attained high mobility of the remote user units.

The input/output interface or the communication interface of the central computer preferably transmitS SMS short messages to the at least one user unit in order to enable use of widespread and handheld inexpensive user units, for instance, electronic pagers, SCALL units and similar equipment.

In addition to SMS messages, the input/output interface or the communication interface of the central computer can transmit a telefax message or an e-mail as information to the user unit.

Preferably, the central computer of the invention is able to initiate by means of its automatic data transfer function a data connection via its communication interface, the first coupling means and the communication interface of the at least one peripheral computer in order to transfer data between the central computer and the at least one peripheral computer. This feature enables the central computer to request and to fetch the remote data and information on demand.

In alternative, at least one peripheral computer can initiate a data connection by means of its automatic data transfer function via its communication interface, the first coupling means and the communication interface of the central computer in order to transfer data between the central computer and the at least one peripheral computer.

A peripheral computer and the sensor means coupled to this remote peripheral computer by the second coupling means can be mounted in a mobile station or object, wherein the first coupling means for coupling the peripheral computer to the central computer is a communication network, particularly the GSM communication network. This configuration allows remote data acquisition, for instance, moving vehicle in order to provide a fleet management.

The sensor means can comprise sensors for detecting temperature, pressure, flow of

water, level, Ph value and/or percentage of oxygen as technical characteristics in order to use the inventive network system as waste water management system. In the case of a normal operation the connection is established and corresponding SMS messages are sent to the user units.

The sensor means can comprise sensors for monitoring the level and flow of water, recording authorised and unauthorised entrance and/or for surveying electricity consumption in order to use the network system of the invention as monitoring system of reservoirs of drinkable water or fresh water.

The sensor means can comprise sensors for measuring of temperature, pressure, humidity, wind speed and/or rain fall in order to use the network system of the present invention as a weather monitoring station.

The sensor means can comprise sensors for counting traffic and/or monitoring the conditions of the traffic environment in order to use the network system of the invention as traffic control and warning system.

The sensor means can comprise sensors for measuring air pollution, smoke and/or the concentration of SO_2 or other harmful substances in order to use the network system of the invention as an air quality control system.

The sensor means can comprise a sensor or voltage and/or current meter for detecting an electrical potential or voltage and/or current in a electrical unit or appliance as characteristic to be monitored in order to detect a malfunction or breakdown of the electrical appliance.

The sensor means can comprise a seismic sensor for detecting seismic movements of the earth or an earthquake.

The sensor means can comprise an identification or recognition sensor unit for identifying or recognising a person, an animal or an object which have a label thereon,

identification means or card or have specific characteristics being readable by the identification or recognition sensor unit.

Further advantageous improvements of the subject matter of the present invention are mentioned in the dependent claims.

Further advantages, advantageous improvements and technical fields of application of the inventive network system are derivable from the following description of preferred embodiments of the network system of the present invention by way of example in connection with the attached drawings that show:

Fig. 1 an overall schematic view of a preferred implementation of the network system with remote data acquisition of the present invention; and

Fig. 2 an specific route of data acquisition and information exchange flow in the network system shown in Fig. 1.

Fig. 1 shows an overall view of a preferred implementation of the network system for remote data acquisition of the present invention. The shown implementation of the invention comprises a central computer 10, at least one but generally a number of n peripheral computers 1, 3, 5 and 7 installed at location remote from the central computer 10, first coupling means 9 that are able to couple or connect the peripheral computers 1, 3, 5 and 7 to the central computer 10 in order to establish a connection between the central computer 10 and the peripheral computers 1, 3, 5 and 7 for information exchange and remote data acquisition, at least one but generally a number of several user units 11, 12, 13 being generally at a location remote from the central computer 10, third coupling means 16 for coupling or connecting the user units 11, 12, 13 to the central computer 10 and at least one but generally a number of n sensor means 2, 4, 6 and 8 that are coupled to the corresponding peripheral computers 1, 3, 5 and 7, respectively, by corresponding second coupling means 47.

The peripheral computers 1, 3, 5 and 7 operate independently of each other. Each of the

peripheral computers 1, 3, 5 and 7 comprises for instance an industrial computer on the basis of an Intel 386 or 486 of Pentium CPU with input/output units and boards, memory units particular a FLASH memory unit and a GSM modem as communication interface 43 (please refer to figure 2), for instance, a WAVECOM TYPE: WM 01-G900 modem on the basis of a AT Hayes instruction set and AT GSM instruction set which is able to initiate or start automatically or establish a connection under control of the processor unit of the respective peripheral computer 1, 3, 5 and 7. All interfaces and units of the whole peripheral computer are mounted in an robust housing. Further, depending on the specific application, the power supply of the peripheral computer installed at remote site is provided by, for instance, a battery or by a solar cell panel unit, if the remote site does not have connection to the main network.

Each of the n peripheral computers 1, 3, 5 and 7 further comprises an output/input interface 41 that enables to establish a connection to the respective sensor means 2, 4, 6 and 8 each of which is assigned to the number of peripheral computers 1, 3, 5 and 7, respectively. Each of the peripheral computers therefore comprises a control function of the corresponding sensor means and a processing function for processing the remote data or information or signals provided by the sensor means and data transfer function for establishing the data connection to the central computer 10 in order to report or send the data of the sensor means 2 or the processed data or information to the central computer 10. These functions correspond to the software implemented in the respective peripheral computer 1, for instance, a control program for controlling the sensor means 2, a communication program for establishing and operating connection, a processing program or application program for processing the data and information from the sensor means and for converting or preparing the processed data into an appropriate format for communication interface 43 of the respective peripheral computer 1. Further an operating system software program is installed on the respective peripheral computer, for instance, MS WINDOWS 95, 98, NT or MS SQL of Microsoft, PHARLAP, LNX, PSOS, VX WORKS.

Each of the sensor means 2, 4, 6 and 8 is connected to its respective and corresponding one of the number of peripheral computers 1, 3, 5 and 7 as shown in figure 1. The

sensor means 2 is coupled to the peripheral computer 1, the sensor means 4 is coupled to the peripheral computer 3, the sensor means 6 is coupled to the peripheral computer 5 and the sensor means 8 is coupled to the peripheral computer 7, wherein the coupling of each pair of sensor means and peripheral computer is provided by the second coupling means that, for instance, is a wire-cable, a radio wave transmission line, an infrared or optical transmission line or a GSM telephone transmission.

Each sensor means 2, 4, 6 and 8 comprises a sensor unit 21 and a sensor interface 22 that is connected to the sensor unit 21. Generally, the sensor unit 21 comprises the specific sensors, sensor element and electrical circuits for detecting a specific physical or technical characteristic of the environment, site or device or appliance where the sensor means is situated in order to detect the specific characteristic and to generate remote information and data as intended. The sensor interface 22 receives the detected information from the sensor unit and generally further processes and outputs the received information on the second coupling means 47 in order to transfer the information and data to the output/input interface 41 of the peripheral computer 1 that is assigned according to figure 2 showing a selected specific route of the network system in figure 1. This specific route, which of course is only an example for a lot of possible routes in the system of figure 1, extends from the sensor means 2 where remote data and information originates, via the peripheral computer 1, the communication network 9, the central computer 10, the SMS short message service 16 to the user unit 11 being remote from the central computer 10. According to the detailed route of figure 2 the detected data or information in the sensor means 2 is serially transferred by the second coupling means 47 to the peripheral computer 1. Therefore the sensor interface 22 and also the input/output interface 41 of the peripheral computer 1 are serial interfaces that meet, for instance, the RS 232, RS 485 or USB (Universal Serial Bus) standards. The second coupling means 47 is, therefore, a wire and optical cable for serial data transmission.

The central computer 10 is for instance placed at the headquarters of the network system administration and management and comprises at least one processor unit, database for mass storage, a memory unit, an input/output interface 45 and a communication interface 44. In a typical configuration the central computer 10 is

adapted to operate as system network server and comprises one or several Pentium II CPU processor units 32 clocked with 300 MHz, a memory unit with 256 MB RAM, a SCSI harddisc 3 x 4GB as database mass storage 30, a dual port SCSI controller, an ethernet network adapter 10/100 for connection to a LAN (Local Area Network) to which the central computer 10 is connected, a 17 inch monitor 33 and additional peripheral units like compact disc player, keyboards, mouse etc..

The communication interface 44 of the central computer comprises one or more GSM modems, for instance on the basis of a WAVECOM TYPE: WM 01-G900 modem that preferably supports the regular AT Hayes instruction set and the AT GSM instruction set for control by the processor unit of the central computer 10. The communication interface 44 of the central computer 10, for instance, can in alternative be implemented by a RAS server (Remote Access Server) 31, gateways or routers in order to establish a point to point connection via the communication network to the respective peripheral computers 1, 3, 5 and 7. The software protocol for establishing and maintaining a connection between the communication interface 43, GSM modem, of each of the peripheral computers 1, 3, 5 and 7 and the communication interface 44 of the central computer 10 in point to point connection over the GSM network 9 is carried out on the basis of the well known TCP/IP communication protocol. As operating system, for instance, the Microsoft WINDOWS NT operating system is installed on the central computer 10. Further on the central computer 10 SQL software program for control of database storage and Exchange communication software for sending e-mails and faxes to user units 14 and 15 are installed on the central computer 10. Further, a controlling, administration and application program being adapted to the specific application of the inventive network system, for instance, as maintenance system, alarm system, monitoring system, etc., is software implemented in the central computer 10. Further the central computer 10 comprises the specific communication software for driving and controlling the communication interface 44 and the input/output interfaces 45 in order to establish and maintain the connection between each of the peripheral computers 1, 3, 5 and 7 and the central computer 10 and each of the user units 11, 12, 13, 14 and 15 and the central computer 10.

In the figures 1 and 2 the input/output interface 45 is an SMS short message service which outputs messages, instructions or information data to each of the user units 11 to 15 or to a group out of the user units via the third coupling means 16 being realised as SMS short message service network. Further the input/output interface 45 of the central computer 10 is adapted to send e-mails and telefax messages and information to a remote administrator PC unit 14 and a remote telefax receiving unit 15, respectively, which units are also user units in the sense of the present invention. The connection between the remote administrator PC unit 14 and the remote telefax unit 15 and the central computer 10 is, for instance, accomplished by a e-mail/telefax network 17 that, for instance, is the usual public telephone network. Further the input/output interface 45 and/or the communication interface 44 of the central computer 10 are able to establish a data communication between a number of further administrator PC units 50, 51 and 52 via a web and network application 18 in order to establish or to implement a remote control function of the central computer 10 by a system administrator or several system administrators or a system supervisor.

Each of the user units 11, 12 and 13 is adapted to communicate over the SMS short message service network 16 with the central computer 10. Each of the user units 11, 12 and 13 therefore comprises a user terminal 46 in order to establish and maintain a connection between each of the user units 11, 12 and 13 and the central computer 10 over the SMS short message network 16, if required.

In the following, the general function of the network system for remote data acquisition in accordance to the implementation of the present invention shown in the figure 1 will be described in a general manner with respect to figure 2 that shows a specific route of data communication within the network of figure 1.

The sensor unit 21 of the sensor means 2 detects a physical or technical characteristic and outputs information or data from the sensor interface 22 over the second coupling means 47 that, in this case, is a wire and optical cable for serial data communication, to the output/input interface 41 of the peripheral computer 1. The peripheral computer 1 receives and processes the data from the sensor means 2. The peripheral computer 1, for

instance, compares the sensor data with a predetermined value or information stored in the memory unit of the peripheral computer 1. If the sensor data have a value exceeding the predetermined value, the peripheral computer 1, specifically its processor unit, generates information or data that, in the following, are referred to as remote alarm data or remote monitor data in accordance to its running application program. Accordingly, the peripheral computer 1 or remote control unit is able to monitor the condition or status of the physical or technical characteristic to be monitored.

