

Art Unit: 3992

presented pursuant to 37 CFR 1.52(a) and (b), and must contain any fees required by 37 CFR 1.20(c).

In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, after final rejection and 37 CFR 41.33 after appeal, which will be strictly enforced. See MPEP § 2250(IV) for examples to assist in the preparation of proper proposed amendments in reexamination proceedings.

Service of Papers

16. After filing of a request for ex parte reexamination by a third party requester, any document filed by either the patent owner or the third party requester must be served on the other party (or parties where two or more third party requester proceedings are merged) in the reexamination proceeding in the manner provided in 37 CFR 1.248. The document must reflect service or the document may be refused consideration by the Office. See 37 CFR 1.550(f).

Extensions of Time

17. Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Litigation Reminder

18. The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 6,587,067 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Conclusion

19. **THIS ACTION IS MADE FINAL.**

A shortened statutory period for response to this action is set to expire two (2) month from the mailing date of this action.

Extensions of time under 37 CFR 1.136(a) do not apply in reexamination proceedings. The provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Further, in 35 U.S.C. 305 and in 37 CFR 1.550(a), it is required that reexamination proceedings "will be conducted with special dispatch within the Office."

Extensions of time in reexamination proceedings are provided for in 37 CFR 1.550(c). A request for extension of time must be filed on or before the day on which a response to this action is due, and it must be accompanied by the petition fee set forth in 37 CFR 1.17(g). The mere filing of a request will not effect any extension of time. An extension of time will be granted only for sufficient cause, and for a reasonable time specified.

The filing of a timely first response to this final rejection will be construed as including a request to extend the shortened statutory period for an additional month, which will be granted even if previous extensions have been granted. In no event however, will the statutory period for response expire later than SIX MONTHS from the mailing date of the final action. See MPEP § 2265.

NOTICE RE PATENT OWNER'S CORRESPONDENCE ADDRESS

Effective May 16, 2007, 37 CFR 1.33(c) has been revised to provide that:

The patent owner's correspondence address for all communications in an *ex parte* reexamination or an *inter partes* reexamination is designated as the correspondence address of the patent.

Revisions and Technical Corrections Affecting Requirements for Ex Parte and Inter Partes Reexamination, 72 FR 18892 (April 16, 2007)(Final Rule)

The correspondence address for any pending reexamination proceeding not having the same correspondence address as that of the patent is, by way of this revision to 37 CFR 1.33(c), automatically changed to that of the patent file as of the effective date.

This change is effective for any reexamination proceeding which is pending before the Office as of May 16, 2007, including the present reexamination proceeding, and to any reexamination proceeding which is filed after that date.

Parties are to take this change into account when filing papers, and direct communications accordingly.

In the event the patent owner's correspondence address listed in the papers (record) for the present proceeding is different from the correspondence address of the patent, it is strongly encouraged that the patent owner affirmatively file a Notification of Change of Correspondence Address in the reexamination proceeding and/or the patent (depending on which address patent owner desires), to conform the address of the proceeding with that of the patent and to clarify the record as to which address should be used for correspondence.

Telephone Numbers for reexamination inquiries:

| | |
|--|----------------|
| Reexamination and Amendment Practice | (571) 272-7703 |
| Central Reexam Unit (CRU) | (571) 272-7705 |
| Reexamination Facsimile Transmission No. | (571) 273-9900 |

Art Unit: 3992

All correspondence relating to this *ex parte* reexamination proceeding should be directed as follows:

By U.S. Postal Service Mail to:

Mail Stop *Ex Parte* Reexam
ATTN: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

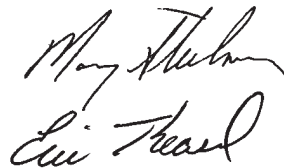
By FAX to: (571) 273-9900
Central Reexamination Unit


By hand to: Customer Service Window
Randolph Building
401 Dulany St.
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Reexamination Legal Advisor or Examiner, or as to the status of this proceeding, should be directed to the Central Reexamination Unit at telephone number (571) 272-7705.



Woo H. Choi
Primary Examiner
Central Reexamination Unit 3992



| | | |
|---|--|---|
| Reexamination  | Application/Control No. 90007876 | Applicant(s)/Patent Under Reexamination 6587067 |
| | Certificate Date | Certificate Number |

Requester Correspondence Address: Patent Owner Third Party

Kenneth D'Alessandro
 Sierra Patent Group, Ltd
 1657 Hwy 395, Suit 202
 Minden, NV 89423

| | | |
|--|----------------------------|----------------------------|
| LITIGATION REVIEW <input checked="" type="checkbox"/> | whc (examiner initials) | 04/04/2008 (date) |
| Case Name | | Director Initials |
| None | | <i>Eric Heasel for Lmm</i> |
| | | |
| | | |
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| COPENDING OFFICE PROCEEDINGS | |
|-------------------------------------|---------------|
| TYPE OF PROCEEDING | NUMBER |
| 1. None | |
| | |
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| | |
| | |

Litigation Search Report CRU 3999

Reexam Control No. 90/007,876

**TO: Woo Choi
Location: CRU
Art Unit : 3992
Date: 03/28/08**

**From: James R. Matthews
Location: CRU 3999
MDW 7C71
Phone: (571) 272-4233**

Case Serial Number: 90/007,876

JamesR.Matthews@uspto.gov

Search Notes

U.S. Patent No.-6,655,067

- 1) I performed a KeyCite Search in Westlaw, which retrieves all history on the patent including any litigation.
- 2) I performed a search on the patent in Lexis CourtLink for any open dockets or closed cases.
- 3) I performed a search in Lexis in the Federal Courts and Administrative Materials databases for any cases found.
- 4) I performed a search in Lexis in the IP Journal and Periodicals database for any articles on the patent.
- 5) I performed a search in Lexis in the news databases for any articles about the patent or any articles about litigation on this patent.

KEYCITE

CUS PAT 6587067 UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND CAPABILITIES, Assignee: Universal Electronics Inc. (Jul 01, 2003)

History

- => 1 **UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND CAPABILITIES, US PAT 6587067, 2003 WL 21502724 (U.S. PTO Utility Jul 01, 2003) (NO. 09/791354)**

Patent Family

- 2 **REMOTE CONTROL DEVICE WITH KEY FUNCTION RE-ASSIGNMENT MODE - HAS KEY RE-ASSIGNMENT TABLE IN MEMORY CONTAINING KEY IDENTITY MODE DATA, DEVICE DATA FORMAT AND FUNCTION DATA., DWPL 1994-218179**

Assignments

- 3 **ACTION: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS). NUMBER OF PAGES: 004, DATE RECORDED: Sep 06, 2001**

Patent Status Files

- . Request for Re-Examination, (OG date: Jun 20, 2006)
- . Certificate of Correction, (OG date: Oct 05, 2004)

Prior Art (Coverage Begins 1976)

- C** 6 **US PAT 3911424 ALPHANUMERIC CHARACTER DISPLAY SCHEME FOR PROGRAMMABLE ELECTRONIC CALCULATORS, Assignee: International Business Machines Corporation, (U.S. PTO Utility 1975)**
- C** 7 **US PAT 4665397 APPARATUS AND METHOD FOR A UNIVERSAL ELECTRONIC LOCKING SYSTEM, Assignee: Universal Photonics, Inc., (U.S. PTO Utility 1987)**
- C** 8 **US PAT 4599491 APPARATUS FOR CONVERTING DIRECT COUPLED DATA DEVICES TO ACOUSTIC COUPLED DATA DEVICES, Assignee: Novation, Inc., (U.S. PTO Utility 1986)**
- C** 9 **US PAT 4935870 APPARATUS FOR DOWNLOADING MACRO PROGRAMS AND EXECUTING A DOWNLOADED MACRO PROGRAM RESPONDING TO ACTIVATION OF A SINGLE KEY, Assignee: Keycom Electronic Publishing, (U.S. PTO Utility 1990)**
- C** 10 **US PAT 4200862 APPLIANCE CONTROL, Assignee: Pico Electronics Limited, (U.S. PTO Utility 1980)**
- C** 11 **US PAT 4823311 CALCULATOR KEYBOARD WITH USER DEFINABLE FUNCTION KEYS AND WITH PROGRAMMABLY ALTERABLE INTERACTIVE LABELS FOR CER-**

- TAIN FUNCTION KEYS, Assignee: Texas Instruments Incorporated, (U.S. PTO Utility 1989)
- C** 12 US PAT 4386412 CALCULATOR WITH EQUATION DISPLAY DEVICE, Assignee: Casio Computer Company, Ltd., (U.S. PTO Utility 1983)
- C** 13 US PAT 4028493 CALL PROGRESS SIGNAL DETECTOR, Assignee: International Business Machines, (U.S. PTO Utility 1977)
- C** 14 US PAT 4251805 CIRCUIT ARRANGEMENT FOR AN INPUT KEYBOARD, Assignee: ITT Industries, Inc., (U.S. PTO Utility 1981)
- C** 15 US PAT 4908612 COMPUTER INPUT-OUTPUT DEVICE, Assignee: Penguin Products, Inc., (U.S. PTO Utility 1990)
- C** 16 US PAT 4517564 CORDLESS REMOTE CONTROL APPARATUS, Assignee: Tokyo Shibaura Denki Kabushiki Kaisha, (U.S. PTO Utility 1985)
- C** 17 US PAT 4246611 DIGITAL CONTROL SYSTEM AND A METHOD OF TRANSMITTING CONTROL DATA IN SUCH A SYSTEM, Assignee: Texas Instruments Incorporated, (U.S. PTO Utility 1981)
- C** 18 US PAT 4177453 DIGITAL REMOTE CONTROL SYSTEM WITH IMPROVED NOISE IMMUNITY, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1979)
- C** 19 US PAT 4860390 DRAINAGE PLUG, (U.S. PTO Utility 1989)
- C** 20 US PAT 4766540 ELECTRONIC CASH REGISTER WITH PROGRAMMABLE MODE/FUNCTION KEY SETTINGS, Assignee: Casio Computer Co., Ltd., (U.S. PTO Utility 1988)
- C** 21 US PAT 4875096 ENCODING OF AUDIO AND DIGITAL SIGNALS IN A VIDEO SIGNAL, Assignee: Smith Engineering, (U.S. PTO Utility 1989)
- C** 22 US PAT 5032983 ENTRY POINT MAPPING AND SKIPPING METHOD AND APPARATUS, Assignee: Tandem Computers Incorporated, (U.S. PTO Utility 1991)
- C** 23 US PAT 5414426 FAVORITE KEY MACRO COMMAND AND CHAINED MACRO COMMAND IN A REMOTE CONTROL, Assignee: Universal Electronics Inc., (U.S. PTO Utility 1995)
- C** 24 US PAT 4038533 INDUSTRIAL CONTROL PROCESSOR SYSTEM, Assignee: Allen-Bradley Company, (U.S. PTO Utility 1977)
- C** 25 US PAT 4509211 INFRARED EXTENSION SYSTEM, Assignee: Xantech Corporation, (U.S. PTO Utility 1985)
- C** 26 US PAT 4745402 INPUT DEVICE FOR A DISPLAY SYSTEM USING PHASE-ENCODED SIGNALS, Assignee: RCA Licensing Corporation, (U.S. PTO Utility 1988)
- C** 27 US PAT 5088023 INTEGRATED CIRCUIT HAVING PROCESSOR COUPLED BY COMMON BUS TO PROGRAMMABLE READ ONLY MEMORY FOR PROCESSOR OPERATION AND PROCESSOR UNCOUPLED FROM COMMON BUS WHEN PROGRAMMING READ ONLY MEMORY FROM EXTERNAL DEVICE, Assignee: Hitachi, Ltd., (U.S. PTO Utility 1992)
- C** 28 US PAT 4503288 INTELLIGENT TELEPHONE, Assignee: Novation, Inc., (U.S. PTO Utility 1985)
- C** 29 US PAT 4965557 INTERACTIVE CONTROL OF ENTERTAINMENT ELECTRONICS APPARATUS, Assignee: Nokia Unterhaltungselektronik, (U.S. PTO Utility 1990)
- C** 30 US PAT 4426662 IR REMOTE CONTROL DETECTOR/DECODER, Assignee: Zenith Radio

- Corporation, (U.S. PTO Utility 1984)
- ▷ 31 US PAT 4425647 IR REMOTE CONTROL SYSTEM, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1984)
- Ⓒ 32 US PAT 6014092 KEY MOVER, Assignee: Universal Electronics Inc., (U.S. PTO Utility 2000)
- Ⓒ 33 US PAT 6195033 KEY MOVER, Assignee: Universal Electronics Inc., (U.S. PTO Utility 2001)
- Ⓒ 34 US PAT 1487784 KEYBOARD MECHANISM FOR TYPOGRAPHICAL MACHINES, (U.S. PTO Utility 1924)
- Ⓒ 35 US PAT 4698618 KEYBOARD WITH ARRAYS OF FUNCTION KEYS, Assignee: American Telephone and Telegraph Company,, (U.S. PTO Utility 1987)
- Ⓒ 36 US PAT 5005118 METHOD AND APPARATUS FOR MODIFYING MICRO- INSTRUCTIONS USING A MACRO-INSTRUCTION PIPELINE, Assignee: Tandem Computers Incorporated, (U.S. PTO Utility 1991)
- Ⓒ 37 US PAT 4356509 MICROCOMPUTER-CONTROLLED TELEVISION/TELEPHONE SYSTEM AND METHOD THEREFORE, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1982)
- Ⓒ 38 US PAT 4431988 MICROPROCESSOR-BASED KEYBOARD/DISPLAY UNIT FOR CONFIGURING CONTROL INSTRUMENTS, Assignee: Bristol Babcock Inc., (U.S. PTO Utility 1984)
- Ⓒ 39 US PAT 4318130 MICROPROCESSOR CONTROL SYSTEM FOR TELEVISION RECEIVERS, Assignee: The Magnavox Company, (U.S. PTO Utility 1982)
- Ⓒ 40 US PAT 4866434 MULTI-BRAND UNIVERSAL REMOTE CONTROL, Assignee: Thomson Consumer Electronics, Inc., (U.S. PTO Utility 1989)
- Ⓒ 41 US PAT 4482947 MULTI-FUNCTION, MULTI-UNIT REMOTE CONTROL SYSTEM AND METHOD THEREFOR, Assignee: Zenith Electronics Corporation, (U.S. PTO Utility 1984)
- Ⓒ 42 US PAT 4779079 MULTI-PURPOSE COMPUTER UTILITY ARRANGEMENT, (U.S. PTO Utility 1988)
- Ⓒ 43 US PAT 4855746 MULTIPLE DEVICE REMOTE CONTROL TRANSMITTER, Assignee: Zenith Electronics Corporation, (U.S. PTO Utility 1989)
- Ⓒ 44 US PAT 4245342 ONE-FOR-N MODEM CONTROL APPARATUS, Assignee: Intech Laboratories, Inc., (U.S. PTO Utility 1981)
- Ⓒ 45 US PAT 4889370 PIPE REPAIR ASSEMBLY, (U.S. PTO Utility 1989)
- Ⓒ 46 US PAT 4626848 PROGRAMMABLE FUNCTIONS FOR RECONFIGURABLE REMOTE CONTROL, Assignee: General Electric Company, (U.S. PTO Utility 1986)
- Ⓒ 47 US PAT 3956745 PROGRAMMABLE KEYBOARD ARRANGEMENTS, Assignee: The Marconi Company Limited, (U.S. PTO Utility 1976)
- Ⓒ 48 US PAT 4802114 PROGRAMMABLE REMOTE CONTROL TRANSMITTER, Assignee: General Electric Company, (U.S. PTO Utility 1989)
- Ⓒ 49 US PAT 4481382 : PROGRAMMABLE TELEPHONE SYSTEM, (U.S. PTO Utility 1984)
- Ⓒ 50 US PAT 4179748 PROGRAMMER AND METHOD OF STORING INFORMATION THEREIN AND ACCESSING INFORMATION THEREFROM, Assignee: National Semiconductor Corporation, (U.S. PTO Utility 1979)
- Ⓒ 51 US PAT 4688020 RECONFIGURABLE KEYBOARD, Assignee: United States Data Corpora-

