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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/329,411	12/05/2008	Beth Marcus	10046-2000102

CONFIRMATION NO. 8728

POA ACCEPTANCE LETTER



51417
Mauriel Kapouytian Woods LLP
27 W. 24th Street
Suite #302
New York, NY 10010

Date Mailed: 10/04/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/24/2013.

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.

/sharris/

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



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/329,411	12/05/2008	Beth Marcus	09096-8001.US02

CONFIRMATION NO. 8728

POWER OF ATTORNEY NOTICE

97075
Perkins Coie LLP - SDO General
PO Box 1247
Seattle, WA 98111-1247



Date Mailed: 10/04/2013

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/24/2013.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/sharris/

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

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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

Practitioners associated with the Customer Number: 51417

OR

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

The address associated with Customer Number: 51417

OR

<input type="checkbox"/> Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		


Assignee Name and Address:

Zeemote Technology Inc.
7F, No. 102, Sec. 4, Civic Blvd.
Daan District, Taipei, Taiwan, 106

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	Apr. 1st 2011
Name	Arron Fang	Telephone	
Title	President		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	16942025
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	HUMAN INTERFACE SYSTEM
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	97075
Filer:	Michael John Mauriel/Jasmine Habbas
Filer Authorized By:	Michael John Mauriel
Attorney Docket Number:	09096-8001.US02
Receipt Date:	24-SEP-2013
Filing Date:	05-DEC-2008
Time Stamp:	16:02:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	100462000102_ChangeofCorrespondence.pdf	586053 <small>c08ad3439245e20879863304f9a18ee73544e513</small>	no	2

Warnings:

Information:

2	Assignee showing of ownership per 37 CFR 3.73.	100462000102_POAtransandSuppsheet.pdf	508880	no	4
			2b1fc55518f81a2eff989f88dbca6c67ebc3d27e		

Warnings:

Information:

3	Power of Attorney	100462000102_POA.pdf	65072	no	1
			e2b7040ffa059dc4b67b89126c1d7e33aa09ee11		

Warnings:

Information:

Total Files Size (in bytes):			1160005		
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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.

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.

**CHANGE OF
CORRESPONDENCE ADDRESS
Patent**Address to:
Mail Stop Post Issue
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Patent Number	7,667,692
Issue Date	February 23, 2010
Application Number	12/329,411
Filing Date	December 5, 2008
First Named Inventor	Beth Marcus
Attorney Docket Number	10046-2000102

Please change the Correspondence Address for the above-identified patent to:



The address associated with Customer Number:

51417

OR**Firm or
Individual Name****Address****City****State****ZIP****Country****Telephone****Email**

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

This form will not affect any "fee address" provided for the above-identified patent. To change a "fee address" use the "Fee Address Indication Form" (PTO/SB/47).

I am the:



Patentee.



If the Patentee was not the applicant for patent (37 CFR 1.42), then a Statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is enclosed or was filed on _____. See 37 CFR 3.71.

Attorney or agent of record. Registration Number 44226.Patent practitioner acting in a representative capacity whose correspondence address is the correspondence address of record. Notice has been given to the patentee or owner. Registration Number 44226.

Signature /Michael Mauriel/ Reg. No. 44,226

Typed or
Printed Name Michael Mauriel, Reg. No. 44,226

Date September 24, 2013

Telephone 212-529-5131

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 _____ forms are submitted.

This collection of information is required by 37 CFR 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop Post Issue, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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.

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.

STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: Beth Marcus; David W. LeeApplication No./Patent No.: 7,667,692 Filed/Issue Date: February 23, 2010Titled: HUMAN INTERFACE SYSTEMZeemote Technology Inc., a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. The assignee of the entire right, title, and interest.
2. An assignee of less than the entire right, title, and interest (check applicable box):
- The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Beth Marcus, David W. Lee To: Zeemote, Inc.The document was recorded in the United States Patent and Trademark Office at
Reel 022199, Frame 0504, or for which a copy thereof is attached.2. From: Beth Marcus, David W. Lee To: Marcus Enterprises, Ltd.The document was recorded in the United States Patent and Trademark Office at
Reel 022261, Frame 0309, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). 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 1.11 and 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: Marcus Enterprises, Ltd. To: Zietoo, Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 022276, Frame 0591, or for which a copy thereof is attached.

4. From: Zietoo, Inc. To: Zeemote, Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 022295, Frame 0596, or for which a copy thereof is attached.

5. From: Zeemote, Inc. To: Fish & Richardson, P.C.

The document was recorded in the United States Patent and Trademark Office at
Reel 023472, Frame 0483, or for which a copy thereof is attached.

6. From: Zeemote, Inc. To: Zeemote, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 023905, Frame 0564, or for which a copy thereof is attached.

Additional documents in the chain of title are listed on a supplemental sheet(s).

As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Michael Mauriel/ Reg. No. 44,226

September 24, 2013

Signature

Date

Michael Mauriel

Attorney for Applicant; Reg. No. 44,226

Printed or Typed Name

Title or Registration Number

7. From: Fish & Richardson, P.C. To: Zeemote, Inc.

This document was recorded in the U.S.P.T.O at

Reel: 023768, Frame: 0631

8. From: Zeemote LLC To: Zeemote Technology Inc.

This document was recorded in the U.S.P.T.O at

Reel: 025137, Frame: 0714

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.

Attorney Docket No.: 10046-2000102
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:
Beth Marcus

Application No.: 12/329,411

Patent Number: 7,667,692

Filing Date: December 5, 2008

Issue Date: February 23, 2010

Title: HUMAN INTERFACE SYSTEM

FEE DEFICIENCY STATEMENT AND PAYMENT UNDER 37 C.F.R. 1.28

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

Dear Sir:

Assignee has recently learned that the amount paid for the 3.5 year maintenance fee for the above-referenced patent may have been deficient. In an abundance of caution, this paper hereby requests the Director to charge payment to Deposit Account No. 50-4242 in the amount of \$800.00, referencing docket number 10046-2000102. This payment amount is the difference between the amount paid and the current large entity fee amount for a 3.5 year maintenance fee. An itemization as required under 37 C.F.R. 1.28(c) is provided below.

Fee Type	Date Paid	Amount Paid	Current Large Entity Fee	Deficiency Amount
3.5 Year Maintenance Fee	July 24, 2013	\$800	\$1600	\$800

09/26/2013 MBANGURA 00000006 504242 7667692

01 FC:1599 800.00 DA

Application Serial No.: 12/329,411

Attorney Docket No.: 10046-2000102

The Director is also hereby authorized to charge any additional fees which may be required by this paper to Deposit Account No. 50-4242, referencing docket no. 10046-2000102.

Dated: September 24, 2013

Respectfully submitted,

By:/Michael Mauriel/ Reg. No. 44,226
Michael Mauriel
Registration No.: 44,226
Mauriel Kapouytian Woods LLP
27 West 24th Street, Suite 302
New York, New York 10010
(212) 529-5131
Attorney for Applicant



New York Office
 27 W. 24th Street Suite 302
 New York, New York 10010
 Phone: 212-529-5131
 Fax: 212-529-5132
 Email: info-ny@mkwlp.com

California Office
 1517 North Point Street #454
 San Francisco, California 94123
 Phone: 415-992-3420
 Fax: 415-992-3421
 Email: info-ca@mkwlp.com

www.mkwlp.com

FAX COVER SHEET

DATE: September 24, 2013

TO: Maintenance Fee Branch

FAX: 571-273-6500

FROM: Michael Mauriel

RE: Fee Deficiency
 US Patent Application No. 12/329,411; Patent No.
 7,667,692

PAGES: 3 (including cover)

Contents:

1. Fee Deficiency Statement and Payment under 37 C.F.R. 1.28



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
12/329,411	12/05/2008	Beth Marcus	19146-0002003

CONFIRMATION NO. 8728

POWER OF ATTORNEY NOTICE

20985
FISH & RICHARDSON P.C. (SD)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022



Date Mailed: 03/17/2011

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/03/2010.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/tmwilliams/

Office of Data Management, 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
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12/329,411	12/05/2008	Beth Marcus	19146-0002003

CONFIRMATION NO. 8728

POA ACCEPTANCE LETTER

97075
Perkins Coie LLP
PO Box 1247
Seattle, WA 98111-1247



Date Mailed: 03/17/2011

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/tmwilliams/

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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Beth Marcus et al.

Application No./Patent No.: 7,667,692 Filed/Issue Date: February 23, 2010

Titled: HUMAN INTERFACE SYSTEM

Zeemote Technology Inc., a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

- 1. the assignee of the entire right, title, and interest in;
- 2. an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
- 3. an assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above by virtue of either:

A. An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

- 1. From: Beth MARCUS, W. David LEE To: Zeemote, Inc.
The document was recorded in the United States Patent and Trademark Office at Reel 022199, Frame 0504, or for which a copy thereof is attached.
- 2. From: Beth MARCUS, W. David LEE To: Marcus Enterprises, LTD.
The document was recorded in the United States Patent and Trademark Office at Reel 022261, Frame 0309, or for which a copy thereof is attached.
- 3. From: Marcus Enterprises, LTD. To: Zictoo, Inc.
The document was recorded in the United States Patent and Trademark Office at Reel 022276, Frame 0591, or for which a copy thereof is attached.

Additional documents in the chain of title are listed on a supplemental sheet(s).

As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Hwa C. Lee 59,747/
Signature

November 3, 2010
Date

Hwa Lee, Reg. No. 59,747
Printed or Typed Name

Attorney for Assignee
Title

STATEMENT UNDER 37 CFR 3.73(b) - Supplemental Sheet

Continuation of chain of title from the inventor(s) to the current assignee.

4. From: Zietoo, Inc. To: Zeemote, Inc.
 The document was recorded in the United States Patent and Trademark Office at
 Reel 022295 , Frame 0596 , or for which a copy thereof is attached.
5. From: Zeemote, Inc. To: Fish & Richardson, P.C.
 The document was recorded in the United States Patent and Trademark Office at
 Reel 023472 , Frame 0483 , or for which a copy thereof is attached.
6. From: Fish & Richardson, P.C. To: Zeemote, Inc.
 The document was recorded in the United States Patent and Trademark Office at
 Reel 023768 , Frame 0631 , or for which a copy thereof is attached.
7. From: Zeemote, Inc. To: Zee Holding LLC
 The document was recorded in the United States Patent and Trademark Office at
 Reel 023778 , Frame 0132 , or for which a copy thereof is attached.
8. From: Zeemote, Inc. To: Zeemote LLC
 The document was recorded in the United States Patent and Trademark Office at
 Reel 023905 , Frame 0564 , or for which a copy thereof is attached.
9. From: Zeemote LLC To: Zeemote Technology Inc.
 The document was recorded in the United States Patent and Trademark Office at
 Reel 025137 , Frame 0714 , or for which a copy thereof is attached.

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

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

Practitioners associated with the Customer Number:

97075

OR

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

The address associated with Customer Number:

97075

OR

<input type="checkbox"/> Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

Assignee Name and Address:

Zeemote Technology Inc.
 6F, No. 102, Sec. 4, Civic Blvd.
 Daan District, Taipei, Taiwan

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature	<i>Robert M. Pedoloff</i>	Date	7/30/10
Name	Robert M. Pedoloff	Telephone	339-234-5740
Title	Chief Technical Officer		x 200

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, 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.

If you need assistance in completing the form, call 1-800-PTO-3198 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	8759573
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	HUMAN INTERFACE SYSTEM
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Dana Spear
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	03-NOV-2010
Filing Date:	05-DEC-2008
Time Stamp:	13:41:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73(b).	2010-11-03_POA.PDF	363719 <small>f11853d613fb378b73caa0c62dee0d124f4698fc</small>	no	3

Warnings:

Information:

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
CERTIFICATE OF CORRECTION

PATENT NO. : 7,667,692 B2
APPLICATION NO. : 12/329411
DATED : February 23, 2010
INVENTOR(S) : Beth Marcus and W. David Lee

Page 1 of 1

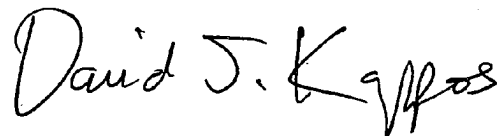
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE CLAIMS:

Column 16, line 6 (Claim 6), delete "The method of claim 3" and insert --The method of claim 1--.

Signed and Sealed this

Twenty-fifth Day of May, 2010



David J. Kappos
Director of the United States Patent and Trademark Office

Staple
Here
Only

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 1 of 2

PATENT No. .: 7,667,692
APPLICATION NO .: 12/329,411
DATED .: FEBRUARY 23, 2010
INVENTOR(S) .: BETH MARCUS AND W. DAVID LEE

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE CLAIMS:

Column 16, line 6 (Claim 6), delete “The method of claim 3” and insert “The method of claim 1”.

MAILING ADDRESS OF SENDER:

Hwa C. Lee
Fish & Richardson P.C.
P.O. Box 1022
Minneapolis, Minnesota 55440-1022

Electronic Acknowledgement Receipt

EFS ID:	7449994
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	HUMAN INTERFACE SYSTEM
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Kelly Smith
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	20-APR-2010
Filing Date:	05-DEC-2008
Time Stamp:	15:10:45
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 Certificate of Correction	19146-0002003TRCOC.pdf	49490 <small>048d98a245e92398eae9447c138bed2e8093e030</small>	no	2

Warnings:

Information:

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 NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/329,411	02/23/2010	7667692	19146-0002003	8728

20985 7590 02/03/2010
 FISH & RICHARDSON, PC
 P.O. BOX 1022
 MINNEAPOLIS, MN 55440-1022

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):

Beth Marcus, Bedford, MA;
 W. David Lee, Newton, MA;

Applicant : Beth Marcus et al.
Serial No. : 12/329,411
Filed : December 5, 2008
Page : 2 of 2

Attorney's Docket No.: 19146-0002003

Respectfully submitted,

Date: January 4, 2009

/Hwa C. Lee/

Hwa C. Lee
Reg. No. 59,747

Fish & Richardson P.C.
PTO Customer No 20985
Telephone: (858) 678-5070
Facsimile: (877) 769-7945

10961648.doc

Electronic Patent Application Fee Transmittal

Application Number:	12329411
Filing Date:	05-Dec-2008
Title of Invention:	HUMAN INTERFACE SYSTEM
First Named Inventor/Applicant Name:	Beth Marcus
Filer:	Hwa C. Lee/Line Gauthier
Attorney Docket Number:	19146-0002003

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	755	755
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1055

Electronic Acknowledgement Receipt

EFS ID:	6739761
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	HUMAN INTERFACE SYSTEM
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/mary ann reed
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	04-JAN-2010
Filing Date:	05-DEC-2008
Time Stamp:	13:45:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$1055
RAM confirmation Number	16
Deposit Account	061050
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Issue Fee Payment (PTO-85B)	19146-0002003_Issue_Fee_Payment.pdf	161700	no	3
			e471955d46d1449dea11bfe9957ee365f6a3a163		

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	31815	no	2
			24d1b07728e9692d19730fa9d82d0b449dfa8d42		

Warnings:

Information:

Total Files Size (in bytes):			193515		
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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.



NOTICE OF ALLOWANCE AND FEE(S) DUE

20985 7590 10/01/2009

FISH & RICHARDSON, PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER
OSORIO, RICARDO
ART UNIT PAPER NUMBER

2629
DATE MAILED: 10/01/2009

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
Values: 12/329,411, 12/05/2008, Beth Marcus, 19146-000203, 8728

TITLE OF INVENTION: HUMAN INTERFACE SYSTEM

Table with 7 columns: APPLN. TYPE, SMALL ENTITY, ISSUE FEE DUE, PUBLICATION FEE DUE, PREV. PAID ISSUE FEE, TOTAL FEE(S) DUE, DATE DUE
Values: nonprovisional, YES, \$755, \$300, \$0, \$1055, 01/04/2010

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 SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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)

20985 7590 10/01/2009

FISH & RICHARDSON, PC
 P.O. BOX 1022
 MINNEAPOLIS, MN 55440-1022

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.
12/329,411	12/05/2008	Beth Marcus	19146-0002003	8728

TITLE OF INVENTION: HUMAN INTERFACE SYSTEM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	01/04/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
OSORIO, RICARDO	2629	345-169000

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, 1 _____

(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. 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)

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO. Includes application details for Beth Marcus and examiner OSORIO, RICARDO.

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.

Notice of Allowability

Application No. 12/329,411	Applicant(s) MARCUS ET AL.	
Examiner RICARDO L. OSORIO	Art Unit 2629	

-- 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 9/2/2009.
- 2. The allowed claim(s) is/are 22-41.
- 3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - 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.

- 4. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 - 5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) 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. Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3. Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 9/18/2009
- 4. Examiner's Comment Regarding Requirement for Deposit of Biological Material
- 5. Notice of Informal Patent Application
- 6. Interview Summary (PTO-413),
Paper No./Mail Date _____.
- 7. Examiner's Amendment/Comment
- 8. Examiner's Statement of Reasons for Allowance
- 9. Other _____.

Art Unit: 2629

DETAILED ACTION

Allowable Subject Matter

1. Claims 22-41 are allowed.

The following is an examiner's statement of reasons for allowance: Claims 22-41 are allowable since certain key features of the claimed invention are not taught or fairly suggested by the prior art. In claims 22 and 33, "**selectively disposing on a second surface a second input assembly having one or more input elements configured to be manipulated by one or more of the human user's fingers, wherein at least one of the input elements of the second input assembly is further configured to selectively map to one or more of the input functions associated with the selected application**". The closest prior art of record of record however singularly or in combination fails to anticipate or render the above underlined limitations obvious.

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."


2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RICARDO L. OSORIO whose telephone number is (571) 272-7676. The examiner can normally be reached on MONDAY-THURSDAY 7:00 am-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, AMARE MENGISTU can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

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). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


/RICARDO L OSORIO/
Primary Examiner, Art Unit 2629

Issue Classification 	Application/Control No. 12329411	Applicant(s)/Patent Under Reexamination MARCUS ET AL.
	Examiner RICARDO L OSORIO	Art Unit 2629

ORIGINAL						INTERNATIONAL CLASSIFICATION												
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED							
345			169			G	0	9	G	5 / 00 (2006.01.01)								
CROSS REFERENCE(S)																		
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																	
345	168																	

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
X	1	X	17	12	33										
X	2	X	18	13	34										
X	3	X	19	14	35										
X	4	X	20	15	36										
X	5	X	21	16	37										
X	6	1	22	17	38										
X	7	2	23	18	39										
X	8	3	24	19	40										
X	9	4	25	20	41										
X	10	5	26												
X	11	6	27												
X	12	7	28												
X	13	8	29												
X	14	9	30												
X	15	10	31												
X	16	11	32												

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)	O.G. Print Claim(s)	O.G. Print Figure
/RICARDO L OSORIO/ Primary Examiner.Art Unit 2629	9/27/2009	22	3a, 3b
(Primary Examiner)	(Date)		

Search Notes 	Application/Control No. 12329411	Applicant(s)/Patent Under Reexamination MARCUS ET AL.
	Examiner RICARDO L OSORIO	Art Unit 2629

SEARCHED			
Class	Subclass	Date	Examiner
345	156, 168, 169, 173	9/27/09	RLO
400	472	9/27/09	RLO
341	22	9/27/09	RLO

SEARCH NOTES		
Search Notes	Date	Examiner
EAST update and inventor search and interference search history	9/27/09	RLO

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
345	169, 168	9/27/09	RLO

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EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	199763	hand adj held or hand-held and weapon adj fire adj button	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L2	3810	L1 and first adj surface	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L3	2850	L2 and second adj surface	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L4	19	((BETH) near2 (MARCUS)).INV.	US-PGPUB; USPAT	OR	ON	2009/09/27 14:39
L5	1644	((W) near2 (LEE)).INV.	US-PGPUB; USPAT	OR	ON	2009/09/27 14:39
L6	13	L3 and delineated adj2 (area or section or part or surface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L7	2223	delineated adj2 (area or section or part or surface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L8	69	L7 and "345"/\$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L9	62	L8 not L6	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39

L10	9	L9 and 345/156,173.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L11	1658	L4 L5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L12	9	L11 and delineated adj2 (area or section or part or surface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L13	1	(hand-held and processor and first adj surface and second adj surface and sensor adj pad and first adj function and second adj function and third adj function and delineated adj active adj area and application).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L14	427101	hand-held or hand adj held or pda	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L15	65447	L14 and game	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L16	3379	L15 and fire	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L17	1743	L16 and pad	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39

L18	85	L17 and first adj (side or surface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L19	62	L18 and second adj (side or surface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L20	4	L19 and (directional or D) adj pad	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L21	62	L19 and (control\$4 or process\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L22	22	(US-20030197688-\$ or US-20050091431-\$ or US-20040208681-\$ or US-20040069600-\$ or US-20040263479-\$ or US-20020067343-\$ or US-20020019259-\$).did. or (US-6587094-\$ or US-6842170-\$ or US-6788294-\$ or US-7088339-\$ or US-5576733-\$ or US-6132118-\$ or US-7010333-\$ or US-6747635-\$ or US-7002553-\$ or US-5410333-\$ or US-6947028-\$ or US-6164853-\$ or US-6909424-\$ or US-6297752-\$ or US-6107988-\$ or US-5515305-\$ or US-7286341-\$ or US-7170496-\$).did.	US-PGPUB; USPAT	OR	ON	2009/09/27 14:39

L23	3	L22 and gyrosco\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L24	3	L22 and (accelerometer or acceleration adj sens\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L25	3	L23 and L24	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L26	3	("2002/0019259").URPN.	USPAT	OR	ON	2009/09/27 14:39
L27	11	((("6947028") or ("6107988") or ("6909424") or ("5515305") or ("6297752")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/09/27 14:39
L28	3	"20040208681"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L29	8	"2004/0208681"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L30	1	dechene and joseph and fernand	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L31	8	("2004/0208681").URPN.	USPAT	OR	ON	2009/09/27 14:39
L32	35	((two-sided or (dual or double) adj side\$3) near3 (hand-held or input adj device))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39

L33	0	("31andgame").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/09/27 14:39
L34	3	L27 and game	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L35	3	"6909424".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L36	22	(US-20030197688-\$ or US-20050091431-\$ or US- 20040208681-\$ or US- 20040069600-\$ or US- 20040263479-\$ or US- 20020067343-\$ or US- 20020019259-\$).did. or (US-6587094-\$ or US- 6842170-\$ or US- 6788294-\$ or US- 7088339-\$ or US- 5576733-\$ or US- 6132118-\$ or US- 7010333-\$ or US- 6747635-\$ or US- 7002553-\$ or US- 5410333-\$ or US- 6947028-\$ or US- 6164853-\$ or US- 6909424-\$ or US- 6297752-\$ or US- 6107988-\$ or US- 5515305-\$ or US- 7286341-\$ or US- 7170496-\$).did.	US-PGPUB; USPAT	OR	ON	2009/09/27 14:39
L37	10	L36 and game	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39

L38	2	"7218313".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L39	577	hand-held and (palm adj top or pda) and game and fire and direction\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L40	402	hand-held and (palm adj top or pda) and game and fire and direction\$4 and pad	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L41	379	hand-held and (palm adj top or pda) and game and fire and direction\$4 and pad and processor	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L42	15	L41 and first adj surface	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L43	22	L41 and "345"/\$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L44	2	"7463245".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L45	513	osorio near3 ricardo	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L46	3	L45 and griffin near3 jason	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:39
L47	19	((BETH) near2 (MARCUS)).INV.	US-PGPUB; USPAT	OR	ON	2009/09/27 14:50

L48	1644	((W) near2 (LEE)).INV.	US-PGPUB; USPAT	OR	ON	2009/09/27 14:50
L49	1658	47 48	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:51
L50	408	49 and interface	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:51
L51	47	50 and first adj2 (surface or input)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:52
L52	27	51 and second adj (input or surface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:52
L53	12	52 and map\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:52
L54	9	52 and map\$4 with (function or application)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:53
L55	2	(human adj interface and hand-held and first adj surface and first adj input adj assembly and map\$4 and function and application and second adj surface and second adj input adj assembly).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/09/27 14:55

9/27/09 2:56:58 PM

C:\Documents and Settings\rosorio\My Documents\EAST\Workspaces\first and second surface
interface to optimize biomechanical effect of hand.wsp

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 19146-0002003	Application No. 12/329,411
	Applicant Beth Marcus et al.		
	Filing Date December 5, 2008		Group Art Unit 2629

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1	US 2003/0083114 A1	05/01/2003	Daniel Lavin et al.			10/11/2002
	2	US 2003/0095156 A1	05/22/2003	Sandro David Klein et al.			11/08/2002
	3	US 2004/0107303 A1	06/03/2004	Daniel Mulligan			11/26/2003

Foreign Patent Documents or Published Foreign Patent Applications


Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	4	DE 298 23 417 U1 & Machine Translation	05/06/1999	Germany			Machine Translation	
	5	EP 1 376 319 A1	01/02/2004	Europe				
	6	WO 03/007117 A2	01/23/2003	WIPO				
	7	WO 03/052948 A1	06/26/2003	WIPO				
	8	WO 2004/019315 A1	03/04/2004	WIPO				

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	9	Communication from the European Patent Office dated 02/11/2009.

Examiner Signature /Ricardo Osorio/	Date Considered 09/27/2009
--	-------------------------------

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Application Number 	Application/Control No. 12/329,411	Applicant(s)/Patent under Reexamination MARCUS ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL
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TERMINAL DISCLAIMER	<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Date Filed : 9/2/09	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
Janice Ford

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Beth Marcus et al. Art Unit: 2629
Serial No.: 12/329,411 Examiner: Ricardo Osorio
Filed: December 5, 2008 Conf. No.: 8728
Title: HUMAN INTERFACE SYSTEM

MAIL STOP AMENDMENT

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

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-1449 form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request. A copy of a communication from a foreign patent office in a corresponding application is also enclosed.

This statement is being filed after a first Office action on the merits, but before receipt of a final Office action or a Notice of Allowance. Please apply \$180 in payment of the late submission fee of §1.17(p) and any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: September 18, 2009

/Hwa C. Lee/
Hwa C. Lee
Reg. No. 59,747

Fish & Richardson P.C.
12390 El Camino Real
San Diego, California 92130
Telephone: (858) 678-5070
Facsimile: (877) 769-7945

HCL/jhg
10943566.doc

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 19146-0002003	Application No. 12/329,411
	Applicant Beth Marcus et al.		
	Filing Date December 5, 2008	Group Art Unit 2629	

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1	US 2003/0083114 A1	05/01/2003	Daniel Lavin et al.			10/11/2002
	2	US 2003/0095156 A1	05/22/2003	Sandro David Klein et al.			11/08/2002
	3	US 2004/0107303 A1	06/03/2004	Daniel Mulligan			11/26/2003

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	4	DE 298 23 417 U1 & Machine Translation	05/06/1999	Germany			Machine Translation	
	5	EP 1 376 319 A1	01/02/2004	Europe				
	6	WO 03/007117 A2	01/23/2003	WIPO				
	7	WO 03/052948 A1	06/26/2003	WIPO				
	8	WO 2004/019315 A1	03/04/2004	WIPO				

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	9	Communication from the European Patent Office dated 02/11/2009.

Examiner Signature	Date Considered
--------------------	-----------------

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Patent Application Fee Transmittal

Application Number:	12329411
Filing Date:	05-Dec-2008
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Filer:	Hwa C. Lee/Julie Giordano
Attorney Docket Number:	19146-0002003

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	1806	1	180	180
Total in USD (\$)				180

Electronic Acknowledgement Receipt

EFS ID:	6105501
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Julie Giordano
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	18-SEP-2009
Filing Date:	05-DEC-2008
Time Stamp:	20:43:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$180
RAM confirmation Number	5212
Deposit Account	061050
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Foreign Reference	191460002003Ref4.pdf	531982 d0e6e6130b7277bae6d59a9fcbf01772555b65	no	15
Warnings:					
Information:					
2	Foreign Reference	191460002003Ref5.pdf	122151 8fb5b47fa9fb41c0dcd2524c0568581cc4b691e9	no	6
Warnings:					
Information:					
3	Foreign Reference	191460002003Ref6.pdf	2068771 7db59ea8d503abcfc2de8416b92073d40e081809	no	38
Warnings:					
Information:					
4	Foreign Reference	191460002003Ref7.pdf	955224 0ce97daf384d2ffacd67e12fc0eef913374842	no	26
Warnings:					
Information:					
5	Foreign Reference	191460002003Ref8.pdf	4950736 ead6387635b9dde476e946ee88d7d5f68ace5574	no	81
Warnings:					
Information:					
6	Foreign Reference	191460002003Ref9.pdf	277211 0798e8033edcdd213c5edfaab79a47ab5915144	no	6
Warnings:					
Information:					
7	Information Disclosure Statement (IDS) Filed (SB/08)	191460002003IDS.pdf	36989 e8a37898378a325810d10916533ff77653a2f7e9	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
8	Fee Worksheet (PTO-875)	fee-info.pdf	29836 f3730452e14ffa528c065577d9703b72c7c80e56	no	2
Warnings:					
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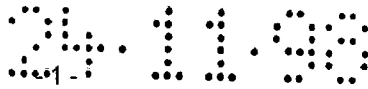
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54 Ergonomische, drahtlose, multifunktionale und kompakte Eingabe- und Anzeigevorrichtung

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Ergonomische, drahtlose, multifunktionale und kompakte Eingabe- und Anzeigevorrichtung

Zusammenfassung

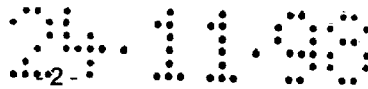
Die vorliegende Erfindung bezieht sich auf eine ergonomische, drahtlose, multifunktionale und kompakte Eingabe- und Anzeigevorrichtung, die aus verschiedenen Bausteinen besteht, die Licht-, Funk- oder Tonsignale senden („Multisender“) bzw. empfangen („Multiempfänger“) können, mit Steuerkugel („Trackball“) für einen stationären Computer sowie einen tragbaren Computer wie einen Notebook, Laptop, usw., mit versetzten Steuertasten und Steuerkugel, sowie Laserpointer und Mikrofon.

Beschreibung

Die vorliegende Erfindung bezieht sich auf eine ergonomische, drahtlose, multifunktionale und kompakte Eingabe- und Anzeigevorrichtung mit Steuerkugel („Trackball“) für einen Computer sowie einen tragbaren Computer wie einen Notebook, Laptop, usw. mit Einrichtungen für den drahtlosen Gebrauch z. B. besonders für Präsentationen und Vorführungen.

Aus dem Stand der Technik sind Eingabevorrichtungen mit Steuerkugel und andere Eingabevorrichtungen bekannt. Außerdem sind auch Laserstifte und Mikrofone bekannt. Aber alle Geräte sind getrennt und nicht ergonomisch und müssen separat benutzt werden. Aber häufig sind gerade deren Gebrauch eng miteinander verbunden. Daß Steuersignale und Datensignale auf einem gemeinsamen Kanal versendet werden können, ergibt sich zwar aus dem Stand der Technik. Aber in dem von uns angesprochenen Umfang, ergonomische, drahtlose, multifunktionale und kompakte Eingabe- und Anzeigevorrichtung, ist es jedoch unbekannt.

Der Erfindung liegt die Aufgabe zugrunde, eine ergonomische, multifunktionale und kompakte Eingabe- und Anzeigevorrichtung anzugeben, die außerdem drahtlos und in einer Hand zu führen ist. Diese hat den Vorteil, daß alle benötigten Eingabe- und Anzeigevorrichtung kompakt und ergonomisch in einer Hand vorhanden ist. Durch die drahtlose Übertragung der Signale durch die Luft, beispielsweise durch Licht



oder Funk, ist der Anwender auch uneingeschränkt in seiner Bewegungsfreiheit. Das eingebaute Mikrofon kann sowohl zur Tonbearbeitung, als auch zur Befehlsübertragung an den Computer und auch zur Aufnahme dienen.

Die erfindungsgemäße Vorrichtung zeichnet sich zum einen dadurch aus, daß sie hauptsächlich aus einer multifunktionalen Eingabe- und Anzeigevorrichtung mit Multisender 20 in Fig. 1, Fig. 4 und Fig. 7 und einem Multiempfänger besteht, der entweder integriert 15 in Fig. 10 und Fig. 11 im Computer oder als Steckkarte 17 in Fig. 10 und Fig. 11 möglich ist. Multisender 20 in Fig. 1, Fig. 4 und Fig. 7 sowie Multiempfänger sind mit einem Frequenzwahlschalter versehen, um eine optimale Übertragung und störungsfreien Betrieb zu gewährleisten.

Die multifunktionale Eingabe- und Anzeigevorrichtung zeichnet sich dadurch aus, daß zum einen die Klicktasten und der Schalter für den Mikrofon sowie die Taste für den Laserpointer mit der Steuerkugel nicht auf einer Ebene liegen. Vorzugsweise gibt es zwei verschiedene Varianten, die in den Figuren 1 - 3 und den Figuren 4 - 8 gezeigt werden.

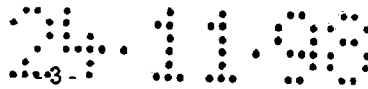
Bei der ersten Variante (Figuren 1 - 3) sitzt die Steuerkugel auf dem unteren Teil der Vorrichtung 11 in Fig. 2 und Fig. 3, so daß sie vorzugsweise mit dem Zeigefinger bewegt wird.

Die Klicktasten 2, 3 und 4 in Fig. 1 und der Mikrofonswitch 5 und die Taste für den Laserpointer 6 in Fig. 1 sind dann auf der oberen Seite angebracht (Fig. 1). Diese werden vorzugsweise durch den Daumen genutzt.

Bei der zweiten Variante (Figuren 4 - 8) ist nun die Steuerkugel 11 in Fig. 4 auf der oberen Seite der Vorrichtung angebracht und wird vorzugsweise mit dem Daumen gesteuert.

Die Klicktasten 2, 3, 4 in Fig. 7 und der Mikrofonswitch 5 und die Taste für den Laserpointer 6 in Fig. 7 sind auf der unteren Seite angebracht, so daß diese nun vorzugsweise mit dem Zeigefinger benutzt werden.

Auf der rechten Seite der Vorrichtung (Fig. 4) ist in dieser Variante eine weitere Klicktaste 12 in Fig. 4 angebracht, die gleiche Funktionen wie die Klicktaste 2 in Fig. 7 aufweist. Diese wird auch vorzugsweise mit dem Zeigefinger betätigt und ist z. B. besonders hilfreich beim „Ziehen“ auf dem Bildschirm. Für Linkshänder sollte es eine entsprechende Möglichkeit auf der linken Seite geben. Desweiteren zeichnet



sich die Vorrichtung dadurch aus, daß auf der oberen Seite ein eingebautes Mikrofon 7 in Fig. 1, Fig. 4 und Fig. 9 beinhaltet.

Außerdem zeichnet sich die Vorrichtung durch einen Schalter 10 in Fig. 3 und Fig. 6 aus, durch die die Vorrichtung ein- und ausgeschaltet werden kann.

Auch zeichnet sich die Vorrichtung durch einen Anschluß 9 in Fig. 1, Fig. 4, Fig. 7 und Fig. 9 aus, durch die die Vorrichtung mit Strom durch ein Ladegerät 13 in Fig. 9 geladen werden kann.

Desweiteren zeichnet sich die Vorrichtung dadurch aus, daß sie einen Multisender 20 in Fig. 1, Fig. 4 und Fig. 7 mit sich führt, das die Übertragung von Steuersignalen der Klicktasten und die Tonsignale senden kann (z. B. durch Licht oder Funk).

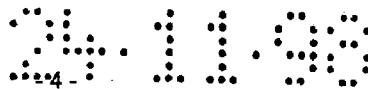
Die Vorrichtung zeichnet sich auch dadurch aus, daß sie auf der unteren Seite des Gehäuses Einkerbungen für die Finger, die die Eingabe- und Anzeigevorrichtung umschließen (Mittelfinger, Ringfinger und kleiner Finger) 19 in Fig. 3 und Fig. 6 besitzt, um ein ergonomisches Handhabe zu gewährleisten.

Die Vorrichtung zeichnet sich auch dadurch aus, daß sie auf der Frontseite eine Öffnung für den Laserpointer 8 in Fig. 2, Fig. 5 und Fig. 8 mit oder ohne Schärfeeinstellvorrichtung besitzt, um die Anzeigefunktion der Vorrichtung zu gewährleisten.

Die Vorrichtung zeichnet sich auch dadurch aus, daß sie an ein Ladegerät 13 in Fig. 9 angeschlossen werden kann, um so das eingebaute Akku 21 in Fig. 1, Fig. 4 und Fig. 7 aufzuladen. Auch ist ein Betrieb mit herkömmlichen Batterien 21 in Fig. 1, Fig. 4 und Fig. 7 möglich.

Der Multiempfänger zeichnet sich zum einen dadurch aus, daß die Empfänger für Tonsignale und Steuersignale getrennt oder zusammen in einer Einheit verschmolzen sind.

Desweiteren zeichnet sich dieser aus, daß er entweder im Computer eingebaut 15 in Fig. 10 und Fig. 11 oder als Computerzubehör 17 in Fig. 10 und Fig. 11 nach Bedarf vom Computerhersteller erhältlich ist, um so das Angebot attraktiver und effektiver gestalten zu können.



Die Erfindung wird im folgenden anhand einer vorteilhaften Ausführungsform unter Bezugnahme auf die beigefügten Zeichnungen beschrieben. Es zeigen:

- Fig. 1 in Draufsicht die erste Variante der Vorrichtung mit dem Griffgehäuse 1, den Klicktasten 2, 3, 4, dem Schalter für das Mikrofon 5, die Taste für den Laser 6, das eingebaute Mikrofon 7, den Multisender 20, den Akku oder Batteriefach 21 und den Ladegerätanschluß 9.
- Fig. 2 in Frontsicht die Klicktasten 2, 3, 4, die Öffnung für den Laserpointer 8 und die untere Steuerkugel 11.
- Fig. 3 in Seitenansicht von der linken Seite die Klicktaste 2, den Schalter für das Mikrofon 5, die Steuerkugel 11, den Schalter für das Ein- und Ausschalten der Vorrichtung 10 und die Einkerbungen 19.
- Fig. 4 in Draufsicht die zweite Variante der Vorrichtung mit der Steuerkugel 11, dem eingebauten Mikrofon 7, der Klicktaste auf der rechten Seite 12, dem Multisender 20, und dem Akku oder Batteriefach 21 und dem Ladegerätanschluß 9.
- Fig. 5 in Frontsicht die Klicktasten 2, 3, 4, die Klicktaste auf der rechten Seite 12, die Öffnung für den Laserpointer 8, und die Steuerkugel 11.
- Fig. 6 in Seitenansicht von der linken Seite die obere Steuerkugel 11, die Klicktaste 2, den Schalter für das Mikrofon 5, den Schalter für das Ein- und Ausschalten der Vorrichtung 10 und die Einkerbungen 19.
- Fig. 7 in der Ansicht von unten die Klicktasten 2, 3, 4, die Klicktaste auf der rechten Seite 12, den Schalter 5 für das Mikrofon, die Taste 6 für den Laserpointer, den Multisender 20, den Akku oder Batteriefach 21 und den Ladegerätanschluß 9.
- Fig. 8 in Frontsicht die Klicktasten 2, 3, 4, die Klicktaste auf der rechten Seite 12, die Öffnung für den Laserpointer 8, und die Steuerkugel 11.
- Fig. 9 in Standsicht die Eingabe- und Anzeigevorrichtung mit eingebautem Mikrofon 7, der Klicktaste auf der rechten Seite 12, der Steuerkugel 11, dem Anschluß 9 für das Ladegerät 13.
- Fig. 10 in perspektivischer Sicht einen tragbaren Computer 14 mit dem eingebauten Multiempfänger 15 oder dem Slot 16 für den ein- und ausbaubaren Multiempfänger 17.

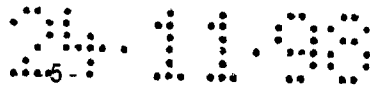
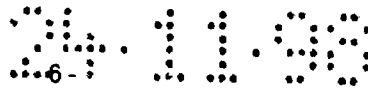
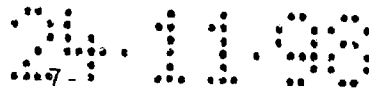


Fig. 11 in perspektivischer Sicht einen stationären Computer 18 mit dem eingebauten Multiempfänger 15 oder dem Slot 16 für den ein- und ausbaubaren Multiempfänger 17.



Schutzansprüche

1. Vorrichtung zur Eingabe von Signalen in ein Datenverarbeitungsgerät und Anzeige von Lichtsignalen für Computer und Präsentationen, umfassend eine Eingabe- und Anzeigevorrichtung (1) mit einem Multisender (20) und einen Multiempfänger (15 bzw. 17) mittels welchen Steuer-, Funk- und Lichtsignale gesendet und von dem Multiempfänger (15 bzw. 17) empfangen werden können, dadurch gekennzeichnet, daß sich auf dem Griffgehäuse die Steuerkugel (11) und die Klicktasten (2, 3, 4, 6, 12) und der Schalter (5) nicht auf einer Ebene befinden, daß die Vorrichtung verschiedene Signale (Licht-, Funk- und Tonsignale) zwecks Steuerung, Anzeige und Tonbearbeitung in einer Einheit verwendet und daß die Anzeige- und Eingabevorrichtung gekennzeichnet ist durch die Integration von Mikrofon und Laserpointer in einem Eingabegerät.
2. Vorrichtung nach Anspruch 1, gekennzeichnet durch das mit versetzten Klicktasten (2, 3, 4, 6, 12), Schalter (5) und Steuerkugel (11) versehene Griffgehäuse (1), wobei sich die Klicktasten (2, 3, 4, 6, 12) auf der oberen Seite und die Steuerkugel (11) auf der unteren Seite des Griffgehäuses befinden.
3. Vorrichtung nach Anspruch 1, gekennzeichnet durch das mit versetzten Klicktasten (2, 3, 4, 6, 12), Schalter (5) und Steuerkugel (11) versehene Griffgehäuse (1), wobei sich die Klicktasten (2, 3, 4, 6, 12) auf der unteren Seite und die Steuerkugel (11) auf der oberen Seite des Griffgehäuses befinden, wobei noch eine zusätzliche Klicktaste (12), die mit der Klicktaste (2) die gleiche Funktion hat, auf der rechten Seite des Griffgehäuses, bei Linkshändern auch auf der rechten Seite, angebracht ist.
4. Vorrichtung nach Anspruch 1, gekennzeichnet durch die Möglichkeit, Steuersignale der Steuerkugel (11) und Signale der Klicktasten (2, 4, 6, 12) dem Computer durch die Luft zu senden.
5. Vorrichtung nach Anspruch 1, gekennzeichnet durch ein integriertes Mikrofon (7), das sowohl zur Tonbearbeitung, als auch zur



- Befehlsübertragung und zur Aufnahme dienen kann, der durch den Schalter (5) ein- und ausgeschaltet werden kann.
6. Vorrichtung nach Anspruch 1, gekennzeichnet durch einen integrierten Laserpointer (8), dessen Schärfe entweder einstellbar oder fest ist.
 7. Vorrichtung nach Anspruch 1, gekennzeichnet durch einen Multisender (20), der sowohl die Steuersignale der Steuerkugel (11) und der Klicktasten (2, 3, 4, 6, 12) als auch die Signale des integrierten Mikrofons senden kann, wobei das Gerät entweder getrennt oder zusammen auf einer Platine im Griffgehäuse angebracht ist.
 8. Vorrichtung nach Anspruch 1, gekennzeichnet durch einen Multiempfänger (15 bzw. 17), der sowohl die Steuersignale der Steuerkugel (11) und der Klicktasten (2, 3, 4, 6, 12) als auch die Signale des integrierten Mikrofons empfangen kann, wobei das Gerät entweder getrennt oder zusammen auf einer Platine im Computergehäuse (15) oder als ein Zubehör (17), wie z. B. eine Steckkarte, angebracht ist.
 9. Vorrichtung nach Anspruch 1, gekennzeichnet durch Funkübertragung mit einer oder mehreren Frequenzen des Multisenders und des Multiempfängers.
 10. Vorrichtung nach Anspruch 1, gekennzeichnet durch die Einkerbungen (19) auf der unteren Seite des Griffgehäuses.
 11. Vorrichtung nach Anspruch 1, gekennzeichnet durch einen Anschluß (9), der an das Ladegerät (13) angeschlossen werden kann, so daß die Vorrichtung nicht nur mit Batterie (21), sondern auch mit dem Akku (21), betrieben werden kann.

Fig. 1

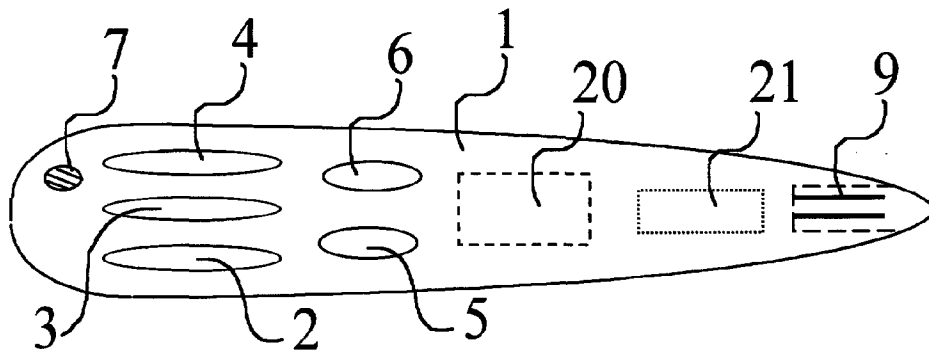


Fig. 2

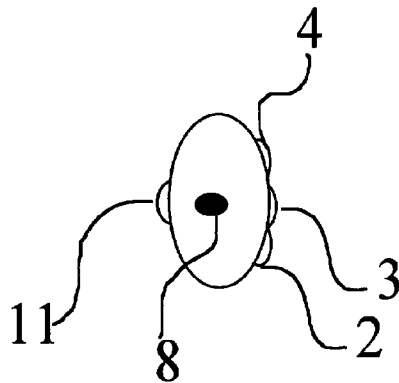


Fig. 3

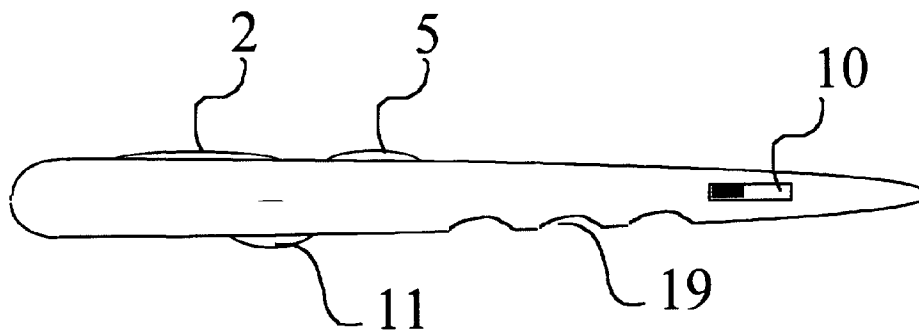


Fig. 4

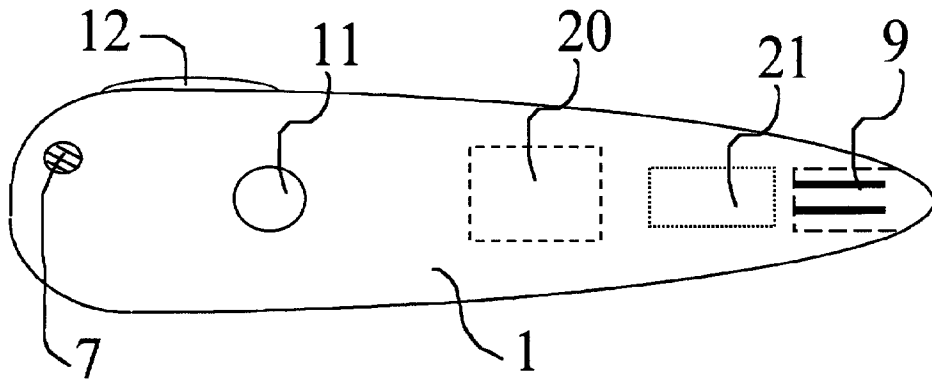


Fig. 5

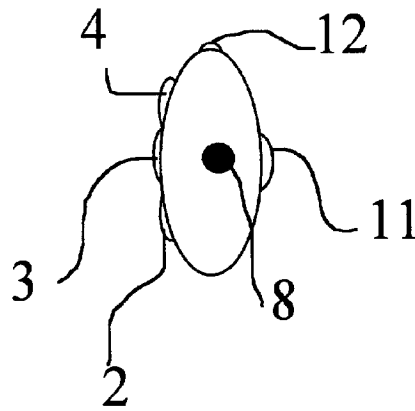


Fig. 6

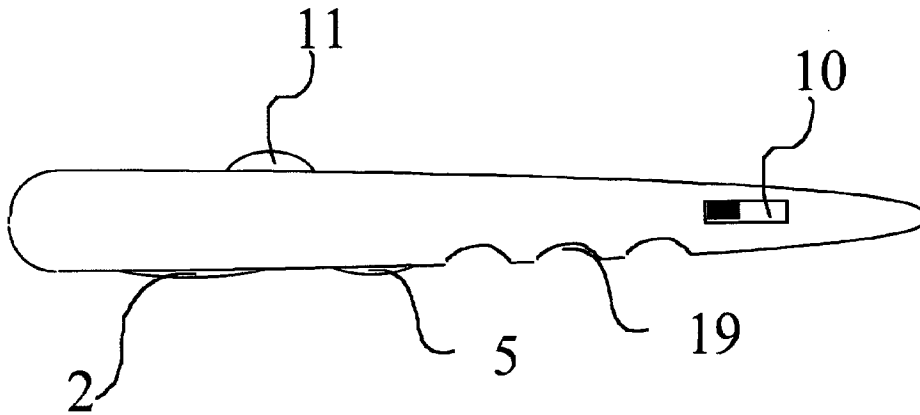


Fig. 7

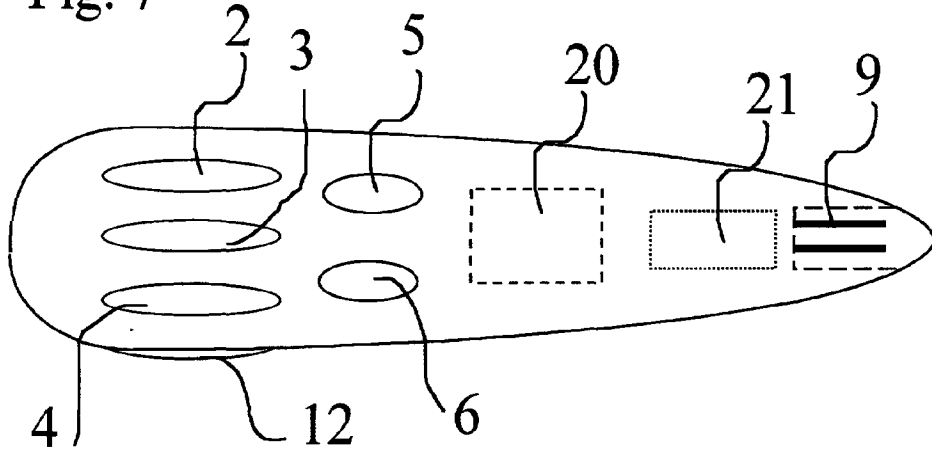


Fig. 9

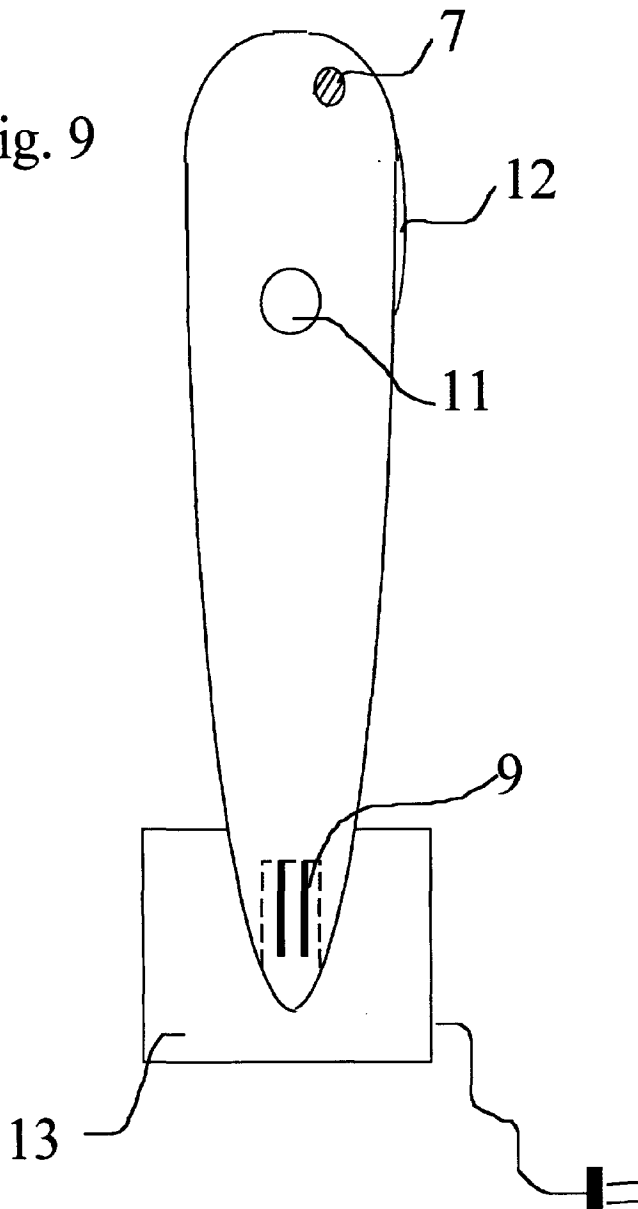


Fig. 8

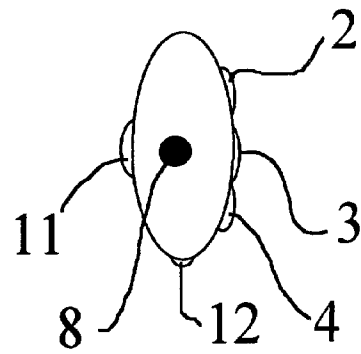


Fig. 10

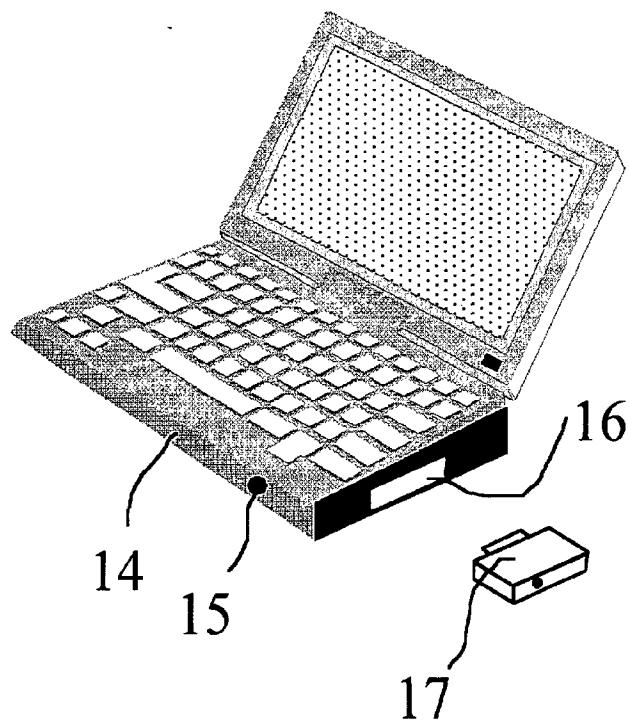
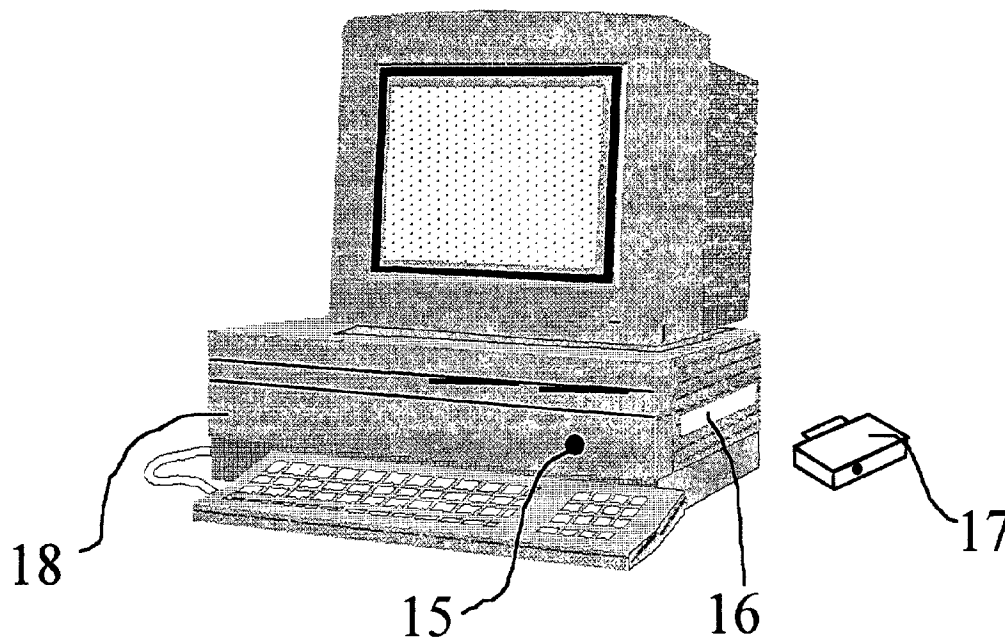


Fig. 11





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The available invention refers to an ergonomic, wireless, multi-functional and compact input and indicator with tax ball (?TRACK ball?) for a computer as well as a portable computer like a Notebook, laptop, etc. with mechanisms for the wireless use z. B. particularly for presentations and demonstrations.

From the state of the art input devices with tax ball and other input devices are well-known. In addition also laser pins and microphones are well-known. But all devices are separate and not ergonomically and must be used separately. But are closely connected frequently straight their use.

The invention is the basis the task, an ergonomic, to indicate multi-functional and compact input and indicator which are to be led in addition wireless and in a hand. This has the advantage that all necessary input and indicator are compactly and ergonomically in a hand present. By the wireless transmission of the signals by air, for example by light or radio, the user is also unrestricted in his freedom of movement. The inserted microphone can serve both for the treatment of clays/tones, and for the command transmission to the computer and also for the admission.

The device according to invention is characterised on the one hand by the fact that it mainly from a multi-functional input and indicator with multi-transmitter 20 in Fig. 1, Fig. 4 and Fig. 7 and a multi-receiver exists, either integrates 15 in Fig. 10 and Fig. 11 in the computer or as plug-in card 17 in Fig. 10 and Fig. is possible for 11. Multi-transmitter 20 in Fig. 1, Fig. 4 and Fig. 7 as well as multi-receivers is provided with a frequency selection switch, in order to ensure an optimal transmission and a troublefree enterprise.

The multi-functional input and indicator are characterised by the fact that on the one hand the clicking keys and the switch for the microphone as well as the key for the laser pointer with the tax ball on one level are not. Preferably there are two different variants, those in the Fig. 1-3 and the Fig. 4-8 to be shown.

With the first variant (Fig. 1-3) the tax ball sits on the lower part of the device 11 in Fig. 2 and Fig. 3, so that it is preferably moved with the index finger.

The clicking keys 2, 3 and 4 in Fig. 1 and the microphone switches 5 and the key for the laser pointer 6 in Fig. 1 are then attached on the upper side (Fig. 1). These are preferably used by the thumb.

With the second variant (Fig. 4-8) now the tax ball is 11 in Fig. 4 on the upper side of the device attached and preferably one steers with the thumb.

The clicking keys 2, 3, 4 in Fig. 7 and the microphone switches 5 and the key for the laser pointer 6 in Fig. 7 is attached on the lower side, so that these are preferably used now with the index finger.

On the right side of the device (Fig. 4) a further clicking key is 12 in Fig in this variant. 4 attached, the same functions as the clicking key 2 in Fig. 7 exhibits. This is operated also preferably with the index finger and is z. B. particularly helpfully when ?pulling? on the screen. For left-handed people there should be an appropriate possibility on the left side. Furthermore the device is characterised by the fact that on the upper side an inserted microphone 7 in Fig. 1, Fig. 4 and Fig. 9 contains.

In addition the device draws by a switch 10 in Fig. 3 and Fig. 6 out, by which the device can be switched on and off.

Also the device draws by a connection 9 in Fig. 1, Fig. 4, Fig. 7 and Fig. 9 out, by those the device with river by a battery charger 13 in Fig. 9 to be loaded can do.

Furthermore the device is characterised by the fact that it a multi-transmitter 20 in Fig. 1, Fig. 4 and Fig. 7 with itself leads, which can send the transmission of control signals of the clicking keys and the sound signals (z. B. by light or radio).

The device is characterised also by the fact that it on the lower side grooves 19 in Fig. 3 and Fig. possesses 6, in order handles an ergonomic to ensure.

The device is characterised also by the fact that it on the front side an opening for the laser pointer 8 in Fig. 2, Fig. 5 and Fig. 8 with or without sharpness rigging device possesses.

The device is characterised also by the fact that it to a battery charger 13 in Fig. to be attached, all the the inserted Akku 21 in Fig can do 9. 1, Fig. 4 and Fig. to load 7. Also an enterprise with conventional batteries is 21 in Fig. 1, Fig. 4 and Fig. 7 possible.

The multi-receiver is characterised on the one hand by the fact that the receivers for sound signals and control signals merged separately or together in a unit.

Furthermore this is characterised that he either built in the computer 15 into Fig. 10 and Fig. 11 or as computer

accessories 17 in Fig. 10 and Fig. 11 as required of the computer manufacturer is available, in order to be able to arrange so the offer more attractive and more effective.

⌘ top

The invention is described in the following on the basis a favourable execution form with reference to the attached designs. Show:

Fig. 1 in plan view the first variant of the device with the grasp housing 1 the clicking keys 2, 3, 4, the switch for the microphone 5, the key for the laser 6, the inserted microphone 7, the multi-transmitter 20, the Akku or battery box 21 and the battery charger connection 9.

Fig. 2 in front view the clicking keys 2, 3, 4, the opening for the laser pointer 8 and the lower tax ball 11.

Fig. 3 in side view from the left side the clicking key 2, the switch for the microphone 5, the tax ball 11, the switch for switching of the device 10 on and off and the grooves 19.

Fig. 4 in plan view the second variant of the device with the tax ball 11, the inserted microphone 7, the clicking key on the right page 12, the multi-transmitter 20, and the Akku or battery box 21 and the battery charger connection 9.

Fig. 5 in front view the clicking keys 2, 3, 4, the clicking key on the right page 12, the opening for the laser pointer 8, and the tax ball 11.

Fig. 6 in side view from the left side the upper tax ball 11, the clicking key 2, the switch for the microphone 5, the switch for switching of the device 10 on and off and the grooves 19.

Fig. 7 in the opinion from downside the clicking keys 2, 3, 4, the clicking key on the right page 12, the switch 5 for the microphone, the key 6 for the laser pointer, the multi-transmitter 20, the Akku or battery box 21 and the battery charger connection 9.

Fig. 8 in front view the clicking keys 2, 3, 4, the clicking key on the right page 12, the opening for the laser pointer 8, and the tax ball 11.

Fig. 9 in condition view the input and indicator with inserted microphone 7, the clicking key on the right page 12, the tax ball 11, the connection 9 for the battery charger 13.

Fig. 10 in perspective view a portable computer 14 with the inserted multi-receiver 15 or the Slot 16 for in and removable multi-receiver the 17.

Fig. 11 in perspective view a stationary computer 18 with the inserted multi-receiver 15 or the Slot 16 for in and removable multi-receiver the 17.



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1. Device to the input of signals into data processing equipment and announcement of light signals for computers and presentations, comprehensively an input and an indicator (1) with a multi-transmitter (20) and a multi-receiver (15 and/or. 17) by means of which steering wheels, radio and light signals sent and of the multi-receiver (15 and/or. 17) to be received it can, by the fact characterized that on the grasp housing the tax ball (11) and the clicking keys (2, 3, 4, 6, 12) and the switch (5) on one level not to be and that the device for control, announcement and treatment of clays/tones in a unit uses different signals.
2. Device according to requirement 1, characterized by grasp housings (1), provided with transferred clicking keys (2, 3, 4, 6, 12), switch (5) and tax ball (11), whereby there are preferably two variants; with first variant find itself clicking keys (2, 3, 4, 6, 12) on upper side and tax ball (11) on lower side grasp housing, with which second exactly turned around, whereby still another an additional clicking key (12), which with the clicking key (2) the the same function has, on which right side of the grasp housing, with left-handed people also on the right side, is attached, in order such an ergonomic handles to ensure.
3. Device according to requirement 1, characterized by the integration of microphone and laser pointer into an input device.
4. Device according to requirement 3, characterized by the possibility of sending control signals of the tax ball (11) and signals of the clicking keys (2, 4, 6, 12) to the computer by air.
5. Device according to requirement 3, characterized by an integrated microphone (7), both for the treatment of clays/tones, and for the command transmission and for the admission to serve can, which by the switch (5) can be switched on and off.
6. Device according to requirement 3, characterized by an integrated laser pointer (8), its sharpness either adjustable or firm is, in order to ensure the indicator function of the device.
7. Device according to requirement 3, characterized by a multi-transmitter (20), both the control signals of the tax ball (11) and the clicking keys (2, 3, 4, 6, 12) and the signals of the integrated microphone to send can, whereby the equipment is attached either separately or together on a plate in the grasp housing.
8. Device according to requirement 3, characterized by a multi-receiver (15 and/or.), both the control signals of the tax ball (11) and the clicking keys (2, 3, 4, 6, 12) and the signals of the integrated microphone received can do 17, whereby the coming either separately or together on a plate in the computer housing (15) or as accessories (17), like z. B. a plug-in card, is attached.
9. Device according to requirement 3, characterized by radio transmission with one or more frequencies of the multi-transmitter and the multi-receiver.
- ⌘ top 10. Device according to requirement 1, characterized by the grooves (19) on the lower side of the grasp housing.
11. Device according to requirement 1, characterized by a connection (9), which can be attached to the battery charger (13), so that the device can be operated not only with battery (21), but also with the Akku (21).



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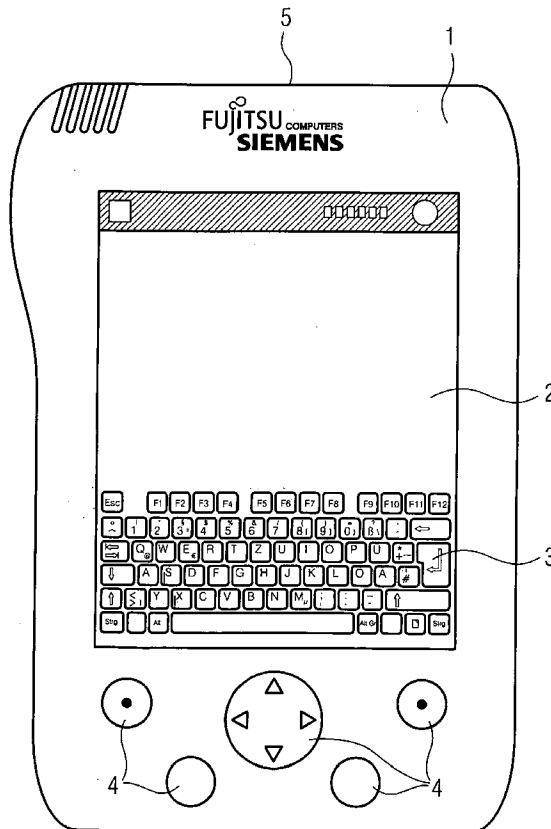
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(54) **Tragbares computerbasiertes Eingabegerät**

(57) Die Erfindung betrifft ein tragbares computerbasiertes Gerät, wobei tragbare computerbasierte Geräte wie z. B. PDA, Handy oder Notebook als Bedienelement für zweite computerbasierte Geräte einsetzbar

sind. Ein erfindungsgemäßes tragbares computerbasiertes Gerät ist in der Lage, Mouse- und Tastatureingaben für ein anderes Gerät zu emulieren und an das fernzusteuende zweite computerbasierte Gerät zu übermitteln.