The communication program of the peripheral computer 1 then, in the case of alarm data, triggers the communication interface 43 of the peripheral computer 1 in order to establish a telephone connection between the peripheral computer 1 and the central computer 10 for transferring the alarm data or information, or generally, remote data. If the communication interface 43 succeeds in establishing a telephone communication with the central computer 10 on the basis of the TCP/IP or some other communication protocol, which means, that the central computer 10 has answered and is prepared to receive the remote data or alarm data, then the peripheral computer 1 transmits the alarm data over the GSM telephone network to the communication interface 44 of the central computer 10.

After receiving the alarm data or remote data or information, the running application program in the central computer 10 processes the alarm data or remote data. and selects one user unit, 11 in figure 2, or a group of user units from the user units 11 to 15 on the basis of data and information stored in the database 30 of the central computer 10. After selecting, for instance, the user unit 11, the central computer 10, particularly its processor unit, triggers the communication program of the central computer 10 in order to establish a SMS short message service connection between the input/output interface 45 of the central computer 10, for instance an SMS short message service interface or communication interface, and the user terminal 46 of the user unit 11. If the central computer succeeds in establishing this connection, the central computer 10 then outputs a SMS short message to the user unit 11 over the SMS network 16. After receiving the SMS message, the user unit 11 indicates receipt of a SMS short message to the user of the user unit 11 and indicates the SMS message itself on its display.

Similar the central computer 10 is able to distribute remote data or information received from each of the peripheral computers 1, 3, 5 and 7 to each of the remote user units 11, 12 and 13. For instance the central computer 10 is able to send information or remote data received from the peripheral computer 5 to the user unit 13 if the central computer 10 has selected the user unit 13 that has to be informed in accordance to the application program.

In the following a short example is given for using the network system of the present invention as a maintenance system. The sensor means 2 and the peripheral computer 1 is situated at a remote location with regard to the central computer 10 of the maintenance system, for instance, at or in an electrical appliance, the power station of a plant.

A task of the maintenance system consists of recognising a malfunction or failure of the power station, in ensuring to eliminate the malfunction and in resuming normal functioning of the power station as soon as possible.

The sensor unit 21 of the sensor means 2 is a current meter or a voltage meter connected to a Schmitt trigger and an electronic analog/digital converter that converts the analog output signal of the Schmitt trigger into a digital value which is output by the serial sensor interface 22 over the serial wire and optical cable 47 to the input/output interface 41 of the peripheral computer 1. If the power current or voltage of the power station falls below a certain value, a malfunction of the plant would result, if no countermeasures are taken. If the malfunction case arises the Schmitt trigger of the sensor unit alters its output signal, which is a strong indication of malfunction and the analog/digital converter converts the output of the Schmitt trigger into digital data that are read by the peripheral computer 1.

The application program of the peripheral computer 1 recognises on the basis of the changing remote data from the sensor means 2 that a malfunction of the power station has occurred and, therefore, the peripheral computer 1 generates alarm data that indicate

the malfunction. The alarm data are sent over the GSM communication network 9 to the central computer 10 after establishing a corresponding GSM data connection between the peripheral computer 1 and the central computer 10.

After receiving the alarm data, the central computer executes corresponding procedure that is a part of the application program in order to select one of the user units 11 to 13. For instance, the selecting procedure at first searches for a user unit 11, 12, 13 being active in the moment at the location nearest to the source of malfunction. This searching is made in the database 30, where a table of all numbers, characteristics and statues of each of the user units 11 to 13 is stored in the form of digital data. For instance, the central computer 10 does find the user unit 13 not activated and that only the user units 11 and 12 are activated. Further the condition of the user unit 12 is found to be occupied which means that this user unit 12 in the moment is already involved in a maintenance procedure and, therefore, cannot be used. Only the user unit 11 is, for instance, in an activated condition and in waiting position for performing a maintenance task. The central computer 10, therefore, sends a corresponding SMS message over the SMS network 16 to the user unit 11. The unit 11 then indicates receipt of the SMS message and the user or the maintenance personal using this user unit 11 therefore is able to recognise the malfunction and to eliminate the malfunction immediately.

Claims

1. Network system for exchanging information between n > 1 peripheral computers (1, 3, 5, 7) and a central computer (10) for remote data acquisition,

each of the n peripheral computers (1, 3, 5, 7) comprising at least one communication interface (43) having automatic data transfer function, a processor unit, a memory unit and an output/input interface (41),

the central computer (10) comprising at least one communication interface (44, 31) having automatic data transfer function, a processor unit (32), a memory unit, a database unit (30) and an output/input interface (45),

first coupling means (9) for coupling the communication interface (44, 31) of the central computer (10) to the communication interface (43) of anyone of the peripheral computers (1, 3, 5, 7) in order to exchange information between the central computer (10) and said peripheral computer,

several sensor means (2, 4, 6, 8) for providing sensor information or data that relate to at least one characteristic to be detected or monitored, the sensor means (2, 4, 6, 8) each comprising a sensor unit (21) for generating the sensor information and a sensor interface (22),

second coupling means (47) for coupling the input/output-interface (41) of one peripheral computer (1, 3, 5, 7) to the sensor interface (22) of a sensor means (2, 4, 6, 8) in order to exchange information between the peripheral computer and the sensor means or vice versa,

several peripheral user units (11, 12, 13) each comprising a user terminal (46),

third coupling means (16) for coupling the user terminal (46) of one user unit (11, 12, 13) to the input/output interface (45) or the communication interface (44, 31) of the central computer (10) in order to exchange information between the central computer (10) and one user unit (11, 12, 13),

wherein each peripheral computer (1, 3, 5, 7) compares the sensor data with a predetermined value or information stored in the memory unit and in case the sensor data have a value exceeding the predetermined value the processor unit

generates remote alarm data;

and the remote alarm data trigger the communication interface (43) of the peripheral computer (1) in order to establish a connection between the peripheral computer (1) and the central computer (10) for transferring the remote alarm data,

each peripheral computer (1, 3, 5, 7) processing also data from the sensor means (2, 4, 6, 8) to generate remote monitor data which are sent to the central computer (10);

wherein in case of remote alarm data the processor unit of the central computer (10) establishes an SMS short message service connection between the input/output interface (45) of the central computer (10) and the user terminal (46) of a selected user unit, and

in case of remote monitor data the central computer (10) distributes the remote monitor data to selected peripheral user units (11, 12, 13).

2. Network system according to claim 1, wherein the first coupling means is the Public Switched Telephone Network (PSTN).

3. Network system according to claim 1, wherein the first coupling means is a leased line.

4. Network system according to claim 1, wherein the first coupling means is the mobile communication network; i. e. PCS 1900, DCS 1800, GSM 900, NMT, TACS and satellite communication network, i. e. Iridium SDMA, and Iridium AMPS with information transmission by radio waves.

5. Network system according to one of the preceding claims 1 to 4, wherein the communication interface of the central computer is a ISDN-modem.

6. Network system according to one of the claims 1 to 4, wherein the communication interface of the central computer is a GSM-modem.

7. Network system according to one of the preceding claims 1 to 6, wherein the communication interface of at least one of the peripheral computers is a ISDN-modem.

8. Network system according to one of the claims 1 to 6, wherein the communication interface of each of the peripheral computers is a GSM-modem.

9. Network system according to one of the preceding claims, wherein the input/output interface of each of the peripheral computers and the corresponding sensor interface of the sensor means are serial interfaces, particularly RS232, RS485 or USB interfaces, and the second coupling means is a wire or optical cable for connecting the interfaces.

10. Network system according to one of the claims 1 to 8, wherein the input/output interface of each of the peripheral computers and the corresponding sensor interface of the sensor means are radio transmission or infrared transmission interfaces.

11. Network system according to one of the preceding claims, wherein the user terminal of each of the user units is a mobile telephone.

12. Network system according to one of the preceding claims, wherein the input/output interface or the communication interface of the central computer transmits SMS messages to at least one user unit.

13. Network system according to one of the claims 1 to 11, wherein the input/output interface or the communication interface of the central computer transmits a telefax message as information to at least one user unit.

14. Network System according to one of the claims 1 to 11, wherein the input/output interface or the communication interface of the central computer transmits an e-mail message as information to at least one user unit.

15. Network system according to one of the preceding claims, wherein the central computer initiates by means of its automatic data transfer function a data connection via its communication interface, the first coupling means and the communication interface of at least one peripheral computer in order to transfer data between the central computer and at least one peripheral computer.

16. Network system according to one of the claims 1 to 14, wherein one peripheral computer initiates by means of its automatic data transfer function a data connection via its communication interface, the first coupling means and the communication interface of the central computer in order to transfer data between the central computer and the one peripheral computer.

17. Network system according to one of the preceding claims, wherein one peripheral computer and the sensor means coupled to one peripheral computer by the second coupling means are mounted in a mobile station or object and wherein the first coupling means for coupling the peripheral computer to the central computer is a mobile telephone or communication network, particularly the GSM data network.

18. Network system according to one of the preceding claims, the sensor means comprising a sensor for detecting the temperature of the environment in place as a characteristic to be monitored.

19. Network system according to one of the preceding claims, the sensor means comprising a sensor for detecting the humidity of the environment as characteristic to be monitored.

20. Network system according to one of the preceding claims, the sensor means comprising a sensor or voltage or current meter for detecting an electrical potential or voltage or current in a electrical unit or appliance as characteristic to be monitored.

21. Network system according to one of the preceding claims, the sensor means comprising a sensor for detecting smoke in the environment in place as characteristic to be monitored, or comprising a movement sensor for detecting the movement of an object in the environment or in a room.

22. Network system according to one of the preceding claims, the sensor means comprising a sensor, particularly an electrical or optical sensor, for detecting water, rain, the level of a fluid or liquid or the flow of a fluid to be monitored.

23. Network system according to one of the preceding claims, the sensor means comprising a seismic sensor for detecting seismic movements of the earth or an earthquake

24. Network system according to one of the preceding claims, the sensor means comprising a pressure sensor for detecting the pressure to be monitored.

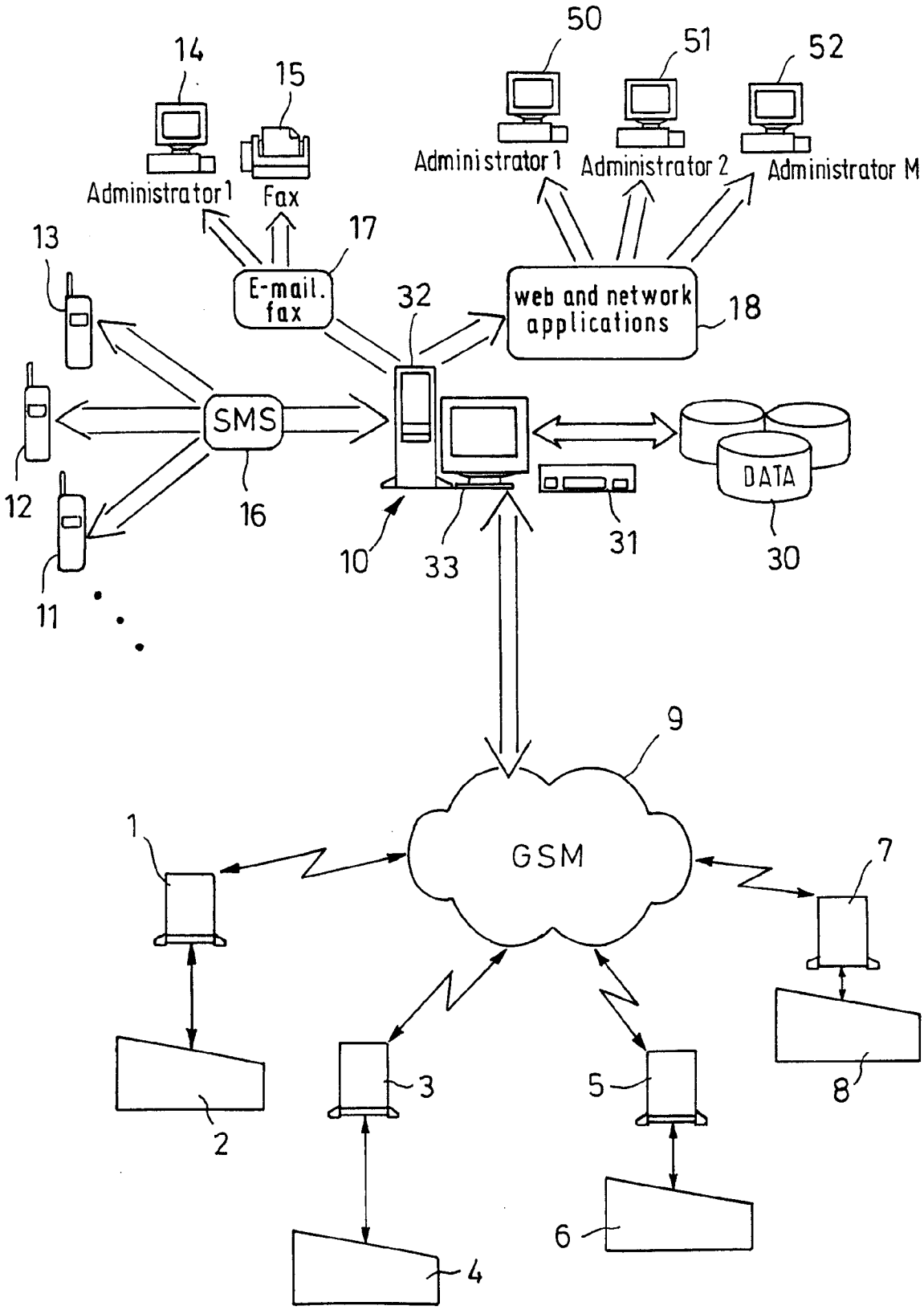
25. Network system according to one of the preceding claims, the sensor means comprising a wind speed sensor for detecting the wind speed to be monitored.