- tion, (U.S. PTO Utility 1987)
- C** 52 US PAT 4623887 RECONFIGURABLE REMOTE CONTROL, Assignee: General Electric Company, (U.S. PTO Utility 1986)
 - C** 53 US PAT 4856081 RECONFIGURABLE REMOTE CONTROL APPARATUS AND METHOD OF USING THE SAME, Assignee: North American Philips Consumer, (U.S. PTO Utility 1989)
 - C** 54 US PAT 5552917 REMOTE CONTROL, Assignee: Universal Electronics Inc., (U.S. PTO Utility 1996)
 - C** 55 US PAT 4656655 REMOTE CONTROL ADAPTER OF ELECTRIC EQUIPMENT USING TELEPHONE LINES, Assignee: Hashimoto Corporation, (U.S. PTO Utility 1987)
 - C** 56 US PAT 4794371 REMOTE CONTROL APPARATUS, Assignee: Fuji Electric Company Ltd., (U.S. PTO Utility 1988)
 - C** 57 US PAT 4718112 : REMOTE CONTROL APPARATUS, Assignee: Sony Corporation, (U.S. PTO Utility 1988)
 - C** 58 US PAT 4918439 REMOTE CONTROL DEVICE, Assignee: CL 9, Inc., (U.S. PTO Utility 1990)
 - C** 59 US PAT 4771283 REMOTE CONTROL DEVICE, Assignee: Alpine Electronics Inc., (U.S. PTO Utility 1988)
 - C** 60 US PAT 4540851 REMOTE CONTROL DEVICE USING TELEPHONE CIRCUIT OF ELECTRIC APPARATUS, Assignee: Hashimoto Corporation, (U.S. PTO Utility 1985)
 - C** 61 US PAT 4885766 REMOTE CONTROL DEVICE USING A TELEPHONE LINE, Assignee: Sharp Kabushiki Kaisha, (U.S. PTO Utility 1989)
 - C** 62 US PAT 4712105 REMOTE CONTROL HAND APPARATUS FOR OPERATING DIFFERENT MODULES, Assignee: U.S. Philips Corporation, (U.S. PTO Utility 1987)
 - C** 63 US PAT 4251812 REMOTE CONTROL SYSTEM, Assignee: Sony Corporation, (U.S. PTO Utility 1981)
 - C** 64 US PAT 4121198 REMOTE CONTROL SYSTEM, Assignee: Matsushita Electric Industrial Co., Ltd., (U.S. PTO Utility 1978)
 - C** 65 US PAT 4231031 REMOTE CONTROL SYSTEM CAPABLE OF TRANSMITTING THE INFORMATION WITH THE AID OF AN INFRA RED BEAM USING PPM OR AN ULTRASONIC BEAM USING PDM, Assignee: U.S. Philips Corporation, (U.S. PTO Utility 1980)
 - C** 66 US PAT 4338632 REMOTE CONTROL SYSTEM FOR TELEVISION MONITORS, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1982)
 - C** 67 US PAT 4746919 REMOTE CONTROL SYSTEM WITH KEY FUNCTION DISPLAY PROVISIONS, Assignee: RCA Licensing Corporation, (U.S. PTO Utility 1988)
 - C** 68 US PAT 4566034 REMOTE CONTROL TRANSMITTER ARRANGEMENT FOR ONE OR MORE TELEVISION DEVICES, Assignee: RCA Corporation, (U.S. PTO Utility 1986)
 - C** 69 US PAT 4626847 REMOTE CONTROL TRANSMITTER SYSTEM, Assignee: Zenith Electronics Corporation, (U.S. PTO Utility 1986)
 - C** 70 US PAT 5689353 REMOTE CONTROL WITH TWO-WAY DATA COUPLING, Assignee: Universal Electronics Inc., (U.S. PTO Utility 1997)
 - C** 71 US PAT 4625080 REMOTE VIDEO RECORDER PROGRAMMING APPARATUS OPERATING OVER TELEPHONE LINES, (U.S. PTO Utility 1986)

- C 72 US PAT 4807052 REMOTELY CONTROLLABLE ELECTRONIC APPARATUS, Assignee: Sony Corporation, (U.S. PTO Utility 1989)
- C 73 US PAT 4823294 SINGLE-HAND COMPUTER KEYBOARD, (U.S. PTO Utility 1989)
- C 74 US PAT 4891786 STROKE TYPING SYSTEM, (U.S. PTO Utility 1990)
- C 75 US PAT 4580009 TELEPHONE MOUTHPIECE MODULAR COUPLER, Assignee: The Microperipherel Corporation, (U.S. PTO Utility 1986)
- C 76 US PAT 4841368 TELEVISION CUSTOMER CONTROL FUNCTIONS RESTORER, Assignee: North American Philips Corporation, (U.S. PTO Utility 1989)
- C 77 US PAT 4386436 TELEVISION REMOTE CONTROL SYSTEM FOR SELECTIVELY CONTROLLING EXTERNAL APPARATUS THROUGH THE AC POWER LINE, Assignee: RCA Corporation, (U.S. PTO Utility 1983)
- C 78 US PAT 4488179 TELEVISION VIEWING CENTER SYSTEM, Assignee: Robert Bosch GmbH, (U.S. PTO Utility 1984)
- C 79 US PAT 4631601 TIME PROGRAMMABLE CONTROL SYSTEM FOR A CONVERTER/VCR SYSTEM, Assignee: Zenith Electronics Corporation, (U.S. PTO Utility 1986)
- C 80 US PAT 4754133 TRANSCEIVER CIRCUIT FOR MODULATED INFRARED SIGNALS, Assignee: Williams Electronics Games, Inc., (U.S. PTO Utility 1988)
- C 81 US PAT 4529980 TRANSMITTER AND RECEIVER FOR CONTROLLING THE CODING IN A TRANSMITTER AND RECEIVER, Assignee: Chamberlain Manufacturing Corporation, (U.S. PTO Utility 1985)
- C 82 US PAT 4535333 TRANSMITTER AND RECEIVER FOR CONTROLLING REMOTE ELEMENTS, Assignee: Chamberlain Manufacturing Corporation, (U.S. PTO Utility 1985)
- C 83 US PAT 4769643 TRANSMITTER DRIVER FOR PROGRAMMABLE REMOTE CONTROL TRANSMITTER, Assignee: General Electric Company, (U.S. PTO Utility 1988)
- C 84 US PAT 4959810 UNIVERSAL REMOTE CONTROL DEVICE, Assignee: Universal Electronics, Inc., (U.S. PTO Utility 1990)
- C 85 US PAT 5959751 UNIVERSAL REMOTE CONTROL DEVICE, Assignee: Universal Electronics Inc., (U.S. PTO Utility 1999)
- C 86 US PAT 5187469 UNIVERSAL REMOTE CONTROL INCLUDING QUICK TOUCH FUNCTION, Assignee: Tandy Corporation, (U.S. PTO Utility 1993)
- ▷ 87 US PAT 5872562 UNIVERSAL REMOTE CONTROL TRANSMITTER WITH SIMPLIFIED DEVICE IDENTIFICATION, Assignee: U.S. Philips Corporation, (U.S. PTO Utility 1999)
- C 88 US PAT 4774511 UNIVERSAL REMOTE CONTROL UNIT, Assignee: NAP Consumer Electronics Corp., (U.S. PTO Utility 1988)
- ▷ 89 US PAT 4703359 UNIVERSAL REMOTE CONTROL UNIT WITH MODEL IDENTIFICATION CAPABILITY, Assignee: NAP Consumer Electronics Corp., (U.S. PTO Utility 1987)



Patent Search 6587067 3/28/2008

No cases found.

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791354 (09) 6587067 July 1, 2003

UNITED STATES PATENT AND TRADEMARK OFFICE GRANTED PATENT

6587067

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July 1, 2003

Universal remote control with macro command capabilities

REEXAM-LITIGATE: January 17, 2006 - Reexamination requested January 17, 2006 by Kenneth D'Alessandro, Sierra Patent Group, Ltd., Minden, NV, Reexamination No. 90/007,876 (O.G. June 20, 2006) Ex. Gp.: 3992

INVENTOR: Darbee, Paul V. - Santa Ana, California, United States (US); Ellis, Richard E. - Garden Grove, California, United States (US); Jansky, Louis Steven - Long Beach, California, United States (US); Grossman, Avram S. - Santa Ana, California, United States (US)

CERT-CORRECTION: September 14, 2004 - a Certificate of Correction was issued for this patent (O.G. October 5, 2004)

APPL-NO: 791354 (09)

FILED-DATE: February 23, 2001

GRANTED-DATE: July 1, 2003

ASSIGNEE-PRE-ISSUE: September 6, 2001 - ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS)., UNIVERSAL ELECTRONICS INC. 6101 GATEWAY DRIVE CYPRESS, CALIFORNIA, 90630, Reel and Frame Number: 012144/0163

ASSIGNEE-AT-ISSUE: Universal Electronics Inc., Cypress, California, United States (US), United States company or corporation (02)

LEGAL-REP: Galis, Mark R.; Jarosik, Gary R.

PUB-TYPE: July 1, 2003 - Utility Patent having a previously published pre-grant publication (B2)

PUB-COUNTRY: United States (US)

REL-DATA:

Continuation of Ser. No. 09/408729, September 29, 1999, GRANTED PATENT 6195033, Utility Patent having no previously published pre-grant publication (A)
, which is a Continuation-in-part of Ser. No. 07/990854, December 11, 1992, GRANTED PATENT 6014092, Utility Patent having no previously published pre-grant publication (A)
, which is a Continuation-in-part of Ser. No. 07/913523, July 14, 1992, ABANDONED
, which is a Continuation-in-part of Ser. No. 07/586957, September 24, 1990, ABANDONED
, which is a Continuation-in-part of Ser. No. 07/127999, December 2, 1987, GRANTED PATENT 4959810, Utility Patent having no previously published pre-grant publication (A)
, which is a Continuation-in-part of Ser. No. 09/109336, October 14, 1987, ABANDONED
Prior Publication 20010010503, August 2, 2001, PENDING

US-MAIN-CL: 341#176

US-ADDL-CL: 341#173, 345#169, 345#171, 348#E05.096

CL: 341, 345, 348

SEARCH-FLD: 341#173, 341#176, 348#734, 340#825.52, 340#825.72, 359#146, 359#148, 345#168, 345#169, 345#172

IPC-MAIN-CL: [7] H04L 017#02

PRIM-EXMR: Horabik, Michael

ASST-EXMR: Wong, Albert K.

REF-CITED:

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CORE TERMS: button, infrared, remote control, pulse, pushbutton, port, connector, panel, pin, circuitry, serial, volt, user, row, transistor, train, keyboard, coupled, blink, battery, control device, cable, green, input, red, universal, sequence, stored, diode, transmitter

ENGLISH-ABST:

A universal remote control comprising a keyboard having a plurality of pushbuttons including a macro pushbutton and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers. Instructions within the remote control are used to match the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard. The instructions are also used to assign to the macro pushbutton a subset of the selected codes and data from the library whereafter activation of the macro pushbutton causes the universal remote control to use the subset of selected codes and data from the library to transmit operating commands to one or more of the matched home appliances.

NO-OF-CLAIMS: 6

EXMPL-CLAIM: 1

NO-OF-FIGURES: 36

NO-DRWNG-PP: 17

PARENT-PAT-INFO:

CROSS-REFERENCE TO RELATED APPLICATIONS

This patent application claims the priority date of U.S. application Ser. No. 109,336 filed on Oct. 14, 1987, now abandoned, as a continuation of U.S. application Ser. No. 09/408,729 filed on Sep. 29, 1999 now U.S. Pat. No. 6,195,033 which is a continuation-in-part of U.S. application Ser. No. 07/990,854 filed on Dec. 11, 1992, now U.S. Pat. No. 6,014,092, which is a continuation-in-part of U.S. application Ser. No. 07/913,523 filed on Jul. 14, 1992, now abandoned, which is a continuation-in-part of U.S. application Ser. No. 07/586,957 filed on Sep. 24, 1990, now abandoned, which is a continuation-in-part of U.S. application Ser. No. 07/127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810, which is a continuation-in-part of U.S. application Ser. No. 09/109,336 filed on Oct. 14, 1987, now abandoned.

This patent application contains the specification of U.S. application Ser. No. 127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810.

This patent application is also related to U.S. application Ser. No. 08/874,184 filed on Jun. 13, 1997, now U.S. Pat. No. 5,959,751, which is a continuation of U.S. application Ser. No. 08/706,794 filed on Sep. 3, 1996, now U.S. Pat. No. 5,689,353, which is a continuation of U.S. application Ser. No. 08/314,970 filed Sep. 29, 1994, now U.S. Pat. No. 5,552,917, which is a divisional of U.S. application Ser. No. 08/093,512 filed on Jul. 16, 1993, now abandoned, which is a continuation of U.S. application Ser. No. 07/586,957 filed on Sep. 24, 1990, now abandoned, which is a divisional of U.S. application Ser. No. 07/127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810, which is a continuation-in-part of U.S. application Ser. No. 07/109,336 filed Oct. 14, 1987, now abandoned.

SUMMARY:

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a universal remote control device of the type which is hand held and which can be coupled via coded infrared signals with a remote control receiver built into a television or other remotely controlled electrical apparatus to turn on the apparatus, such as the television, at a distance, to adjust the volume, tone and brightness, to change channels, and to turn the television off.