Beschreibung

[0001] Die Erfindung betrifft ein tragbares computerbasiertes Gerät.

[0002] Tragbare computerbasierte Geräte wie PDAs (Personal Digital Assistant), Handys (Mobiltelefon) oder Notebooks (tragbarer Computer) erfreuen sich aufgrund ihrer kompakten Bauform immer größerer Beliebtheit. Zudem besitzen die Geräte Funk und IR-Schnittstellen die zur Übertragung von Daten geeignet sind. Diese Geräte befinden sich auch aufgrund ihrer ureigensten Aufgabe stets in Reichweite eines Anwenders.

[0003] Dennoch ist der Einsatzbereich dieser Geräte begrenzt. Dies steht im deutlichen Gegensatz zu dem oftmals sehr hohen Anschaffungspreis für diese Geräte. Es ist deshalb wünschenswert, die Einsatzmöglichkeiten solcher, hochpreisigen, tragbaren und computerbasierten, Geräte zu erweitern.

[0004] Es sind für tragbare computerbasierte Geräte wie zum Beispiel PDA's Anwendungen bekannt, die den ursprünglichen Einsatzzweck von PDA's dahingehend erweitern, daß diese Geräte als vielseitige Fernbedienungen für Geräte der Unterhaltungselektronik, wie TV-Geräte oder HiFi-Geräte einsetzbar sind. Anwendungen dieser Geräte als Bedienelemente, bzw. Eingabegeräte für computerbasierte Geräte sind nicht bekannt. Wesentliche Bedienelemente dieser zweiten computerbasierten Geräte sind z. B. Mouse und/oder Tastatur, womit die Anwendungen des Computers mit Daten gefüttert und bedient werden. Alternativ sind solche Eingabegeräte auch als drahtlose Geräte bekannt, die über eine Funk- oder Infrarotstrecke mit dem zweiten computerbasierten Gerät verbunden sind.

[0005] Es ist die Aufgabe der Erfindung, diese Situation zu verbessern.

[0006] Diese Aufgabe wird durch computerbasierte tragbare Geräte gemäß Patentanspruch 1 gelöst und in den untergeordneten Ansprüchen vorteilhaft weitergebildet.

[0007] Dabei werden tragbare computerbasierte Geräte wie z. B. PDA, Handy oder Notebook als Bedienelement für zweite computerbasierte Geräte einsetzbar. Ein erfindungsgemäßes tragbares computerbasiertes Gerät ist in der Lage, Mouse- und Tastatureingaben für ein anderes Gerät zu emulieren und an das fernzusteuernde zweite computerbasierte Gerät zu übermitteln. Die Vorteile eines solchen tragbaren computerbasierten Gerätes lassen sich wie folgt zusammenfassen:

1. Durch Nutzung von Standardübertragungswegen ist eine Vielzahl von zweiten computerbasierten Geräten ansteuerbar.

2. Vorhandene-Hardware wie PDA, Handy oder Notebook stellen durch die zusätzlichen Funktionen eine Alternative zu den sonst üblichen, bzw. notwendigen Zusatzgeräten als Bedienelemente dar.

3. Gerätespezifische Eingabegeräte der zweiten computerbasierten Geräte sind ersetzbar.

4. Eine Vielzahl von drahtlosen Anbindungsmöglichkeiten auf das zu steuernde zweite computerbasierte Gerät, wie z. B. WLAN, IR, "Bluetooth" ist nutzbar.

5. Komplexe Bedienungsschritte wie z. B. Tastenkombinationen oder Tasteneingabefolgen können zusammengefasst werden und dann durch eine einfache Aktion wie zum Beispiel einem Tastendruck, oder ein Schriftkürzel, abgerufen und übermittelt werden.

[0008] Vorteilhafte Ausführungsformen des tragbaren computerbasierten Gerätes sind z. B. ein PDA, Handy oder Notebook mit Infrarotanbindung an ein zweites computerbasiertes Gerät. Mit diesem tragbaren computerbasierten Gerät eröffnen sich vielseitige Bedienungsmöglichkeiten für das zweite computerbasierte Gerät. So sind, über die am Display des PDAs angezeigte PopUp-Tastatur, Tastenkombination für die Emulation komplexer Befehlsketten erzeugbar. Desweiteren ist der Touchscreen des PDA als Touchpad für das zweite computerbasierte Gerät benutzbar. Ebenso sind, spezielle Mousebewegungen bzw. Mousepositionierungen per Software oder per Tastendruck durchführbar. Dazu gehören zum Beispiel die Positionierung der Mouse oder des Cursors in eine der Bildschirm oder Display-Ecken oder die Positionierung der Mouse oder des cursors in die Mitte des Bildschirms oder Displays, oder in die Mitte einer der Bildschirm oder Displayseiten. Desweiteren sind vielgenutzte Tastaturkommandos schnell erzeugbar.

[0009] Bei einer Erweiterung der Datenübertragung zwischen dem PDA, Handy oder Notebook auf einen bidirektionalen Datenverkehr, wobei Daten von dem fernzusteuernenden Gerät an das fernsteuernde Gerät zurücksendbar sind, ergeben sich weitere vielseitige Anwendungsvarianten, zum Beispiel: Information- oder Statusanzeigen des ferngesteuerten Gerätes auf dem tragbaren bzw. fernsteuernden Gerät.

[0010] Das erfindungsgemäße computerbasierte Gerät ist in der Lage, mit verschiedenen Funkprotokollen, wie zum Beispiel "Bluetooth" oder WLAN oder eine Funk-Draht-Kombination mit einem geeignetem Zusatzgerät mit USB, Kontakt zu dem zweiten fernzusteuernenden computerbasierten Gerät zu halten. Alternativ ist das tragbare computerbasierte Gerät auch über eine drahtgebundene Verbindungsstrecke, z. B. ein USB an das zweite computerbasierte Gerät anschließbar.

[0011] Es ist gemäß einer vorteilhaften Weiterbildung des computerbasierten Gerätes ein Notebook zur Fernsteuerung eines zweiten computerbasierten Gerätes einsetzbar. Damit sind Ferneingaben über die Notebook-Tastatur und Notebook-Mouse realisierbar.

[0012] Sehr vorteilhaft ist auch die Möglichkeit einer

erfindungsgemäßen Weiterbildung eines computerbasierten Gerätes wie beispielsweise eines Handys, wobei dies zur Emulation einer Mousefunktion gegenüber einer Menübedienung eines TV-Geräts heranziehbar ist.

[0013] Im folgenden ist die Erfindung unter der Bezugnahme auf ein Ausführungsbeispiel und eine Zeichnung erläutert. Die Figur zeigt einen erfindungsgemäßen PDA, stellvertretend für andere computerbasierte Geräte.

[0014] Der erfindungsgemäße PDA 1 weist eine Schnittstelle 5 auf. Diese Schnittstelle 5 ist alternativ als Funk- oder Infrarotschnittstelle ausgeführt, wobei im Falle einer Funkschnittstelle diese den Protokollen von zum Beispiel "Bluetooth" oder WLAN entspricht.

[0015] Desweiteren verfügt der PDA 1 über einen Touchscreen bzw. Touchpad 2, das vorzugsweise als Eingabeelement für Mousepositionierungen gegenüber dem zweiten computerbasierten Gerät dient.

[0016] Desweiteren weist der PDA 1 am unteren Ende 3 des Touchscreen eine Darstellung einer vollständigen Tastatur auf, wobei die Zeichen durch Berührung mit einem spitzen Gegenstand ausgewählt und selbstständig durch den PDA 1 an das zweite computerbasierte Gerät übergeben werden.

[0017] Desweiteren verfügt der PDA 1 über Mousepositionierungstasten 4, die eine schnelle Bewegung des Mousezeigers am ferngesteuerten zweiten computerbasierten Gerät in ganz vorbestimmte Positionen wie z. B. links oben, rechts unten, links unten, rechts unten oder Bildschirmmitte, oder wahlweise auch in andere vorbestimmte Positionen ermöglichen.

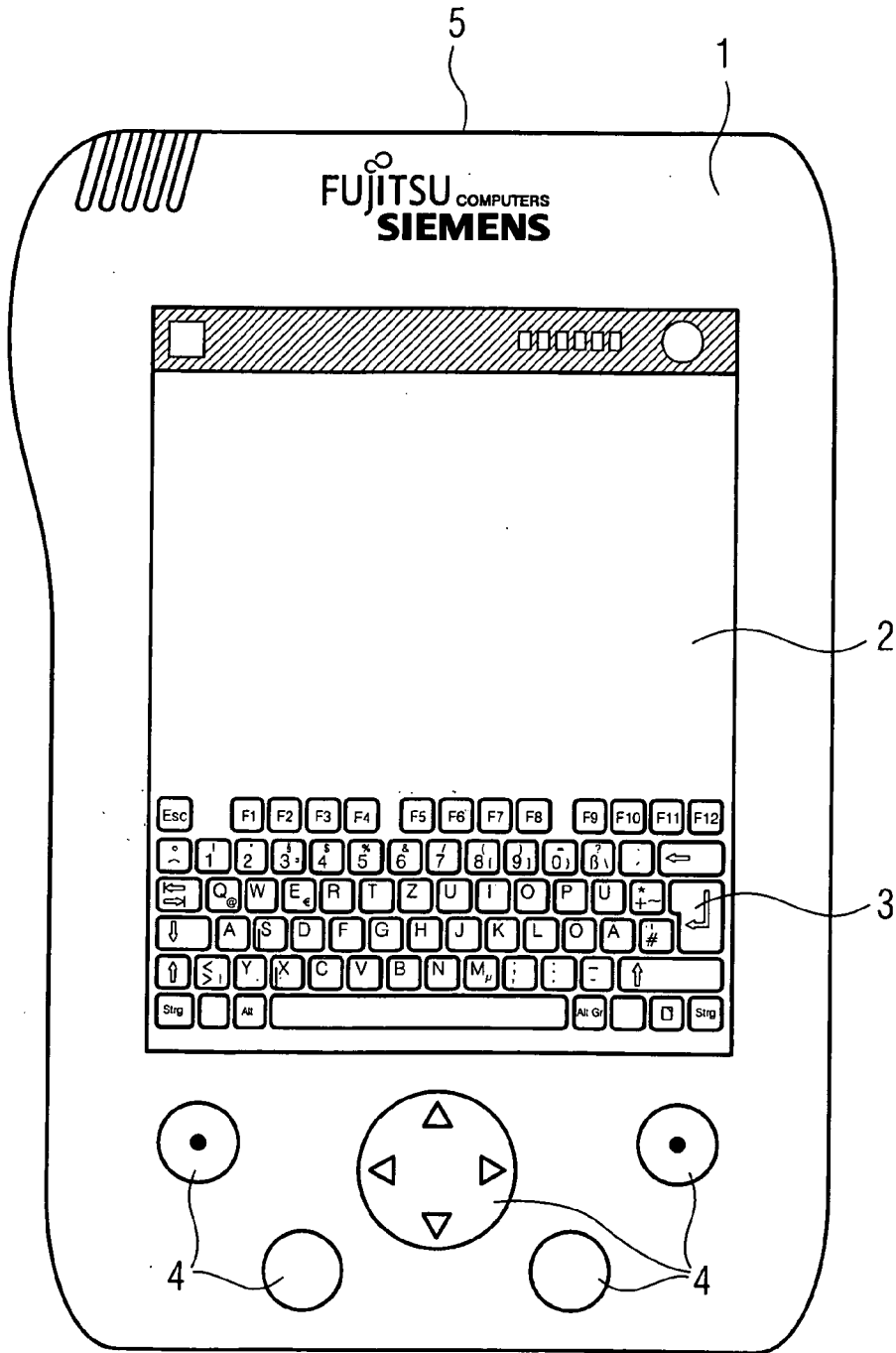
[0018] Zunächst ist vorstehend die Anwendung für computerbasierte Geräte wie zum Beispiel PDAs, Handys, oder Notebooks beschrieben, wobei diese ein zweites computerbasiertes Gerät wie PCs oder ähnliches bedienbar machen. Die Erfindung ist jedoch nicht allein an diese Ausführungsbeispiele gebunden. Vielmehr ist klar erkennbar, daß der Grundgedanke der Erfindung auf weitere Kombinationen computerbasierter Geräte anwendbar ist.

Patentansprüche

1. Tragbares computerbasiertes Gerät wie zum Beispiel PDA, Handy oder Notebook, als Bedienelement für ein zweites computerbasiertes Gerät, **dadurch gekennzeichnet, daß** das tragbare computerbasierte Gerät als Eingabegerät, wie zum Beispiel Maus oder/und Tastatur, gegenüber dem zweiten computerbasierten Gerät einsetzbar ist.
2. Tragbares computerbasiertes Gerät nach Patentanspruch 1, **dadurch gekennzeichnet, daß** zur Übertragung der Daten zwischen dem ersten

und dem zweiten computerbasierten Gerät eine Infrarotschnittstelle besteht.

3. Tragbares computerbasiertes Gerät nach Patentanspruch 1, **dadurch gekennzeichnet, daß** zur Übertragung der Daten zwischen den beiden computerbasierten Geräten eine Funkverbindung besteht.
4. Tragbares computerbasiertes Gerät nach Patentanspruch 3, **dadurch gekennzeichnet, daß** die Funkverbindung gemäß den Protokollen von "Bluetooth" oder WLAN oder GSM/GPRS durchgeführt wird.
5. Tragbares computerbasiertes Gerät nach Patentanspruch 1, **dadurch gekennzeichnet, daß** zur Übertragung der Daten zwischen den beiden computerbasierten Geräten eine Drahtverbindung besteht.
6. Tragbares computerbasiertes Gerät nach Patentanspruch 5, **dadurch gekennzeichnet, daß** die Drahtverbindung nach den Protokollen von seriellen Verbindungen, USB, Firewire oder LAN durchgeführt wird.
7. Tragbares computerbasiertes Gerät nach einem der vorhergehenden Patentansprüche, **dadurch gekennzeichnet, daß** ein Touchscreen des computerbasierten Gerätes als "Remote Touchpad" nutzbar ist.
8. Tragbares computerbasiertes Gerät nach einem der vorhergehenden Patentansprüche, **dadurch gekennzeichnet, daß** Bewegungen und/oder Positionierungen des Mousezeigers/Cursors auf dem zweiten computerbasierten Gerät durch vorbestimmte Tasten ausführbar sind.
9. Tragbares computerbasiertes Gerät nach einem der vorhergehenden Patentansprüche, **dadurch gekennzeichnet, daß** Tastatureingabefolgen des zweiten computerbasierten Gerätes durch vorbestimmte Tasten auf dem tragbarem Gerät ausführbar sind.
10. Tragbares computerbasiertes Gerät nach einem der vorhergehenden Patentansprüche, **dadurch gekennzeichnet, daß** die Datenübertragungswege zwischen dem computerbasierten Gerät und dem zweitem computerbasierten Gerät bidirektional sind.





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EINSCHLÄGIGE DOKUMENTE			
Kategorie	Kennzeichnung des Dokuments mit Angabe, soweit erforderlich, der maßgeblichen Teile	Betrifft Anspruch	KLASSIFIKATION DER ANMELDUNG (Int.Cl.7)
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Recherchenort MÜNCHEN		Abschlußdatum der Recherche 16. Juni 2003	Prüfer Pohl, M
KATEGORIE DER GENANNTEN DOKUMENTE			
X : von besonderer Bedeutung allein betrachtet Y : von besonderer Bedeutung in Verbindung mit einer anderen Veröffentlichung derselben Kategorie A : technologischer Hintergrund O : mündliche Offenbarung P : Zwischenliteratur		T : der Erfindung zugrunde liegende Theorien oder Grundsätze E : älteres Patentdokument, das jedoch erst am oder nach dem Anmeldedatum veröffentlicht worden ist D : in der Anmeldung angeführtes Dokument L : aus anderen Gründen angeführtes Dokument & : Mitglied der gleichen Patentfamilie, übereinstimmendes Dokument	

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**ANHANG ZUM EUROPÄISCHEN RECHERCHENBERICHT
 ÜBER DIE EUROPÄISCHE PATENTANMELDUNG NR.**

EP 03 01 0694

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten europäischen Recherchenbericht angeführten Patendokumente angegeben.

Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am
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WO 03/007117 A2

(54) Title: PORTABLE, HAND-HELD ELECTRONIC INPUT DEVICE AND COMBINATION WITH A PERSONAL DIGITAL DEVICE

(57) Abstract: A portable electronic data input device includes a housing sized to be held in the palm of one hand. One housing side has four individual dual-position control buttons arranged in a row and positioned to be actuated by an individual finger of a user grasping the input device in the palm of the hand. A multi-position control mechanism in an adjacent housing side comprises a plurality of individual switch contacts arranged in a predetermined pattern that enables a user, while holding the input device in the palm of one hand and the user's other fingers each touching an individual one of the dual-position control buttons, to reach with the thumb of the hand the multi-position control mechanism. Using only the thumb, the user activates any individual switch contact or activates two or more switch contacts simultaneously. The arrangement of the control buttons and multi-position control mechanism provides a chordic-keyboard capable of generating a variety of different electronic signals as determined by the user manipulating the dual-position control buttons, the multi-position control mechanism, or both simultaneously.

1 **PORTABLE, HAND-HELD ELECTRONIC INPUT DEVICE & COMBINATION WITH**
2 **A PERSONAL DIGITAL DEVICE**

3
4 RELATED PATENT APPLICATIONS & INCORPORATION BY REFERENCE

5
6 This application is a PCT application based on U. S. provisional patent application
7 Serial No. 60/304,875, entitled "Portable, Hand-Held Electronic Data Input Device &
8 Combination With Digital Assistant," filed July 12, 2001. This related application is
9 incorporated herein by reference and made a part of this application. Moreover, Applicant
10 incorporates herein by reference any and all U. S. patents, U. S. patent applications, and
11 other documents cited or referred to in this application or cited or referred to in the U. S.
12 patents and U. S. patent applications incorporated herein by reference.

13
14 BACKGROUND OF THE INVENTION

15
16 A personal digital device (PDD) is a very popular device that provides portability for
17 data normally stored in the memory of a computer and allows a user to input data into the
18 PDD and later download this data from the PDD. In many cases it also allows for the
19 transference of data or other digital artifacts (digital artifacts being considered special case of
20 data) via wired or wireless communication systems to other handheld units or data networks.
21 For example, a list of phone numbers may be stored in the memory of a PDD and new
22 numbers added to this memory. Periodically, the memory of the personal digital device is
23 connected to the computer's memory and the new data, such as, for example, new phone
24 numbers, is downloaded into the computer's memory. In other scenarios, data or other digital
25 artifacts (such as sound, images, or messages) captured with the PDD can be sent to other
26 units or networks via wired or wireless communication systems. A personal digital device
27 may be connected to the global computer network (e. g., the internet), it may be a component
28 of a mobile telephone, it may even be connected to a television broadcast or cable network.
29 All forms of communication systems are rapidly converging into a single portable, hand-held
30 unit.

31 There are several disadvantages using state-of-the-art PDDs. It is difficult to input
32 data conveniently. When hand writing on a writing pad, using a pen or stylus, as opposed to
33 using a keyboard, data entry is often inaccurate. Generally, the rate of data input is slow, for

1 example, typically data can only be inputted at a rate of less than 10 words per minute by
2 most users. And despite their portability, PDDs can only be used in a narrow variety of
3 circumstances; they cannot, for example, be used casually while operating a vehicle, walking,
4 or lying down.

5 6 SUMMARY OF THE INVENTION

7
8 This invention is an improvement in the device disclosed in U. S. Patent No.
9 5,432,510, and it is summarized in the CLAIMS that follow. After reading the following
10 section entitled "DETAILED DESCRIPTION," one will understand how the features of this
11 invention provide its benefits. The benefits of this invention include, but are not limited to:
12 convenience of use, both position and activity independence so it can be used in situations
13 where other data inputs devices cannot, rapid and accurate data input, and the capability to be
14 used with converging communication systems now evolving.

15 Some, but not all, of the features of this invention are:

16 The electronic data input device of this invention is portable. It includes a housing
17 sized to be held in the palm of one hand of a user. This housing has at least one pair of
18 adjacent sides. The housing holds a control circuit having an input and output, and typically
19 comprises a read only memory, a random access memory, and a central processing unit (CPU)
20 connected to the memories. One adjacent side has four individual dual-position control
21 buttons arranged in a row and positioned to be actuated by an individual finger of the hand of
22 a user grasping the input device in the palm of the hand. The housing preferably holds a
23 display that provides a visual readout corresponding to the unique symbol, command, or
24 results of a command (for example a map, graphical or character, different language, etc.) The
25 housing may also hold an audio generator that provides a sound corresponding to the unique
26 symbol, command, or results of a command.

27 In one embodiment, a multi-position control mechanism is employed. This multi-
28 position control mechanism preferably is seated in a depression in the other adjacent side of
29 the housing. The depression preferably is substantially hemispherical. As discussed
30 subsequently in greater detail, the depression is configured to seat therein the underside end
31 portion of a thumb of a user while he or she is grasping the input device in the palm of the
32 hand. The multi-position control mechanism comprises a plurality of individual switch
33 contacts. These switch contacts are arranged in a predetermined pattern that enables a user,

1 while holding the input device in the palm of one hand and his or her other fingers each
2 touching an individual one of the dual-position control buttons, to reach with the thumb of
3 the hand holding the input device the multi-position control mechanism and, using only the
4 thumb, activate any individual switch contact or activate two or more switch contacts
5 simultaneously.

6 The control buttons and multi-position control mechanism are connected via the input
7 to the control circuit. The arrangement provides a chordic-keyboard capable of generating a
8 variety of different electronic signals at the input to the control circuit as determined by the
9 user manipulating the dual-position control buttons, or the multi-position control mechanism,
10 or both simultaneously. The central processing unit (CPU) has a program that converts input
11 signals into signals at the output corresponding to a unique symbol or a unique command
12 depending upon which switch contact or combination of contacts is activated. Thus, in
13 response to activation of the dual-position control buttons, or the multi-position control
14 mechanism, or both simultaneously, the device generates at the output in accordance with the
15 program an electronic signal corresponding to a unique symbol or a unique command as
16 determined by the activation of the buttons or control mechanism.

17 The data input device may include an output connector adapted to connect the device
18 to a computing platform, a communication device or system, a computer network, a personal
19 digital device with or without a display, or with or without a keyboard. For example, the data
20 input device may be connected to a PDD or mobile communication device.

21 22 DESCRIPTION OF THE DRAWING

23
24 The preferred embodiments of this invention, illustrating all its features, will now be
25 discussed in detail. These embodiments depict the novel and non-obvious data input device
26 of this invention and the combination of data input device and PDD as shown in the
27 accompanying drawing, which is for illustrative purposes only. This drawing includes the
28 following figures (Figs.), with like numerals indicating like parts:

29
30 Fig. 1 is a perspective view of the first embodiment of data input device of this
31 invention having visual display screen straddled by a pair of unique multi-position (five
32 position) control mechanisms.

1 Fig. 1A is a perspective view of the data input device shown in Fig. 1 being used as a
2 user interface for a video game or other electronic device having dual input, enabling the user
3 to grasped the input device more conveniently and naturally.

4 Fig. 1B is a perspective view of an embodiment of the data input device of this
5 invention that does not have a visual display screen and is connected to a PDD.

6 Fig. 1C is a plan view of an embodiment of the data input device of this invention
7 connect via a 2-way infrared link to a mobile communications device, such as a cell phone
8 with text messaging capabilities.

9 Fig. 2 is a diagram illustrating the different switch contact positions of each individual
10 contact of the five position control mechanism depicted in each of the embodiments shown in
11 Figs. 1, 1A, 1B, 1C, and 3B.

12 Fig. 3A is a typical conventional switch used in calculator and laptop keyboards.

13 Fig. 3B is an exploded perspective view of the five-position control mechanism used
14 in this invention comprising five of the conventional switches shown in Fig. 3A arranged in
15 accordance with this invention.

16 Fig. 3C is a perspective view of the underside of the key top of the control mechanism
17 shown in Fig. 3B.

18 Fig. 3D is a side elevational view of the key top of the five-position control
19 mechanism shown in Fig. 3B.

20 Fig. 3E is a side elevational view of an embodiment of the data input device of this
21 invention using a one alternate embodiment of the five-position control mechanism.

22 Fig. 3F is a side elevational view of another alternate embodiment of the five-position
23 control mechanism used in this invention.

24 Fig. 4 is an illustration of various switch contact combinations for the five-position
25 control mechanism shown in Figs. 1, 1A, 1B, 1C, 2 and 3B.

26 Fig. 5 is a block diagram of the control circuit for the data input device discussed in the
27 **First Scenario.**

28 Fig. 6 is a block diagram of the control circuit for the data input device discussed in the
29 **Second Scenario.**

30 Fig. 7 is a conventional pager.

31 Fig. 8 is a block diagram of the control circuit for the data input device discussed in the
32 **Third Scenario.**

1 Fig. 9 is a perspective view depicting an embodiment the data input device of this
2 invention incorporated into a conventional, hand-held mobile phone.

3 Fig. 10 is a perspective view depicting an embodiment of the data input device of this
4 invention incorporated into a conventional, hand-held mobile phone, eliminating the
5 conventional alpha-numeric keyboard as shown in Fig. 9 and enlarging its visual display
6 screen.

7 Fig. 11 is a plan view of a conventional PDD adapted to be used with a mountable
8 version of the data input device of this invention shown in Fig. 12A.

9 Fig. 12A is a perspective view of an embodiment of data input device of this invention
10 showing the conventional PDD illustrated in Fig. 11 being mounted to this input device.

11 Figure 12B is a perspective view of an embodiment of this invention showing an
12 alternative mobile communication device, such as a mobile wireless phone with digital artifact
13 messaging capabilities, being mounted to this input device.

14 Fig. 13 is a block diagram of the control circuit for the data input device of used with
15 the embodiment shown in Fig. 12A.

16 Fig. 14 is a view of an astronaut using the data input device of this invention in outer
17 space, a zero gravity environment.

18 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

19 First Embodiment

20
21
22
23 The input device 10 shown in Fig. 1 has a housing 11 with one side 11a having a pair
24 of five-position control mechanisms 12. Along a side 11b adjacent to side 11a is a row of dual
25 position finger control buttons 14a, 14b, 14c, and 14d. Between the two five-position control
26 mechanisms 12 is a visual display screen 13, for example, a liquid crystal display that
27 displays visual images generated by a control circuit contained within the housing depending
28 on which contact position of the five-position control mechanisms 12, or which dual position
29 control button, or combinations thereof, is actuated by the user. Preferably, the housing 11
30 has a pair of substantially hemispherical depressions 32a and 32b in the side 11a with a five-
31 position control mechanism 12 seated in each depression. This physical arrangement is
32 ergonomically advantageous.

1 The thumb-actuated five-position control mechanism 12 provides upward of 121
2 unique chord combinations. As schematically depicted in Fig. 2, the five-position control
3 mechanism 12 is a 4-way rocker switch (similar to cursor controls used in video game
4 controllers) having contacts a, b, c, and d and a center post e switch contact (marked with a
5 circle). A more detailed explanation of how the five-position control mechanism 12 works
6 appears in the diagram shown in Fig. 4. The large “plus” shape represents the control
7 mechanism 12 with switch contacts a, b, c, and d at the ends of the individual legs, and the
8 large oval o lying diagonally over it represents how a thumb is positioned over the control
9 mechanism in a “normal” position, with the first joint of the thumb resting on (but not
10 depressing) the center post e switch contact. The four arrows and center circle represent
11 pressure-sensitive areas, that when individually depressed close switch contacts. The thumb
12 can actuate each individual switch contact a, b, c, d and e or a combination of switch contacts.
13 This is achieved for example by pressing directly downward to actuate the center post e
14 switch contact or by lateral rotation, or physically repositioning the thumb slightly to actuate
15 switch contact a, b, c, or d. Although the five-position control mechanism 12 has 5
16 depressible switch contacts a, b, c, d, and e, there are 9 most practical combinations which are
17 depicted in the illustrations shown in Fig. 4. (Many other less practical combinations are
18 possible as well such as multiple arrow keys being depressed simultaneously. These
19 combinations may be used, for example, by 3rd party specialized application software.) With
20 the switch contact combinations depicted in Fig. 4, the data input device 10 is now capable of
21 approximately 144 single-chord combinations. All of the switch contact combinations, as
22 well as the 4 other dual position finger buttons 14a, 14b, 14c, and 14d used in the data input
23 device typing scheme, work silently but provide ample tactile feedback to the user.

24 The five-position control mechanism 12 includes a key top 30 (Fig. 3B) and a printed
25 circuit board 24 having five pairs of open electrical contacts 21 and 22 (only one pair shown
26 in Fig. 3A). The key top 30 overlies the circuit board 24 and is mounted to move into one of
27 the five different positions depicted in Fig. 4, depending on how a user manipulates the key
28 top 30, each different position closing one pair of open electrical contacts. The key top 30
29 may be in the form of a substantially cross 31 as depicted in Fig. 1, 1A, or 1B, including a
30 central element 31e with four legs 31a, 31b, 31c, and 31d extending outward from said a
31 central element. One pair of contacts is positioned beneath each of the legs 31a, 31b, 31c, and
32 31d and one pair of contacts 31e is positioned beneath the central element 31e. Alternately,
33 the key top 30 may be circular as shown in Fig. 3C, with a cross on its exterior surface 30a.

1 As depicted in Fig. 1A, the input device 10 provides two-handed user interface. Two
2 five-position control mechanisms 12 are used as an ideal and natural video game interface.
3 Using two hands instead of one, the users' two thumbs operate the pair of control
4 mechanisms 12 simultaneously like a video game controller.

5 6 **Five-Position Control Mechanism**

7
8 A conventional elastomeric switch 16 (those often used in calculator keypads and
9 laptop keyboards, for example) is illustrated in Fig. 3A. It includes a rubberized, hollow
10 dome 18, which contains a conductive polymer at its top 19. The dome 18 sits upon a
11 printed circuit board (PCB) 20 with two exposed (but not touching) electrical contacts 21 and
12 22 in the very center of the PCB. A key top 22 overlying the dome 18 is mounted to move
13 towards and away from the printed circuit board 20. When a force is applied by a user to the
14 key top 22, the switch 16 is closed. Specifically, the user's finger, exerting pressure on the
15 key top 22, depresses the key top. With the key top 22 pressing on the top 19 of the dome
16 18, the dome's shape collapses temporarily, allowing the conductive polymer of the top 19 to
17 bridge the two electrical contacts 21 and 22 on the printed circuit board 20, thereby closing
18 the circuit. When the finger pressure is released, the dome 18 springs back to its original
19 shape, breaking the circuit, and ready for the next actuation.

20 As depicted in Fig. 3B, the five-position control mechanism 12 includes five
21 rubberized domes 18a through 18e arranged on an internal, flat support surface 24a of the
22 printed circuit board 24 of the input device's housing 11 in a cross configuration: one central
23 dome 18e and domes 18a through 18d at each polar position. The center dome 18e, unlike the
24 others, has a small divot 26 at its top 19 that serves as a semispherical pivot point. There are
25 five contact pads 28a through 28e on the underside 30b of the key top 30 in registration with
26 the tops of the domes 18a through 18e. A central pad 28e rests on the central dome 18e and
27 the other pads 18a through 18d are positioned at polar points surrounding the pad 28e.
28 Preferably, the central dome 18e is designed to require a slightly greater actuation force than
29 the other domes 18a through 18d, since it must also act as part of the support structure for
30 key top 30. The key top 30 may have a circular configuration with a cross-shape design on
31 its exterior surface 30a, or it may simply be cross-shaped. In both cases, the key top 30 is
32 manually moveable into the contact positions depicted in Fig. 4 to depress individual domes
33 18a through 18e, or combinations of two or even more domes. In normal operation, the five-

1 position control mechanism 12, when not actuated, has the contact pads 28a through 28e of
2 the key top 30 just touching all 5 rubberized domes 18a through 18e. (The 5-position key
3 top 30 is held in place by the exterior surface of the case.) When a user's thumb presses
4 down on any one of the 5 positions (up, down, left, right, or center), the corresponding pads
5 28a through 28e of the key top 30 will exert a force downward on the rubberized dome below
6 it, thereby completing the circuit by closing the contacts beneath a dome as depicted in Fig.
7 3A. The dome's springing restoration force will also move the five-position key top 30 back
8 to its normal "home" position once the pressure is released.

9 One may wish to place the four outer rubberized domes 18a through 18d at a slight
10 angle as shown in Fig. 3F to better transfer the force of the thumb directly to the top of a
11 rubberized dome.

12

13 An Alternative Five-Position Thumb Button

14

15 Fig. 3E depicts another embodiment of the five-position control mechanism, namely
16 mechanism 34, using the same rubberized dome elastomeric switches 16 as described above in
17 Fig. 3A, but arranged differently than that depicted in Figs. 3B and 3F. Four of the five
18 switches 16 are arranged in a semicircle or arc, angled such that they match the natural angle of
19 the thumb as the thumb traverses four key tops 36a through 36d on the side 11a of the
20 housing 11. The second button from the left could be shaped slightly differently to allow the
21 user to identify it purely by feel (for example, a small bump or indentation on the top
22 surface), so a "home" position can quickly be identified blindly when in use. A fifth key top
23 36e, preferably a longer button along the row of key tops 36a through 36d, can be constructed
24 using two or more rubberized domes underneath, so pressing anywhere along the horizontal
25 bar will result in a proper closure of contacts.

26

27 Implementation 1— As an auxiliary keyboard

28

29 The following scenario benefits the owner of a PDD 42 (Fig. 1B) such as for example,
30 a Palm Pilot, or a Windows CE (now called "Pocket Windows") device, both of which fit into
31 the category of pen or keyboard based PDDs. Although users rely on them as a portable
32 device for the rapid retrieval of information, they are not often used for note taking due to
33 their inadequate writing pad 42a employing stylus, pen-, keypad-, or keyboard-based text

1 entry schemes. In this first usage scenario, a data input device 40 according to this invention,
2 which does not have a display 13, is used as an external, peripheral keyboard for users who
3 already use PDDs and is depicted in Fig 1B. The device 10 could also connect to a mobile
4 communications device D1, such as a cell phone with text messaging capabilities, via a
5 connection method native to the device, such as a 2-way infrared link, depicted in Fig. 1C.

7 *First Scenario*

8 *A busy executive uses his Palm Pilot extensively to keep his appointments,*
9 *and as his phone book, but one time while traveling he had a brainstorm of*
10 *ideas he wanted to write down while standing in a long line at the airport.*
11 *Not being able to take meaningful notes using the Palm Pilot's Graffiti*
12 *handwriting system (which might recognize 5 words per minute on a good*
13 *day, but this was not a good day since one had was holding a briefcase,*
14 *and two hands are required to use a Palm Pilot), he whips out his data*
15 *input device, using it as keyboard peripheral, he proceeds to capture his*
16 *ideas at 30 words per minute for the next half hour as the airport line*
17 *progresses. Taking his seat on board the airplane, the executive folds*
18 *down the tray table, takes out his Palm Pilot, and then transmits the ideas*
19 *captured earlier by the data input device into the Palm Pilot. A final idea*
20 *comes to him, and, while the two portable devices are communicating with*
21 *each other, he types the idea into the data input device which then acts as a*
22 *"real time" keyboard that transmits the information to the Palm Pilot in*
23 *typed form.*

24
25 Using today's technology, most of that executive's ideas would have been lost
26 because there was no way realistically to take notes on the conventional PDD. In this first
27 scenario matters were made worse because the executive had only one hand free, making the
28 conventional PDD use impossible. In this first scenario, the data input device 40 acts as a
29 supplement to the PDD already being used by the executive. Data can be transmitted to the
30 PDD via either a physical cable, infrared light, or a radio frequency link. The data input
31 device 40 in this scenario would have its own central processing unit and memory so as to
32 remember the notes for later transmission. This facilitates the take-notes-wherever-you-are
33 advantage of the data input device of this invention.

34 To build a device which fulfills this first scenario, a system similar to the block
35 diagram layout depicted in Fig. 5 would be required. Because the amount of processing
36 required of the hardware is minimal (Note the data input device chords via the 9-button
37 combinations, buffer it in local RAM, and send to the device via one of the I/O options
38 depicted in green boxes), almost any off-the-shelf components could be used to realize this
39 design. The CPU, for example, could be a "plain vanilla" Intel 8051 chip; the RAM (because

1 the buffering will only be holding a few characters at a time) could be a minimal amount
2 (perhaps a 4K memory chip). The green I/O boxes could either be part of the CPU (such as
3 the serial port, which is common today) or, as in the case of the Bluetooth RF protocol, a
4 dedicated chip set could be used¹.

5 6 **Second Embodiment**

7 8 Implementation 2—As a fully-functional Personal Digital Device (PDD)

9
10 Implementation 1 had the data input device 40 acting as a peripheral to an existing
11 PDD, necessitating the user to carry around two separate instruments in order to get
12 maximum benefit. There is no reason why the functionality of the hand-held data input
13 device of this invention cannot be encapsulated into a PDD, so that only one small device
14 need be carried without sacrifice of utility or performance.

15 A second scenario proposes just this. As shown in Fig. 6, a chordic data input device
16 44 having appropriate input control buttons/multi-position control mechanism, is combined
17 with PDD components within a single, unitary housing 11e. The PDD capability is
18 provided by employing adequate memory, CPU power, and software which performs
19 functions commonly found on PDDs. This second scenario has the on-the-go user utilizing
20 the data input device 44 for common PDD functions, except that these functions can be
21 accessed while driving, standing in line, lying down, or even running a marathon if the user so
22 chooses. Common PDD functions are:

- 23 • Complete appointment calendar, synchronizable with common contact management
24 software residing on a separate computing device.
- 25 • Complete phone book, including reverse-search phone book file, so you can cross-
26 reference who just paged you.
- 27 • Note pad desktop calendar applications such as Microsoft Outlook.
- 28 • Calculator (switchable between Scientific, Business, or Plain modes)
- 29 • Offline E-mail reader and writer
- 30 • Travel alarms w/ reminders. Interval alarms for exercising.

31

¹ In this paper, the term "Bluetooth" will be used in the broader term, meaning a generic 2-way close-proximity Radio Frequency (RF) protocol. IEEE Standard 802.11 is another example of an RF scheme that fits in this category.

1 Not-so-common functions that the data input device could perform are:

- 2 • Automatic Touch tone dialing - type in name, hold unit up to phone to dial out via
- 3 sound.
- 4 • Language translator
- 5 • Imaging Module (still, motion)
- 6 • Sound Recorder
- 7 • Foreign currency exchange calculator
- 8 • Games! Especially for the youth market.
- 9 • Handy thesaurus/spell checker program
- 10 • Grocery shopping mode– Capture things you need during the week as you think
- 11 of them; check off items, keep running cost total as you shop.
- 12 • Electronic score keeper for 2- and 3-person games, especially golf.

14 *Second Scenario*

15
16 *A restaurant critic had a difficult time being treated like just a “normal*
17 *customer” by the restaurants she reviewed; as her constant note taking*
18 *while sitting at the table would always tip off the local staff as to her*
19 *purpose there; blowing her cover and guaranteeing that her experience*
20 *there would be anything but typical. Fortunately, our reviewer started*
21 *learning to type on a data input device 44 the night before (it takes about an*
22 *hour to learn the basic alphabet), so she thought she’d try to take notes*
23 *with the a data input device instead. With her eyes on the menu and her*
24 *hand under the table, none of the staff ever suspected that she was actually*
25 *typing her thoughts with the hidden hand. With this new discreet note*
26 *taking tool, she ended up being treated like common folk, and therefore had*
27 *lots of dirt to report in her column, which subsequently increased her*
28 *reader following which led eventually to a raise. All because of the data*
29 *input device 44.*

30
31 *Suddenly her pager went off. She looked at the pager, but did not recognize*
32 *the telephone number at all, and so could not ascertain if it was an*
33 *important page or one she could blow off till after her meal. (Her cell*
34 *phone was no help; although it has a phone book inside, you can only look*
35 *up numbers by name; not the other way around. Here she had a number,*
36 *and needed to do a “reverse look-up” for the name.) Fortunately, since*
37 *her data input device 44 had all the functionality of a PDD, including the*
38 *ability to synch up with a phone book program on her desktop, she had her*
39 *entire contact list in the palm of her hand, and was able to do a reverse*
40 *lookup on the number. “Ohmigawd!”, she said, in her best Valley Girl*
41 *voice, “That’s the publisher of the magazine!! I’d better not keep him*
42 *waiting.”*

43

1 Real Estate agents are another good market for this function, as they are constantly
2 driving around neighborhoods, showing properties, and taking notes from behind the wheel
3 (sometimes while the vehicle is moving!). Using a data input device in this scenario is
4 perfectly fitted to the needs of the traveling note taker.

5 The circuit illustrated in Fig. 6 provides the electronic components (hardware and
6 software) that are required to realize the *Second Scenario*. Because the data input device 44
7 depicted in Fig. 6 is being asked to do quite a bit more, the components required have to have
8 more “horsepower.” The CPU, for example, not only has to manage all the data (upwards of
9 several megabytes worth of RAM, or as much as the technology of the day will allow), but it
10 also has to handle the bit-mapped display, and react quickly when data is typed and/or
11 manipulated on-screen. A CPU similar to the Motorola “Dragonball” 68000-based CPU
12 (which can have many of the required green-box peripherals on-chip) represents a good
13 combination of horsepower and low power consumption, and would be ideal for this
14 application. (The “Dragonball” is the same CPU used by the Palm Pilot.) Displays can be
15 large, flat, and bitmapped, similar to the type used in the Xircom REXX 6000 Micro PDD.

16 17 **Third Embodiment**

18 19 **Implementation 3 – As a fully-functional PDD with 2-way text paging**

20
21 As depicted in Fig. 8, the third embodiment of this invention, the data input device 48,
22 has a reasonably easy-to-use typing scheme and the functionality of a 2-way text pager (for
23 example, like that offered by the RIM 950 alphanumeric pager 44 which has a tiny yet
24 unusable keyboard 44a on its face as illustrated Fig. 7). With this kind of 2-way wireless e-
25 mail feature, the data input device 48 has these kinds of integrated functions for its user:

- 26
27 • Built-in alphanumeric pager (with automatic cross-referencing of names and numeric
28 pages). Users can download, respond to, and upload e-mail messages in the
29 background; answer messages while waiting in line, walking, driving, lying down, or at a
30 concert.
- 31
32 • A complete PDD as described above in connection with the data input device 44.

33

Third Scenario

1
2
3 *Miles Nader, renown for being a Master Negotiator, sat down at the*
4 *negotiating table representing his client. A top manager for Prisney*
5 *Company, Mr. E, has threatened to not renew the license to use Prisney*
6 *characters on some sweatshirts unless "better" terms are negotiated. The*
7 *conversation went something like this:*

8
9 *Mr. E: Well, I appreciate the amount of work you've done for us in the*
10 *past. Because of you we sold 100,000 of your sweatshirts last year, and we*
11 *both made a killing. But that was last year. As you know, your contract*
12 *ends tonight and I have already received better offers from two of your*
13 *competitors for the same rights that are expiring with you. As a*
14 *businessman, I'm obligated to go with the higher offer. It's nothing*
15 *personal.*

16
17 *Nader: If I can ask, who bid what?*

18
19 *Mr. E: Well, Sally's Sweats offered me \$50,000 for the rights; and Ben's*
20 *Britches offered an undisclosed yet higher amount but with slightly different*
21 *terms.*

22
23 *Nader stared at Mr. E and listened with intent, with one hand on top of the*
24 *table. Unbeknownst to Mr. E, he was also quietly typing an e-mail on his*
25 *data input device, which he had in his other hand, underneath the table.*
26 *The e-mail was short but sweet:*

27
28 *Better offers?*
29 *Sally's: \$50K*
30 *Ben's: >\$50K*
31 *Please advise.*

32
33 *And with that, he sent an e-mail off to Della Street, his research assistant.*
34 *Della made some quick phone calls to try to confirm these bids, while Miles*
35 *Nader went through the usual negotiation dance. Within 15 minutes, Miles*
36 *got a page, which he looked at briefly and then ignored as if it was another*
37 *client:*

38
39 *"Both gave Mr. E the bird."*

40
41 *With this discreet and time-sensitive intelligence, Miles had the upper hand*
42 *in the negotiations, was able to call Mr. E's bluff, and everyone lived*
43 *happily ever after.*

44
45 Needless to say, there is no way you can do this with any other instruments available today.

46 To make this **Third Scenario** a reality, new RF (Radio Frequency) modules need to be added

1 to the data input device hardware that will make it compatible with any one of the many
2 different text-based paging infrastructures worldwide.

3 As depicted in Fig. 8, the input device of the *Third Scenario* employs, for example,
4 text-paging infrastructures such as an RF Transmitter/Receiver that needs to be compatible
5 with (both in terms of frequency and in terms of protocol/packet construction) the
6 Motorola's Flex network (operating at either 400 or 900 MHz), and the RAM Mobile Data
7 packet-based infrastructure (operating at 800 MHz). This functionality can easily be
8 designed in using the RF manufacturer's pre-fabricated boards or chipsets. The same
9 Dragonball microprocessor discussed in Implementation 2 above can be used here as well.

10 11 **Fourth Embodiment**

12 13 **Implementation 4—As a fully-functional PDD with web browsing capabilities**

14
15 The idea of 2-way e-mail is being extended. There is a new generation of handheld
16 devices that are always connected to the global computer network (The Internet) via radio,
17 and have in them web browsers that are capable of displaying pictures, playing sound files,
18 etc. The current offerings in this category are pretty useless, mostly because nobody has
19 figured out how to address the conflicting requirements of portability and data entry. There's
20 no reason why one cannot simply apply the data input device's typing scheme to a
21 manufacturer's pre-existing platform to create a superior and usable unit. To a casual
22 observer, this implementation might appear to be exactly the same as Implementation 3: a
23 data input device 48 (Fig. 8) with a wireless connection to the Internet. However, from a
24 technical point of view, the two are vastly different. A text-based pager transfers only ASCII
25 (text) data and can do so at relatively slow speeds in the background while it's worn on the
26 user's belt. A wireless web based unit must be able to transfer larger amounts of information
27 (graphics, audio, video, in addition to Unicode) nearly "on demand" as the user surfs the web.
28 The infrastructures, frequencies, protocols, and chipsets that would be used in
29 implementation are completely different and therefore warrant its own section for discussion.

30 A short list of emerging frequencies and protocols that would support such an internet
31 appliance are listed below. (This is not an exhaustive list; it is here for illustrative purposes
32 only). Because this is a transitional technology and the markets are just now emerging, most
33 of these protocols are based and/or grafted onto cell phone standards:

1

Basic digital Cell Phone frequencies – 900 MHz, 1800 MHz (PCS)
Cellular Digital Packet Data (CDPD) – data channel used with today’s digital cell phones. (I.e., Omniskey)
Short Message System (SMS) Protocol – Protocol used to send brief text-based messages from one cell phone to another.
Wireless Application Protocol (WAP) – lightweight protocol used for the “microbrowsers” employed in some of today’s today’s cell phones. Often layered on top of the SMS protocol.
Handiphone – A Japanese standard for up to 56K in wireless Internet Access Speeds (scheduled to arrive in the U.S. shortly)
WCDPD, CDPD 2000 – Wider bandwidth standard of the Cellular Digital Packet Data standard.

2

3

Fourth Scenario

4

5

Tommy the tourist is lost in a foreign country, looking for the closest Hilton hotel. If he were by his desktop computer at work, Tommy would simply go to a web search engine and look up all the information he needs, and then print it out for the road. But because he has his data input device-based Internet Appliance with him, he can quickly do the same thing regardless of where he is.

6

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12

Tommy whips the data input device from his belt and, using the device’s chording method of typing, types in the URL for the search engine. Because the handheld unit has a large, color touch-sensitive screen, Tommy can then use the index finger of his free hand to point to hyperlinks and surf the web from that point. Because the unit is “always on” via the built-in packet radio interface, Tommy does not have to wait for the unit to connect to the Internet in order to use it.

13

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*Tommy can also check his web-based hotmail account using the web browser, and respond to any and all messages throughout the day as he takes periodic rests. But because the web is multi-media (rather than text only), Tommy can also send multimedia e-post cards via the unit’s built-in camera and audio recorder (see **Second Scenario**). For example, when sending e-mail, Tommy can point the unit’s built-in camera toward the monument he just found, record a 10-second audible caption, and send both of these artifacts as attachments to an e-mail and off it goes.*

21

22

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29

Tommy puts the device back in its holster and thinks of what to do next. Meanwhile, the data input device is transmitting the message to the Internet via radio in the background while Tommy is free to concentrate on other things.

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Fifth Embodiment

Implementation 5 – Incorporation into a cell phone

In implementation 5 a data input device is combined with a cell phone including all the conventional components that go into making a cell phone function. Imagine the poor cell phone user who is also driving his car and needs to take his eyes off the road in order to take notes or even just to dial the next number. The cell phone user who actually tries to make use of his phone’s 2-way e-mail feature by trying to type a message onto the tiny keypad on the cell phone is most likely driving negligently. Incorporating the data input device’s typing scheme into an existing mobile cell phone as the embodiment 50 of this invention illustrates in Fig. 9 alleviates this problem, plus solves some others.

Fifth Scenario

John was just released from the hospital, having spent 3 weeks recovering from an automobile crash. John was a Field Sales Rep, and made most of his business phone calls from the road. Although he used a headset while he drove, the headset did not eliminate the need to take his eyes off the road while he initiated and ended phone calls. The day of the accident was particularly bad; as John was hastily trying to write down a quick phone number during a call. That’s when a car cut in front of him and, because John’s eyes were off the road for the wrong few seconds, he was not able to react in time.

John learns from his mistakes. He immediately went out and purchased a cell phone which had the data input device typing scheme built-in. Using the typing scheme, John can now dial numbers, type in a person’s name and have the phone dial that person’s number, and he can also take notes during a phone call, all without having to take his eyes off the road.

John’s 20-year-old son, Darrin, didn’t like talking much on the phone; he grew up on the Internet and therefore can only communicate with people if they’re in a chat room. Although Darrin owned a cell phone, he would never be seen talking on one; he and his friends just send e-mail messages to each other over their cell phones. (Because he didn’t know any better, it hadn’t even occurred to him that typing a message using the letters on the telephone keypad was not only hideously slow, but it might also possibly be a really stupid way to type.) When Darrin saw his father’s new phone with the built-in Data input device scheme, he immediately grabbed his skateboard and went out to buy one of his own. Now, whenever Darrin sends a phone-based e-mail message to his friends, he can type his

1 *message about ten times faster, and he can do it during class, too, where*
2 *the teacher sees only that Darrin is looking straight ahead and appears to*
3 *be alert.*

4
5 Another great market for a data input device with communication capabilities would be
6 Highway Patrol Officers who must routinely “run” license plates through the central computer,
7 sometimes before the motorist is pulled over. Current police cars use laptops mounted over
8 the transmission hump, where the officer is expected to take his eyes off the road, hunt-and-
9 peck with one hand, and then read the results on the screen, all while keeping an eye on traffic.
10 A data input device with a Speech Synthesizer and 2-way communication would be a superior
11 solution; license plates could be typed in while the officer keeps his eyes on the road, and the
12 results could be “spoken” back to the officer using the unit’s built-in speech synthesizer. In
13 this case, the eyes never leave the road.

14 A slightly different, perhaps more visionary cell phone embodiment 52 of this
15 invention appears in Fig. 10, where the keypad is done away with completely, leaving room
16 for a larger and far more useful visual display 54 (especially when it comes to those cell
17 phones that can browse the web – all existing web-enabled cell phones have displays that are
18 far too small to be useful.)

19 20 **Sixth Embodiment**

21 22 Implementation 6 – As an Exoskeleton for an existing product

23 As a quick way to “jump to market”, this embodiment 56 of this invention (Fig. 12A)
24 would bypass a lot of the development and R&D required to build a fully-functional,
25 integrated product from scratch. There are several existing PDD and portable communication
26 products on the market for which one can manufacture an external peripheral (an exoskeleton)
27 comprising a jacket 58 to which the conventional PDD 60 (Fig. 11) or other communication
28 device, such as a message-capable mobile phone, is mounted. The jacket 58 has the required
29 control buttons 14a through 14d and a multi-position control mechanism 12 on the exterior of
30 the jacket and includes a program that allows the PDD 60 or other device to recognize the
31 chording as inputs from the actuated buttons/multi-position control mechanism on the jacket
32 58 .

33 As an example, Fig. 11 shows the commercially available “Micro PDD”. It is the size
34 of a PC or credit card and can slip very easily into a laptop computer’s PCMCIA slot. It has

1 its own CPU, display, batteries, display 60a, and memory. Its display 60a or screen is
2 touch-sensitive so one can point to and touch an icon 60b and then navigate within that
3 subscreen. The only thing it is missing is a good way to enter information. That's where
4 implementation 6 comes in.

5 As shown in Fig. 12A, the jacket 58 has a slot 58a designed specifically to
6 accommodate the Micro PDD 60. When the PDD 60 is inserted into the open end 58b of the
7 slot 58a, it couples electronically to the control buttons and multi-position mechanism.
8 Consequently, the embodiment 56 acts as a keyboard to the PDDs own CPU and display
9 60a.

10 Another example is shown in Fig. 12B, where the exoskeleton accommodates a mobile
11 communications device D2 (such as a cell phone with text messaging capabilities). Using a
12 coupling similar to that described for Fig. 12A, having a user press combinations of buttons
13 will end up "typing" a message which can then be sent via the communications device.

14 Advantages to marketing a product like this are numerous:

- 15 1) Easy manufacture – all the intelligence and development work already reside in the
16 PDD or mobile communications device.
- 17 2) Low cost – same reason as in implementation 1.
- 18 3) Right Demographic – "early adopters" who buy this instead of a Palm Pilot for the
19 portability and convenience will be drawn to the low-cost data input device keyboard
20 adapter for the same reasons.
- 21 4) Low risk for investors – relatively little R&D required.

22
23 The requirements for this sixth embodiment depend on which the PDD or mobile
24 communications device is being interfaced. Fig. 13 shows what is required to make one
25 version of this sixth embodiment when being interfaced to the Xircom Rex Micro PDD 60
26 shown in Fig. 12A. Like Implementation 1, this implementation 6 is a relatively lightweight
27 application, and the CPU can be a lightweight performer. One possibility might be an all-in-
28 one integrated or hybrid package, such as the "Basic Stamp" from PIC Corp. The PCMCIA
29 (Now often called "PC CARD") Chipset is another off-the-shelf solution that would interface
30 with this particular organizer. Other organizer products might require another interface
31 method, such as a dedicated serial interface or 2-way infrared communications scheme.
32

Miscellaneous

If the data input device were to be manufactured with special markets and uses in mind, the following kinds of very unique features could be included:

- Bar code reader (great for Federal Express workers)
- Text-to-Speech synthesizer for those with speech problems. (You should see the bulky units available on the market!)
- Text-to-Speech foreign language converter – type in the phrase in the language you know, have the speech synthesizer say it in the language you don't.
- Digital audio recorder: have it record sound for musicians who might forget that great musical phrase they just thought of.
- Built-in digital camera. (Combined with the above feature, the invention becomes an ideal companion for field journalists.)
- Camera time exposure control port - program the invention to take “timed exposure” pictures using various over- and under-exposures. Makes for beautiful nighttime shots without the guesswork.
- Include an Infrared transmitter and receiver; turn the Data input device into a learning TV/VCR/Cable remote control. (Can replace bolted down remote controls in hotel rooms.)

Most, if not all of these are features, are not present in any conventional hand-held unit available at the time of this writing.

Sixth Scenario

Jane was traveling in Nepal as a tourist, but like most Americans, hadn't bothered to learn the language before embarking. Instead, she had her Data input device always at her side – it was the ideal companion for the traveler. She had the foresight to have added the Nepal Travel software module to the unit before she left.

When Jane was at a store and wanted to know how much something would cost in US Dollars, she would discreetly take out her data input device, type in the price of the object in Rupees, and press the “convert” chord command to get the price. If there was no price tag, Jane would hold the object in one hand, and with the other hand type in the sentence “How much does this cost?”, press the “Translate” chord, and the onboard speech synthesizer would verbally ask the question in perfect Hindi. (The shopkeeper would then write down an answer using numbers, a response she could understand.)

The remarkable thing about the ***Sixth Scenario*** is that at no time did Jane have to put down her purse, packages, or object and scurry toward a counter or tabletop surface in order to realize the usefulness of the data input device. It is handy and usable in real-life situations,

1 while standing, holding packages, articles of clothing, etc. No other hand-held device on the
2 planet can be used with such transparency.

3 The Nepal software module also has in it a complete travel guide, which is all
4 searchable via keywords, and easily readable via the unit's large display, which can display
5 several lines of text and graphics at once. Jane saved considerable space in her backpack by
6 leaving the travel books home and used the data input device to quickly look up information
7 she needed. Future incarnations of the device might do away with a travel module altogether,
8 instead accessing the internet wirelessly in real time from wherever she was.

9

10 Implementation 7- In space

11

12 As illustrated in Fig. 14, when floating in space an astronaut 100 can manipulate the
13 data input device 10 of this invention with one hand and avoid strapping him or herself to a
14 stationary object in the spacecraft when taking notes or otherwise gathering data (or outside
15 the spacecraft where it's not possible to place a conventional computer or keyboard).

16

17 SCOPE OF THE INVENTION

18

19 The above presents a description of the best mode contemplated of carrying out the
20 present invention, and of the manner and process of making and using it, in such full, clear,
21 concise, and exact terms as to enable any person skilled in the art to which it pertains to make
22 and use this invention. This invention is, however, susceptible to modifications and alternate
23 constructions from that discussed above which are fully equivalent. Consequently, it is not
24 the intention to limit this invention to the particular embodiments disclosed. On the contrary,
25 the intention is to cover all modifications and alternate constructions coming within the spirit
26 and scope of the invention as generally expressed by the following claims, which particularly
27 point out and distinctly claim the subject matter of the invention:

28

29

30

31

32

33

THE CLAIMS

- 1
2
- 3 1. A portable, electronic data input device, including
4 a housing sized to be held in the palm of one hand of a user and having at least one
5 pair of adjacent sides,
6 said housing holding a control circuit having an input and output, and
7 one adjacent side having four individual dual-position control buttons arranged in a
8 row and positioned to be actuated by an individual finger of the hand of a user grasping the
9 input device in the palm of the hand, and
10 the other adjacent side having a depression configured to seat therein the underside end
11 portion of a thumb of a user while he or she is grasping the input device in the palm of the
12 hand,
13 a multi-position control mechanism in said depression, said multi-position control
14 mechanism comprising a plurality of individual switch contacts arranged in a predetermined
15 pattern that enables a user, while holding the input device in the palm of one hand and his or
16 her other fingers each touching an individual one of the dual-position control buttons, to reach
17 with the thumb of the hand holding the input device said multi-position control mechanism
18 and, using only the thumb, activate any individual switch contact or activate two switch
19 contacts simultaneously,
20 said control buttons and multi-position control mechanism being connected via the
21 input to the control circuit and providing a chordic-keyboard capable of generating a variety
22 of different electronic signals at the input to the control circuit as determined by the user
23 manipulating the dual-position control buttons, the multi-position control mechanism, or both
24 simultaneously,
25 said control circuit in response to activation of said buttons, multi-position control
26 mechanism, or both simultaneously, generating at the output an electronic signal
27 corresponding to a unique symbol or a unique command in accordance with said activation.
28
- 29 2. The input device according to Claim 1 where the control circuit comprises a read only
30 memory, a random access memory, and a central processing unit connected to said memories.
31
- 32 3. The input device according to Claim 1 including an output connector adapted to
33 connect the input device to one or more of the following: a computing platform, a

1 communication device, a computer network, a personal digital device with or without a
2 display, or with or without a keyboard.

3
4 4. The input device according to Claim 1 where the housing holds a display that provides
5 a visual read-out corresponding to the unique symbol, command, or results of a command.

6
7 5. The input device according to Claim 4 where the results of a command include a map,
8 a graphical or character, or different language.

9
10 6. The input device according to Claim 1 where the housing holds an audio generator that
11 provides a sound corresponding to the unique symbol, command, or results of a command.

12
13 7. The input device according to Claim 1 where the housing has on an exterior surface of
14 said other adjacent side a display that provides a visual read-out corresponding to the unique
15 symbol, command, or results of a command, and there is a pair of said multi-position control
16 mechanisms on said other adjacent side, said display being disposed between individual ones
17 of the pair of multi-position control mechanisms.

18
19 8. The input device according to Claim 1 connected to a personal digital device.

20
21 9. In combination,

22 a portable hand-held input device and a personal digital device including a data storage
23 device and a data entry mechanism connected to the data storage device, said data entry
24 mechanism activated by a user to input data to the data storage device,

25 said hand-held input device and personal digital device each including couplers that
26 enable them to be manually connected and disconnected under the control of a user, upon
27 connection said hand-held input device being directly linked to the data storage device or a
28 communication system, so that, when the hand-held input device is activated by a user, data
29 is transmitted from the hand-held input device to the data storage device or the
30 communication system, bypassing the data entry mechanism,

31 said hand-held input device including

32 a housing sized to be held in one hand of a user and having a plurality of control
33 buttons that provide a chordic-keyboard capable of generating a variety of different electronic

1 data signals as determined by which single button or combination of buttons are activated,
2 each single button or combination of buttons corresponding to a unique symbol or a unique
3 command,

4 said button or combination of buttons being activated by a user manually manipulating
5 his or her digits while the housing is being grasped by a hand of the user from which the digits
6 extend.

7
8 10. The combination according to Claim 9 where the data entry mechanism is a writing
9 pad.

10
11 11. The combination according to Claim 10 where the writing pad responds to a stylus
12 manipulated by user to touch, or otherwise to stimulate, the writing pad.

13
14 12. The combination according to Claim 9 where the data entry mechanism is a keyboard.

15
16 13. The combination according to Claim 9 where the personal digital device has a
17 connector enabling the personal digital device to be linked to a communication system.

18
19 14. The combination according to Claim 9 where the data storage device includes a
20 program that provides phone numbers.

21
22 15. The combination according to Claim 9 where the personal digital device has a
23 connector device enabling the personal digital device to be linked to a global computer
24 network.

25
26 16. The combination according to Claim 9 where the personal digital device has a
27 connector device enabling the personal digital device to be linked to a high-bandwidth
28 communication system.

29
30 17. The combination according to Claim 16 where the high-bandwidth communication
31 system is television.

32
33

1 18. The combination according to Claim 9 where the personal digital device includes a
2 visual display for displaying visual data.

3
4 19. The combination according to Claim 18 where visual display and writing pad share a
5 common screen.

6
7 20. A jacket serving as an external peripheral for a communication device, said jacket
8 comprising

9 a compartment adapted to hold the communication device,
10 a plurality of control buttons on an exterior surface of the jacket, and
11 a program that allows the communication device to recognize as input data signals the
12 manual actuation by a user of a button, or combination of the buttons.

13
14 21. The jacket according to Claim 20 where the communication device is personal digital
15 device for collecting data.

16
17 22. The jacket according to Claim 20 where the communication device is a mobile
18 telephone.

19
20 23. A electronic data input device, including
21 a housing sized to be held in the palm of one hand of a user,
22 said housing including a control circuit having an input and output,
23 four individual dual-position control buttons arranged in a row along a first side of the
24 housing, each of said dual-position control button positioned to be actuated by an individual
25 finger of the hand of a user grasping said input device in the palm of the hand, and

26 at least one five-position control mechanism on a second side of the housing that is
27 adjacent to said first side, said five-position control mechanism positioned to be within reach
28 of the thumb of a user while holding the input device in the palm of one hand with the other
29 fingers of said one hand each positioned next to an individual dual-position control button,

30 so that, using only the thumb and with each of said other fingers so positioned next to
31 an individual dual-position control button, the user can actuate one position of the five-
32 position control mechanism, or, can activate simultaneously at least two positions of the five-
33 position control mechanism,

1 said control buttons and five-position control mechanism being connected via the
2 input to the control circuit and providing a chordic-keyboard capable of generating a variety
3 of different electronic signals at the input to the control circuit as determined by the user
4 manipulating the dual-position control buttons and five-position control mechanism,

5 said control circuit providing individual data signals corresponding to a unique symbol
6 or a unique command depending on which individual dual position control button, or which
7 position of the five-position control mechanism, or combination thereof, is actuated.

8
9 24. The electronic data input device according to Claim 23 where the five-position control
10 mechanism includes a key top member and a circuit board having five pairs of open electrical
11 contacts, said key top member overlying the circuit board and mounted to move into five
12 different positions depending on how a user manipulates the key top member, each different
13 position closing one pair of open electrical contacts.

14
15 25. The electronic data input device according to Claim 24 where the key top member has
16 a substantially cross-shape configuration, including a central element with four legs extending
17 outward from said a central element.

18
19 26. The electronic data input device according to Claim 25 where one pair of contacts is
20 positioned beneath each of said legs and one pair of contacts is positioned beneath the central
21 element.

22
23 27. A electronic data input device, including
24 a housing sized to be held in the palm of one hand of a user,
25 said housing holding a control circuit having an input and output, and
26 having four individual dual-position control buttons arranged in a row along a first side
27 of the housing, each of said dual-position control buttons positioned to be actuated by an
28 individual finger of the hand of a user grasping said input device in the palm of the hand, and
29 at least one multi-position control mechanism on a second side of the housing that is
30 adjacent to said first side, said multi-position control mechanism comprising a plurality of
31 buttons arranged in an arc and at least one button next to the arc of buttons, said buttons of
32 the multi-position control mechanism being positioned to be within reach of the thumb of a

1 user while holding the input device in the palm of one hand with the other fingers of the this
2 one hand each positioned next to an individual dual-position control button,

3 so that, using only the thumb and with each of said other fingers so positioned next to
4 an individual dual-position control button, the user can actuate one position of the multi-
5 position control mechanism, or, can activate simultaneously at least two positions of the
6 multi-position control mechanism,

7 said control buttons and multi-position control mechanism being connected via the
8 input to the control circuit and providing a chordic-keyboard capable of generating a variety
9 of different electronic signals at the input to the control circuit as determined by the user
10 manipulating the dual-position control buttons and five-position control mechanism,

11 said control circuit providing individual data signals corresponding to a unique symbol
12 or a unique command depending on which individual dual position control button, or which
13 position of the multi-position control mechanism, or combination thereof, is actuated.