26. Network system according to one of the preceding claims, the sensor means comprising a sensor for detecting pollution of an environment to be monitored.

27. Network system according to one of the preceding claims, the sensor means comprising a sensor for detecting, controlling or counting traffic to be monitored.

28. Network system according to one of the preceding claims, the sensor means comprising an identification or recognition sensor unit for identifying or recognising a person, an animal or an object which have a label thereon, identification means or card or have specific characteristics being readable by the identification or recognition sensor unit.

FIG.1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Fax
Administrator 1
Administrator 2
Administrator M
13
17
E-mail. fax
32
web and network applications
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SMS
DATA
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9
GSM
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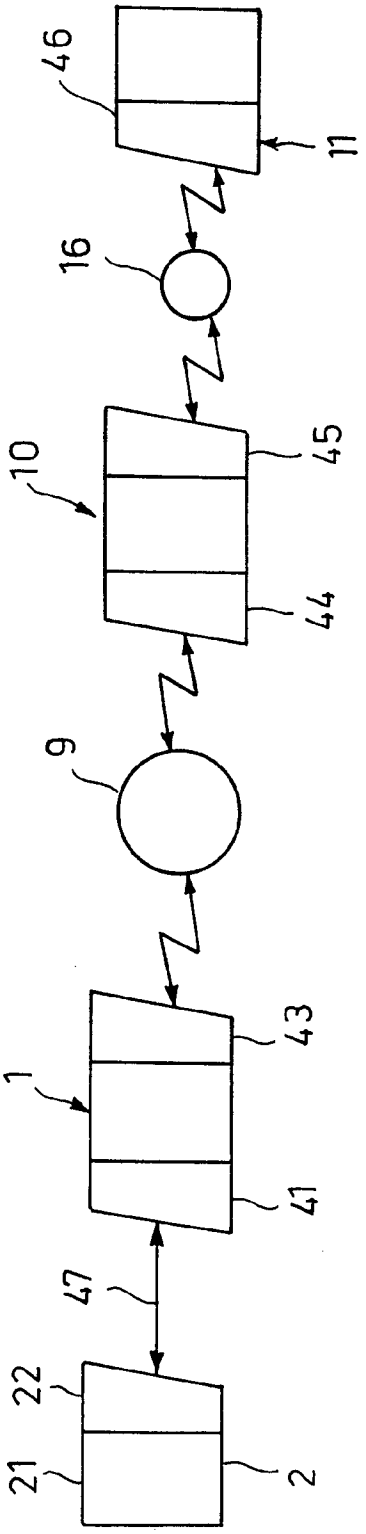
2
3
5
8
6
4

FIG.2



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First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Customer Number:	2101
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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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Practitioner's Docket No. 3781/1010 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Wesby van-Swaay

Application No.:	13/801,773	Art Unit/Group No.:	2642
Filed:	March 13, 2013	Examiner:	Not yet assigned
		Confirmation No.:	7047

For: PROGRAMMABLE COMMUNICATOR

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT WITHIN THREE MONTHS OF FILING OR BEFORE MAILING OF FIRST OFFICE ACTION (37 C.F.R. § 1.97(b))

IDENTIFICATION OF TIME OF FILING THE ACCOMPANYING INFORMATION DISCLOSURE STATEMENT

The information disclosure statement submitted herewith is being filed within three months of the filing date of the application or date of entry into the national stage of an international application or before the mailing date of a first Office action on the merits, whichever event occurs last. 37 C.F.R. § 1.97(b).

DATE: May 14, 2013

/Jonathan C. Lovely, #60,821/

Jonathan C. Lovely
Registration No. 60,821
SUNSTEIN KANN MURPHY & TIMBERS LLP
Customer Number 02101
125 Summer Street
Boston, MA 02110-1618
United States

03781/01010 1887138.1

Practitioner's Docket No. 3781/1010 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.: 13/801,773
Filed: March 13, 2013
For: Programmable Communicator

Group No.: 2642
Examiner: Not yet assigned

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT TRANSMITTAL

1. Transmitted herewith is a Preliminary Amendment for this application.

STATUS

2. Applicant is a small entity. A statement was already filed.

EXTENSION OF TERM

3. The proceedings herein are for a patent application and the provisions of 37 C.F.R. 1.136 apply. Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

FEE FOR CLAIMS

4. The fee for claims (37 C.F.R. 1.16(b)-(d)) has been calculated as shown below:

	(Col. 1)		(Col. 2)		(Col. 3)		SMALL ENTITY			
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE		ADDIT. FEE	
TOTAL	30	–	20	=	10	x	$ 40.00	=	$	400.00
INDEP.	1	–	3	=	0	x	$ 210.00	=	$	0.00
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM						+	$ 0.00	=	$	0.00
							TOTAL ADDIT. FEE		$	400.00

Total additional fee for claims required $400.00

FEE PAYMENT

5. Authorization is hereby made to charge the amount of $400.00 to Deposit Account No. 19-4972.

Charge any additional fees required by this paper or credit any overpayment in the manner authorized above.

FEE DEFICIENCY

6. If an additional extension and/or fee is required, charge Account No. 19-4972.

If an additional fee for claims is required, charge Account No. 19-4972.

Date: May 10, 2013

/Jonathan C. Lovely, #60,821/
Jonathan C. Lovely
Registration No. 60,821
SUNSTEIN KANN MURPHY & TIMBERS LLP
125 Summer Street
Boston, MA 02110-1618
617-443-9292
Customer No. 02101

03781/01010 1888252.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Wesby-van Swaay	Att'y Docket:	3781/1010
Appln. No.:	13/801,773	Filing Date:	March 13, 2013
Customer No.:	02101	Conf. No.:	7047
Examiner:	Not yet assigned	Art Unit:	2642
Invention:	PROGRAMMABLE COMMUNICATOR		

FILED BY USPTO ELECTRONIC FILING SYSTEM

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Dear Sir:

Please amend the above identified application as follows:

Listing of the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

LISTING OF THE CLAIMS

1 – 20 (Cancelled)

21. (New) A programmable communicator device comprising:

a wireless communications circuit for communicating through an antenna over a communications network;

a programmable interface for establishing a communication link with at least one monitored technical device, wherein the programmable interface is programmable by wireless packet switched data messages;

a processing module configured to authenticate one or more wireless transmissions sent from a programming transmitter and received by the programmable communicator device by determining if at least one transmission contains a coded number;

wherein the programmable communicator device is configured to use a memory to store at least one telephone number or IP address included within at least one of the transmissions as one of one or more permitted callers if the processing module authenticates the at least one of the transmissions including the at least one telephone number or IP address and the coded number by determining that the at least one of the transmissions includes the coded number;

wherein the programmable communicator device is configured to use an identity module for storing a unique identifier that is unique to the programmable communicator device;

and wherein the one or more wireless transmissions from the programming transmitter comprises a General Packet Radio Service (GPRS) or other wireless packet switched data message;

and wherein the programmable communicator device is configured to process data received through the programmable interface from the at least one monitored technical device.

22. (New) A programmable communicator device according to claim 21, wherein the

processing module is configured to process data received through the programmable interface from the at least one monitored technical device in response to programming instructions received in an incoming wireless packet switched data message.

23. (New) A programmable communicator device according to claim 21, wherein the programmable communicator device comprises the identity module.

24. (New) A programmable communicator device according to claim 21 wherein the wireless communications circuit is configured to receive wireless transmissions compliant with Bluetooth wireless air interface standards.

25. (New) A programmable communicator device according to claim 21 wherein each permitted caller has a corresponding stored telephone number or IP address from which the programmable communicator device is permitted to receive incoming wireless transmissions for processing.

26. (New) A programmable communicator device according to claim 21 wherein each permitted caller has a corresponding stored telephone number or IP address to which the wireless communications circuit is permitted to send outgoing wireless transmissions.

27. (New) A programmable communicator device according to claim 21 wherein each permitted caller has a corresponding stored telephone number or IP address from which the programmable communicator device is permitted to receive incoming wireless transmissions for processing, and to which the wireless communications circuit is permitted to send outgoing wireless transmissions.

28. (New) A programmable communicator device according to claim 21 further configured to request that an at least one monitored technical device send data through the programmable interface for processing by the programmable communicator device.

29. (New) A programmable communicator device according to claim 21 further configured to transmit the processed data to an at least one monitoring device either periodically or in response to a data request initiated by the monitoring device.

30. (New) A programmable communicator device according to claim 29, wherein the processing module is configured to cause the processed data to be transmitted to the at least one monitoring device.

31. (New) A programmable communicator device according to claim 29 further configured to determine whether the data request initiated by the monitoring device includes a required access code.

32. (New) A programmable communicator device according to claim 31, wherein the processing module is configured to determine whether the data request includes the required access code.

33. (New) A programmable communicator device according to claim 21 further configured to determine whether the processed received data indicates a change in status of the at least one monitored technical device that crosses a threshold parameter, or that otherwise indicates an alarm condition.

34. (New) A programmable communicator device according to claim 33 further configured to send an at least one transmission for alerting an at least one monitoring device of said change in status or other alarm condition.

35. (New) A programmable communicator device according to claim 21 further configured to request that an at least one monitored technical device send data through the programmable interface for receipt by the programmable communicator device.

36. (New) A programmable communicator device according to claim 21 further configured to transmit the received data to an at least one monitoring device either periodically or in response to a data request initiated by the monitoring device.

37. (New) A programmable communicator device according to claim 36, wherein the processing module is configured to cause the received data to be transmitted to the at least one monitoring device in response to programming instructions received in an incoming wireless packet switched data message.

38. (New) A programmable communicator device according to claim 36, wherein the processing module is configured to cause the received data to be transmitted to the at least one monitoring device.

39. (New) A programmable communicator device according to claim 21 further configured to transmit the received data to an at least one monitoring device either periodically or in response to a data request initiated by the monitoring device in response to programming instructions received in an incoming wireless packet switched data message.

40. (New) A programmable communicator device according to claim 21 configured to process an at least one data monitoring or data collection request contained in an at least one transmission received from an at least one monitoring device.

41. (New) A programmable communicator device according to claim 21 further comprising a location processing module configured to determine an at least one location of the programmable communicator device, and wherein the programmable communicator device is configured to respond to an at least one transmission initiated by an at least one monitoring device requesting that said location data be sent to the monitoring device.