Additionally, the present invention relates to a method for acquiring the infrared codes for a controlled apparatus, such as a television, generating code data related to these infrared codes for storage in a remote control device and methods for using the remote control device for finding, in a library or table of code data for generating infrared codes for operating different electrical apparatus manufactured by different manufacturers stored in a RAM of the remote control device, the code data for generating infrared coded signals for operating a particular apparatus, such as a television, and then for using the stored code data for generating the coded infrared signals for operating the controlled apparatus.

2. Description of the Prior Art

Heretofore it has been proposed to provide a reconfigurable remote control device and

programmable functions for such a remote control device which will enable one to learn, store and retransmit infrared codes that are emitted from the controller for a remotely controlled apparatus, such as a television.

For example, in the Welles II U.S. Pat. No. 4,623,887 and the Ehlers U.S. Pat. No. 4,626,848, there is disclosed a reconfigurable remote control device which has the ability to learn, store and repeat remote control codes from any other infrared transmitter. Such a reconfigurable remote control transmitter device includes an infrared receiver, a microprocessor, a non-volatile random access memory, a scratch pad random access memory, and an infrared transmitter.

According to the teachings of the Ehlers patent, the infrared signals received by the remote control device are in bursts of pulses and the device counts the number of pulses in each burst as well as the time duration of each pause in a transmission between bursts.

As will be described in greater detail hereinafter, the universal remote control device of the present invention utilizes a single non-volatile RAM does not provide a separate scratch pad RAM or, more importantly, a ROM.

In learning the infrared code and transforming same to code data which is then stored in a RAM of the control device and later used to generate infrared codes, a novel method is utilized wherein no counting of pulses takes place, and only the time duration of the pulses in a burst of pulses from the leading edge of the first pulse in a burst of pulses to the trailing edge of the last pulse in the burst as well as the time duration of the pause between bursts are sensed and used to learn and later to generate the infrared codes.

Additionally, unique methods for use of the remote control device are provided so that a number of infrared operation code sequences can be generated by the remote control device for operating various types of electronic apparatus.

SUMMARY OF THE INVENTION

According to the invention there is provided a universal remote control system having input means for inputting commands, signal output means for supplying infrared signals to a controlled device, a central processing unit (CPU) coupled to the input means and to the signal output means, a single non-volatile, read-write RAM (such as a battery-backed RAM) coupled to the central processing unit and data coupling means including terminal means coupled to the CPU for enabling new code data to be supplied from outside the system to, or retrieved from the RAM through the terminal means and the CPU.

Further according to the invention, there is provided a method of loading a RAM in a ROM-less microprocessor system comprising a central processing unit, a single non-volatile, read-write RAM, input means, output means, and means for coupling said central processing unit, said RAM, said input means, and said output means together, said method including the steps of:

- (a) disabling the central processing unit;
- (b) connecting a separate microprocessor system to said RAM;
- (c) transferring instructions and/or data to said RAM;
- (d) re-enabling the central processing unit to enable the central processing unit to execute the instructions so transferred.

Still further according to the present invention, there is provided a process of learning, storing and reproducing the remote control codes of any of a diverse plurality of remote control transmitters, comprising the steps of:

- (a) receiving a transmission of a train of pulses from a remote control transmitter;
- (b) recording the point-in-time of an edge of each pulse in a train of said pulses;
- (c) transforming the recorded point-in-time data into a list of instructions for generating a replica of said train of pulses;
- (d) timing the duration of a train of said pulses;
- (e) timing the period between trains of pulses;
- (f) associating a function key of a universal remote control device with said time duration of said train of pulses and said list of instructions for generating a replica of said train of pulses;
- (g) determining whether or not repetitions of the transmission of train of pulses is present;
- (h) ignoring repetitions of the train of pulses;
- (i) noting that repetitions are present; and
- (j) storing for use in a universal remote control device, the information acquired in steps (c), (d), (e), (f) and (i).

DRWDESC:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front perspective view of the universal remote control device constructed according to the teachings of the present invention.

FIG. 2 is an exploded perspective view of the control device shown in FIG. 1.

FIG. 3 is an enlarged fragmentary sectional view through two of the push buttons of the control device shown in FIGS. 1 and 2.

FIG. 4 is a fragmentary corner view of a push button containing panel and a base panel.

FIG. 5 is a fragmentary corner view similar to FIG. 4 as the panels are brought together and shows one of the push buttons cut away from the push button containing panel.

FIG. 6 is a fragmentary sectional view of the assembly 15 formed by bringing the push button containing panel into engagement with the base panel.

FIG. 7 is a plan view of the circuit board assembly mounted inside the control device viewing the control device from the back side thereof with a back cover panel removed.

FIG. 8 is a block diagram of the operating circuitry in the control device.

FIGS. 9A & 9B are a detailed schematic circuit diagram of the operating circuitry shown in FIG. 8.

FIG. 10 is a perspective view showing the connection of a programming connector over the central processing unit of the operating circuitry in the control device, the programming connector being connected to a microprocessor, being operable to disable the central processing unit, and being used to program the random access memory (RAM) of the operating circuitry.

FIGS. 11a to 11i are graphical representations of several modulation schemes which are used in infrared remote control transmitters.

FIG. 12A is a flow chart of a first part of a method for capturing an IR code and FIG. 12B is a graph of the envelope of the code.

FIG. 13A is a flow chart of a second part of a method for capturing an IR code; FIG. 13B is a waveform of the IR bit stream and filtered bit stream; and FIG. 13C is a graph of the waveform of a filtered repetition of a filtered bit stream.

FIG. 14 is a flow chart of the method used for generating an infrared code.

FIG. 15 is a front plan view of the control device shown in FIG. 1 and shows the various pushbuttons of the device.

FIG. 16 is a flow chart of the search and set procedure followed in using the control device of the present invention.

FIG. 17 is a flow chart of a direct-entry/quick-set procedure followed in using the remote control device.

FIG. 18A is a flow chart of the procedure followed in setting a "DO" command and FIG. 18B is a flow chart of the method for executing a "DO" command.

FIG. 19A is a flow chart of the method used to identify what type of unit the remote control device is set for and FIG. 19B is a table of the identifying blink code.

FIG. 20 is a fragmentary perspective view with portions broken away of a connector with conversion circuitry therein and a special battery case cover for the control device by which new data can be inputted into the RAM of the operating circuitry of the control device.

FIG. 21 is a schematic circuit diagram of part of the conversion circuitry in the connector shown in FIG. 20.

FIG. 22 is a schematic circuit diagram of another part of the conversion circuitry in the connector shown in FIG. 20.

DETDESC:

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1 in greater detail, there is illustrated therein a universal remote control device 10 constructed according to the teachings of the present invention.

As shown, the device 10 includes a housing 11 including an upper housing member 12 having a base panel 14, and a lower housing member 16. An overlay face panel 18 is positioned over the base panel 14.

The two panels 14 and 18 have openings 22 and 24 (FIG. 2) therethrough for receiving elastomeric pushbuttons 25, all of which extend from and are fixed to or integral with an elastomeric body panel 26 as shown in FIG. 2.

The pushbuttons 25 are arranged in rows and columns and are identified as follows on the overlay face panel 18:

Search terms may have been found within the contents of this table. Please see the table in the original document.

This arrangement is shown in FIG. 15 and the manner in which these pushbuttons 25 are utilized in operating the control device 10 will be described in greater detail in connection with the description of FIGS. 15-19B.

At a top or forward end 28 of the device 10, there is provided an opening 30 for three light emitting diodes, LED 1, LED 2 and LED 3. The opening 30 is covered by an infrared-transport lens 31. Also, provided on a top surface 32 of the upper housing member 12 of the control device 10 is a light emitting diode, LED 4, by which information, in the form of red and green blink codes, is communicated to the user of the device 10.

FIG. 2 is an exploded view of the components of the device 10. As shown, the device 10 includes the overlay face panel 18 with pushbutton-receiving, generally rectangular openings 22, the upper housing member 12 with base panel 14 having a plurality of generally rectangular, pushbutton receiving openings 24, the elastomeric body panel 26 having pushbuttons 25 extending from an upper surface 34 thereof, a printed circuit board 36 having conductive switches 38 on an upper surface 40 thereof and operating circuitry 42 (FIG. 7) mounted on the underside 43 thereof, the lower housing member 16, a cover 44 for a battery compartment 45 (FIG. 7) for receiving batteries 46 (FIG. 10) for the circuitry 42 of the control device 10, and the infrared-transport lens 31.

It will be noted that the base panel 14 of the upper housing member 12 has pushbutton openings 24 completely across each one of fourteen (14) rows across and four (4) columns down. However, not all of these openings or holes 24 have pushbuttons 25 extending therethrough, as noted by the lesser number of pushbutton-receiving openings 22, in the overlay face panel 18. Likewise, the body panel 26 initially has pushbuttons 25 arranged completely across the upper surface 34 thereof in fourteen (14) rows across and fourteen (14) columns down.

The printed circuit board 36 has conductive switches 38 aligned with each one of the pushbuttons 25 so that more switches 38 are provided than may be necessary for this particular control device 10.

The availability of additional pushbutton openings 24 in the base panel 14 will enable the control device 10 to be modified as necessary by the addition of further pushbuttons 25 to perform numerous other functions as called for.

This mechanical construction of the upper and lower housing members 12 and 16 and the panels 14 and 18 and circuit board 36 enable the control device 10 to be modified to include additional circuits in the operating circuitry 42 and pushbutton switches 25 for performing additional functions, if desired. In this respect, overlay face panel 18 is easily replaceable to modify the device 10 to include more or less pushbuttons 25 and associated switches 38.

The simplicity of the construction of the pushbuttons 25, the base panel 14 and the overlay panel 18 is shown in FIGS. 3-6. As shown in FIG. 3, the body panel 26 has a plurality of raised pushbuttons 25 formed thereon. Each raised rectangular button 25 has a recessed area or hollow 48 on the underside 49 of each button 25 in which is mounted a conductive plunger or puck 50 adapted to engage one of the conductive switches 38 on the circuit board 36. With the pushbuttons 25 and the panel 26 being formed from a sheet of elastomeric material it is an easy matter to remove the buttons 25 that are not necessary with a scissors or other cutting element, as shown in FIG. 4.

Then, the pushbutton body panel 26 is moved into engagement with the base panel 14, as shown in FIG. 5, to form the assembly shown in FIG. 6.

After the pushbutton body panel 26 and the base panel portion 14 have been assembled as shown in FIG. 6, the overlay face panel 18 is mounted on top of the base panel 14 and the circuit board 36 is mounted within the housing member 12.

Referring now to FIG. 7, there is illustrated therein the operating circuitry 42 of the control device 10 which includes batteries 46 (FIG. 10) mounted in the compartment 45 for providing power for the circuitry 42 and a lithium battery 52, which backs up a static RAM 54. A central processing unit (CPU) 56, is coupled through a latch 58 to the RAM 54. Three LEDs, LED 1, LED 2, and LED 3 are coupled to the circuitry 42 for communication with the apparatus to be controlled. All elements of the circuitry 42 are mounted on the circuit board 36 mounted in the upper housing member 12. A further LED, LED 4 is coupled to CPU 56 for communication with the user of the device 10 as will be described in greater detail below.

A block schematic circuit diagram of the operating circuitry 42 is shown in FIG. 8 and includes CPU 56, the infrared light emitting diodes, LED 1, LED 2, and LED 3 coupled to the CPU 56, serial input/output ports 60 of CPU 56, the RAM 54 coupled to CPU 56 and backed up by lithium battery 52 and a 4*14 keyboard 61 coupled to CPU 56. The four AAA batteries 46 are also shown.

FIGS. 9A and 9B are a detailed schematic circuit diagram of the operating circuitry 42. The operating circuit 42 includes the central processing unit 56, the latch 58, the random access memory 54 and LED 1, LED 2, LED 3 and LED 4.

The operating circuitry also includes several subcircuits. One of those subcircuits 62 (FIG. 9B) includes the keyboard 61 having pushbuttons 25, each of which is connected to a port 63 of the CPU 56 shown in FIG. 9B and can be referred to as the keyboard circuit 62. The X's in FIG. 9B indicate the pushbuttons 25 and when one of those pushbuttons X is pressed, current flows through a resistor in a column line, e.g., when button 25[prime] is pressed current flows through resistor 64 in column line 138 going to the button or key 25[prime]. That raises the voltage on a supply line VCC to the CPU 56 of the microprocessor.

Accordingly, whenever a button 25 is pressed, it will increase the voltage on line VCC which initiates a switching process in a wake up circuit 70 for "waking up" or energizing the CPU 56 in the manner described below.

In addition to the keyboard circuit 62 and the wakeup circuit 70, the subcircuits include a reset circuit 74, and a write protect circuit 78.

When the voltage on line VCC goes up, a signal is passed through capacitor 102, to the base of a transistor 104 in the wake up circuit 70. This turns on the transistor 104 which in turn turns on transistor 106. This turning on of the transistors 104 and 106 will bring voltage on line VCC to the full DC voltage of about $5\frac{12}{12}$ volts. When the voltage on line VCC reaches $5\frac{12}{12}$ volts, the CPU 56 begins to operate.

When operating, the CPU 56 establishes a signal on line ALE 108 which is passed through a resistor 110 and filtered by capacitor 102. Once the ALE signal is established, it causes a voltage to be generated at the base of transistor 104, maintaining transistor 104 turned on, which in turn maintains transistor 106 turned on, thus enabling the CPU 56 to continue to run. The CPU 56 can turn itself off by executing a HALT instruction which causes the ALE signal to cease, thus turning off transistors 104 and 106 and removing power via line VCC to the CPU 56.

It is to be noted that the wake up circuit 70 can be activated by depression of a key or button 25 or by an input signal at serial port 3 coupled to an input port 112 of the CPU 56.

The circuit elements described above form the wakeup circuit 70 for activating the operating circuitry 42 of the device 10. This circuit uses substrate static-protection diodes 114 in a CMOS chip coupled to the keyboard 61. With this arrangement, source current is supplied to transmitter 104 via line VCC when a key or pushbutton 25 is depressed.

The RAM 54 is connected to the lithium battery 52 and, when the device 10 is not being used, draws about 20 nanoamps from the battery 52, which gives the device 10 a shelf life between 5 and 10 years. A backup capacitor 116 is coupled to the RAM 54 and has (at 20 nanoamps) a discharge time of about 10 minutes, providing ample time to change (if necessary) the battery 52 without losing the instructions and data stored in the RAM 54. Capacitor 116 is kept charged by battery 46 through diode 117 when the device 10 is operating and, at other times, by battery 52 through diode 118.

After the CPU 56 has been powered up, or awakened, the CPU 56 makes a scan of row lines 121-128 to the keyboard 61 by sequentially forcing each line 121-128 low and then polling the other lines to find out which button 25, such as button 25[prime], has been pressed. As a result of pushbutton 25[prime] being pressed, a low impressed upon row line 121 will cause a low on column line 128 and that will result in the row line 128 being low.