14
15 28. A portable, electronic data input device, including

16 a housing sized to be held in the palm of one hand of a user,

17 said housing including

18 one side having four individual dual-position control buttons arranged in a row
19 and positioned to be actuated by an individual finger of the hand of a user grasping the
20 input device in the palm of the hand, and

21 another side having a multi-position control mechanism positioned to be
22 actuated by a thumb of a user while he or she is grasping the input device in the palm
23 of the hand,

24 said multi-position control mechanism comprising a plurality of individual
25 switch contacts arranged in a predetermined pattern that enables a user, while holding
26 the input device in the palm of one hand and his or her other fingers each touching an
27 individual one of the dual-position control buttons, to reach with the thumb of the
28 hand holding the input device said multi-position control mechanism and, using only
29 the thumb, activate any individual switch contact or activate two switch contacts
30 simultaneously,

31 said control buttons and multi-position control mechanism being connected to a
32 control circuit to provide a chordic-keyboard capable of generating a variety of different

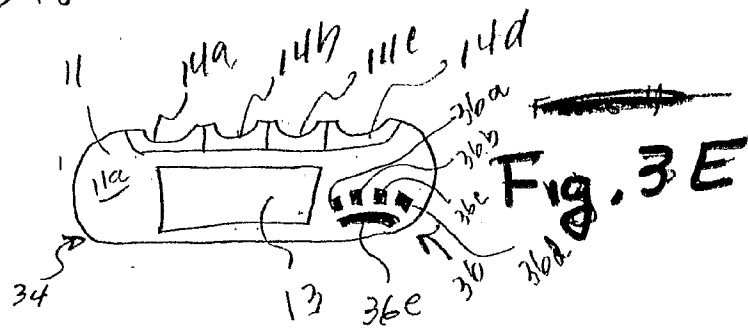
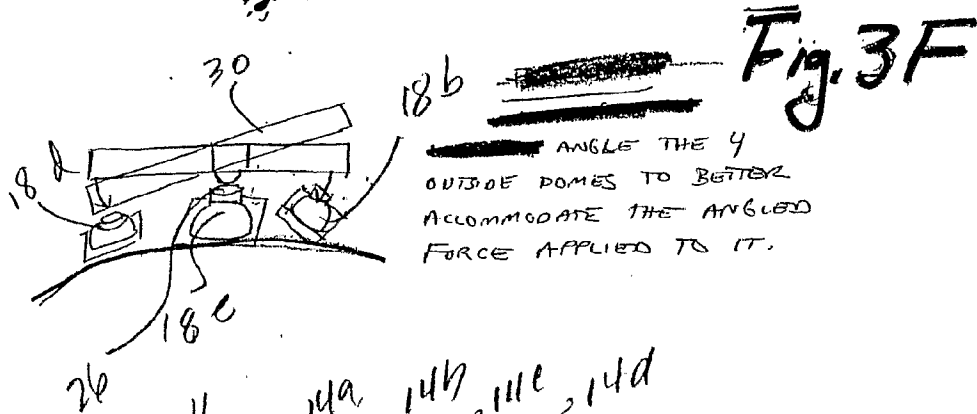
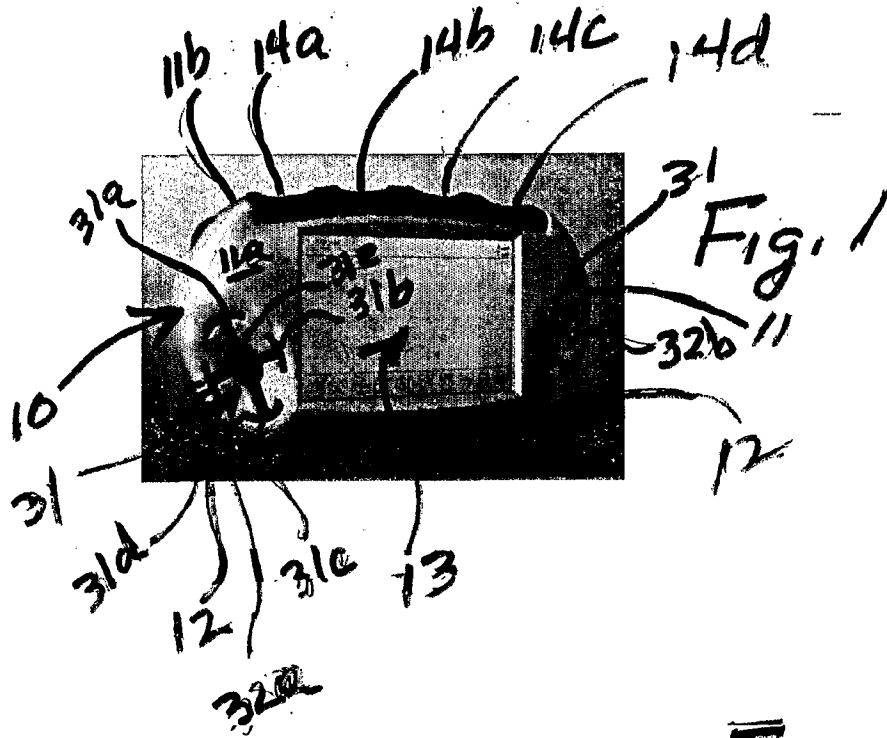
1 electronic signals at an input as determined by the user manipulating the dual-position control
2 buttons, the multi-position control mechanism, or both simultaneously,

3 said control circuit in response to activation of said buttons, multi-position control
4 mechanism, or both simultaneously, generating at the output an electronic signal
5 corresponding to a unique symbol or a unique command in accordance with said activation.

6
7 29. The electronic data input device according to Claim 28 where the multi-position
8 control mechanism is seated in a substantially hemispherical depression.

9
10 30. The electronic data input device according to Claim 28 where at least some of the
11 switch contacts of multi-position control mechanism are arranged in an arcuate pattern.

12
13
14



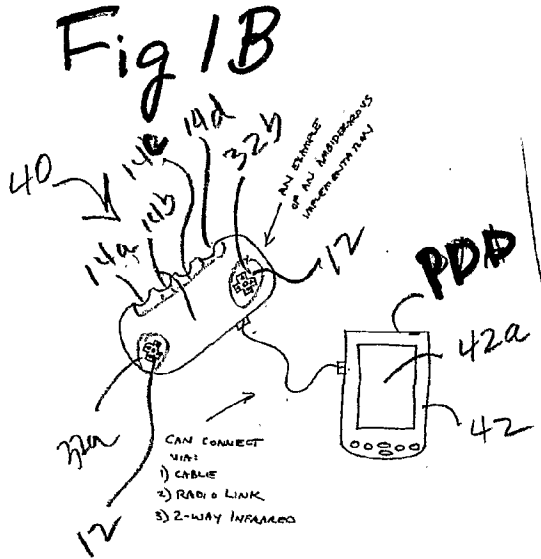
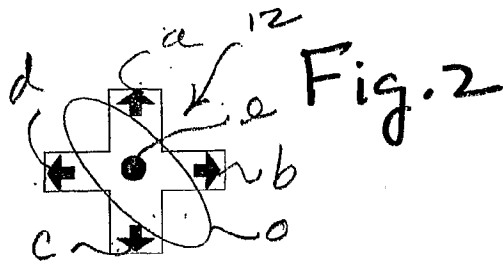
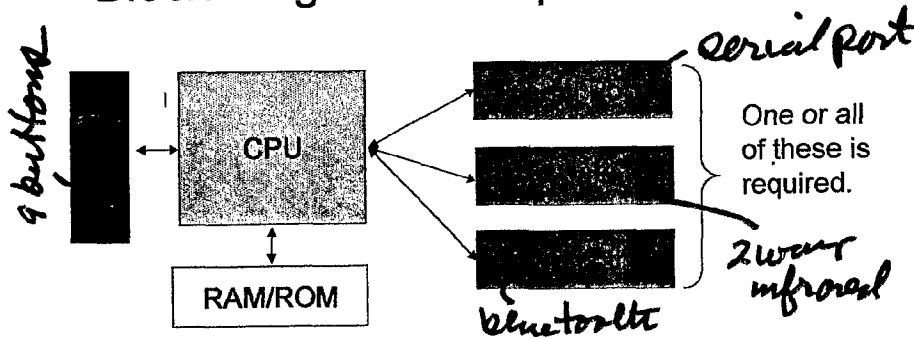
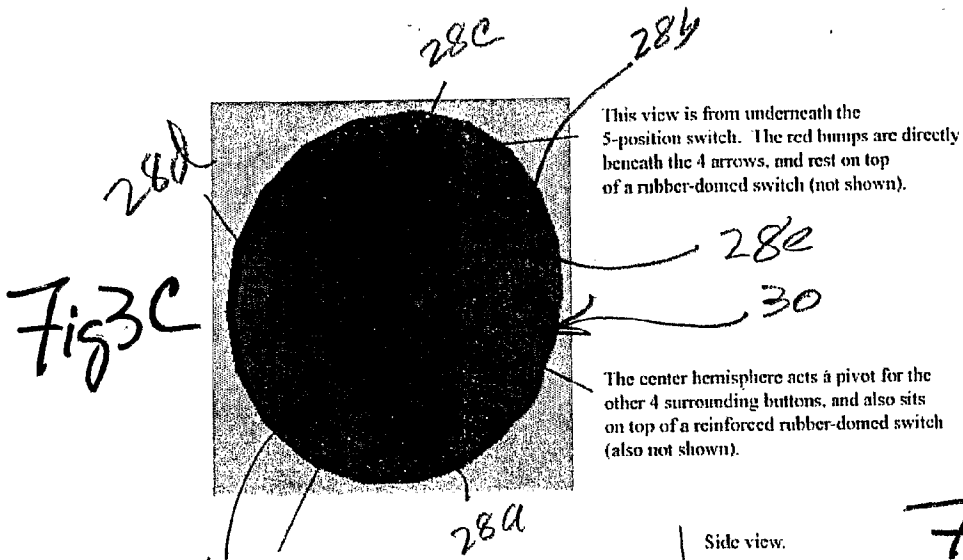


Fig. 5

Block Diagram for Implementation 1



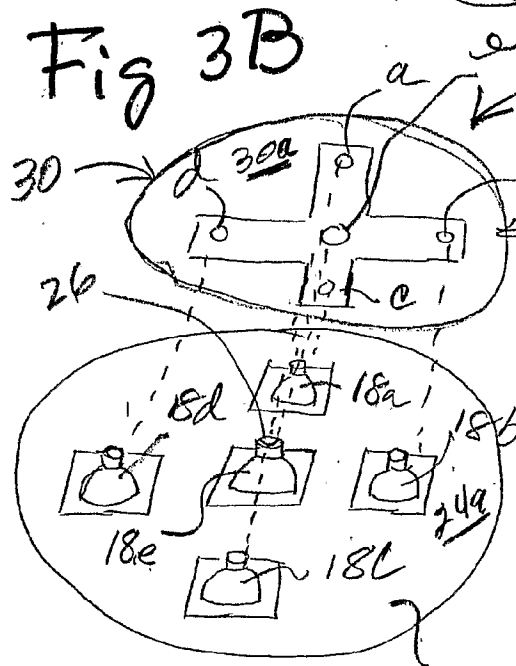
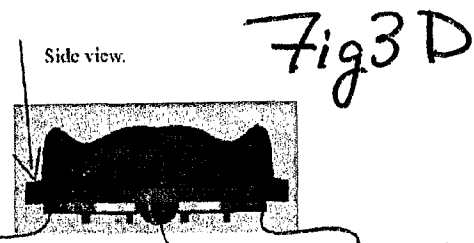
* Bluetooth is an industry brand name referring to a 2-way close-range radio frequency link designed for close-range peripherals to communicate and share information.



This view is from underneath the 5-position switch. The red bumps are directly beneath the 4 arrows, and rest on top of a rubber-domed switch (not shown).

The center hemisphere acts a pivot for the other 4 surrounding buttons, and also sits on top of a reinforced rubber-domed switch (also not shown).

30b The bottom side of the 5-position button can appear circular, even though the top may appear to be 4 thin arrows.



KEY TOP AS SEEN FROM BENEATH (SHORTER ARM IS SUPPOSED TO REPRESENT PERSPECTIVE)

5 RUBBERIZED DOMES SITTING ATOP A PRINTED CIRCUIT BOARD

[Handwritten signature]

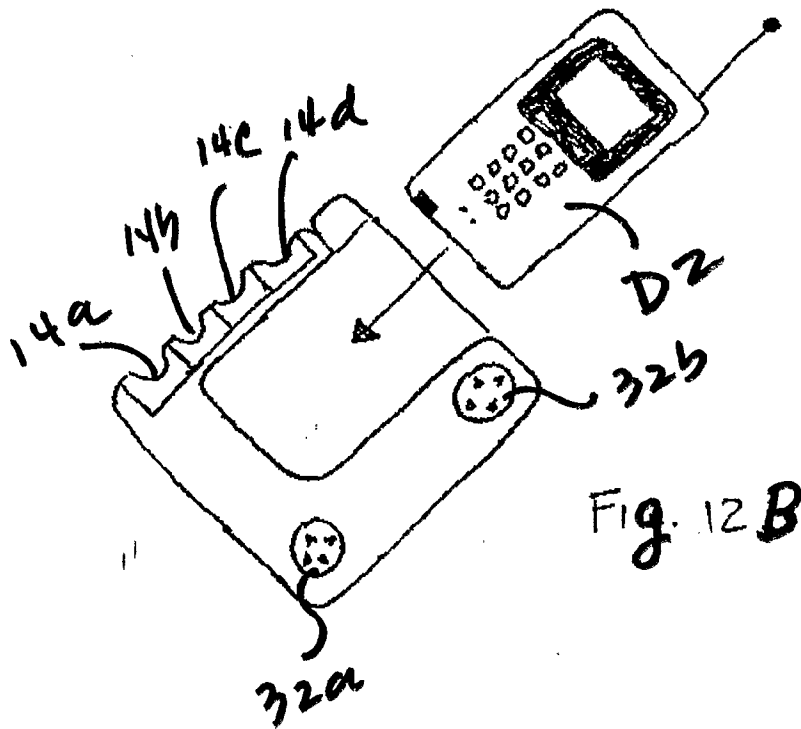
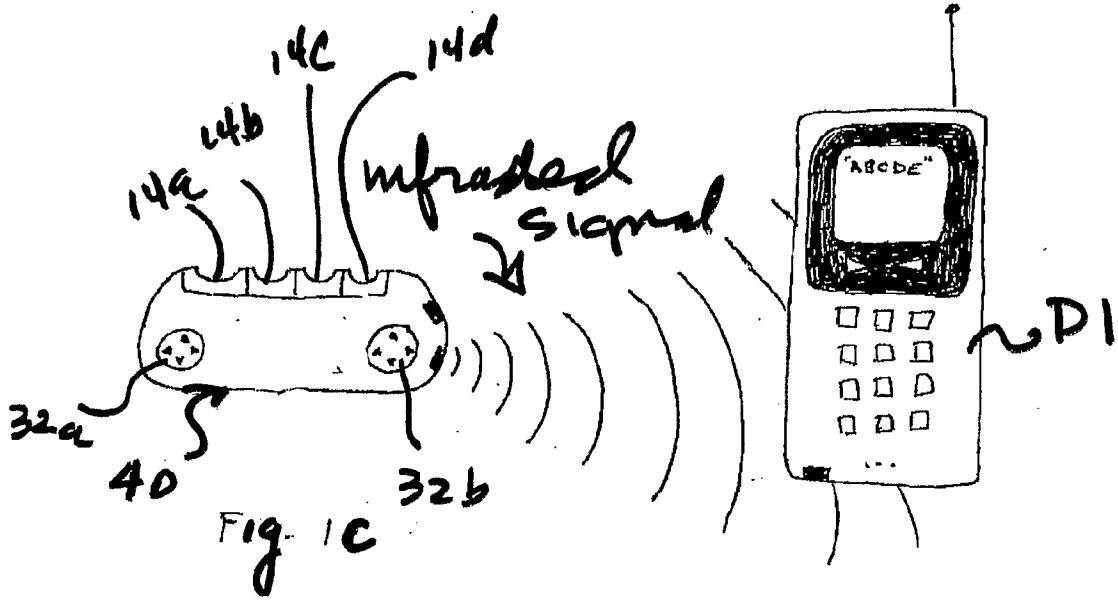


Fig 4

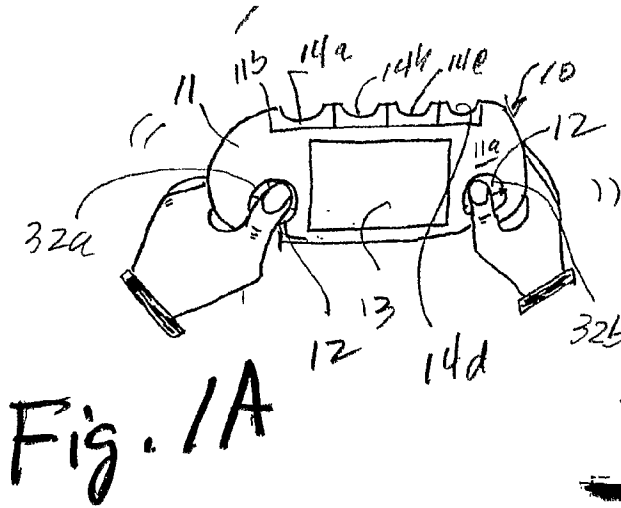
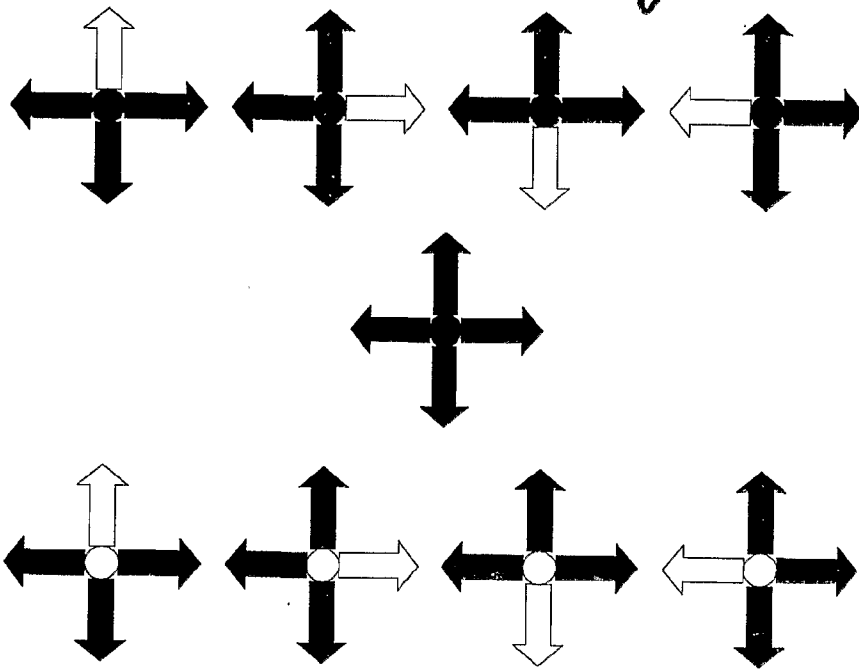


Fig. 1A

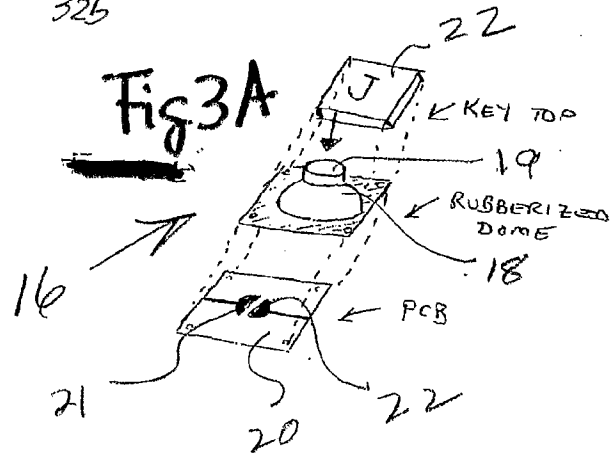
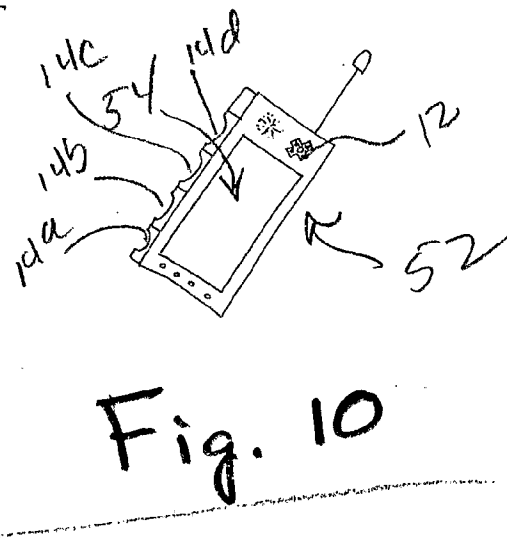
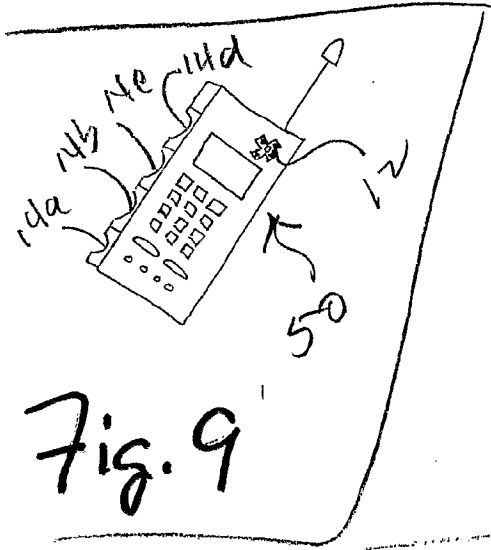
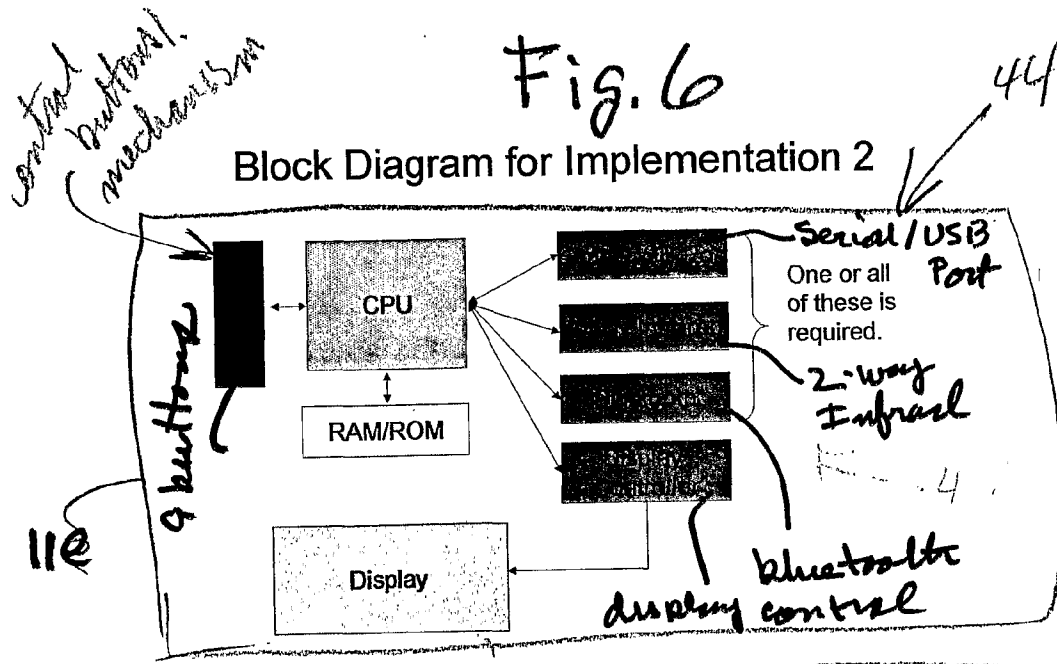


Fig 3A



Block Diagram for Implementation 3

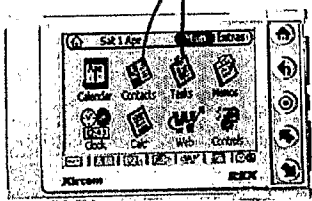
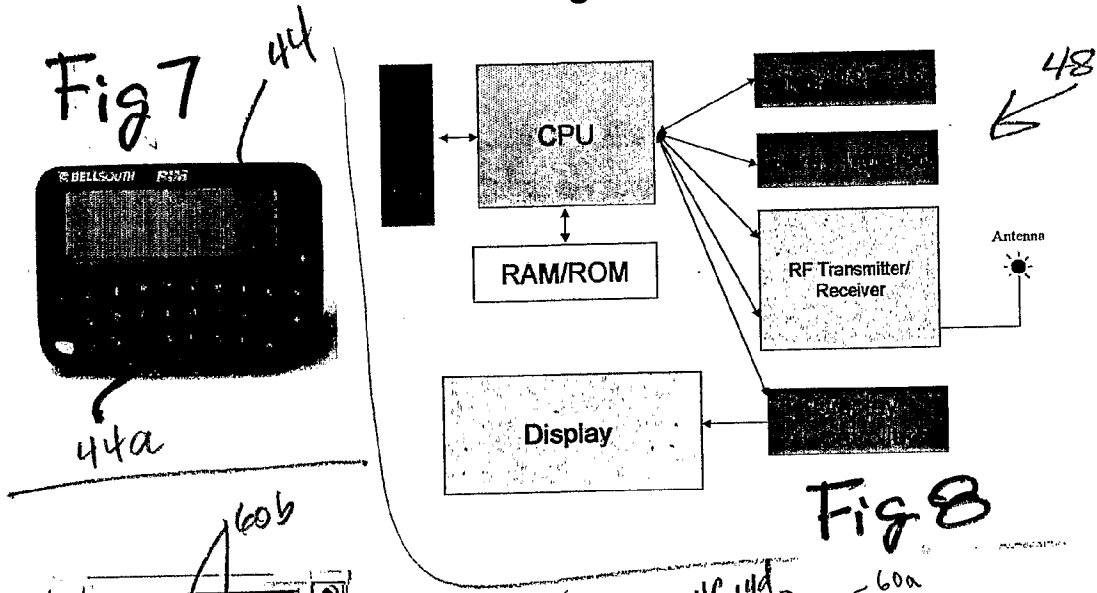


Fig. 11

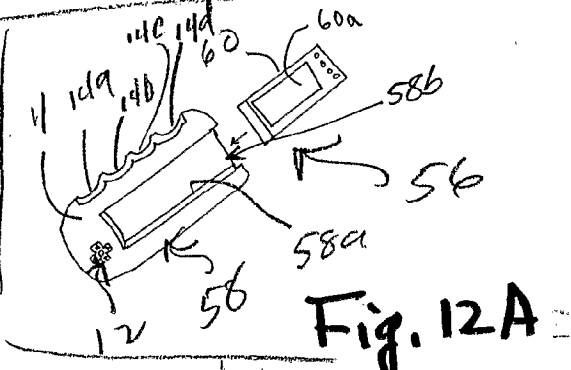


Fig. 8

Fig. 12A

Block Diagram for Implementation 4

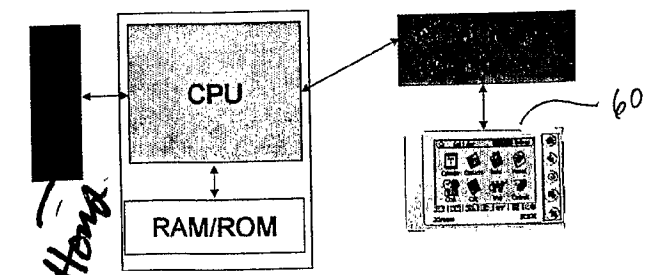
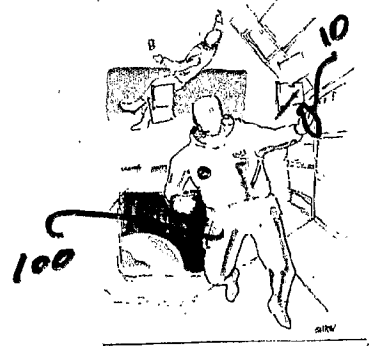


Fig. 13

Fig. 14



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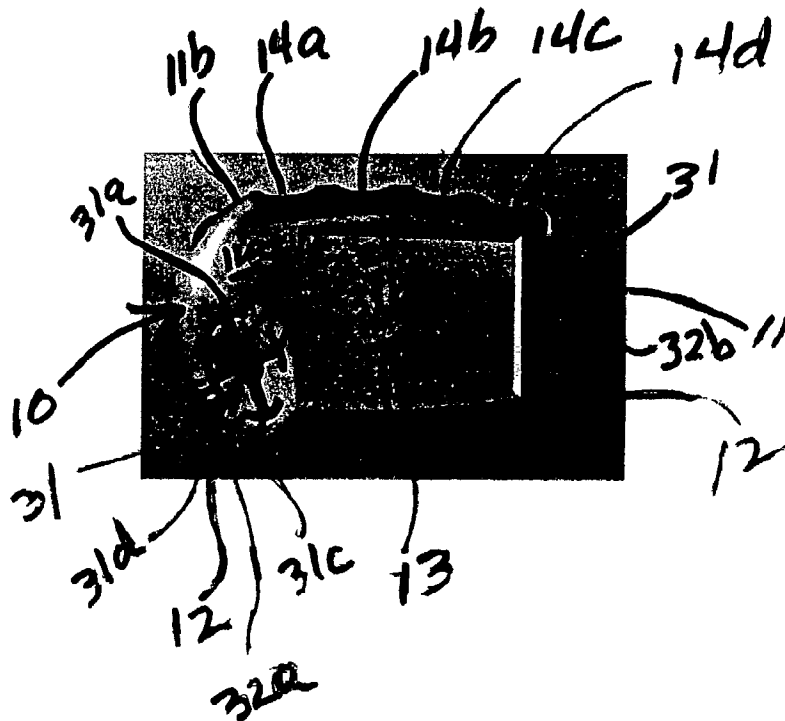
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(54) Title: PORTABLE, HAND-HELD ELECTRONIC INPUT DEVICE AND COMBINATION WITH A PERSONAL DIGITAL
DEVICE



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(57) Abstract: A portable electronic data input device (10) includes a housing (11) sized to be held in the palm of one hand. One housing side has four individual dual-position control buttons (12) arranged in a row and positioned to be actuated by an individual finger of a user grasping the input device (10) in the palm of the hand. A multi-position control mechanism (12) in an adjacent housing side comprises a plurality of individual switch contacts (a, b, c, d, e) arranged in a predetermined pattern that enables a user, while holding the input device (10) in the palm of one hand and the user's other fingers each touching an individual one of the dual-position control buttons, to reach with the thumb of the hand the multi-position control mechanism (12). Using only the thumb, the user activates any individual switch contact (a, b, c, d, e) or activates two or more switch contacts simultaneously. The arrangement of the control buttons and multi-position control mechanism (12) provides

a chordic-keyboard capable of generating a variety of different electronic signals as determined by the user manipulating the dual-position control buttons, the multi-position control mechanism (12), or both simultaneously.



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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,791,408 A (HEUSINKVELD) 13 December 1988, column 4 line 61 to column 5 line 24.	1-30
A	US 4,998,457 A (SUZUKI et al) 12 March 1991, see columns 3-4.	1-30

Further documents are listed in the continuation of Box C. See patent family annex.

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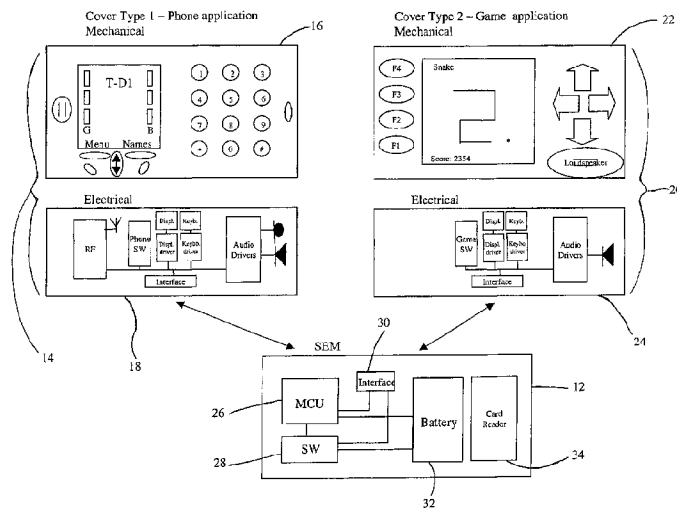
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(54) Title: REMOVABLE HOUSING COVER FOR A PORTABLE RADIO COMMUNICATION DEVICE



(57) Abstract: The invention provides an electronic mobile communications/entertainment device capable of a plurality of modes of operation, comprising a basic module (12) having circuitry common to the operation of the device in said plurality of modes of operation, and a plurality of supplementary modules (14, 20), each supplementary module being provided in the form of a housing cover for the device and including controlling means configured to provide for a corresponding mode of operation when coupled to the basic module (12), the supplementary modules (14, 20) being interchangeably attachable/detachable to the basic module (12) so as to provide respective modes of operation, and the device only being operational when one of said plurality of supplementary modules (14, 20) is attached to the device.

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Removable housing cover for a portable radio communication device

5 The present invention relates to a portable radio communication device, and more particularly to a suite of removable covers therefor.

Removable covers, such as that disclosed in the Applicant's UK patent number 2, 324, 929, afford an end-user of a mobile phone disclosed in the said patent the
10 facility to swap the front housing cover of the mobile phone with a different front housing cover selected by the user as he or she wishes. In this way, the end-user is empowered to replace the housing cover if he or she wishes to change the appearance of the mobile phone, or to substitute a broken or scratched housing cover, without having to employ the services of a skilled technician.

15

Another type of replaceable housing cover is disclosed in Applicant's co-pending patent application number GB 0030048.3 (published as GB 2,362,071). The invention that is disclosed in GB0030048.3 relates to a removable housing cover that is adapted to be detachably connectable to a mobile phone. In one embodiment the
20 removable cover carries some form of embedded data chip, which data chip is designed to be read by a reader on the mobile phone which results in the alteration of the operating characteristics of the mobile phone, e.g. such as a ringtone or a screensaver.

25 Against this background, the present invention in one aspect provides a removable housing cover adapted to be detachably connectable to a portable radio communication device, said removable housing cover being a user selectable one of a range of different removable housing covers having different respective functionalities, the arrangement being such that when a removable housing cover is
30 connected to the portable radio communication device the device is operationally enabled in accordance with the functionality associated with the connected removable housing cover, and when the removable housing cover is disconnected from the portable radio communication device the device is operationally disabled.

Expressed alternately, the present invention resides in a removable housing cover for a portable radio communication device, said removable housing cover being a user selectable one of a range of different removable housing covers having different respective functionalities, the removable housing cover having a control means, the control means providing the operational instructions for enabling the operation of the portable radio communication device in accordance with the functionality associated with the connected removable housing cover, the operational instructions being arranged to be read by a reader associated with the portable radio communication device, whereby the presence and absence of the removable housing cover in relation to the portable radio communication device renders the device active and inactive respectively.

Conveniently, the operational instructions of the removable housing cover are provided on a memory chip, and said memory chip is used as a memory extension for the portable radio communication device when the removable cover is present on the portable radio communication device. In this sense, the operational instructions are not read by a reader as such, but are interfaced with the memory of the portable radio communication device.

By means of this invention, the absence of presence of the removable housing cover in relation to the portable radio communication device determines whether or not the device can be used. Thus, the user of the portable radio communication device is able himself/herself not only to change the outward appearance of the phone, but also to enable/disable the device, which because this requires the presence/absence of a physical component of the device (i.e. the removable housing cover), the invention leads to increased security for the user against unauthorised use of the device. Also, the portable radio communication device can be economically produced, as it implements only limited common functionalities and customisation is achieved with the removable housing cover.

In one form of the invention, the control means that is carried by the removable housing cover comprises a processor for the portable radio communication device, whereby when the removable housing cover is placed on the portable radio communication device, the processor co-operates with the electronic circuitry of the device thereby to provide for an operational device.

In a further embodiment, the device is without an operating system and/or application software, and the removable housing cover includes an operating system and/or application software for the device. In this way, the connection of the removable housing cover with the device renders the device operational.

5

The removable housing cover may include the RF circuitry for the communication device, in which case the RF circuitry would not be present in the device.

In general terms, the approach taken in the present invention is as follows. The removable housing cover is equipped with one or more application specific elements to provide some given functionality; the application elements may be embodied in a readable software module, or connectable electronics hardware. When the user wishes to change the user interface, or the type of application, he/she removes the housing cover currently attached to the phone, for example by using the releasable attachment means described in the Applicant's patent referenced above, the releasable attachment aspects of which are incorporated herein by reference. Then the new housing cover that the user wishes to install onto the phone is located onto the phone and secured in position, again making use of the releasable attachment means. Once in place, the application elements of the removable housing cover interface in a way that co-operates with a corresponding interfacing element provided on the device. When the interfacing element on the device senses the presence of the application element of the removable housing cover, this enables the device to be activated and to operate in accordance with the application element of the removable housing cover.

25

For instance, a user may purchase a removable housing cover with games software functionality. On connecting the housing cover to the phone, the phone is enabled with the ability to allow playing of the particular game. In this way, the phone conveniently is accompanied with a dedicated User Interface that is adapted to game playing.

30

In another aspect, the invention provides an electronic mobile communication/entertainment device capable of a plurality of modes of operation, comprising

a basic module having circuitry common to the operation of the device in said plurality of modes of operation, and
a plurality of supplementary modules,
each supplementary module being provided in the form of a housing cover for the
5 device and including controlling means configured to provide for a corresponding
mode of operation when coupled to the basic module,
the supplementary modules being interchangeably attachable/detachable to the
basic module so as to provide respective modes of operation,
and the device only being operational when one of said plurality of supplementary
10 modules is attached to the device.

This alleviates the problem experienced when using conventional personal communication devices which typically offer a variety of different applications, but in which any one particular User Interface (UI) cannot facilitate all functionalities
15 corresponding to the different applications in an optimal manner.

In addition, since the basic module includes only a base level of common circuitry and the attachable/detachable supplementary modules contain much of the componentry required to support the particular application, the cost of the basic
20 module can be relatively modest.

Hence, this aspect of the invention offers the possibility to purchase a basic module for a comparatively low price, and add to this, at the choice of the user, one or more supplementary modules in the form of housing covers, thereby providing for
25 applications and functions that the user wishes to have. This aspect of the invention further benefits in that because for a given application the attached housing cover provides a UI that is specially dedicated to that application, the user is able to use the application in the most convenient and user friendly way. Furthermore, any particular housing cover may provide some very basic functionalities for other applications.

30
In order to aid a more detailed understanding of the present invention, various embodiments of the invention will now be described. These should not be construed as necessarily limiting the invention but merely as examples of specific ways of putting the invention into effect. In particular, the invention will be described with
35 reference to the accompanying drawings in which:

- Figure 1 illustrates one embodiment of the invention;
Figure 2 illustrates a second embodiment of the invention;
Figure 3 illustrates a third embodiment of the invention;
Figure 4 illustrates a fourth embodiment of the invention;
5 Figure 5 illustrates a mechanical form of the invention;
Figure 6 illustrates a further embodiment of the invention and
Figure 7 illustrates a further mechanical form of the invention.

Figure 1 shows an embodiment of the present invention comprising a basic module
10 12 in the form herein termed a Standard Entertainment Module (SEM) which in and
of itself is inoperative. Figure 1 also shows a first supplementary attachable module
14 in the form of a removable housing cover 16 which is provided with an application
controller 18 providing phone functionality. When the removable cover 16 is
15 attached to the SEM the application controller 18 interfaces with the SEM so as to
render it operative in accordance with the application controller, thereby to provide
standard phone functionality. Figure 1 further shows a second supplementary
attachable module 20 in the form of a removable housing cover 22 which is provided
with an application controller 24 providing games functionality. When the removable
cover 22 is attached to the SEM the application controller 24 interfaces with the SEM
20 so as to render it operative in accordance with the application controller, thereby to
provide games functionality. Thus it can be seen that the removable housing covers
16 and 22 can be interchangeably attached to the SEM to provide for phone and
gaming functionalities respectively.

25 The features of the SEM 12 include:

- Microprocessor MCU 26,
- Software storage SW 28,
- Interface 30
- 30 - Battery 32,
- Card Reader 34.

It is preferred to include the card reader 34 in the SEM because this may be
constructional more practical than placing the card reader in the housing cover. The

card reader 34 of the SEM might also be useful for taking other kinds of memory cards for memory extension and the like.

5 The SEM may contain other components and circuitry common to the different modes of operation of the SEM. For instance, the SEM may include RF circuitry for a particular cellular communication mode of operation. Equally, the SEM may include fewer components than those described above if certain components can be dispensed with. For instance, the RF circuitry may be absent from the SEM in which case the SEM is adapted to operate in different telecommunication protocols by
10 connecting different covers having for instance GSM, TDMA, UMTS capabilities.

As indicated above, the first supplementary attachable module 14 takes the form of a removable housing cover 16 which is provided with an application controller 18 providing phone functionality. Because the removable cover 16 is designed to
15 provide phone functionality, the User Interface (UI) of the removable cover consists of features necessary for carrying out phone operations. Thus the UI includes a microphone and earpiece, a keypad, a display and menu and control buttons. The application controller 18 associated with the removable cover 16 has components necessary for making and receiving calls, both voice and data, and thus includes e.g.
20 RF circuitry, baseboard software, drivers etc. When the removable cover 16 is snapped onto the SEM 12 the components of the application controller 18 connect up and cooperate with the components of the SEM to enable phone functionality.

Also as indicated above, the second supplementary attachable module 20 takes the
25 form of a removable housing cover 22 which is provided with an application controller 24 providing games functionality. In this case because the removable cover 22 is designed to provide games functionality, the User Interface (UI) of the removable cover 22 consists of features necessary for carrying out gameplay operations. Thus the UI directions keys (or a joystick), a display, and other control buttons. The
30 application controller 24 associated with the removable cover 22 has components necessary for playing computer/video games, and thus includes e.g. memory for games software, drivers etc. When the removable cover 22 is snapped onto the SEM 12 the components of the application controller 24 connect up and cooperate with the components of the SEM to enable games functionality.

35

Turning to Figure 2, there is shown a second embodiment of the invention in which there is an SEM 12 of the type described above, along with two supplementary modules 36 and 38 which can be interchangeably attached to the SEM 12. Supplementary module 36 comprises a removable housing cover 40 which is
5 provided with an application controller 42 providing browsing functionality, so that when the removable cover 40 is attached to the SEM 12 the application controller 42 interfaces with the SEM so as to provide for browsing of the internet. Thus, the removable cover 40 has a UI designed for allowing user friendly browsing, and hence may include a wide display and a QWERTY keypad, as well as control keys. The
10 application controller 42 correspondingly includes browser software and RF circuitry, etc.

Supplementary module 38 comprises a removable housing cover 44 which is provided with an application controller 46 providing combined games and pager
15 functionalities, so that when the removable cover 44 is attached to the SEM 12 the application controller 46 interfaces with the SEM so as to allow for gaming and pager functions. Thus, the removable cover 44 has a UI designed for allowing user friendly gaming and pager messaging, and hence may include a display, games control keys, etc. The application controller 46 correspondingly includes gaming software and
20 pager componentry, etc.

Supplementary modules that provide for combined applications may be advantageous in particular circumstances, for example for a child who is allowed by his parents to use the SEM with a games cover may find a pager functionality useful
25 for receiving short messages (e.g. "Lunch is ready, come home !"). Analogously, in another embodiment, a music application cover might also offer some basic phone functionalities to handle phone calls.

Figure 3 illustrates a further embodiment of the invention in which there is an SEM 12
30 of the type described above, and two supplementary modules 48 and 50 which can be interchangeably attached to the SEM 12. Supplementary module 48 comprises a removable housing cover 52 which is provided with an application controller 54 providing music functionality, so that when the removable cover 52 is attached to the SEM 12 the application controller 54 interfaces with the SEM so as to provide music
35 applications. Thus, the removable cover 52 has a UI designed for allowing user

friendly music controls, and hence may include control keys such as PLAY, SKIP, EDIT, MP3, RADIO etc. The application controller 54 correspondingly includes a broadcast radio receiver, MP3 software and storage, etc.

5 Supplementary module 50 is a further example of a combined application module which comprises a removable housing cover 56 with an application controller 58 that is capable of providing both games and phone functionalities, so that when the removable cover 56 is attached to the SEM 12 the application controller 58 interfaces with the SEM so as to allow for gaming and phone functions. Thus, the removable
10 cover 56 has a UI designed for allowing user friendly gaming and call handing, and hence may include a display, games control keys, etc. The application controller 46 correspondingly includes gaming software and mobile phone componentry, etc.

Figure 4 illustrates a further embodiment of the invention in which there is an SEM 12
15 of the type described above, and two supplementary modules 60 and 62 which can be interchangeably attached to the SEM 12. Supplementary module 60 comprises a removable housing cover 64 which is provided with an application controller 66 providing music and phone functionality, so that when the removable cover 64 is attached to the SEM 12 the application controller 66 interfaces with the SEM so as to
20 provide music and phone applications. Thus, the removable cover 64 has a UI designed for allowing user friendly music and phone controls, and hence may include control keys such as PLAY, SKIP, EDIT, MP3, RADIO, as well as an earpiece and loudspeaker etc. The application controller 66 correspondingly may include a broadcast radio receiver, MP3 software and storage, RF circuitry, baseboard
25 software etc.

Supplementary module 68 is a general representation of an unspecific module which illustrates the mechanical and electrical sub components of a module.

30 In use there are possibilities of overlap of functionality. For example, the phone function cover might provide a convenient way of storing phone numbers in a phonebook that could be stored in a memory of the SEM. The internet cover offers a convenient keyboard for adding names to the phonebook entries which may also be stored on the SEM. When the user elects to use the music application cover he
35 might be content just to access the phonebook with some keystrokes and choose a

name for dialling and making a phone call. Also the covers may allow for voice dialling which enables to make phone calls without having a keyboard for number/name selection while using the games or music cover.

- 5 Referring to Figure 5, there is shown a schematic arrangement for connecting a supplementary module 72 to the basic module 74. In this arrangement the supplementary module receives the basic module within a cavity or recess 76 that is defined by the walls of the removable cover supplementary module.
- 10 Figure 6 illustrates a further variant of the invention; in this variant the SEM is modified in that it also includes a radio transceiver 78 which is desirable for a user who wishes to have communication possibility always enabled. In this case the supplementary attachable modules do not require to have transceiver, but may simply have UI features that allow use sending and receiving calls. Thus Figure 6
- 15 illustrates two supplementary modules 78 and 80 both of which (although separately providing Internet/PDA and Music applications) can be used to place and receive calls. Supplementary module 78 is an Internet/PDA removable cover optimised in its design for Browsing and PDA operations. This is particularly advantageous because the QWERTY keyboard preferred for internet browsing also provides good capability
- 20 for entering text and other PDA software functions and therefore it is beneficial to add PDA functionality to the cover because a user might wish to use the device for calendar applications, extended phone book function, document control and other functions associated with a PDA. The SEM may contain basic phone SW, while the application SW of the phone for internet browsing and aural communication is
- 25 conveniently provided in the cover.

The embodiment of Figure 6 has a bus structure like connection between the modules in the SEM which provides for more simplified interconnection. The interface between cover and SEM can be named Application Programming Interface

30 API. The SEM interfaces the removable housing cover through a dedicated Application Programming Interface (API). The API specifies how the functionalities of the removable housing cover and the standard functionalities provided by the SEM work together in order to form a product that operates according to the users needs. The API may consist of a set of pre-defined messages that can be exchanged

between the SEM and the removable housing cover in order to access the provided functions in the SEM and cover.

Furthermore, in the embodiment of Figure 6, there is a block labelled "Memory" which corresponds to the blocks labelled SW in the SEM of the embodiments of Figures 1 to 4. This indicates that the "Memory" of the SEM of the Figure embodiment, without an attached cover, may not contain SW as such, but instead provides the storage capacity for the SW from the cover. The same can apply to all the previously described embodiments, meaning that rather than storing SW in a memory, they provide only memory which can be loaded with SW from the attached cover. Additionally, it is, in further variants, possible for the SEMs to contain no memory as such, since in such variant it is possible for the MCU of the SEM to access the SW in the cover through the API, in which case the API is a hardware interface comprising a wired connection between the MCU of the SEM and the memory chip in the cover. In such a variant the SW API is a portion of a more extensive hardware and software interface.

The SEM may also comprise a display and in this case the removable covers simply provide the display lens. This is illustrated in Figure 7 which shows a display being provided with the SEM 84, and a display lens 86 being provided with the removable cover 88. Alternatively, the SEM might also contain a display with an integrated lens, in which the housing cover does not cover the display and merely has an aperture configured for alignment with the lens.

For all embodiments, it may be that the SW relating to an attached cover is erased from the SEM memory upon removal of the cover.

Thus, it can be seen that the SEM holds functionality common to a wide variety of different applications, while the removable cover adds specific functionality that adapts the SEM plus cover to the user's needs.

In another form of the invention, the application controller comprises in a memory chip patch that carries data associated with the particular removable cover. The memory chip patch may be embedded during manufacture in the inside surface of the removable cover.

When a new removable cover is installed onto the SEM and secured in position, the memory chip patch of the removable housing cover are brought into registration with a sensor in the form of a reader provided in the SEM. This reader detects the memory chip patches of the removable housing cover and proceeds to read data
 5 from it.

Hence, the reader reads information of the memory chip and certain predefined functionality is transferred to a controller/processor of the SEM. This transfer of data causes the SEM to become operational in accordance with the data transferred from
 10 the chip patch.

Thus, it can seen that a user can personalise and customise the SEM by the means of choice of removable cover. By combining the SEM with a given cover, the user can generate a usable product that meets his/her particular current requirements. In
 15 addition to the embodiments described above, further examples include:

SEM + cover with ITU-Keypad (Phone Keypad) Phone centric usage

SEM + cover with Joystick dedicated for playing games
 20

SEM + cover with SENSORS dedicated for special purposes

Depending on the sensor, there will be a dedicated design and dedicated SW to process the sensor data. Some examples include:

25 Noise meter- Special design of the cover and special functionality to perform noise measurements,

Distance meters- Special design and functionality to perform distance and area measurements; may be useful for builders and architects,

30 Humidity, Temperature, Air Pressure- Wearable weather station,

GPS Sensor- For navigation, this may require to have a dedicated display for map display,

Sunshine Intensity sensor- personal device to measure the exposure to UV-Rays to prevent sunburn.

- 5 SEM + cover with specific Memory Device Memory Extension (e.g. for MP3)
- SEM + cover with ROM (Game inside) Cover + Game inside as a bundle
- 10 SEM + cover with extra MCU + Memory Extension of device functionality
This provides a flexible and substantially future-proof variant of the SEM.
The MCU allows the cover to execute its applications without exposing any load to the SEM Microcontroller.
- 15 SEM + cover with Adaptation unit Smart Adapter
The adaptation unit may be for example some means for connecting to other devices such games consoles, PCs, PDAs, TVs, USBs etc.

20 In an advantageous embodiment, a cover may contain some functionality that entitles the user do download applications or games from a remote server/service, e.g. Club Nokia. Thus, the SEM may be equipped to download data e.g. from the Internet and transfer this data to a supplementary module application controller. E.g. it may be possible to download a JAVA applet into a Virtual Machine in the Cover MCU. The grant to download of applications may be included in the purchase of the cover. In this case the user can customise his device via the Web.

25 Thus, according to the invention, the user can build up a suite of removable covers relating to the different applications which the user is interested in owning.

30 The present invention may be embodied in other specific forms without departing from its essential attributes. For instance, the mobile phone covers could comprise touchscreen keys rather than a keypad. Reference should thus be made to the appended claims and other general statements herein rather than to the foregoing description as indicating the scope of invention.

35 Furthermore, each feature disclosed in this specification (which term includes the claims) and/or shown in the drawings may be incorporated in the invention

independently of other disclosed and/or illustrated features. In this regard, the invention includes any novel feature or combination of features disclosed herein either explicitly or any generalisation thereof irrespective of whether or not it relates to the claimed invention or mitigates any or all of the problems addressed.

5

The appended abstract as filed herewith is included in the specification by reference.

CLAIMS

1. An electronic mobile communication/entertainment device capable of a plurality of modes of operation, comprising:
- 5 a basic module having circuitry common to the operation of the device in said plurality of modes of operation, and one or more supplementary modules, each supplementary module being provided in the form of a housing cover for the device and including controller means configured to provide for a corresponding
- 10 mode of operation, the supplementary modules being interchangeably attachable/detachable to the basic module so as to provide respective modes of operation, and the device only being operational when one of said plurality of supplementary modules is attached to the device.
- 15
2. A device according to claim 1, wherein the controller means of a supplementary module includes a mobile phone application for a telecommunications mode of operation.
- 20
3. A device according to claim 1, wherein the controller means of a supplementary module includes an electronic gaming application for a gaming mode of operation .
4. A device according to claim 1, wherein the controller means of a
- 25 supplementary module includes an internet browsing application for a browsing mode of operation.
5. A device according to claim 1, wherein the controller means of a supplementary module includes a pager application for a pager mode of operation.
- 30
6. A device according to claim 1, wherein the controller means of a supplementary module includes a music application for a music mode of operation.
7. A device according to claim 1, wherein the controller means of a
- 35 supplementary module includes a PDA for a PDA mode of operation.

8. A device according to claim 1, wherein the controller means of a supplementary module comprises one or more control elements for multi-functional modes of operation corresponding to two or more combinations of the control means
5 of claims 2 to.7
9. A device according to any preceding claim, wherein the basic module includes a microprocessor, a memory, a battery and a reader.
- 10 10. A device according to any preceding claim, wherein the supplementary modules have a user interface dedicated to respective modes of operation.
11. A device according to claim 1, wherein the controller means is configured to download a mode of operation from a remote server/service.
15
12. A housing cover for an electronic device,
the housing cover being adapted to be removably detachable with respect to the electronic device, the device having means for interfacing with the housing cover and being inoperative when a housing cover is not attached to it,
20 said housing cover being a user selectable one of a range of different housing covers having different respective functionalities;
each housing cover having a respective control means, such that when a housing cover is coupled to the electronic device the control means of the housing cover couples with means for interfacing of the electronic device, whereby the electronic
25 device is caused to be operational in accordance with the functionality associated with the coupled housing cover.
13. An electronic mobile communication/entertainment device capable of a plurality of modes of operation, and adapted to be couplable to a housing cover of
30 claim 12.
14. An interface module for the electronic mobile communication/entertainment device of claim 1.

15. An electronic mobile communication/entertainment device substantially as hereinbefore described with reference to and/or as shown in the accompanying drawings.
- 5 16. A removable housing cover substantially as hereinbefore described with reference to and/or as shown in the accompanying drawings.