42. (New) A programmable communicator device according to claim 21 further comprising a location processing module configured to determine an at least one location of the programmable communicator device, and wherein the programmable communicator device is configured to respond to an at least one transmission initiated by an at least one monitoring device requesting that said location data be sent to the monitoring device in response to programming instructions received in an incoming wireless packet switched data message.

43. (New) A programmable communicator device according to claim 42 wherein the location processing module comprises a Global Positioning System (GPS) module.

44. (New) A programmable communicator device according to claim 21 wherein the monitored technical device is a sensor device.

45. (New) A programmable communicator device according to claim 21 wherein the monitored technical device is a health monitoring system.

46. (New) A programmable communicator device according to claim 45 wherein the programmable communicator device is configured to receive data from the health monitoring system through the programmable interface representing at least one of body temperature, blood pressure, periodic or continuous electrocardiogram heart rhythm, blood glucose concentration, blood electrolyte concentration, kidney function, liver function, and labor contractions.

47. (New) A programmable communicator device according to claim 46 wherein the programmable communicator device is configured to receive data from the health monitoring system through the programmable interface in response to programming instructions received in an incoming wireless packet switched data message.

48. (New) A programmable communicator device according to claim 21 wherein the

monitored technical device is a vending machine.

49. (New) A programmable communicator device according to claim 21 wherein the monitored technical device is a home or domestic appliance.

50. (New) A programmable communicator device according to claim 21 wherein the monitored technical device is at least one of a door status monitoring device, a window status monitoring device, a proximity detector device, and a fire alarm device.

REMARKS

New claims are submitted herewith replacing all previous claims in this application. Please consider the patentability of the claims in this amendment in accordance with the requested prioritized handling.

Applicants would like to note that, with this preliminary amendment, the application still contains no more than four independent claims, no more than thirty total claims, and no multiple dependent claims. Therefore, Applicants do not believe that this amendment will result in termination of special status under Track 1 Prioritized Examination.

It is believed that the application is in condition for allowance and Applicant respectfully requests that a notice of allowance be issued. Applicant does not believe any extension of time is required. However, if an extension of time is required, please charge the associated fee and any additional fees required by this paper or credit any overpayment to deposit account number 19-4972. Applicant also requests that the examiner contact applicant's attorney, Jonathan Lovely, if it will assist in processing this application through issuance.

DATE: May 10, 2013

Respectfully submitted,

/Jonathan C. Lovely, #60,821/

Jonathan C. Lovely
Registration No. 60,821
Attorney for Applicant

Sunstein Kann Murphy & Timbers LLP
125 Summer Street
Boston, MA 02110-1618
(617) 443-9292
03781/01010 1887783.1

Electronic Patent Application Fee Transmittal

Application Number:	13801773
Filing Date:	13-Mar-2013
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Filer:	Jonathan Lovely
Attorney Docket Number:	3781/1010

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	2202	10	40	400
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**400**

Electronic Acknowledgement Receipt

EFS ID:	15745535
Application Number:	13801773
International Application Number:	
Confirmation Number:	7047
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Customer Number:	2101
Filer:	Jonathan Lovely
Filer Authorized By:	
Attorney Docket Number:	3781/1010
Receipt Date:	10-MAY-2013
Filing Date:	13-MAR-2013
Time Stamp:	16:28:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$400
RAM confirmation Number	3353
Deposit Account	194972
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Preliminary Amendment	klw3781_1010_PrelimAmdt.pdf	165513 03b3b18de97a0e6443471e1b8c4fc2fc799e7496	no	10
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	29542 266d6b7fe8b53b986b7a54a5b5ea02a173346f96	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	195055		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/801,773	Filing Date 03/13/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT

05/10/2013	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 30	Minus	** 20	= 10	X $40 =	400
Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**400**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/SHARAIN MORELAND/

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

SUNSTEIN KANN MURPHY & TIMBERS LLP
125 SUMMER STREET
BOSTON MA 02110-1618

MAILED
MAY 07 2013
OFFICE OF PETITIONS

Doc Code: TRACK1.GRANT

Decision Granting Request for Prioritized Examination (Track I or After RCE)	Application No.: 13/801,773

1. THE REQUEST FILED 3/13/13 IS **GRANTED.**

The above-identified application has met the requirements for prioritized examination

A. ☒ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination.** The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;
B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims**, or a multiple dependent claim;
C. filing a **request for continued examination**;
D. filing a notice of appeal;
E. filing a request for suspension of action;
F. mailing of a notice of allowance;
G. mailing of a final Office action;
H. completion of examination as defined in 37 CFR 41.102; or
I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to Terri Johnson at 571-272-2991. In his/her absence, calls may be directed to Brian Brown at 571-272-5338

/Terri Johnson/ Petitions Examiner

[*Signature*] (Title)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/801,773	03/13/2013	2642	833	3781/1010	20	1

CONFIRMATION NO. 7047

2101
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

FILING RECEIPT

OC000000060486354

Date Mailed: 04/22/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Eveline Wesby van-Swaay, Stratford-upon-Avon, UNITED KINGDOM;

Applicant(s)

M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

Assignment For Published Patent Application

M2M SOLUTIONS LLC, Stratford-upon-Avon, UNITED KINGDOM

Power of Attorney: The patent practitioners associated with Customer Number 02101

Domestic Priority data as claimed by applicant

This application is a CON of 13/328,095 12/16/2011
which is a CON of 12/538,603 08/10/2009 PAT 8094010
which is a CON of 11/329,212 01/10/2006 PAT 7583197
which is a CON of 10/296,571 01/21/2003 ABN
which is a 371 of PCT/EP01/05738 05/18/2001

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
FINLAND 20001239 05/23/2000 No Access Code Provided

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 04/16/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/801,773**

Projected Publication Date: 08/01/2013

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

Programmable Communicator

Preliminary Class

455

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/801,773

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/801,773	03/13/2013	Eveline Wesby van-Swaay	3781/1010

CONFIRMATION NO. 7047

2101
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

POA ACCEPTANCE LETTER

OC000000060486564

Date Mailed: 04/22/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/13/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/mgabre/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (09-12)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Eveline Wesby van-Swaay	Nonprovisional Application Number (if known):	3781/1010
Title of Invention:	Programmable Communicator		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i), the prioritized examination fee set forth in 37 CFR 1.17(c), and if not already paid, the publication fee set forth in 37 CFR 1.18(d) have been filed with the request. The basic filing fee, search fee, examination fee, and any required excess claims and application size fees are filed with the request or have been already been paid.

2. The application contains or is amended to contain no more than four independent claims and no more than thirty total claims, and no multiple dependent claims.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. The executed inventor's oath or declaration is filed with the application. (37 CFR 1.63 and 1.64)

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Jonathan C. Lovely, #60,821/	Date March 13, 2013
Name (Print/Typed) Jonathan C. Lovely	Practitioner Registration Number 60821

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☑ *Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Eveline		Wesby van-Swaay	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Stratford-upon-Avon	Country of Residence i	GB

Mailing Address of Inventor:

Address 1	Camden House, School Lane		
Address 2	Tiddington		
City	Stratford-upon-Avon	**State/Province**	
Postal Code	CV37 7AJ	**Country** i	GB

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	02101		
Email Address	patents@sunsteinlaw.com	Add Email	Remove Email

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

Application Information:

Title of the Invention	Programmable Communicator		
Attorney Docket Number	3781/1010	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	3	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	02101		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	13/328095	2011-12-16
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13/328095	Continuation of	12/538603	2009-08-10	8094010	2012-01-10

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12/538603	Continuation of	11/329212	2006-01-10	7583197	2009-09-01

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11/329212	Continuation of	10/296571	2003-01-21

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
10/296571	a 371 of international	PCT/EP01/05738	2001-05-18

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country i	Filing Date (YYYY-MM-DD)	Priority Claimed
20001239	FI	2000-05-23	◉ Yes ○ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name	M2M Solutions LLC		
Mailing Address Information:			
Address 1	Camden House, School Lane		
Address 2	Tiddington		
City	Stratford-upon-Avon	**State/Province**	
Country i GB		Postal Code	CV37 7AJ
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3781/1010
	Application Number	
Title of Invention	Programmable Communicator	

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

Remove

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1	
Address 2	

City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/Jonathan C. Lovely, #60,821/			Date (YYYY-MM-DD)	2013-03-13
First Name	Jonathan C.	Last Name	Lovely	Registration Number	60821

Additional Signature may be generated within this form by selecting the Add button. Add

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Attorney Docket: 3781/1010

Programmable Communicator

Priority

This patent application is a continuation of and claims priority from all priority dates of U.S. patent application serial number 13/328,095, filed December 16, 2011, and entitled "**Programmable Communicator**" (attorney docket number 3781/1007). As a consequence of this priority claim, this patent application also claims priority to U.S. patent application serial number 12/538,603, filed August 10, 2009, now U.S. Patent No. 8,094,010, and entitled "**Programmable Communicator**" (attorney docket number 3781/1006), which is a continuation of U.S. patent application serial number 11/329,212, filed January 10, 2006, now U.S. Patent No. 7,583,197, and entitled "**Programmable Communicator**" (attorney docket number 3781/1002) which is a continuation of and claims priority to U.S. Patent Application 10/296,571, filed January 21, 2003, and entitled "**Programmable Communicator**," which, in turn, is a National Phase filing of and claims priority to PCT/EP01/05738 filed on May 18, 2001, which further claims priority from Finland Application 20001239, filed May 23, 2000. The disclosures of each of these applications are incorporated herein by reference in their entirety.

Background of the Invention

The invention relates to a programmable wireless communications apparatus. More particularly, it relates to a programmable wireless communications apparatus, which can provide an improved means of communication between children and their parents, between elderly persons and caring relatives, and between mentally less-able individuals and supervising adults. In addition, the invention provides a solution for smart clothes applications, which may comprise a telecommunications means within the lining of a jacket or other article of clothing, as well as a solution for user-programmable data tags which convey information from remotely located devices such as vending machines. The invention relates to and significantly improves upon a previously filed patent application claiming Finnish priority of Sep. 9, 1997 entitled a Portable Hotlink Communicator published as

international patent application PCT/GB98/02715.

In this previously filed application, is taught the invention of using a mobile phone comprising a programmable identity module such as a SIM card, in the context of the GSM telecommunications standard, to program the number of any mobile or fixed telephone to which the Hotlink communicator, comprising a similar type of programmable identity module, is to be linked. Existing and known methods of communication between the mobile phone and Hotlink communicator for the purpose of programming comprise the obvious choice of data calls such as the Short Message Service in the GSM telecommunications standard. Alternatively a PDA type communicator might call up a web page to instruct a network element to program the programmable identity module of the Hotlink with the number of any fixed or mobile telephone to which the Hotlink communicator is to be linked.

This use of a separate mobile phone to program the number to which the Hotlink may call is particularly useful and convenient should a parent wish to change the number if the parent must leave shortly and want that the Hotlink is connected immediately to the mobile phone or fixed line of another parent or supervising neighbour.

The current invention builds upon the teaching of this earlier application and extends the concept significantly that it has more general and suitable application to both the child Hotlink communicator and also to the field of programmable wireless data communication tags for the purpose of providing information about the status of a vending machine or other piece of technical equipment such as a home appliance or a device to monitor whether a door is open or closed.

In addition to this, the current invention relates directly to programmable wireless data communication tags, which comprise the means to be interfaced directly with other technical equipment such that each tag can be programmed remotely by any means to be linked to any fixed or mobile telephone to enable data to be sent to or from the device and to allow a person to make a voice call connection to the linked telephone.

Today parents are concerned whether to provide a young child with a mobile phone or not. The concern relates to the cost of the mobile phone should it be lost or stolen and also to the cost of the use of the mobile phone. Clearly there is a need to provide a means to limit the cost of calling and also to provide a means to prevent the child dialling overseas numbers for extensive periods of time.