The CPU 56 first sets row line 121 low and then begins scanning, starting with the row line 122, for another row line having a low voltage thereon and by finding the row line with the low voltage, in the above example, row line 128, the CPU 56 knows that button 25[prime] at the intersection of row line 128 and column line 138 has been depressed.

If the CPU 56 had not found a low on another row line, such as row line 128, after having set line row 121 low, line 121 is returned to its previous value and row line 122 is then set low, and the scan continued until a low row line is found to identify which button 25 has been depressed.

When the CPU 56 determines which pushbutton 25 has been depressed the CPU 56 will then know what function is to be carried out.

It is to be noted that the keyboard circuit 62 is uniquely designed to include only eight (8) row lines 121-128 and eight (8) column lines 131-138 each having a resistor 64 and a current directing diode 114 therein and each being arranged across the row lines 131-138 so that 56 switch positions are provided with only eight (8) lines.

All memory cycles exercised must involve the latch 58 because the CPU 56 has its data bus multiplexed with the lower 8 bits of the address bus on lines 141-148.

Coming out of the CPU 56 to the latch 52, is a group of nine (9) lines 108 and 141-148. One of the lines, line 108, carries the ALE signal. The eight (8) lines 141-148 between the latch 58 and the CPU 56 are the multiplexed data and address bus lines. These lines comprise the lower 8 bits of the address bus. A group of multiplex lines are identified with reference numeral 150. Five more lines 151-155 comprise the upper five bits of the address bus,

making a total of 13 bits of address.

An inverting OR gate 156 having an output line 158 and two input lines 160 and 162 together with ground line 164 are coupled between the CPU 56 and the RAM 54. The line 158 defines an output enable for the RAM 54.

Accordingly, when the CPU 56 wants to do a read, it actuates either of the two input lines 160 or 162 going into the OR gate 156. Line 160 is a PSEN line for telling the RAM 54 that it is to be enabled to receive data and line 162 is a Read Output line to tell the RAM 54 that the CPU is going to read the information stored in the RAM 54. With OR gate 156 the two lines and functions are combined on one line 158. In other words, the CPU 56 tells the RAM 54, through the OR gate 156, that it wants to read information stored in the RAM 54.

The circuitry 42 also includes the write protect circuit 78 which has the double duty of being a low battery indicating circuit. The circuit 78 includes a resistor 170, a transistor 171, two resistors 172, 173 and a Zener diode 174 connected as shown.

A write enable line 176 is connected between the transistor 171 and the CPU 56.

When the CPU 56 desires to write information into the RAM 54, it places the address on the address bus lines 141-148 and 151-155, strokes the lower 8 bits of the address bus on lines 141-148 into the latch 58 using ALE line 108, places the information on the data bus lines 141-148, and then brings the write enable line 176 low.

When the write enable line 176 goes low, unless the transistor 171 is turned on by virtue of the battery voltage being more than 4.3 volts, a line 178 going into the RAM 54 at the collector 180 of the transistor 171 (which is the "write enable" for the RAM 54), is prevented from going low, maintaining the RAM "Write Protected". This condition also is created when the battery 48 is low. The "write enable" line 176 also functions as a low battery detector because, during execution of the program, a check is made to see whether writing to the RAM 54 is enabled. If it is not, this shows that the batteries are weak and a signal is sent to the user by flashing the red LED, of LED 4, 5 times.

Note that LED 4 includes a red LED and a green LED incorporated into one package so that when both LEDs are turned on, a yellow light is emitted, making LED 4 a tricolor LED. Such tricolor LED 4 enables the device 10 easily to communicate to the user by way of the color, number and sequence of light blinks.

A clock circuit 182 including a crystal resonator is coupled to the CPU 56.

Three serial ports 1-3 are coupled to the CPU 56 and include port 1 which is a transmitting port, port 2 which is ground and port 3 which is a receiving port. Serial port 1 is connected to row line 121 so that data can be serially transmitted in the form of highs and lows by CPU 56 from the RAM 54 over row line 121 to serial port 1. Incoming data is received serially at serial port 3 and conveyed to input port 112, when it is desired to update the code data and/or instructions in the RAM 54.

The three infrared-emitting LEDs, LED 1, LED 2, and LED 3 are connected in the circuitry 42 as shown.

The reset circuit 74 includes two resistors and a capacitor connected as shown and coupled between line VCC and a reset line 184.

As will be described in greater detail in connection with the description of FIGS. 11-14, the manufacturer of the device 10, using known methods or the method described herein with reference to FIGS. 12A-13C, will decipher the infrared codes for operating various pieces of

equipment, such as a TV, a VCR, a CD, a Cable Converter or other equipment which is controlled by a remote infrared transmitting device.

After the infrared code is deciphered, the code data therefor and instructions for generating such code (see the flow chart in FIG. 14) are stored in a programming computer 200 (FIG. 10) and the device 10 is programmed as explained below.

It is to be noted that the circuitry 42 has no ROM and all instruction codes and code data are loaded directly into the RAM 54. This allows for infinite upgradability in the field via the serial ports 1, 2, 3.

FIG. 10 is a perspective view of a programming computer 200 coupled by a cable 202 to a special connector 204 which is adapted to be received over the CPU 56 in the operating circuitry 42 for disabling the CPU 56 and for enabling the RAM 54 to be programmed by the programming computer 200. Essentially this is done by tri-stating the CPU 56 and placing the RAM 54 into the address space of the computer 200 which writes initial instruction code including code for the serial port driver, and subsequently serially, other instruction code and code data into the RAM 54. For this purpose the programming computer 200 has instruction codes such as serial port driver instructions and data relative to the infrared codes for operating a multiple number of electronic apparatus, such as televisions, VCR's, etc stored therein. Signals from the programming computer 200, via the connector 204 causes the inputs and outputs 60 of the CPU to be disabled so that instruction codes and data can be input into the RAM 54 quickly and efficiently from the programming computer after the operating circuitry 42 is mounted in the control device 10.

Later, after the device 10 has been in use for some time and the RAM 54 needs to be updated with instruction codes and data relative to new equipment on the market, the control device 10 can be simply and easily updated at a service outlet having an ordinary personal computer with a serial port using a novel nine pin to three pin, 9 volt to 5 volt; signal coupling and converting assembly 206 (FIG. 20). The updating can be done by adding to the data in RAM 54 or by rewriting (writing over) the data in RAM 54. The assembly 206 is described in greater detail hereinafter in connection with the description of FIGS. 20-22.

The infrared codes to be learned include a wide range of different codes for operating different electrical apparatus manufactured by the same or different manufacturers. In FIG. 11, which is identical to FIG. 1 in U.S. Pat. No. 4,623,887, there are illustrated several modulation schemes for infrared codes. FIGS. 11a-11g illustrate different types of gated carrier frequencies. Typical carrier frequencies for infrared remote transmitters are 20 Khz to 45 Khz, with the majority being at 38 Khz and 40 Khz. The gating schemes illustrated include both fixed and variable bit periods, non-return to zero (NRZ), variable burst widths, single/double burst modulation schemes, and a final catch-all category called random because there is no readily distinguishable pattern of ones and zeros.

In addition to these schemes, there is also a transmitter which puts out a different continuous frequency (CW) for each key as represented in FIG. 11h.

Finally, several new types of transmitters do not use a carrier frequency at all but instead send a stream of pulses where the data is encoded in the spaces between the infrared pulses as shown in FIG. 11i.

Data modulation schemes for most transmitters have a higher level of data organization which may be called a keyboard encoding scheme which causes different data to be sent depending upon the transmitter and the key pressed. This will be described in greater detail hereinafter in connection with FIGS. 15-19.

The code data for the infrared codes may be obtained from vendor information sheets and

specifications, can be determined using the methods disclosed in U.S. Pat. Nos. 4,623,887 and 4,626,848, or by the method disclosed herein.

In the method for learning or acquiring code data for infrared codes disclosed herein, no counting of pulses is carried out. Instead the method involves the following steps:

- (a) receiving a transmission of a train of pulses from a remote control transmitter;
- (b) recording the point-in-time of an edge of each pulse in a train of the pulses;
- (c) transforming the recorded point-in-time data into a list of instructions for generating a replica of the train of pulses;
- (d) timing the duration of a train of the pulses;
- (e) timing the period between trains of pulses;
- (f) associating a function key of the universal remote control device 10 with the time duration of the train of pulses and the list of instructions for generating a replica of the train of pulses;
- (g) determining whether or not repetitions of the transmission of train of pulses is present;
- (h) ignoring repetitions of the train of pulses;
- (i) noting that repetitions are present; and
- (j) storing for use in a universal remote control device, the information acquired in steps (c), (d), (e), (f) and (i).

Typically, each pulse has a fixed duty cycle and in carrying out the above described method it can be assumed that each pulse has a fixed duty cycle.

The manual and computer steps followed in practicing this method are set forth in FIGS. 12A and 13A.

FIG. 12A is a flow chart of the first part of this method for capturing an IR code and FIG. 12B is a graph of a pulse train comprising a portion of the code.

There is shown in FIG. 12B, adjacent the transforming step in FIG. 12A, a graph of the waveform of the captured, and later recreated, infrared codes, showing when the infrared signal is on and when it is off. When the CPU 56 executes the instructions set forth below the waveform in FIG. 12B, infrared-emitting LEDs, LED 1, LED 2, and LED 3 are turned on when the instruction IR-ON is executed and turned off when the instruction IR-OFF is executed. No operation is performed when the instruction NOP is called for. In this way the infrared codes are transformed into a bit stream of 0's and 1's.

FIG. 13A is a flow chart of a second part of the method for capturing an IR code.

FIG. 13B shows the IR infrared bitstream and an envelope of the filtered bitstream.

FIG. 13C shows the filtered waveform that is analyzed for repetition. The repetition scheme and a pointer to indicate, upon regeneration of the infrared code, which key will generate that code are stored in a memory for later inputting into the RAM 54.

FIG. 14 is a flow chart of a sequence of eleven (11) steps that a user initiates to generate a specific IR code for performing a specific function, namely, for generating a captured IR code

stored in the remote control device 10. The code data is stored in the RAM 54 of the remote control device 10 and the sequence of steps the circuitry 42 goes through to take the code data in the RAM 54 and generate the infrared code therefrom is set forth in this Figure.

FIG. 15 is a plan view of the keyboard 61 and shows the different keys or pushbuttons 25 of the control device 10 extending through the base panel 14 of upper housing member 12 and the face panel 18 where the label or identification for each pushbutton or key 25 is shown. The light emitting diode, LED 4, is also indicated.

FIG. 16 is a flowchart of the steps initiated by a user of the device 10 in a step and set procedure for searching for code data in the device 10 for the infrared code needed to operate the user's specific apparatus and to set the device 10 for that code data.

FIG. 17 is a flow chart of the steps initiated by a user in carrying out a direct-entry/quick-set procedure for matching the user's equipment or apparatus to the device 10.

The steps of this procedure include:

STEP 1. Look up make and model number of the controlled apparatus in a table provided to the user in an instruction booklet.

STEP 2. Model number is found and matched with a series of 8 "R"s and "G"s.

STEP 3. Here the operator presses the desired mode button or key.

STEP 4. Press DO, Enter, Recall. This tells the device 10 to do a Quick-Match.

STEP 5. Next enter the sequence of eight red and green blinks found in TABLE I (set forth below) provided in the instruction booklet. This is done by pressing Channel Down for "R" and Channel Up for "G".

STEP 6. Here a determination is made if a key other than Channel Up or Channel Down, was pressed.

STEP 7. The device 10 tricolor LED 4 will flash red or green depending on what button is pushed.

STEP 8. When all eight codes are entered, the program goes on to STEP 9.

STEP 9. Here a check is made to see if the blink code is in the table in the RAM 54 of the remote control device 10.

STEP 10. If the device 10 has successfully Quick-Matched to the controlled apparatus, the LED 4 will flash green twice.

STEP 11. If it did not match, it will flash yellow indicating that codes for that controlled apparatus are not loaded into the RAM 54.

Search terms may have been found within the contents of this table. Please see the table in the original document.

For numbered functions, press "DO" then the two digit number.

FIG. 18A is a flow chart of the steps for setting a "DO" command macro, for achieving a function that normally requires the actuation of several buttons, by programming one particular button to perform the functions required of the several buttons to achieve a specific function.

FIG. 18B is a flowchart of the simple two pushbutton steps required for executing the "DO" macro command created in FIG. 18A.

FIG. 19A sets forth the steps initiated by a user to determine the various blink codes which identify what equipment or apparatus the remote control device 10 is set for.

FIG. 19B illustrates a sample blinking grid of eight red and green blinks which will be presented to the user. Once a particular pattern of eight red or green blinks has taken place, the user of the device 10 will look up the blink pattern or code in TABLE I included in a user handbook. This table shows the user which pushbuttons 25 labeled A-H are associated with additional functions stored which may be stored in the RAM 54. Additional functions beyond the eight supported by pushbuttons A-H are performed by pushing "DO", and then the two-digit sequence shown in TABLE I.

The instructions for using the control device 10 which are supplied to a purchaser thereof in an instruction booklet are set forth below.

Matching the Device to Your Equipment

The device 10 can control most remote controlled TV's, VCR's, cable converters, and CD players, but it needs the user's input to match it to your particular equipment. The easiest way to do this is to STEP-and-SET your device 10. You will only need to do this once for each different type of device you have.

1. To STEP-and-SET your device 10, first press DO, Enter.
2. Press one of the following equipment selection buttons to tell the device 10 what kind of equipment to match.

Search terms may have been found within the contents of this table. Please see the table in the original document.

3. Aim the device 10 at the equipment and try various function buttons to see if the equipment responds correctly. Make sure you are reasonably close to the equipment and that nothing is blocking the path. The light (LED 4) at the top of the device 10 will shine green whenever it is sending an infrared code, or it will not light at all if it does not send a code for a particular button.
4. If your equipment did not respond correctly or did not respond at all, press DO1 to change the device 10 so that it will send the next set of infrared codes in its library, or press DO2 to change it so it will send the previous set of codes.
5. When you use DO1 or DO2 to step the device 10 setting forward or back, its light will blink yellow each time you step it. The settings step around in a circle. Whenever you get back to the setting where you started the device 10 light will blink red to notify you.
6. Use DO1 and DO2 to step through the sets of codes and keep trying out functions until your equipment responds correctly. The device 10 will then be set to send the proper infrared

codes for operating your particular equipment.

7. When you are satisfied that the device 10 is properly matched, press DO, or any of the equipment selection buttons to restore the DO1 and DO2 buttons to their normal functions.

8. If your equipment is responding to your device 10 but some buttons are causing the wrong thing to happen, keep going. Some equipment responds to the infrared codes of other brands of equipment.