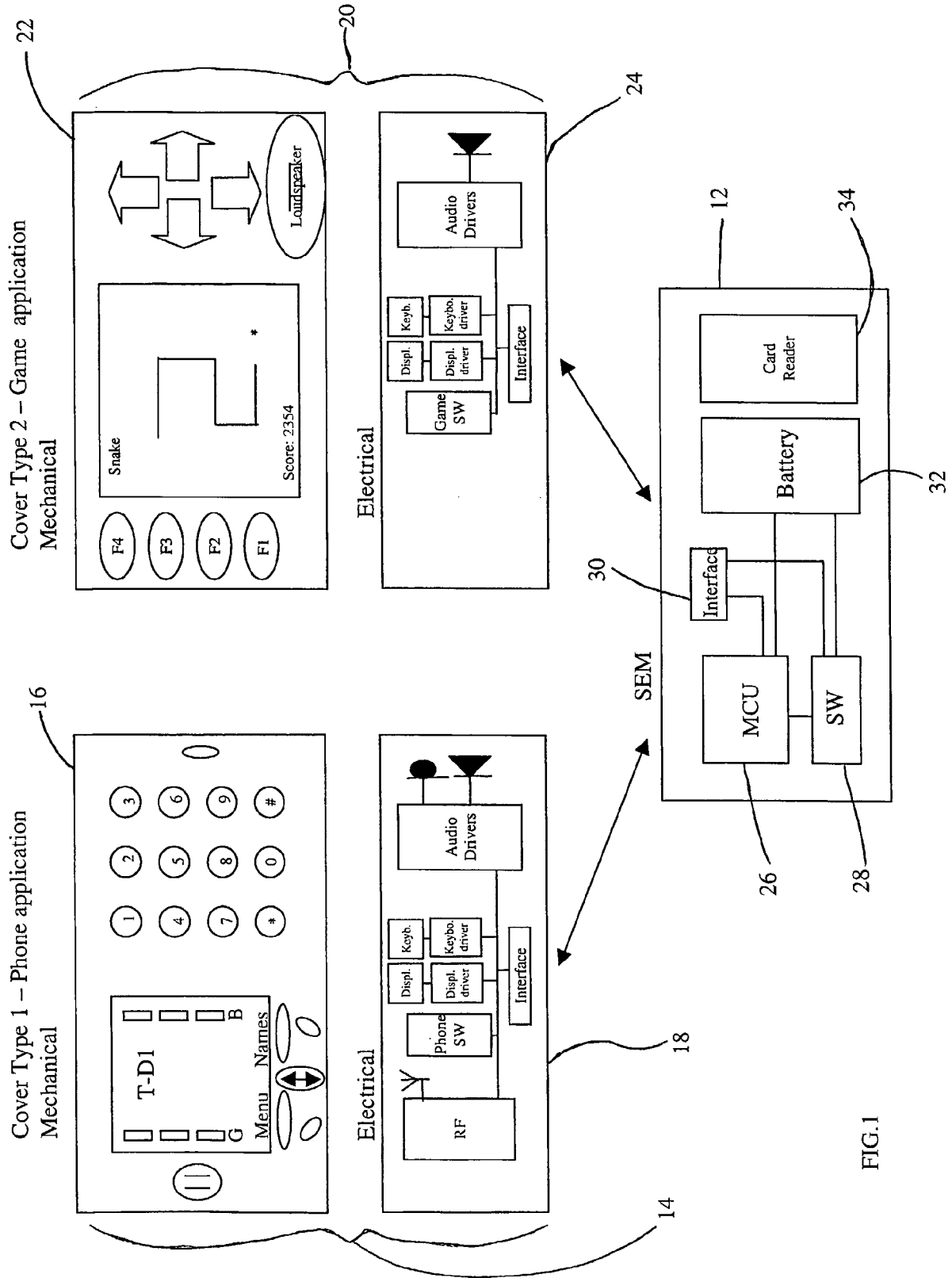


FIG.1

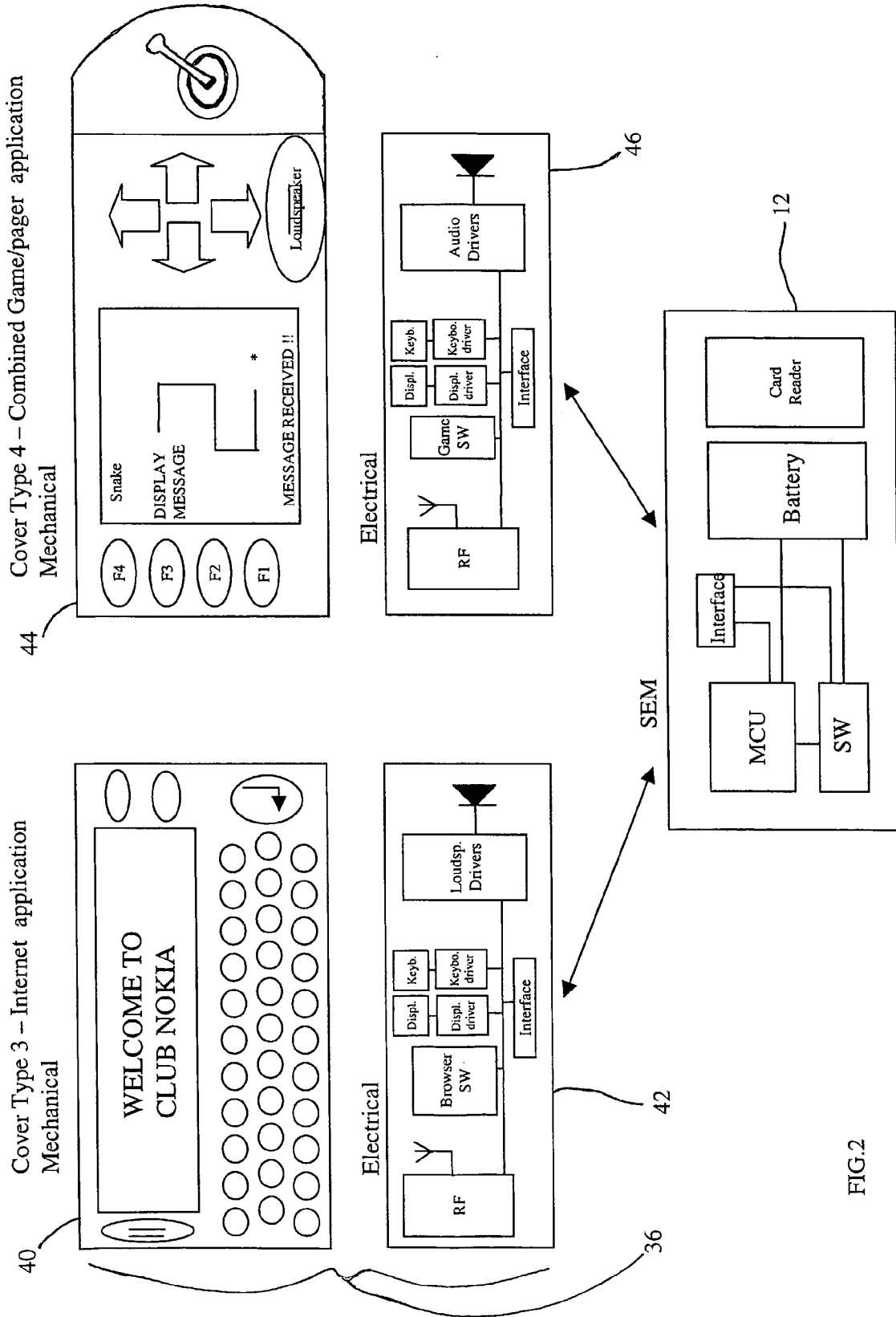


FIG.2

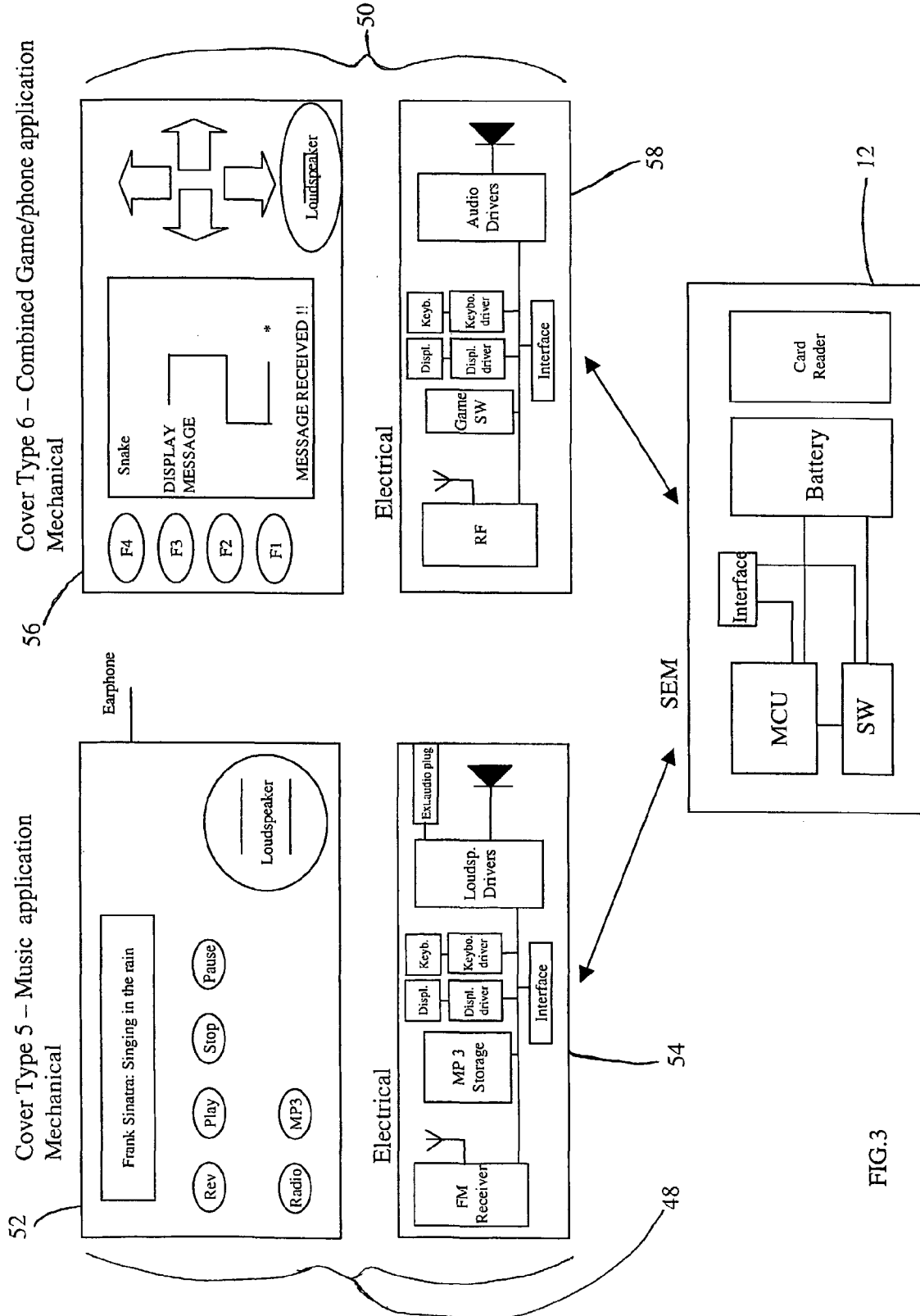


FIG.3

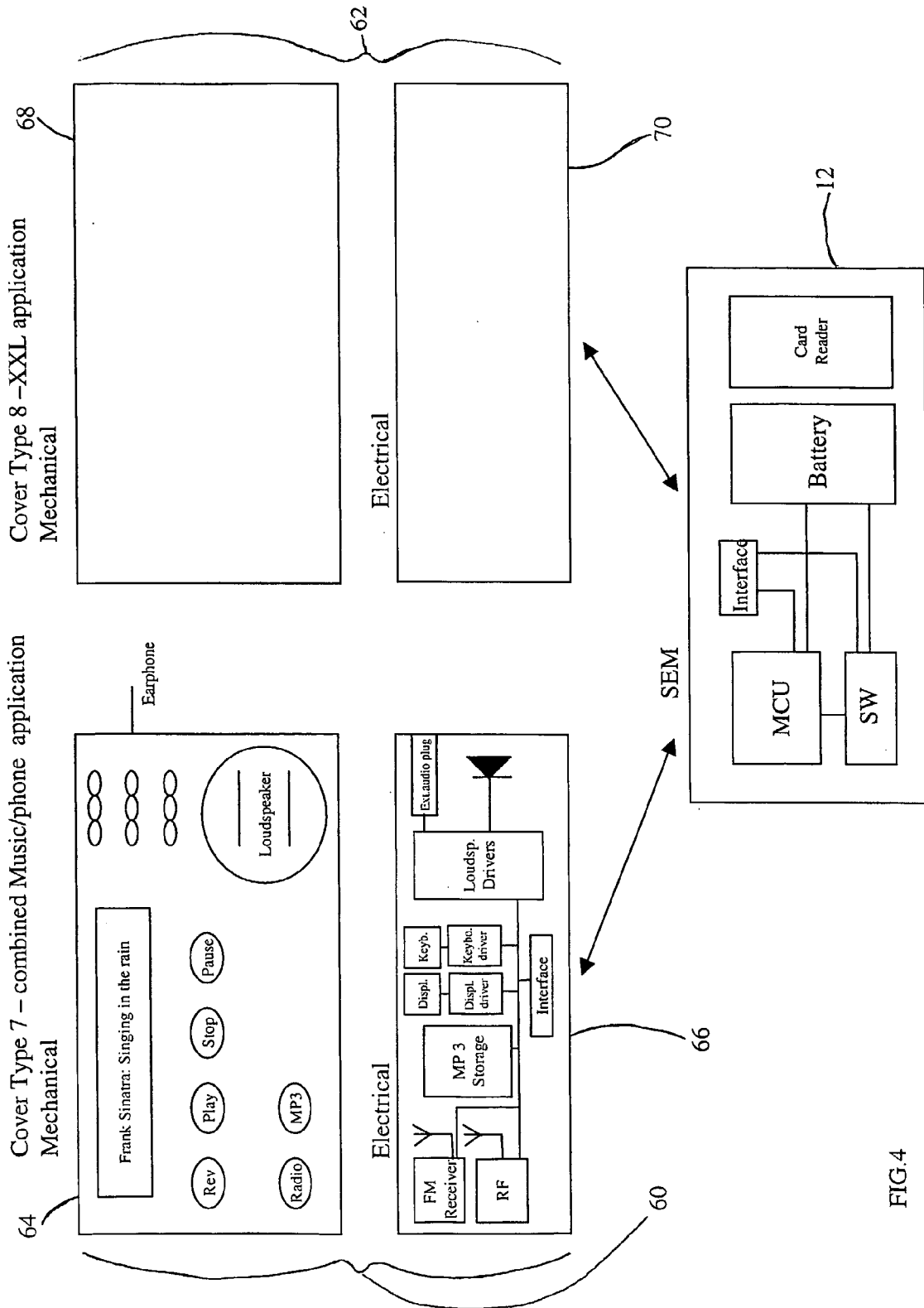


FIG.4

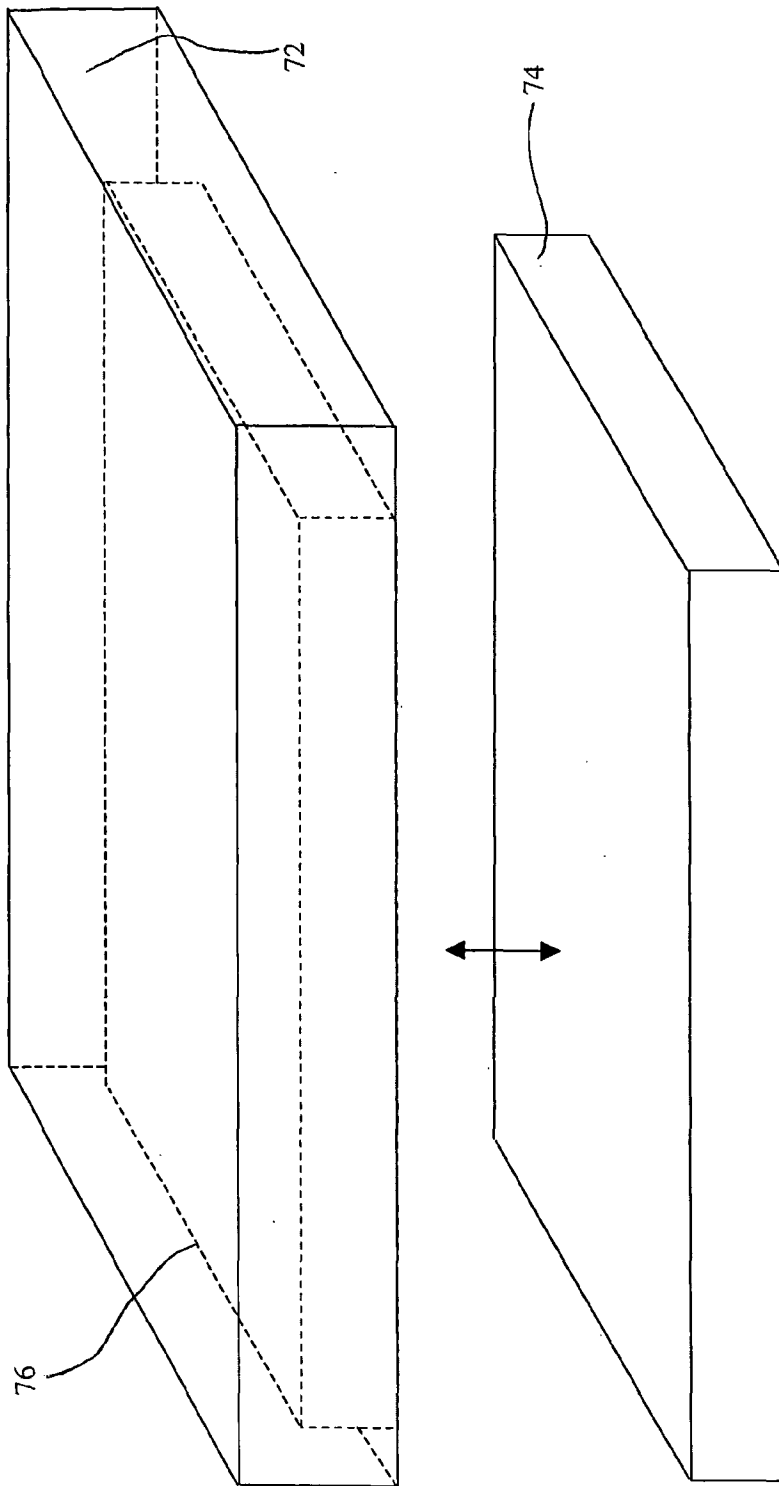


FIG.5

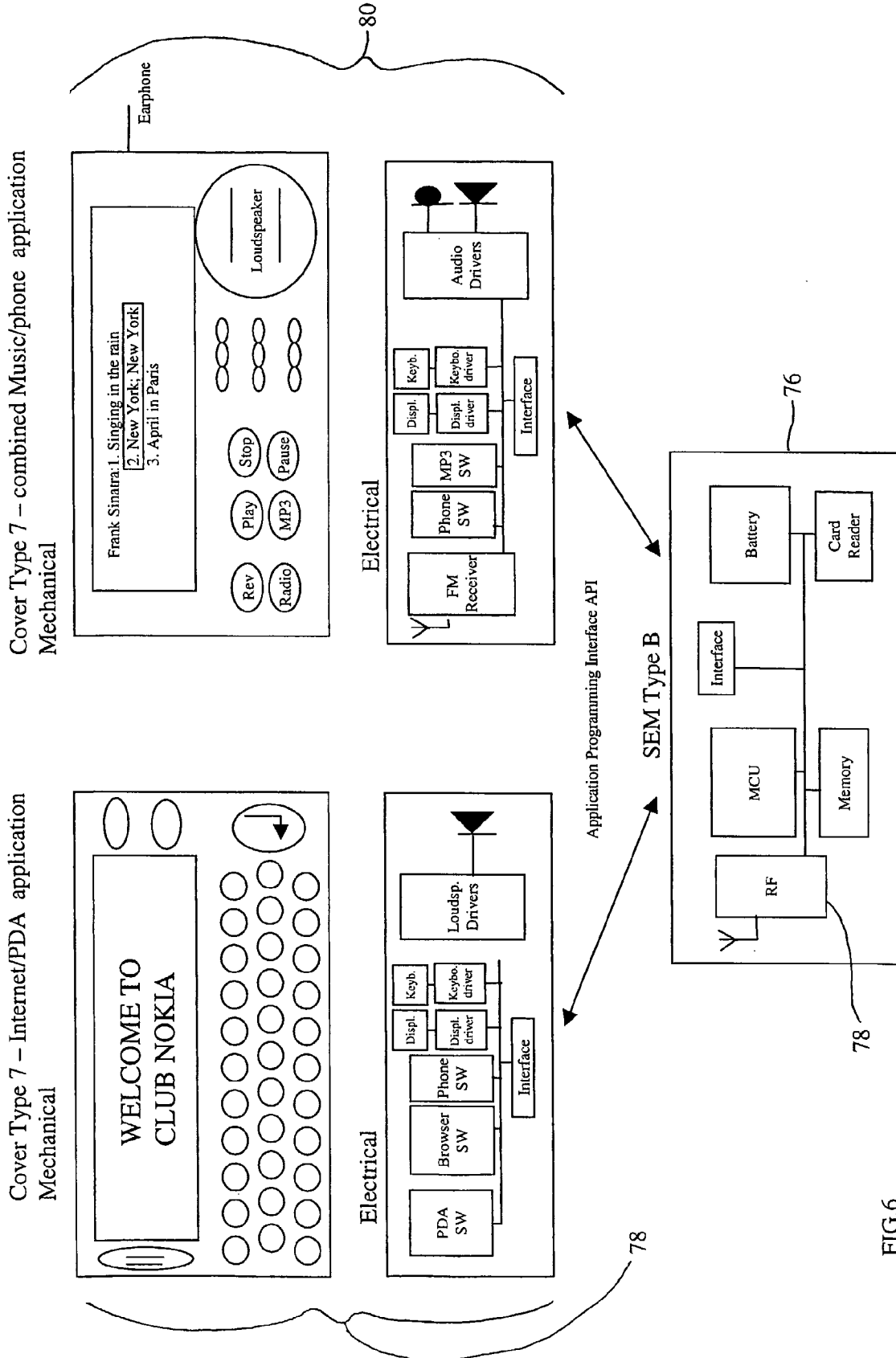


FIG.6

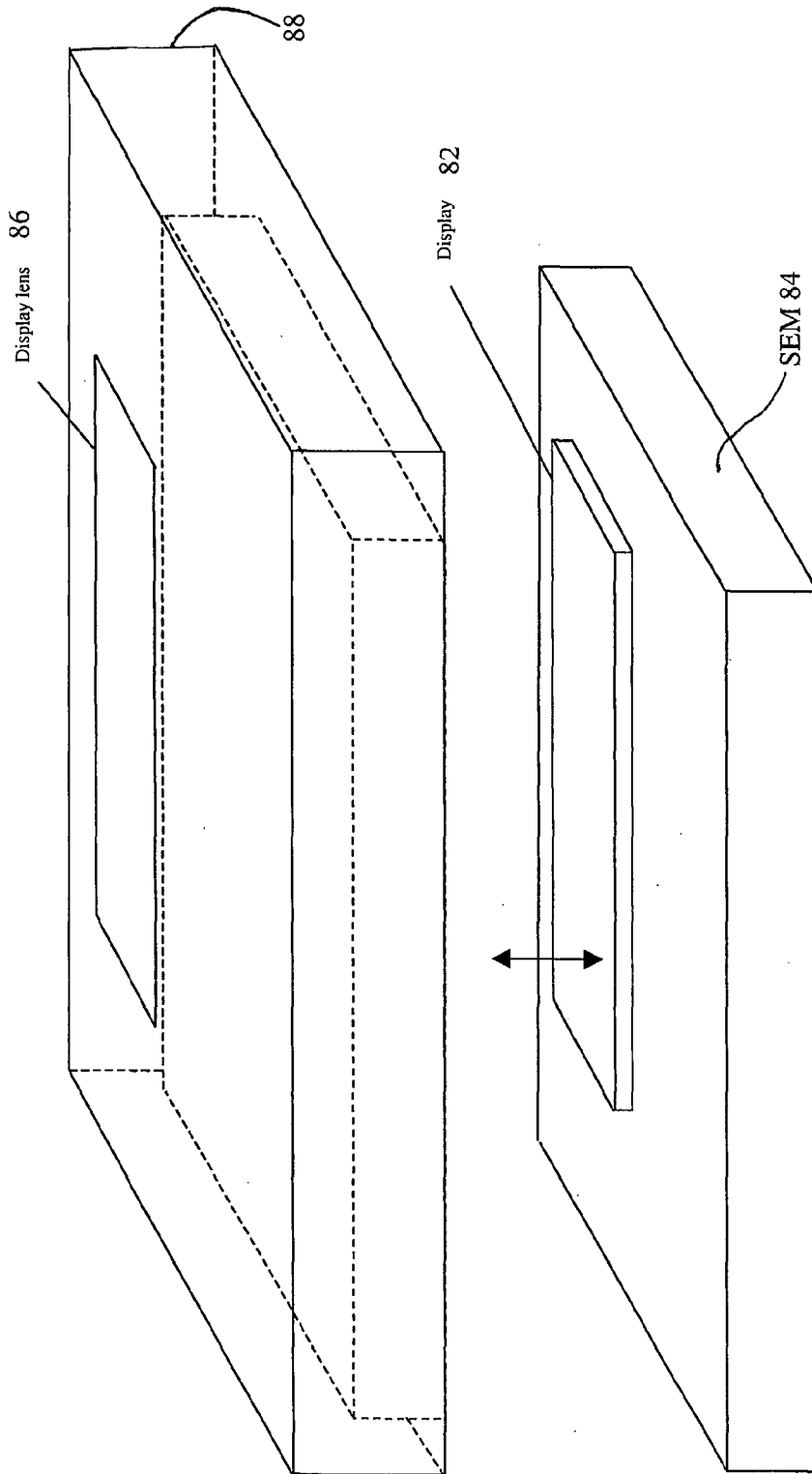


FIG.7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB01/02809

A. CLASSIFICATION OF SUBJECT MATTER		
IPC(7) :H04B 1/38 US CL :455/90 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) U.S. : 455/90,575,558,556,550,66,74,558		
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 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 6,118,986 A (HARRIS et al) 12 September 2000, col. 2, lines 50-58 and col. 8, lines 27-56.	1-3,5,8,9, 10,12,13
A		4,6,7,11
A	US 5,661,641 A (SHINDO) 26 August 1997, entire document.	1-13
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
•	Special categories of cited documents:	"I" 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
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier document published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	
Date of the actual completion of the international search 01 DECEMBER 2002		Date of mailing of the international search report 19 DEC 2002
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230		Authorized officer JOY K. CONTE <i>For James R. Matthews</i> Telephone No. (703) 308-0149

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB01/02809

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 15-16
because they relate to subject matter not required to be searched by this Authority, namely:

claims reference drawings
2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest**
- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
4 March 2004 (04.03.2004)

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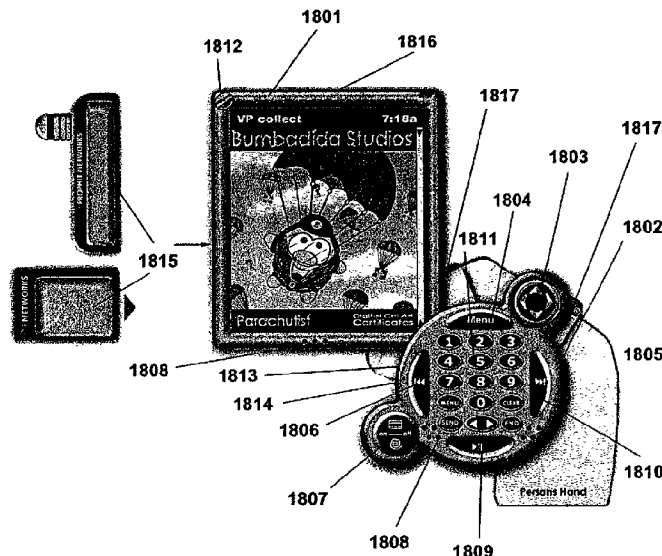
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM AND METHOD FOR FINGER HELD HARDWARE DEVICE



(57) Abstract: A finger held hardware device (1801, 1802) provides portable terminal and communicative devices and other functions in a system which can be securely braced against and/or attached to a finger or side of a user's hand, facilitating secure or one-handed operation of the device (1801, 1802). The device is flexible and modular in nature, allowing for flexible positioning of a keypad/control unit relative to a display (1801), as well as selection from among various displays and keypad/control units to suit a user's needs. A device (1801, 1802) can operate without physical function buttons or any physical buttons, and can be activated by a separate key mechanism for security. A remote control stylus allows a user to operate the device more quickly. An energy absorbing cover protects the device. A resource cradle (1816) supports portions of the device by providing power storage, network access, and other resources.

WO 2004/019315 A1

SYSTEM AND METHOD FOR FINGER HELD HARDWARE DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority from United States Provisional Application
5 No. 60/305,615, filed July 17, 2001.

TECHNICAL FIELD

The present invention relates to personal electronic devices. More particularly, the present invention relates to systems and methods for physically supporting,
10 controlling, customizing, accessing, and protecting personal electronics devices

BACKGROUND OF THE INVENTION

Portable, personal electronics devices have become increasingly more popular as the costs to manufacture and sell them has decreased. Cellular telephones,
15 handheld computers, portable game players, and other related devices have become commonplace. Furthermore, users have become increasingly dependent on these devices, using them more and more, and for an increasing range of applications. For example, people use cellular telephones seemingly constantly. Moreover, cell phone users use their cell phones to send text messages, browse the Internet, and for many other purposes.
20 Similarly, handheld computer users not only have come to rely on these devices for keeping appointment calendars and address lists, but now use these devices for everything from casual word processing, to posting on-line transactions, to playing games

With the passage of time, the use of these devices has become better understood to the point of second nature. Users know which buttons perform which
25 functions without great mental deliberation. In fact, it is not uncommon to see an individual conduct a phone call with her cellular phone in one hand, while operating her handheld computer with another.

Unfortunately, the creators of current devices seemingly designed them with an expectation that use of these devices would be more single-minded, and that a user

would be willing to devote both hands to the task. As a result, while a user may not be intimidated by the prospect of using his cellular phone and his handheld computer at the same time, manipulating the controls on these devices might not be practical or possible. A typical cellular phone is much more easily dialed if the user cradles the phone in one hand and dials with the other. Use of a typical handheld computer also requires two hands: one is needed to support the handheld unit, while the other operates a stylus or presses keys to initiate various commands.

A similar concern is that while a handheld computer may be designed in a way in which it is well-suited for some applications, it may not be for others. For example, it may be a simple matter to access one's schedule for the day by depressing the calendar function button, then scrolling down through the day using scroll keys. This can be done with one hand while resting the handheld device on a table or desk, but is not easily done if one both tries to hold and control the device with one hand. Further, if one wants to use the handheld computer's calculator functions, because the stylus or another tapping device is required to actuate the touch-screen "buttons" of the calculator program, one cannot merely use the calculator with one hand while writing down the resulting figures with another.

Handheld devices also pose other concerns. To name one example, it is good to have a compact cellular phone so it can be carried easily; on the other hand, when viewing text, a larger display would be very helpful. Similarly, the ability to send text messages is very useful, but it would be more helpful if a more user friendly keyboard could be provided. Security is a concern when so many people store so much valuable information in various types of handheld devices. Comparably, so many people rely on their devices that if the device were damaged, the user may have suffered a tragedy. Finally, while compact devices are convenient, they often sacrifice expandability in exchange for small size; certainly, it would be helpful to be able to augment the function of these devices as needed.

Overall, what is needed is a way to make portable electronic devices more ergonomic so that even unskilled users can more easily operate them with a single hand, or

can do more with the devices while using both hands. Devices need to be better secured and protected, and to allow for upgradeability and flexibility in function.

It is to these objects that the present application is directed.

5 SUMMARY OF THE INVENTION

There are numerous general variations of the present invention.

One form of the present invention employs on a lower corner of the device a finger and thumb based support, attachment, and activation device. In this manner, a user can both support and operate the handheld device with one hand, leaving her other hand
10 free for other tasks or, at least, reducing the demand on the hand supporting the device.

A variation of the present invention features detachable and interchangeable display and button-based mechanisms. In this way, users can attach different keypads for different applications or to suit a preference of which hand to use in operating the device. Similarly, users can attach different types of displays for different applications.

15 Another variation of the present invention has no physical buttons on which all commands are initiated via a touch-sensitive display. The only physical button on this variation is a power switch to activate the device.

Another variation of the present invention has no physical buttons on which all commands are initiated via a touch-sensitive display. Because there are no physical
20 buttons, the device can only be accessed with a separate key to activate the device.

Another variation of the present invention receives input both conventionally from the pressing of function control buttons as well as pressing of touch sensitive areas on the touch screen, and from remote control signals issued by a user activating buttons on a remote control stylus.

25 Another variation of the present invention is largely covered with a gel pad to protect the device from damage that it might suffer upon being dropped or handled roughly, as well as to allow a user a better grip on the device.

Another variation of the present invention employs resource cradle for providing functional support to various sections of the device.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a front view of one embodiment employing on a lower corner of the device a finger activated keypad and a finger attachment means.

5 Figure 2A is a front view another embodiment which features detachable and interchangeable display and keypad/control units.

Figure 2B is a front view of the embodiment shown in Figure 2A showing an alternative keypad/control unit that can attached to the display device.

10 Figure 2C is a front view of the embodiment shown in Figure 2B showing the alternative keypad/control unit attached to the display device.

Figure 2D is a front view of the embodiment shown in Figure 2A using a rotatable keypad/control unit.

Figure 2E is a front view of the embodiment shown in Figure 2A using a rotatable keypad/control unit oriented to allow a user to hold the device at a different angle.

15 Figure 2F is a front view of the embodiment shown in Figure 2A using an alternate function keypad/control unit.

Figure 2G is a front view of the embodiment shown in Figure 2A using a different display device.

20 Figure 3 is a front view of another embodiment in which the handheld device accepts commands through the touch screen device with the exception of a power switch.

Figure 4A is a front view of another embodiment in which the handheld device accepts commands only through the touch screen device, and can only be activated through the use of a key.

25 Figure 4B is a front view of another embodiment in which the handheld device accepts commands only through the touch screen device, and can only be activated through the use of a wireless access device.

Figure 5A is a front view of another embodiment in which a handheld device receives input both conventionally from the pressing of function control buttons and on the touch-sensitive screen, as well as from a remote control stylus.

Figure 5B is a bottom view of the remote control stylus shown in Figure 5A.

5 Figure 6A is a front view of another embodiment in which a handheld device is covered by a protective gel pad.

Figure 6B is an underside view of another embodiment in which a handheld device is covered by a protective gel pad.

10 Figure 6C is an underside view of a variation of the embodiment in which a handheld device is covered by a protective gel pad.

Figure 7A is a perspective view of another embodiment of a resource cradle used by the handheld device.

Figure 7B is a perspective view of a resource cradle used by a different embodiment of the handheld device.

15 Figure 7C is a perspective view of a resource cradle used by a keypad/control unit.

Figure 7D is a perspective view of a resource cradle used by an alternate keypad/control unit.

20 Figure 7E is a perspective view of a resource cradle used by a plurality of devices at the same time.

Figure 8 is a general block diagram of a finger held hardware device employing one particular design of the preferred embodiment of the present invention;

Figure 9 is a general block diagram of a finger held hardware device employing a remote control unit, network card, removable media, and wired capabilities.

25 Figure 10 is an embodiment of the present invention employed in another type of finger held hardware device.

Figure 11 is an embodiment of the present invention utilizing various forms of removable functions and capabilities of finger held hardware device;

Figure 12 is a general block diagram of a finger held hardware device employing one particular design to remove multiple portions of a device.

Figure 13 is a general block diagram of a finger held hardware device employing that enables any removable portions of a device.

5 Figure 14 is an embodiment of the present invention employed utilizing a modified version of finger held hardware device.

Figure 15 is an embodiment of the present invention employed utilizing a modified version of a viewable screen apparatus to provide a user with the same capabilities as an entire portable terminal device.

10 Figure 16 is an embodiment of the present invention utilizing a modified version of a physical button apparatus to perform the same capabilities as an entire portable terminal device, as well as its interchangeability with at least one type of portable terminal device, and/or a viewable screen device, and/or a finger held hardware device, or any other type of portable device.

15 Figure 17 is a general block diagram of at least one type of gel pad.

Figure 18 is an embodiment of the present invention employed utilizing a modified version of a viewable screen apparatus, finger held hardware device, and/or any type of portable device that does not have any physical buttons or characteristics;

20 Figure 19 is an embodiment of the present invention employed utilizing possible modified versions or variations of a viewable screen apparatus, finger held hardware device, and/or any type of portable device that does not have any physical buttons.

25 Figure 20 is an another embodiment of the present invention employed utilizing possible modified versions or variations of a viewable screen apparatus, finger held hardware device, and/or any type of portable device that does not have any physical buttons.

Figure 21 is a general block diagram of a stand device employing one particular design that supplies function to any type or component of finger held device.

Figure 22 is a general block diagram of a stand device employing one particular design that provides various types and forms of interaction.

Figure 23 is an embodiment of the present invention utilizing a modified version of finger held hardware device that employs modified versions of a viewable screen apparatus enabling the a viewable screen apparatus to be moved by the user.

Figure 24 is an embodiment of the present invention utilizing a modified version of finger held hardware device that employs modified versions of a viewable screen apparatus enabling the a viewable screen apparatus to be moved.

Figure 25 is a general block diagram of a cellular phone based finger held hardware device employing one particular design that enables any type of finger held device, with a fixed and/or removable display screen device and physical button device that can provide various functions.

Figure 26 is an embodiment of the present invention employed utilizing a modified version of finger held hardware device that employs modified versions of a cellular phone based finger held hardware device.

DETAILED DESCRIPTION OF THE INVENTION

Embodiments of the present invention are directed to providing handheld electronic devices, such as personal digital assistants, cellular phones, game players, digital cameras, and media players, with functional advantages. These advantages include improved ways of holding the devices, improved flexibility in function of these devices, and improved security, among other objectives. One skilled in the art will understand, however, that the present invention may be practiced without several of the details described in the following description. Moreover, in the description that follows, it is understood that the figures related to the various embodiments are not to be interpreted as conveying any specific or relative physical dimensions, and that specific or relative physical dimensions, if stated, are not to be considered limiting unless the claims expressly state otherwise. Further, illustrations of the various embodiments when presented by way of

illustrative examples are intended only to further illustrate certain details of the various embodiments, and shall not be interpreted as limiting the scope of the invention.

There are several general embodiments of the invention, which will be described first, as well as several more detailed embodiments of the invention.

5 A first general embodiment of the present invention is a finger held personal electronics device. Figure 1 shows a top view of a finger held device 100 supported by a user's hand 104. The finger held device generally comprises three sections: a display 108, a control unit 112, and an attachment device 116. The display device 108 provides data viewing access and/or touch screen control as is generally known with handheld computers.
10 However, as compared with conventional handheld computers which have control buttons disposed across the bottom edge of the device under the lower portion of the display, in the embodiment shown, the control buttons 120 are arrayed on a keypad 124 on the control unit 112 which can be positioned over a user's hand 104.

 Positioning the keypad 124 on the control unit 112 in this way shifts some of
15 the weight of the finger held device 100 over the top of the user's hand 104 to better allow the finger held device to be supported by one hand, as compared to a conventional handheld device wherein the center of gravity would be positioned further away from the user's hand. In addition, by moving the keypad 124 over the user's hand 104, pressure applied to the keypad 124 is directed through the keypad 124 and against the user's hand 104.
20 Accordingly, depressing the keys 120 only helps to secure the finger held device 100 against the user's hand 104, rather than twist the device out of a user's hand as might happen if a user attempted to support a conventional device in this manner and depressed keys which are positioned away from the user's hand 104.

 In addition, for extra security and support in allowing the user to hold the
25 device with one hand, a finger attachment device 116 allows the user to secure the device 100 about one or more fingers of the user's hand 104. The finger attachment device 116 can be a flexible strap the user can wrap around one or more of the fingers of his hand 104. Alternatively, the finger attachment device 116 can be a more rigid ring type device into which the user can slip one or more of the fingers of the user's hand 104. With the device

100 anchored to the user's hand 104 by this finger attachment device, the user need not concern himself with making sure he is hanging onto the device 100 so as to fully support its weight and the force of any force applied in operating the device 100. The finger attachment device 116 ensures the device will not fall.

5 With the keypad 124 moved over the off-centered control unit 112 and secured to the user's hand 104 with the finger attachment 116 mechanism, the user can actuate keys 120 on the keypad 124 with the thumb of the user's hand 104 without dropping the device. Even if the user chooses to use his other hand to actuate the device, the user need not concentrate on directing the muscle's of his own hand 104 to support the
10 device at that time because the application of force on an axis through the user's hand 104 coupled with the finger attachment device 116 make it much easier to support the device 100.

 Another general embodiment of the present invention shown in Figure 2A features detachable and interchangeable display 200 and keypad/control units 204. In this
15 way, users can attach different keypad/control units 204 for different applications or to suit a preference of which hand 208 to use in operating the device. Similarly, users can attach different displays 200 for different applications. Parts of the device can be exchanged with others to be able to exchange data with other users of such a system.

 In a preferred version of this embodiment, both the displays 200 and the
20 keyboard/control units 204 have resident logic systems and power supplies (not shown). Accordingly, one type of keypad/control unit 204 might have resident functions or store downloadable applications, while another might have different resident functions and store different applications. The keypad/control units 204 might be of the same form, just having different functions and applications, and their interchangeability might be comparable to
25 changing a cartridge in a handheld game system. It will be appreciated that the keypad/control units 204 can be adapted to receive such cartridges, whether they store applications, data, media files, or other helpful content in any of the embodiments disclosed in this specification.

Alternatively, as shown in Figures 2B and 2C, alternative keypad/control units 220 can be of different shapes, have keys related to different functions, or have different keypad arrangements entirely. Figure 2B shows a more linear keypad/control unit 220 to be coupled with the display as shown in Figure 2C. Moreover, keypad/control units 204, in the detachable embodiment or the previously described embodiment, can comprise rotatable keypads 124 (Figure 1). These rotatable keypads 124 allow a user to arrange the keys to suit her preferences. Similarly, the rotatable aspect of the keypad/control units 204 (Figure 2A) can allow the user to position the display 200 at different angles to the keypad/control unit 204. As shown in Figure 2A, one user might select a position where the keypad/control unit 204 is positioned more to one side of the display 200. On the other hand, as shown in Figure 2D, another user might choose to position the keypad/control unit 204 more directly beneath the display 200, or as shown in Figure 2E, the user might prefer to position the display 200 to the opposite side of the keypad/control unit 204. Further, considering the relative position of the display 200 and the keypad/control unit 204, this rotation would allow for a user to adjust the device to use it on his opposite hand.

In addition, alternative keypad/control units can have keypad arrangements targeted toward different applications. For example, if a cellular telephone is incorporated in the keypad/control unit as shown in Figure 2F, the telephone keypad control/unit 230 could have a conventional telephone keypad arrangement. A keypad/control unit for special math functions (not shown) could have calculator keys for calculation intensive applications, while another could have more typical scrolling and clicking keys. If a gaming system is incorporated in the keypad/control unit (not shown), the keys could be tailored to a specific game, or the keypad arrangement could mirror a keypad layout of a popular game controller.

Just as the keypad control units can be of different types, displays can be of different types as shown in Figure 2G. A typical handheld computer display of a few inches on a side as shown in Figures 2A through 2F might be suitable for most typical handheld computer applications or for a gaming system. A larger display (not shown) might be chosen if the device is being used for reading e-books or e-magazines.

Alternatively, if the device is being used primarily as a telephone directory and/or cellular phone/paging device, a compact display 240, which might comprise even a single-line display, might be chosen for the space and weight savings in the smaller package.

In this detachable embodiment, both the display and the keypad control unit
5 can have their own control logic, power supplies, and applications. As a result, a display used by itself can still have some resident functions which can be initiated through the touch-sensitive display. These displays, for example, may have some native functions such as calendaring and a to-do list manager. At the same time, a keypad/control unit might be added that includes a cellular telephone module and an address book function, therefore,
10 combining these devices not only adds a device for entering commands to the display, but also adds additional functionality.

Along the lines of the detachable display with its own on-board functionality, another embodiment of the present invention shown in Figure 3 is a handheld “display-only” device 300 with no physical buttons other than a power switch 304 to
15 activate the turn the device on and off. The designation “display-only” is somewhat of a misnomer because, as previously described, the display would have its own power supply and control logic. Moreover, the display-only device 300 can be controlled through touch-screen directives through designated icons 308 on the viewing area 312 of the device. Variations of this embodiment could be coupled with a keypad/control unit as previously
20 described to add different functions and user handling options. Notwithstanding, the display-only device can be a standalone device, or at least be able to function as a standalone device.

Another general embodiment of the present invention shown in Figures 4A and 4B is a handheld device 400 with no physical buttons with which all commands are
25 initiated via a touch-sensitive display 404. In a preferred variation of this embodiment, although some predefined keystroke on the touch-sensitive display 404 could activate that the device 400, it may be preferred to require the user to carry a security key 408. By issuing a physical key 408 to a user, the user can be sure that the information in the unit is secure as long as the user keeps the key 408.

It will be appreciated that the key 408 can be a physical interlocking teeth type key, as shown in Figure 4A, or other types can be used. Figure 4B, for example, shows an radio frequency identification (RFID) tag 420. With an RFID tag, which the user could wear as a charm on a chain, carry in a pocket, or hang on a key ring 424 as shown, the user need not actually insert a key into the device 400. The device 400 would poll for the presence of the RFID tag 420, and when the RFID tag 420 is in suitable proximity to the device 400, the device 400 powers itself on. Again, if the device 400 is separated from the user, the user's information remains secure as long as he still has the RFID tag 420 with him. It will be appreciated that this same sort of security can be implemented without an interlocking key using infrared, bar code scanning, or similar technologies.

Another general variation of the present invention shown in Figures 5A and 5B is a handheld device 500 which receives input both conventionally from the pressing of function control buttons on the keypad/control unit 504, through entry of commands on the touch sensitive display 508, and from a remote control stylus 512. Using the remote control stylus 512, the user can enter commands by pressing function control buttons 516 which can be received by the device 500 via infrared, RF, ultrasonic signals, or similar transmission means. The remote control stylus 512 has a stylus tip, therefore a user need not carry multiple styli. Allowing the user to enter commands via remote control stylus 512 can speed system operation in a number of ways. For one, the function control buttons 516 on the remote control stylus 512 can bear keys which trigger functions different from those on the keypad/control unit 504, giving the user more one-touch commands to use. Similarly, the function control buttons 516 could initiate macros for generating text or triggering commands the user regularly uses. Further, because the user necessarily already uses a stylus to use the touch-sensitive display 508, without moving her hands, the user has access to more one-touch commands by merely pressing down with her fingers on a device she already holds in her hand.

Figure 5B shows a reverse view of a variation of the remote control stylus 512. On a side away from the function control buttons 516, the remote control stylus 512 could support a display 524 which can display its own content, comparable to another

window in a multitasking environment. For example, while a user browses notes on the display 508 (Figure 5A) of the device 5, on the display 528 (Figure 5B) of the stylus, the user could be reminded of impending appointments. The display 528 would display content transmitted by the device 500 (Figure 5A) because, if the remote control stylus 512 can transmit to the device 500, using the same technology, the device 500 can transmit to the remote control stylus 512. It will be appreciated that the remote control stylus 512 and the device 500 can communicate using infrared, ultrasonic, RF, or similar technology. In fact, the same functions could be provided by a remote control stylus 512 coupled to the device 500 by a wired interface (not shown).

10 Another general embodiment of the present invention shown in Figures 6A, 6B, and 6C is a handheld device 600 protected by a gel pad 604. The gel pad 604 is comprised of the energy-absorbing gel type material which has become popular for shoe insoles. As shown in Figure 6A, the gel pad 604 can provide ridges 608 of thickened pockets of gel to help absorb blows to the device 600 if the device 600 should be dropped or otherwise experience shock. Figure 6B shows a rear view of the gel pad 604 installed on the device 600. Figure 6A shows how the ridges 608 extend around the perimeter of the device 600 to protect it. Moreover, it will be appreciated that these ridges 608, as well as one or more textured pads 612, can make the gel pad 604 more tacky. Increasing the tackiness of the device 600 allows a user to more securely hold the device 600. Further, if an underside of the device 600 is tacky, the device 600 is less likely to slide off of a surface on which it has been rested, further protecting the device from potential harm. Figure 6C shows another variation of the underside of the gel pad 604 showing that the textured pad 612 can be created in the form of a logo or another message. Thus, the gel pad 604 can carry the logo of the manufacturer of the device 600, or the gel pad 604 may carry personalized or personalizable content in the same way that such content is available on hard shell covers for cellular telephones. It should be noted that the content on hard shell cellular phone covers adds no tackiness to the case of the cellular phone, nor does it serve to protect the phone.

Figures 7A, 7B, 7C, 7D, and 7E show one more aspect of the present invention, a resource cradle 700 for the devices previously described. Considering the flexible aspect of the handheld devices previously described, the resource cradle 700 needs to be able to accommodate a wide range of devices and configurations. Figure 7A shows a unified handheld device 704 coupled with the resource cradle 700. Figure 7B shows a display-only handheld device 708 as previously described coupled with the resource cradle 700. Figures 7C and 7D show a keypad/control unit 712 and an alternate keypad/control unit 716, respectively, coupled with the resource cradle 700. Figure 7E shows a display-only device 708, a wireless transmission module 720, a remote control stylus 724, and an auxiliary function module 728 all coupled with the resource cradle. It will be appreciated that one resource cradle can provide multiple couplings to accommodate various devices in use in the system previously described.

The resource cradle 700 provides a variety of functions to the devices it serves. Certainly, power supplies of the devices can be recharged by the cradle 700, just as the cradle 700 can be a conduit to another computer to synchronize the device with that other computer. In addition to these expected functions, however, the resource cradle 700 also provides additional functions to the devices with which it is coupled. The resource cradle 700 can provide function to the devices without using a personal computer. The resource cradle 700 can provide a storage device (not shown) for backing up content stored on the handheld device, or for storing interchangeable content that a user can request be offloaded from the handheld device to storage, or downloaded from storage to the handheld device. As previously discussed, in the case of handheld devices with detachable display and keypad/control units, those devices have their own control logic, thus each can operate with a resource cradle 700 to exchange content. In addition, the resource cradle 700 can provide a network interface, a microphone and/or speakers for audio or telephony applications.

Turning to the more specific depictions of embodiments of the invention, Figure 8 is a front side view of a finger held hardware device(s) 8 constructed in accordance with the invention. At least one type of finger held hardware device 8 can be

designed, configured, manufactured, and sold to be utilized in providing, inputting, sending, receiving, interacting, storing all types of content, communications with any and all content, data, and information from internal means and methods, and/or from external means, and/or methods. Services can include at least one type of carrier, and/or network provider to/by/from at least one type of finger held hardware device(s) 8 with any and all content that is provided from the network(s) provider(s).

At least one type of finger held hardware device 8 can interact, receive, save, store, erase, exchange, or trade all types of content. At least one type of finger held hardware device 8 can turn ON / OFF 10 by physical means, at anytime, and/or can also be facilitated by various other means which do not require, and/or utilize at least one type of physical interface. At least one type of finger held hardware device 8 has the capability to turn ON / OFF 10 by itself, from off, sleep mode, wake mode when the user(s) receives any types of content, picks up at least one type of finger held hardware device 8, and/or becomes available based on ones location. At least one type of finger held hardware device 8 has the ability to turn OFF by itself, such as to save power resources or other purposes, and/or if the user does not engage any new content after a predetermined period of time, that is established by the user within the User Preferences of at least one type of finger held hardware device 8, and/or by setting up User Preferences from/by at least one type of carrier, and/or network provider, and/or user at the device level (hardware, software, middleware), and/or network level by many methodologies, protocols, platforms, configurations, and alike. At least one type of finger held hardware device 8 can also be designed and configured to automatically turn ON when a user connects, attaches, or come in contact with the device; such as slipping a portion of the finger held hardware device 8, such as a strap(s) 2 on to the users finger, thumb or other methodologies that determine the users presence or desire to turn ON the hardware device. The same can hold true when a user wishes to turn OFF their hardware device, by removing a finger, thumb or other methodologies that determines the users desire to turn OFF the hardware device.

At least one User can establish in the User Preferences of at least one type of finger held hardware device 8 what type(s) of content that the user wishes to receive/block

out, allowing content in pre-identified categories to be sent to/from at least one type of finger held hardware device 8, as well as blocking any and all other types of content that the user does not wish to receive, or be informed about. At least one User can save, store, view, exchange, recall, trade, delete and alike all types of content from/to/with at least one
5 type of finger held hardware device 8 internally, externally, removable media, and/or from/at/to at least one type of local and/or remote network. At least one type of content can be saved locally inside and/or outside of at least one type of finger held hardware device 8, and/or remotely that has been provided by at least one type of carrier, and/or network provider. If the user selected to save at least one type of content locally, the content could
10 be saved internally, externally, and/or be saved onto at least one type of removable media or storage means 5. At least one type of antenna could be built into/out of the side frame of at least one type of finger held hardware device 8 on the 7, 8, and 9 number area, or other areas as determined by a manufacturer, distributor, dealer, carrier, provider, and/or user. At least one purpose for the antenna is to improve the signal strength, and coverage area to
15 reduce to the furthest extent hot spots, dropouts, signal coverage stability, and/or disconnections while at least one user is operating at least one type of finger held hardware device 8.

At least one type of internal/external antenna can have the ability/capability in the hardware design, and/or software, and/or as provided by a middleware architecture to
20 provide and/or enable at least one user, carrier, provider or alike to control the signal variation strength for/from/to at least one finger held hardware device 8 based on signal strength variations, whereby at least one finger held hardware device 8 can automatically, and/or manually be adjustable to enhance signal strength at times when signal strength is not at an optimum level, and/or at times when signal strength easily attained at an optimum
25 level. In such cases, power resources, software applications, system architecture protocol, frequency variations and/or fluctuations can be utilized to maintain optimum operating environment, and can save power resources, maintain primary frequency utilization, and/or a multitude of other variations for achieving one in the same.

At least one type of finger held hardware device 8 may have the ability and expandability for at least one user to facilitate its interaction requests with At least one type of finger held hardware device 8 from at least one type of remote control device 12. At least one type of remote control device 12 can have at least one type of button, viewable screen, and the ability to be incorporated into any type of finger held hardware device 8 and have the ability to become detached. A front view 12 (a) for at least one type of remote control device 12 could be designed as illustrated, as well as the back view 12 (b) for at least one type of remote control device 12. At least one type of remote control device 12 can be designed to operate directly with at least one type of finger held hardware device 8, and/or any other type of hardware device(s), including but not limited to any type of data, information and networking communications from paging, cellular phone, wireless phone, computer devices, and/or desktop devices to name a few.

Interaction by/with/thru at least one type of remote control device 12 can provide the same or different capabilities as a manufacturer, carrier, provider, or user selects from at least one type of physical button(s) 3, 10, & 11 and can include basic navigation, to more complex functions, along with interacting with user preference settings, selection and decision of saving, deleting, recalling, viewing, exchanging, trading, any pre-stored content, stopping transmission of any type of content, selection of other categories, dialing phone numbers, sending and receiving email, text messaging services, stock ticker information, and other professional services, and/or subcategories including but not limited to phone, calendar, VP Collect, VP Gallery, email or message center, keyboard, scrolling, software categories, general section, plug-in, expansion slot, dual or split spectrum capabilities, and features.

At least one type of finger held hardware device 8 can enable at least one user with at least one type of viewable screen area 6, 7, and 9 area to review, interact, and/or interface with any and all types of virtual content. The upper part of the viewable screen area 7 may be utilized to either be a single screen design, dual screen, and/or split screen, that allows at least one type of content can be provided to the viewable screen area 9 portion, (in this example audio/visual content), while other types of content can be

provided to the viewable screen area 7 portion, (in this example text based data and information) content. By utilizing more than one viewable screen area 6, 7, and 9 for at least one purpose, at least one type of user can actively be doing one thing (in say viewable screen area 9), while data, content, information, text messaging, email and other forms of interaction can be active (say on viewable screen area 7). In this way, at least one user is able to multi-task and is able to get more things done. At least one type of finger held hardware device 8 can also provide unlimited number of other types of content, entertainment, and information such as; playing electronic games of all types, styles, and formats, digital content, music, camera, video, professional services, information content, location means, network access means, and all types of content and services that can be provided to a user(s). These different types of content can either be connected and related, and/or separate in purpose than the other. At least one type of content can be configured and/or provided as continued information, and/or from time to time in portions, pieces, segments, and alike.

At least one type of speaker and microphone can be incorporated and/or provided on any portion of a finger held hardware device 8 principally to provide sound capabilities, but can also include voice recognition capabilities thru a speaker/microphone/video camera or other. At least one type of LED and/or lighting up of at least one type of button images 3, 10, and 11 assist the user at night and dark lit locations, including at least one portion of the viewable screen area 6, 7, and 9. At least one type of LED feature could be utilized to inform the user of current power resource levels, incoming/outgoing signal strength level, an incoming call, an incoming text message, a certain time reminder event based on a software application scheduler that utilizes time as part of, or in addition to a scheduler, how long another party has been on hold on another line, as well as if the finger held hardware device 8 is ON, in sleep mode, or OFF, whether the network card device, smart card device, headphone jack and/or wired data connection capabilities 4 and/or removable media 5 is properly or improperly connected, and/or ON/OFF, whether functioning properly, and much more.

At least one type of finger held hardware device 8 can come with gel pad capabilities 13. At least one type of gel pad 13 could be located anywhere on at least one type of device, and could be utilized for unlimited purposes. At least one type of gel pad 13 design, configuration, or alike can come as part of at least one type of device, hardware device, accessory device, media device, or all other types of physical objects. At least one
5 type of gel pad 13 can be incorporated as part of, in addition to, or other at the factory level, as an aftermarket piece from a third party provider, wholesaler, distributor, dealer, distribution organization, as a consumer any type of object. Some examples of functions and features can include; at least one type of material that can make it easier for at least one
10 type of user to utilize and interact with a device, to reduce physical user interaction from slipping around, to protect at least one type of device from the elements, weather, use, the impact and shock from dropping at least one type of device, for holding, connecting, engaging one device and/or portion of at least one type of device with another type of device, including accessories, upgrades, and the like.

15 At least one type of microphone 14 can equally be incorporated, or in addition to at least one type of finger held hardware device 8 design. At least one type of finger held hardware device 8 can be converted and/or utilized for a multitude of other purposes including; a digital camera, video camera, wireless phone, cellular phone, text
20 messaging, a pager, walki-talkie, trunk radio, PDA, music player, game player, CD player, DVD player, desktop computer, laptop computer, notepad device, as well as a host of other types of hardware device capabilities. At least one type of finger held hardware device 8 can have at least one type of headphone jack and/or wired data connection capabilities 4 on the side for users to use headphone capabilities, wired and/or wireless data transfer to name
a few.

25 At least one type of volume control can be provided on the outside/inside of at least one type of finger held hardware device 8 and/or accessory device such as a network card, remote control unit, or other type of device that would allow at least one user to utilize such features locally, and/or remotely, and/or can be provided to a user as part of,

or in addition to at least one type of network card, smart card, remote control device 12, and/or removable media item.

At least one type of remote control device 12 can be designed at the factory level to perform at least one function, and/or be of any number of buttons, any size, any style, any design, any form, any format, any color, any shape, any material, and/or a
5 plethora of variations that has any type of image, name, or reference on any such remote control device 12. At least one type of carrier, provider, device, and/or user can configure any numerable variations for at least one button. At least one type of strap(s) 2 can be part of, and/or in addition to at least one type of finger held hardware device 8 design enabling
10 at least one type of user to have at least one means for holding, connecting, or being engaged with at least one type of finger held hardware device 8. At least one type of configuration for at least one button, but in particular for the design utilized in Figure 8, the middle buttons 3 can be utilized to provide at least one user with up, down, left, and right scrolling, navigation, directory, sub-directory, and other command sets that the
15 manufacturer, distributor, dealer, retailer, carrier, and/or provider user chooses/configures for these buttons from at least one type of hardware, software and/or middleware interface. At least one type of configuration for the middle buttons 3 can enable at least one user to play any type of game, and/or communication on the finger held hardware device 8.

At least one type of physical ON / OFF button 10 can be designed and
20 utilized to override a sleep mode configuration, as well as a wake mode configuration that may come as standard, or is offered as a feature by at least one type of network provider or carrier, or established by at least one type of user and can be established as a default setting in the finger held hardware device 8. If at least one type of user wishes, they may actively change settings, and/or override the defaulted features at any time.

25 If/when at least one type of finger held hardware device 8 is in sleep mode, a finger held hardware device 8 can automatically wake up by itself by unlimited means, including but not limited to various types of content and/or data and information triggering (actively, and passively) be provided to the user – waking up the finger held hardware device 8 to allow the user to interact with the related content. If after a certain period of

time, the user has not interacted with the finger held hardware device 8, and/or no new forms of communication, and/or content is not being provided to the finger held hardware device 8, the finger held hardware device 8 can automatically go into sleep mode to conserve power resources. At least one type of manufacturer, distributor, dealer, carrier, provider, and/or user can configure the finger held hardware device 8 so that when both sleep mode, and wake mode are commenced, the finger held hardware device 8 can provide the user with at least one type of [audio], [visual], [motion or vibration], or other means. There are multiple ways, means, and methods for at least one type of user to hold/attach/connect 2 the finger held hardware device 8 principally with at least one finger, thumb, or secondarily another part/portion of the body, or object near the body, such as clothing, a strap, a belt, necklace, or other unlimited methods on at least one hand based on any type of design, style, configuration, material, approach, methodology, reasoning, purpose, including at least one part, piece, component, unit, extension, accessory or alike, rather than a persons hand, wrist, forearm, arm, waist, leg, hip, head, neck, or other parts of the body.

At least one preferred method and style can be utilized for holding, hanging, carrying, and/or attaching at least one type and/or portion of at least one type of finger held hardware device 8. The primary purpose of demonstrating at least one method of achieving this objective, as provided in the illustration in Figure 8, at least one user can hold/attach/connect or engage 2 with at least one finger, thumb, or other portions of the body, and/or other devices or means that would allow at least one user to bring, carry, hold, or have, bring or carry at least one type of finger held hardware device 8 and/or any other type of hardware device, network card device, media device, and/or other such types of hardware devices. At least one type of button such as those found in Figure 8 located on this illustration and number as buttons 3, 10, & 11 can be designed at the factory level to be of any number of buttons, any size, any style, any design, any form, any format, any color, any shape, any material, and/or a plethora of variations that has any type of image, name, or reference on any such buttons 3, 10, & 11.

Figure 9 is a front side view of a finger held hardware device(s) constructed in accordance with the invention. At least one type of finger held hardware device 208 or expansion capabilities 201 device such as network, data and information, removable media, games, network carrier and/or provider, or accessory device to name a few. Inversely, these same functions and features can be built into and comprised of within any type of finger held hardware device 208. At least one type of carrier, and/or provider can operate and/or provide such services on at least one type of spread spectrum, split spectrum, and/or multiple spectrum, from RF, IR, lightwave, and much more. Currently, all forms of wireless hardware communications devices; from cellular mobile phones, pagers, personal digital assistants, and more are manufactured to operate only on one frequency, spectrum, or carrier network. However, at least one type of finger held hardware device 208 or expansion capabilities 201 device can be designed and configured that will allow at least one user, network, carrier, provider or other party to select, modify, change, adjust, or by means that will allow it to work, operate, communicate with, utilize more than one frequency, spectrum, protocol, architecture, network, carrier, provider, or other services. The preferred method for modifying current settings are based on embedded software, graphic utility interface, button based, voice recognition interface platform. By contrast, multiple IC designs, chip and/or chip sets can be utilized in a particular design. Other methods, structures, protocols, methodologies, platforms, and configurations can be utilized for achieving one in the same result. This feature is significant when a user travels to other towns, cities, states, and countries whereby a local carrier, and/or network provider(s) content on at least one type of spectrum from the local carrier, and/or network provider(s) defaulted network connection configuration. With this type of expansion capabilities 201 design feature, more than one network or service provider can be offered to the user.

At least one type of expansion capabilities 201 can allow and/or enable signal strength by/to/from/between any type of portable terminal hardware device and any local and/or remote location, network, carrier, provider, or frequency spectrum to fluctuate based on signal strength requirements by increasing, and/or decreasing power resources or

other methods and techniques that would enhance signal strength during or at times when any type of device is in or is about to enter into an area or commonly referred to as a hot spot, and inversely reducing power requirements and power usage or resources when any type of hardware device is in an area that provides optimum signal strength, thus reducing
5 power usage and/or resources. This can be achieved by hardware, firmware or middleware, and/or software design at the hardware device level, and/or from a local and/or remote network, carrier, provider, and/or operator level.

At least one type of remote control device 207 can be designed with and/or to perform at least one type of feature to the user, either directly by and/or between at least
10 one type of finger held hardware device 208, or other type(s) of hardware device or accessory device, or directly by, to, and/or thru any other type of device, network, carrier, or provider platform, architecture, protocol, spectrum, configuration, design, and/or other variations thereof. For the primary purpose of demonstrating at least one method of achieving this objective, as provided in the illustration in Figure 9, at least one user can
15 utilize the point 206 of at least one type of remote control device as an expandable and/or retractable antenna, as a pointing device, and/or as a stylus to name a few. At least one type of physical button 202 could be utilized and incorporated into the design of a remote control device 207.

At least one type of removable media 205 could be utilized and incorporated
20 into the design of a remote control device 207. At least one type of headphone jack and/or wired data connection capabilities 204 could be utilized and incorporated into the design of a remote control device 207. At least one type of scrolling button 203 features could be utilized and incorporated into the design of a remote control device 207 that would allow and/or provide the user to facilitate such things as quickly and remotely recalling, sending,
25 retrieving data and information, such as text messaging or paging services from/by/to/from a network, a carrier, or provider, and/or by and between at least one type of finger held hardware device 208, and/or any other type of hardware device, accessory, network card, removable media, and/or other configuration. At least one advantage to such a feature would be for at least one user to quickly check and/or look up any type of data and/or

information without having to turn on any type of hardware device like a cellular mobile phone, PDA, pager unit, digital camera, stock quotes, music, or other, including a finger held hardware device 208 without actually having to physically interface directly turn ON a device to send, receive, look up, retrieve, store, recall, file, delete, exchange, trade, give, or other forms with at least one type of data and information.

At least one type of viewable screen area 209 could be utilized and incorporated into the design of a remote control device 207 to provide to the user at least one form of data and information such as numeric paging, alpha numeric paging, text messaging services of any type, and/or other types of services.

Figure 10 purpose is to show at least one possible design and/or configuration for what could possibly be the front side view of at least one type of finger held hardware device 308 constructed in accordance with the invention. At least one type of finger held hardware device 308 could be designed to have at least one type of monochrome viewable area design 306, 307, 308, 309. At least one type of monochrome viewable area design 306, 307, 309 design could primarily be used for paging, instant text messaging, stock ticker information, text messaging service of any type, and other text based services from at least one carrier, and/or network service provider. At least one type of finger held hardware device 308 could be utilized for all types of data and communications with any and all types of content, data, and information as provided at least one carrier, provider, or product – such as a game, software program, or other.

At least one type of finger held hardware device 308, although providing a means for at least one type of user to physically turn ON/OFF 310 the device can be incorporated into a design, the finger held hardware device 308 itself upon the user entering a physical location can automatically wake up and engage in providing any and all related type(s), style(s), format(s) of content to the user, based on the user, carrier, network provider, or other parties user preferences. At least one type of finger held hardware device 308 can have the ability to turn OFF by itself as well, to save power resources or other purposes, if the user does not engage any new content after a pre-determined period of time, in which the predetermined period of time can be established by at least one party. At least

one party can establish in the user preferences what type(s) of content that the user is allowed, wishes to receive, only enabling content in pre-identified categories to be sent/received, as well as blocking any and all other types of content that the user does not wish to receive, or is allowed to receive. At least one party (carrier, provider, and/or user) can be given the ability to save, store, view, exchange, recall, trade, delete and alike all authorized content that is provided to at least one users hardware device by actively facilitating these requests themselves on an active or passive basis. Content can be saved at the location that has been pre-selected by the carrier, provider, and/or user, whether it be at the hardware device location, locally, and/or remotely, and whether it be internally, externally, and/or removable. At least one carrier, provider, and/or user may elect to save content locally, and can utilize any type of removable media storage 305. At least one type of antenna can be built into at least one type of designed finger held hardware device 308. At least one purpose of the antenna is to improve the signal strength, and coverage area to reduce to the furthest extent hot spots, dropouts, and disconnections while the user is operating the finger held hardware device 308. At least one type of finger held hardware device 308 design can also provide unlimited number of other types of content, entertainment, and information such as; playing electronic games of all types, styles, and formats, digital content, music, media and entertainment, camera features, video, professional services, information content, location means, network access means, and all types of content and services that can be provided to a user(s). At least one type of user has the ability to save content on a local and/or remote network.

At least one type of finger held hardware device 308 can have the ability and expandability for the users to facilitate its interaction requests with the finger held hardware device 308 from a remote control unit as well. Interaction can include basic navigation, interacting with user preference settings, selection and decision of saving, deleting, recalling, viewing, exchanging, trading, any pre-stored content, stopping transmission of any type of content, selection of other categories, and/or subcategories including but not limited to phone, calendar, VP Collect, image Gallery, email, text messaging, message

center, keyboard, scrolling, software categories, general section, plug-in, expansion slot, dual or split spectrum capabilities, and features.

At least one type of finger held hardware device 308 can have the ability to provide at least one user a viewable screen area 306, 307, and 309 area to view any and all
5 content. The viewable screen area 307 could be utilized as a single screen design, or as a dual or multiple screen design, so that different forms of content can be provided to different portions of the viewable screen area 307.

One example can include stock ticker information being provided to the user in viewable screen area 309 while other types of content, such as text messaging
10 information is being provided to the screen in viewable screen area 306, while the user is interacting with any type of data and information in the middle viewable screen area 307. In this way, the user is able to multi-task several things at the same time. These different types of content can either be connected and related, or separate in purpose, function, information, and design. The user, carrier, and/or provider can also move, change, and/or
15 modify various types of content to other locations on the viewable screen area 307 at any time.

At least one type of speaker and/or microphone can be incorporated into the design of the finger held hardware device 308 to provide all types of sound capabilities. Figure 10 illustration has the speaker located on the backside of the finger held hardware
20 device 308. At least one type of LED and/or lighting up of at least one type of button 303, 310, and 311 to assist the user at night and dark lit locations. The LED features can be utilized to inform the user power resource levels, as well as if the finger held hardware device 308 is ON, in sleep mode, or OFF.

At least one type of finger held hardware device 308 can be converted and
25 utilized as a digital camera, video camera, wireless phone, cellular mobile phone, pager, PDA, music player, CD player, DVD player, video camera, game player, as well as a host of other hardware device capabilities. At least one type of finger held hardware device 308 can be designed to incorporate any type of wired connection and/or headphone jack 304. At

least one type of physical or non-physical volume control can also be configured into the design of finger held hardware device 308 for user convenience.

At least one type of strap(s) 302 can be incorporated into the design of a finger held hardware device 308 used for the user to hold, hang, attach, connect with a
5 finger held hardware device 308, or as an accessory to any such device, or accessory.

Middle buttons 303 can be configured and utilized for up, down, left, and right scrolling, navigation, directory, sub-directory, and other command sets that the manufacturer, carrier, provider, and/or user can configure chooses for these buttons. These middle buttons 303 can allow user a user to play all types of games on the finger held
10 hardware device 308. At least one type of physical ON / OFF button 10 can be utilized to override sleep mode, and wake mode features that are set as defaulted on a finger held hardware device 308. If a user wishes, they can actively change these settings, and/or override the defaulted features at any time. When the finger held hardware device 308 is in
15 a user physically moves around a building, town, city, state, or country, whereby all types of content will (actively, and passively) be provided to the user – waking up the finger held hardware device 308 to allow the user to interact with the related content. If after a certain period of time, the user has not interacted with the finger held hardware device 308, and/or no new content is being provided to the finger held hardware device 308, the finger held
20 hardware device 308 may automatically go into sleep mode to conserve power resources. The user can configure the finger held hardware device 308 so that when both sleep mode, and wake mode are commenced, the finger held hardware device 308 can provide the user with at least one type of [audible], [visual], [motion or vibration], or other means of notification.

25 Figure 11 is a front side view of a finger held hardware device 401 constructed in accordance with the invention. The monochrome finger held hardware device 401 has expansion capabilities 402 to provide to the user at least one type of carrier, network, or provider services. This feature is significant when a user travels to other towns, cities, states, and countries whereby the network provider(s) content is on a different

spectrum, or dual/split spectrum from the units defaulted network connection configuration. With such expansion capabilities 402 design feature more than one network or service provider can be offered. The purpose of the illustration in Figure 11 is to show what expansion capabilities 403 looks like when connected to at least one type of finger held
5 hardware device 401.

Figure 12 is a front side view of a finger held hardware device 501, 502, and 503 constructed in accordance with the invention. The purpose of illustration Figure 12 is to show that at least one type of finger held hardware device 501, 502, 503 can be separated, and/or the user is able to detach at least one portion of a finger held hardware
10 device 501, 502, 503 from another portion of a finger held hardware device 501, 502, 503 design. For the purposes of illustration, the viewable screen portion 501 of a finger held hardware device 501, 502, 503 can be removed, separated, taken away from another portion of a finger held hardware device 501, 502, 503, such as the finger held navigation buttons 502 portion of the device.

15 This enables at least one user to remove the viewable screen portion 501 and place, connect, interact a different viewable screen; such as a larger one, a different viewable screen with a different embedded software and system that provides characterizes or features to at least one users viewable screen apparatus to the device. At least one type of user can now send, give, trade, exchange, the viewable screen portion 501 with at least one
20 other user.

At least one type of viewable screen portion 501 can be designed with at least one type of electromechanical technologies, circuit board design, IC design, CPU, processor, chip or chip set, sound and/or graphics capabilities, memory, hard drive and/or data storage capabilities, power resources, OS, software, middleware, any type of ports, as
25 well as any and all other components that would allow the viewable screen portion 501 to provide any and all of the same functions as any type of other device, including but not limited to a desktop computer, laptop, notepad, PDA, cellular phone, telephone, pager, music player, camera, video device, data storage device, scanning device, reading device, and all other types of devices.

Any type of viewable screen portion 501 has the capability to provide to at least one user, any and all types of functions and features as any type of hardware device stated hereto in this patent documentation. In one particular design, the viewable screen portion 501 can be detached from the navigation button 502 portion of the original finger held hardware device 501, 502, 503, and/or other portions of a hardware device, and given
5 to at least one other user, and for the receiving user to be able to turn ON and utilize the viewable screen portion 501 as an entire fully functioning hardware device, without requiring connection with any other type of physical hardware device, or apparatus. The same full range of services can be provided to the receiving user as with the original user.

10 Any and all types of data, information, inputting/outputting, data - viewing, storing, recalling, filing, modifying, utilization of all types of content such as; music, video, games, and photos, text based data, and all types of communications can be provided on just the viewable screen portion 501.

At least one type of finger held hardware device 501, 502, 503 can utilize at
15 least one type of removable navigation button 502 configuration and/or apparatus to interact with at least one type of hardware device, or accessory device.

At least one type of user can utilize, send, give, trade, exchange, connect, interact, interface, and alike with navigation button 502 with at least one other user. At least one type of navigation button 502 can be designed with at least one type of
20 electromechanical technologies, circuit board design, IC design, CPU, processor, chip or chip set, sound and/or graphics capabilities, memory, hard drive and/or data storage capabilities, power resources, OS, software, middleware, any type of ports, as well as any and all other components that would allow the viewable screen portion 501 to provide any and all of the same functions as any type of other device, including but not limited to a
25 desktop computer, laptop, notepad, PDA, cellular phone, telephone, pager, music player, camera, video device, data storage device, scanning device, reading device, and all other types of devices.

At least one type of strap(s) 302 can be incorporated into the design of a navigation button 502 for the user to hold, hang, attach, connect with navigation button 502, and/or as an accessory to any such device, or accessory.

Any type of navigation button 502 has the capability to provide to at least one user, any and all types of functions and features as any type of hardware device stated hereto in this patent documentation. In one particular design, the navigation button 502 can be detached from the viewable screen portion 501 portion of the original finger held hardware device 501, 502, 503, and/or other portions of a hardware device, and given to at least one other user, and for the receiving user to be able to turn ON and utilize the navigation button 502 as an entire fully functioning hardware device, without requiring connection with any other type of physical hardware device, or apparatus. The same full range of services can be provided to the receiving user as with the original user. Any and all types of data, information, inputting/outputting, data - viewing, storing, recalling, filing, modifying, utilization of all types of content such as; music, video, games, and photos, text based data, and all types of communications can be provided on just the navigation button 502.

Figure 13 is a front side view of a finger held hardware device 601, 602 constructed in accordance with the invention. The purpose of illustration in Figure 13 is to illustrate or demonstrate that at least one type of viewable screen area 601, and/or navigation button 602 apparatus can be designed, configured, and made to include at least one type of capability that will provide to a user at least one type or form of removable medium 604, and 606, as well as wired data connection and/or headphone capabilities 605, and 607. One particular design and configuration for a viewable screen area 601 can also have the capability to provide the user with at least one type or form of network, carrier, and/or provider 603 means. Navigation button 602 can also be designed and configured to also have the capability to provide the user with at least one type or form of network, carrier, and/or provider 603 means. At least one type of navigation button 602 can also include a viewable screen area as part of its primary design, so that in such cases when at

least one user were to remove a primary viewable screen area 601, the navigation button 602 can still retain a viewable content area.

Figure 14 is a front side view of another modified, configured, and designed finger held hardware device(s) 708 and also shows a persons hand 701 for the express purpose of providing additional sample variations that can be constructed in accordance with the invention. This particular finger held hardware device 708 can equally be utilized in providing, inputting, sending, receiving, interacting, storing all types of content, communications with any and all content, data, and information from internal means and methods, and/or from external means, and/or methods. Services can include network(s) provider(s) medium 712 to any type of configured finger held hardware device(s)708 with any and all content that is provided from the network(s) provider(s). The finger held hardware device 708 can interact, receive, save, store, erase, exchange, or trade all types of content. User(s) finger held hardware device 708 can turn ON / OFF 710 physically at anytime.

At least one type of finger held hardware device 708 has the capability to turn ON and OFF by itself, from sleep mode, to wake mode when the user(s) receives any types of content. At least one type of finger held hardware device 708 has the ability to turn OFF by itself as well, to save power resources or other purposes, if the user does not engage any new content after a predetermined period of time, that is established by the user within the user preferences of the finger held hardware device 708, and/or by setting up user preferences by the network provider, and/or user at the network level by many methods. Users can establish in the user preferences of the finger held hardware device 708 what type(s) of content that the user wishes to interact with, allowing content in pre-identified categories to be sent to the users finger held hardware device708, as well as blocking, limiting, filtering, and/or restricting any and all other types of content that the user does not wish to receive directly, or to be sent to a remote location where the user is able to access by wired, wireless, and/or combinations thereof, such data and information at a later point in time.

At least one user can save, store, view, communicate, exchange, recall, trade, delete and alike all types of content that the finger held hardware device 708 offers to the user(s). Content can be saved locally inside and/or outside of the finger held hardware device 708, and/or remotely that has been provided by at least one carrier, and/or network provider(s). If the user selected to save content locally, the content could be saved internally, externally, and/or be saved onto removable media storage means 705. At least one type of wired connection and/or headphone jack 704 can be utilized with the finger held hardware device 708. At least one type of antenna can be built as part of or in addition to the finger held hardware device 708. The primary purpose of the antenna is to improve the signal strength, and coverage area to reduce to the furthest extent hot spots, dropouts, and disconnections while the user is operating the finger held hardware device 708.

At least one type of finger held hardware devices 708 may have the ability and expandability for the users to facilitate its interaction requests with the finger held hardware device 708 from a remote control unit as well. Interaction buttons 703, 710, & 711 can include basic navigation, interacting with user preference settings, selection and decision of saving, deleting, recalling, viewing, exchanging, trading, any pre-stored content, stopping transmission of any type of content, selection of other categories, dialing phone numbers, sending and receiving email, instant messaging services, stock ticker information, and other professional services, and/or subcategories including but not limited to phone, calendar, VP Collect, VP Gallery, email or message center, keyboard, scrolling, software categories, general section, plug-in, expansion slot, dual or split spectrum capabilities, and features.

At least one type of finger held hardware device 708 can have the ability to provide at least one user a viewable screen area 706, 707, and 709 area to view any and all content. The viewable screen area 707 could be utilized as a single screen design, or as a dual or multiple screen design, so that different forms of content can be provided to different portions of the viewable screen area 707. One example can include stock ticker information being provided to the user in viewable screen area 709 while other types of content, such as text messaging information is being provided to the screen in viewable

screen area 706, while the user is interacting with any type of data and information in the middle viewable screen area 707. In this way, the user is able to multi-task several things at the same time. These different types of content can either be connected and related, or separate in purpose, function, information, and design. The user, carrier, and/or provider
5 can also move, change, and/or modify various types of content to other locations on the viewable screen area 707 at any time.

At least one type of finger held hardware device 708 can also provide an unlimited number of other types of content, entertainment, and information such as; playing electronic games of all types, styles, and formats, digital content, music, camera features,
10 video features, professional services, information content, location means, network access means, and all types of content and services that can be provided to a user(s).

These different types of content can either be connected and related, or separate in purpose than the primary intended data and/or information. At least one type of speaker can be part of, or in addition to at least one type of finger held hardware device 708
15 design. At least one type of LED 713 and/or lighting up of at least one button 703, 710, and 711 can be utilized to assist the user at night and dark lit locations, or as a form of notification. These forms of notification can be part of the carrier, or provider network services, and/or can be configured by a user by various types of hardware and/or software configurations either directly on the finger held hardware device 708, and/or remotely by a
20 multitude of other avenues. At least one LED 713 feature can be utilized to inform the user about power resource level, as well as if the finger held hardware device 708 is ON, in sleep mode, OFF, as well as incoming data, communications, and information, or pending outgoing data, communications, and information, including file size, download, upload, and/or data transfer timeframe. At least one type of microphone can equally be incorporated
25 into the finger held hardware device 708.

At least one type of finger held hardware device 708 might have the capability to be converted and utilized as a digital camera, video camera, wireless phone, cellular mobile phone, pager, PDA, music player, CD player, DVD player, as well as a host of other hardware device capabilities. At least one type of finger held hardware device 708

can be designed with a headphone jack and/or wired data and communications plug in 704 on the device that can allow a user the ability to utilize any type of headphone, as well as wired data transfer capabilities. At least one type of volume control for the control of sound levels can also be made available internally, externally, and/or combinations thereof as part of, or in addition to a finger held hardware device 708 for user convenience.