In the context of mobile phone operators, there exists a need to provide a simple and effective communication device, which can provide the means for family tariffing such that subscriptions for children can be related to the subscriptions of their parents' mobile phones. An improved child Hotlink communicator, which restricts the usage of the mobile phone and thereby does not generate high charges through uncontrolled calling, is clearly a solution to the family tariffing challenge.

Parents are often concerned about the whereabouts of their children and new positioning technologies are being developed for locating mobile phones. These solutions include self-positioning solutions and remote positioning solutions. One example of a self-positioning solution includes the satellite-based Global Positioning System technology in which the mobile phone comprising a GPS signal processing circuit is able to determine the coordinates of its own position by processing signals received from satellites and communicate these coordinates to a location centre associated with the network. One example of a remote positioning solution is the method taught in U.S. Pat. No. 5,051,741 claiming priority of Mar. 27, 1990 in which the mobile phone is paged and caused to transmit a response which is processed by communication stations such as time-of-arrival measurement units associated with the network of master stations or base stations.

This remote positioning method has the advantage that the position of the mobile phone can be determined by making use of existing signalling between the mobile phone and the network without requiring any changes to the mobile phone, which would increase its cost. The generic network-based, remote-positioning architecture method of U.S. Pat. No. 5,051,741 may make use of time of arrival methods or phase difference calculations to increase the resolution of the area or sector within which the mobile phone is located.

While the location of the mobile phone itself is a good indication of the present location of the person carrying the mobile phone, an improvement would be a means to lock the mobile phone to the child, such that use of the mobile phone positioning technologies would then determine the position of the child.

In addition to these concerns about the failures of existing mobile communications technology to provide an improved and more secure method of instant communication between a parent and a young child, and the means to determine the position of the child, there is additional concern that the battery of the communicator may drain its power without the parent knowing, or may be removed, which would prevent the communicator from receiving calls or dialling to the programmed fixed or mobile number to which the communicator is linked.

In addition to these specific communication problem needs, there is a growing yet unsubstantiated concern about the potentially harmful effect of electromagnetic radiation from mobile phones upon the developing brains of young children. Within this context, there is an opportunity to design a communication device for children, which positions the radiating electromagnetic field of a communication device away from the close proximity of the brain. In this regard, parents who maintain the belief that mobile telephones present a health risk due to the radiating antenna may rest secure in the knowledge that this risk can be significantly reduced.

In a separate context, there exists a growing need for a mobile telephone solution, which is cost effective to manufacture, but which is versatile such that it can form the basis for a smart clothes tag or communications application platform. In this context the requirement is for an embedded mobile phone platform comprising no keypad or display, which may be sewn into the lining of a jacket, or other article of clothing, having only the call button protruding and a simple pin connection to recharge the battery. The problem with prior art solutions is that unless the smart clothes tag can be user-programmable to call any fixed or mobile number by making use of an acceptable method such as via an SMS data call or via a BlueTooth radio

transmission from a mobile phone or intelligent PDA, the solution is impractical to implement.

In security applications where emergency service personnel carry hand-held primary communications devices such as conventional mobile phones, a back-up communications device such as a smart clothes embedded tag can be of great value in the instance that the primary communications device is lost or broken.

In sports areas such as on lakes where there may be people using canoes, a smart clothes communications tag embedded in a life vest may serve to alert a central control point that a person is in difficulty and also to alert other persons in the area to go to their rescue.

In an additional application area, skiers in difficulty would benefit from a smart clothes user-programmable communications tag attached to their clothing, which is pre-programmed to be linked with a fixed or mobile telephone and need only have its protruding button pressed to make communication with a central alarm point.

In an additional application area there exists the need for a user-programmable remote wireless communications data tag, which can be used to relay information about the status of a remote piece of technical equipment such as a vending machine. Home networks could be simplified by making use of the existing mobile network infrastructure to relay data about the status of a home appliance or to indicate whether a door is open or closed. Packet switched technologies such as GPRS may be used as the radio access technology to communicate the status of the technical equipment.

In an additional application area there exists the need for a versatile communications platform, which can be combined with remote health monitoring technology to assist doctors with remote diagnosis of patients.

In an additional application there is the need for a versatile communications which is able to work effectively when the network is temporarily overloaded such that it has the means to

store a sound message as a sound byte or convert it using voice recognition software such that it can be forwarded as soon as the network capacity becomes less loaded.

Further to these limitations of existing technologies, and so far as is known, no portable communication apparatus is presently available which serves to offer an improved programmable communicator which is directed towards the specific needs of this problem area as outlined.

Objects of the Invention

Accordingly, it is an object of the present invention to provide an improved programmable communications apparatus, which can be remotely programmed by any mobile phone or IP device such that it can be linked to any particular fixed or mobile phone or IP device.

It is a further object of the present invention to provide a programmable communications apparatus, which may be programmed at close range using infrared light or a BlueTooth radio connection, or via a terminal-to-terminal network based data call such as the GSM SMS short message service or via a GPRS packet data communication.

It is a further object of the present invention to provide a programmable communications apparatus, which may be programmed by a mobile or fixed device which is able to call up an Internet web page and which comprises the means to instruct the network to reprogram the communications apparatus with the mobile or fixed number to which the programmable communications device is to be linked.

It is a further object of the present invention to provide a programmable communications apparatus, which may be programmed via the Internet such that the network communicates with a device in the vicinity of the programmable communications apparatus which itself causes the said apparatus to be programmed using any means such as wireless communication, infrared light or a BlueTooth radio link.

It is a further object of the present invention to provide a plurality of programmable

communications apparatuses, which may be simultaneously programmed by a mobile or fixed device which is able to call up an Internet web page and select one or more apparatuses of the said plurality and cause each of the selected number of apparatuses to be linked to the identical mobile or fixed telephone.

It is a further object of the present invention to provide a programmable communications apparatus, which comprises a processing means to process coded transmissions and permit only transmissions comprising a coded number, which determines the authenticity of the message, to be allowed to program the number to which the said apparatus be linked.

It is a further object of the present invention to provide a programmable communications apparatus, which comprises a wrist strap, or an attachment such as in the case of the smart clothes application, and a first alarm means which can be programmed such that it can cause a message to be sent to the fixed or mobile number to which the said apparatus is linked in the case that the wrist strap be broken or undone or in the case that the said attachment be broken or displaced from an initial position of equilibrium.

It is a further object of the present invention to provide a programmable communications apparatus, which may have a separate pressure sensitive means or displaceable means which becomes activated in the pressed position or displaced position respectively such that it is able to generate an alarm or data message when pressure is removed or when the displacement returns to the non-displaced position. Such a feature serves, by way of example, to replace the need for the wrist strap feature of the previous object such that when the wrist worn communicator is removed from the wrist the pressure sensitive means or displaceable means can provide the required alarm message.

It is a further object of the present invention to provide a programmable communications apparatus, which comprises a heat sensor, which can detect that the communicator is adjacent to a heat source such as the skin of a child and the means to generate an alarm message if the heat source is removed.

It is a further object of the present invention to provide a programmable communications apparatus, which has the means to detect any other detectable physical characteristic of the human skin, which may be used to trigger an alarm if the means is moved away from the skin.

It is a further object of the present invention to provide a programmable communications apparatus for a security application, which comprises an infrared heat detector and which is able to generate an alarm message if a change in the level of infrared radiation is detected.

It is a further object of the present invention to provide a programmable communications apparatus, which may form part of a home network of devices, which is used to monitor a domestic appliance such as a washing machine or a device to monitor whether a door or window is open or closed and to react to a change in status of said appliance or device by sending an alarm message or data message to a linked fixed or mobile telephone or internet IP address to indicate a current status of said appliance or device. In addition the said apparatus may be incorporated in a bicycle frame or attached to a bicycle for monitoring movement of the bicycle.

It is a further object of the present invention to provide a programmable communications apparatus, which has a memory means to store sound as a sound byte for a certain period of time such as the voice of the child wearing the programmable communicator and the means to send this sound to the telephone number to which the said apparatus is linked.

It is a further object of the present invention to provide a programmable communications apparatus, which has a means to store and transmit a sound byte in response to receiving a sound above a predetermined threshold such that a person who is in distress may shout out and the distress call is processed by the programmable communicator and forwarded to the fixed or mobile telephone or IP address to which the said communicator is linked.

It is a further object of the present invention to provide a programmable communications apparatus, which is able to make a call to a linked fixed or mobile telephone or IP address

and which if it detects that the telephone number is engaged or does not answer or that the IP address is invalid, the said apparatus has the means to select any other telephone number or IP address in the permitted callers list such that it can be connected to said other telephone or IP device.

It is a further object of the present invention to provide a programmable communications apparatus, which is able to store a sound byte or store a data record and send the sound byte or data record to any other telephone number or IP address in the permitted callers list after a certain interval of time in the instance that the primary number or IP address is engaged or connection is not able to be made at that time due to the network capacity not being sufficient at that time. The feature may also include a continuous retry feature such that the attempt to send the sound byte or data record is continued until the sound byte or data record is successfully sent.

It is a further object of the present invention to provide a programmable communications apparatus, which has the means to convert a voice message into text and send this as a data message to a fixed or mobile telephone or IP address to which the said apparatus is linked.

It is a further object of the present invention to provide a programmable communications apparatus, which is able to receive data from a plurality of data monitoring devices, which may be connected by any wired or wireless means, and that each of said devices has an associated status condition, such that the programmable communications apparatus can transmit data from said devices on request or periodically to a fixed or mobile telephone or IP address to which the said apparatus is linked.

It is a further object of the present invention to provide a programmable communications apparatus, in which the said first alarm means may communicate directly with a central communications point in the network.

It is a further object of the present invention to provide a programmable communications apparatus, in which the said first alarm means may communicate directly with a web page

and write information to that page or cause an E-mail to be sent to a specific address.

It is a further object of the present invention to provide a programmable communications apparatus, which comprises a second alarm means, which can be programmed to cause a message to be sent to the fixed or mobile number to which the said apparatus is linked in the case that the battery is low in power or in the case that the battery is removed or in the case that the communicator be switched off.

It is a further object of the present invention to provide a programmable communications apparatus, which comprises a second alarm means, which can be programmed to send a message periodically comprising any status message such as the current power status of the battery.

It is a further object of the present invention to provide a programmable communications apparatus, which comprises a battery charger adapter-pin such that the apparatus can make use of suitable battery chargers of other mobile phones.

It is a further object of the present invention to provide a programmable communications apparatus, which comprises the means to be interrogated remotely by another fixed or mobile telephone or network connected device, such that different codes are used to obtain different data from the said apparatus. In the context of remote health monitoring, by way of example, a doctor could send different codes from her mobile terminal and obtain different data on blood pressure and the heart rate of the person wearing the apparatus associated with a health monitoring system. The said apparatus may make use of physical monitoring means associated with said apparatus for providing information about the skin temperature and blood pressure and other characteristics of the human body.

It is a further object of the present invention to provide a programmable communications apparatus, which has application to smart clothes such that it provides a secondary communications means for emergency service personnel.

It is a further object of the present invention to provide a programmable communications apparatus, which is suitable for attachment to a life vest. A further object of this application includes a water-enabled communications apparatus, which may be used to communicate with a portable central communications unit.

It is a further object of the present invention to provide a programmable communications apparatus, which comprises a GPS signal processing circuit and the means to respond to an authenticated request to determine its own position and send data relating to its position to the linked fixed or mobile telephone or to a location determination centre or to a specified web page.

It is a further object of the present invention to provide a programmable communications apparatus, which may be securely attached to a device such as a bicycle, which may be used for communication and for determining the position of the bicycle.

It is a further object of the present invention to provide a programmable communications apparatus, which is suitable for young children such that it comprises an auto-answer facility to connect the caller immediately with an associated microphone and loudspeaker to avoid the need that the child must press a button to answer the call. This application also includes the feature, which returns the programmable communicator automatically to idle state as soon as the caller to the child terminates the call remotely. This avoids the need that the child must terminate the call. It also prevents the child from terminating the call by accident.