9. If you try out all of the codes in the device 10 library and your equipment still does not respond, it is probably because the code data for generating the infrared codes for operating your equipment is not in the library of your control device 10.

The Keyboard 61

Take a look at the keyboard. There are four groups of buttons:

1. Equipment Selection Buttons tell the device 10 which equipment is to be controlled:

Search terms may have been found within the contents of this table. Please see the table in the original document.

2. Basic Function Buttons are used to control your TV, VCR, CABLE and CD. They work in much the same way as in older remotes which typically have the following buttons.

Search terms may have been found within the contents of this table. Please see the table in the original document.

3. Extended Function Buttons perform any special functions your equipment may have, such as color control, picture control, tint control, etc. These buttons are identified with the following alphabet letters.

Search terms may have been found within the contents of this table. Please see the table in the original document.

4. DO Buttons are used to perform very powerful DO Commands which are explained below.

Special Features

Besides the basic functions such as channel up/down and volume up/down that most TV remote controls have, there could be special features as well, for example:

Color up/down.

Picture up/down.

Tint up/down.

Sleep.

Your VCR's remote control can also have special features such as:

Frame advance

Channel up/down

Your cable converter remote control can also have additional features such as:

Channel recall

Delete

Your CD player remote control can have special features such as:

Repeat

Track programming

Once you have matched the device 10 to your TV, VCR, Cable Converter and CD player, all functions that were controlled by your old remote control devices can now be controlled by the device 10. You may even notice some extra features that weren't controlled by your old remote.

Since the device 10 can control such a wide range of equipment, there is not enough room on it for buttons for every possible feature of every remote control. Instead, there are eight extended function buttons at the bottom labelled A through H. To find out what these eight buttons control for your particular TV, VCR, cable converter and CD player:

1. Get your pen and paper ready.
2. Press DO and then the button (TV VCR1 VCR2 Cable CD) of the device you want to know the special features of.
3. The device 10 will blink "red" or "green" 8 times. Every time it blinks "red" write down an "R". Every time it blinks "green" write down a "G". When you're finished writing it should look something like this:

RRRGRRRG

This is the "Blink Code" for your device. If you miss it the first time around, just press DO and the device button a second time.

4. Look at TABLE I and find the sequence of "R"s and "G"s that matches the one you wrote down.
5. Read the special features chart next to your Blink Code sequence which tells you what functions the A through H buttons control for your particular device.

For example, the feature chart of your TV might read:

Search terms may have been found within the contents of this table. Please see the table in

the original document.

6. To turn the color up in this example, you would press TV (of course if the device 10 is already set to control your TV, you do not have to press TV again but it doesn't hurt if you do so), then A.

7. To turn the color back down, you would just press B.

8. Write down what special functions are controlled by the A through H buttons on the handy stick-on labels enclosed with the control device 10.

9. After writing down the special functions on the labels, stick them on to the back of the control device 10 for quick and easy reference.

If The Controlled Equipment Has More Than 8 Extended Functions

Usually, the eight A through H buttons are enough for most controlled equipment. If they're not, don't worry. If your controlled equipment has more than eight special features these too are controlled by the device 10.

Beyond the A through H function buttons, any additional functions are performed by pressing DO then two of the 0-9 number buttons. For example, your TV's feature chart may show additional functions like these:

Search terms may have been found within the contents of this table. Please see the table in the original document.

If you did have these features and wanted to use them, you would press DO and then the two-digit number for that feature. For example, you might:

Press DO,3,0. This would turn your TV's stereo broadcast feature on.

If you use a feature like this frequently you may want to assign it to a DO command, our next topic of discussion.

Setting DO Commands

DO Commands give you the power to perform a multitude of different functions with the push of just one or two buttons. DO Commands let you assign any of the following buttons to tell the device 10 to automatically perform a series of keystrokes you use often:

Search terms may have been found within the contents of this table. Please see the table in the original document.

To tell the device 10 to do what you want, you must teach it. As an example, you can teach the device 10 to turn your whole system on and set the TV to channel 4 by doing the following:

1. Press DO, Recall. This tells the device 10 that you want to teach it something to do.

2. Next, you must assign a button 25 you will use to DO whatever you teach it. You can use any of the device 10's buttons 25 set forth above. For example, let's use DO1 at the top of the keyboard: Press DO1.

3. Now, you must tell the device 10 what button sequence you would press to turn your whole system on and set the TV to channel 4.

4. Press TV Power. This tells the device 10 to turn your TV on.

5. Press 4, Enter (pressing Enter may not be required for your TV). This tells the device 10 to set your TV to channel 4.

6. Press VCR, Power. This tells the device 10 to turn your VCR on.

7. Press Cable, Power. This tells the device 10 to turn your cable converter on.

Now you have pressed all the buttons you want the device 10 to learn for this example.

8. Press DO, Recall. This tells the device 10 that you are finished teaching it and to remember what you have taught it.

Now the device 10 knows how to turn your TV, VCR, and cable converter on and set the TV to channel 4, just by pressing one button.

9. Aim the device 10 at your equipment and press DO1. Make sure you keep the device 10 pointed at your equipment while the light is flashing.

Now that you know how DO Commands work, you can teach the device 10 to "DO" practically any sequence of keystrokes. Just remember to keep the following in mind:

To perform a DO Command, press DO then the button you assigned to remember the DO Command. However, if you assigned the DO1 or DO2 buttons to remember a DO Command, you do not have to press DO first, just press DO1 or DO2.

If the device 10 light (LED 4) starts blinking green, yellow, red while you are trying to teach it, it is telling you that RAM 54 is full. The DO command you are teaching is automatically erased. You can teach the device 10 a shorter DO command, or erase some other DO command you have already taught the device 10 to obtain more memory space.

After the DO Command is finished, the last apparatus 10 selected within the DO Command will be the apparatus the device 10 will work with next.

Erasing a DO command

If you just want to change a DO Command, you do not have to erase it first—just set up the new DO Command in its place. However, to get rid of a DO Command without replacing it with a new one:

1. Press DO Recall.

2. Press the button you have assigned to the DO command that you want to erase. For example, to erase the DO command you taught the device 10 in the above example:

Press DO1.

3. Press DO, Recall again. The old DO Command is now erased.

QUICK-MATCHING To Your Equipment

There is a quicker way to match your equipment to the device 10 by Quick-Matching. Quick-Matching is a way to set the device 10 directly to match any controlled equipment in its library. Follow the steps below to do a Quick-Match:

1. Match the device 10 to your equipment using STEP-and-SET.
2. Press DO, then the desired device button (TV, VCR1, VCR2, Cable or CD). The device 10 light will blink red or green eight times.
3. Write down the sequence of red and green blinks. This is the "Blink Code" for the particular device.
4. Press DO Enter Recall. This tells the device 10 to do a Quick-Match.
5. Enter the correct sequence by pressing Ch Dn for "R" and Ch Up for "G". The device 10 light (LED 4) will flash "red" or "green" depending on what button you push. The Ch Dn and Ch Up buttons 25 are labelled with the correct color for each.
6. When the device 10 has successfully Quick-Matched your equipment it will automatically flash green twice. If it did not match, it will flash yellow. If it fails to Quick-Match, it is probably because the requisite code data is not stored in the library in your device 10.

QUICK-MATCHING Between Controlled Equipment

One of the great benefits of Quick-Matching is that you can switch the device 10 functions between the remote controlled TVs, VCRs and cable converters you may own. This is done by using "Quick-Match" within a "DO command".

Let's suppose you have two TVs in your house and only one device 10. Here's how to switch between them:

1. Press DO Recall. the button you want to use to switch to your other TV set.

For example, press DO2. This tells the device 10 that you want to teach it a DO Command.

2. Press DO Enter Recall. This tells the device 10 that you want to do a Quick-Match.
3. Enter the R and G blink sequence of the second TV you want to control by pressing Ch Dn for "R" and Ch Up for "G".
4. Press DO, Recall. This tells the device 10 that you are finished teaching it a "DO command".

Now, to set the device 10 to control your second TV, press DO2. This tells the device 10 that you will be controlling your second TV.

To go back to controlling your first TV, simply teach device 10 another "DO command". Just repeat the steps above, except use a different button and the correct R and G sequence for your first TV.

The device 10 can easily be taught to control a whole houseful of infrared remote controlled equipment—just teach the device 10 a DO Command to QUICK-MATCH each additional

piece of equipment.

In FIG. 20 is shown a unique signal coupling and converting assembly 206 which includes a connector assembly 207, a cable 208 and a special cover plate 210 for the battery compartment 45. The cover plate 210 has on the underside thereof three pins 212, 214 and 216 which are positioned to connect with the three serial ports 1, 2 and 3. The pins 212, 214 and 216 mounted to the cover plate 210 are connected by three wire conductors 224, 226 and 228 in cable 208 to connector assembly 207 which has conversion circuitry 230 therein. The connector assembly 207 has a nine pin array 250 of sockets 251-259 for receiving nine pins and the conversion circuitry 230 which enables one to use some of the nine sockets 250 of the connector assembly 207 for communication with the three pins 212, 214, 216 that are connected to the serial ports 1, 2 and 3 as shown in FIGS. 21 and 22.

FIGS. 21 and 22 are a schematic diagram of the conversion circuitry 230.

In FIG. 21 is shown circuit portion 230A. In this circuit portion, plus nine volts goes into pin 4 of connector DB-9 or pin 20 of connector DB-25 and minus 9 volts goes into pin 7 of DB-9 or pin 4 of connector DB-25, which are connected to the circuit portion 230A of the conversion circuitry 230. This provides a constant source of positive and negative voltage and is used as the power supply for the circuit. Note that two different types of personal computer host female connectors can be used, namely, female connector DB-9 or female connector DB-25 in the connector assembly 207.

Serial information is transmitted by the hand held control device 10 via line HTXD at serial port 1 and is level translated by the operating circuitry 42 from a range of from plus 5 volts to zero volts to a range of from minus 9 volts to plus 9 volts.

In this respect, when 0 volts is present at serial port 1, transistors Q1 and Q2 are turned on such that [plus]9 volts is supplied from pin 4 of connector DB-9 or pin 20 of connector DB25 through transistor Q1 to pin 2 of connector DB-9 or pin 3 of connector DB-25.

Then, when [plus]5 volts is present at serial port 1, the emitter-base of transistor Q2 is reverse biased, turning off transistor Q2 which turns off transistor Q1. As a result, the 9 volts at pin 7 of connector DB-9 or pin 4 of connector DB-25 is supplied through resistor 270 to pin 2 of connector DB-9 or pin 3 of connector DB-25.

The circuit portion 230B is shown in FIG. 22 and performs a receiving function for the control device 10. When pin 3 of connector DB-9 or pin 2 of connector DB-25 is at -9 volts, its normal resting state, then HTXD at serial port 3 is at 0 volts. When pin 3 of connector DB-9 or pin 2 of connector DB-25 goes to [plus]9 volts, HTXD at serial port 3 goes to plus 5 volts. Pin 5 of connector DB-9 or pin 7 of connector DB-25 is directly connected to serial port 2 and always stays at ground.

In transmitting data to the control device 10, the programming computer supplies [plus]9 v or -9 v to pin 3 of connector DB-9 or pin 2 of connector DB-25. When [plus]9 v is present on IBMTXD, 4.3 volts established by Zener diode 272 is passed through diode 274 to serial port 3.

When -9 v is present on IBMTXD, the Zener diode 272 clamps to -0.6 volts resulting in conduction through transistor Q3 pulling serial port 3 to 0 volts.

The diode 274, the transistor Q3 and a resistor 276 connected as shown are provided to allow pressing a key 25 on keyboard 26 to "wake up" CPU 56 (actuate the wake up circuit 70) even though circuit portion 230B is connected to the control device 10.

From the foregoing description, it will be apparent that the universal remote control device

10, the signal coupling and converting assembly 206, the disclosed methods of learning and storing infrared codes, and the methods for operating the control device 10 of the present invention have a number of advantages, some of which have been described above and others of which are inherent in the device 10, assembly 206 and the methods of the invention disclosed herein. For example:

(1) With no ROM in the circuitry 42, the instruction codes and code data in the RAM 54 can be upgraded at any time via the serial ports 1, 2 and 3.

(2) By loading the instruction codes and initial code directly into the RAM 54 by tri-stating the CPU 56, the circuitry 42 is enabled to function without a ROM.

(3) The serial ports 1, 2 and 3 together with the signal coupling and converting assembly 206 enable new data to be input into the circuitry 42 from an RS-232 interface device to the serial ports 1, 2 and 3.

(4) The visible LED 4 providing red/green/yellow/off blink code provides a means for communicating to the user where the device 10 has "landed" after searching for codes to control a specific apparatus. The user can then look up in the instruction booklet what extended functions are available via the letter keys A-H or number keys, plus the DO key for that particular apparatus or equipment.

(5) The write-protect circuit 78 prevents corruption of the operating program or data in the RAM 54 during transient states when the microprocessor is being turned on or turned off.

(6) The multiplexing of the address and data lines between the RAM 54 and the CPU 56 enables scrambling of the instruction codes and the code data so that the memory image in the RAM 54 is encrypted.

(7) The construction of the keyboard 61 enables one to have 56 keys which can be decoded using only 8 bidirectional input (and output) ports 63.

(8) The keyboard 61 including the keyboard circuitry 62 plus the wakeup circuit 70 provides a system whereby pressing any key turns on power to the CPU 56.

(9) The provision of three infrared LEDs 1, 2 and 3 with no current-limiting resistors enables the device 10 to use maximum energy to create the infrared control pulses with a minimum amount of energy wasted.

(10) The DO keys together with the numeral and letter keys allow a number of DO functions to be performed with the device 10 by a user.

(11) Any combination of products can be controlled with the universal remote control device 10.

(12) The step-and-set method for locating the code data for generating the infrared code necessary to operate the user's equipment or for the user to learn that such code data is not present in the library in the RAM 54.

Also modifications can be made to the device 10, the assembly 206 and the described methods of the present invention without departing from the teachings of the present invention. Accordingly, the scope of the invention is only to be limited as necessitated by the accompanying claims.

ENGLISH-CLAIMS:

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What is claimed is:

1. In a universal remote control comprising a keyboard having a plurality of pushbuttons including a macro pushbutton and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a readable medium having instructions for performing steps comprising:

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard, the pushbuttons of the keyboard being activated to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched; and

assigning to the macro pushbutton a subset of the selected codes and data from the library whereafter activation of the macro pushbutton causes the universal remote control to use the subset of selected codes and data from the library to transmit a plurality of operating commands to one or more of the matched home appliances.

2. The readable medium as recited in claim 1, wherein the instructions further perform the step of using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton.

3. In a universal remote control comprising a keyboard having a plurality of pushbuttons and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a readable medium having instructions for performing steps comprising:

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard; and

using activation of one or more pushbuttons of the keyboard to match the universal remote control to the plurality of different home appliances of different manufacturers;

instructions further perform the step of using activation of one or more of the pushbuttons of the keyboard to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched.