At least one type of configurable strap 702 can be designed as part of, and/or in addition to a finger held hardware device 708. Such a feature can primarily be utilized by the user to hold onto the finger held hardware device 708 from at least one finger, and/or thumb of a users hand 701 and/or other portion of the user body, clothing, belt, or alike, and/or other means of attaching or allowing the user to bring the finger held hardware device 708 with them.

The bottom right buttons 703 in Figure 14 can be utilized for navigation, for up, down, left, and right, scrolling, directory, sub-directory, data inputs and outputs, and other command sets that the manufacturer, carrier, service provider, and/or user decides to offer, is made available, and/or selects from user preferences for operating the finger held hardware device 708, and/or other interrelated devices that can be wired, and/or wireless, such as a network card, smart card, removable media, scanning, pointing, or reading device, memory device, camera device, video device, and music device to name a few. The bottom right buttons 703 can also be utilized to allow at least one user to play all types of games on the finger held hardware device 708. Besides typical physical game cartridges, other methods can be achieved by downloading the software game by various wired and/or wireless means to an internal, and/or external data storage location that does not require and/or utilize a removable media commonly utilized within the hand held game market.

At least one type of ON / OFF button 710 can override the sleep mode, and wake mode features that are set as defaulted in the finger held hardware device 708. If the manufacturer, carrier, service provider, and/or user wishes, any can passively and/or actively change these settings, and/or override the defaulted features at any time.

If a finger held hardware device 708 is in sleep mode, the finger held hardware device 708 can automatically wake up by itself when a user physically moves

around a building, town, city, state, or country, whereby all types of content will (actively, and passively) be provided to the user -- waking up the finger held hardware device 708 and allow the user to interact with the related content. If after a certain period of time, the user has not interacted with the finger held hardware device 708, and/or no new content is being provided to the finger held hardware device 708, the finger held hardware device 708, the carrier, service provider, and/or finger held hardware device 708 can automatically go into sleep mode to conserve power resources. The user can configure the finger held hardware device 708 so that when both sleep mode, and wake mode are commenced, the finger held hardware device 708 can provide the user with a [audio], [visual], [motion or vibration], or other means.

There are a plethora of ways, means, and methods for a user to hold onto the finger held hardware device 708 by use of the users fingers, thumb, or other means other than the entire hand. The preferred styles, as provided in the illustration, slides onto the pointing finger of a users hand 701 at the lowest extension of the pointing finger by at least one type of configurable strap 702, and could possibly also have a second on the extension of the pointing finger section of an adjustable, flexible, and configurable strap 702 to provide balance to the user while utilizing the device(s). A strap 702, can be made of any type of material(s), combination of materials, of any size, shape, color, whether fixed, or flexible by design or function, or variations thereof achieving one in the same in whole and/or in part.

At least one type of physical navigation button 703, 710, & 711 can be designed at the factory level, and/or added by aftermarket products offered to a user that would be comprised of any number of buttons, any size, style, design, form, format, color, shape, that has any type of image, name, or reference on any such buttons 703, 710, & 711.

Likewise, these physical navigation and interaction buttons can be non-physical by design, function, and nature, and can be configurable in a plethora of platforms, configurations, protocols, and architectures utilizing various means of achieving one in the same by at least one carrier, service provider, and/or user.

Figure 15 is a front, left and right side view of another modified, configured, and designed viewable screen device 801 for the express purpose of providing additional sample variations that can be constructed in accordance with the invention. At least one type of viewable screen device 801 and/or any type of physical device can be designed with the following capabilities and features. This particular viewable screen device 801 does not have any physical navigation, or main category buttons, whereby all of these functions and features are provided to the user after the user turns ON 802 the viewable screen device 801. All buttons 804 are non-physical by design and show up in this particular example on the upper portion of the viewable screen device 801. The user can be provided information such as what category or category identification 807 they are utilizing at the moment, as well as date and time 808 information. The viewable screen device 801 can have an antenna apparatus 803 for communications with any type of external device, carrier, network, provider, or alike. At least one type of viewing area 806 can be incorporated into the viewable screen device 801. At least one type of scrolling capability 805 can also be incorporated into the design of the viewable screen device 801. At least one type of removable media 811, headphone jack 812, and/or wired data and communications plug in 813 capabilities can be incorporated into the design. At least one type of port 814 capabilities can be incorporated into the design. A right side view 810 and left side view 809 of at least one type of viewable screen device 801 is provided in this illustration.

Figure 16 is a front side view of another modified, configured, and designed viewable screen device 901 for the express purpose of providing additional sample variations that can be constructed in accordance with the invention. At least one type of viewable screen device 901 and/or any type of physical device can be designed with the following capabilities and features. This particular viewable screen device 901 can be designed with the capability to interact and/or be connected to at least one type of physical navigation button apparatus 902 that connects from the bottom, rather than the prior side portion and/or back of the viewable screen device 901 in prior Figure 8, 9, 10, 11, 12, and 13, which illustrates flexibility in design, and configuration.

At least one user is then able to utilize multiple types, forms, styles, functions, capabilities of button apparatus 902 devices for achieving the same, or different objectives and purposes. Since button apparatus 902 devices can be designed, configured, and made with all the necessary CPU, processor, chip or chip set, memory, hard drive
5 and/or data storage capabilities, software, graphic utility interface, middleware, OS, and even network accessibility, a user can utilize different types of button apparatus 902 devices to perform a specific and/or unique set of functions, or a single button apparatus 902 device to perform any and all user required functions.

Viewable screen device 903 shows what it could look like when one
10 particular design of viewable screen device 901 and button apparatus 902 are connected together.

Figure 16 is a front side, and back side view of another modified, configured, and designed viewable screen device 1006 for the express purpose of providing additional sample variations that can be constructed in accordance with the invention. At
15 least one type of viewable screen device 1006 and/or any type of physical device can be designed with the following capabilities and features. This particular viewable screen device 1006 can be designed with the capability to provide to the user at least one type of gel pad 1001, 1002, 1003, and 1004. At least one type of gel pad can be designed, configure, and applied at the manufacturing level, wholesale, distributor, dealer, user or
20 other as part of the primary viewable screen device 1006 and/or in addition to, as an accessory. A least one type of Gel pad can be applied to the back 1001, front 1003, side 1004, or middle 1001, 1002 of/to any type of device. At least one type of gel pad can include at least one type of logo, marking, icon, name, illustration, or facsimile thereof
25 1002, whether the logo or alike is gel pad based or not. At least one type or speaker/microphone 1005 can be incorporated into the design of a device.

At least one purpose for the gel pad is to provide a means for any type of hardware device not slipping around or slippery in a person's hand, on a counter, or all other forms. The gel pad provides a grip to any surface, object, or alike that is currently not available with any type of hardware device, whether it be a pager, mobile phone, cellular

mobile phone, PDA, CD player, MD player, DVD player, cassette player, camera, video player, data inputting device, portable terminal device, and all other types of devices and apparatuses. At least one other purpose for the gel pad is to provide shock protection or shock reduction in cases where a user were to drop any type of device. At least one other
5 purpose for the gel pad is to reduce the effects of heat from external and/or internal generated.

At least one other purpose for the gel pad is to make it easier for a user to hold onto any type of device. At least one other purpose for the gel pad is so that any type of device does not slide off of a surface that it has been set on; such as a counter top, table,
10 desk, or alike, which are traditionally slick and smooth surfaces.

A Gel pad can be made, comprised, configured, designed, and produced in/of at least one type and/or combination of color, size, shape, substance, material, in any form or format, procedure, technique, methodology, made to last a specified timeframe, smell, be modified from hard to soft, or soft to hard, or anything else.

15 Figure 17 is a front, left side, right side, and back side of another modified, configured, and designed viewable screen device 1101 for the express purpose of providing additional sample variations that can be constructed in accordance with the invention. At least one type of viewable screen device 1101 and/or any type of physical device can be designed with the following capabilities and features.

20 The purpose of Figure 17 is to illustrate and show at least one way of producing a viewable screen device 1101 that does not have any physical buttons at all. The viewable screen device when turned OFF can possibly look like 1101(a), illustrating that there is no external way for at least one user to utilize the viewable screen device without permission. The viewable screen device when turned ON can possibly look like 1101(b),
25 illustrating that only upon at least one user is able to turn ON the device by non-physical means are they able to gain access to navigation buttons 1104, main category 1107 information, date and time 1108 information, scrolling 1105 capabilities, and at least one type of content 1106 area. The left side 1102 and right side 1103 provides at least one possible way of designing, designing such a device.

The above function can be designed, incorporated, configured, made, and/or provided as all other forms of devices, including but not limited to - a camera, video, wireless phone, cellular mobile phone, text messaging device, a pager, walki-talkie, trunk radio, PDA, music player, a reader device, scanner device, cassette player, CD player, DVD
5 player, desktop computer, laptop computer, notepad device, computing device, data inputting device, communications device, data storage device, as well as a host of other types of hardware devices.

Figure 18 are front side views of other modified, configured, and designed viewable screen device 1201 and/or finger held hardware device 1201 for the express
10 purpose of providing additional sample variations that can be constructed in accordance with the invention. At least one type of viewable screen device 1201, finger held hardware device 1201 and/or any type of physical device can be designed with the following capabilities and features. The purpose of Figure 18 is to illustrate and show at some ways, variations, and methods for producing a viewable screen device 1201, finger held hardware
15 device 1201 and/or any type of physical device that does not have any physical buttons at all, but at least one user is able to utilize at least one method to gaining access, whether stated hereto or not.

The first example is by utilizing any type of key 1202 to gain access to any type of device. At least one type of key design or configuration can provide at least one
20 variable to access any type of device.

Another possible method may be utilizing at least one type of fob 1203 as a means to gain access to any type of device. At least one type of fob design or configuration can provide at least one variable, code, authorization technique, data and/or information, protocol, platform, or alike for access any type of device.

25 Another possible method may be utilizing at least one type of CPU (RAM, ROM, EEPROM) 1204, RFID, IRID, or ID as a means to gain access to any type of device. At least one type of CPU or ID design or configuration can provide at least one type of variable, code, authorization technique, unique code or sequence of codes, data and/or information, protocol, platform, or alike for access any type of device.

Another possible method may be utilizing at least one type of cryptic / algorithm 1207 as a means to gain access to any type of device. At least one type of cryptic / algorithm, user name, password, design or configuration can provide at least one variable, code, authorization technique, data and/or information, protocol, platform, or alike for access any type of device.

Another possible method may be utilizing at least one type of voice recognition and/or biometric 1206 as a means to gain access to any type of device. At least one type of voice recognition and/or biometric design or configuration can provide at least one variable, code, authorization technique, data and/or information, protocol, platform, or alike for access any type of device.

The purpose of 1205 in Figure 18 is to illustrate at least one way in which any of the above methods could look like in physical form, if a technique were to require physical interact to authorize, authenticate turning ON the device, and/or maintaining the device in ON mode, or a means of utilizing at least one type of non-physical authorization and/or authentication means near and/or close in proximity to at least one type of device, and/or accessory, or send by local and/or remote network, carrier, and/or provider means.

Any and all types and techniques, whether stated hereto in illustration form or not, can utilize physical, and non-physical means for achieving one in the same effect, whether in whole, and/or part, and/or in combination with at least one other step, procedure, method, configuration, procedure, protocol, algorithm, biometric sensing, scanning, reading, or other technique. At least one of the stated capabilities can be designed, incorporated, configured, made, or provided in all other forms of devices to at least one type of user, including but not limited to - a digital camera, video camera, wireless phone, cellular phone, text messaging device, a pager, walki-talkie, trunk radio, PDA, music player, a reader device, scanner device, cassette player, CD player, DVD player, desktop computer, laptop computer, notepad device, computing device, data inputting device, communications device, data storage device, as well as a host of other types of hardware device capabilities.

Figure 19 is a front, side, and back view of another modified, configured, and designed viewable screen device 1301 for the express purpose of providing additional sample variations that can be constructed in accordance with the invention. At least one type of viewable screen device 1301, and/or any type of physical device can be designed with the following capabilities and features. The purpose of Figure 19 is to illustrate and show some ways, variations, and methods for at least one user to gain access to at least one type of device, and design that does not have any external physical buttons.

The first example is by utilizing any type of RFID techniques to non-physically confirm, authenticate, authorize, and approve at least one user to gain access to any type of device, and turn ON the device. At least one type of key design or configuration can provide at least one variable to access any type of device. For example purposes, the illustration in Figure 19 shows an RFID tag incorporated into say a bracelet or band design 1302, although any type of configurable means is possible that achieves on in the same, and the spirit of the stated invention. The RFID tag can be of any passive, active, or other variation, can include at least one type of antenna or not, at least one type of power source or not, at least one type of cryptic / algorithm, user name, password, design or configuration can provide at least one variable, code, authorization technique, data and/or information, protocol, platform, at least one type of other material, substance, or alike to adhere to, attach to, affix to, or alike.

Inversely, the design can incorporate at least one type of barcode, any other technology, or technique for achieving one in the same objective, and more.

Another possible method could include an apparatus that is comprised of the primary wireless communications protocol, and requirements that are built into a ring device 1303, or even a key chain 1304 device, or any other type of object.

A second possible method for turning ON and/or OFF any type of device, can be based on any type of remote signal on any wireless communications frequency spectrums, protocols, architecture, algorithms, configurations, carrier, provider, and/or platform, where at least one carrier, provider, or user can facilitate, engage, enact, request,

perform, or alike transmit, send, receive any type of signal that would turn ON any type of device.

A third possible method could be provided by at least one user placing a call, keying in any type of numbers, letters, and/or code combinations from any type of wired and/or wireless telephone, mobile cellular phone through any type of carrier and/or provider network, whereby sending a signal, algorithm, cryptic/non-cryptic to turn ON any type of device.

A fourth possible method could be provided by at least one user sending, transmitting, remitting, signaling from any type of pager device, and/or text messaging device, through any type of carrier and/or provider network, whereby sending a signal, algorithm, cryptic/non-cryptic to turn ON any type of device. Any other type of hardware device can be utilized in whole and/or in part, as a single unit, and/or along with any type of networking accessory device, any wired network, and/or wireless network for achieving one in the same result.

At least one type of technique or method can utilize any type of wireless platform, protocol, architecture, configuration, or alike. Any and all types and techniques, whether stated hereto in illustration form or not, and/or in addition hereto, can utilize physical, and non-physical means for achieving one in the same effect, whether in whole, and/or part, and/or in combination with at least one other step, procedure, method, configuration, procedure, protocol, algorithm, biometric sensing, scanning, reading, or other technique.

At least one of the stated capabilities can be designed, incorporated, configured, made, or provided in all other forms of devices to at least one type of user, including but not limited to - a digital camera, video camera, wireless phone, cellular mobile phone, text messaging device, a pager, walki-talkie, trunk radio, PDA, music player, a reader device, a scanner device, cassette player, CD player, DVD player, desktop computer, laptop computer, notepad device, computing device, data inputting device, communications device, data storage device, as well as a host of other types of hardware device capabilities.

Figure 20 is a front side view of another modified, configured, and designed finger held hardware device(s) 1402 and its possible interaction with at least one type of stand device 1401 to provide additional examples of variations that can be constructed in accordance with the invention. At least one type of stand device 1401 can be utilized and incorporated along with, and/or in addition to at least one type of finger held hardware device(s) 1402, or any other type of hardware device, or accessory device of any kind that will allow and/or provide by/thru/to/from a multitude of functions, services, and features to at least one user, carrier, and/or network provider. At least one type of viewable area, keyboard, stylus, touch or voice recognition capabilities, hard drive, memory, or other data storage capabilities can be added to any type of stand device 1401.

In the first aspect, at least one type of stand device 1401 can provide and/or allow at least one user to conveniently place / rest any type of finger held hardware device(s) 1402, a viewable screen portion 1403 of any type of device, a physical button portion 1404, or other button based design 1405 and/or any type of device, or any other configuration, design, style, or design, including network device 1407, remote control type of device 1408, or removable media 1406 capabilities.

Other advantages can include, but are not limited to, providing power resources, data storage or hard drive capabilities, wired and/or wireless data and communications, uploading, downloading, inputting and outputting of all types of data and information, printing capabilities, and any other capabilities that can be found, offered, provided made possible, including but not limited to, by any type of desktop computer device, laptop, notepad, digital camera, video camera, wireless phone, cellular mobile phone, text messaging device, a pager, walki-talkie, trunk radio, PDA, music player, a reader device, a scanner device, cassette player, CD player, DVD player, stereo system, computing device, data inputting/outputting device, communications device, data storage device, as well as a host of other types of hardware device capabilities, including internal, and/or external data storage, and/or removable media means of any type.

Figure 21 is a front side view of another modified, configured, and designed stand device 1501 and its possible interaction with other types of devices, networks,

carriers, providers, and users to provide additional examples of variations that can be constructed in accordance with the invention.

At least one type of stand device 1501 can be designed, configured, assembled, and incorporated and designed with at least one type internal, external, and/or
5 removable type of primary and/or secondary board, IC design, processor, sound and/or graphics capabilities, chip or chip sets, CPU, memory, data storage or hard drive capabilities, power resources, OS, software, middleware, any type of ports, ability to provide any type of viewable screen area, any type of keyboard, stylus, or other forms of data input capabilities, microphone, speakers, as well as any and all other components that
10 would allow the stand device 1501 to provide any and all of the functions as any type of computing device, player device, including but not limited to a desktop computer, laptop, notepad, PDA, cellular phone, scanning device, reading device, telephone, pager, music player, camera, video device, data storage device, and all other types of devices can provide to at least one type of user, as well as any of these types of devices having the ability to
15 utilize at least one type of stand device 1501 design.

At least one type of stand device 1501 can be designed, configured, assembled, and incorporated to at least one type of viewable screen based device 1502. The Stand device 1503 shows a top view of at least one possible design, configuration, or layout, and shows at least one possible apparatus location 1504 that could be designed into
20 any such type of stand device 1501 that would allow direct physical contact to facilitate a multitude of functions for at least one user.

At least one type of stand device 1501 can be designed, configured, assembled, and incorporated to at least one type of antenna 1505, 1512 to assist in any and all types of communication with at least one other type of device, carrier, network, and/or
25 provider.

At least one type of stand device 1501 can be designed, configured, assembled, and incorporated to at least one type of adjustable coverage settings 1506 that can be adjusted, tuned, and modified by physical and/or non-physical means based on the installation location requirements, as well as adjusting for humidity, power resources, and

other external factors that can effect the performance to assist in any and all types of communication with at least one other type of device, carrier, network, and/or provider. At least one type of stand device 1501 may have at least one type of adjustable coverage settings 1506 to control the angel of dispersion, angle scattering, and/or cone shaped dispersion for the signal transmission of a content delivery device(s). At least one type of stand device 1501 may have at least one type of internal external, and/or removable power resources 1507. At least one type of stand device 1501 can perform its communication 1508 functions based on a wired, wireless, and/or combination thereof.

At least one type of stand device 1501 can run on, in, out, thru, by, between, from, to any type of or combination of [wired or wireless] platforms, or networks. At least one type of path, bandwidth allocation, protocol format, and/or other transmission means, such as wired transmission, (such as over a phone line, cable line, laser, photonic, copper or fiber means, power lines, local or remote network server, computer system, telephone, digital or analog wired network, local area network, optical fiber interface or network, cable network(s), or bi-directionally amplified coaxial cable interface digital subscriber lines (DSL), D1 or T1 line copper or all other types of line network or alike), and/or wireless transmission (such as over a cellular mobile phone, paging, trunk radio, laser, (RBS) radio base station network(s), satellite uplink, and/or downlink, digital or analog wireless network, WLAN, wireless cellular, paging, trunk analog or digital platforms or RF signal transmitter, satellite), whether it be analog or digital, whether it be cryptic, non-cryptic, whether it be spread spectrum, split spectrum or duel or multiple spectrums, whether it be in RF, IR, UWB, lightwave, Meghertz, Gigahertz, or any other type of frequency or spectrum utilized in providing and/or retrieving any type of data and/or information.

At least one type of stand device 1509, 1511 can be designed, configured, assembled, and incorporated to have at least one type of hardware device 1510 of any shape, design, function, purpose, and alike that can be attached and/or removed from any type of stand device 1501, 1509, 1511 or any other type of hardware device, such as a camera, video camera, wireless phone, cellular phone, text messaging, a pager, walkie-

talkie, trunk radio, PDA, music player, CD player, DVD player, desktop computer, laptop computer, notepad device, as well as a host of other types of hardware device capabilities.

At least one type of stand device 1501 can be designed, configured, assembled, and incorporated to allow remote control units, network cards, removable
5 media, camera, music player and other types of accessory item slots as part of at least one type of stand device 1501 design as well.

At least one type of stand device 1501 can be designed, configured, assembled, and incorporated and designed with at least one type of wired, wireless, and/or combination thereof capabilities from/by/to/between at least one type of carrier, network
10 provider, service provider, or alike on any type of environment.

This means that at least one type of stand device 1501 has the capability to allow at least one type of user to interface and interact by sending, receiving, inputting, outputting, recalling, storing, filing, arranging, and alike any type of data and information from at least one type of local and/or remote network, provider, and/or user hardware
15 device.

At least one advantage to such a structure will allow at least one user to preview a certain type of data and information and have it sent directly to its stand device 1501 so that the user does not have to carry around such data files and information with them. At least one user can at any point in time by wired and/or wireless means interface
20 and interact with the stand device 1501 to view, recall, download, arrange, move around, modify, or interact with any such data and information.

At least one other advantage to such a structure will allow at least one user to utilize a stand device 1501 as its primary, and/or secondary data storage or hard drive location, where from time to time, at least one user can add directly or indirectly any type
25 of data and information, as well as retrieve any type of data and information.

At least one type of hardware device, whether it fixed or mobile by design, are able to communicate and interact with all types of data and information that is on at least one type of stand device 1501, including but not limited to any type of computing device, player device, desktop computer, laptop, notepad, PDA, cellular mobile phone,

scanning device, reading device, telephone, pager, music player, camera, video device, data storage device, and all other types of devices and apparatuses.

Currently, there are many different types of cradle or stand devices on the market that allow and/or enable at least one type of cellular mobile phone, pager, Personal
5 Digital Assistant, scanning device, reading device, camera device, music player device, video device, and other types of gadgets by they only provide the capability to (1) recharge power resources, or (2) transfer data and information capabilities primarily by wired means, but in some cases by wireless means from/thru/by/between - to another hardware device such as a desktop computer device, laptop device, or alike. But these capabilities stop here.

10 With the above stated invention, a user is now able to utilize any type of cradle or stand device to provide more functions, features, and services to at least one user than just power or data transfer capabilities.

Now a user can utilize a cradle or stand device as a primary hard drive or data storage device. A user then does NOT require any type of computer device (such as a
15 desktop computing device, laptop, pad device or alike) to interact, interface, store, arrange, file, recall, modify, delete, or alike. A user can send any type of data and information to the cradle or stand device by wired and/or wireless means at any time, and from anywhere. A user does not have to acquire and save such data and information to say a mobile device, removable media device, or alike, then carry it with them back to physically input the data
20 and information into the cradle or stand device to store and data.

An example of this is related to Cellular Mobile Phones, PDA's, or Pager devices. Say the user is running around a city area. They find some kind or type of data and information that they like, but it takes to long to download the data and information onto their hardware device, or removable media device, or the device does not have any or very
25 little data hard drive capabilities inside of it, or it will use up to much of the persons hardware devices power resources to facilitate such a request. Now the user can simply have it sent to their cradle or stand device and keep going through life. The user can access this information at a later point in time by wired means, when they have time to do so,

when they have access to another device that is wired to plentiful power resources, or a larger size hardware device such as a desktop, laptop, pad device, or other.

Figure 22 the purpose is to show an alternative preferred embodiment of the present invention employed utilizing a modified version of finger held hardware device that employs modified versions of a viewable screen apparatus enabling the a viewable screen apparatus to be moved around horizontally by the user, and configured at various locations, angles, degrees, and alike constructed in accordance with the invention. At least one type of finger held hardware device could be designed that would allow a user to move, adjust, modify, arrange, change, or alike to various positions, angles, degrees, and alike from the far left of the finger held hardware device 1603, to the far right of the finger held hardware device 1604, or in the middle portion of the finger held hardware device 1602.

Flexibility in design, and configuration of at least one type of finger held hardware device will allow and enable the device to be more personalized by its user.

At least one type of physical button apparatus 1601 of at least one type of finger held hardware device design can also be flexible in design to allow the user of the device to move, replace, twist, turn, rotate, spin, push, pull, arrange, modify, change, the location of each physical button, or by changing and establishing a new set of command sets applied to each physical button when the user touches each button. This can come on the form of physical adjustments, by replacement of the entire physical button apparatus, by software applications that are available on the finger held hardware device, the screen portion, or on the replaced button apparatus, from a local and/or remote network, carrier, or provider, by removable media, by wired or wireless communications or connections, or other means.

Figure 23 the purpose is to show an alternative preferred embodiment of the present invention employed utilizing a modified version of finger held hardware device that employs modified versions of a viewable screen apparatus enabling the a viewable screen apparatus to be moved around vertically by the user, and configured at various locations, angles, degrees, and alike constructed in accordance with the invention. At least one type of finger held hardware device could be designed that would allow a user to move, adjust,

modify, arrange, change, or alike to various positions, angles, degrees, and alike vertically up and down from the left side of the finger held hardware device 1701, or vertically up and down from the right side of the finger held hardware device 1702, or there locations, and configurations.

5 Flexibility in design, and configuration of at least one type of finger held hardware device will allow and enable the device to be more personalized by its user.

Figure 24 the purpose is to show a general block diagram to the preferred embodiment of the present invention employed utilizing a cellular phone based finger held hardware device employing one particular design that enables any type of finger held
10 device, with a fixed and/or removable display screen device and physical button device that can provide cellular phone, (PDA) personal digital assistant, paging, text messaging, camera, music player, game player, internet access, and other capabilities as part of or in addition to of the preferred embodiment of the present invention and alike constructed in accordance with the invention..

15 At least one type of cellular phone based finger held hardware device can utilize at least one type of display screen 1801 apparatus, or physical button 1802 apparatus, as part of a single unit design, or as part of a multiple, comprising of more than one, removable and interchangeable configuration. At least one type of single unit design, or multiple component or sectional unit can utilize any type of flexible design 1811 that
20 would allow a user to move, adjust, rotate, twist, slide, modify, arrange, or alike to various positions, angles, degrees, or other configurations to the display, buttons, and other portions, or functions of any particular display, buttons, or other portions of the device.

At least one type of cellular phone based finger held hardware device could utilize at least one type of navigation or scrolling button 1803 configuration, at least one
25 type of menu 1804 selection configuration, at least one type of physical cellular phone button 1805 configuration, at least one type of music player capabilities with menu 1804 selection, rewind 1806, fast forward 1810, play/pause/stop 1809, at least one type of microphone 1808, speaker 1812, power connector 1813, head phone plug in 1814, at least one type of On/Off, main and sub-category 1807 to day timers, calendar, things to do list,

addresses, internet access, paging, text messaging, and other configurations to name a few, at least one type of connection point for a cradle or stand 1816, and at least one type of flexible or adjustable strap 1817, or material configuration enabling user to hold onto the device with at least one finger, or thumb.

5 Figure 25 the purpose is to show an alternative preferred embodiment of the present invention employed utilizing a modified version of finger held hardware device that employs modified versions of a cellular phone based finger held hardware device employing one particular design that enables any type of finger held device, with a fixed and/or removable display screen device and physical button device that can provide cellular
10 phone, (PDA) personal digital assistant, paging, text messaging, camera, music player, game player, internet access, and other capabilities as part of or in addition to of the preferred embodiment of the present invention and alike constructed in accordance with the invention.

 At least one type of cellular phone based finger held hardware device can
15 utilize at least one type of display screen 1901 apparatus, or physical button 1902 apparatus, as part of a single unit design, or as part of a multiple, comprising of more than one, removable and interchangeable configuration. At least one type of single unit design, or multiple component or sectional unit can utilize any type of attachment in the design 1911 that would allow a user to attach the display screen portion to the physical button
20 portion and operate in accordance to the design.

 At least one type of cellular phone based finger held hardware device could utilize at least one type of navigation or scrolling button 1903 configuration, at least one type of microphone 1908 and speaker 1912, 9 at least one type of physical cellular phone
25 button 1904 configuration, at least one type of On/Off button 1906, at least one type of main and sub-category 1907 selections to day timers, calendar, things to do list, addresses, internet access, paging, text messaging, and other configurations, at least one type of microphone 1908, speaker 1909, power connector 1910, head phone plug in 1911, at least one type of network capabilities, removable media, and games capabilities 1912, ,at least

one type of connection point for a cradle or stand 1914, and at least one type of flexible or adjustable strap 1913, or material configuration enabling user to hold onto the device with at least one finger, or thumb.

At least one type of finger held hardware device, viewable screen area,
5 and/or physical button device can be utilized in providing, inputting, sending, receiving, interacting, storing all types of content, communications with any and all content, data, and information from internal means and methods, and/or from external means, and/or methods. At least one type of finger held hardware device can be utilized as a cellular
10 phone hardware device, a personal digital assistant device, pager, an electronic game, or game device, a music player or other player device, camera device, video device, radio device, tracking device, scanning device, reading device, remote control device, and interaction with home appliances, office equipment of all types and styles including desktop computers, laptops, printers, scanners, radio device, paging device, and all other forms, any types of combinations, types, styles, formats, and kinds of hardware devices. At
15 least one type of finger held hardware device can be utilized to communicate and interact with anyone, anywhere, at any time, on a single, dual, and/or multiple frequency, spectrum, and/or at least one network service provider, or multiple network service providers on any wired, wireless, and/or combination platforms thereof.

Any and all functions, and features in whole and/or in part can be
20 incorporated into any such designed finger held hardware device and/or any type of hardware device, portable terminal device, or computing device.

From the foregoing it will be appreciated by one skilled in the art that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope
25 of the invention. Accordingly, the invention is not limited except as by the appended claims.

CLAIMS

1. A personal handheld electronics device, comprising:
 - at least one control logic system, the control logic system comprising a processor and a system memory;
 - a display coupled with the control logic system; and
 - a keypad unit, the keypad unit being coupled with the control logic system and further comprising:
 - an array of function control keys coupled with the control logic system;
 - a finger held base, the finger held base resting against at least one finger of a user's hand and supporting the function control keys, the finger held base extending outside a perimeter of the display so that applying pressure to the function control keys causes pressure to be exerted against the at least one finger of the user's hand to facilitate a grip on the device; and
 - a finger attachment device coupled with the finger held base, the finger attachment device extending from the finger held base and wrapping around the at least one finger of the user's hand to support the grip on the device.

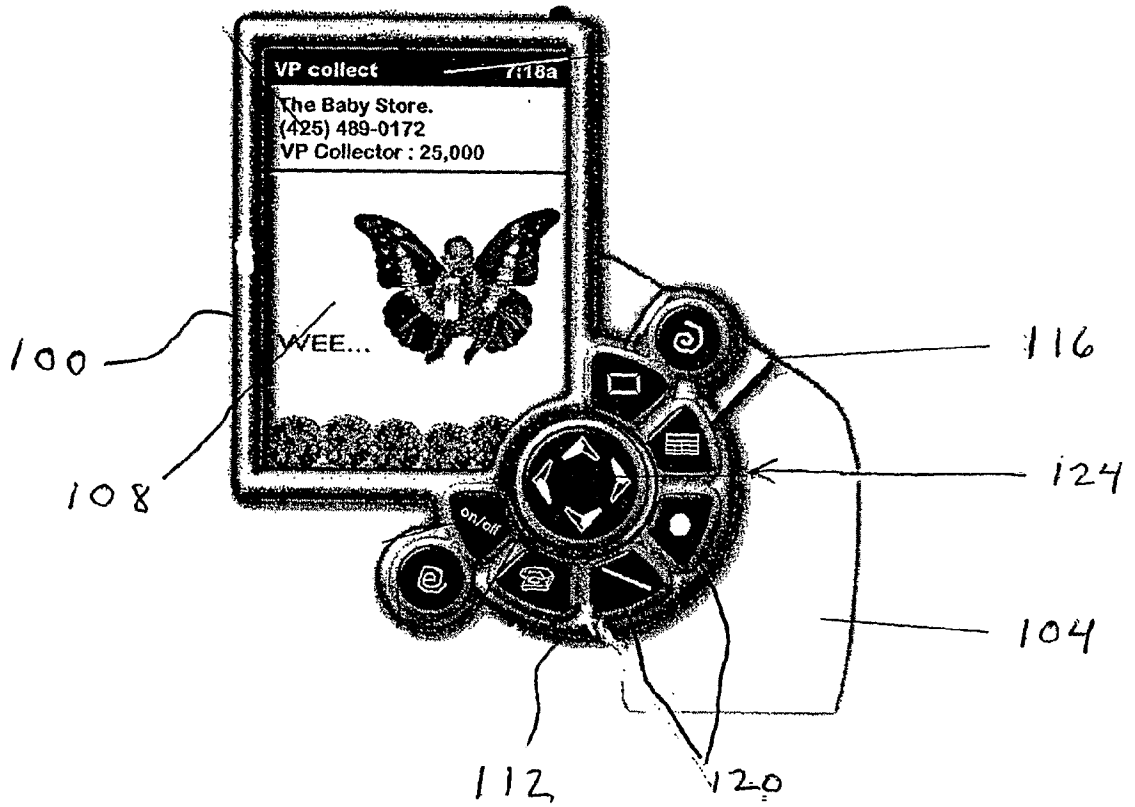


FIG. 1

FIG. 2A

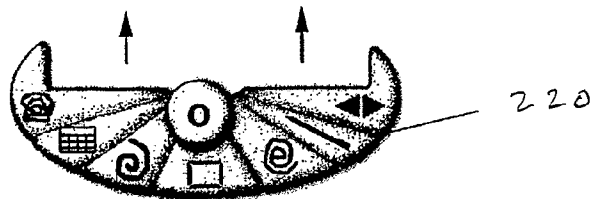
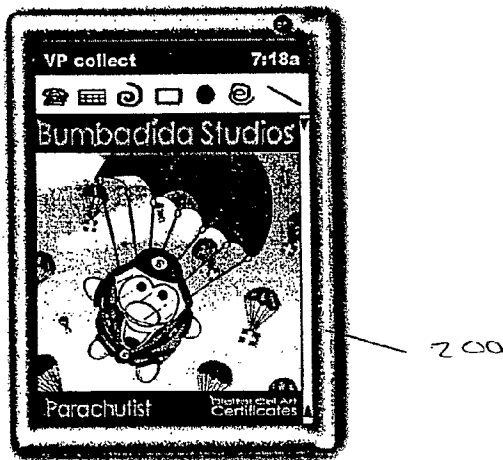
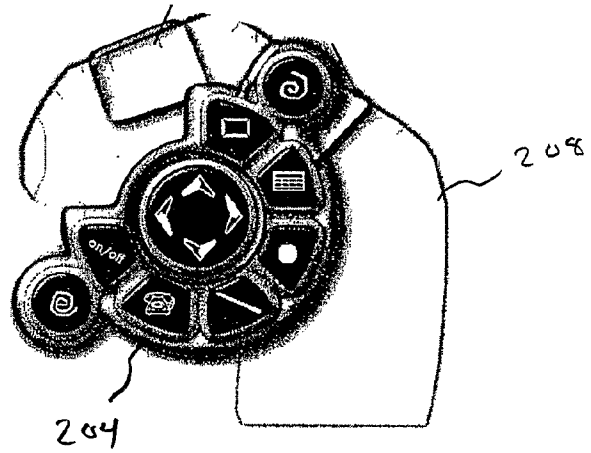
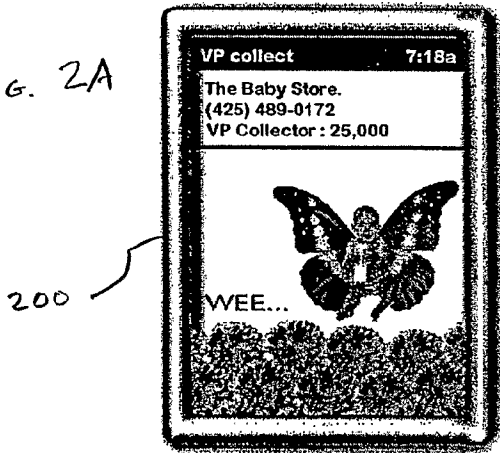


FIG. 2B

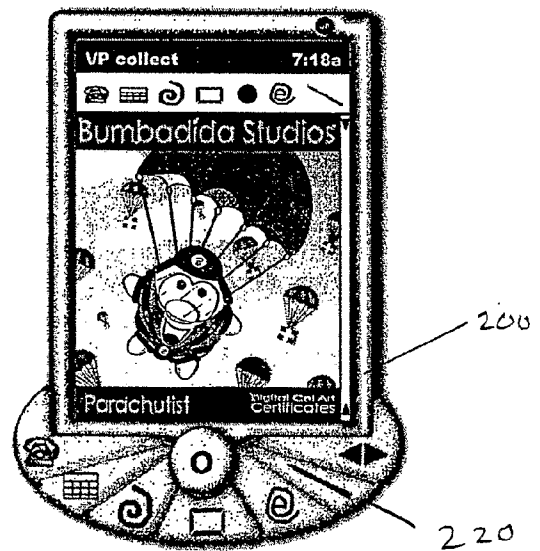


FIG. 2C

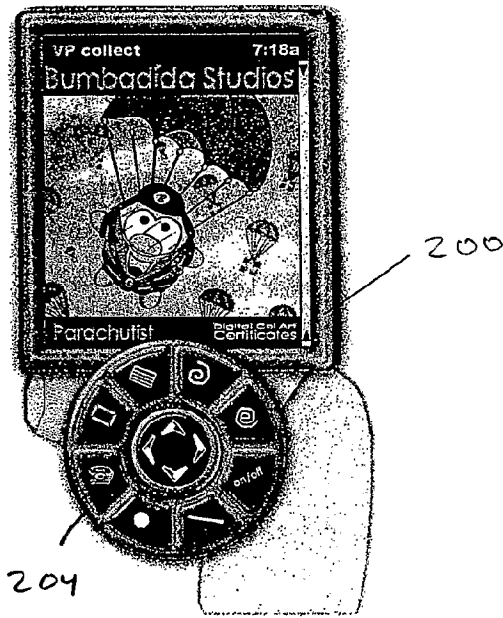


FIG. 2D

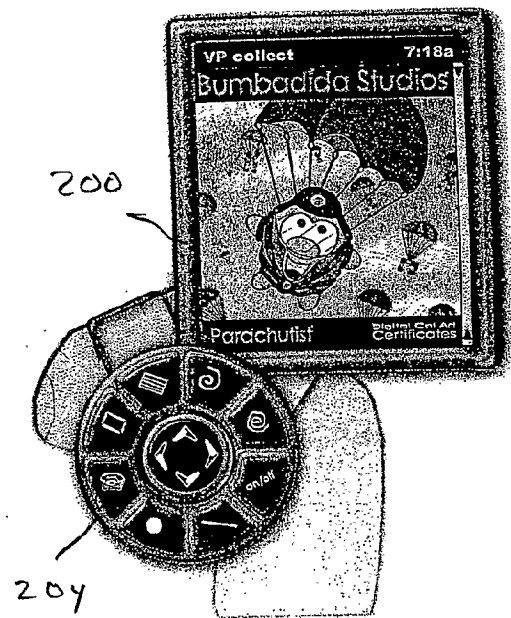


FIG. 2E



FIG. 2F

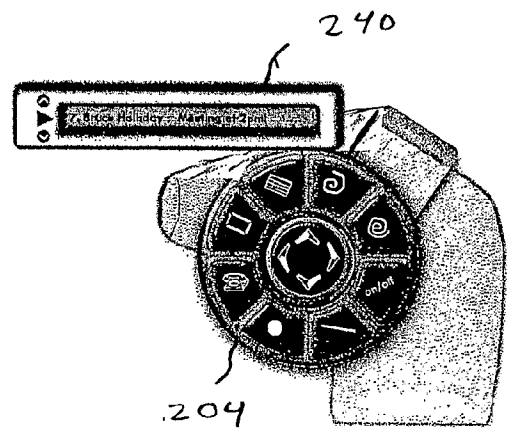


FIG. 2G

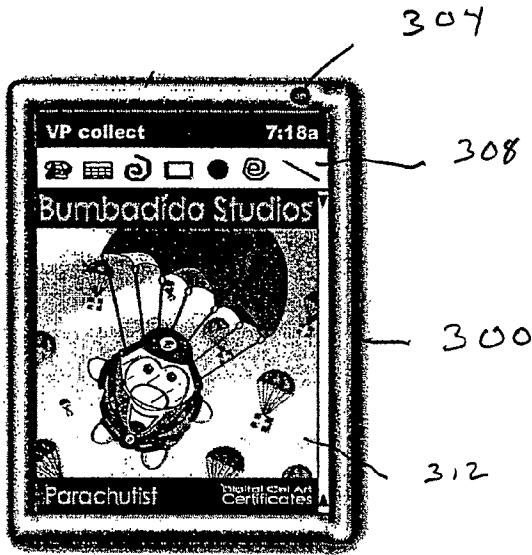


FIG. 3



FIG. 4A

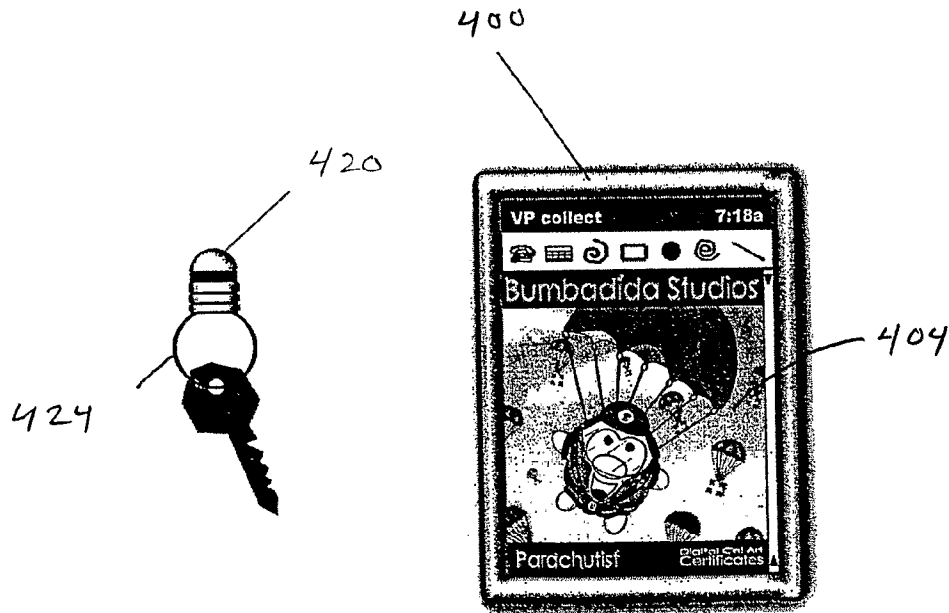


FIG. 4B

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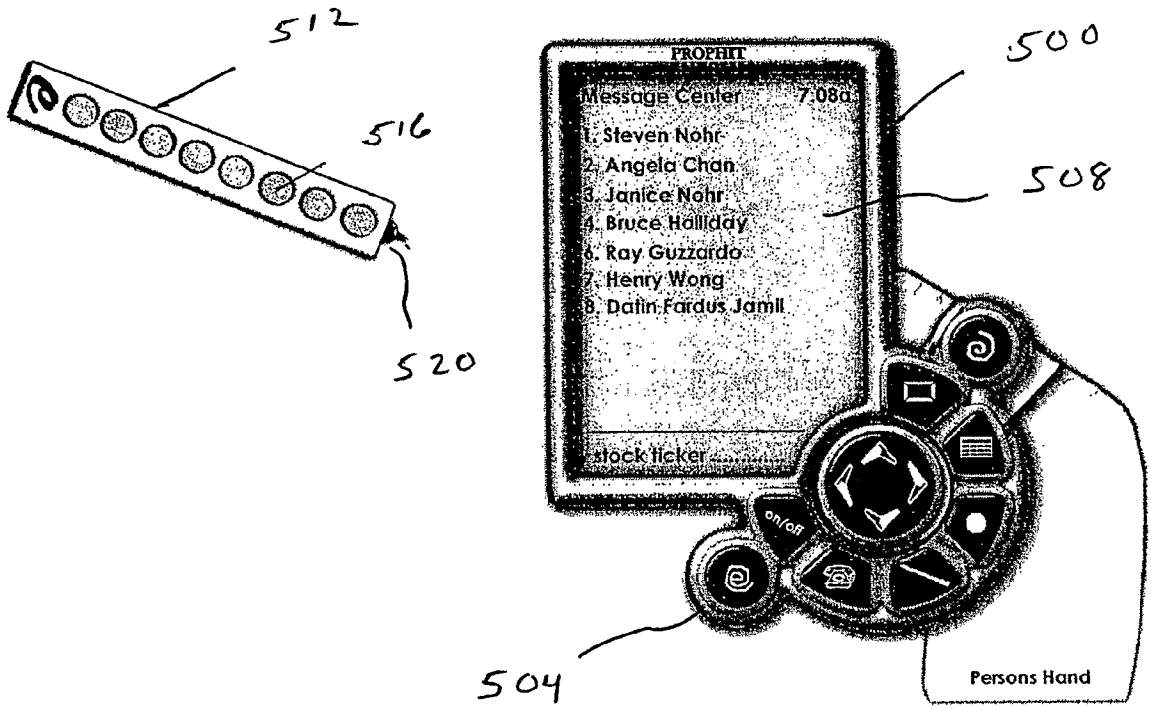


FIGURE 5A

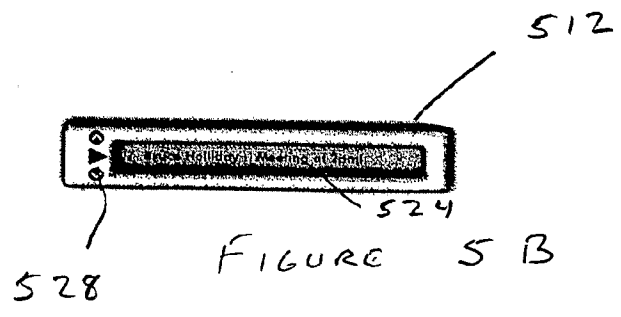


FIGURE 5B

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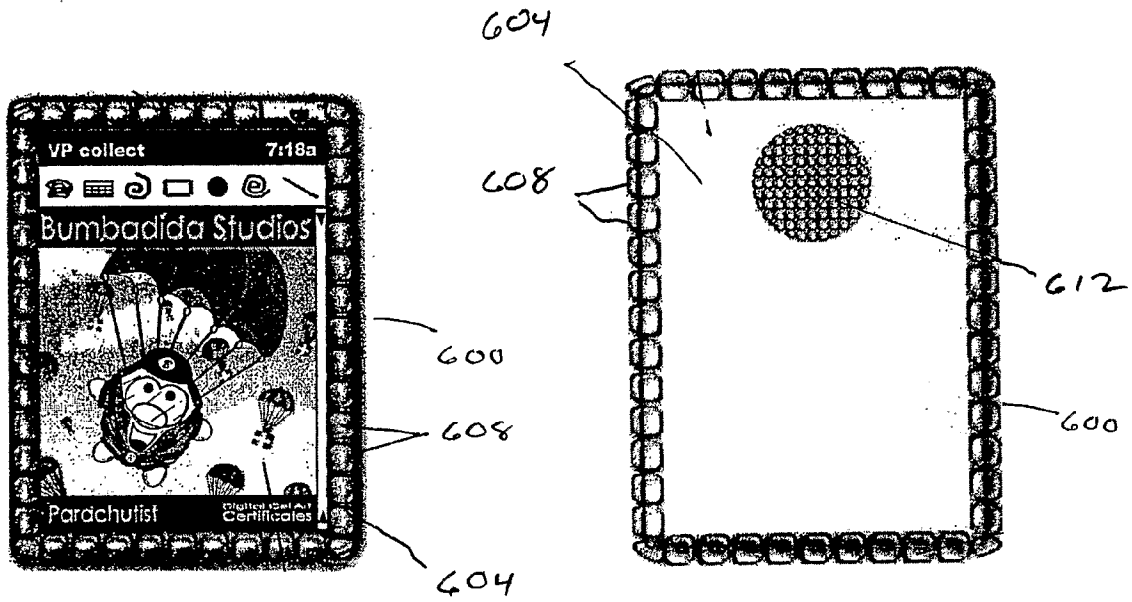


FIG. 6A

FIG. 6B

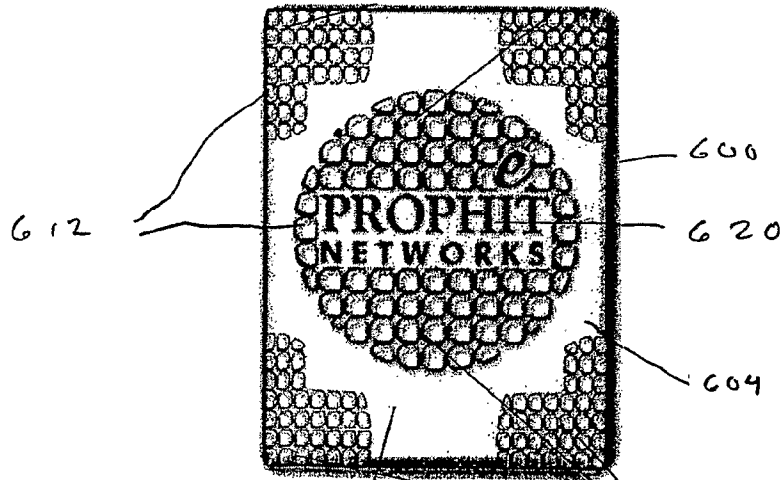


FIG. 6C

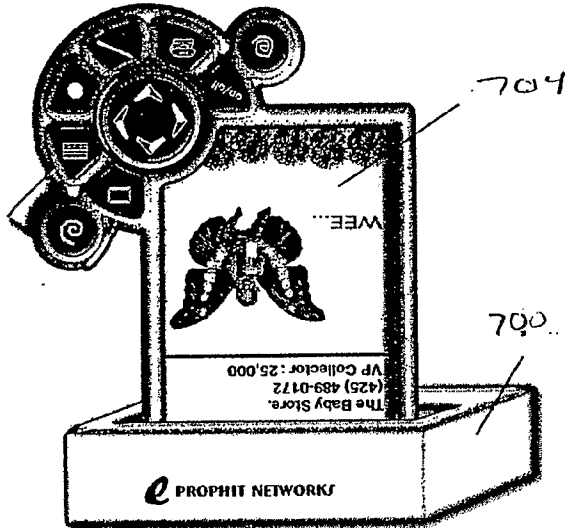


Fig. 7A

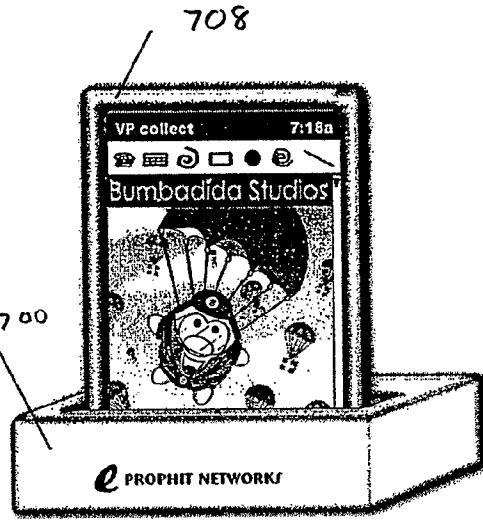


Fig. 7B

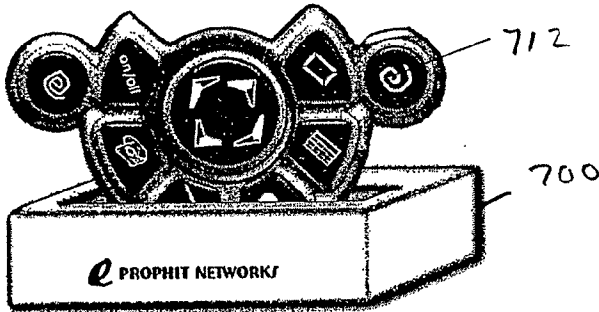


Fig. 7C

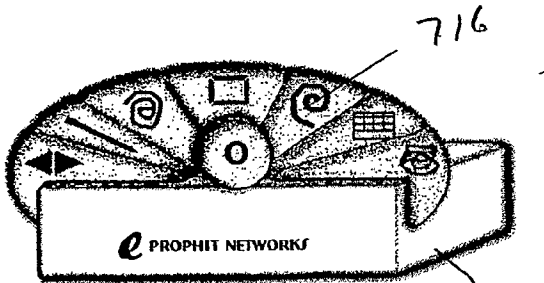


Fig. 7D

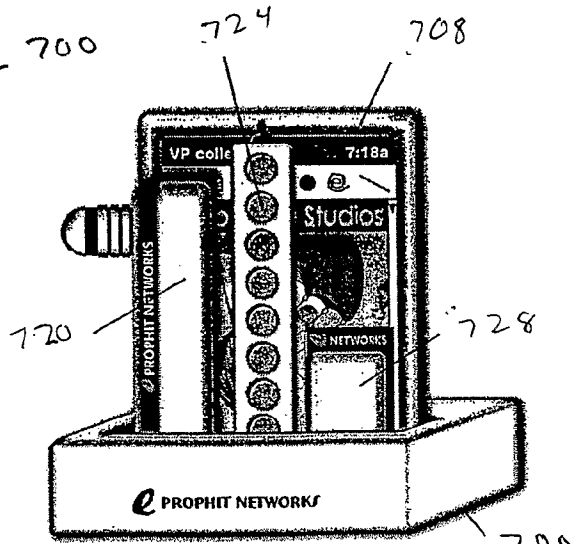
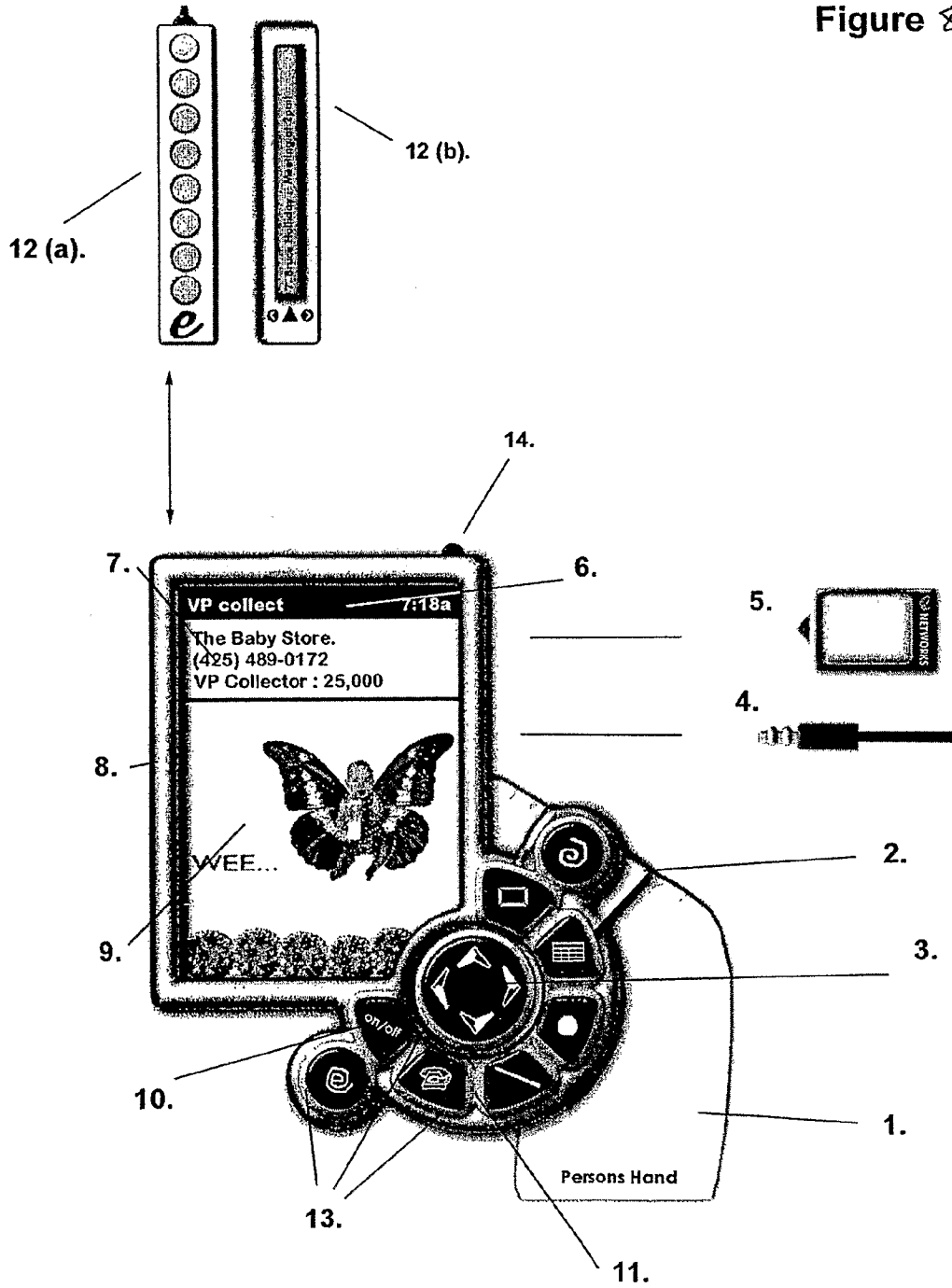


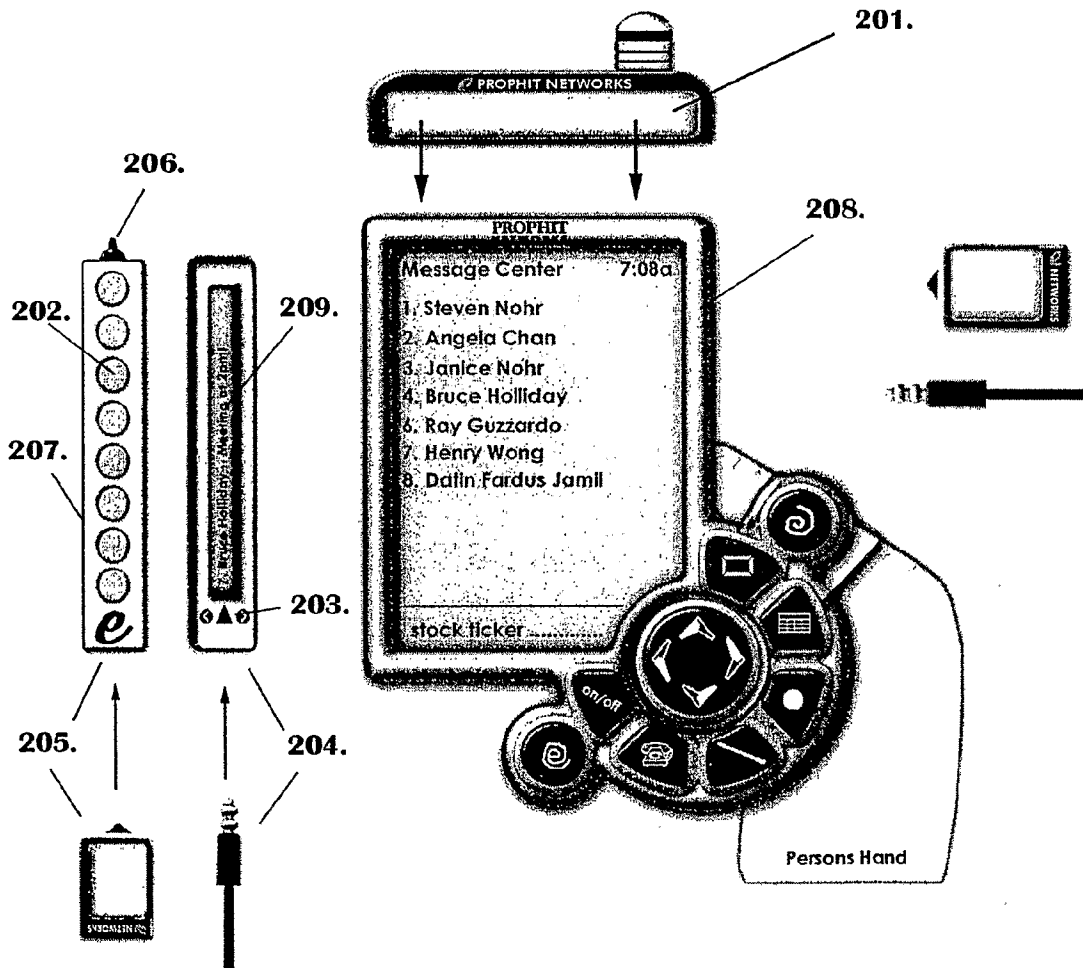
Fig. 7E

Figure 8



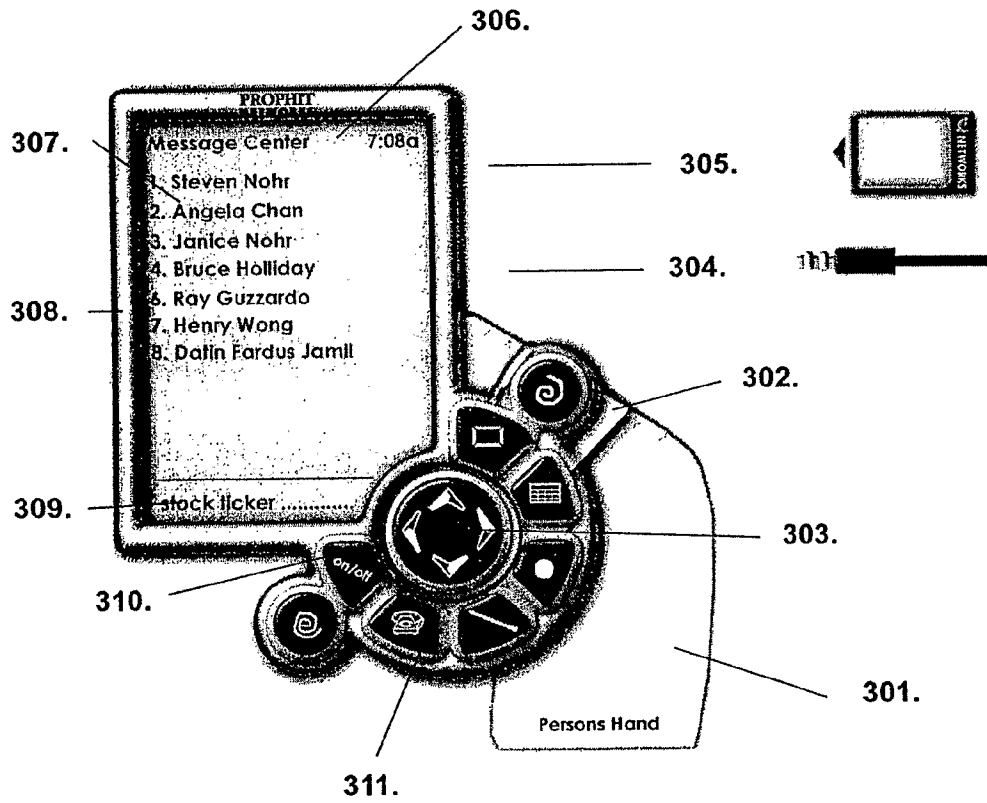
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Figure 9



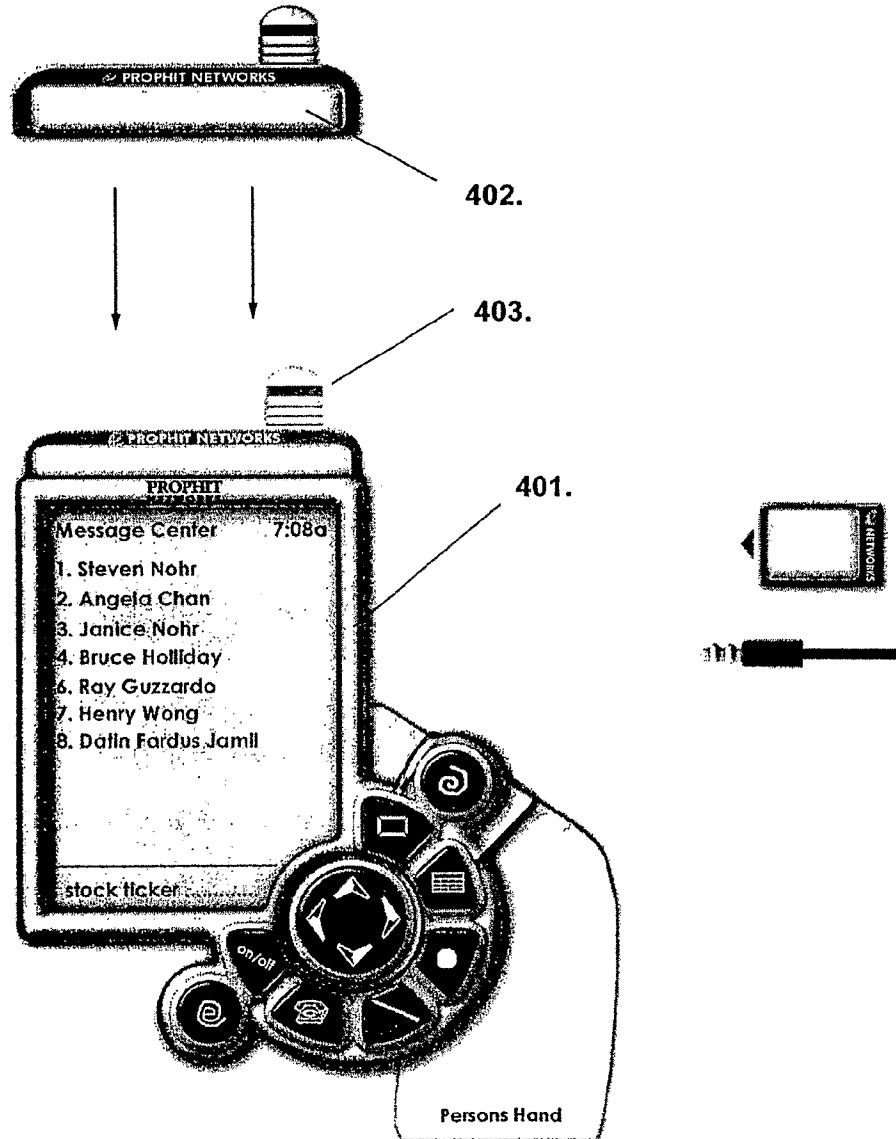
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Figure 10