It is a further object of the present invention to provide a programmable communications apparatus, which can be used with mobile location based services such that it is possible for an authenticated person to access a web page, either on a hand-held terminal or fixed device, which shows the position of the programmable communications apparatus as an icon on a map after its position has been determined by its own GPS signal processing circuitry or remotely by the network.

Other objects and advantages of this invention will become apparent from the description to follow when read in conjunction with the accompanying drawings.

Summary of the Invention

Certain of the foregoing and related objects are readily-attained according to the present invention by the provision of a novel portable programmable communicator, which serves to address the diverse communication requirements of children and elderly persons and for the purposes of remote data monitoring applications such as for monitoring the status of remote technical devices.

The programmable communicator preferably comprises a basic mobile telephone circuit having no keypad or display and a rechargeable battery and antenna and a basic two-way microphone device and remotely pre-programmable identity module linking it to a single mobile or fixed telephone. Where appropriate, in alternative embodiments, the programmable communicator comprises an alarm means to indicate certain conditions of the communicator such as the charge level of its battery or if the battery is removed. Similar alarm messages are generated according to the particular embodiment of the programmable communicator application which include the generation of messages when an associated wrist strap or attachment of the communicator in the case of a smart clothes application is undone or displaced or when the communicator is switched on or off or when the communicator is set to monitor the status condition of an associated device and the status changes beyond a preset threshold level. The invention also includes the generation of periodic messages to indicate that the communicator is working and that any associated status condition thresholds remain unchanged. This last set of messages, which includes periodic reassurances messages includes the facility that the user may set the duration of the period according to the application.

The programmable communicator has direct and effective application to home networks for the purpose of transmitting information about the status condition of domestic appliances such as the pressure of water pipes and whether a door or window is opened or closed. The wireless programmable communicator can be attached to an associated monitoring device

and programmed with the number of a mobile or fixed telephone to which it is to be linked or to an Internet web page which can be made accessible to authenticated users or to security monitoring personnel.

Other objects and features of the present invention will become apparent from the following detailed description considered in connection with the accompanying drawings, which disclose one embodiment of the invention. It is to be understood, however, that the drawings are designed for the purpose of illustration only and that the particular description of the portable hot link communicating apparatus is given by way of example only and does not limit the scope of the invention.

Brief Description of the Drawings

The foregoing features of the invention will be more readily understood by reference to the following detailed description, taken with reference to the accompanying drawings, in which:

FIG. 1 illustrates the schematic of the programmable communicator according to one embodiment of the invention.

FIG. 2 illustrates a schema showing the actions performed by the programmable communicator in response to an incoming call or message according to the present invention.

FIG. 3 illustrates a schema showing actions done by the programmable communicator and the outgoing calls or messages, which are generated as a consequence of said actions.

Description of a Preferred Embodiment

Referring now in detail to the drawings and in particular FIG. 1 thereof, therein illustrated is a programmable communicating apparatus according to one embodiment of the present invention.

The following description makes reference to the detailed features as outlined in the objects

of the invention.

In FIG. 1 is shown a telephone circuit 10, which comprises an antenna 20 and a battery 30. To the telephone circuit, which may similarly comprise a communicating PDA device circuit, is shown an optional BlueTooth module 40 for communication with a nearby data communication or programming device having a similar BlueTooth radio module. The telephone circuit 10 has a ringing tone generator and an auto answer module 50 which may be used to cause the programmable communicator to generate one of a number of ringing tones or to auto answer upon receipt of an authenticated permitted caller.

For the purposes of programming the IP address or telephone number of the fixed or mobile telephone to which the communicator is linked is provided an SMS processing means 60. This communicates with an authentication means 90, which in turn is able to store numbers into a permitted callers list 110. For the purposes of security, a sound byte capture means and threshold detector means 100 is provided to generate an alarm message or to send a sound byte to one of the numbers on the permitted callers list. Additional voice recognition software may be used to convert the sound byte into text and send this to the destination telephone number or IP address.

An SMS alarm generation means 70 is provided to work together with a battery charge monitor 35 and a sensor means 80 and an alarm message list 120 and a programmable interface means 140 to generate alarm messages in response to changes in status conditions. Said programmable interface means may be attached to all manner of sensor devices for the purpose of relaying data from external devices and sensors either automatically or in response to a request for information from a remote device.

The periodic status report means 130 may be programmed to provide data on the current status of the programmable communicator as well as data from one or more devices, which may be connected to the communicator via the BlueTooth module 40.

In the case that the programmable communicator is unable to make an immediate connection

with the linked telephone or IP address, a reselection means 150 provides one or more connection numbers from the permitted callers list.

This device comprises a novel combination of existing technologies and features, which make possible the existence of a new and improved communicating apparatus to address the communication needs of children and elderly persons and for programmable data tags for monitoring the status of associated technical equipment.

The use of the programmable communicator involves two phases, a pre-programming phase and an active phase. In the pre-programming phase, the communicator is programmed with the number it can call which comprises a unique code. By way of example only, the invention is now described in the context of the GSM mobile telecommunications standard using the Short Message Service or SMS circuit-switched data call. The invention relates to all telephone standards including, and not limited to CDMA and US-TDMA, and is effectively used also in a packet switching mode such as the GSM GPRS packet switching mode. Furthermore the invention is suitably applicable to IP devices, which comprise IP addresses rather than telephone numbers.

According to the invention, it is wished to allow only authenticated callers to change the telephone number or IP address of a fixed or mobile telephone or network device to which the programmable communicator is to be linked. This may be done in GSM using an SMS message, which includes data as well as a unique code such as the unique code of the Subscriber Identity Module or SIM card, often referred to as the PUK code. The PUK code is a unique identifier, which is different for every SIM card. The choice of the PUK is made by way of example only and any similar unique coding may be used for the purpose of the invention

It is a straightforward procedure to communicate with the programmable communicator by SMS. The remote transmitting device includes the PUK code of the receiving programmable communicator in its SMS transmission as well as a telephone number to which the programmable communicator is to be linked.

The programmable communicator includes a processing means to determine that the PUK code is correct and the means to store the transmitted number. The PUK code may also be used to program the list of permitted callers. An SMS comprising the PUK code may contain a plurality of telephone numbers each of which designates a permitted caller's number. Only numbers, which are stored as designated permitted callers, will cause the programmable communicator to generate a ringing tone.

Alternatively, the programmable communicator may include circuitry to terminate the calls of non-permitted callers automatically. In the same way that the telephone number of an incoming call can be shown on the screen of a mobile phone before the phone is answered, this information may be used to enable the programmable communicator to receive the call or to reject it.

Additional codes may be used by authenticated callers to interrogate the status condition of the programmable communicator, or to interrogate the status of data monitoring devices to which the communicator is wired or wirelessly attached.

In this way, in the application for an improved child communicator, only persons knowing the secret PUK code would be able to change the calling number. This provides the essential security for the parents. Furthermore, the feature, which causes the communicator to reject all calls but those from telephone numbers on the permitted callers list serves to shield the child from unwelcome contact.

The following example demonstrates how five SMS messages might program the permitted callers list A-E

SMS 1. PUK code A:040 111 1111
SMS 2. PUK code B:040 222 2222
SMS 3. PUK code C:040 333 3333
SMS 4. PUK code D:040 444 4444

SMS 5. PUK code E:040 555 5555

The letters A to E in the five messages or any equivalent coding may be used to designate the priority of the telephone numbers of the permitted callers such that letter A designates the number to which the programmable communicator is linked at this moment.

In a simple use scenario, a child may be playing in the garden or near to the house wearing a programmable communicator programmed to the mother's telephone phone number, 040 111 1111. In the next moment, the father comes home and sends an SMS to the child's programmable communicator using his phone having telephone number 040 222 2222. In this example, the message comprises PUK code A:040 222 2222 which cause the calling number of the programmable communicator to be now reprogrammed to call the father's number if its call button is pressed by the child.

An additional security feature comprises software, which will cause an SMS emergency message to be sent automatically to the pre-programmed number if the wrist strap is broken or undone, or the communicator is switched off. An additional sensor may be used instead of a means to generate an SMS message if the wrist strap is broken or undone whereby said sensor can sense the heat of the skin, which will cause an SMS message to be sent if the communicator is moved away from the skin.

Additional software features may generate messages to indicate the charge of the battery or if the battery drains completely or is removed.

To avoid a total failure condition, the programmable communicator may comprise a separate back-up power supply in addition to the battery, which is sufficient to generate an alarm message or number of alarm messages, in the instance that a power connection is lost from an associated device or if its own battery supply drains completely.

In this way, the telephone number to which the programmable communicator is linked receives messages about the status of the battery and an indication of whether the

communicator has been removed from the child.

In a separate embodiment, is included the feature that certain alarm messages are sent to one or more of the telephone numbers, or IP addresses in the IP network application of this invention, which are on the permitted callers list. This feature would enable at least one other person to receive an alarm message in case the primary linked telephone is busy or the associated user of the linked telephone is unable to read the message immediately.

The programmable communicator comprises a processing module, which can receive information about its wrist strap or associated attachment. In the embodiment of a smart clothes tag, the said associated attachment may comprise a fibre or wire, which, if mechanically pulled, causes the generation of an alarm message. Clearly, in the case of a wrist worn communicator, the opening or closing of the wrist strap may be used to activate an electronic circuit to generate a status condition of the wrist strap. It is anticipated that the receiver of the alarm message may then call the child directly, if possible, to check if there is a problem. Additionally, location based services may be used to locate the position of the communicator relative to the network infrastructure.

In a separate embodiment, the programmable communicator comprises a feature, which enables a user to cause it to transmit a status message periodically, according to a periodic duration as set by the user, which will provide reassurance that the communicator is functioning correctly, and for example, that the wrist strap is closed, and that the battery has sufficient power.

The types of data that the communicator can provide periodically, or on request, are determined directly by the application of the invention according to different remote monitoring embodiments. In each application the programmable communicator has the appropriate means to receive the data from the monitoring device and the means to process the data.

The programmable communicator has further direct application to the field of remote data monitoring such as in the home network environment. Today, domestic appliances such as washing machines and sauna heaters remain separate from one another and only a few have the capability to be integrated into remote monitoring applications.

The programmable communicator may be used to generate data messages, which describe the status or change in status beyond a threshold condition, of a household appliance and communicate this data directly to a linked telephone number or IP address of a linked device or Internet web page.

The use of GSM GPRS packet switching technology in this context is ideal since the application does not require a continuous circuit switched connection to the network. The remote monitoring application comprises the use of a programmable communicator, which reacts to a status condition and then initiates a packet data transmission to the network. Consequently, the programmable communicator comprises a separate back-up power supply in addition to the battery, which is sufficient to generate an alarm message or number of alarm messages, in the instance that a power connection is lost from an associated device or if its own battery supply drains completely.

In a separate home-network application, the programmable communicator may be used to gather data from a number of associated monitoring devices and to communicate this to the linked telephone or IP device or Internet web page. The monitoring devices may be directly linked to the programmable communicator by wire or wirelessly connected by, for example, the BlueTooth radio technology in which case the programmable communicator comprises the necessary additional BlueTooth communications module.

In a sports or safety application, the programmable communicator may comprise a smart clothes tag and be sewn into the lining of a life vest such that a person paddling a canoe may use it for urgent communication.

Other applications for the programmable communicator include theme parks and other sports

events or places where children may become lost in the crowds.

In addition, the invention may be utilised as a voice and data communicator for bicycles. In this application, data from the bicycle such as speed could be used in sports training as a means to enhance the performance of a cyclist. In a more general application, a programmable communicator can be used to inform the owner of a bicycle that his parked bicycle is being moved and to determine its location, if needed, by making use of the location-based services functionality of the telecommunications network.