4. In a universal remote control comprising a keyboard having a plurality of pushbuttons including a macro pushbutton and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a method comprising:

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbutton of the keyboard, the pushbutton of the keyboard being activated to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched; and

assigning to the macro pushbutton a subset of the selected codes and data from the library whereafter activation of the macro pushbutton causes the universal remote control to use the

subset of selected codes and data from the library to transmit a plurality of operating commands to one or more of the matched home appliances.

5. The method as recited in claim 4, further comprising using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton.

6. In a universal remote control comprising a keyboard having a plurality of pushbuttons and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a method comprising:

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbutton of the keyboard; and

using activation of one or more pushbuttons of the keyboard to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched.

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12/03/07

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---------------------|--------------------------|---|------------------------------|
| Applicant: | Darbee et al. |) | Examiner: Majid A. Banankhah |
| | |) | |
| Reexam Control No.: | 90/007,876 |) | Attny Doc.: 81230.05US4 |
| | |) | |
| Filing Date: | 01/17/2006 |) | Art Unit: 3992 |
| | |) | |
| Patent No.: | 6,587,067 |) | |
| | |) | |
| Title: | Universal Remote Control |) | |
| | With Macro Command |) | |
| | Capabilities |) | |

RESPONSE

Mail Stop "Ex Parte Reexam"
 Central Reexamination Unit
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action dated October 29, 2007 please consider the remarks which begin on page 2 of this paper.

Certificate of Mailing: I hereby certify that this correspondence is being deposited with the US Postal Service as First Class mail in an envelope addressed to Mail Stop "Ex-Parte Reexam," Central Reexamination Unit, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 29th day of November, 2007

By: 
 Sheri Fassl

REMARKS

In the latest Office Action pending claims 1-6 were rejected under 35 U.S.C. § 102 as allegedly being anticipated by the disclosure within the “Home Run Micromint’s Home Control System User’s Manual Rev. 1.0” (hereinafter “Micromint”). The reconsideration of this rejection is respectfully requested.

In rejecting the claims, it was asserted that Micromint discloses the exact invention set forth within the claims at issue because the Micromint central controller “transmits codes and data to remote BRS units co-located with appliances” and “these remote units receive commands from the central controller *and send appropriate control signals/commands to the appliances.*” (page 6, second para. 10; emphasis added). It was further asserted that the Micromint central controller “uses the house, device, and command codes to tell the remote units *to transmit operating commands to the appliance.*” (*Id.*; emphasis added).

In response to these assertions, it is again respectfully submitted that Micromint discloses a central controller that is capable of controlling nothing more than BSR units, i.e., the Micromint controller is not a “universal” remote control but is a controller “dedicated” to controlling nothing more than BSR units. It is further respectfully submitted that the BSR units utilized within the Micromint system do not and are not capable of sending operating commands to any appliance as is being asserted in the Office Action. Rather, the BSR units utilized within the Micromint system are nothing more than remotely located, addressable, power supply switches, i.e., on/off switches and dimmer switches:

These remotely controlled **switches turn the power on or off** to lights and appliances that are plugged into them. A separate controller **activates the individual switches** by transmitting a coded command sequence through the power lines.

(BYTE article of April 1985; emphasis added).

Lamp and wall-switch modules are essentially the same.
The are triac controlled **on/off switches** rated at 300 watts

(W), that include dimmers. The lamp module is plugged into a wall outlet in series with the light to be controlled while the wall switch module replaces a conventional wall switch.

(BYTE article of May 1985, pages 110-111; emphasis added).

All receivers (lamp modules, appliance modules, wall-receptacle modules, and wall-switch modules) are essentially the same. Also incorporating a custom LSI IC, the receiver section monitors the AC line, waiting for a coded message corresponding to its unique house code (A through P) and unit device code (1 through 16). To turn on channel 10, you simply press 10 and ON, one after the other. **When an appliance or wall-receptacle module activates, it energizes a relay.** The lamp and wall-switch modules use a triac instead and have the capability to brighten or dim in response to control commands.

(BYTE article of May 1985, pages 111-112; emphasis added).

Because a BSR unit is nothing more than a controllable electrical power supply switch it will be appreciated that, just like any power switch, a BSR unit simply does not transmit operating commands to an appliance that might be plugged into or otherwise electrically connected in series to the BSR unit. It will therefore be further appreciated that, contrary to the position taken by Reexam requestor, the BSR units of the Micromint system are incapable of “directing” an appliance to do anything. For example, if the power switch of an appliance plugged into a BSR unit is itself placed into the off position, causing the BSR unit to turn on and thereby supply power to the appliance will nevertheless still fail to cause the appliance do anything. For at least this reason, it is respectfully submitted that Micromint cannot be said to disclose the exact invention claimed as is required to maintain the rejection under 35 U.S.C. § 102 and, as such, the rejection of the claims under 35 U.S.C. § 102 must be withdrawn.

It was additionally asserted in the Office Action that, giving a broad interpretation to the claims, the Micromint system functions to transmit BSR commands “to” an appliance. (page 6, second para. 10). In response, it is again respectfully submitted that the Micromint

central controller only functions to transmit BSR commands “to” a BSR unit having an appropriate address, namely, a BSR unit that has been matched to the house code and unit code accompanying a transmitted BSR command. Thus, much like a letter that is addressed to a business is not sent “to” or “towards” a person that happens to open the letter at the addressed business, the BSR commands sent to an addressed BSR unit are not sent “to” or “towards” an appliance that happens to be plugged into the addressed BSR unit. This is particularly evidenced by the fact that a BSR unit will always respond to an appropriately addressed command *even when no appliance is plugged into that BSR unit*. For at least this further reason, it is respectfully submitted that Micromint cannot be said to disclose the exact invention claimed as is required to maintain the rejection under 35 U.S.C. § 102, even giving the claims their “broadest” interpretation, and, as such, the rejection of the claims under 35 U.S.C. § 102 must be withdrawn.

In summary, it is respectfully submitted that Micromint central controller is used to do nothing more than transmit commands to BSR units and, as such, the Micromint controller does not include, and need not include, a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, i.e., the Micromint central controller includes only a single, fixed set of codes for use in transmitting BSR commands to BSR units. Accordingly, the Micromint central controller need not be, and is not, interacted with in any manner for the purpose of matching the central controller to a plurality of different home appliances of different manufacturers such that selected codes and data from a library are used to transmit operating commands to the matched home appliances. In this regard, it is respectfully noted that the Micromint central controller does not even have any appliance awareness. Rather, the Micromint central controller functions to always send the same BSR commands and *a BSR unit that is matched to the address accompanying a sent BSR command* will always respond to that BSR

command in the exact same manner, e.g., to activate/deactivate a relay and cause power to be switched on/off, *without regard to the type of appliance plugged into the BSR unit or even if an appliance is plugged into the BSR unit.* For at least these reasons it is respectfully submitted that Micromint fails to disclose, teach, or suggest each and every element set forth in the claims of the '067 patent as is required to maintain a rejection under 35 U.S.C. § 102 and, as such, the rejection of the claims under 35 U.S.C. § 102 must be withdrawn.

Conclusion

It is respectfully submitted that the claims of the '067 patent are patentable over Micromint. Should it be determined, however, that a telephone conference would expedite the prosecution of this reexamination, the Examiner is respectfully requested to contact the attorney undersigned.

Respectfully Submitted;



Date: November 29, 2007

By: Jeffrey G. Mote; Reg. No. 48,791
Greenberg Traurig, LLP
77 West Wacker Drive, Suite 2500
Chicago, Illinois 60601
(312) 456-8449

PROOF OF SERVICE

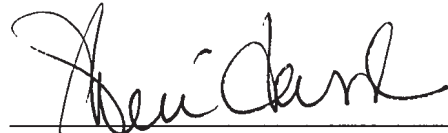
I declare that:

1. I am a citizen of the United States and am employed in the County of Cook, State of Illinois.
2. I am over the age of eighteen years and am not a party to this action.
3. My business address is 77 W. Wacker Drive, Suite 2500, Chicago, Illinois 60601-1732.
4. On November 29, 2007, I served a copy of a Response in Reexamination No. 90/007,876 by placing a copy in a sealed envelope and mailing it via First Class Mail with the U.S. Postal Service, addressed as follows:

Jonathan D. Hanish
Sierra Patent Group Ltd.
1657 Hwy 395, Suite 202
Minden, NV 89423

I declare under penalty of perjury in accordance with the laws of the State of Illinois that the foregoing is true and correct.

Date: November 29, 2007



Sheri Eassl

56858381v1



2-COMMON OUTGOING (EX PARTES)

1449 _____
Reviewed List of Refs Cited by Appl

RXLET. _____
Reexam Misc Incoming Letter

892. _____
List of Refs Cited by Examiner

RXLITSR _____
Reexam Litigation Search

EXIN. _____
Examiner Interview Summary

RXMISC _____
Reexam Miscellaneous Outgoing Action or Letter

NIRC. _____
Notice of Intent to Issue Reexam Certificate

DRAFT

RXRINF _____
Reexam Non-Final Office Action

RXADV. _____
Reexam proceeding Advisory Action

RXREXO _____
Order Granting Reexamination

RXCERT _____
Reexam Certificate

SRFW _____
Examiner's Search Notes

RXDOR _____
Director Initiated Order for Reexam

OTHER

RXEPQ. _____
Reexam Exparte Quayle Action

Other document (Please indicate doc code & page count)

RXFR. _____
Reexam Final Rejection

Document Date: 10-29-07



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 90/007,876 | 01/17/2006 | 6587067 | | 7865 |

7590 10/29/2007

GREENBURG TRAURIG PC
77 W WACKER DRIVE
SUITE 2500
CHICAGO, IL 60101

EXAMINER

ART UNIT PAPER NUMBER

DATE MAILED: 10/29/2007

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



DO NOT USE IN PALM PRINTER

(THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS)

Kenneth D'Alessandro
Sierra Patent Group, Ltd
1657 Hwt 395, Suite 202
Minden, NV 89423

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. 90/007,876.

PATENT NO. 6587067.

ART UNIT 3992.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

| | | | |
|--|---------------------------------------|--|--|
| Office Action in Ex Parte Reexamination | Control No. 90/007,876 | Patent Under Reexamination 6587067 | |
| | Examiner Majid A. Banankhah | Art Unit 3992 | |

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

- a Responsive to the communication(s) filed on 07 April 2006. b This action is made FINAL.
c A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).** If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 3. <input type="checkbox"/> Interview Summary, PTO-474. |
| 2. <input checked="" type="checkbox"/> Information Disclosure Statement, PTO/SB/08. | 4. <input type="checkbox"/> _____. |

Part II SUMMARY OF ACTION

- 1a. Claims 1-6 are subject to reexamination.
1b. Claims _____ are not subject to reexamination.
2. Claims _____ have been canceled in the present reexamination proceeding.
3. Claims _____ are patentable and/or confirmed.
4. Claims 1-6 are rejected.
5. Claims _____ are objected to.
6. The drawings, filed on _____ are acceptable.
7. The proposed drawing correction, filed on _____ has been (7a) approved (7b) disapproved.
8. Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some* c) None of the certified copies have
1 been received.
2 not been received.
3 been filed in Application No. _____.
4 been filed in reexamination Control No. _____.
5 been received by the International Bureau in PCT application No. _____.
* See the attached detailed Office action for a list of the certified copies not received.
9. Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.
10. Other: _____

cc: Requester (if third party requester)

DETAILED ACTION

Reexamination

1. This is an *ex parte* reexamination of U.S. Patent No. 6,587,067. Claims 1 – 6 are pending. The references discussed herein are as follows:

“Home Run Micromint’s Home Control System User’s Manual Rev. 1.0, The Micromint, Inc, Terrace Drive, Vernon, Connecticut 06066, April 1, 1985, pages 1-159 (“Mircomint”).

Claim Rejections - 35 USC § 102

2. 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 –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 – 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Micromint.
4. With respect to claim 1 Micromint discloses **in a universal remote control** (page 1, The Home Run HCS is a single board computer that can remotely control lights and appliances in a home) **comprising a keyboard having a plurality of pushbuttons** (page 27, Figure 10; see also page 1, HCS can use any terminal, or a personal computer emulating a terminal) **including a macro pushbutton** (page 2, superkey, HCS has 16 function keys which cause a user defined list of actions to be performed when the appropriate key is entered. This allows a complete sequence of events to be transmitted.) **and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers** (page 8, BRS system can accommodate 256 independently addressable receivers, i.e., a library of 256

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codes; see also page 44, HSC has a library of codes and data for use in transmitting operating commands such as ON, OFF, DIM, etc. to multiple appliances, each of which can be of different manufacturer), **a readable medium having instructions** (page 12, RAM and ROM used to run HCS is disclosed) **for performing steps comprising:**

matching the universal remote control to a plurality of different home appliances of different manufacturers (see page 44, HCS can be matched with 16 different home appliances of different manufacturers) **such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard** (page 44 show that in response to activation of selected pushbuttons, e.g., 1Y2N3DDD <Ret>, selected codes and data from the library, i.e. 8 bit BRS address codes and commands, are used to transmit operating commands to three different appliances), **the pushbuttons of the keyboard being activated to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched** (page 44, numeric keys of the keyboard are pressed, or activated, to directly identify three different home appliances, each of which can be of different manufacturer, matched to the HCS as modules 1, 2, and 3, respectively); **and**

assigning to the macro pushbutton a subset of the selected codes and data from the library (pages 65 – 67, a superkey can be programmed to associate a subset of selected codes, for example, a code for a thermostat that is matched as module 1, a code for a coffee pot matched as module 9, and code for an alarm system matched as module 4, and data from the library) **whereafter activation of the macro pushbutton causes the universal remote control to use the subset of selected codes and data from the library to transmit a plurality of operating**

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commands to one or more of the matched home appliances (activation of superkey causes transmission of associated command sequence to turn down the heat, turn off the coffee pot, and activate the alarm system, in the example shown on pages 65 – 67).

5. With respect to claim 2, **the instructions further perform the step of using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton** (pages 65 – 67 shows a specific example of assigning the subset of selected codes and data from the library to a superkey using the keyboard).