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Figure 11



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Figure 12

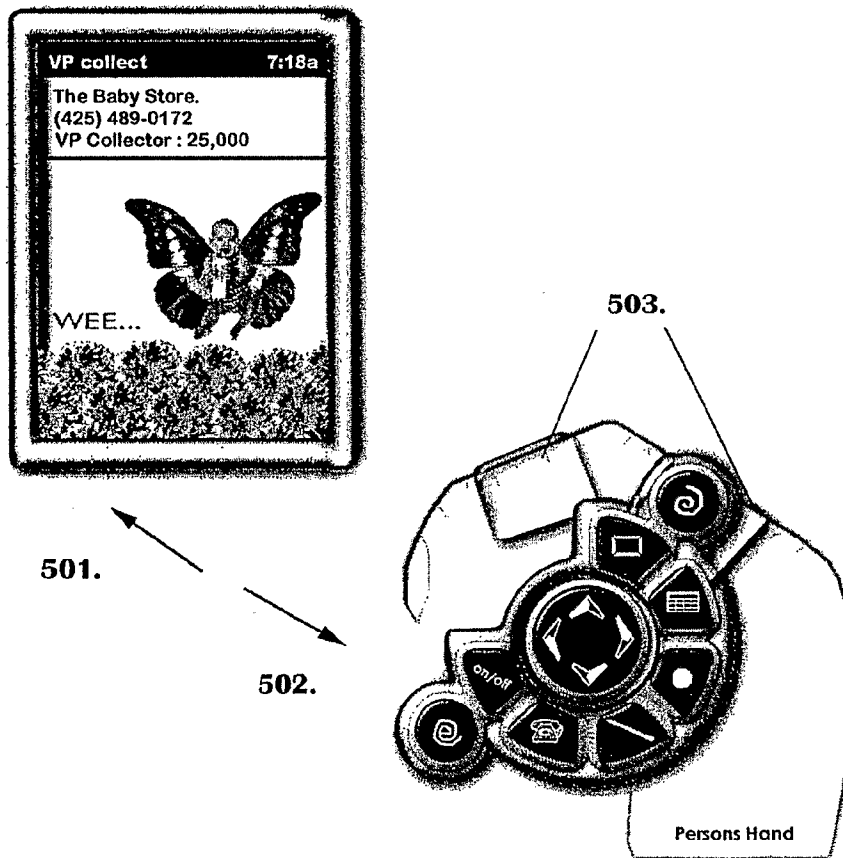


Figure 13

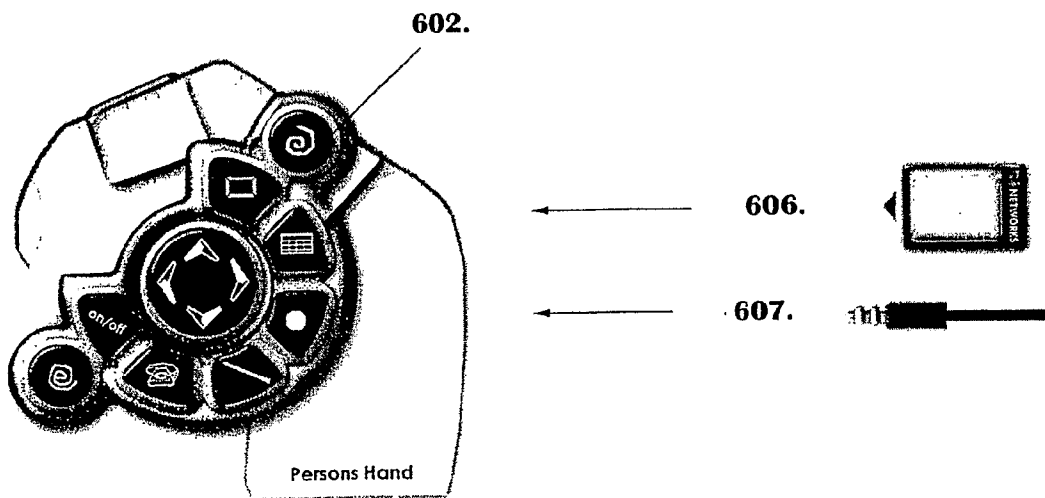
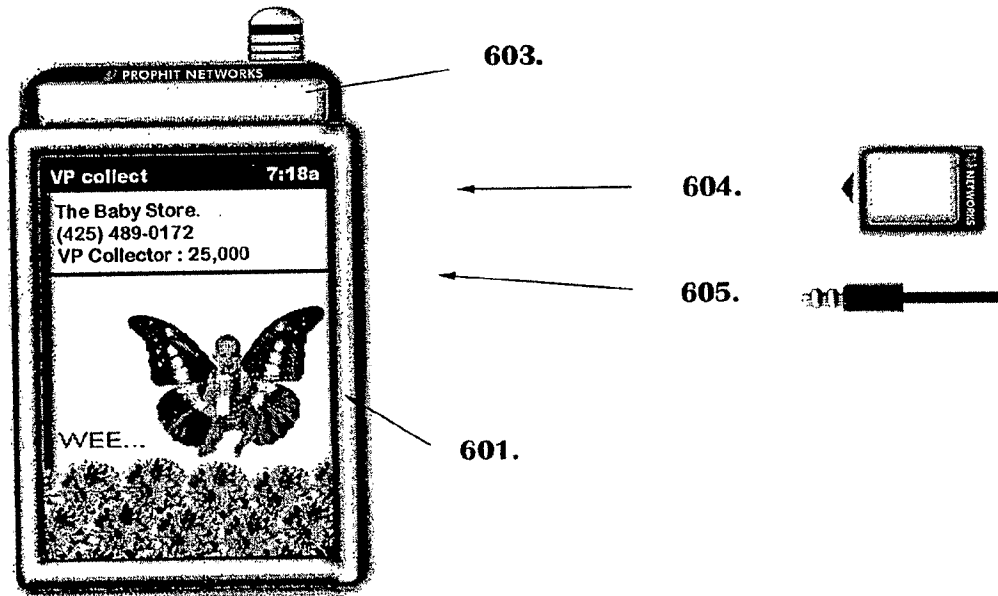
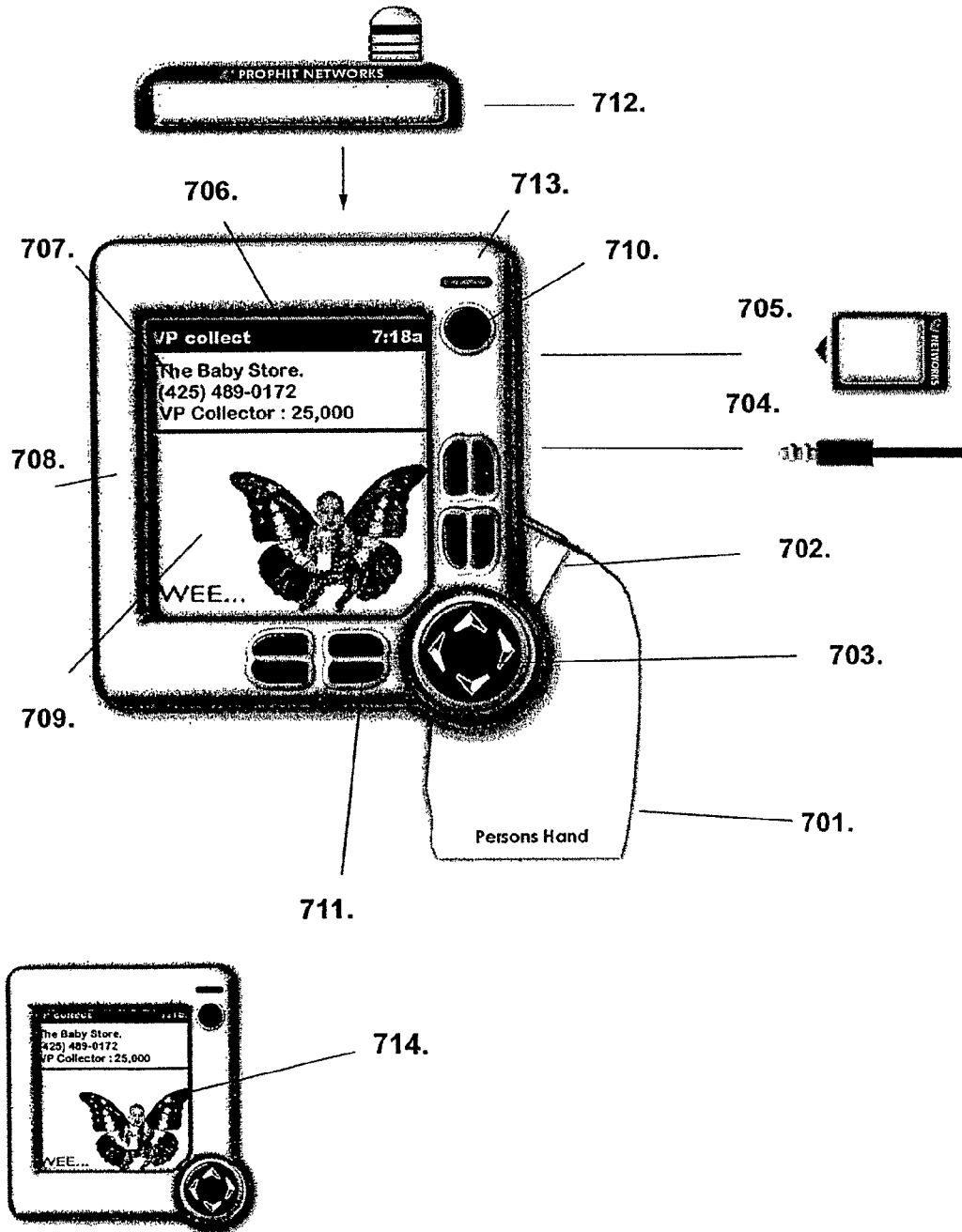


Figure 14



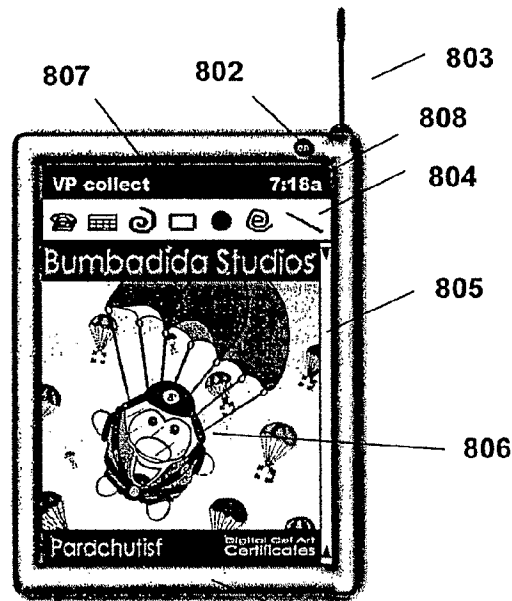


Figure 15

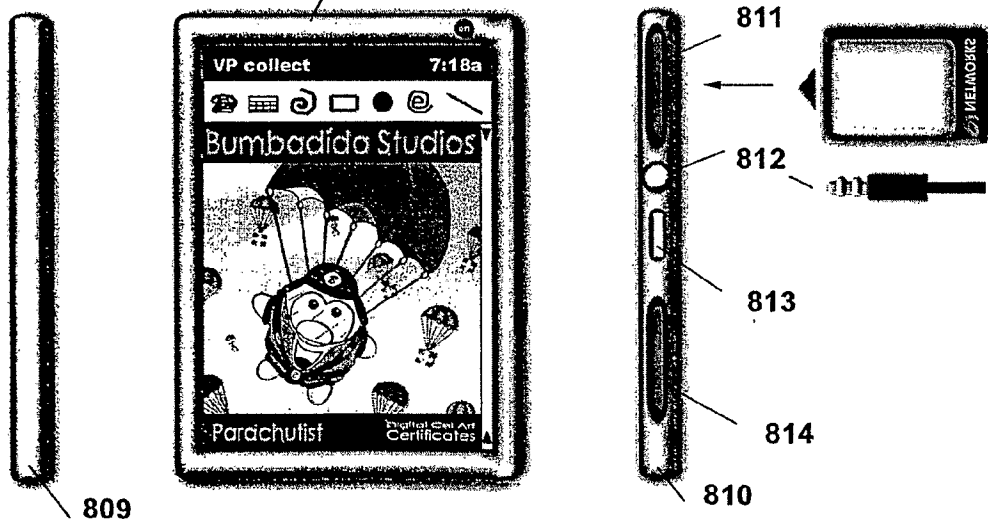
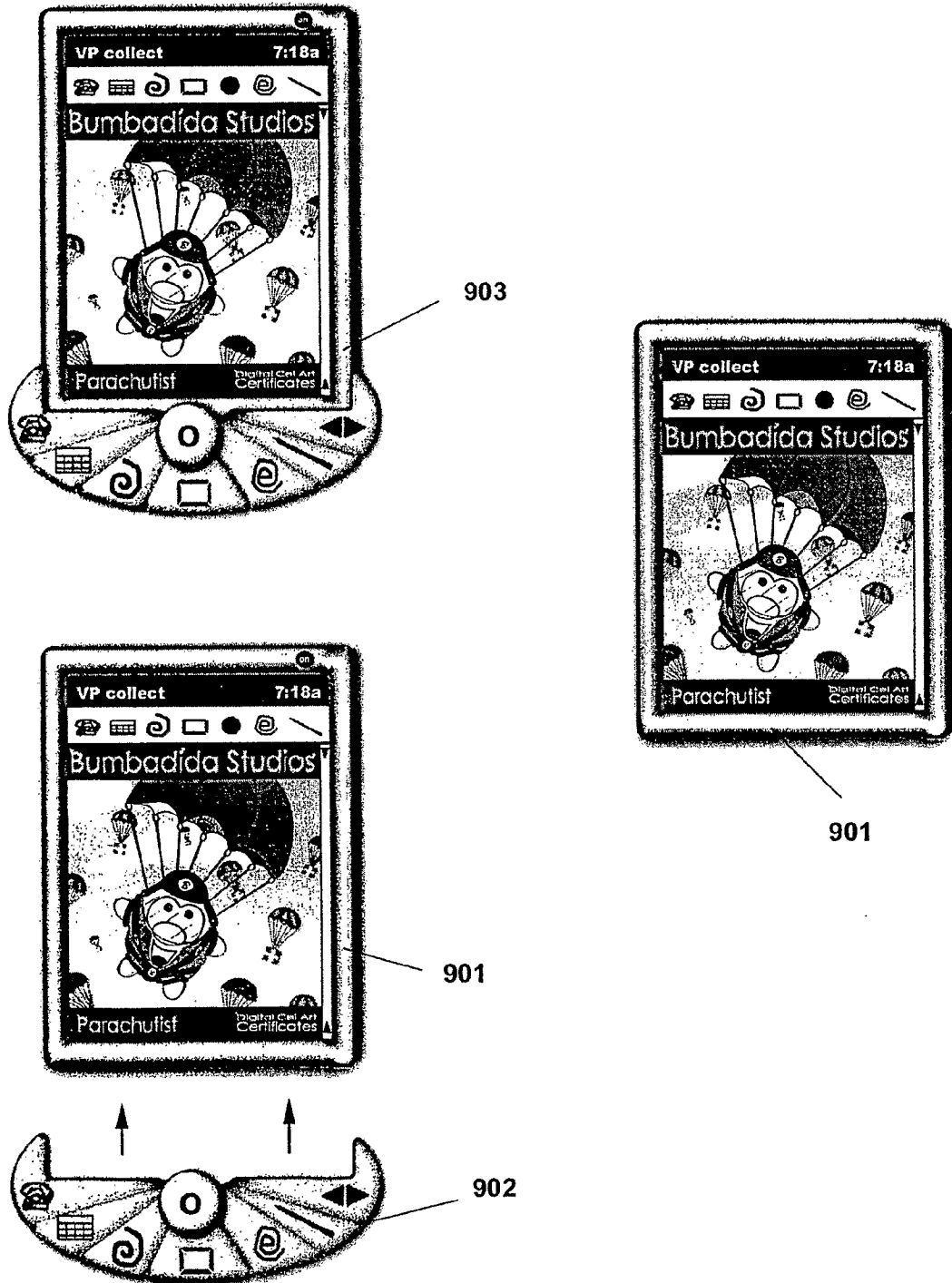


Figure 16



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Figure 17

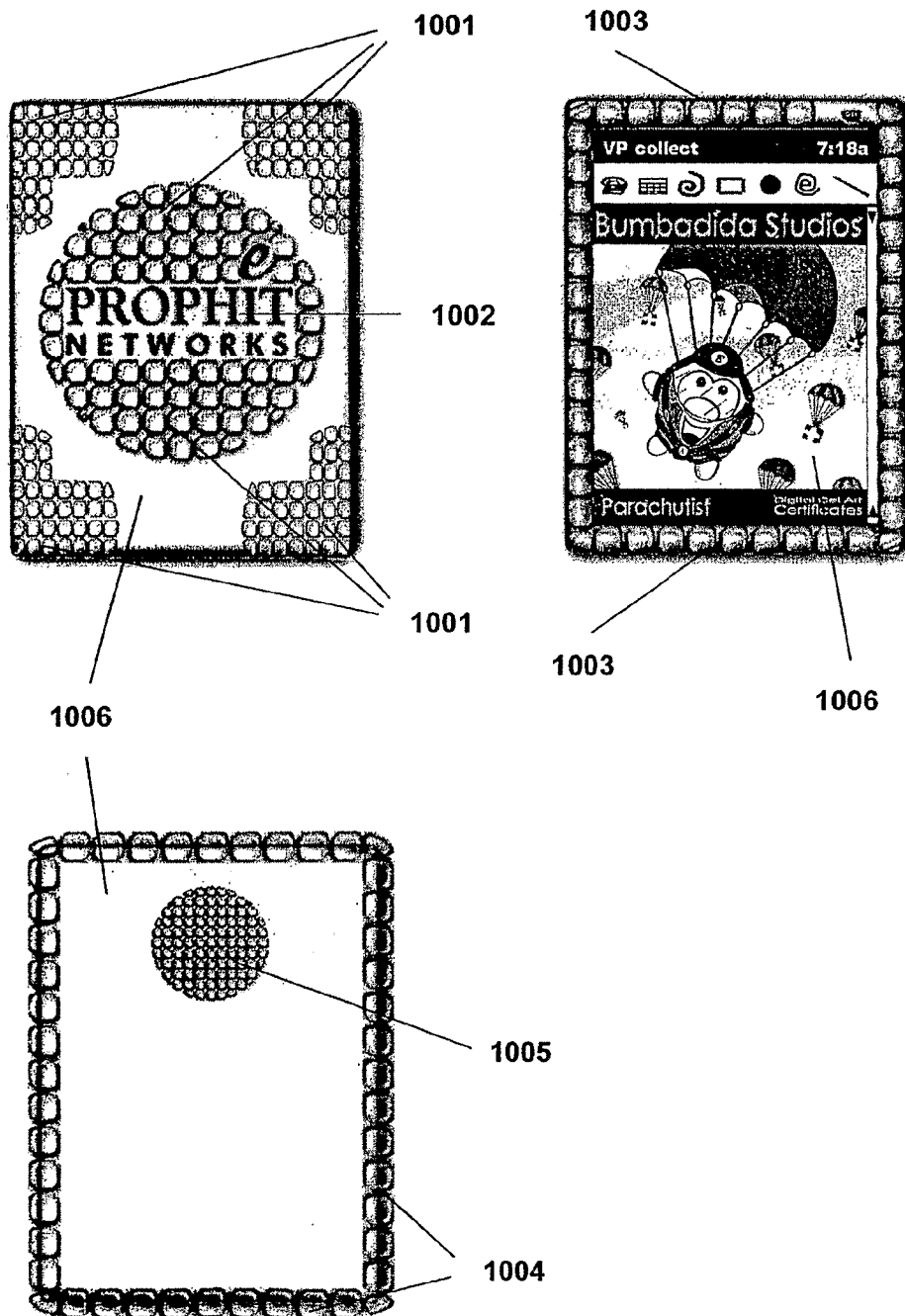


Figure 18

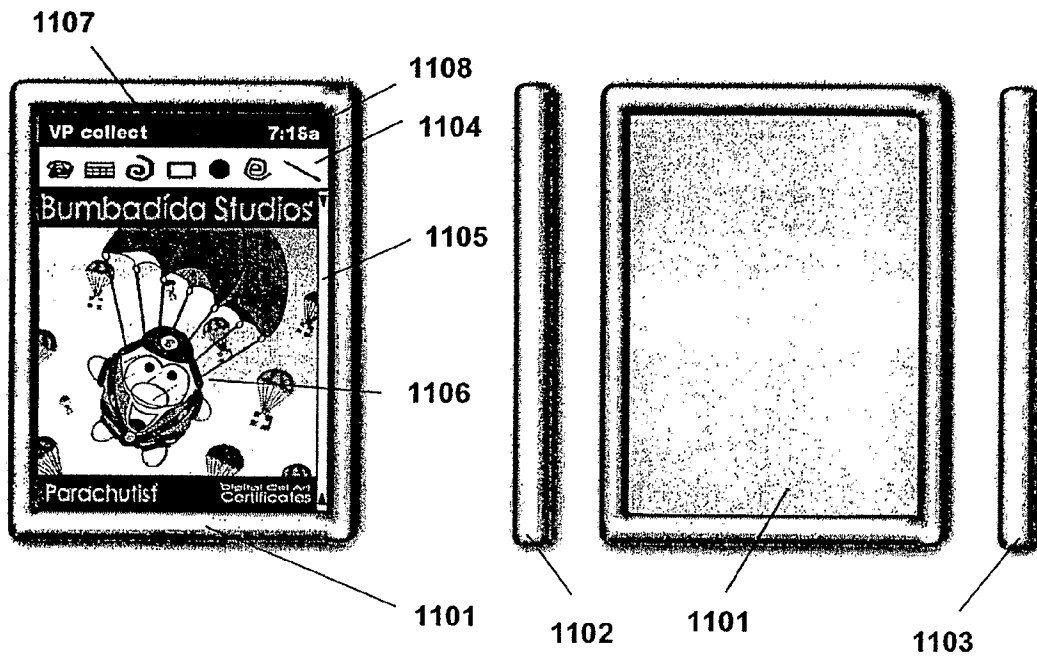


Figure 19

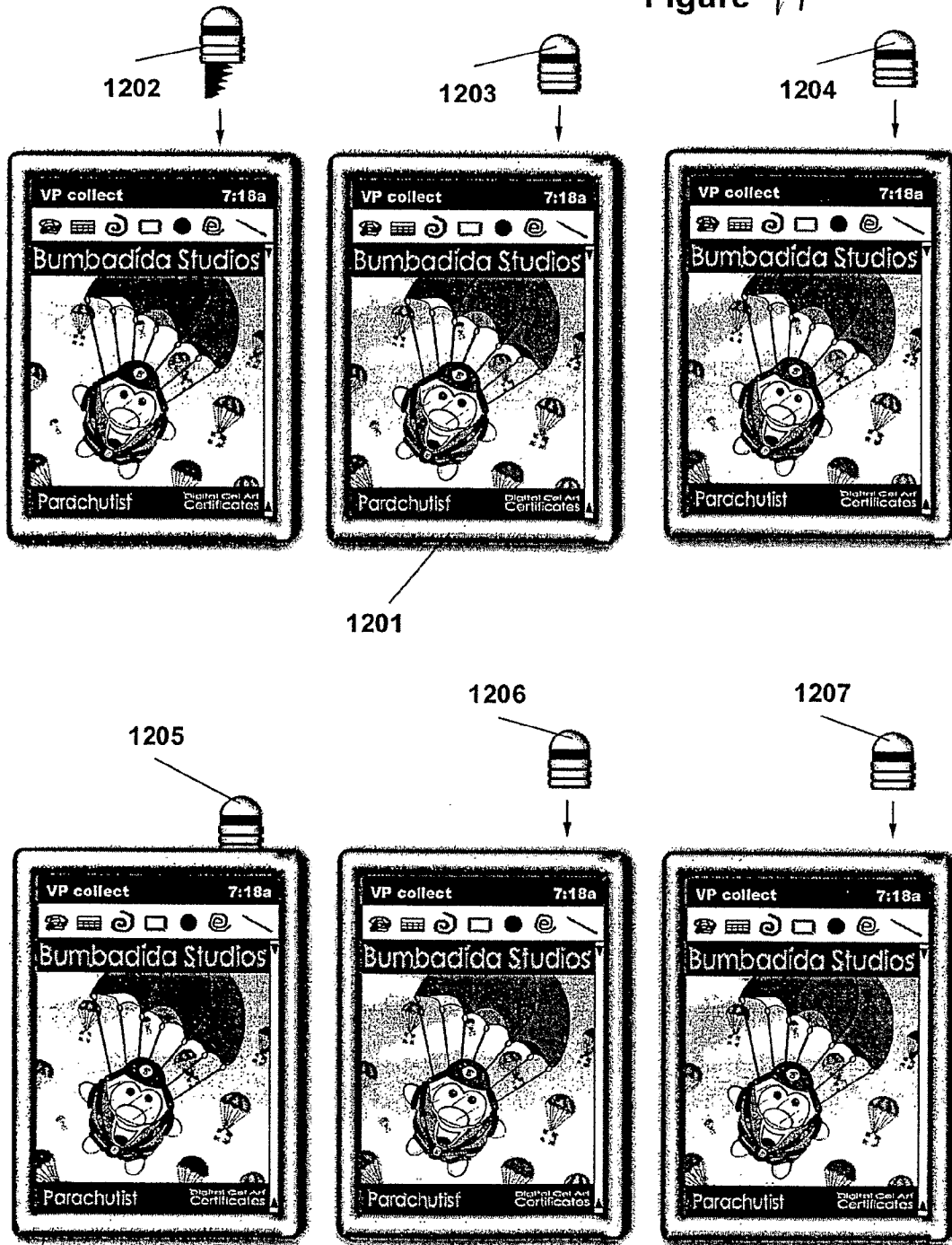


Figure 20

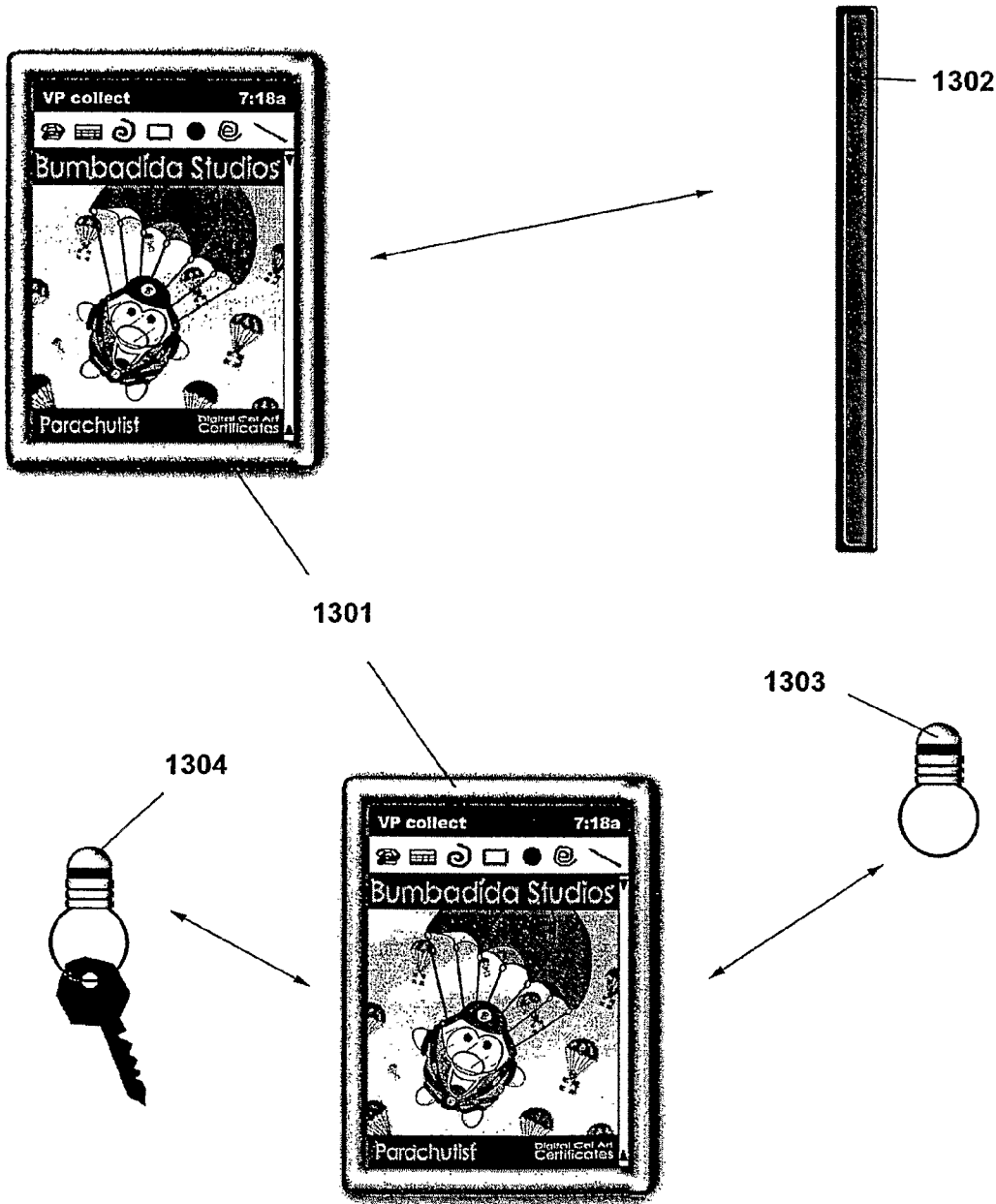


Figure 21

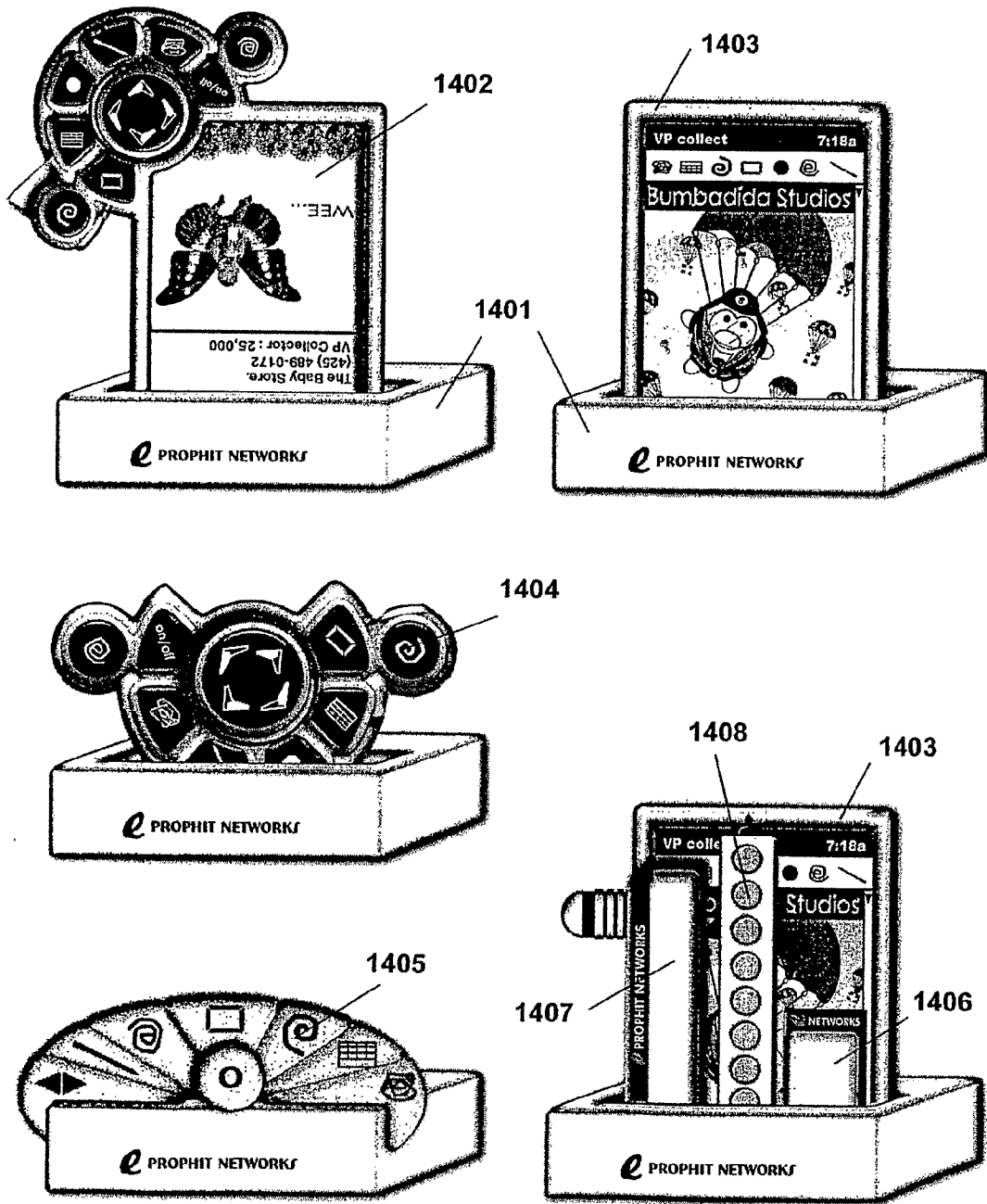


Figure 22

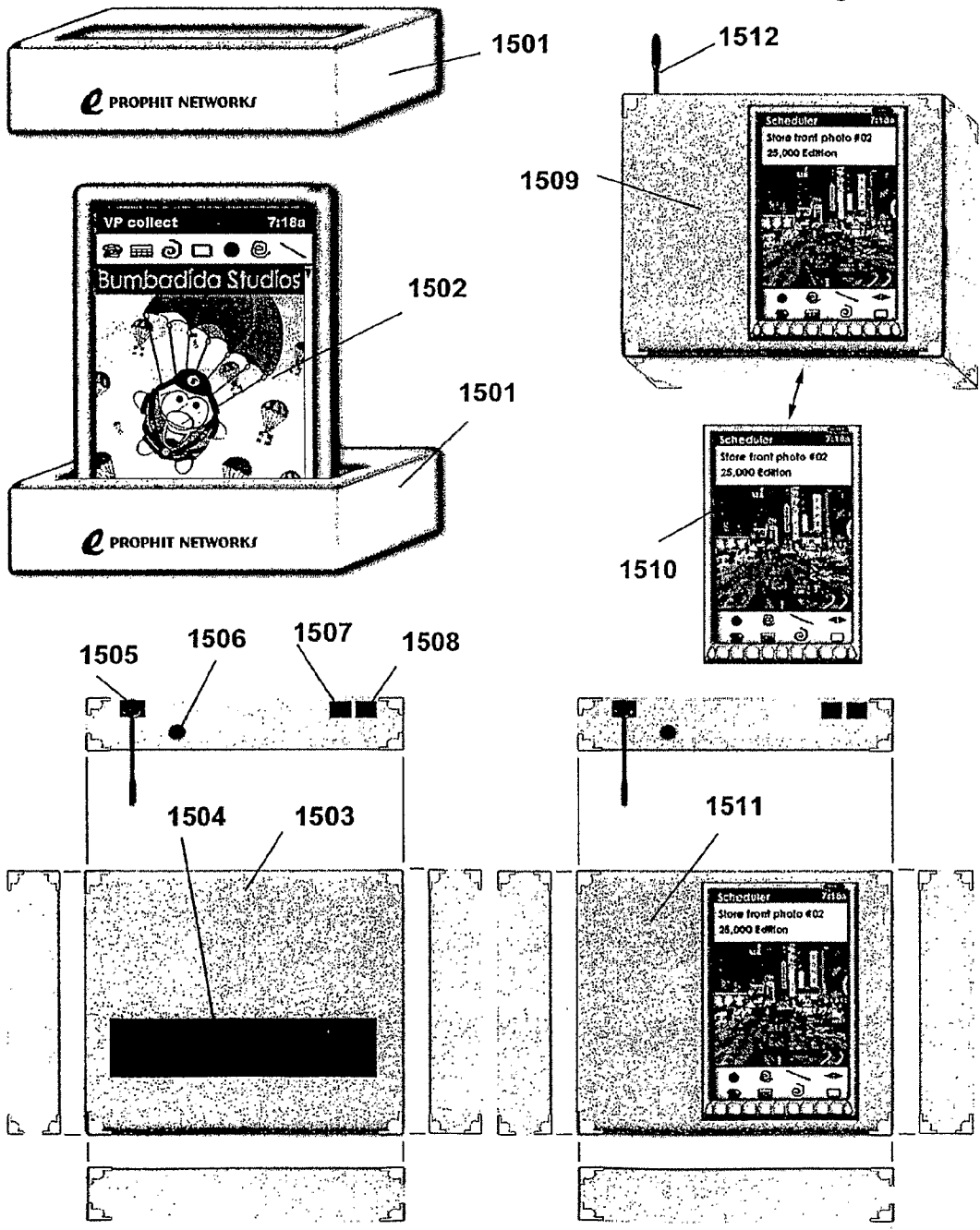


Figure 23

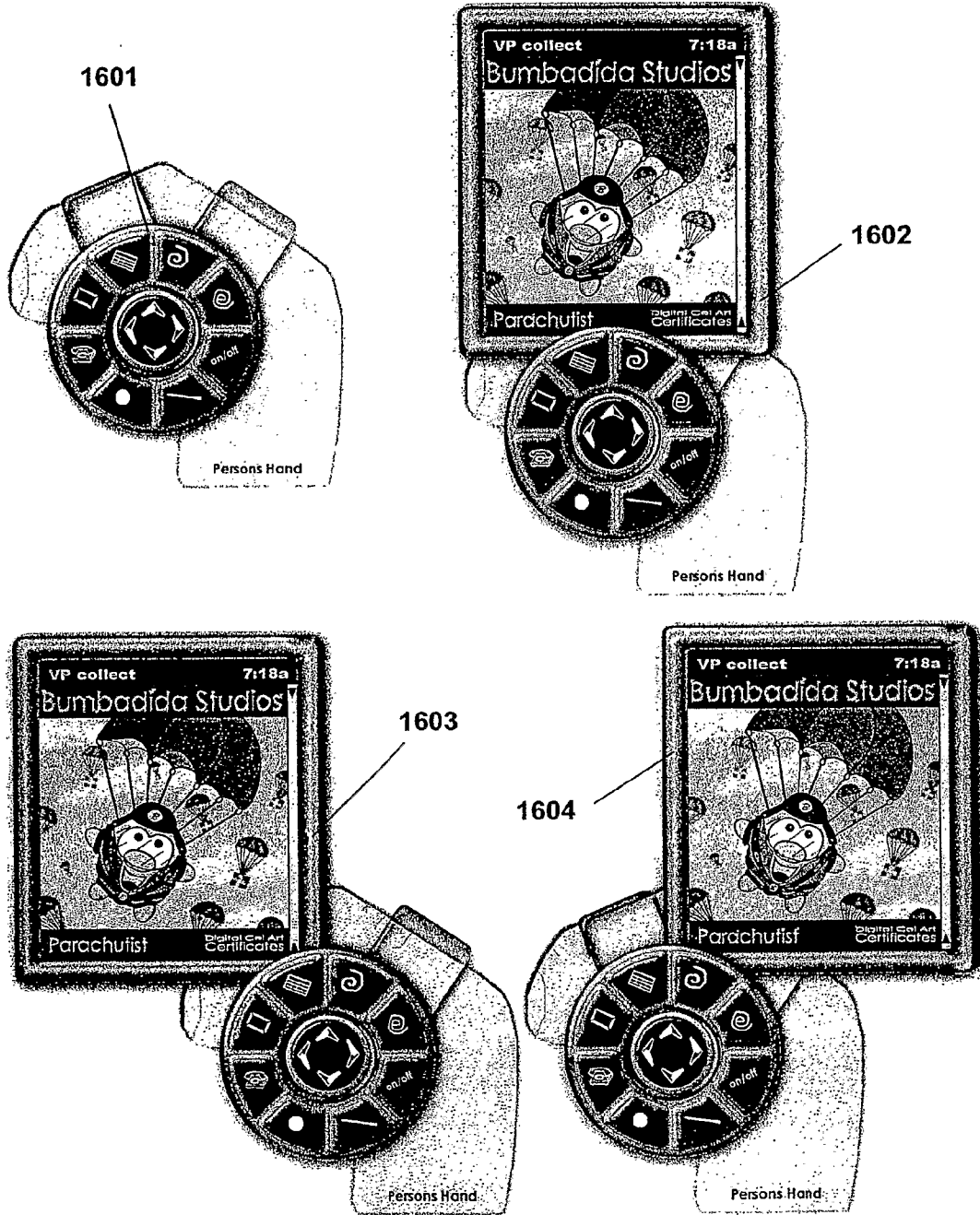


Figure 24

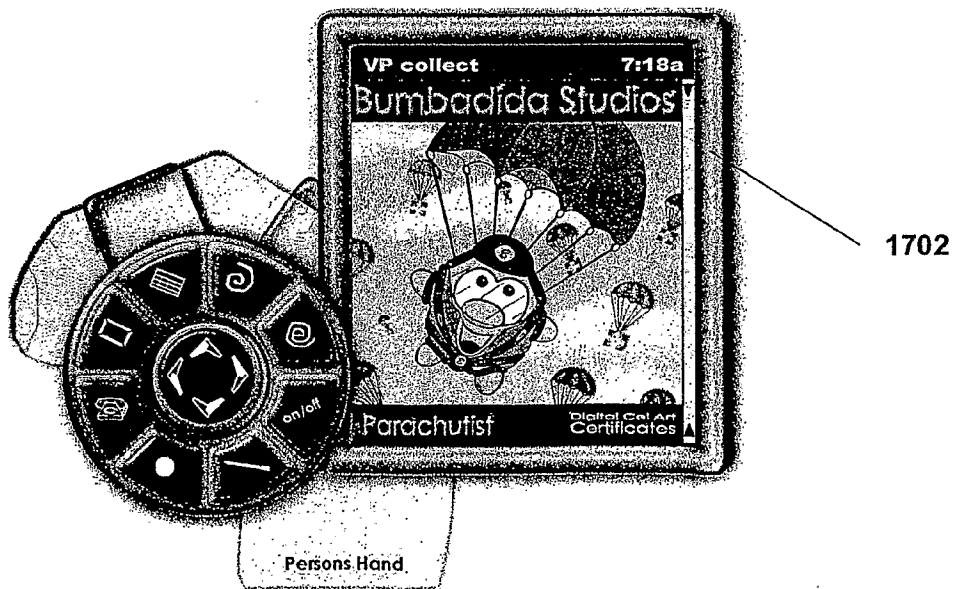
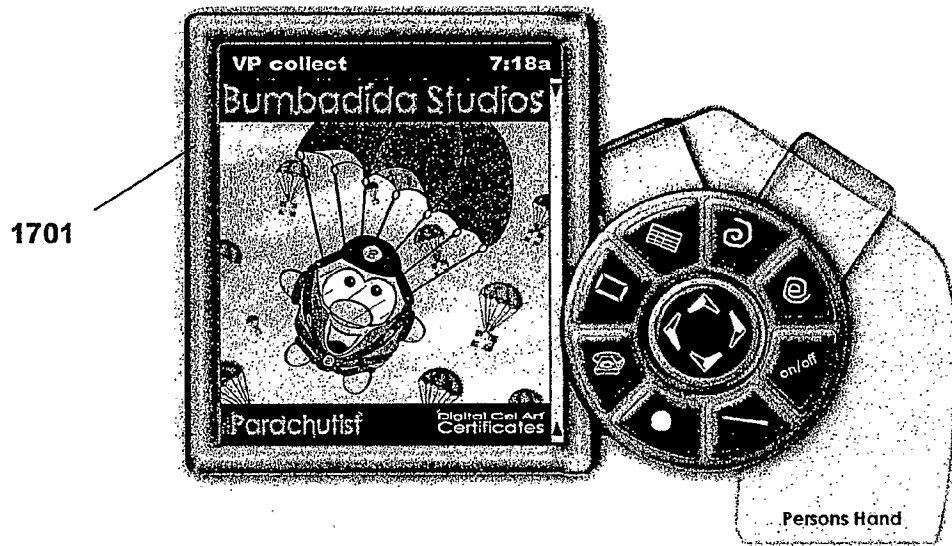


Figure 25

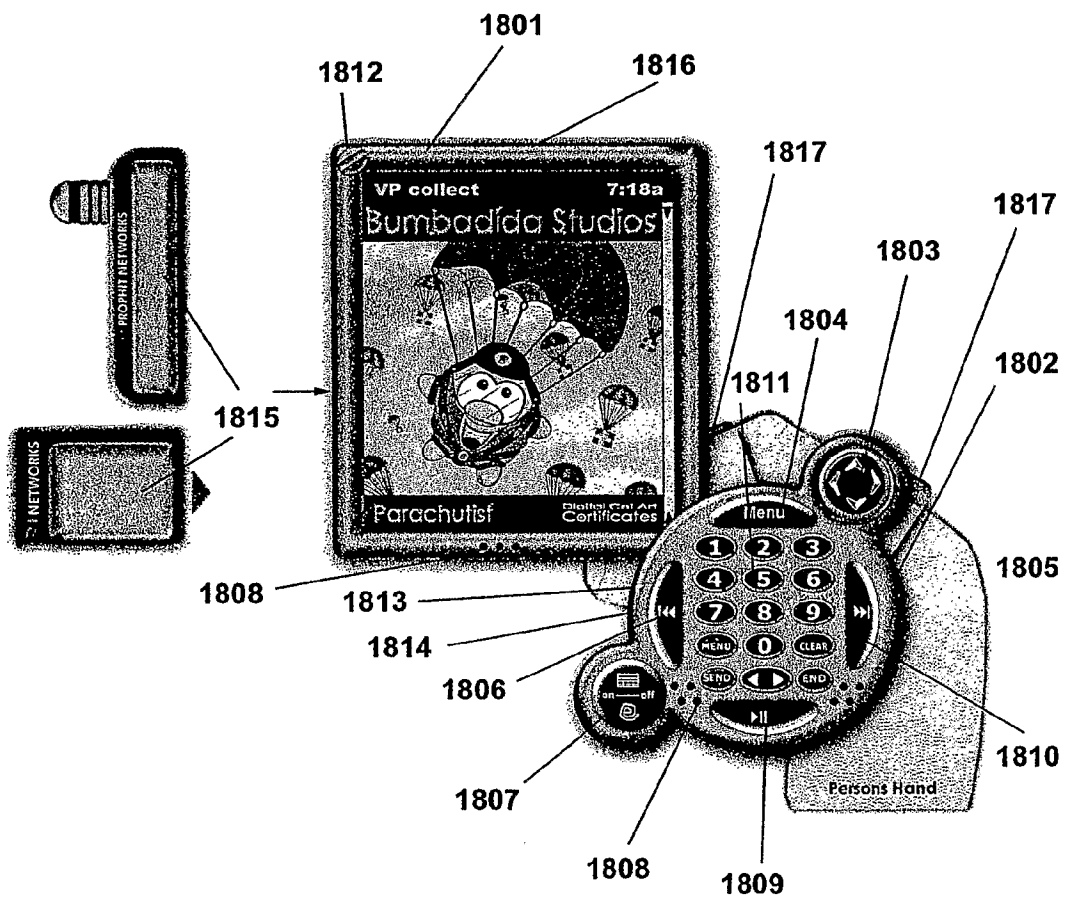
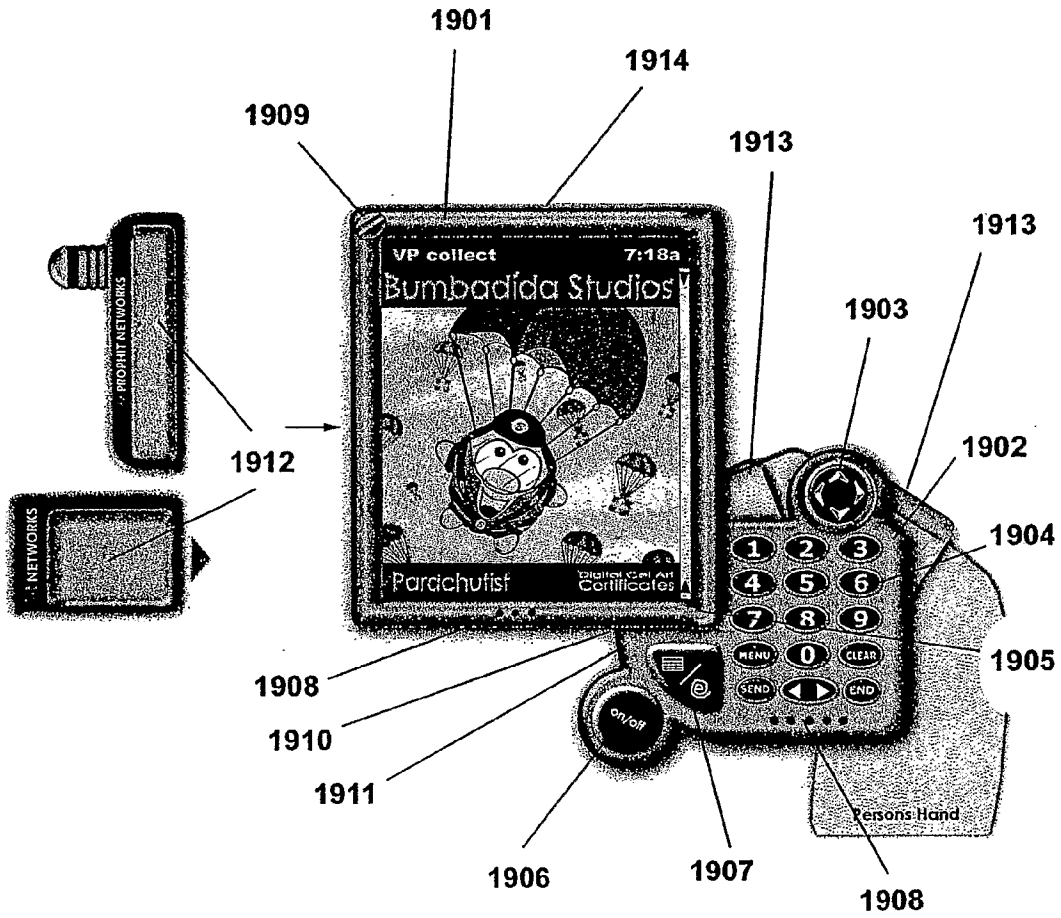


Figure 26



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/22851

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(7) : G0G9 5/00
 US CL : 345/169, 864
 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)
 U.S. : 345/169, 864, 173, 156, 168, 179, 182, 901, 902; 341/21, 22, 23; 361/679, 680, 681

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 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 6,177,926 B1 (KUNERT) 23 January 23, 2001 (23.01.2001), column 8, lines 9-41.	1
A	US 5,949,643 A (BATIO) 07 September 1999 (07.09.1999), column 5, lines 20-54.	1
A	US 6,331,867 B1 (EBERHARD et al) 18 December 2001 (18.12.2001), column 3, lines 40-63.	1
A	US 6,335,725 B1 (KOH et al) 01 January 2002 (01.01.2002), column 5, lines 15-53.	1

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search: 13 November 2002 (13.11.2002)
 Date of mailing of the international search report: 24 JAN 2003

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks
 Box PCT
 Washington, D.C. 20231
 Facsimile No. (703)305-3230
 Authorized officer: *Chanh Nguyen*
 Telephone No. (703) 308-6603

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/22851

Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

NEW ABSTRACT

A finger held hardware device (1801, 1802) provides portable terminal and communicative device and other functions in a system which can be securely braced against and/or attached to finger or side of a user's hand, facilitating secure or one hand operation of the device (1801,1802). The device is flexible and modular in nature, allowing for flexible positioning of a keypad/control unit relative to a display (1801), as well as selection from among various displays and keypad/control unit to suit a user needs. A device (1801, 1802) can operate without physical function buttons or any physical buttons, and can be activated by a separate key mechanism for security. A remote control stylus allows a user to operate the device more quickly. An energy absorbing cover protects the device. A resource cradle (1816) supports portions of the device by providing power, storage, network access, and other resources.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Beth Marcus et al.	Art Unit:	2629
Serial No.:	12/329,411	Examiner:	Ricardo Osorio
Filed:	December 5, 2008	Conf. No.:	8728
Title:	HUMAN INTERFACE SYSTEM		

Mail Stop Amendment

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

AMENDMENT IN REPLY TO ACTION OF MARCH 5, 2009

This paper is filed in response to the Office Action mailed March 5, 2009. Please consider the remarks below, and please amend the above-identified application as indicated:

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 6 of this paper.

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-21. (Cancelled).

22. (New) A method for configuring a human interface and input system for use with a host hand-held electronic device configured to run applications, wherein at least one of the applications is associated with multiple input functions, the method comprising:

selectively disposing on a first surface of the system a first input assembly having input elements configured to receive input from a human user through manipulation of the input elements, wherein at least one of the input elements of the first input assembly is further configured to map to one or more of the input functions associated with a selected one of the applications;

selectively disposing on a second surface a second input assembly having one or more input elements configured to be manipulated by one or more of the human user's fingers, wherein at least one of the input elements of the second input assembly is further configured to selectively map to one or more of the input functions associated with the selected application; and

selectively arranging the first input assembly and the second input assembly in substantial opposition to each other.

23. (New) The method of claim 22 further comprising connecting a controller to the input elements of the first input assembly or the second input assembly to receive signals generated by a manipulation of one or more of the input elements-of first input assembly or the second input assembly.

24. (New) The method of claim 22 further comprising:
selectively disposing the second input assembly to include at least one sensor pad comprising a selectively configurable sensing surface that provides more than one delineated active area based on the selected application.
25. (New) The method of claim 24 further comprising positioning a shape changing media relative to the sensor pad so as to permit the human user to tactilely discriminate between the plurality of delineated active areas.
26. (New) The method of claim 24, further comprising selectively arranging the first delineated active area and the second delineated active area based on the user's hand.
27. (New) The method of claim 22 further comprising positioning a palpable detent with at least one input element of the first input assembly or the second input assembly so as to provide tactile feedback when manipulated by the human user.
28. (New) The method of claim 22, wherein selectively arranging the first and second input assemblies comprises selectively arranging the first and second input assemblies based on thumb-finger opposition arrangement of the human user's hand.
29. (New) The method of claim 22, wherein the selected application is at least one of a scrolling application, a text application and a game application.
30. (New) The method of claim 22, further comprising:
physically or electronically labeling at least one input element of the first input assembly or the second input assembly so as to visually indicate an input function that can be selectively accessed by actuating the input element.

31. (New) The method of claim 22, wherein selectively disposing the first and second input assemblies comprises selecting the first and second input assemblies to include input elements configured to be actuated by the human user's thumb and fingers arranged in substantial opposition.

32. (New) The method of claim 22, further comprising including with the system at least one of a gyroscope or an accelerometer.

33. (New) A method for configuring a human interface and input system for use with a host hand-held electronic device configured to run applications, wherein at least one of the applications is associated with multiple input functions, the method comprising:

selectively disposing on a first surface a first input assembly having input elements configured to receive input from a human user's hand through manipulation of the plurality of input elements, wherein at least one of the input elements of the first input assembly is further configured to map to one or more of the input functions associated with a selected one of the of applications;

selectively disposing on a second surface a second input assembly having one or more input elements configured to be manipulated by one or more of the human user's fingers, wherein at least one of the input elements of the second input assembly is further configured to selectively map to one or more input functions associated with the selected application; and

selectively mapping the input functions of the selected application to the one or more input elements of the first input assembly and the second input assembly based on finger-thumb opposition arrangement of the human user's hand.

34. (New) The method of claim 33 further comprising:

selectively disposing the second input assembly to include at least one sensor pad comprising a selectively configurable sensing surface that provides more than one delineated active area based on the selected application.

35. (New) The method of claim 34 further comprising positioning a shape changing media relative to the sensor pad so as to permit the human user to tactilely discriminate between the plurality of delineated active areas.

36. (New) The method of claim 33, wherein the selected application is at least one of a scrolling application, a text application and a game application.

37. (New) The method of claim 33 further comprising:
physically or electronically labeling at least one input element of the first input assembly or the second input assembly so as to visually indicate an input function that can be selectively accessed by actuating the input element.

38. (New) The method of claim 33 further comprising:
connecting a controller to the input elements of the first input assembly or the second input assembly, wherein the controller is configured to receive signals generated by a manipulation of one or more of the input elements of first input assembly or the second input assembly.

39. (New) The method of claim 33, wherein selectively disposing the first and second input assemblies comprises selecting the first and second input assemblies to include input elements configured to be actuated by the human user's thumb and fingers arranged in substantial opposition.

40. (New) The method of claim 33, further comprising including with the system at least one of a gyroscope or an accelerometer.

41. (New) The method of claim 22, wherein selectively arranging the first and second input assemblies comprises selectively arranging the first and second input assemblies based on thumb-finger opposition arrangement of the human user's hand.

REMARKS

Claims 22-41 are pending after amendment with claims 2 and 33 being independent. Claims 1-21 have been deleted. Claim 22-41 has been added. No new matter has been added.

The new claims 22-41 are fully supported by the specification (see, e.g., ¶¶ [0037]-[0041]; FIGS. 1-2 and 8).

In light of the foregoing amendment and following remarks, reconsideration, and allowance of all pending claims are respectfully requested.

Double Patenting Rejections

Claims 1-21 stand rejected on the ground of nonstatutory obviousness-type double patenting rejection as allegedly being unpatentable over claims 1-6, 11-16, 20, 21, 37, and 41-51 of U.S. Patent No. 7,218,313. A Terminal Disclaimer is filed with this response to obviate the rejections.

Rejections Under 35 U.S.C. § 102

Claims 1-2, 7-12 and 16-21 stand rejected under 35 U.S.C. § 102 as allegedly being anticipated by U.S. Patent No. 6,947,028 to Shkolnikov ("Shkolnikov"). While not agreeing with the rejections, claims 1-21 have been cancelled and new claims 22-41 have been added to obviate the rejections and advance the prosecution of the present application.

Method claims 22-41 have been added to obviate the pending rejections over Shkolnikov. In contrast to claims 22-41, Shkolnikov teaches an embodiment of the selection device 36 is a touch pad with multiple contacts, such that when a user presses near a corner of the pad or in the middle of the pad the pressure is detected by one of the contacts. (See Shkolnikov at FIG. 2D and Column 4, lines 45-53.) Shkolnikov does not teach or suggest configuring a system for use with a hand-held electronic host device as required in claims 22-41.

For at least these reasons, claim 1 is allowable over Shkolnikov. Claims 7-10 depend from claim 1 and are allowable for at least the same reason.

Rejections Under 35 U.S.C. § 103 Based on Shkolnikov and Ni

Claims 3 and 13 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Shkolnikov in view of U.S. Patent No. 6,297,752 to Ni ("Ni"). While not agreeing with the rejections, claims 1-21 have been cancelled and claims 22-41 have been added to obviate the rejections and advance the prosecution of the present application.

The addition of Ni fails to alleviate the deficiencies of Shkolnikov. While Ni teaches a two-sided hand-held device that can be used as a game (see col. 2, lines 38-46, and col. 3, lines 1-6), Ni fails to teach or suggest the claimed methods for configuring a system for use with a hand-held electronic device. For at least these reasons, claims 22-41 are allowable over the proposed combination.

Rejections Under 35 U.S.C. § 103 Based on Shkolnikov Ni and Armstrong

Claims 4-6, 14 and 15 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Shkolnikov in view of Ni and further in view of U.S. Patent Application Publication No. 2002/0019259 to Armstrong ("Armstrong"). While not agreeing with the rejections, claims 1-21 have been cancelled and claims 22-41 have been added to obviate the rejections and advance the prosecution of the present application.

The addition of Ni fails to alleviate the deficiencies of Shkolnikov and Ni. While Armstrong teaches a two-handed game controller (see Armstrong at paragraph [0036]), Armstrong fails to teach or suggest the claimed methods of configuring a system for use with a hand-held electronic device or a host device. Thus, even if combinable, which is not conceded, a hypothetical combination of Shkolnikov, Ni and Armstrong still fails to teach or suggest each and every feature of claims 22-41. For at least these reasons, claims 22-41 are allowable over the proposed combination.

Applicant: Beth Marcus et al.
Serial No.: 12/329,411
Filed: December 5, 2008
Page: 8 of 8

Attorney's Docket No.: 19146-0002003

CONCLUSION

The foregoing comments made with respect to the positions taken by the Examiner are not to be construed as acquiescence with other positions of the Examiner that have not been explicitly contested. Accordingly, the above arguments for patentability of a claim should not be construed as implying that there are not other valid reasons for patentability of that claim or other claims.

Please charge the 3-month Extension of Time fee and any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: September 2, 2009

/Hwa C. Lee/
Hwa C. Lee
Reg. No. 59,747

Fish & Richardson P.C.
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Facsimile: (877) 769-7945

HCL/jhg
10910675.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Beth Marcus et al. Art Unit: 2629
Serial No.: 12/329,411 Examiner: Ricardo Osorio
Filed: December 5, 2008 Conf. No.: 8728
Title: HUMAN INTERFACE SYSTEM

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

TERMINAL DISCLAIMER UNDER 37 C.F.R. §§ 3.73(b) AND 1.321(C)

Pursuant to 37 C.F.R. § 3.73(b), ZEEMOTE, INC., a corporation of Delaware, certifies that it is the assignee of the entire right, title, and interest in the present application by virtue of:

An assignment from the inventors of the present patent application. The assignment was recorded in the Patent and Trademark Office at Reel_____, Frame _____ on February 20, 2009, or a copy thereof is attached.

A chain of title from the inventors of the present patent application to the current assignee as shown below:

1. From Beth Marcus and Lee W. David, the inventors, to Marcus Enterprises, LTD. The document was recorded in the Patent and Trademark Office at Reel 022261, Frame 0309 on February 13, 2009, or a copy thereof is attached.

2. From Marcus Enterprises, LTD. to Zietoo, Inc. The document was recorded in the Patent and Trademark Office at Reel 022276, Frame 0591 on February 18, 2009, or a copy thereof is attached.

3. From Zietoo, Inc. to Zeemote, Inc. to effectuate a name change. The document was recorded in the Patent and Trademark Office at Reel 022295, Frame 0596 on February 20, 2009, or a copy thereof is attached.

To the best of undersigned's knowledge and belief, title is in the assignee identified above.

The undersigned is empowered to act on behalf of the assignee.

Applicant: Beth Marcus et al.
Serial No.: 12/329,411
Filed: December 5, 2008
Page: 2 of 2

Attorney's Docket No.: 19146-0002003

Pursuant to 37 C.F.R. § 1.321(c), and to obviate a double patenting rejection, the assignee identified above hereby waives and disclaims the terminal portion of the term of the entire patent to be granted upon the present application subsequent to the expiration date of [*“U.S. Patent No. 7,463,245”*] provided that any patent granted on the present application shall be enforceable only for and during such period that it is commonly owned with [*“U.S. Patent No. 7,463,245”*].

The assignee identified above does not disclaim any terminal part of any patent granted on the present application prior to the expiration date of the full statutory term of [*“U.S. Patent No. 7,463,245”*] in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid, is statutorily disclaimed in whole or terminally disclaimed under 37 C.F.R. § 1.321(a), has all claims cancelled by a reexamination certificate, or is otherwise terminated prior to expiration of its statutory term, except for the separation of legal title as stated above. The full statutory term of any patent includes any term adjustment under 35 U.S.C. § 154(b). Assignee herein does not disclaim or otherwise affect any part of [*“U.S. Patent No. 7,463,245”*].

This disclaimer runs with any patent granted on the present application and is binding upon the grantee, its successors or assigns.

Please apply \$70 for the required fee pursuant to 37 C.F.R. § 1.20(d) and any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: September 2, 2009

/Hwa C. Lee/

Hwa C. Lee
Reg. No. 59,747

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San Diego, California 92130
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10940912.doc

Electronic Patent Application Fee Transmittal

Application Number:	12329411
Filing Date:	05-Dec-2008
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Filer:	Hwa C. Lee/Julie Giordano
Attorney Docket Number:	19146-0002003

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:				
Extension - 3 months with \$0 paid	2253	1	555	555

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Statutory disclaimer	2814	1	70	70
Total in USD (\$)				625

Electronic Acknowledgement Receipt

EFS ID:	6004485
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Julie Giordano
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	02-SEP-2009
Filing Date:	05-DEC-2008
Time Stamp:	17:09:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$625
RAM confirmation Number	3724
Deposit Account	061050
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1		191460002003Amendment.pdf	88884 37956294a4f16048ae150d922f608a7735f32da2	yes	8
Multipart Description/PDF files in .zip description					
		Document Description	Start	End	
		Amendment/Req. Reconsideration-After Non-Final Reject	1	1	
		Claims	2	5	
		Applicant Arguments/Remarks Made in an Amendment	6	8	
Warnings:					
Information:					
2	Terminal Disclaimer Filed	191460002003Terminal.pdf	76061 279d194f32fc136649b97d9313154bda7a3890f6	no	2
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	31634 d220c5b64a6ca2934d2d637afe175122d9527dc8	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			196579		
<p>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.</p> <p><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.</p> <p><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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					



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Table with 4 columns: APPLICATION NUMBER (12/329,411), FILING OR 371(C) DATE (12/05/2008), FIRST NAMED APPLICANT (Beth Marcus), ATTY. DOCKET NO./TITLE (19146-0002003)

CONFIRMATION NO. 8728

PUBLICATION NOTICE

20985
FISH & RICHARDSON, PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022



Title: Human Interface System

Publication No. US-2009-0143142-A1

Publication Date: 06/04/2009

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 Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/329,411	12/05/2008	Beth Marcus	19146-0002003

CONFIRMATION NO. 8728

POA ACCEPTANCE LETTER

20985
FISH & RICHARDSON, PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022



Date Mailed: 03/19/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/12/2009.

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.

/vvan/

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

Applicant : Beth Marcus et al.
Serial No. : 12/329,411
Filed : December 5, 2008
Page : 2 of 2

Attorney's Docket No.: 19146-0002003

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 patents issued thereon.

Please direct all communications regarding the application to **Customer Number 20985**.

Signature: Beth Marcus Date: 3/12/09
Typed name: BETH MARCUS
Title: CTO, SVP & Founder
Assignee: Zeemote, Inc.

Fish & Richardson P.C.
Telephone: (858) 678-5070
Facsimile: (858) 678-5099

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Electronic Acknowledgement Receipt

EFS ID:	4954329
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Jeanne Amour
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	12-MAR-2009
Filing Date:	05-DEC-2008
Time Stamp:	14:00:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	191460002003POA.PDF	68850 <small>294e82ed6ca62fe043930502e92102bc24763a33</small>	no	2

Warnings:

Information:

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.



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Table with columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
Rows include application details for Beth Marcus, examiner OSORIO, RICARDO, art unit 2629, and notification date 03/05/2009.

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):

PATDOCTC@fr.com

DETAILED ACTION***Double Patenting***

1. 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).

2. Claims 1-21 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 7,463,245. Although the conflicting claims are not identical, they are not patentably distinct from each other because independent claims 1 and 11 of the instant application have the same limitations as independent claims 1 and 12 of US Patent No. 7,463,245, including limitations such as a hand-held device, a processor, a first surface, a second surface, etc. However, claims 1 and 11 of the instant application are broader than claims 1 and 12 of U.S. Patent No. 7,463,245.

The omission of an element and its function where not needed is obvious. Ex parte Rainu, 168 USPQ 375 (PTO Bd. Of App. 1969). The omission of an element and

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its function in a combination is an obvious expedient if the remaining elements perform the same as before. In re Karlson, 136 USPQ 184 (CCPA 1963).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 7-12, and 16-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Shkolnikov (6,947,028).

Regarding claim 1, Shkolnikov discloses a hand-held device (Fig. 1, character 30) comprising: a processor configured to process a selected application having two or more functions (col. 4, lines 11-12, and col. 5, lines 16-18 and 48-51); a first surface including at least a first input element (Fig. 1, characters 32a-32d) mapped to at least a first function of the selected application (col. 4, lines 12-14, and col. 5, lines 16-18); and a second surface including at least a second input element having a sensor pad (Fig. 1, character 36, Fig. 2D, Fig. 3C, col. 4, lines 46-53) mapped to at least a second function of the selected application, wherein the second surface is substantially in opposition to the first surface (col. 4, lines 15-17, and col. 5, lines 16-18).

As to claim 2, Shkolnikov discloses the sensor pad comprises active areas (Fig. 2D, characters 66), wherein at least one of the active areas is mapped to the second function of the selected application (col. 4, lines 46-53).

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As to claim 7, Shkolnikov discloses second surface further includes a directional pad (col. 5, lines 8-9).

As to claim 8, Shkolnikov discloses the processor is further configured to communicate with a host device (col. 4, lines 11-12, col. 5, lines 16-18 and 48-51, and col. 7, lines 11-23. Although not specifically mentioned, as the processor works with the software to interpret commands and data entered by the user, and one of the modes is the internet navigation mode. It is inherent that the processor is configured to communicate with a host device or many host devices, since while in said internet mode the processor necessarily communicates with other computer(s) or host device(s)).

As to claim 9, Shkolnikov discloses further comprising an accelerometer (col. 5, lines 35-37).

As to claim 10, Shkolnikov discloses further comprising a gyroscope (col. 5, line 44).

As to claim 11, Shkolnikov discloses a hand-held device comprising: a first surface including at least an input element (Fig. 1, characters 32a-32d) mapped to at least a first function of an application (col. 4, lines 12-14, and col. 5, lines 16-18); and a second surface including at least a touch sensing input element (Fig. 1, character 36, Fig. 2D, Fig. 3C, col. 4, lines 46-53) mapped to at least a second function of the application, wherein the second surface is substantially in opposition to the first surface (col. 4, lines 15-17, and col. 5, lines 16-18).