While only one embodiment of the present invention: the programmable communicator within the context of the digital GSM telephone system in particular, has been shown and described in detail, it will be obvious to those persons of ordinary skill in the art, that many changes and modifications may be made thereunto without departing from the spirit of the invention. For example, the hot link communicator may make use of any telephone technology such as CDMA, and US-TDMA. Moreover, the inventive features of the programmable communicator may be incorporated into a monitoring device and integrated with it such that the device comprises the capability of the programmable communicator. The invention is not limited to the application of the programmable communicator as a separate device, which separately communicates with data monitoring devices but also includes the application of the functionality of the invention as an integrated part of the monitoring device.

It is further to be understood that the invention may make use of all coding schemes for storing numbers to the programmable apparatus and the use of the PUK code was by way of example only. The programmable communicator may comprise the means to accept all manner of clip on covers so that the same base model may carry one of a number of different covers to suit the tastes and the age groups of different wearers.

What is claimed is:

1. A programmable communicator device comprising:

a wireless communications circuit for communicating through an antenna over a communications network;

an identity module for storing a unique identifier that is unique to the programmable communicator device;

a programmable interface for establishing a communication link with at least one monitored technical device;

a processing module for authenticating an at least one transmission sent from a programming transmitter and received by the programmable communicator device, the at least one transmission including a coded number and at least one telephone number or Internet Protocol (IP) address corresponding to an at least one monitoring device, wherein the processing module authenticates the at least one transmission by determining if the at least one transmission contains the coded number, the processing module authenticating the at least one transmission if the transmission includes the coded number;

a memory module for storing the at least one telephone number or IP address from the authenticated transmission as one of one or more permitted callers if the processing module authenticates the at least one transmission by determining that the at least one transmission includes the coded number; and

wherein the at least one transmission from a programming transmitter comprises a General Packet Radio Service (GPRS) or other packet switched data message, and wherein the programmable communicator comprises the means to process data received from at least one monitored technical device

2. A programmable communicator device according to claim 1 wherein the programmable interface is programmable via wireless transmissions.

3. A programmable communicator device according to claim 2 wherein the wireless transmissions comprise transmissions compliant with Bluetooth wireless air interface standards.

4. A programmable communicator device according to claim 1 wherein the at least one transmission from a programming transmitter comprises a GPRS data message.

5. A programmable communicator device according to claim 1 wherein each permitted caller has a corresponding stored telephone number or IP address from which the programmable communicator device is permitted to receive incoming transmissions for processing.

6. A programmable communicator device according to claim 1 wherein each permitted caller has a corresponding stored telephone number or IP address to which the programmable communicator device is permitted to send outgoing transmissions.

7. A programmable communicator device according to claim 1 wherein each permitted caller has a corresponding stored telephone number or IP address from which the programmable communicator device is permitted to receive incoming transmissions for processing, and to which the programmable communicator device is permitted to send outgoing transmissions.

8. A programmable communicator device according to claim 1 wherein storing the at least one telephone number or IP address from the authenticated transmission as one of one or more permitted callers further entails changing, replacing, or reprioritizing one or more previously stored telephone numbers or IP addresses corresponding to one or more other permitted callers.

9. A programmable communicator device according to claim 1 configured to receive data through the programmable interface from an at least one monitored technical device.

10. A programmable communicator device according to claim 9 configured to process the data received through the programmable interface from the at least one monitored technical device.

11. A programmable communicator device according to claim 10, wherein the processing

module processes the received data.

12. A programmable communicator device according to claim 10 further configured to request that an at least one monitored technical device send data through the programmable interface for processing by the programmable communicator device.

13. A programmable communicator device according to claim 10 further configured to transmit the processed data to an at least one monitoring device either periodically or in response to a request initiated by the at least one monitoring device.

14. A programmable communicator device according to claim 13, wherein the processing module causes the processed data to be transmitted to the at least one monitoring device.

15. A programmable communicator device according to claim 13 further configured to determine whether the data request initiated by the monitoring device includes a required access code.

16. A programmable communicator device according to claim 15, wherein the processing module determines whether the data request includes the required access code.

17. A programmable communicator device according to claim 10 wherein the received data is processed to determine whether it indicates a change in status of the at least one monitored technical device that crosses a threshold parameter, or that otherwise indicates an alarm condition.

18. A programmable communicator device according to claim 17 further configured to send an at least one transmission for alerting an at least one monitoring device of said change in status or other alarm condition.

19. A programmable communicator device according to claim 18, further comprising an alarm module for sending the at least one transmission for alerting the at least one

monitoring device of said change in status or other alarm condition.

20. A programmable communicator device according to claim 9 further configured to request that an at least one monitored technical device send data through the programmable interface for receipt by the programmable communicator device.

Attorney Docket: 3781/1010

Programmable Communicator

Abstract

A programmable communicator device is disclosed having a wireless communications circuit, including an antenna, configured to receive a transmission, and an identity module having a unique identifier. The programmable communicator further includes a processing module including program code configured to determine if the transmission is from an authenticated caller by determining whether a received transmission contains the unique identifier, and memory configured to store telephone numbers or IP addresses received in transmissions from an authenticated caller.

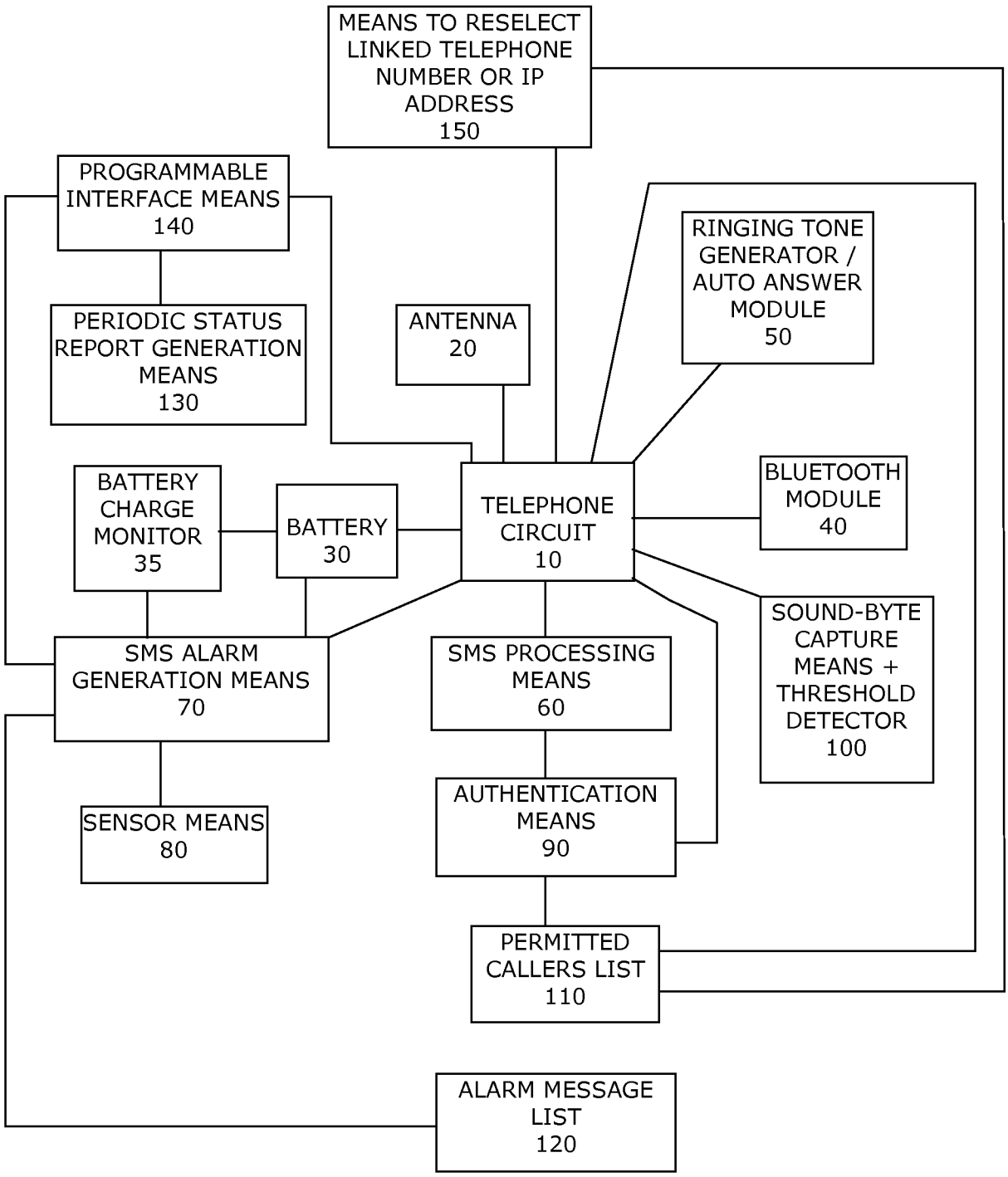
MEANS TO RESELECT LINKED TELEPHONE NUMBER OR IP ADDRESS 150
PROGRAMMABLE INTERFACE MEANS 140
RINGING TONE GENERATOR / AUTO ANSWER MODULE 50
PERIODIC STATUS REPORT GENERATION MEANS 130
ANTENNA 20
BATTERY CHARGE MONITOR 35
BATTERY 30
TELEPHONE CIRCUIT 10
BLUETOOTH MODULE 40
SOUND-BYTE CAPTURE MEANS + THRESHOLD DETECTOR 100
SMS ALARM GENERATION MEANS 70
SMS PROCESSING MEANS 60
SENSOR MEANS 80
AUTHENTICATION MEANS 90
PERMITTED CALLERS LIST 110
ALARM MESSAGE LIST 120