6. With respect to claim 3, **in a universal remote control comprising a keyboard having a plurality of pushbuttons and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a readable medium having instructions for performing steps comprising** (see rejection of claim1 above):

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard (see rejection of claim 1 above); and

using activation of one or more pushbuttons of the keyboard to match the universal remote control to the plurality of different home appliances of different manufacturers (Each BRS receiver requires a device code and a house code. See page 8. HCS requires the use

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of the key buttons on the keyboard to set the house code to match the plurality of appliances associated with the BRS receivers to the HCS. Remote appliances will not respond to HCS control unless the house code is matched. See page 103, house code. See also pages 36 – 38, the keyboard is also used to match module 1 to front porch light. Alternatively, manual control command “C” can also be used via the keyboard to match an appliance to a particular module recognized by HCS. For example, by manually sending ON/OFF command to module 1, HCS user can match a particular appliance to HCS module 1 and verify that the appliance is matched to module 1.);

instructions further perform the step of using activation of one or more of the pushbuttons of the keyboard to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched (see page 44, each of the plurality of different home appliances of different manufacturer can be identified directly as modules 1, 2, and 3. Alternatively, each appliance can be identified directly by sending manual commands and observing it respond to commands. See also pages 36 – 38, the keyboard is used to directly identify the front porch light.).

7. With respect to claims 4 and 5, see rejections of claims 1 and 2 above, respectively.
8. With respect to claim 6, see rejection of claim 1 or 3.

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Response to Arguments

9. Patent owner's arguments filed on April 7, 2006 have been fully considered but they are not persuasive.

10. Patent owner argues that "Micromint fails to disclose a controller that has a library of codes and data for use in transmitting command signals to a plurality of different home appliances of different manufacturers as disclosed and claimed in the '067 patent" (Patent Owner's Statement in Response to Order, Remarks, page 3), because "the Micromint controller is a dedicated controller in that it is provided only with a fixed code and the data that is required to transmit command signals to a BSR X-10 home control module" (Id). While the Examiner agrees that Micromint's HCS transmits BSR command signals to remotely control a plurality of different home appliances of different manufacturer, the Examiner does not agree that Micromint does not teach the claimed limitations. HCS clearly has a library of codes and data to recognize and transmit remote unit address codes for use in transmitting operating commands to remotely control a plurality of different home appliances.

10. HCS transmits codes and data to remote BRS units co-located with the appliances. These remote units receive commands from the central controller and send appropriate control signals/command to the appliances. This disclosure reads on the claimed limitations in two ways. First, the claims merely require that codes and data from the library be **used** to transmit operating commands to the appliances. HCS **uses** the house, device, and command codes to tell the remote units to transmit operating commands to the appliances. Secondly, "during

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examination proceedings, claims are given their broadest reasonable interpretation consistent with the specification.” In re Hyatt, 211 F.3d 1367, 1372 (Fed. Cir. 2000). A dictionary definition of “to” according to Merriam Webster’s Collegiate Dictionary, 10th Edition is “1a – [a word] used as a function word to indicate movement or an action or condition suggestive of movement toward a place, a person, or thing reached.” This definition is also consistent with the specification, because the specification discloses transmitting operating commands towards an appliance. HCS transmits BRS codes and data towards the appliances for the purposes of remotely controlling the appliances. Thus, Micromint’s teaching of transmitting BSR signals towards an appliance also fairly reads on the claimed limitations.

11. Patent owner emphasize that HCS transmits the same “fixed code”, i.e., protocol format, to support the argument that Micromint does not teach the claimed invention. First of all, the Examiner does not agree with Patent owner’s characterization of HCS as having the same “fixed code”, as the word “code” has a much broader meaning. Micromint disclose a variety of codes that are not “fixed”, for example, house codes, device codes, command codes, etc. any one of which reads on the claimed code and/or data. Secondly, the Examiner notes that the term “fixed code” is Patent owner’s own term to mean “protocol format”. The Examiner notes that the claims do not specify the protocol format of the codes and data. There’s nothing in the claim that requires the codes and data, for use in transmitting command signals to different appliances, to be of different native protocol formats of the corresponding appliances.

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12. Patent owner further argues that “the Micromint controller is not, and need not be, matched to a plurality of different home appliances of different manufacturers” because the HCS controller is use to transmit BSR commands (Remarks, page 4). Again, the Examiner disagrees. Unless appliances to be remotely controlled are specifically matched such that selected codes and data (a unique combination of a house code and a device code, and commands) are associated with specific and identified appliances, HCS would not be able to perform its function of remotely controlling them. As to Patent owner’s assertion that HCS will always transmit the same signal (Remarks, page 4), this is simply incorrect. HCS must transmit signals with different house and device code combinations to different appliances to control the devices. HCS must also transmit different commands to achieve different desired results.

Amendment in Reexamination Proceedings

13. Patent Owner is notified that any proposed amendment to the specification and/or claims in this reexamination proceeding must comply with 37 CFR 1.530(d)-(j), must be formally presented pursuant to 37 CFR 1.52(a) and (b), and must contain any fees required by 37 CFR 1.20(c).

In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, after final rejection and 37 CFR 41.33 after appeal, which will be strictly enforced. See MPEP § 2250(IV) for examples to assist in the preparation of proper proposed amendments in reexamination proceedings.

Service of Papers

14. After filing of a request for ex parte reexamination by a third party requester, any document filed by either the patent owner or the third party requester must be served on the other party (or parties where two or more third party requester proceedings are merged) in the reexamination proceeding in the manner provided in 37 CFR 1.248. The document must reflect service or the document may be refused consideration by the Office. See 37 CFR 1.550(f).

Extensions of Time

15. Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Litigation Reminder

16. The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 6,587,067 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Art Unit: 3992

NOTICE RE PATENT OWNER'S CORRESPONDENCE ADDRESS

Effective May 16, 2007, 37 CFR 1.33(c) has been revised to provide that:

The patent owner's correspondence address for all communications in an *ex parte* reexamination or an *inter partes* reexamination is designated as the correspondence address of the patent.

Revisions and Technical Corrections Affecting Requirements for Ex Parte and Inter Partes Reexamination, 72 FR 18892 (April 16, 2007)(Final Rule)

The correspondence address for any pending reexamination proceeding not having the same correspondence address as that of the patent is, by way of this revision to 37 CFR 1.33(c), automatically changed to that of the patent file as of the effective date.

This change is effective for any reexamination proceeding which is pending before the Office as of May 16, 2007, including the present reexamination proceeding, and to any reexamination proceeding which is filed after that date.

Parties are to take this change into account when filing papers, and direct communications accordingly.

In the event the patent owner's correspondence address listed in the papers (record) for the present proceeding is different from the correspondence address of the patent, it is strongly encouraged that the patent owner affirmatively file a Notification of Change of Correspondence Address in the reexamination proceeding and/or the patent (depending on which address patent owner desires), to conform the address of the proceeding with that of the patent and to clarify the record as to which address should be used for correspondence.

Telephone Numbers for reexamination inquiries:

| | |
|--|----------------|
| Reexamination and Amendment Practice | (571) 272-7703 |
| Central Reexam Unit (CRU) | (571) 272-7705 |
| Reexamination Facsimile Transmission No. | (571) 273-9900 |

Art Unit: 3992

All correspondence relating to this *ex parte* reexamination proceeding should be directed as follows:

By U.S. Postal Service Mail to:

Mail Stop *Ex Parte* Reexam
ATTN: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

By FAX to: (571) 273-9900
Central Reexamination Unit

By hand to: Customer Service Window
Randolph Building
401 Dulany St.
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Reexamination Legal Advisor or Examiner, or as to the status of this proceeding, should be directed to the Central Reexamination Unit at telephone number (571) 272-7705.



Majid A. Banankhan
Primary Examiner
Central Reexamination Unit 3992

Conferees:

ESK
WAC

| Form PTO 1449 (Rev. 2-32) U.S. Department of Commerce Patent and Trademark Office | | | | Atty. Docket No. | | Serial No. 90/007,876 | | |
|---|--|--|------|--------------------------|---------------------------------|--------------------------|-------------|----|
| Information Disclosure Statement by Applicant | | | | Applicant: Darbee et al. | | | | |
| (Use several sheets if necessary) | | | | Filed: 1/17/06 | | Group: 3992 | | |
| U.S. Patent Documents | | | | | | | | |
| Init. | | Document No. | Date | Name | Class | Subclass | Filing Date | |
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| Other Documents (Including Author, Title, Date, Pertinent Pages, etc.) | | | | | | | | |
| <i>MB</i> | | Steve Ciarcia "BUILD THE HOME RUN CONTROL SYSTEM." <i>Byte</i> April 1985, Vol. 10, No. 4 | | | | | | |
| <i>MB</i> | | Steve Ciarcia "BUILD THE HOME RUN CONTROL SYSTEM PART 2" <i>Byte</i> May 1985, Vol. 10, No. 5 | | | | | | |
| <i>MB</i> | | Steve Ciarcia "BUILD THE HOME RUN CONTROL SYSTEM PART 3" <i>Byte</i> June 1985, Vol. 10, No. 6 | | | | | | |
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| Examiner <i>M... B...</i> | | | | | Date Considered <i>10/25/07</i> | | | |
| Examiner: Initial if citation considered, whether or not citation is in conference with MPEP 609; Draw line through citation if not conformance and not considered. Include a copy of this form with the next communication to applicant. | | | | | | | | |



2-COMMON OUTGOING (EX PARTES)

1449 _____
Reviewed List of Refs Cited by Appl

RXLET. _____
Reexam Misc Incoming Letter

892. _____
List of Refs Cited by Examiner

RXLITSR _____
Reexam Litigation Search

EXIN. _____
Examiner Interview Summary

RXMISC _____
Reexam Miscellaneous Outgoing Action or Letter

NIRC. _____
Notice of Intent to Issue Reexam Certificate

RXRINF _____
Reexam Non-Final Office Action

RXADV. _____
Reexam proceeding Advisory Action

RXREXO _____
Order Granting Reexamination

RXCERT _____
Reexam Certificate

SRFW _____
Examiner's Search Notes

RXDOR _____
Director Initiated Order for Reexam


RXEPQ. _____
Reexam Exparte Quayle Action

OTHER

RXFELJKT _____
Other document (Please indicate doc code & page count)

RXFR. _____
Reexam Final Rejection

Document Date: 10-29-07

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| Reexamination  | Application/Control No. 90/007,876 | Applicant(s)/Patent Under Reexamination 6587067 |
| | Certificate Date | Certificate Number |

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| Requester Correspondence Address: <input type="checkbox"/> Patent Owner <input checked="" type="checkbox"/> Third Party |
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| LITIGATION REVIEW <input checked="" type="checkbox"/> | MB <small>(examiner initials)</small> | 10/26/2007 <small>(date)</small> |
| Case Name | | Director Initials |
| none | | <i>Eric Hessel for MB</i> |
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| COPENDING OFFICE PROCEEDINGS | |
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| TYPE OF PROCEEDING | NUMBER |
| 1. no concurrent office proceedings | |
| 2. | |
| 3. | |
| 4. | |

64660 U.S. PTO



06/08/06

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 3992

Examiner: St. John Courtenay III

Reexam Control Number: 90/007,876

Filing Date: January 17, 2006

In re Application of: Darbee et al.

For: UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND
CAPABILITIES

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail, in an envelope addressed to Mail Stop Ex Parte Reexam, Commissioner for Patents, P.O. Box 1450/Alexandria, VA 22313-1450

on 6/5/06

Signed


Stephanie Davis

REPLY BY THIRD-PARTY REQUESTOR PURSUANT TO 37 C.F.R. §1.535

Mail Stop Ex Parte Reexam
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The Patent Owner has filed Remarks concerning the decision by the Examiner to re-examine all of the claims in application serial No. 90/007,876, in which reexamination of all of the claims of United States Patent No. 6,587,067 (hereinafter “the ‘067 Patent”) has been sought. It is respectfully submitted that these Remarks by the patent owner are insufficient to establish that the claims in the application are not anticipated by or are unobvious over the “Home Run Micromint’s Home Control System” (hereinafter “Micromint”).

Briefly, the Remarks presented by the patent owner are insufficient on their face, since they do not even attempt to address any of the language of any of the claims presently pending in the application, but rather appear to narrowly focus on

the particular embodiment disclosed in the specification and attempt to compare that disclosed embodiment with the features disclosed in the Micromint reference. Such an analysis is substantially misplaced, since it is axiomatic that patent claims are not usually limited in scope to the particular embodiment disclosed in the specification. Further, there is no evidence in the file history of the '067 Patent for which reexamination is sought that applicants intended to restrict the scope of the claims to the single disclosed embodiment. It is respectfully submitted that the Remarks are thus irrelevant to the patentability of the pending claims and do not refute the lack of patentability of those claims.

More specifically, the patent owner contends that "it is to be understood that the Micromint controller does not function to transmit commands to the different appliances but only to the BSR X-10 home control module that the different appliances may be plugged into." It is respectfully submitted that, in the embodiment disclosed in the specification of the above-identified application, with respect to each appliance to be controlled, the disclosed remote control transmits codes to an infrared receiver that is associated with the appliance. The infrared receiver then interprets the codes and directs the appliance to respond appropriately.

It is respectfully submitted that the BSR X-10 home control module in the Micromint system functions in exactly the same manner as the infrared receiver in the home appliance to be controlled. The BSR X-10 module also receives the codes originated by the remote control, then interprets the codes and directs the appliance to respond appropriately. There is no language in any of the claims that would serve to distinguish them over the disclosure of the Micromint reference.

The patent owner is apparently contending that, because the components in the particular embodiment of the system disclosed in the above-identified application

are physically distributed in a manner somewhat different from the manner in which the components in the Micromint system are physically distributed, this somehow renders the Micromint system irrelevant to the claims despite the fact that the components perform the same functions in both systems. It is respectfully asserted that this argument does not serve to distinguish the claimed invention over the prior art.

The patent owner makes much of the fact that the Micromint remote control communicates with a controller and that the controller then communicates with the BSR X-10 modules. It is respectfully asserted that this distinction is immaterial to the claims at issue. There is no language in the pending claims that would preclude the presence of a controller such as is provided in the Micromint system. In any event, such a controller operates to interpret the command and ultimately cause it to perform a control function in one of the appliances, as does the infrared receiver in each of the appliances that may be controlled by the remote control disclosed in the above-identified application. Again, the patent owner's arguments here appear to attempt to distinguish the disclosure of the '067 Patent from the disclosure in the Micromint reference on the basis of certain details concerning the physical distribution of the hardware elements of the two systems, subject matter which does not appear in the presently-pending method claims. It is respectfully submitted that arguments based on such unclaimed distinctions are of no moment.

The patent owner continues: "As further described in Micromint, since all of the BSR X-10 home control modules are essentially the same appliance . . . , the Micromint controller always transmits command signals to the BSR X-10 home control modules using the same fixed code, i.e., protocol format." While it is not entirely clear what this statement is supposed to mean, it is respectfully urged that

The Examiner take notice that the remote control of the invention claimed in the above-identified patent application can be viewed in the same manner. It cannot be disputed that the infrared receivers in each of the plurality of home appliances with which the remote control communicates are essentially identical and are themselves each “essentially the same appliance” in that sense.