As to claim 12, Shkolnikov discloses the touch sensing input element comprises a sensor pad having active areas (Fig. 2D, characters 66), wherein at least one of the active areas is mapped to the second function of the application (col. 4, lines 46-53).

As to claim 16, Shkolnikov discloses the input element comprises a rotary sensor or a directional pad (col. 5, lines 8-9).

As to claim 17, Shkolnikov discloses the input element and the touch sensing input element are communicatively coupled to a host device (col. 4, lines 11-12, col. 5, lines 16-18 and 48-51, and col. 7, lines 11-23. Although not specifically mentioned, as the processor works with the software to interpret commands and data entered by the user, through the keys and the selection device, and one of the modes is the internet navigation mode. It is inherent that the processor and for that matter, the input element and the touch input element, are configured to communicate with a host device or many host devices, since while in said internet mode the processor and the input element and the touch input element, necessarily communicate with other computer(s) or host device(s)).

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As to claim 18, Shkolnikov discloses further comprising an accelerometer or a gyroscope (col. 5, lines 35-37 and 44).

As to claim 19, Shkolnikov discloses further comprising an accelerometer or a gyroscope (col. 5, lines 35-37 and 44).

As to claim 20, Shkolnikov discloses the second surface comprises a back surface or a side surface (col. 4, lines 15-17).

As to claim 21, Shkolnikov discloses the second surface comprises a back surface or a side surface (col. 4, lines 15-17).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shkolnikov (see above) in view of Ni (6,297,752).

Regarding claims 3 and 13, Shkolnikov does not specifically disclose that the selected application comprise a game application.

Ni teaches of a two-sided hand-held device that can be used as a game having a game application, among many other possible applications (col. 2, lines 38-46, and col. 3, lines 1-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the game device or application, as taught by Ni, in the device of Shkolnikov because game applications are well known in the art to be used in handheld devices as one of

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many possible applications so the user, for example, can play games anywhere, during leisure time, since handhelds are portable.

7. Claims 4-6, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shkolnikov in view of Ni as applied to claims 3 and 13 above, and further in view of Armstrong (US 2002/0019259).

Regarding claims 4, 5 and 14, Shkolnikov discloses a directional control (col. 5, lines 8-9).

However, further, Shkolnikov, as anticipated by Ni, does not specifically disclose that at least one of the first functions of the game application comprises a directional control.

Armstrong discloses a hand-held, two-sided, input device used for game applications, which includes a directional control on a first surface (Fig. 11, character 42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the directional control, as taught by Armstrong, in the combined device of Shkolnikov and Ni because directional controls are overwhelmingly known in the art of game controllers, such as for character movement control, or for scrolling.

Regarding claims 6 and 15, Shkolnikov, as anticipated by Ni, does not specifically disclose that the second surface further comprises a weapon fire control.

Armstrong discloses, further, a weapon fire control (paragraph 14, lines 12-15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the weapons fire control, as taught by Armstrong, in the device of Shkolnikov

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and Ni because weapons games are commonly known in the art of games as some of the many different types of games that are available alternately, as desired by the user.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RICARDO L. OSORIO whose telephone number is (571) 272-7676. The examiner can normally be reached on MONDAY-THURSDAY 7:00 am-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, AMARE MENGISTU can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RICARDO L OSORIO/
Primary Examiner, Art Unit 2629



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BIB DATA SHEET

CONFIRMATION NO. 8728

SERIAL NUMBER 12/329,411	FILING or 371(c) DATE 12/05/2008	CLASS 345	GROUP ART UNIT 2629	ATTORNEY DOCKET NO. 19146-0002003	
APPLICANTS Beth Marcus, Bedford, MA; W. David Lee, Newton, MA; ** CONTINUING DATA ***** This application is a CON of 11/747,863 05/11/2007 PAT 7,463,245 which is a CON of 10/699,555 10/31/2003 PAT 7,218,313 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 12/16/2008					
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and Acknowledged <u>/RICARDO OSORIO/</u> Examiner's Signature	<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY MA	SHEETS DRAWINGS 9	TOTAL CLAIMS 21	INDEPENDENT CLAIMS 2
ADDRESS FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022 UNITED STATES					
TITLE Human Interface System					
FILING FEE RECEIVED 553	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 19146-0002003	Application No. 12/329,411
	Applicant Beth Marcus et al.		
	Filing Date December 5, 2008		Group Art Unit

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1	6,297,752	10/2/2001	Ni			
	2	2003020692	1/3/2003	Griffin et al.			
	3	2003122784	7/3/2003	Shkolnikov			
	4						
	5						
	6						
	7						
	8						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	9							
	10							
	11							
	12							

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	13	State Intellectual Property Office of PRC Notification of First Office Action dated November 21, 2008, Chinese Patent Appln No. 200710153371.3
	14	
	15	

Examiner Signature /Ricardo Osorio/	Date Considered 03/01/2009
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EXAMINER: Initials citation considered. 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. /R.O./

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	387800	hand-held or hand adj held or pda	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L2	57599	L1 and game	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L3	3040	L2 and fire	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L4	1562	L3 and pad	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L5	77	L4 and first adj (side or surface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L6	56	L5 and second adj (side or surface)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L7	3	L6 and (directional or D) adj pad	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L8	56	L6 and (control\$4 or process\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51


L9	23	(US-20030197688-\$ or US-20050091431-\$ or US-20040208681-\$ or US-20040069600-\$ or US-20040263479-\$ or US-20020067343-\$ or US-20020019259-\$).did. or (US-6587094-\$ or US-6842170-\$ or US-6788294-\$ or US-7088339-\$ or US-5576733-\$ or US-6132118-\$ or US-7010333-\$ or US-6747635-\$ or US-7002553-\$ or US-5410333-\$ or US-6947028-\$ or US-6164853-\$ or US-6909424-\$ or US-6297752-\$ or US-6107988-\$ or US-5515305-\$ or US-7286341-\$ or US-7170496-\$).did.	US-PGPUB; USPAT	OR	ON	2009/03/01 12:51
L10	3	L9 and gyrosco\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L11	3	L9 and (accelerometer or acceleration adj sens\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L12	3	L10 and L11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L13	3	("2002/0019259").URPN.	USPAT	OR	ON	2009/03/01 12:51
L14	11	(("6947028") or ("6107988") or ("6909424") or ("5515305") or ("6297752")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/03/01 12:51

L15	3	"20040208681"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L16	7	"2004/0208681"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L17	1	dechene and joseph and fernand	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L18	7	("2004/0208681").URPN.	USPAT	OR	ON	2009/03/01 12:51
L19	34	((two-sided or (dual or double) adj side\$3) near3 (hand-held or input adj device))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L20	0	("31andgame").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/03/01 12:51
L21	3	L14 and game	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L22	3	"6909424".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L23	23	(US-20030197688-\$ or US-20050091431-\$ or US- 20040208681-\$ or US- 20040069600-\$ or US- 20040263479-\$ or US- 20020067343-\$ or US- 20020019259-\$).did. or (US-6587094-\$ or US- 6842170-\$ or US- 6788294-\$ or US- 7088339-\$ or US- 5576733-\$ or US-	US-PGPUB; USPAT	OR	ON	2009/03/01 12:51

		6132118-\$ or US-7010333-\$ or US-6747635-\$ or US-7002553-\$ or US-5410333-\$ or US-6947028-\$ or US-6164853-\$ or US-6909424-\$ or US-6297752-\$ or US-6107988-\$ or US-5515305-\$ or US-7286341-\$ or US-7170496-\$).did.				
L24	11	L23 and game	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L25	2	"7218313".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L26	515	hand-held and (palm adj top or pda) and game and fire and direction\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L27	353	hand-held and (palm adj top or pda) and game and fire and direction\$4 and pad	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L28	330	hand-held and (palm adj top or pda) and game and fire and direction\$4 and pad and processor	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L29	14	L28 and first adj surface	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51
L30	18	L28 and "345"/\$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/03/01 12:51

3/1/09 1:02:00 PM

C:\Documents and Settings\rosorio\My Documents\EAST\Workspaces\first and second surface interface to optimize biomechanical effect of hand.wsp

Search Notes 	Application/Control No. 12329411	Applicant(s)/Patent Under Reexamination MARCUS ET AL.
	Examiner RICARDO L OSORIO	Art Unit 2629

SEARCHED			
Class	Subclass	Date	Examiner
345	156, 168, 169, 173	3/1/09	RLO
400	472	3/1/09	RLO
341	22	3/1/09	RLO

SEARCH NOTES		
Search Notes	Date	Examiner
EAST	3/1/09	RLO

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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Index of Claims 	Application/Control No. 12329411	Applicant(s)/Patent Under Reexamination MARCUS ET AL.
	Examiner RICARDO L OSORIO	Art Unit 2629

✓	Rejected
=	Allowed

-	Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

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

CLAIM		DATE							
Final	Original	03/01/2009							
	1	✓							
	2	✓							
	3	✓							
	4	✓							
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	16	✓							
	17	✓							
	18	✓							
	19	✓							
	20	✓							
	21	✓							

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office		Attorney's Docket No. 19146-0002003	Application No. 12/329,411
	Applicant Beth Marcus et al.			
	Filing Date December 5, 2008		Group Art Unit	

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1						
	2						
	3						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	4	2002 27645 A1	4 April 2002	Germany				
	5							

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	6	
	7	
	8	
	9	

Examiner Signature /Ricardo Osorio/	Date Considered 03/01/2009
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EXAMINER: Initials citation considered. 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. /R.O./

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office		Attorney's Docket No. 19146-0002003	Application No. unknown
	Applicant Beth Marcus et al.			
	Filing Date December 5, 2008		Group Art Unit unknown	

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1	4,793,312	12/27/1988	Doinaga et al.			
	2	4,867,028	09/19/1989	Peter S. Jones			
	3	4,891,777	01/02/1990	James M. Lapeyre			
	4	4,896,554	01/30/1990	Craig F. Culver			
	5	4,912,462	03/27/1990	Washizuka et al.			
	6	5,189,416	02/23/1993	Mark D. Estes			
	7	5,365,589	11/15/1994	Howard A. Gutowitz			
	8	5,432,510	07/11/1995	Walter S. Matthews			
	9	5,473,325	12/05/1995	Peter J. McAlindon			
	10	5,512,919	04/30/1996	Yoshitsugu Araki			
	11	5,515,305	05/7/1996	Register et al.			
	12	5,612,690	03/18/1997	David Levy			
	13	5,782,642	07/21/1998	Michael Goren			
	14	5,824,931	10/20/1998	M. G. Papadopoulos			
	15	5,859,629	01/12/1999	Bruce Tognazzini			
	16	5,900,864	05/04/1999	Bruce W. Macdonald			
	17	5,973,621	10/26/1999	David Levy			
	18	6,005,496	12/21/1999	Hargreaves et al.			
	19	6,084,576	07/04/2000	Leu et al.			
	20	6,107,988	08/22/2000	Phillipps			
	21	6,115,028	09/5/2000	Balakrishnan et al.			
	22	6,184,804	02/06/2001	Shelton E. Harrison			
	23	6,219,731	04/17/2001	Howard A. Gutowitz			
	24	6,228,709	05/8/2001	Wen-Yi Hsieh			
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	Applicant Beth Marcus et al.		
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Examiner Signature /Ricardo Osorio/	Date Considered 03/01/2009
EXAMINER: Initials citation considered. 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. /R.O./

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office		Attorney's Docket No. 19146-0002003	Application No. unknown
	Applicant Beth Marcus et al.			
	Filing Date December 5, 2008		Group Art Unit unknown	

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
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Examiner Signature <i>/Ricardo Osorio/</i>	Date Considered 03/01/2009
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Table with 7 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY.DOCKET.NO, TOT CLAIMS, IND CLAIMS. Row 1: 12/329,411, 12/05/2008, 2626, 553, 19146-0002003, 21, 2

CONFIRMATION NO. 8728

UPDATED FILING RECEIPT

20985
FISH & RICHARDSON, PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022



Date Mailed: 02/26/2009

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

Applicant(s)

Beth Marcus, Bedford, MA;
W. David Lee, Newton, MA;

Assignment For Published Patent Application

ZEEMOTE, INC., Chelmsford, MA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 11/747,863 05/11/2007 PAT 7,463,245
which is a CON of 10/699,555 10/31/2003 PAT 7,218,313

Foreign Applications

If Required, Foreign Filing License Granted: 12/16/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US 12/329,411

Projected Publication Date: 06/04/2009

Non-Publication Request: No

Early Publication Request: No

** SMALL ENTITY **

Title

Human Interface System

Preliminary Class

704

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/329,411	12/05/2008	Beth Marcus	19146-0002003

CONFIRMATION NO. 8728

IMPROPER CPOA LETTER

20985
FISH & RICHARDSON, PC
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MINNEAPOLIS, MN 55440-1022



Date Mailed: 02/26/2009

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/18/2009. The Power of Attorney in this application is not accepted for the reason(s) listed below:

- The Power of Attorney you provided did not comply with the new Power of Attorney rules that became effective on June 25, 2004. See 37 CFR 1.32.

/tpnguyen/

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

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 19146-0002003	Application No. 12/329,411
	Applicant Beth Marcus et al.		
	Filing Date December 5, 2008		Group Art Unit

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1						
	2						
	3						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	4	2002 27645 A1	4 April 2002	Germany				
	5							

Other Documents (include Author, Title, Date, and Place of Publication)		
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(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
4. April 2002 (04.04.2002)

PCT

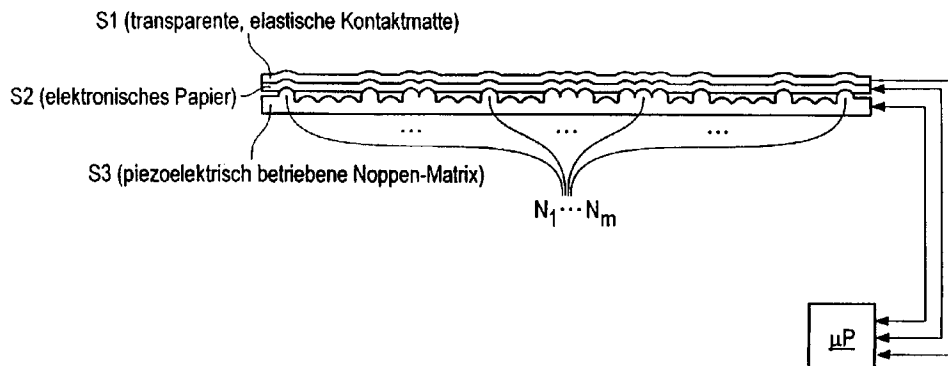
(10) Internationale Veröffentlichungsnummer
WO 02/27645 A1

- (51) Internationale Patentklassifikation⁷: G06K 11/06, 11/08, 11/16 (71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von US): SIEMENS AKTIENGESELLSCHAFT [DE/DE]; Wittelsbacherplatz 2, 80333 München (DE).
- (21) Internationales Aktenzeichen: PCT/DE01/03402 (72) Erfinder; und (75) Erfinder/Anmelder (nur für US): FRANZEN, Michael [DE/DE]; Elbestr. 33, 46395 Bocholt (DE).
- (22) Internationales Anmeldedatum: 5. September 2001 (05.09.2001) (74) Gemeinsamer Vertreter: SIEMENS AKTIENGESELLSCHAFT; Postfach 22 16 34, 80506 München (DE).
- (25) Einreichungssprache: Deutsch (81) Bestimmungsstaaten (national): CN, JP, US.
- (26) Veröffentlichungssprache: Deutsch (84) Bestimmungsstaaten (regional): europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).
- (30) Angaben zur Priorität: 100 46 099.2 18. September 2000 (18.09.2000) DE

[Fortsetzung auf der nächsten Seite]

(54) Title: TOUCH-SENSITIVE DISPLAY WITH TACTILE FEEDBACK

(54) Bezeichnung: BERÜHRUNGSENSITIVE ANZEIGE MIT TAKTILER RÜCKKOPPLUNG



S1 (TRANSPARENT, ELASTIC CONTACT MAT)
S2 (ELECTRONIC PAPER)
S3 (PIEZOELECTRIC KNOB MATRIX)

(57) Abstract: The invention relates to a touch-sensitive display with tactile feedback, comprising a first layer S₁, a mechanically flexible display medium, a second layer S₂ with at least one receptor, and a third layer S₃ with at least one controllable actuator. The second layer S₂ is disposed in such a way that the receptor detects a contact in at least one section of the first layer S₁ and generates at least one first signal. The third layer S₃ is disposed in such a way that the controllable actuator mechanically manipulates the first layer S₁ at least in some points of the section. The display is further provided with a control device µP that is designed and contacted with the second layer S₂ and the third layer S₃ to generate in an initial state at least one second signal for controlling the actuator, at least one modified second signal being generated on the basis of the first signal.

(57) Zusammenfassung: Berührungssensitive Anzeige mit taktiler Rückkopplung mit einer ersten Schicht S₁, mit einem mechanisch flexiblen Anzeigemedium, einer zweiten Schicht S₂ mit mindestens einem Rezeptor, einer dritten Schicht S₃ mit mindestens einem steuerbaren Aktor, wobei die zweite Schicht S₂ derart angeordnet ist, dass der Rezeptor eine Berührung in zumindest einem Teilbereich der ersten Schicht S₁ unter Erzeugung mindestens eines ersten Signals erfasst und

[Fortsetzung auf der nächsten Seite]

WO 02/27645 A1

**Erklärungen gemäß Regel 4.17:**

hinsichtlich der Berechtigung des Anmelders, ein Patent zu beantragen und zu erhalten (Regel 4.17 Ziffer ii) für die folgenden Bestimmungsstaaten CN, JP, europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR)

Erfindererklärung (Regel 4.17 Ziffer iv) nur für US

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Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

wobei die dritte Schicht S3 derart angeordnet ist, dass der steuerbare Aktor die erste Schicht S1 zumindest in dem Teilbereich punktuell mechanisch manipuliert, sowie eine Steuereinrichtung mP, die mit der zweiten Schicht S2 und dritten Schicht S3 derart ausgestaltet und verbunden ist, dass in einem Ausgangszustand mindestens ein zweites Signal zur Ansteuerung des Aktors erzeugt wird, wobei auf Grundlage des ersten Signals mindestens ein geändertes zweites Signal erzeugt wird.

Beschreibung

Berührungssensitive Anzeige mit taktiler Rückkopplung

- 5 Die Erfindung betrifft eine berührungssensitive Anzeige mit taktiler Rückkopplung.

Berührungssensitive Anzeigen "Touchscreens" kommen überwiegend in sogenannten Touchscreen-Terminals zu Einsatz, die
10 mittels Fingerberührung des Bildschirms durch einen Benutzer bedient werden, wobei die vom PC bekannte Tastatur und Maus meist entfallen.

Eine Bestätigung, dass eine von einem Benutzer getätigten
15 Eingaben erfolgt ist, wird im Allgemeinen durch audiovisuelle Rückkopplung erreicht, beispielsweise durch einen Piepton oder Farbwechsel des Anzeigebereichs beim Berühren der Anzeige.

20 Touchscreen-Terminals werden auf Messen, Präsentationen oder im Empfangsbereich eines Unternehmens zum Dialog mit Kunden aufgestellt. Ebenso finden Touchscreen-Terminals auch Anwendung auf Flughäfen, in Stadtzentren als Informations-Terminals für Touristen und in Produktionsstätten zur Erfas-
25 sung und Steuerung von Produktionsabläufen.

Ein Nachteil bei den zuletzt genannten Anwendungen sind laute und unregelmäßig auftretende Umgebungsgeräusche, die an Flughäfen, Straßen bzw. Produktionsstätten gegeben, so das die
30 Gefahr besteht, dass eine auditive Rückkopplung durch die Umgebungsgeräusche überlagert werden und vom Benutzer unbemerkt bleiben.

Eine visuelle Rückkopplung ist ebenfalls von Umgebungseinflüssen abhängig. Beispielsweise können direkte oder reflektierte Sonnenstrahlen zu Irritationen führen, so dass eine
35 visuelle Rückkopplung nicht ihre Wirkung erzielt. Zudem kommt

es auch vor, dass der Benutzer für die visuelle Rückkopplung vorgesehenen Bereiche der Anzeige durch die Hand verdeckt.

Aus der US 4,885,565 ist dazu ein berührungssensitiver Monitor bekannt, bei dem bei einer durch Berührung erfolgten Eingabe eines Benutzers eine taktile Rückkopplung ausgelöst wird, wobei dazu eine Schwingspule durch einen Mikroprozessor derart angesteuert wird, dass sie einen mechanischen Impuls auslöst, der das Gehäuse des Monitors in Schwingung versetzt, so dass zusätzlich zur audiovisuellen Rückkopplung der Benutzer auch spürt, dass seine Eingabe detektiert wurde.

Nachteilig bei dieser Lösung ist, dass egal welche Eingabe durch Berührung erfolgt ist, stets die gleiche taktile Rückkopplung erfolgt und erst durch die Verbindung mit der nach wie vor vorhandenen audiovisuellen Rückkopplung eine Differenzierung möglich ist.

Die der Erfindung zugrundeliegende Aufgabe ist es eine berührungsempfindliche Anzeige mit taktiler Rückkopplung anzugeben, die die Nachteile des Standes der Technik löst.

Diese Aufgabe wird durch die Merkmale des Patentanspruches 1 gelöst.

Erfindungsgemäß weist eine berührungssensitive Anzeige mit taktiler Rückkopplung eine erste mechanisch flexible Schicht, derart ausgestaltet, dass sie als Anzeige funktioniert beispielsweise eine als elektronisches Papier bekannte Folie, eine zweite Schicht aufweisend mindestens einen Rezeptor, eine dritte Schicht aufweisend mindestens einen steuerbaren Aktor, wobei die zweite Schicht derart angeordnet ist, dass der Rezeptor eine Berührung in zumindest einem Teilbereich der ersten Schicht unter Erzeugung mindestens eines ersten Signals erfasst und wobei die dritte Schicht derart angeordnet ist, dass der steuerbare Aktor die erste Schicht zumindest in dem Teilbereich punktuell mechanisch manipuliert sowie eine

Steuereinrichtung, die mit der zweiten und dritten Schicht
derart ausgestaltet und verbunden ist, dass in einem Aus-
gangszustand mindestens ein zweites Signal zur Ansteuerung
des Aktors erzeugt wird, wobei auf Grundlage des ersten Sig-
5 nals mindestens ein geändertes zweites Signal erzeugt wird.

Die erfindungsgemäße Anzeige ermöglicht ein Erfassen einer
Berührung der Anzeige durch den Rezeptor, wobei unmittelbar
10 am Ort der Berührung ein taktiler Feedback gegeben wird, in
dem beispielsweise bei einem auf der Anzeige dargestellten
virtuellen Tastenblock, der durch Druck auf die entsprechende
Stelle der Anzeige bedient werden kann, für jede der darge-
stellten Tasten des Tastenblocks durch den Aktor eine fühlba-
15 re Begrenzung und/oder eine Tastaturbeschriftung, die insbe-
sondere auch für die Realisierung eines Terminals für Sehbe-
hinderte bzw. Blinde hilfreich ist - realisiert wird. Bei-
spielsweise ist es denkbar, dass Tastatur und Beschriftung für
Sehende dargestellt werden, während gleichzeitig durch den
20 Aktor eine Ausgabe in Blindenschrift "Brailleschrift" unter-
halb der dargestellten Taste erzeugt wird.

Durch geeignete Steuerung (Software) kann, um den Eindruck
einer wirklichen Tastatur näher zu kommen, ein Nachgeben bzw.
25 Einrasten der virtuellen Taste erzeugt werden und es ist so-
gar möglich, einen Schieberegler zu simulieren, in dem eine
einen Regler darstellende virtuelle Taste der Berührung bzw.
dem Ziehen der Taste folgt, wobei dazu evtl. die Oberfläche
eines solchen Reglers insbesondere rau und griffig erzeugt
30 wird. Durch die erfindungsgemäße Anzeige erhält der Benutzer
eine intuitive Rückkopplung, die dem Benutzer eine höhere Si-
cherheit im Umgang mit einer berührungssensitiven Anzeige ge-
währt und den Einfluss störender Geräusche und Lichtegeben-
heiten minimiert bzw. neutralisiert.

35

Als erste Schicht besonders geeignet sind Anzeigemedien, die
gemäß der Technologie des "elektronischen Papiers", "mikroge-

kapselten elektrophoretischen Anzeige" oder "organischen Elektro-Lumineszenz" ausgestaltet sind, da diese sehr dünn und ausgestaltet als flexible Folie mechanischen Kräften, die insbesondere punktuell auf die Folienfläche wirken, wie sie
5 der Aktor erzeugt, nachgibt. Dabei ist die Folie derart elastisch ausgestaltet, dass sie in den Ausgangszustand vor der mechanischen Krafteinwirkung zurückkehrt, sobald die Krafteinwirkung beendet ist.

10 Eine Ausgestaltung des Rezeptors als Lichtgitter, erlaubt das indirekte Detektieren von Berührungen, da ein solches knapp über der ersten Schicht angebrachte Lichtgitter lediglich den Ort erfasst an dem ein Benutzer beispielsweise mit dem Finger das Licht des Gitters unterbricht, um eine virtuelle Taste zu
15 berühren. Des Weiteren hat diese Ausgestaltung den Vorteil, dass die zweite Schicht aus dem Luft gebildet wird, welches nur durch die das Lichtgitter realisierende Einrichtungen begrenzt ist, so dass der Aktor keinen zusätzlichen Widerstand zur punktuellen mechanischen Manipulation erfährt und wenig
20 Antriebsenergie benötigt.

Die Ausgestaltung des Aktors als Matrixanordnung von elektrisch und/oder magnetisch angetriebenen Stiften erlaubt die Erzeugung einer Rauheit bzw. Griffigkeit der virtuellen Tas-
25 ten und ist insbesondere für die Realisierung der Ausgabe einer Blindenschrift besonders geeignet.

Eine Matrix von senkrecht zur Anzeige gelagerten beweglichen Stiften als Rezeptor ist geeignet, um das Einrasten bzw.
30 Nachgeben auf einen Tastendruck zu simulieren. Auch das Erfassen eines virtuellen Schiebereglers ist mit dieser Ausgestaltung einfach zu realisieren, da für die Ermittlung der Schieberichtung lediglich der Zustand benachbarter Stifte geprüft werden muss.

35

Stifte von Aktor-Matrix und der Rezeptor-Matrix nebeneinander abwechselnd in der gleichen Ebene (Schicht) anzuordnen spart Raum.

5 Noch vorteilhafter ist es die Stifte derart auszugestalten, dass sie sowohl die Aktor als auch Rezeptor-Funktion erfüllen. Dadurch lässt sich auch effektive und platzsparende Art die Begrenzung bzw. Beschriftung einer virtuellen Taste erzeugen (herausfahren der Stifte), wobei ein (hinein-)drücken
10 der Stifte zum einen das Detektieren der Berührung ermöglicht und zum anderen das Nachgeben bzw. Einrasten. Zudem ist die durch die Ortsübereinstimmung von Rezeptor und Aktorfunktion eine präzisere Zuordnung von ermitteltem Druckpunkt und dargestellter virtueller Information möglich.

15 Piezoelektrische Elemente eignen sich besonders für den Antrieb bzw. das Detektieren von Berührungen da sie, beispielsweise durch Mikroprozessoren erzeugte, Spannungen (Signale) in Druck bzw. Bewegung direkt umsetzen können und umgekehrt
20 Druck in sofort, durch Mikroprozessoren, weiterverarbeitbare Spannungen (Signale) erzeugen.

Elektromagnetische Elemente werden, ebenso wie die piezoelektrischen Elemente, für die Realisierung von Blindenschrift
25 Terminalen, Braillezeile, bekannt und daher leicht zu erwerben.

Eine Sensormatte als Rezeptor vorzusehen, hat unter anderem den Vorteil, dass die Sensormatte als Massenprodukt günstig
30 in der Anschaffung ist.

Ist die zweite Schicht als transparente Sensormatte ausgestaltet, die zudem unmittelbar oberhalb der ersten Schicht zu liegen kommt, wird das mechanisch flexible Anzeigemedium geschützt da es nicht mehr direkt der Berührung durch einen
35 Nutzer ausgesetzt ist. Die Lebensdauer des, sicherlich im

Vergleich zur Sensormatte mit höheren (Anschaffungs-)Kosten verbundenen Anzeigemediums wird erhöht.

Ein Ausführungsbeispiel der Erfindung wird anhand der einzigen Figur dargestellt. Diese zeigt:

Seitenansicht des Schichtaufbaus einer berührungssensitiven Anzeige mit taktilem Feedback.

- 10 In der Figur ist eine in drei Schicht S_1 , S_2 und S_3 gegliederte Anzeige in Seitenansicht dargestellt, wobei in der ersten Schicht S_1 eine transparente, flexible Sensormatte zu liegen kommt.
- 15 Diese Sensormatte ist derart ausgestaltet, dass sie Berührungen detektiert und mindestens ein erstes Signal erzeugt, das zumindest den Ort (kartesische Koordinaten) der Berührung bestimmt.
- 20 Unmittelbar oberhalb dieser ersten Schicht S_1 ist die zweite Schicht S_2 angeordnet, die durch eine flexible elastische Folie gebildet wird, welche nach der Technologie des sogenannten elektronischen Papiers ausgestaltet ist.
- 25 Unter einem elektronischem Papier wird in der Fachwelt ein eine Technologie verstanden, bei der die Vorteile von Flachbildschirmen und Druckerfarbe auf Papier vereint werden, indem kleinste Farbkapseln mit mindestens zwei Farben - etwa Schwarz und Weiß - auf einer Papierfläche je nach elektrischer Ladung an einer einzelnen Stelle mit der einen oder der
- 30 anderen Seite nach oben zeigen. Für die Ansteuerung des dafür notwendigen elektrischen Feldes sind sogenannte Plastik Transistoren gedacht.
- 35 Alternative der Fachwelt bekannte Technologien sind "organische Elektro-Lumineszenz Folien" oder "mikrogekapselte e-

lektrophoretische Anzeigen", die ebenfalls eine Ausgestaltung als flexible sehr dünne Anzeigemedien erlauben.

Für die erfindungsgemäße Anordnung ist die Anwendung dieser
5 Technologie auf eine Folie gedacht, die mechanisch flexibel und elastisch ausgestaltet ist, so dass sie punktuell mechanisch manipuliert werden kann, um Auswuchtungen auf der Oberfläche der Folie zu erzeugen, die sich nach Beenden der mechanischen Manipulation selbständig zurückbilden.

10 Unterhalb der zweiten Schicht S_2 kommt die dritte Schicht S_3 zu liegen, die durch eine flächendeckende Matrix aus senkrecht zur Folienfläche beweglich gelagerten piezoelektrisch betriebenen als Nylon- oder Metallstift ausgestaltete "Noppen"
15 $N_1..N_m$ gebildet wird.

Die drei Schichten S_1, S_2 und S_3 sind dabei derart angeordnet, dass die piezoelektrisch betriebenen Noppen $N_1..N_m$ die ersten beiden Schichten S_1 und S_2 punktuell mechanisch manipulieren
20 können, so dass durch nebeneinander angeordnete Noppen $N_1..N_m$ in einem Ausgangszustand Tastaturbegrenzungen und/oder -beschriftungen eines virtuellen Tastenblock auf der Oberfläche der zweiten Schicht erzeugt und dort zu ertasten sind. Hierbei kann die Beschriftung in der Brailleschrift verfasst
25 sein, so dass sehende Nutzer die Möglichkeit haben eine vom Anzeigenmedium dargestellte virtuelle Tastatur und ihre Funktion zu sehen, wobei sie die Tastaturbegrenzung fühlen können, und gleichzeitig sehbehinderte Nutzer die Möglichkeit haben die Tastaturfunktion durch die von den Noppen $N_1..N_m$
30 erzeugte Brailleschrift zu ertasten.

Zumindest die zweite Schicht S_2 und die dritte Schicht S_3 sind mit einer Steuereinheit μP verbunden, die derart ausgestaltet ist, dass sie in einem Ausgangszustand, d.h. ein Zustand in dem (noch) keine Eingabe durch Berührung erfolgt
35 ist, beispielsweise einen virtuellen Tastaturblock und/oder eine virtuelle Menüleiste durch Erzeugung mindestens eines

zweiten Signals, zur Ansteuerung der Noppen-Matrix $N_1..N_m$,
realisiert wird. Des Weiteren ist die Steuereinheit μP derart
ausgestaltet, dass sie das aufgrund einer Berührung von der
Sensormatte erzeugtes erstes Signal ein mindestens ein neues
5 zweites Signal erzeugt, wobei die Berührung in einem zulässigen
Bereich, das heißt ein Bereich in dem ein virtuelles Be-
dientelement dargestellt ist, erfolgt sein muss.

Die Steuereinheit μP ist dazu außerdem noch mit einer die An-
10 zeige steuernden Einheit verbunden oder bildet mit ihr eine
Einheit, so dass auch Steuersignale zur Erzeugung bedienungs-
bedingter Veränderungen der virtuellen Bedienelemente erzeugt
werden.

15 Als Alternative zu der Sensormatte kann in der zweiten
Schicht S_2 auch ein Lichtgitter zu liegen kommen.

Lichtgitter bestehen im Allgemeinen aus zwei senkrecht zuein-
ander angeordneten Senderleisten, die jeweils mehrere Licht-
20 strahlen emittieren sowie gegenüber jeder Senderleiste ange-
ordnete Empfängerleisten, die die Lichtstrahlen detektiert.
Die Lichtstrahlen der senkrecht angeordneten Senderleisten
kreuzen sich dabei und erzeugen ein Lichtgitter. Bei einem
Durchdringen des Lichtgitters werden auf den senkrecht zuein-
25 ander angeordneten Empfängerleisten, das Ausbleiben jeweils
mindestens eines Lichtstrahls detektiert, so dass sich Koor-
dinatenpaare bilden lassen, mit denen eine genau Bestimmung
des Durchdringungsortes erfolgt. Die ermittelten Koordinaten
können dann als erstes Signal an die Steuereinheit μP gelei-
30 tet werden.

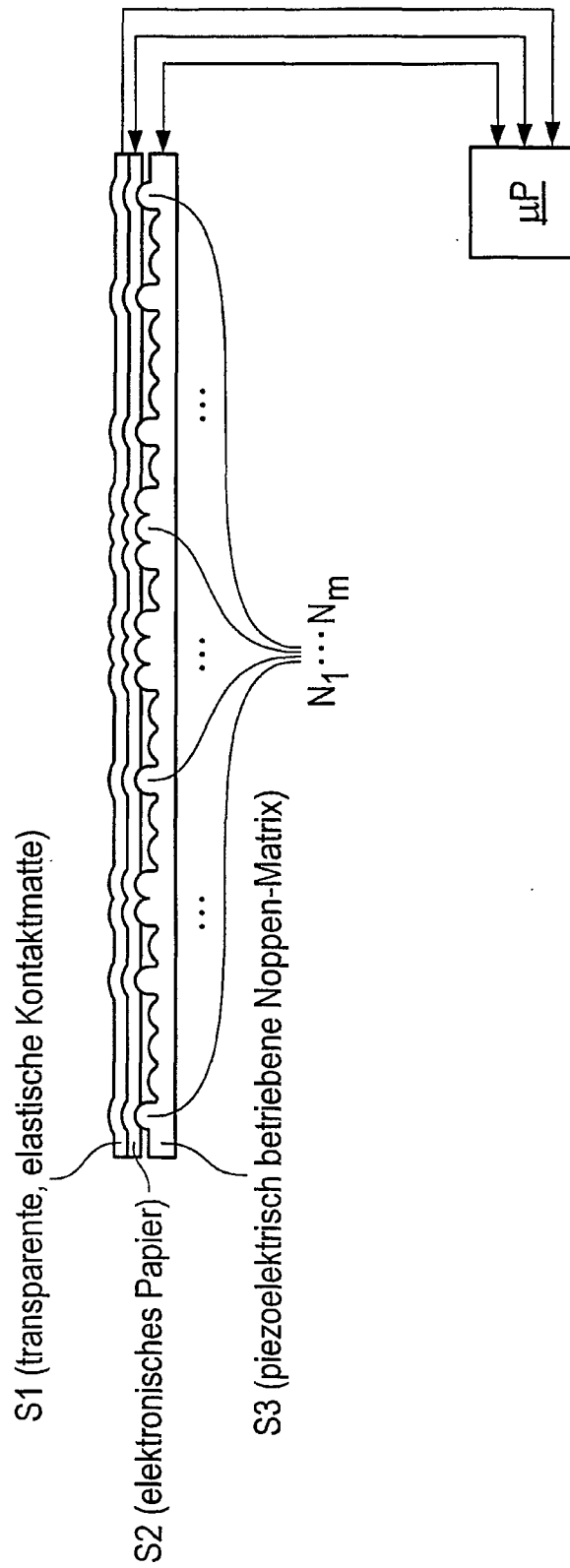
Das Lichtgitter ist dabei derart oberhalb der ersten Schicht
 S_1 angeordnet, dass die durch die Noppen-Matrix $N_1..N_2$ punktu-
ellen Ausbuchtungen der Anzeigenoberfläche keine Lichtstrah-
35 len unterbrechen.

Patentansprüche

1. Berührungssensitive Anzeige mit taktiler Rückkopplung gekennzeichnet durch
 - 5 a) eine erste Schicht S_1 , mit einem mechanisch flexiblen Anzeigemedium,
 - b) eine zweite Schicht S_2 mit mindestens einem Rezeptor,
 - c) eine dritte Schicht S_3 mit mindestens einem steuerbaren Aktor,
 - 10 d) die zweite Schicht S_2 derart angeordnet ist, dass der Rezeptor eine Berührung in zumindest einem Teilbereich der ersten Schicht S_1 unter Erzeugung mindestens eines ersten Signals erfasst,
 - e) die dritte Schicht S_3 derart angeordnet ist, dass der steuerbare Aktor die erste Schicht S_1 zumindest in dem
15 Teilbereich punktuell mechanisch manipuliert,
 - f) eine Steuereinrichtung μP , die mit der zweiten Schicht S_2 und dritten Schicht S_3 derart ausgestaltet und verbunden ist, dass in einem Ausgangszustand mindestens
20 ein zweites Signal zur Ansteuerung des Aktors erzeugt wird, wobei auf Grundlage des ersten Signals mindestens ein geändertes zweites Signal erzeugt wird.
2. Anzeige nach Anspruch 1, dadurch gekennzeichnet, dass das
25 Anzeigemedium eine gemäß der Technologie des "elektronischen Papiers", "mikrogekapselten elektrophoretischen Anzeige" oder "organischen Elektro-Lumineszenz", ausgestaltete Folie ist.
- 30 3. Anzeige nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass der Rezeptor als "Lichtgitter" ausgestaltet ist.
4. Anzeige nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, dass
35 a) der Aktor eine erste Matrixanordnung beweglich gelagerter elektrisch und/oder magnetisch angetriebener Stifte $N_1..N_m$ ist,

- b) die Stifte $N_1..N_m$ senkrecht zur Fläche der ersten Schicht S_1 bewegbar sind.
5. Anzeige nach einem der Ansprüche 2 bis 4, dadurch gekennzeichnet, dass
- 5 a) der Rezeptor eine zweite Matrixanordnung beweglich gelagerter Stifte $N_1..N_m$ ist,
- b) die Stifte $N_1..N_m$ senkrecht zur Fläche der ersten Schicht S_1 bewegbar sind.
- 10 6. Anzeige nach Anspruch 5, dadurch gekennzeichnet, dass die zweite Schicht S_2 und dritte Schicht S_3 eine gemeinsame Schicht bilden, wobei die Stifte $N_1..N_m$ der ersten Matrixanordnung und die Stifte $N_1..N_m$ der zweiten Matrixanordnung nebeneinander angeordnet sind.
- 15 7. Anzeige nach Anspruch 6, dadurch gekennzeichnet, dass die Stifte $N_1..N_m$ als Aktor und zugleich Rezeptor ausgestaltet sind.
- 20 8. Anzeige nach einem der Ansprüche 4 bis 6, dadurch gekennzeichnet, dass die Stifte $N_1..N_m$ piezoelektrische Elemente sind.
- 25 9. Anzeige nach einem der Ansprüche 4 bis 6, dadurch gekennzeichnet, dass die Stifte $N_1..N_m$ elektromagnetische Elemente sind.
- 30 10. Anzeige nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, dass die zweite Schicht S_2 eine Sensormatte ist.
- 35 11. Anzeige nach Anspruch 10, dadurch gekennzeichnet, dass
- a) die erste Schicht S_1 unterhalb der zweiten Schicht S_2 zu liegen kommt,
- b) die zweite Schicht S_2 transparent und flexibel ist.

1/1



INTERNATIONAL SEARCH REPORT

International Application No
PCT/DE 01/03402

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G06K11/06 G06K11/08 G06K11/16</p>		
<p>According to International Patent Classification (IPC) or to both national classification and IPC</p>		
<p>B. FIELDS SEARCHED</p>		
<p>Minimum documentation searched (classification system followed by classification symbols) IPC 7 G06K</p>		
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>		
<p>Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, PAJ</p>		
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 118 435 A (KAWAKAMI MASAHIKO ET AL) 12 September 2000 (2000-09-12) column 3, line 63 -column 9, line 5; figures 1,2	1
A	US 5 977 867 A (BLOUIN FRANCOIS) 2 November 1999 (1999-11-02) the whole document	1
A	US 5 412 189 A (CRAGUN BRIAN J) 2 May 1995 (1995-05-02) abstract	1
<p><input type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.</p>		
<p>* Special categories of cited documents :</p>		
<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p>		
<p>*E* earlier document but published on or after the international filing date</p>		
<p>*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)</p>		
<p>*O* document referring to an oral disclosure, use, exhibition or other means</p>		
<p>*P* document published prior to the international filing date but later than the priority date claimed</p>		
<p>*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</p>		
<p>*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</p>		
<p>*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.</p>		
<p>* & * document member of the same patent family</p>		
<p>Date of the actual completion of the international search</p>		<p>Date of mailing of the international search report</p>
<p>12 December 2001</p>		<p>20/12/2001</p>
<p>Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016</p>		<p>Authorized officer Schmidt, R</p>

INTERNATIONAL SEARCH REPORT

International Application No
PCT/DE 01/03402

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6118435	A	12-09-2000	JP 10289061 A JP 10293644 A	27-10-1998 04-11-1998
US 5977867	A	02-11-1999	NONE	
US 5412189	A	02-05-1995	NONE	

INTERNATIONALER RECHERCHENBERICHT

In: ionales Aktenzeichen

PCT/DE 01/03402

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
 IPK 7 G06K11/06 G06K11/08 G06K11/16

Nach der internationalen Patentklassifikation (IPK) oder nach der nationalen Klassifikation und der IPK

B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)
 IPK 7 G06K

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

EPO-Internal, WPI Data, PAJ

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	US 6 118 435 A (KAWAKAMI MASAHIKO ET AL) 12. September 2000 (2000-09-12) Spalte 3, Zeile 63 -Spalte 9, Zeile 5; Abbildungen 1,2 ---	1
A	US 5 977 867 A (BLOUIN FRANCOIS) 2. November 1999 (1999-11-02) das ganze Dokument ---	1
A	US 5 412 189 A (CRAGUN BRIAN J) 2. Mai 1995 (1995-05-02) Zusammenfassung -----	1

Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

Siehe Anhang Patentfamilie

* Besondere Kategorien von angegebenen Veröffentlichungen :

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Z Veröffentlichung, die Mitglied derselben Patentfamilie ist

Datum des Abschlusses der internationalen Recherche

12. Dezember 2001

Absendedatum des internationalen Recherchenberichts

20/12/2001

Name und Postanschrift der Internationalen Recherchenbehörde

Europäisches Patentamt, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Bevollmächtigter Bediensteter

Schmidt, R

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen
PCT/DE 01/03402

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
US 6118435 A	12-09-2000	JP 10289061 A JP 10293644 A	27-10-1998 04-11-1998
US 5977867 A	02-11-1999	KEINE	
US 5412189 A	02-05-1995	KEINE	

Electronic Acknowledgement Receipt

EFS ID:	4851728
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Jeanne Amour
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	24-FEB-2009
Filing Date:	05-DEC-2008
Time Stamp:	20:11:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		191460002003IDSSTMT.pdf	199964 <small>2a553e5071f834ec200024c12055783e2706cef9</small>	yes	2

Multipart Description/PDF files in .zip description			
Document Description	Start	End	
Information Disclosure Statement Letter	1	1	
Information Disclosure Statement (IDS) Filed (SB/08)	2	2	

Warnings:

Information:

2	Foreign Reference	191460002003FOREIGNREF. PDF	638837 <small>b9ad28523f4ea7178a5eae1bef7c65213aa39641</small>	no	17
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Warnings:

Information:

Total Files Size (in bytes):	838801
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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Beth Marcus et al. Art Unit : Unknown
Serial No. : 12/329,411 Examiner : Unknown
Filed : December 5, 2008 Conf. No. : 8728
Title : HUMAN INTERFACE SYSTEM

MAIL STOP MISSING PARTS

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

RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION

In response to the Notice to File Missing Parts of Application under 37 CFR §1.53(b) mailed December 18, 2009, applicant claims small entity status (see 37 CFR §1.27) and submits herewith the following:

- Payment of the basic filing fee of \$82;
- Payment of the search fee of \$270;
- Payment of the examination fee of \$110;
- Payment of the additional/multiple dependent claims fees of \$26;
- Payment of the surcharge of \$65 for late filing of the basic filing fee and/or declaration; and
- A Declaration in compliance with 37 CFR §1.63.

Please apply the total amount due of \$553 to Deposit Account No. 06-1050.

It is understood that this perfects the application and no additional papers or filing fees are required. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: February 18, 2009

/Hwa C. Lee/
Hwa C. Lee
Reg. No. 59,747

Fish & Richardson P.C.
PTO Customer No. 20985
Telephone: (858) 678-5070
Facsimile: (877) 769-7945

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled HUMAN INTERFACE SYSTEM, the specification of which:

- is attached hereto.
- was filed on _____ as Application Serial No. _____ and was amended on _____.
- was described and claimed in PCT International Application No. _____ filed on _____ and as amended under PCT Article 19 on _____.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information I know to be material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim the benefit under Title 35, United States Code, §119(e)(1) of any United States provisional application(s) listed below:

U.S. Serial No.	Filing Date	Status
-----------------	-------------	--------

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information I know to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

U.S. Serial No.	Filing Date	Status
-----------------	-------------	--------

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

Country	Application No.	Filing Date	Priority Claimed
---------	-----------------	-------------	------------------

I hereby appoint the following attorneys and/or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Scott C. Harris, Reg. No. 32,030
 David L. Feigenbaum, Reg. No. 30,378
 Hans R. Troetch, Reg. No. 36,950
 Bing Ai, Reg. No. 43,312
 Frederick H. Iabin, Reg. No. 24,488
 John C. Phillips, Reg. No. 35,322
 Alexander C. Chen, Reg. No. 45,591
 Denis Malone, Reg. No. 29,670; including

John Hayden, Reg. No. 37,640
 Dorothy Whelan, Reg. 33,814
 Linda G. Gunderson, Reg. No. 46,341
 Richard J. Anderson, Reg. No. 36,732
 Samuel Borodach, Reg. No. 38,388
 Kenyon Jenckes, Reg. No. 41,873
 William Hunter, Reg. No. 47,671

Combined Declaration and Power of Attorney
Page 2 of 2 Pages

Direct all telephone calls to JOHN P. SCHNURER at telephone number (858) 678-5070.

Direct all correspondence to the following:

20985
PTO Customer Number

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 of any patents issued thereon.

Full Name of Inventor: BETH MARCUS

Inventor's Signature: Beth Marcus

Date: 9/25/03

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Citizenship: United States

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Full Name of Inventor: W. DAVID LEE

Inventor's Signature: W. David Lee

Date: September 19, 2003

Residence Address: 343 Otis Street
Newton, MA 02165

Citizenship: United States

Post Office Address: 343 Otis Street
Newton, MA 02165

10327279.doc

Electronic Patent Application Fee Transmittal

Application Number:	12329411
Filing Date:	05-Dec-2008
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Filer:	Hwa C. Lee/Carroll Allman
Attorney Docket Number:	19146-0002003

Filed as Small Entity

Utility 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	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110

Pages:

Claims:

Claims in excess of 20	2202	1	26	26
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Miscellaneous-Filing:

Late filing fee for oath or declaration	2051	1	65	65
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Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD (\$)	553

Electronic Acknowledgement Receipt

EFS ID:	4813889
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Carroll Allman
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	18-FEB-2009
Filing Date:	05-DEC-2008
Time Stamp:	14:36:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$553
RAM confirmation Number	9923
Deposit Account	061050
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1		19146-0002003MP.PDF	100984 d12378e687ab8a784d76db48aacbbe5a28a91565	yes	3
Multipart Description/PDF files in .zip description					
Document Description		Start		End	
Applicant Response to Pre-Exam Formalities Notice		1		1	
Oath or Declaration filed		2		3	
Warnings:					
Information:					
2	Fee Worksheet (PTO-06)	fee-info.pdf	37696 158002055a3ab79ae399f252e126ffd84092631c	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			138680		
<p>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.</p> <p><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.</p> <p><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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>					

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 19146-0002003	Application No. 12/329,411
	Applicant Beth Marcus et al.		
	Filing Date December 5, 2008		Group Art Unit

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1	6,297,752	10/2/2001	Ni			
	2	2003020692	1/3/2003	Griffin et al.			
	3	2003122784	7/3/2003	Shkolnikov			
	4						
	5						
	6						
	7						
	8						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	9							
	10							
	11							
	12							

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	13	State Intellectual Property Office of PRC Notification of First Office Action dated November 21, 2008, Chinese Patent Appln No. 200710153371.3
	14	
	15	

Examiner Signature	Date Considered
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EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt

EFS ID:	4661290
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Carroll Allman
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	22-JAN-2009
Filing Date:	05-DEC-2008
Time Stamp:	19:15:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		19146-0002003IDS.PDF	1282586 447abc56989b5ba9f80b1808eef1b7cb3269bdd9	yes	21

Multipart Description/PDF files in .zip description			
Document Description		Start	End
Information Disclosure Statement Letter		1	1
Information Disclosure Statement (IDS) Filed (SB/08)		2	2
Foreign Reference		3	21

Warnings:

Information:

Total Files Size (in bytes):	1282586
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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
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Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 4 columns: APPLICATION NUMBER (12/329,411), FILING OR 371(C) DATE (12/05/2008), FIRST NAMED APPLICANT (Beth Marcus), ATTY. DOCKET NO./TITLE (19146-0002003)

CONFIRMATION NO. 8728

FORMALITIES LETTER



20985
FISH & RICHARDSON, PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Date Mailed: 12/18/2008

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given TWO MONTHS from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment.

- The statutory basic filing fee is missing. Applicant must submit \$82 to complete the basic filing fee for a small entity.
The oath or declaration is missing. A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of \$26 as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is \$553 for a small entity

- \$82 Statutory basic filing fee.
\$65 Surcharge.
The application search fee has not been paid. Applicant must submit \$270 to complete the search fee.

- The application examination fee has not been paid. Applicant must submit **\$110** to complete the examination fee for a small entity in compliance with 37 CFR 1.27.
- Total additional claim fee(s) for this application is **\$26**
 - **\$26** for **1** total claims over 20.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/rerry/

Office of Data Management, 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
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Alexandria, Virginia 22313-1450
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Table with 7 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY. DOCKET NO, TOT CLAIMS, IND CLAIMS. Row 1: 12/329,411, 12/05/2008, 2626, 0.00, 19146-0002003, 21, 2

CONFIRMATION NO. 8728

20985
FISH & RICHARDSON, PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

FILING RECEIPT



Date Mailed: 12/18/2008

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

Applicant(s)

Beth Marcus, Bedford, MA;
W. David Lee, Newton, MA;

Assignment For Published Patent Application

ZEEMOTE, INC., Chelmsford, MA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 11/747,863 05/11/2007 PAT 7,463,245
which is a CON of 10/699,555 10/31/2003 PAT 7,218,313

Foreign Applications

If Required, Foreign Filing License Granted: 12/16/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US 12/329,411

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

** SMALL ENTITY **

Title

Human Interface System

Preliminary Class

704

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 Assets Control, 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).

FISH & RICHARDSON P.C.

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12390 EL CAMINO REAL
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Web Site
WWW.FR.COM

December 5, 2008

Attorney Docket No.: 19146-0002003

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

Presented for filing is a new continuation patent application of:

Applicant: BETH MARCUS AND W. DAVID LEE

Title: HUMAN INTERFACE SYSTEM

Assignee: Zeemote, Inc.

The prior application is assigned of record to Zeemote, Inc., a Delaware corporation, by virtue of an assignment submitted to the Patent and Trademark Office and recorded on August 22, 2008, at Reel 021429/Frame 0373.

Enclosed are the following papers, including those required to receive a filing date under 37 C.F.R. § 1.53(b):

	<u>Pages</u>
Specification	21
Claims	4
Abstract	1
Declaration	[To be Filed at a Later Date]
Drawings	9

Enclosures:

- Application Data Sheet, 5 pages.
- Form PTO-1449, 10 pages, listing documents cited in the parent application(s). Please confirm that these have been considered in this application by returning a copy of the Form PTO-1449 with the examiner's initials.

This application is a continuation (and claims the benefit of priority under 35 USC 120) of U.S. application serial no. 11/747,863, filed May 11, 2007; and claims the benefit of priority under 35 USC 120) of U.S. application serial no. 10/699,555, filed October 31, 2003. The disclosure of the prior applications is considered part of (and is incorporated by reference in) the disclosure of this application.

Applicant claims small entity status. See 37 CFR 1.27.

Frederick P. Fish
1855-1930

W.K. Richardson
1859-1951



ATLANTA

AUSTIN

BOSTON

DALLAS

DELAWARE

HOUSTON

MUNICH

NEW YORK

SAN DIEGO

SILICON VALLEY

TWIN CITIES

WASHINGTON, DC

FISH & RICHARDSON P.C.

Commissioner for Patents
December 5, 2008
Page 2

Basic Filing Fee			\$82
Search Fee			\$270
Examination Fee			\$110
Total Claims 21	over 20	1 x \$26	\$26
Independent Claims 2	over 3	0 x \$110	\$0
Fee for Multiple Dependent claims			\$0
Fee for each additional 50 pages of Specification and Drawings over 100 - 0			\$0
Total Filing fee			\$0

Under 37 C.F.R. §1.53(f), no filing fee is being paid at this time.

If this application is found to be incomplete, or if a telephone conference would otherwise be helpful, please call the undersigned at (858) 678-5070.

Please direct all correspondence to the following:

20985

PTO Customer Number

Respectfully submitted,



Hwa C. Lee
Reg. No. 59,747
Enclosures
HCL/cla
10889233.doc

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 19146-0002003	Application No. unknown
	Applicant Beth Marcus et al.		
	Filing Date December 5, 2008		Group Art Unit unknown

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1	4,793,312	12/27/1988	Doinaga et al.			
	2	4,867,028	09/19/1989	Peter S. Jones			
	3	4,891,777	01/02/1990	James M. Lapeyre			
	4	4,896,554	01/30/1990	Craig F. Culver			
	5	4,912,462	03/27/1990	Washizuka et al.			
	6	5,189,416	02/23/1993	Mark D. Estes			
	7	5,365,589	11/15/1994	Howard A. Gutowitz			
	8	5,432,510	07/11/1995	Walter S. Matthews			
	9	5,473,325	12/05/1995	Peter J. McAlindon			
	10	5,512,919	04/30/1996	Yoshitsugu Araki			
	11	5,515,305	05/7/1996	Register et al.			
	12	5,612,690	03/18/1997	David Levy			
	13	5,782,642	07/21/1998	Michael Goren			
	14	5,824,931	10/20/1998	M. G. Papadopoulos			
	15	5,859,629	01/12/1999	Bruce Tognazzini			
	16	5,900,864	05/04/1999	Bruce W. Macdonald			
	17	5,973,621	10/26/1999	David Levy			
	18	6,005,496	12/21/1999	Hargreaves et al.			
	19	6,084,576	07/04/2000	Leu et al.			
	20	6,107,988	08/22/2000	Phillipps			
	21	6,115,028	09/5/2000	Balakrishnan et al.			
	22	6,184,804	02/06/2001	Shelton E. Harrison			
	23	6,219,731	04/17/2001	Howard A. Gutowitz			
	24	6,228,709	05/8/2001	Wen-Yi Hsieh			
	25	6,232,956	05/15/2001	Daniel S. Mailman			
	26	6,297,752	10/2/2001	Ni			
	27	2002/0019259	02/14/2002	Brad A. Armstrong			

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 19146-0002003	Application No. unknown
	Applicant Beth Marcus et al.		Filing Date December 5, 2008
			Group Art Unit unknown

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	28	2002/0023265	02/21/2002	Mercalf			
	29	6,377,685	04/23/2002	Ravi C. Krishnan			
	30	RE37723	06/4/2002	Michael Goren			
	31	2002/163504	11/7/2002	Pallakoff			
	32	6,512,511	01/28/2003	Willner et al.			
	33	2003/020692	01/30/2003	Griffin, et al.			
	34	6,520,699	02/18/2003	Toshiyasu Abe			
	35	2003/0048205	03/13/2003	He			
	36	2003/061103	03/27/2003	Kanai			
	37	6,541,715	04/01/2003	Philip Swanson			
	38	6,542,091	04/01/2003	Wayne Allen Rasanen			
	39	6,546,239	04/08/2003	Pazdersky et al.			
	40	6,573,844	06/3/2003	Venolia et al.			
	41	6,606,486	08/12/2003	Cubbage et al.			
	42	2003/169188	09/11/2003	Chang et al.			
	43	2003/193418	10/16/2003	Shi			
	44	6,654,733	11/25/2003	Goodman et al.			
	45	6,703,963	03/9/2004	Timothy B. Higginson			
	46	6,738,045	05/18/2004	Hinkley et al.			
	47	6,741,235	05/25/2004	Michael Goren			
	48	6,760,013	07/6/2004	Willner et al.			
	49	2004/0208681	10/21/2004	Dechene, Joseph Fernand			
	50	6,865,718	03/8/2005	Levi Montalcini			
	51	6,885,317	04/26/2005	Howard A. Gutowitz			
	52	6,885,318	04/26/2005	Matthew J. Bickerton			
	53	2005/093846	05/5/2005	Marcus et al.			
	54	6,909,424	06/21/2005	Liebenow et al.			

Examiner Signature	Date Considered
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EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 19146-0002003	Application No. unknown	
	Applicant Beth Marcus et al.		Filing Date December 5, 2008	Group Art Unit unknown

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	55	6,911,608	06/28/2005	David H. Levy			
	56	6,947,028	09/20/2005	Shkolnikov			
	57	6,980,200	12/27/2005	Michael Goren			
	58	7,072,975	07/4/2006	Kato			
	59	7,092,734	08/15/2006	Herle, et al.			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	60	0251477	01/7/1988	EPO				
	61	91/05303	04/18/1991	WIPO				
	62	0585730	03/9/1994	EPO				
	63	1999-0072889	09/27/1999	Korea				
	64	JP2000-267787A	09/29/2000	Japan			X	
	65	1103883	05/30/2001	EPO				
	66	1293882	03/19/2003	EPO				
	67	03/042805	05/22/2003	WIPO				

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	68	"Introducing the Dvorak Keyboard", http://www.mwbrooks.com/dvorak/
	69	Alphagrip http://www.alphagrips.com/AlphagripAG5UsersManual.pdf
	70	Amy K. Karlson, Benjamin B. Bederson, John SanGiovanni, 2004. AppLens and LaunchTile: Two Designs for One-Handed Thumb Use on Small Devices http://hcil.cs.umd.edu/trs/2004-37/2004-37.html
	71	Andriy Pavlovych, Wolfgang Stürzlinger: Less-Tap: A Fast and Easy-to-learn Text Input Technique for Phones. Graphics Interface 2003, 97-104 http://www.graphicsinterface.org/cgi-bin/DownloadPaper?name=2003/170/paper170.pdf
	72	Atrua: sensor company http://www.atrua.com/s-mobilephones.html

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 19146-0002003	Application No. unknown
	Applicant Beth Marcus et al.		
	Filing Date December 5, 2008		Group Art Unit unknown

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	73	Baillie, L., Kunczier, H., and Anegg, H. 2005. Rolling, rotating and imagining in a virtual mobile world. In Proceedings of the 7th international Conference on Human Computer interaction with Mobile Devices & Services (Salzburg, Austria, September 19 - 22, 2005). MobileHCI '05, vol. 111. ACM Press, New York, NY, 283-286. http://doi.acm.org/10.1145/1085777.1085833
	74	Bartlett, J. F. 2000. Rock 'n' Scroll Is Here to Stay. IEEE Comput. Graph. Appl. 20, 3 (May. 2000), 40-45. http://portal.acm.org/citation.cfm?id=618728&coll=Portal&dl=GUIDE&CFID=66588306&CFTOKEN=73460863#
	75	Bluetooth GPS http://mobilitytoday.com/news/005986/mobility_buyGPSnow_i-Blue_bluetooth_GPS
	76	Buxton, "A Directory of Sources for Input Technologies", 10/1/2003, http://www.billbuxton.com/InputSources.html
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Human Interface System

PRIORITY INFORMATION

[0001] This application is a continuation of U.S. application serial no. 11/747,863, filed on May 11, 2007, and claims priority under 35 U.S.C. 119(e) to U.S. application serial no. 11/747,863, filed on May 11, 2007; and to U.S. application serial no. 10/699,555, filed on October 31, 2003; and the disclosure of the prior applications is considered part of (and is incorporated by reference in) the disclosure of this application.

BACKGROUND

[0002] The following description relates to human interface and input systems for electronic devices, particularly hand-held electronic devices, such as cell phones, personal digital assistants (“PDAs”), pocket personal computers, smart phones, hand-held game devices, bar-code readers, remote controls, and other similar input devices having a keypad or one or more input elements.

[0003] Electronic devices have become increasingly sophisticated and physically smaller due in part to a decrease in the price of processing power and a concurrent increase in demand by consumers for smaller devices. Such devices, however, tend to be limited in function and utility by the user’s ability to interface with the device for data input (e.g., text, numeric, and functional input) and/or device control, which becomes increasingly more difficult to do as the available space on the device’s surface for positioning the input elements, which are used for data input and/or device control, continues to decrease.

[0004] Various human interface and input systems and techniques for hand-held electronic devices have been developed for data input and device control. These include miniature keyboards and keypads used in combination with chordal input techniques, modal input techniques and/or smart keys; and touch screens used in combination with on-screen keyboard or keypad software or hand-writing recognition software.

Keyboard or Key pad Used With Chordal, Modal and Smart Key Techniques

[0005] Miniature keyboards and keypads are similar to their standard full-size versions—i.e., a keyboard generally has a full set or substantially full set of numeric, character, and functional input elements, while key pads typically have a reduced set of numeric, character and/or functional input elements compared to keyboards. These miniature input devices

typically are designed to fit the available space on one surface of a hand-held electronic device or are designed as small, easily transportable, external plug-in devices. Thus, as hand-held electronic devices become smaller, the size of the input elements typically has been reduced in order for the desired number of input elements to fit on one surface of the electronic device.

5 [0006] For data input and device control, miniature keyboards and keypads typically either require one of two input techniques-- use of one or more thumbs or fingers to press the desired input elements or use of a stylus to "peck" the desired input elements (which is usually done where the input element is of smaller size). Various techniques, such as chordal input techniques, modal input techniques and smart keys, have been developed and implemented to
10 improve the efficiency and effectiveness of using miniature keyboards and keypads.

- **Chordal Input Techniques**

[0007] Chordal input techniques generally are based upon the principle that characters, symbols, words, phrases or concepts can be represented by a reduced set of input elements. Thus, by only having to press a reduced combination of input elements, functionality can be
15 increased and quicker and more accurate data input can be realized. Chordal input techniques can be used on any keyboard or keypad configuration or any device having more than one input element, and typically results in fewer input elements or more functions compared to conventional keyboards or keypads. An example of an electronic device using two-handed chordal input techniques is a court reporter or stenographer's typewriter. One chordal input
20 technique using a keypad to decrease the number of actuations to achieve a large number of functions is described in U.S. Patent No. 5,973,621 to Levy, entitled "Compact Keyed Input Device," which is incorporated herein by reference.

- **Modal Input Techniques**

[0008] Modal input techniques are based on the concept that functions of the electronic
25 device, e.g., text messaging in a cell-phone or PDA, can be accessed by pressing a particular input element (or combination of elements) on a keyboard or keypad. Once that particular input element is pressed, the functionality of all or a portion of the input elements on the keyboard or keypad may change. Modal techniques typically are used in calculators, cell-phones, and PDAs. For example, in cell phones, a modal technique called multi-tap is common, in which individual
30 input elements on the keypad are associated with multiple symbols, such as characters, letters, numbers, icons or other types of symbols, which tends to reduce the number of input elements

required to achieve the desired functions, e.g., a twelve-input-element keypad can be used to represent all letters of the English alphabet and the decimal digits. A user can input a desired symbol within a set of symbols associated with a certain input element by tapping on that particular input element with a thumb, finger, or stylus, one or more times to input the desired character. Thus, if a user desires to send a text message, the user may press a functional input element, e.g., a mode key, to access the text messaging functionality of the cell phone and then tap an individual input element one or more times to select the associated symbol for input. The number of taps needed to input a particular symbol may differ depending on the language character set chosen. For example, Japanese keypad or keyboards typically require a minimum set of 46 characters for text input, while English or American keyboards and keypads usually require a minimum set of 26 characters for text input. These modal input techniques have gained some popularity as users perform more text functions.

- **Smart Keys**

[0009] Smart keys are typically used on keypads and refer to a single key or combination of keys that, when pressed, predict the users next logical action. Some implementations work better than others and some applications reduce the number of keystrokes required to complete a function better than others. Word-predictor software, for example, attempts to predict the word or character the user intends to input based upon one or more letters inputted by the user and the likely probabilities within a given language. The probability of the software guessing correctly increases with the length of the word or number of letters or characters inputted. In a device using smart keys on the keypad, a user may tap the keys 2, 2 and 8 in sequence to generate the word “cat” and the device would display that word first because it is usually the most common combination, whereas the word “bat,” which can be generated by pressing the same keys, would not be displayed first because it is not as common. Also, the word “cat” may be displayed after pressing the 2 key the second time based on a guess by the word-predictor software.

[0010] Smart keys also are typically used for Japanese data input where a user phonetically inputs letters representing the sound of the Japanese character (e.g., a Kanji character). Based on the inputted letters, the predictor software guesses the Japanese character. To select the character, a user would press the accept button or use the scrolling function to go to the next character with a similar set of phonetic inputs.

Touch Screen Using On-Screen Keyboard or Handwriting Recognition Software

[0011] Using on-screen keyboard or keypad software with a touch screen offers users the ability to enter data with fingers or thumbs on a screen-sized keyboard or buttons, allowing faster data input without a stylus or physical keyboard or keypad accessory; while using handwriting recognition software with a touch screen, such as Graffiti[®] on the Palm operating system, offers users the ability to enter text with a stylus by writing the text directly on the touch screen. Touch screens usually consume more power and are more expensive than non touch-sensitive screens. This higher power consumption can be a problem for hand-held electronic devices, which typically have limited power resources. Moreover, touch screens usually require the user to use both hands (e.g., one hand is used to hold and steady the device while the other hand is used to grasp the stylus), which is generally undesirable for interfacing with and controlling one handed hand-held electronic device, such as cell phones. Handwriting recognition software has improved the slowness and awkwardness inherent in stylus, finger or thumb input but other drawbacks still remain, such as high power consumption, the necessity to use both hands, and lack of tactile feedback to inform a user when an input element has been. Moreover, recognition software requires training to use properly, and, even then, still results in a high error rate.

Game Control

[0012] For game control, many of the above approaches have been used, but in most hand-held electronic devices, a user typically controls game play through the use of some form of input element, such as on a miniature keypad and/or directional pad (“D-pad”), which typically is located on the front surface of the device. Game control on some hand-held electronic devices, such as cell phones, is inherently one handed or at most two thumbbed because of the size of the device, while game control on other hand-held electronic devices, such as PDAs and conventional game console controllers, is typically two-handed. The input elements associated with game control on these devices are typically digital even though analog input elements have been used on game controllers for PC and console game systems, such as Microsoft’s Xbox or Sony’s Play Station 2.