Fig. 1

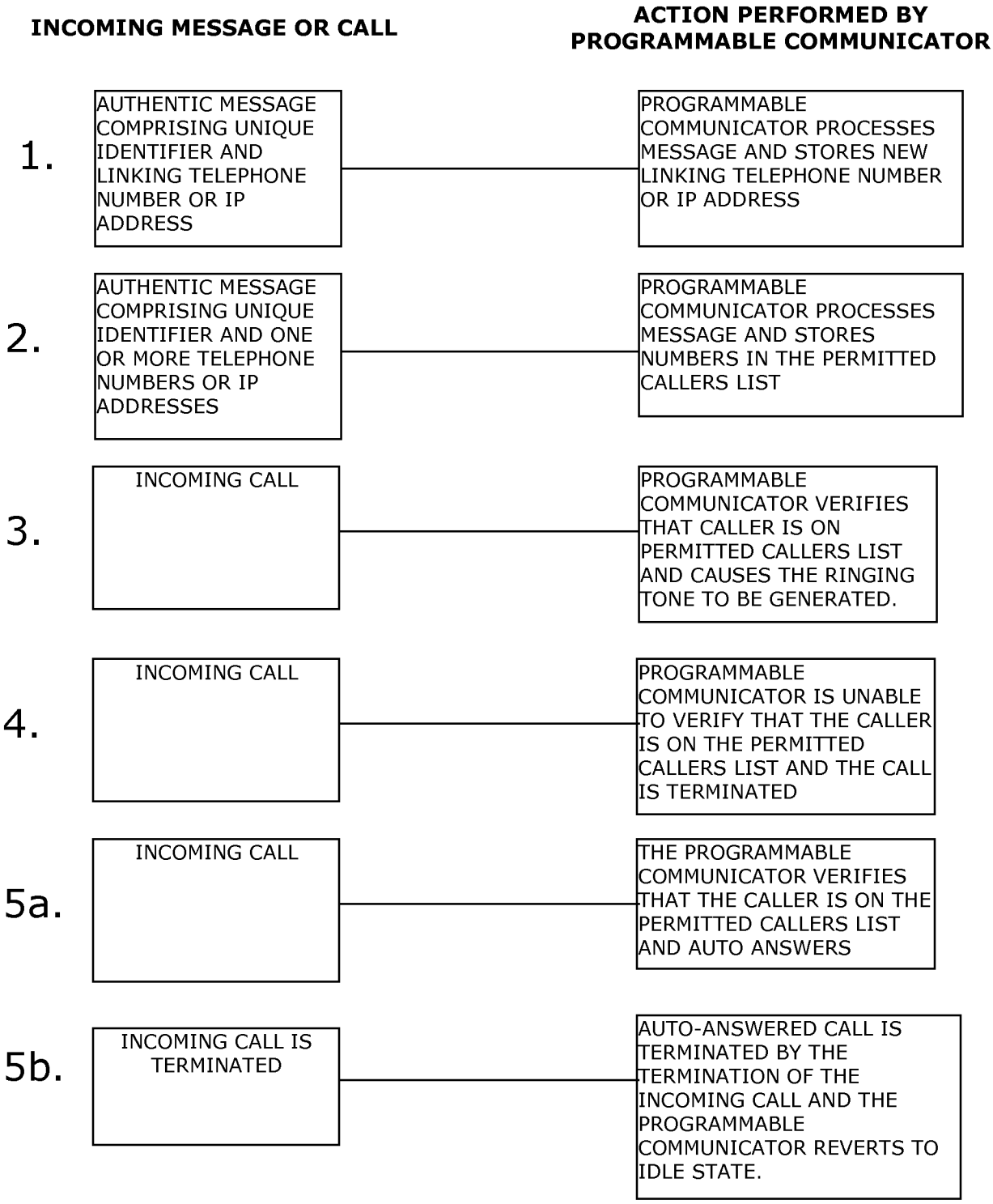
INCOMING MESSAGE OR CALL
ACTION PERFORMED BY PROGRAMMABLE COMMUNICATOR
1.
AUTHENTIC MESSAGE COMPRISING UNIQUE IDENTIFIER AND LINKING TELEPHONE NUMBER OR IP ADDRESS
PROGRAMMABLE COMMUNICATOR PROCESSES MESSAGE AND STORES NEW LINKING TELEPHONE NUMBER OR IP ADDRESS
2.
AUTHENTIC MESSAGE COMPRISING UNIQUE IDENTIFIER AND ONE OR MORE TELEPHONE NUMBERS OR IP ADDRESSES
PROGRAMMABLE COMMUNICATOR PROCESSES MESSAGE AND STORES NUMBERS IN THE PERMITTED CALLERS LIST
3.
INCOMING CALL
PROGRAMMABLE COMMUNICATOR VERIFIES THAT CALLER IS ON PERMITTED CALLERS LIST AND CAUSES THE RINGING TONE TO BE GENERATED.
4.
INCOMING CALL
PROGRAMMABLE COMMUNICATOR IS UNABLE TO VERIFY THAT THE CALLER IS ON THE PERMITTED CALLERS LIST AND THE CALL IS TERMINATED
5a.
INCOMING CALL
THE PROGRAMMABLE COMMUNICATOR VERIFIES THAT THE CALLER IS ON THE PERMITTED CALLERS LIST AND AUTO ANSWERS
5b.
INCOMING CALL IS TERMINATED
AUTO-ANSWERED CALL IS TERMINATED BY THE TERMINATION OF THE INCOMING CALL AND THE PROGRAMMABLE COMMUNICATOR REVERTS TO IDLE STATE.

Fig.2

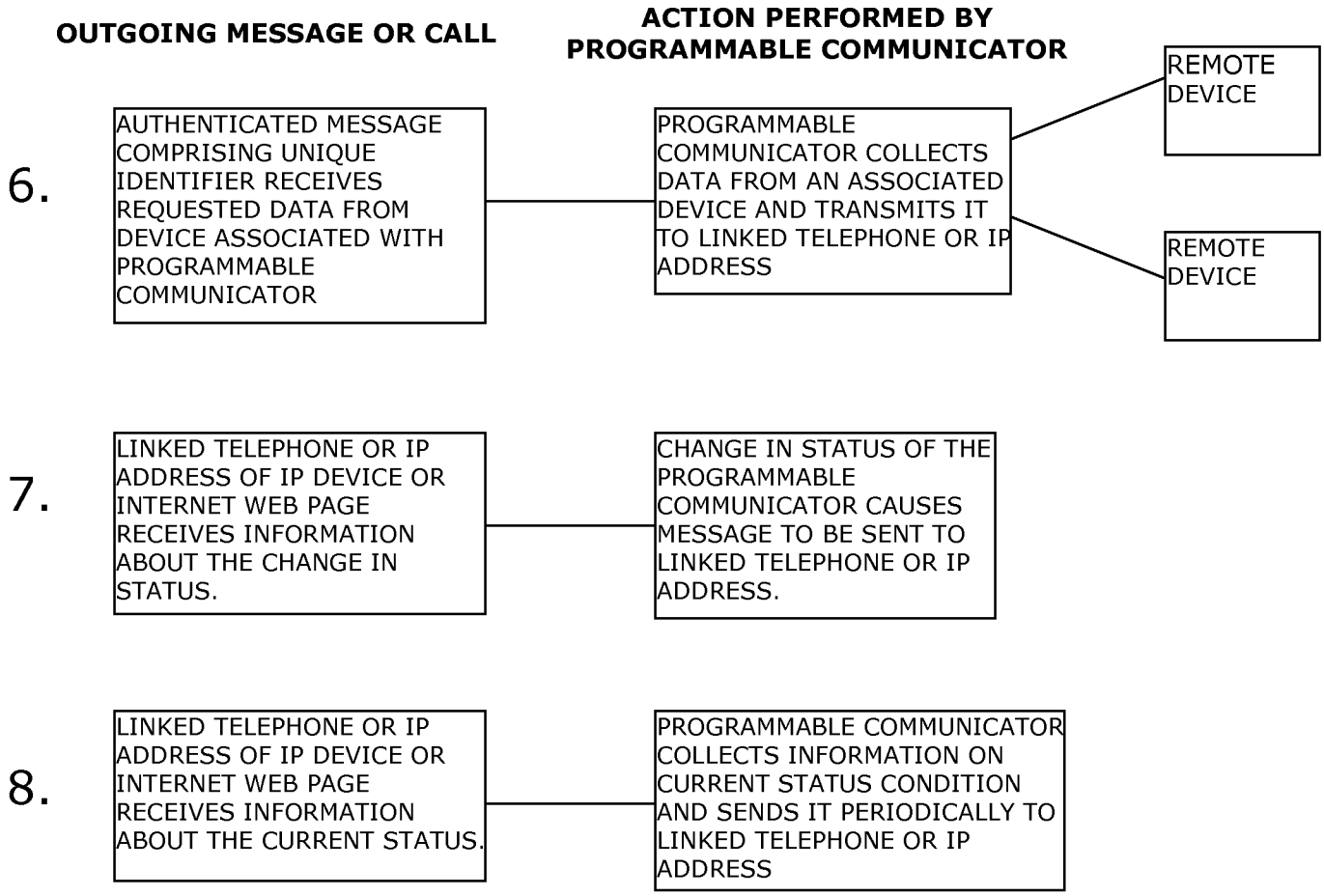
OUTGOING MESSAGE OR CALL
ACTION PERFORMED BY PROGRAMMABLE COMMUNICATOR
6.
AUTHENTICATED MESSAGE COMPRISING UNIQUE IDENTIFIER RECEIVES REQUESTED DATA FROM DEVICE ASSOCIATED WITH PROGRAMMABLE COMMUNICATOR
PROGRAMMABLE COMMUNICATOR COLLECTS DATA FROM AN ASSOCIATED DEVICE AND TRANSMITS IT TO LINKED TELEPHONE OR IP ADDRESS
REMOTE DEVICE
REMOTE DEVICE
7.
LINKED TELEPHONE OR IP ADDRESS OF IP DEVICE OR INTERNET WEB PAGE RECEIVES INFORMATION ABOUT THE CHANGE IN STATUS.
CHANGE IN STATUS OF THE PROGRAMMABLE COMMUNICATOR CAUSES MESSAGE TO BE SENT TO LINKED TELEPHONE OR IP ADDRESS.
8.
LINKED TELEPHONE OR IP ADDRESS OF IP DEVICE OR INTERNET WEB PAGE RECEIVES INFORMATION ABOUT THE CURRENT STATUS.
PROGRAMMABLE COMMUNICATOR COLLECTS INFORMATION ON CURRENT STATUS CONDITION AND SENDS IT PERIODICALLY TO LINKED TELEPHONE OR IP ADDRESS

Fig. 3

3781/0001

GENERAL POWER OF ATTORNEY

I/we hereby appoint the practitioners associated with the Customer Number: **02101**

with the firm: SUNSTEIN KANN MURPHY & TIMBERS LLP
125 Summer Street
Boston, MA 02110-1618
United States

As attorneys to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications where the assignee is named as an applicant or where the applications are assigned to the undersigned according to the USPTO assignment records or assignment documents, in which case the details will be listed on an attached form in accordance with 37 CFR 3.73(c).

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Direct all telephone calls to: 617-443-9292
Facsimiles to: 617-443-0004

(a) Full name and registered address of Assignee

I/We, (a) M2M Solutions LLC
Assignee

Camden House, School Lane, Tiddington, Stratford-Upon-Avon
United Kingdom CV37 7AJ
Address

Dated this 5th day of February 2013

(b) Signature of Assignee

(b) Philip B Wesby

By (c) PHILIP B. WESBY

(c) Signatory's name

(d) Signatory's Title

(d) Title: C.E.O.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Filer:	Jonathan Lovely
Attorney Docket Number:	3781/1010

Filed as Small Entity

Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	98	98
Utility Search Fee	2111	1	310	310
Utility Examination Fee	2311	1	125	125
Request for Prioritized Examination	2817	1	2400	2400
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Publ. Fee- Early, Voluntary, or Normal	1504	1	300	300
Processing Fee, Except for Provis. Apps	1808	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**3363**

Electronic Acknowledgement Receipt

EFS ID:	15211541
Application Number:	13801773
International Application Number:	
Confirmation Number:	7047
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby van-Swaay
Customer Number:	2101
Filer:	Jonathan Lovely
Filer Authorized By:	
Attorney Docket Number:	3781/1010
Receipt Date:	13-MAR-2013
Filing Date:	
Time Stamp:	19:04:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$3363
RAM confirmation Number	15640
Deposit Account	194972
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	TrackOne Request	3781_1010_TrackOneRequest.pdf	106936 01f174ba9cd19b9316cde209f9af0b8dba2f9878	no	2
Warnings:					
Information:					
2	Application Data Sheet	klw3781_1010_ADS.pdf	1433369 f495a5086e9938b893e044b75a5c5a9fbd12bf0d	no	6
Warnings:					
Information:					
3		klw3781_1010_Application.pdf	120833 7b400ef16794b64496f5593f9f866eb38d1e833f	yes	25

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	20
Claims	21	24
Abstract	25	25

Warnings:					
Information:					
4	Drawings-only black and white line drawings	klw3781_1010_Drawings.pdf	54848 2f23dbfa0f34d1605be67a4a909ea2b2ffa4cca5	no	3
Warnings:					
Information:					
5	Oath or Declaration filed	3781_1010_Declaration.pdf	69533 4e6dfbee781ff358a41a854f09e76f768e741c6e	no	1
Warnings:					
Information:					
6	Power of Attorney	3781_GenPOA.pdf	162088 8f288f19c3c6140aaa7380209aa4a2d230becc55	no	1
Warnings:					

Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	39718 1c8dcae51ffd310daff0a305af56df0807302 70b	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	1987325	

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National Stage of an International Application under 35 U.S.C. 371
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

(For Application filed on or after September 16, 2012)

Title of Invention: Programmable Communicator

This declaration is directed to:

■ The attached application, or

□ United States application or PCT international application number _____
filed on _____
as amended on _____ (if applicable).

The application was made or was authorized to be made by me.

I have reviewed and understand the contents of the above-identified application.

I believe myself to be the original inventor or an original joint inventor of a claimed invention in the application.

I acknowledge the duty to disclose to the US Patent and Trademark Office all information known to me to be material to patentability.

I hereby acknowledge that any willful false statement made in this Declaration is punishable under 18 U.S.C. § 1001, by fine or imprisonment of not more than five years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Eveline Wesby-van Swaay Date: 13 March 2013

Signature: _____

03781/01010 1796280.1