SUMMARY

[0013] The present inventors recognized that conventional human interface and input systems for hand-held electronic devices tended to be relatively inflexible, cumbersome, and

inefficient to use, among other reasons, because they were not designed to take advantage of the biomechanics of the human hand, particularly the advantages associated with the opposition of the thumb to the fingers and the beneficial attributes of the thumb, e.g., its large range of motion and ability to impart large sustained forces, and the beneficial attributes of the fingers, e.g., their fine motor control, spatial memory and rapidity of motion.

[0014] The present inventors also recognized that the input techniques developed to improve the efficiency of data input and device control, such as chordal and modal techniques, were limited by the inefficiencies inherent in conventional input systems. For example, miniature keyboards and keypads used in combination with chordal input techniques not only required the user to memorize numerous input combinations and develop the necessary motor skills to control a reduced number of input elements to provide even more complex functionality compared to typical QWERTY keyboards, but also did not use or allocate input tasks to the fingers and thumb of the human hand effectively. Moreover, miniature keyboards and keypads used in combination with modal input techniques tended to limit the user's ability to efficiently input data depending on the number of taps required to input a particular symbol and how fast the user could tap the input element with his thumb or a stylus to select the particular symbol.

[0015] The present inventors also recognized that a user's ability to control game play in such devices was greatly limited. For example, while analog game control has been available to users of PC and console game systems, analog game control generally has not been widely available on hand-held electronic devices, such as cell phones and PDAs. Moreover, because the game controls for conventional hand-held electronic devices were typically positioned on the front surface of the device, the user's hand typically obscured the user's view of the video screen. Also, the "fast twitch" control (e.g., a trigger) for shooting or activating special purpose game controls, which users have come to expect in console and PC game systems, generally has not been available to users of such hand-held electronic devices due in part to the nature of conventional interface and input systems, which were optimized for data input rather than for game control.

[0016] Consequently, the present inventors developed a flexible and efficient human interface and input system and techniques for hand-held electronic devices (whether one handed or two handed) that utilize the opposed thumb and finger ergonomics inherent in the hand and the skills already developed for using conventional input techniques to accomplish data input,

device control and game control in a timely, efficient, comfortable and intuitive manner. Thus, no specialized training beyond that normally expected with any newly purchased hand-held device is expected.

[0017] Implementations of the human interface and input system for hand-held electronic devices described here may include various combinations of the following features.

[0018] The human interface and input system for a hand-held electronic device may be configured to include on a first surface a plurality of input elements that can be manipulated by one or both of a human user's thumbs or a stylus. At least one of the input elements may be configured in software to provide access to a plurality of input functions. For example, one of the input elements may provide access to the text symbols 5, j, k and l, while another input element may provide access to the text symbols 3, d, e and f, such as is found on a typical cell phone keypad. The human interface and input system also includes on a second surface one or more selection elements that may be manipulated by any of the human user's fingers. The selection elements may be associated with one or more input functions, which may be configured in software. For example, the selection elements may be configured to correspond to a particular shift position. Therefore, when a user manipulates a selection element, which is configured to correspond to a third shift position, for example, then the input function that may be accessed by a particular input element will be the third input function associated with the input element. In the example provided above, the third input function may be the text symbol "k" for the input element that provides access to the text symbols 5, j, k and l.

[0019] One of the selection elements may be a pressure sensor pad that can be configured to represent a plurality of delineated active areas, as well as inactive areas. These delineated active areas likewise can be configured in software to represent one or more input functions. A shape changing media also may be provided with the pressure sensor pad so as to permit a human user to tactilely discriminate between the plurality of delineated active areas and/or inactive areas.

[0020] The input elements and/or selection elements also may be associated with a palpable detent, vibratory unit and/or force producing unit, which may provide tactile feedback to the user when the user manipulates the elements or in response to events occurring in a software application running on a processor.

[0021] The human interface and input system also may be configured to include a first input assembly and a second input assembly. The first input assembly may include a plurality of input or selection elements situated on one or more surfaces of the electronic device and configured to be easily and comfortably actuated by one or both of a human user's thumbs or a stylus. The second input assembly may include one or more input or selection elements situated on one ore more surfaces of the electronic device and configured to be easily and comfortably actuated by one or more of the human user's fingers. The first input and second input assemblies may be disposed on one or more surfaces of the hand-held electronic device to take advantage of the full range of opposition configurations of the thumb and the fingers. Sensing circuitry, such as an input controller, may be provided to receive signals generated by the elements of the first and/or second input assemblies when the elements are manipulated by the human user and convert those signals in a form suitable to be received by a processor running application software, which based on the received signals, can determine the type of input provided by the human user.

[0022] The first input assembly may be situated on a front surface of the electronic device, while the second input assembly may be situated on the back surface of the electronic device to take advantage of the thumb/finger opposition. As configured, a user may manipulate input elements in the first input assembly with one or both thumbs or a stylus, while, manipulating elements in the second input assembly with one or more fingers.

[0023] The input function of the input elements of the first and/or the second input assembly may change depending on the application running on the electronic device. When a text application (e.g., e-mail, word processing, or text messaging) is running on the electronic device, the elements of the first and/or second input assembly may be associated with data input keys, such as symbols. When a game application is running on the electronic device, the input elements of the first and/or second input assembly may be associated with game controls, such as a directional control, action buttons, and trigger buttons. The mapping of one ore more of the input elements of the first and/or second input assembly to a software application, i.e., whether one ore more of the input elements will operate as data input keys, game controls or device controls can be customized by the software application developer or the user through downloads or other programming modalities. Moreover, to reduce the cost of manufacturing hand-held

electronic devices that will be used in multiple countries, input element sets particular to the language of a desired country can be implemented in software.

[0024] The systems and techniques described here may provide one or more of the following advantages. The human interface and input system and associated techniques offer the functionality of a high performance game controller, which can support the most demanding game input requirements, and the speed and accuracy of data input that can be obtained with the use of a conventional standard QWERTY keyboard, but without the large footprint. Also, the human interface and input system and associated techniques can increase the number of functions that may be associated with a given number of input elements without increasing the number of keystrokes or taps that is required. Moreover, it allows the input element size to remain consistent with the ergonomics of the human hand without increasing the time it takes to learn how to use the input system compared to conventional input systems.

[0025] Details of one or more implementations are set forth in the accompanying drawings and the description below. Other features and advantages will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0026] Fig. 1 is a block diagram of a typical hand-held electronic device upon which the human interface and input system may be implemented.

[0027] Fig. 2 is a block diagram of an implementation of the human interface and input system.

[0028] Figs. 3a and 3b show front and back isometric views, respectively, of a hand-held electronic device wherein the second input assembly includes a pressure sensor pad having a plurality of configurable active areas.

[0029] Fig. 3c illustrates an exploded view of an example of an input element of the first input assembly.

[0030] Fig. 3d depicts one implementation of how the plurality of configurable active areas of the pressure sensor pad of the second input assembly may be configured.

[0031] Figs. 4a and 4b depict front and back isometric views, respectively, of a hand-held electronic device wherein the second input assembly includes three touch pads.

[0032] Figs. 5a and 5b depict front and back isometric views, respectively, of a hand-held electronic device wherein the second input assembly includes three two-position rockers.

[0033] Figs. 6a and 6b illustrate front and back isometric views, respectively, of a hand-held electronic device wherein the second input assembly includes a D-pad and two contact
5 sensors.

[0034] Figs. 7a and 7b show a two-handed hand-held electronic device wherein the second input assembly includes two rotary dials.

[0035] Fig. 8 is a block diagram of a hand-held electronic device in the context of a communication system that may be used to implement the human interface and input systems
10 and techniques described here.

[0036] Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

Biomechanics of the Human Hand

[0037] The human hand comprises an opposable thumb and four fingers, i.e., the thumb
15 may be used in opposition, in concert, in combination or functional relation with any of the four fingers. Compared to the human fingers, the human thumb may be characterized as having larger range of motion, stronger sustaining force actuation and poorer dexterity. The human base joint of the thumb has three degrees of freedom, such as side-to-side movement, up and down movement, and rotation about the thumb's long axis; while the base joint of the fingers has two
20 degrees of freedom, such as side-to-side and up and down movement. Thus, the thumb typically is considered to have better range of motion than any of the fingers. Also, because the human thumb has a bigger actuation muscle than any of the fingers, it can provide larger sustaining forces than the fingers. But also because of the larger muscle, the human thumb may suffer from diminished fine motor control and rapidity of motion that can be exerted compared to the fingers.
25 Thus, the human fingers are more suitable for performing tasks that require fine motor coordination or the ability to pinpoint or rapidly repeat actuation.

Hand-Held Electronic Device Hardware Overview

[0038] FIG. 1 is a block diagram that illustrates a hand-held electronic device 100, such as a cell-phone, PDA, pocket PC, or smart phone, or other similar input devices upon which the
30 human interface and input system and associated input techniques described herein may be

implemented. Electronic device 100 may include a bus 102 or other communication mechanism for communicating information, and a processor 104, such as an ARM, OMAP or other similar processor, coupled with bus 102 for processing information, such as one or more sequences of one or more instructions, which may be embedded software, firmware, or software applications, such as a text messaging application or video game. Electronic device 100 also may include a main memory 106, such as a random access memory (RAM) or other dynamic storage device, coupled to bus 102 for storing information and instructions to be executed by processor 104. Main memory 106 also may be used for storing temporary variables or other intermediate information during execution of instructions to be executed by processor 104. Electronic device 100 further may include a read only memory (ROM) 108 or other static storage device coupled to bus 102 for storing static information and instructions for processor 104. A storage device 110 may be provided and coupled to bus 102 for storing information and instructions. Electronic device 100 may also include a display 112, such as a liquid crystal display (LCD), for displaying information to a user, and a human interface and input system 114 for communicating information and command selections to processor 104. Electronic device 100 also may include a communication interface 118 coupled to bus 102. Communication interface 118 provides a two-way data communication coupling to a base station. For example, communication interface 118 may be a wireless link, a modem to provide a data communication connection to a corresponding type of telephone line or any other communication interface known to one of ordinary skill. As another example, communication interface 118 may be a local area network (LAN) card to provide a data communication connection to a compatible LAN. In the wireless link implementation, communication interface 118 may send and receive electrical, electromagnetic or optical signals that carry digital data streams representing various types of information.

Human Interface and Input System Overview

[0039] FIG. 2 is a block diagram illustrating the major subsystems of the human interface and input system 114. The input system 114 may include a first input assembly 206, a second input assembly 208, and an input controller 216. The first input assembly 206 and the second input assembly 208 may include one or more input or elements. The input or selection elements, which may be keys, buttons, pressure sensor pads, touch pads or other actuators, associated with one or more sensors, which produce one or more electrical signals 214 when the input or selection elements are actuated. The input controller 216, which may include one or more

processors, receives the one or more electrical signals 214 and converts them into a form suitable to be received and interpreted by processor 104 after passing through bus 102.

[0040] One or more context signals 222 are provided to input controller 216 through bus 102 in response to processor 104 executing embedded software, firmware, or software applications, such as a text messaging application. The context signals 222 are received and used by input controller 216 to map input or selection elements in the first input assembly 206 and/or the second input assembly 208 to one or more application input functions and responses. For example, if a text application is being executed by processor 104, then the input controller 216 may map one or more input elements of the first input assembly 206 to one or more symbols, such as characters, letters, numbers, icons, other types of symbols, or combinations of different types of symbols, and map one or more input or selection elements of the second input assembly 208 to a shifting or indexing functionality. If processor 104 is executing a game application, then the input controller 216 may map the input or selection elements of the input assemblies 206, 208 to game functions. The mapping of the input or selection elements to particular input functions for a given software application, whether done by the input controller 216 or processor 104, may be customized by the application developer or the user through downloads or other programming modalities. Moreover, the mapping of the input or selection elements may be done for language key set changes, which may reduce the cost of manufacturing hand-held electronic devices for manufacturers servicing multiple countries.

[0041] Alternative implementations of the input system 114 need not have the input controller 216, particularly where cost is of a concern. In those instances, processor 104 may assume the functions of the input controller 216. Thus, processor 104 can perform the mapping function described above.

Human Interface and Input System and Techniques Implementations

[0042] Figs. 3a and 3b illustrates front and back isometric views, respectively, of a hand-held electronic device 302 upon which an implementation of the human interface and input system may be implemented. Electronic device 302 may include six planar or contoured surfaces: a front-side surface 312, a back-side surface 314, a left-side surface 316, a right-side surface 318, a top-side surface 320, and a bottom-side surface 322. Although, in other implementations, electronic device 302 may have more or fewer planar and/or contoured surfaces. On the front-side surface 312, a display 330, such as an LCD, and a first input

assembly 340 is disposed adjacent to each other. Alternatively, display 330 may be on a separate assembly such as those displays for PDA's and cell phones with a swivel-mounted screen or flip-phone configurations. Also, the first input assembly 340 may be disposed on more than one surface. The first input assembly may be a typical cell-phone keypad, which may include twelve
5 input elements 342, although any number of input elements may be provided. A user's thumb or thumbs or a stylus may actuate the input elements 342.

[0043] A second input assembly 350 is disposed on the back-side surface 314, left-side surface 316 and right side surface 318. Alternatively, the second input assembly may be disposed on one of those surfaces or a combination of those surfaces. In this implementation, the
10 first input assembly 340 is disposed relative to the second input assembly 350 to take advantage of the opposition of the human thumb and finger. The second input assembly 350 includes a pressure sensor pad 354 having a plurality of software configurable active areas, which may be actuated by one or more of the user's fingers. The pressure sensor pad 354 in this
15 implementation may include an actuator, such as an elastomeric material, attached to a force sensitive resistor array, a capacitive mat or array, or other similar pressure sensitive device or grid that can provide multiple outputs corresponding to the pressure readings of the plurality of active areas on the pad's 354 surface. Here, the pressure sensor pad 354 wraps around from the left-side surface 316 across the back-side surface 314 to the right-side surface 318.

[0044] It is to be understood that the input elements 342, 354 in this implementation and
20 any other implementation could be analog and/or digital buttons, keys, rockers (which may be a one or more position buttons or an analog joystick-type button), sliders, dials or touch pads used in combination with pressure sensors (such as force sensitive resistors, piezo resistive sensors, and capacitive sensors), positional sensors (such as rotary encoders, linear potentiometers and the like) or other sensors or a combination of them.

[0045] Fig. 3c depicts an exploded view of an input element 342 of the first input
25 assembly 340, which is mapped to represent one or more text functions. Here, the input element is mapped to represent the number 7 and letters p, q, r and s, as is found on a typical keypad of a cell phone. Other input elements 342 may be associated with other letters, numbers and/or icons. For example, one input element may be associated with the number 4 and letters g, h and i, while
30 another input element may be associated with the number 2 and the letters a, b and c.

[0046] As shown in FIG. 3d, the pressure sensor pad 354 may be configured in software to represent one or more delineated active areas corresponding to different programmable functions depending on the application. In this case, inverted U-shaped active area 360 forms an active area-- the vertical sides 362 of the inverted U-shaped active area 360 are on the left-side surface 316 and the right-side surface 318 and the horizontal side 364 of the inverted U-shaped active area 360 is along the top edge of the pressure sensor pad 354 on the back-side surface 314. Below the inverted U-shaped active area 360 on the back-side surface 314 are five oblong-shaped active areas 372 labeled from 1 to 5. On the bottom of both the left-side surface 316 and the right-side surface 318 and stretching to the back-side surface 314 of the pressure sensor pad 354 are rectangular-shaped active areas 374, 376, 378, 380. The remaining area of the pressure sensor pad 354 may be configured to be inactive.

[0047] In this implementation, inverted U-shaped active area 360 may be used for navigation-- the vertical sides 362 for y-directional movement and the horizontal side 364 for x-directional movement. The oblong-shaped active areas 372 may be used for shifting or indexing between symbols, such as characters, letters and/or numbers, or text input. The rectangular-shaped active areas 374, 376, 378, 380 may be used for shifting between modes—two of the active areas 374, 376 for left-handed users and the other two active areas 378, 380 for right-handed users. In another configuration of the pressure sensor pad 354, the entire surface of the pressure sensor pad 354 may be covered by horizontal rectangular active areas interspersed between small rectangular horizontal inactive areas to achieve any desired number of active areas. Other configurations of the pressure sensor pad 354 may be realized depending on the requirements of the desired application.

[0048] The delineated active areas of the pressure sensor pad 354 may be actuated by one or more of the user's fingers, such as by applying pressure against the delineated active areas of the pad 354 beyond a pre-defined or user-adjustable threshold pressure. Likewise, the absence of pressure may be used as an actuation event. The pressure sensor pad 354 also may contain or be mounted above or below a shape-changing media such as an electrorheostatic fluid, shape memory metal array or similar material, which can permit the user to tactilely discriminate between the one or more delineated active areas. Thus, the user will be able to perceive the one or more delineated active areas as if they were physical buttons. Also, a computer graphical representation (not shown) of the configuration of the delineated active areas of the pad 354 may

be displayed temporarily (or some predetermined time) on a portion of the display 330 to visually assist the user in locating where the delineated active areas of the pad 354 are positioned. Moreover, an input element 342 of the first input assembly 340 may be mapped to activate and/or deactivate the displaying of the computer graphical representation.

5 [0049] The input architecture described above, with the first input assembly 340 on the front-side surface 312 and the second input assembly 350 on the back-side surface 314, left-side surface 316 and right-side surface 318, is configured to take advantage of the biomechanics of the hand, whether the user is left-handed or right-handed. This configuration, for example, can reduce the number of thumb taps required to input a particular symbol compared to the number
10 of thumb taps or stylus presses required using only a typical key pad with modal input techniques, such as is found in conventional text input systems. Moreover, this configuration can permit full keyboard capability with fewer input elements on the first input assembly 340 and with greater spacing between input elements to enhance the ease of input compared to typical keypads for existing cell phones. Also, this configuration can permit full functionality of a high
15 performance game controller, which can support the most demanding game input requirements.

[0050] A method to implement full keyboard capability and reduce the number of thumb taps is to map in software the delineated active areas of the pressure sensor pad 354, such as the oblong-shaped active areas 372, to an indexing or shifting functionality to take advantage of the capability of the human finger, i.e., rapidity of motion, spatial memory and fine motor control,
20 and to map in software the input elements 342 of the first input assembly 340 to text functionality to take advantage of the capability of the human thumb, i.e., range of motion and sustained force actuation.

[0051] When a text messaging application is running on the electronic device 302 and displayed on the screen 330, the first input assembly 340 and the second input assembly 350 are
25 used together to perform the text messaging functions. Each input element 342 of the first input assembly 340 may represent one or more text functions, e.g., one input element may be associated with the decimal digit 2 and letters a, b and c, while another input element may be associated with the decimal digit 7 and letters p, q, r and s (as shown in Fig. 3c), such as is found on typical keypads.

30 [0052] In this implementation, the input elements 342 are configured the same as a typical keypad on a cell phone. The specific text function inputted by a user for a particular

input element 342 is determined by which delineated active area of the pressure sensor pad 354 is pressed. For example, going from left to right, each oblong-shaped active area 372 may be mapped to represent a separate index or shift position such that index position 1 may be assigned to the left-most oblong-shaped active area (labeled 1), index position 2 may be assigned to the adjacent oblong-shaped active area 372 (labeled 2) and so on, where index position 5 may be assigned to the right-most oblong-shaped active area 372 (labeled 5). Thus, to input the word “yes”, the user may press the oblong-shaped active area 372 representing index position 4 with any of his fingers and press the particular input element 342 representing the letter “y” with his thumb; then the user may press the oblong-shaped active area 372 representing index position 3 with any of his fingers and press the input element 342 representing the letter “e” with his thumb; and then the user may press the oblong-shaped active area 372 representing index position 5 with any of his fingers and press the input element 342 representing the letter “s” with his thumb.

[0053] The coordination of finger motions and thumb motions in other than a grasping motion may be difficult for most people. Generally, doing two separate types of motions simultaneously can be difficult. However, the human interface and input system described herein does not require those types of motions due to the flexibility of the system. Generally, it is easier to tap both the fingers and thumbs or leave either the thumb or fingers in contact with an input element or delineated active area while moving the other. For example, a user’s finger may press an oblong-shaped active area 372 at the same time or nearly the same time the user’s thumb taps an input element 342 in the first input assembly 340.

[0054] Also, a user may tap an input element 342 with his thumb while pressing an oblong-shaped active area 372. Pressing or touching an oblong-shaped active area 372 while tapping on an input element 342 in the first input assembly 340 typically is natural, comfortable and easy to do. Likewise, the same holds true where the index finger moves substantially linearly from one oblong-shaped active area 372 to the next, generally a left to right motion or vice versa, while the thumb taps an input element 342 in the first input assembly 340.

[0055] Another way to implement finger/thumb coordination would be to permit asynchronous or sequential tapping between the finger tap and the thumb tap. For example, pressing an input element 342 within a pre-determined time (e.g., one second) after pressing and depressing a oblong-shaped active area 372 would constitute the same action as if both were

pressed simultaneously. This time window could be configured by the user to facilitate different proficiencies in typing or different types of applications—for game applications, the time window could be quite short, whereas for text input applications, the time window could be much longer. The time window also could be different for different delineated active areas based on their intended function in a given application.

[0056] Another method to implement full keyboard capability and reduce the number of thumb taps is map in software the delineated active areas of the second input assembly 350 as follows: left vertical side 362 of the inverted U-shaped active area 360 to be shift position 1; anywhere along the horizontal side 364 to be shift position 2; the top-left rectangular-shaped active area 378 to be shift position 3; the top-right rectangular-shaped active area 374 to be shift position 4; the bottom-left rectangular-shaped active area 380 to be shift position 5; and, if needed, the bottom-right rectangular-shaped active area 376. The input elements 342 of the first input assembly 340 may again be mapped to text functionality.

[0057] Thus, to input the word “yes”, the user may press the top-right rectangular-shaped active area 374 representing shift position 4 with any of his fingers and press the particular input element 342 representing the letter “y” with his thumb; then the user may press the top-left rectangular-shaped active area 378 representing index position 3 with any of his fingers and press the input element 342 representing the letter “e” with his thumb; and then the user may press the bottom-left rectangular-shaped active area 380 representing index position 5 with any of his fingers and press the input element 342 representing the letter “s” with his thumb.

[0058] A method of implementing the functionality of a game controller is to assign in software the input elements 342 of the first input assembly 340 specific game functions to take advantage of the capability of the human thumb, i.e., range of motion and sustained force actuation, and to map in software the delineated active areas of the pressure sensor pad 354 of the second input assembly 350 analog control to take advantage of the capability of the human finger, i.e., rapidity of motion, spatial memory and fine motor control. Thus, as a user’s index finger or middle finger slides from left to right across the oblong-shaped active areas 372, the horizontal side 364 of the inverted U-shaped active area 360, and/or the rectangular active area 370, the input controller (not shown) may interpret the motion as “increasing” a parameter such as speed, size, position, etc. Alternatively, the input controller may be programmed to interpret

different levels of applied pressure to these delineated active areas as the “increasing” parameter, i.e., increased pressure may represent increased speed, size, position, etc.

[0059] In this implementation, the vertical side 362 of the inverted U-shaped active area 360 may be programmed to represent the y-directional (vertical) movement of control of a character in a game, while the horizontal side 364 of the U-shaped active area 360 may be programmed to represent the x-directional (horizontal) movement. Movement into or out of the field of view may be controlled by the left and right rectangular buttons 374, 376, 378, 380, thereby allowing 3-D control. Rapid firing of weapons may be accomplished by using the input elements 342 of the first input assembly 340 or one of the five oblong-shaped active areas 372, with each one representing a different weapon or action. Complex moves or mode shifts could be accomplished by combining input elements 342 of the first input assembly 340 with any delineated active area of the second input assembly 350. In this way, a game developer may optimize the mapping of delineated active areas based on the best configuration for a particular game. For example, a game developer could set up control configurations for novice users differently than for advanced users, such as mapping different numbers or sizes of delineated active areas, in order to reduce the learning time to be proficient and make game control easier for first time players.

[0060] Figs. 4a and 4b illustrate front and back isometric views, respectively, of a hand-held electronic device 402 similar to the device shown in Figs. 3a and 3b, except the second input assembly 450 includes three input or selection elements 454, 456, 458, which may be rectangular-shaped touch pads. Each touch pad 454, 456, 458 may transduce the location of the contact of an object or a user’s finger anywhere on its surface. Also each touch pad 454, 456, 458 may correspond to different programmable functions. Here, touch pad 454 may be disposed on the back-side surface 414; touch pad 456 may be disposed on the left-side surface 416; and touch pad 458 may be disposed on the right-side surface 418.

[0061] In a hand-held device such as a cell-phone or PDA, the second input assembly 450 may include a touch-pad located diagonally on the back-side surface 414 with another touch-pad on the left-side surface 416 because a right-handed user’s index finger typically is placed along a diagonal path on the back-side surface 414 wrapping around to the left-side surface 416. In that case, second input assembly 450 may include touch pad 454 and touch pad 456. A user’s finger may move along the length of the touch-pad strip 454 in order to select the

desired function. For example, a far left portion of touch-pad 454 may be mapped to be index position 1, a far right portion of touch-ad 454 may be mapped to be index position 5, and portions between the far-left portion and the far right portion of the touch-pad 454 may be mapped to intervening index positions. Alternatively, index position 1 may be mapped to touch pad 456 for right-handed users and mapped to touch pad 458 for left-handed users. Thus, in this implementation, text input is similar to that as described with respect to Figs. 3a and 3b. Other configurations of the active areas of the touch pads 454, 456, 458 are possible and can be tailored to specific applications.

[0062] Figs. 5a and 5b illustrate front and back isometric views, respectively, of a hand-held electronic device 502 similar to the device shown in Figs. 3a and 3b, except the second input assembly 550 includes three input or selection elements 554, which may be actuated by any of the user's fingers, typically the user's index finger or middle finger or a combination of both. The input elements 554 in this implementation are conventional two-position rockers. Thus, the second input assembly 550 can provide six index positions at a relatively low cost with passive tactile feedback built in.

[0063] Figs. 6a and 6b illustrate front and back isometric views, respectively, of a hand-held electronic device 602 similar to the device shown in Figs 3a and 3b, except the second input assembly 650 includes three input or selection elements 654, 656, 658. Input element 654 may be a D-pad input device and input elements 656, 658 may be either digital or analog contact sensors. The D-pad 654 may be mounted on the center of the back-side surface 614 and mapped in software to represent one or more index or shift positions. For example, the D-pad 654 may be mapped to represent four index positions with each compass heading of the D-pad (e.g., North, South, East and West) representing a different index position. A fifth index position could be mapped to orthogonal movement of the center of the D-pad 654 into the device 602. Alternatively, the D-pad 654 may be mapped to represent eight index positions, e.g., the compass directions North, South, East, West, Northeast, Northwest, Southeast and Southwest may be mapped. The contact sensors 656, 658 may be used as mode functions, for firing weapons, or any other functionality specified by an application developer.

[0064] Figs. 7a and 7b illustrate front and back isometric views, respectively, of a two-handed hand-held electronic device 702. A first input assembly 740 including a plurality of input elements 742 is disposed on the front-side surface 712. A second input assembly 750, including

two input or selection elements 754, 756, is disposed on the back-side surface 714. In this implementation, the two input elements 754, 756 are rotary dials. Alternatively, rotary dial 754 may be disposed on the left-side surface 716 and rotary dial 756 may be disposed on the right-side surface 718. In a one-handed hand-held electronic device, such as a cell-phone, typically one rotary dial is needed if placed on the back-side surface 714 or two rotary dials are needed if placed on the left and right side surfaces 716, 718. Rotation of the rotary dials 754, 756 may be mapped in software to represent one or more index positions. The rotary dials 754, 756 may be implemented with detents so that the user can distinguish between separate index positions, i.e., tactile feedback may be provided to the user's finger(s).

[0065] FIG. 8 is a block diagram that illustrates a hand-held electronic device 800, such as a cell-phone or PDA, upon which the human interface and input system and associated techniques described herein may be implemented in a communication system. Network link 820 typically provides data communication through one or more networks to other devices. For example, network link 820 may provide a connection through local network 822 to a host computer 824 or to data equipment operated by an Internet Service Provider (ISP) 826. ISP 826 in turn provides data communication services through the world wide packet data communication network now commonly referred to as the "Internet" 828. Network link 820 also could provide data communication directly to the ISP 826 and Internet 828. Local network 822 and Internet 828 both use electrical, electromagnetic or optical signals that carry digital data streams. The signals through the various networks and the signals on network link 820, which carry the digital data to and from electronic device 800, are exemplary forms of carrier waves transporting the information.

[0066] Electronic device 800 can send messages and receive data, including program code, which includes one or more sequences of one or more instructions, through the network(s) and network link 820. In the Internet example, a server 830 might transmit a requested code for an application program through Internet 828, ISP 826, local network 822 and network link 820. In one aspect, one such downloaded application may be for software games to be played on electronic device 800, which may obtain application code in the form of a carrier wave.

[0067] In any of the above implementations, active and/or passive tactile feedback may be implemented. To provide passive tactile feedback, the input elements of the first and/or second input assemblies may be combined with a palpable detent, such as a dome cap or dome

spring so that a user can tactilely perceive, through his fingers or thumbs, activation and/or deactivation of an input element. In one implementation, among others, the palpable detent may be positioned between the actuator and sensor components of the input elements. To provide active tactile feedback, one or more vibratory units or force producing units may be mounted in the hand-held electronic device and activated to provide tap or index level or other information to a user. The vibratory unit may be an electric motor with an eccentric mass attached to the motor's shaft, a solenoid, a variable reluctance device, a loud speaker or any other vibrator that can provide tactile feedback. A force producing unit may be a solenoid in non-vibratory mode, a motor, non-vibratory actuators or any other actuator that can produce forces. A vibratory unit and/or force producing unit may be provided for each input element. In that case, the vibratory unit and/or force producing unit may be mounted below the input element so that when the vibratory unit and/or force producing unit is activated, the vibratory unit and/or force producing unit can push out the surface of the electronic device to a different level or position depending on the information to be communicated. Thus, in implementations using a pressure sensor pad or touch-pad as the input element, a stepped array may be configured to indicate higher and higher levels of index positions across the touch pad or pressure sensor pad. The vibratory units and/or force producing units may also be used to provide tactile feedback to indicate the momentary achievement of an objective, such as target lock in game applications. Tactile feedback may also be accomplished by actuators, such as a solenoid, which changes the stiffness of the input element electronically or pushes against the user's hand or fingers to indicate an event of interest in the software application.

[0068] The computational aspects described here can be implemented in analog or digital electronic circuitry, or in computer hardware, firmware, software, or in combinations of them. Where appropriate, aspects of these systems and techniques can be implemented in a computer program product tangibly embodied in a machine-readable storage device for execution by a programmable processor; and method steps can be performed by a programmable processor executing a program of instructions to perform functions by operating on input data and generating output.

[0069] The systems and techniques described above utilize the biomechanics of the thumb and fingers, i.e., it uses the function of opposition, the fine motor control of the fingers, and the larger range of motion and stronger actuation provided by the thumb. By using the

fingers and thumb in concert, the number of taps and time needed to accomplish a given function is reduced, the accuracy is improved, and the natural programming inherent in the human hand replaces the training required for other systems.

5 [0070] A number of implementations have been described. Other implementations may include different or additional features. For example, other configurations of the one or more input elements of the first and second input assemblies may be realized. Also, the hand-held electronic devices described herein may have more or less than six planar or contoured surfaces. Moreover, the number of input elements in the first and second input assemblies are not limited to the number of input elements described in the implementations above.

10 [0071] Also, the one or more input elements of the first and second input assemblies may be any input or selection type known to one of skill in the art, such as keys, buttons, touch pads, other types of pads, rockers, sliders, dials, contact sensors or other actuators associated with any sensor. Each sensor associated with an actuator may include digital momentary on/off switches or analog sensors, such as pressure sensors (e.g., force sensitive resistors, piezo film sensors, or
15 capacitive sensors), or positional sensors (e.g., rotary or linear potentiometers or encoders), or other analog sensors known to those of ordinary skill, or accelerometers or gyroscopes. The first and second input assemblies may include a combination of these different types of input or selection elements, which may be mounted in the configurations shown in the figures or imbedded within the device to permit control through motion of the overall device.

20 [0072] Moreover, the methods to provide data input, device control or game control may be performed in a different order and still achieve desirable results. Accordingly, other implementations are within the scope of the following claims.

WHAT IS CLAIMED IS:

1. A hand-held device comprising:

a processor configured to process a selected application having two or more functions;

a first surface including at least a first input element mapped to at least a first function
5 of the selected application; and

a second surface including at least a second input element having a sensor pad mapped to at least a second function of the selected application, wherein the second surface is substantially in opposition to the first surface.

10 2. The hand-held device of claim 1, wherein the sensor pad comprises active areas, wherein at least one of the active areas is mapped to the second function of the selected application.

15 3. The hand-held device of claim 1, wherein the selected application comprises a game application.

4. The hand-held device of claim 3, wherein at least one of the functions of the game application comprises a weapon fire control, directional control, speed control, a size control or a position control.

20

5. The hand-held device of claim 3, wherein the first function of the game application comprises a directional control, a speed control, a size control or a position control.

6. The hand-held device of claim 1, wherein the second function of the game application comprises a weapon fire control.

5 7. The hand-held device of claim 1, wherein the second surface further includes a directional pad.

8. The hand-held device of claim 1, wherein the processor is further configured to communicate with a host device.

10

9. The hand-held device of claim 1, further comprising an accelerometer.

10. The hand-held electronic device of claim 1, further comprising a gyroscope.

15

11. A hand-held device comprising:

a first surface including at least an input element mapped to at least a first function of an application; and

a second surface including at least a touch sensing input element mapped to at least a second function of the application, wherein the second surface is substantially in opposition

20

to the first surface.

12. The hand-held device of claim 11, wherein the touch sensing input element comprises a sensor pad having active areas, wherein at least one of the active areas is mapped to the second function of the application.

13. The hand-held device of claim 11, wherein the application comprises a game application.

5 14. The hand-held device of claim 13, wherein first function comprises a directional control, a speed control, a size control or a position control.

15. The hand-held device of claim 13, wherein the second function comprises a weapon fire control.

10

16. The hand-held device of claim 11, wherein the input element comprises a rotary sensor or a directional pad.

17. The hand-held device of claim 11, wherein the input element and the touch sensing
15 input element are communicatively coupled to a host device.

18. The hand-held device of claim 11, further comprising an accelerometer or a gyroscope.

20 19. The hand-held device of claim 17, further comprising an accelerometer or a gyroscope.

20. A hand-held device of claim 1, wherein the second surface comprises a back surface or a side surface.

21. A hand-held device of claim 11, wherein the second surface comprises a back surface or a side surface.

ABSTRACT

A human interface configured to optimize a biomechanical effect of a human user's opposing thumb and fingers by including, on one surface, one or more software configurable input elements manipulatable by a user's thumb(s) or a stylus, and, on another surface, one or
5 more software configurable selection elements manipulatable by a user's finger(s). A selection element may be a pressure sensor pad configurable to represent delineated active areas that are mapped to one or more input functions. Shape changing media may be provided to permit a user to tactilely discriminate between delineated active areas. Tactile feedback may be provided to a user through palpable detents, vibratory or force producing
10 units. Inputting data may include mapping each selection element to a shift function, mapping each input element to text functions, and using the selection elements to shift between text functions associated with an input element to input a desired text function.

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Fig. 1

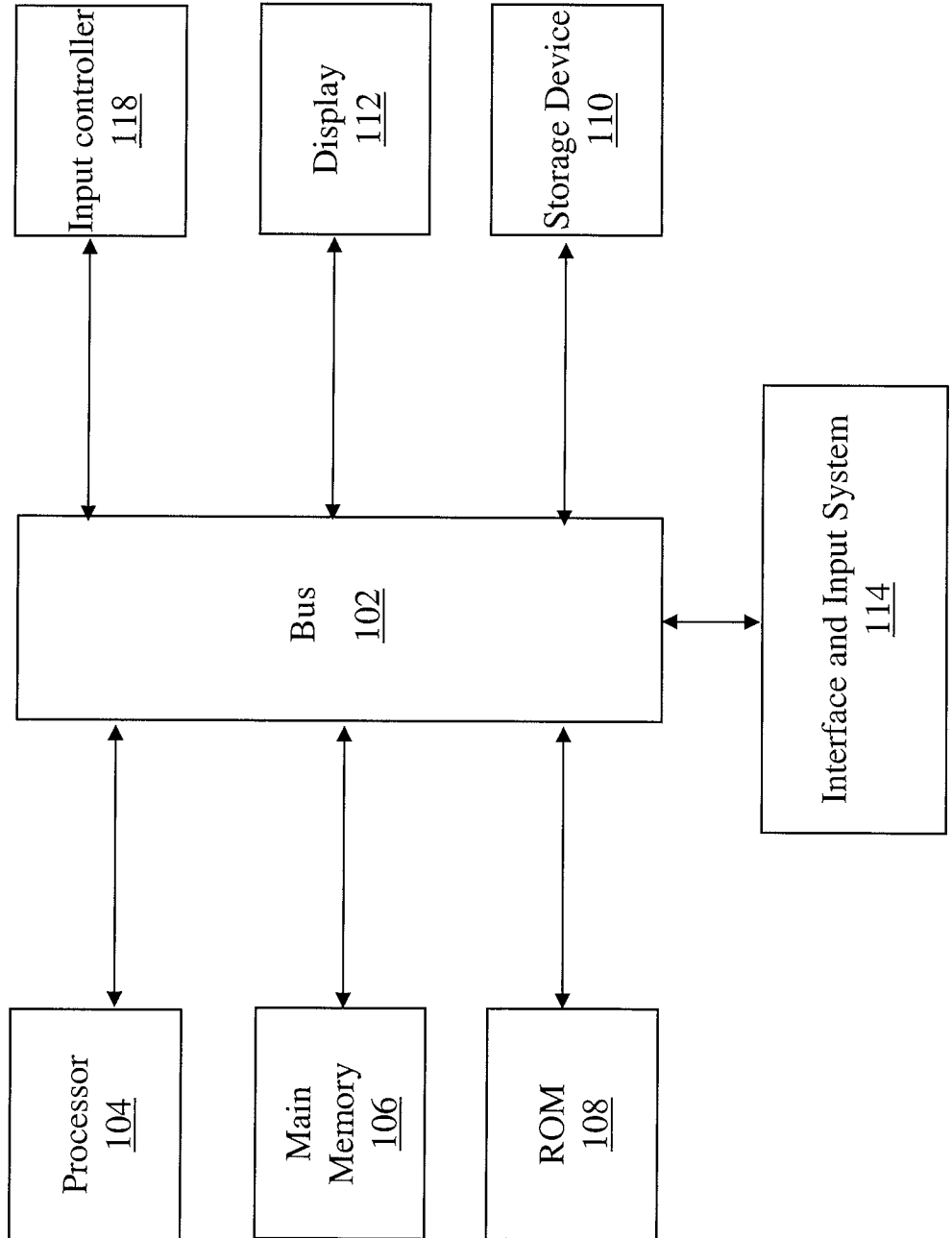
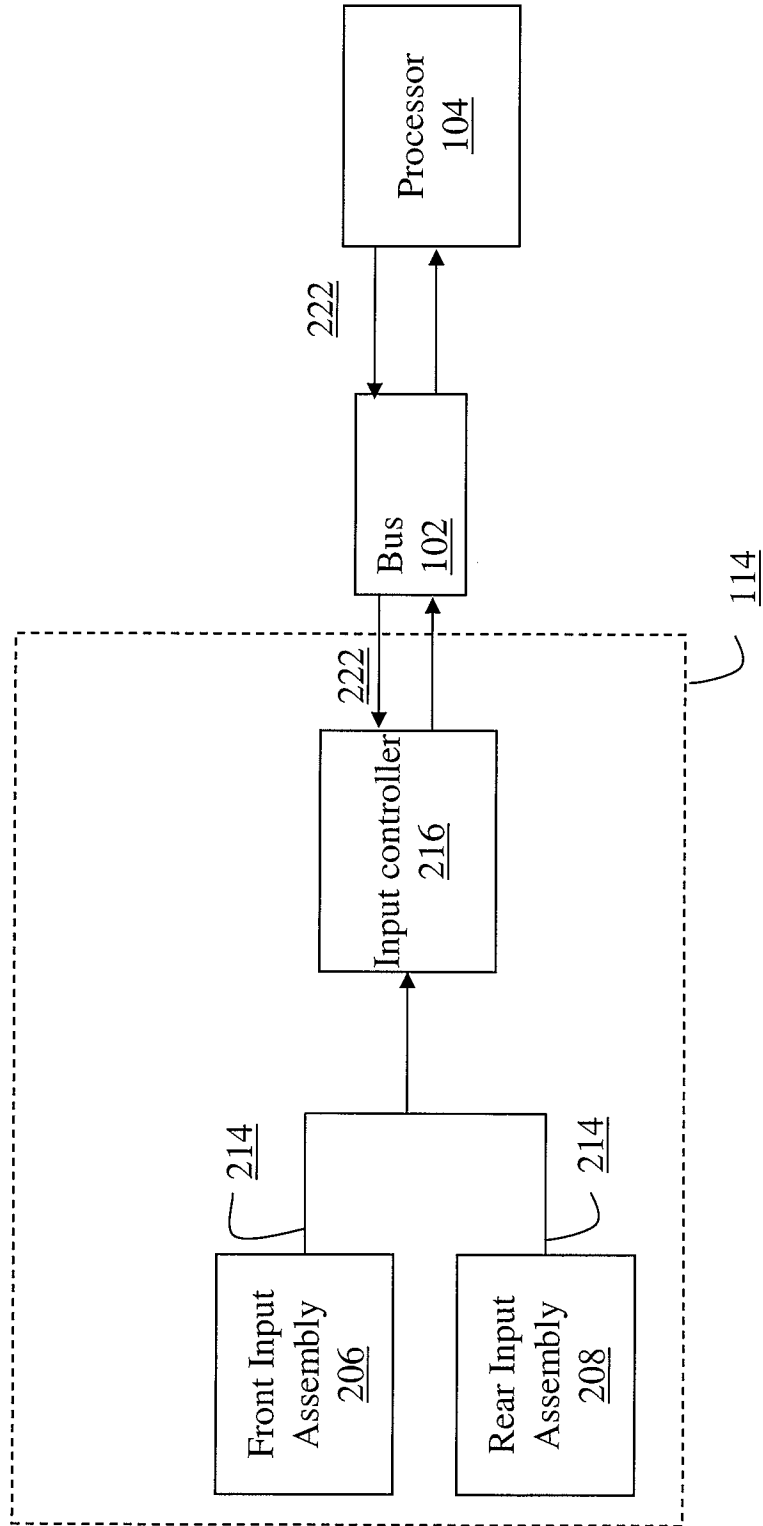


Fig. 2



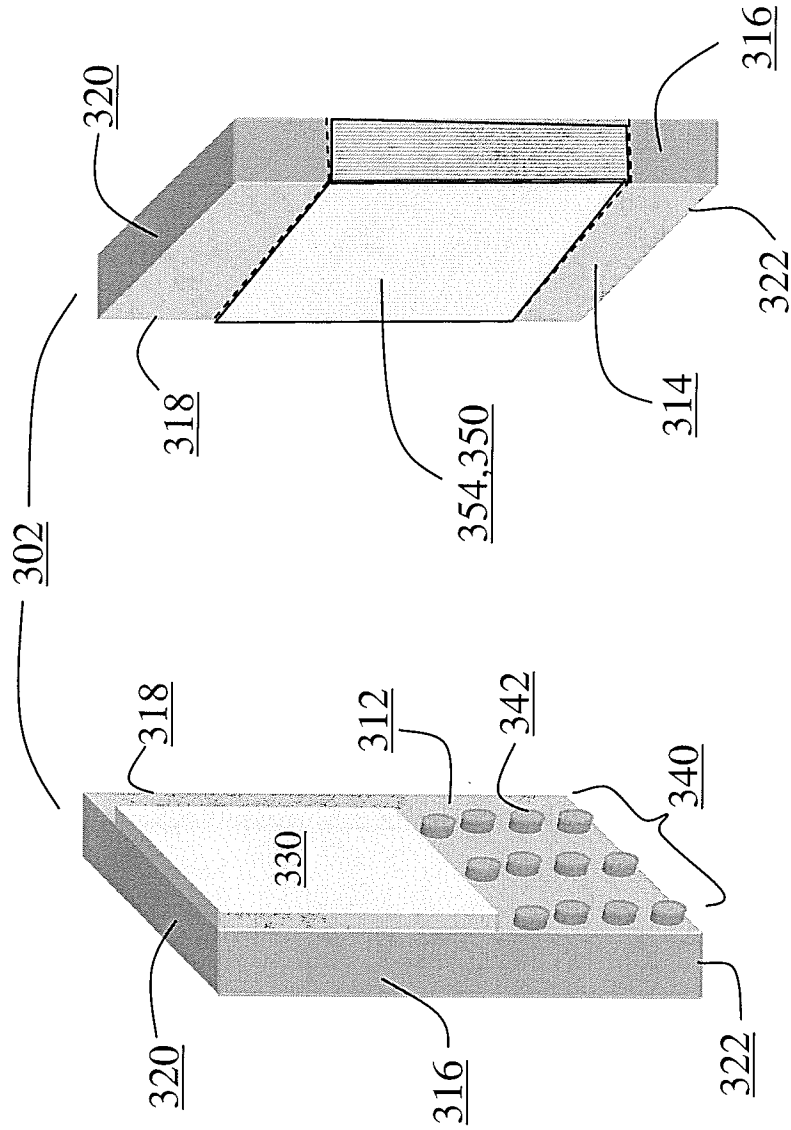


Fig. 3b

Fig. 3a

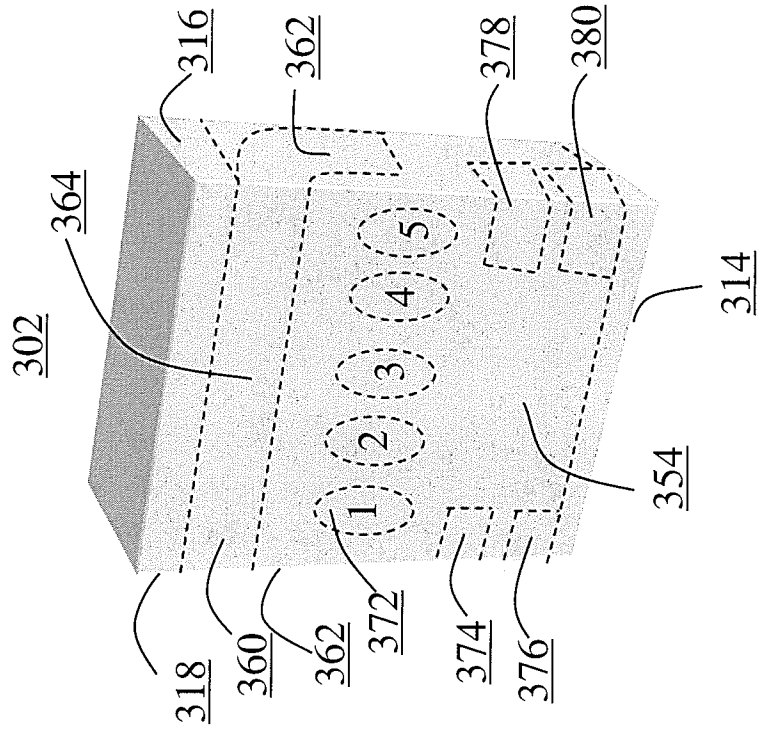


Fig. 3d

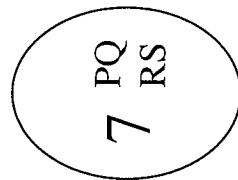


Fig. 3c

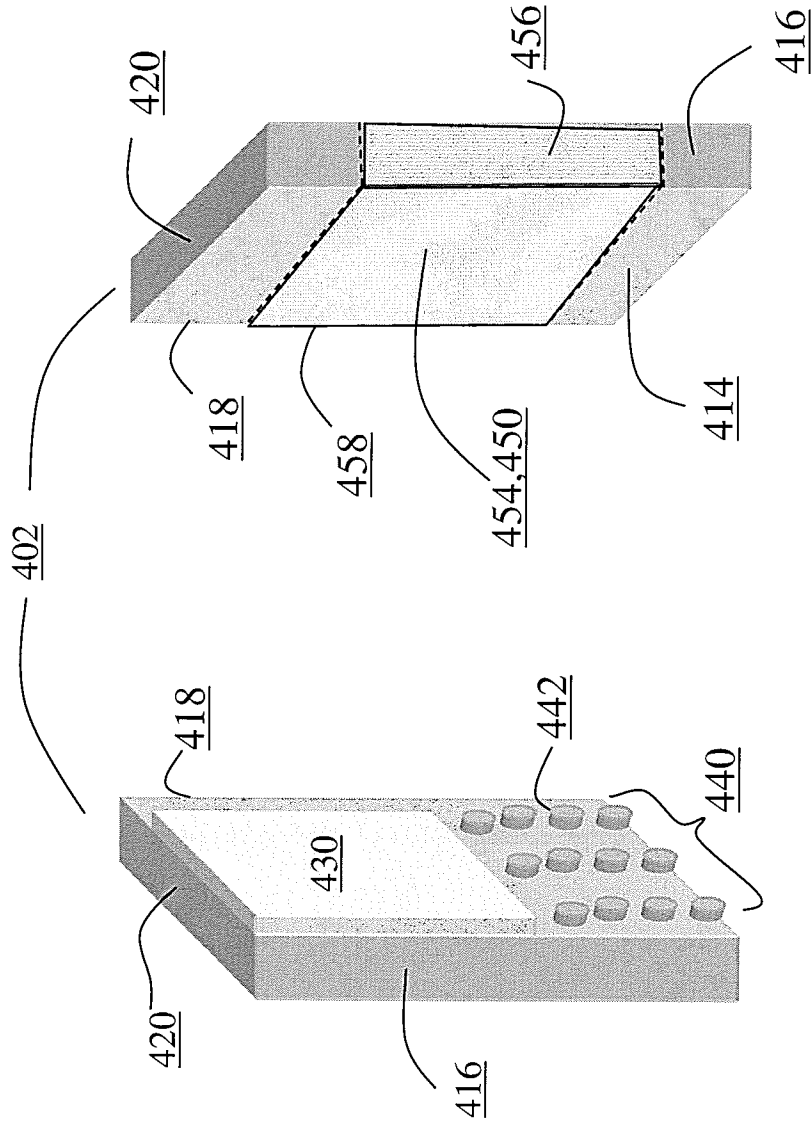


Fig. 4b

Fig. 4a

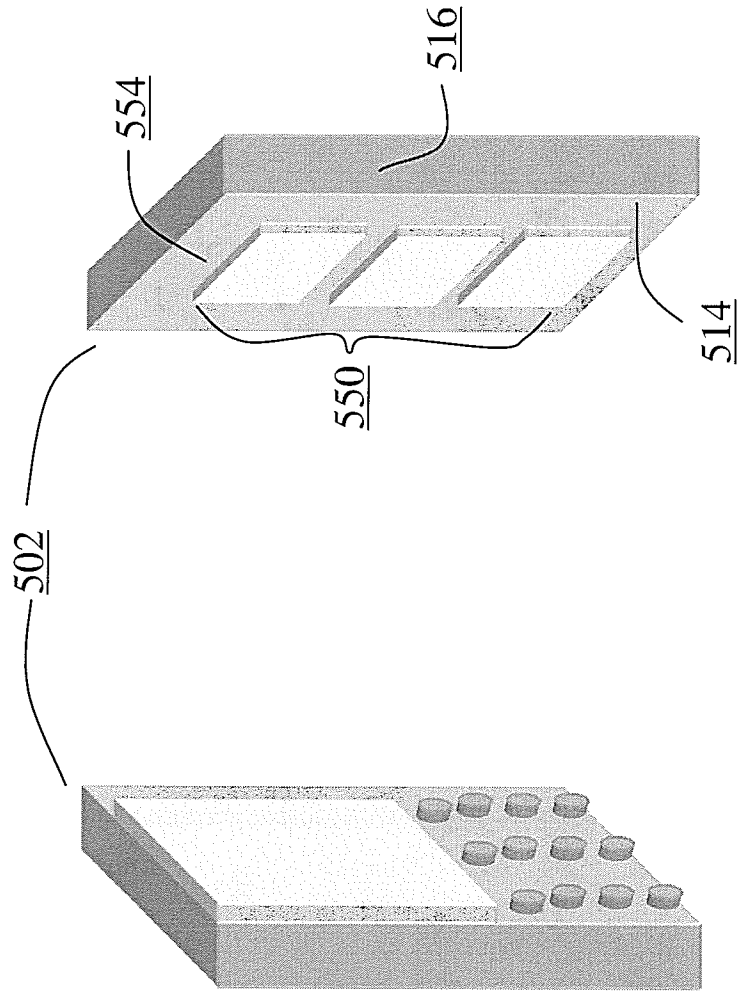


Fig. 5a

Fig. 5b

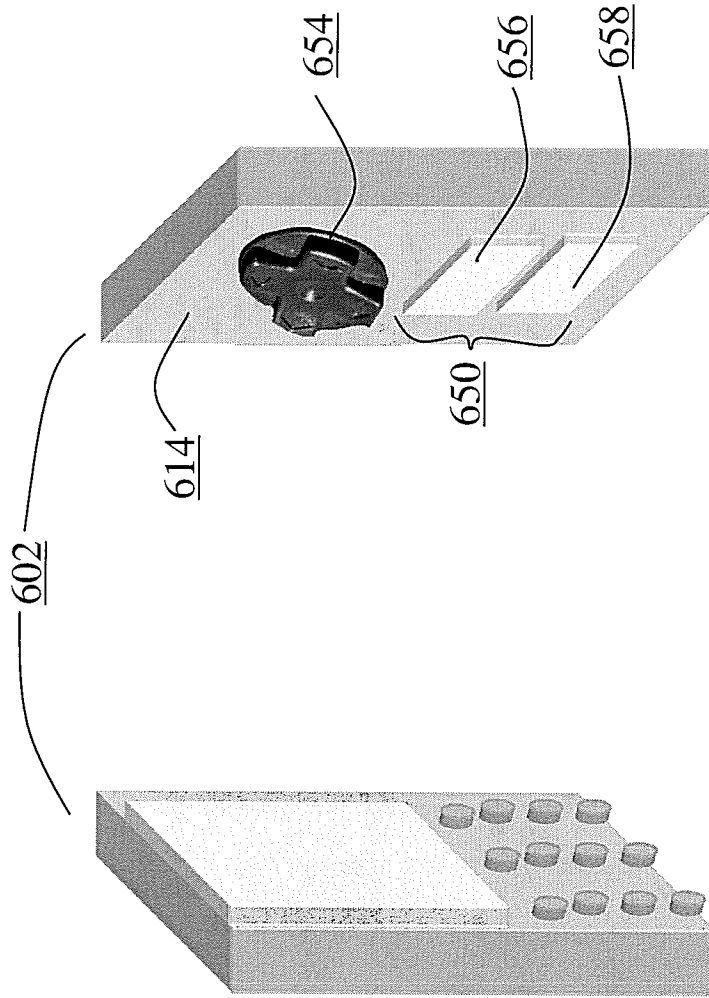


Fig. 6b

Fig. 6a

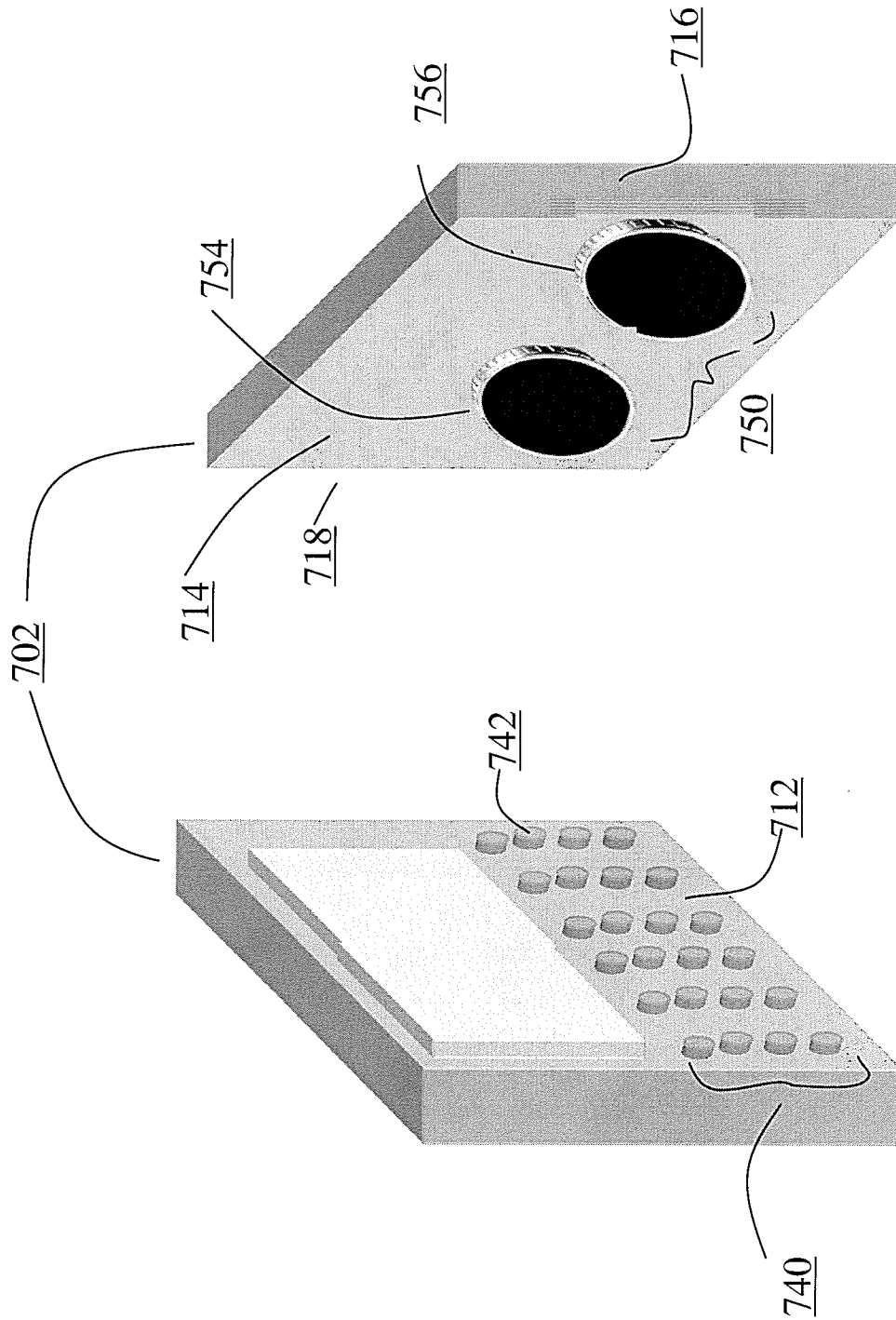
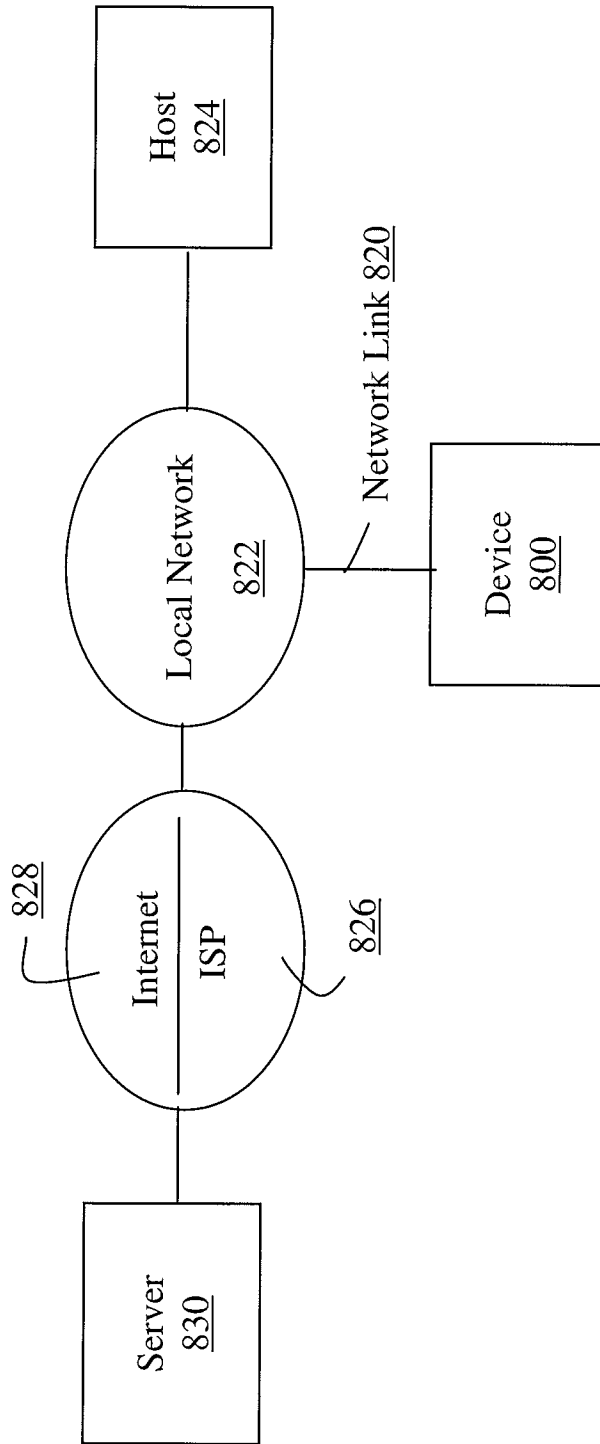


Fig. 7b

Fig. 7a

Fig. 8



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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	19146-0002003
		Application Number	
Title of Invention	Human Interface System		
<p>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.</p>			

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.)

Applicant Information:

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Applicant Authority		<input checked="" type="radio"/> Inventor		<input type="radio"/> Legal Representative under 35 U.S.C. 117		<input type="radio"/> Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name		Suffix	
	Beth		Marcus			
Residence Information (Select One)						
		<input checked="" type="radio"/> US Residency		<input type="radio"/> Non US Residency		<input type="radio"/> Active US Military Service
City	Bedford	State/Province	MA	Country of Residenceⁱ	US	
Citizenship under 37 CFR 1.41(b)ⁱ		US				
Mailing Address of Applicant:						
Address 1	2 Donovan Drive					
Address 2						
City	Bedford	State/Province	MA			
Postal Code	01730	Countryⁱ	US			
Applicant 2						Remove
Applicant Authority		<input checked="" type="radio"/> Inventor		<input type="radio"/> Legal Representative under 35 U.S.C. 117		<input type="radio"/> Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name		Suffix	
	W.	David	Lee			
Residence Information (Select One)						
		<input checked="" type="radio"/> US Residency		<input type="radio"/> Non US Residency		<input type="radio"/> Active US Military Service
City	Newton	State/Province	MA	Country of Residenceⁱ	US	
Citizenship under 37 CFR 1.41(b)ⁱ		US				
Mailing Address of Applicant:						
Address 1	343 Otis Street					
Address 2						
City	Newton	State/Province	MA			
Postal Code	02165	Countryⁱ	US			
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.						Add

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	19146-0002003	
		Application Number		
Title of Invention	Human Interface System			
Customer Number	20985			
Email Address			<input type="button" value="Add Email"/>	<input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	Human Interface System			
Attorney Docket Number	19146-0002003	Small Entity Status Claimed	<input checked="" type="checkbox"/>	
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)	9	Suggested Figure for Publication (if any)		

Publication Information:

<input type="checkbox"/>	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/>	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.

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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). Enter either 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:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	20985		

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(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status	Pending	<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	11747863	2007-05-11
Prior Application Status	Patented	<input type="button" value="Remove"/>	

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	19146-0002003		
		Application Number			
Title of Invention	Human Interface System				
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
11747863	Continuation of	10699555	2003-10-31	721831	2007-05-15
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					<input type="button" value="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).

				<input type="button" value="Remove"/>
Application Number	Country ⁱ	Parent Filing Date (YYYY-MM-DD)	Priority Claimed	
			<input type="radio"/> Yes <input checked="" type="radio"/> No	
Additional Foreign Priority Data may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

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				<input type="button" value="Remove"/>
Assignee 1				
If the Assignee is an Organization check here. <input checked="" type="checkbox"/>				
Organization Name	Zeemote, Inc.			
Mailing Address Information:				
Address 1	285 Mill Road			
Address 2				
City	Chelmsford	State/Province	MA	
Country ⁱ	US	Postal Code	01824	
Phone Number		Fax Number		
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Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Hwa C. Lee/		Date (YYYY-MM-DD)	2008-12-05
First Name	Hwa	Last Name	Lee	Registration Number
				59747

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	19146-0002003
	Application Number	
Title of Invention	Human Interface System	

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.**

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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.
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Electronic Acknowledgement Receipt

EFS ID:	4406262
Application Number:	12329411
International Application Number:	
Confirmation Number:	8728
Title of Invention:	Human Interface System
First Named Inventor/Applicant Name:	Beth Marcus
Customer Number:	20985
Filer:	Hwa C. Lee/Joe Farrell
Filer Authorized By:	Hwa C. Lee
Attorney Docket Number:	19146-0002003
Receipt Date:	05-DEC-2008
Filing Date:	
Time Stamp:	19:08:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		191460002003App.pdf	3039781 <small>89f57d5aa6cfe2c575acc1400445bf69ed7e1693</small>	yes	47

Multipart Description/PDF files in .zip description			
Document Description	Start	End	
Transmittal of New Application	1	2	
Information Disclosure Statement (IDS) Filed (SB/08)	3	12	
Specification	13	33	
Claims	34	37	
Abstract	38	38	
Drawings-only black and white line drawings	39	47	

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2	Application Data Sheet	191460002003ADS.pdf	1572806	no	5
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Application Number: 12329411 Document Date: 12/5/2008

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- Design Drawings

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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PATENT APPLICATION FEE DETERMINATION RECORD					Application or Docket Number																																																		
Substitute for Form PTO-875					12/329,411																																																		
APPLICATION AS FILED – PART I																																																							
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OR					OTHER THAN SMALL ENTITY																																																		
FOR	NUMBER FILED	NUMBER EXTRA			RATE (\$)	FEE (\$)																																																	
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<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">BASIC FEE (37 CFR 1.16(a), (b), or (c))</td> <td style="width: 20%;">N/A</td> <td colspan="3" style="width: 20%;">N/A</td> <td style="width: 10%;">N/A</td> <td style="width: 10%;">N/A</td> </tr> <tr> <td>SEARCH FEE (37 CFR 1.16(k), (l), or (m))</td> <td>N/A</td> <td colspan="3">N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))</td> <td>N/A</td> <td colspan="3">N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>TOTAL CLAIMS (37 CFR 1.16(i))</td> <td style="text-align: center;">21</td> <td style="text-align: center;">minus 20</td> <td style="text-align: center;">=</td> <td style="text-align: center;">1</td> <td></td> <td></td> </tr> <tr> <td>INDEPENDENT CLAIMS (37 CFR 1.16(h))</td> <td style="text-align: center;">2</td> <td style="text-align: center;">minus 3</td> <td style="text-align: center;">=</td> <td style="text-align: center;">*</td> <td></td> <td></td> </tr> <tr> <td>APPLICATION SIZE FEE (37 CFR 1.16(s))</td> <td colspan="6">If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$260 (\$130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR</td> </tr> <tr> <td colspan="7">MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))</td> </tr> </table>							BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A			N/A	N/A	SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A			N/A	N/A	EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A			N/A	N/A	TOTAL CLAIMS (37 CFR 1.16(i))	21	minus 20	=	1			INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3	=	*			APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$260 (\$130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))						
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SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A			N/A	N/A																																																	
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* If the difference in column 1 is less than zero, enter "0" in column 2.																																																							
APPLICATION AS AMENDED – PART II																																																							
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AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA																																																			
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AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA																																																			
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* 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.

This collection of information is required by 37 CFR 1.16. 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, 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.

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