The patent owner conveniently omits the fact that each BSR X-10 controller, just like each infrared receiver in the system disclosed and claimed in the above-identified patent application, is connected to a separate and different appliance which is ultimately controlled by the signals from the remote control. It is respectfully submitted that this argument by the patent owner is not pertinent to the presently-pending method claims.

The patent owner places great reliance on the fact that “the Micromint controller always generates a 120 KHz signal that is used to pulse width modulate the AC lines to which the BSR X-10 modules are attached,” a fact that does not appear to be relevant to the claims at issue, which themselves do not prescribe any particular manner in which the control information is to be sent between the remote and the receiver coupled to the appliance other than the fact that the signal is initiated in a remote control device, just as it is in the invention disclosed and claimed in the ‘067 Patent. Again, the patent owner seems to be making arguments concerning the specific architectural distribution of the electrical components necessary to implement the method steps recited in the claims, as well as particular message protocols and formats, design features that are not recited anywhere in the pending claims, which are directed to methods. Accordingly, any differences in the distribution and location of components, and in the particular communications protocols used, do not appear to relate to the issues at hand.

The patent owner concludes that: “From the foregoing, it will be readily appreciated that Micromint, which discloses a controller dedicated to commanding nothing more than BSR X-10 modules, simply fails to disclose, teach, or suggest a universal remote control as is disclosed and claimed in the ‘067 Patent.” This conclusion is not at all supported by the patent owner’s arguments.

First, this conclusion of course fails to deal with the fact that the universal remote disclosed in the Micromint reference controls a plurality of home appliances as required by the pending claims. It also fails to account for the fact that each BSR X-10 module individually responds to commands intended to control the home appliance to which it is connected. This would not be possible if, as contended by the patent owner, “the Micromint controller always transmits command signals to the BSR X-10 home control modules using the same fixed code, i.e., protocol format,” since there would be no way for the individual BSR X-10 controllers to know which control signals were intended for the appliance that they alone control.

As previously noted, claims 1-6 of the pending application are directed to methods. It is elementary patent law that method claims can be performed using more than one particular apparatus. The patent owner’s Remarks are particularly unhelpful in this respect since they are unfortunately largely directed to differences between the apparatus disclosed in the pending application for performing the claimed methods and apparatus disclosed in the Micromint reference for performing these same methods.

The patent owner also asserts: “It is also respectfully submitted that, since the Micromint controller is used to transmit command signals only to BSR X-10 modules, the Micromint controller is not, and need not be, matched to a plurality of different home appliances of different manufacturers, i.e., be caused to select at least codes

from a library of codes and data to thereby set up the controller to transmit commands to identified ones of a plurality of different home appliances of different manufacturers as is disclosed and claimed in the '067 Patent.”

Of course, as previously noted, it can equally be said that the invention disclosed and claimed in the '067 Patent is used to transmit command signals only to infrared receivers that are associated with different home appliances of different manufacturers. As is plain from an examination of the Micromint reference, the patent owner is mistaken in the assertion that “the Micromint controller is not, and need not be, matched to a plurality of different home appliances of different manufacturers.” It is respectfully urged that this argument is a nonsequitur and simply makes no sense.

As was noted in the claim chart provided in the Request for Reexamination, each different home appliance in the Micromint system is matched by assigning to it a unique address that is used by the home run control system to send commands destined for the home appliance. If there were no matching of the remote to a particular appliance to be controlled, there would be no way for the Micromint system to identify which appliance a control message from the remote was intended to control. Again, the pending claims do not include any limitations that would preclude this process from being considered as “matching” the remote control to a plurality of different home appliances of different manufacturers. There is no evidence at all in the file wrapper of the '067 Patent that the patentee intended to exclude such matching from the scope of the claims. There is no teaching in the specification of the '067 Patent that the claimed method excludes an implementation in which a plurality of modules (e.g., BSR X-10 modules) is provided, each module associated with each different home appliance and responsive to commands from the remote control to control the individual appliances.

In fact, the specification of the '067 Patent explicitly states: "Also modifications can be made to the device 10, the assembly 206, and the described methods of the present invention without departing from the teachings of the present invention." Given that all of the pending claims are method claims, this statement by the inventors is strong evidence that they contemplated that their methods are implementable using apparatus other than and different from the apparatus disclosed in the specification for performing the claimed methods.

The patent owner admits that "the desired BSR X-10 module must be matched to the [that] command signal" as required by the pending claims. However, the patent owner seems to make much of how the Micromint reference discloses the manner in which this matching step is performed by the apparatus described in the reference: "For this purpose, a BSR X-10 module is provided with a thumbwheel which is used to setup the BSR X-10 module to respond to the BSR formatted command signal transmissions." It can scarcely be said that by the priority date of the above-identified application, persons of ordinary skill in the data processing art well knew how to provide an address to configure an electronic component such as the BSR X-10 module via a data-entry device such as a remote control.

The patent owner asserts that "it will be appreciated that the Micromint system functions in a manner that is in direct contrast to that which is disclosed and claimed in the '067 Patent as evidenced by the fact that, by merely changing the thumbwheel of a BSR X-10 module, a BSR X-10 module may at one point in time be setup to react to a command signal transmitted by the Micromint controller and at another point in time be setup to ignore that exact same command signal when it is transmitted by the Micromint controller." This assertion does not appear to relate to the pending claims and it is respectfully urged that it is otherwise misleading.

Again, to establish this “direct contrast,” the patent owner appears to be relying on features of the particular single embodiment disclosed in the specification, which the inventors have already dismissed elsewhere in the specification as not serving to limit the scope of the invention. Further, the above-quoted argument by the patent owner appears to reason that, because the programming of a BSR X-10 module can be changed (reprogrammed) at some time during the lifetime of the system, this fact somehow renders it materially different from the claimed invention.

What the patent owner does not mention is that the embodiment disclosed in the specification can also be reprogrammed at some time during the lifetime of the system. The specification, at col. 8, lines 19-27 and 46-49, makes it clear that the data in the RAM 54 (containing the codes) can be updated, thus establishing that the same may be said of the disclosed embodiment of the claimed invention (it “may at one point in time be setup to react to a command signal . . . and at another point in time be setup to ignore that exact same command signal . . .”) thus refuting the alleged distinction counsel attempts to make. At any rate, not only does the specification contemplate that the programmed codes may be changed at some point and discloses a means for accomplishing such reprogramming, but none of the pending claims contain language precluding the possibility that the system may be reprogrammed at some undetermined time.

Finally, the patent owner contends that “it has not been substantiated that Micromint was actually in the public domain prior to the earliest filing date to which the ‘067 Patent is entitled.” This assertion is somewhat cryptic since the patent owner fails to identify the earliest filing date to which it believes the ‘067 Patent is entitled. In any event, this assertion is puzzling considering the fact that the reference bears a date of April 1, 1985, and the earliest filing date of any application

from which the '067 Patent can claim priority is October 14, 1987. Plainly, the inventors of the '067 Patent cannot swear behind a date that is more than two years prior to their priority date.

Other than by a possible vague implication, the patent owner has also failed to particularly identify any genuine issue concerning the date or availability of the Micromint reference. In any event, included herewith are copies of portions of three issues of Byte Magazine, a nationwide computer periodical, bearing relevant dates of April 1985, May 1985, and June 1985. These copies of Byte Magazine include articles that discuss the Micromint system in detail and conclusively establish beyond doubt that Micromint was actually in the public domain prior to the earliest filing date to which the '067 Patent is entitled, thus putting to rest any fears of the patent owner to the contrary. These articles are included to demonstrate that the Micromint system was "in the public domain" more than one year prior to the earliest filing data to which the above-identified patent application is entitled. A PTO Form 1449 listing these documents is also enclosed herewith.

Respectfully submitted,
Sierra Patent Group, Ltd.



Kenneth D'Alessandro
Reg. No. 29,144

Dated: June 5, 2006

Sierra Patent Group, Ltd.
1657 Hwy 395, Suite 202
Minden, NV 89423
(775) 586-9500



PROOF OF SERVICE

I declare that:

1. I am a citizen of the United States and am employed in the County of Douglas, State of Nevada.
2. I am over the age of eighteen years and am not a party to this action.
3. My business address is 1657 Highway 395, Suite 202, Minden, Nevada 89423.
4. On Mon, Jun 5, 2006, I served a copy of a Reply by Third-Party Requestor Pursuant to 37 C.F.R. §1.535 in it's entirety by placing a true copy thereof enclosed in a sealed envelope via the United States Post Office at Minden, Nevada, addressed as follows:

Gary R. Jarosik
Greenburg Taurig, LLP
77 West Wacker Drive, Suite 2500
Chicago, IL 60601

I declare under penalty of perjury in accordance with the laws of the State of Nevada that the foregoing is true and correct.

Dated: Mon, Jun 5, 2006


Stephanie Davis

PROOF OF SERVICE

I declare that:

1. I am a citizen of the United States and am employed in the County of Cook, State of Illinois.
2. I am over the age of eighteen years and am not a party to this action.
3. My business address is 77 W. Wacker Drive, Suite 2500, Chicago, Illinois 60601-1732.
4. On Wednesday, April 5, 2006, I served a copy of a Response in Reexamination No. 90/007,876 by placing a copy in a sealed envelope and mailing it via First Class Mail with the U.S. Postal Service, addressed as follows:

Jonathan D. Hanish
Sierra Patent Group Ltd.
1657 Hwy 395, Suite 202
Minden, NV 89423

I declare under penalty of perjury in accordance with the laws of the State of Illinois that the foregoing is true and correct.

Date: April 5, 2006



Ranni Matar

64660 U.S. PTO



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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|---------------------|--------------------------|---|----------------------------------|
| Applicant: | Darbee et al. |) | Examiner: St. John Courtenay III |
| | |) | |
| Reexam Control No.: | 90/007,876 |) | Attny Doc.: 81230.05US4 |
| | |) | |
| Filing Date: | 01/17/2006 |) | Art Unit: 3992 |
| | |) | |
| Patent No.: | 6,587,067 |) | |
| | |) | |
| Title: | Universal Remote Control |) | |
| | With Macro Command |) | |
| | Capabilities |) | |

RESPONSE

Mail Stop "Ex Parte Reexam"
 Central Reexamination Unit
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action dated February 9, 2006 please consider the remarks which begin on page 2 of this paper.

Certificate of Mailing: I hereby certify that this correspondence is being deposited with the US Postal Service as First Class mail in an envelope addressed to Mail Stop "Ex Parte Reexam," Central Reexamination Unit, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 5th day of April, 2006

By: Ranni Matar
 Ranni Matar

REMARKS

It is respectfully submitted that the disclosure within the “Home Run Micromint’s Home Control System User’s Manual Rev. 1.0” (hereinafter “Micromint”) fails to anticipate or render obvious the claims of U.S. Patent No. 6,587,067 (hereinafter “the ‘067 patent”).

Considering first the ‘067 patent, the ‘067 patent discloses and claims a universal remote control. As further disclosed and claimed in the ‘067 patent, to allow the universal remote control to transmit commands to a plurality of different home appliances of different manufacturers, the universal remote control is provided with a library of codes, i.e., instructions for sending commands in different protocol formats recognizable by different home appliances of different manufacturers, and data, i.e., the specific data to be transmitted to cause different home appliances of different manufacturers to perform various operations, as is conventional in universal remote controls. However, unlike universal remote controls known prior to that disclosed and claimed in the ‘067 patent, the ‘067 patent discloses and claims a method for using pushbuttons of a keyboard of the universal remote control to setup the universal remote control to command identified ones of the plurality of different home appliances of different manufacturers.

More particularly, the ‘067 patent discloses and claims a universal remote control that is setup by activating pushbuttons of its keyboard where the activated pushbuttons function to directly identify to the universal remote control the ones of the plurality of different home appliances of different manufacturers that the universal remote control is to command. As further disclosed and claimed in the ‘067 patent, the universal remote control uses the pushbutton activations to match the universal remote control to a plurality of different home appliances of different manufacturers by selecting from the library of codes and data those codes and data that are appropriate for the appliances so identified to the universal remote control. In this manner, the universal remote control disclosed and claimed in the ‘067 patent

will, upon being setup and in response to subsequent activations of pushbuttons on the keyboard of the universal remote, use those codes and data selected from the library of codes and data to transmit commands to the plurality of different home appliances of different manufacturers to which the universal remote control has thus been matched. Since the universal remote control disclosed and claimed in the '067 patent is capable of being matched to a plurality of different home appliances of different manufacturers, it will be appreciated that, when a pushbutton of the universal remote control is activated during normal operation, e.g., TV "channel up," the universal remote control will not always use the same protocol format and data when transmitting a command signal to an intended target appliance. Rather, the universal remote control disclosed and claimed in the '067 patent will, in response to activation of a pushbutton during normal operation, send a command signal that uses a code, i.e., protocol format, and data that will vary depending upon which appliances the universal remote control was matched to, i.e., depending upon which pushbuttons were activated during its setup.

Turning now to Micromint, it is respectfully submitted that Micromint fails to disclose a controller that has a library of codes and data for use in transmitting command signals to a plurality of different home appliances of different manufacturers as is disclosed and claimed in the '067 patent. Rather, in direct contrast to a universal remote control, the Micromint controller is a dedicated controller in that it is provided only with a fixed code and the data that is required to transmit command signals to a BSR X-10 home control module. Thus, while the Micromint controller may be described as being usable to control the operations of different appliances that may be plugged into a BSR X-10 home control module, it is to be understood that the Micromint controller does not function to transmit commands to the different appliances but only to the BSR X-10 home control module that the different appliances may be plugged into. (*see* pgs. 7+). As further described in Micromint,

since all of the BSR X-10 home control modules are essentially the same appliance without regard to the trademark under which a BSR X-10 home control module was sold (*see*, for example, pgs. 4, 7, 8, and 9), the Micromint controller always transmits command signals to the BSR X-10 home control modules using the same fixed code, i.e., protocol format. Specifically, the Micromint controller always generates a 120 kHz signal that is used to pulse width modulate the AC lines to which the BSR X-10 modules are attached. (*see*, for example, pgs. 8 and 9).

From the foregoing, it will be readily appreciated that Micromint, which discloses a controller dedicated to commanding nothing more than BSR X-10 modules, simply fails to disclose, teach, or suggest a universal remote control as is disclosed and claimed in the '067 patent. More particularly, it will be readily appreciated that, while the Micromint controller may have a fixed code and the data for transmitting command signals to BSR X-10 modules, since the Micromint controller is used to transmit command signals only to BSR X-10 modules, the Micromint controller does not include, and does not require, at a minimum, a library of codes that are used to transmit command signals to different home appliances of different manufacturers as is disclosed and claimed in the '067 patent.

It is also respectfully submitted that, since the Micromint controller is used to transmit command signals only to BSR X-10 modules, the Micromint controller is not, and need not be, matched to a plurality of different home appliances of different manufacturers, i.e., be caused to select at least codes from a library of codes and data to thereby setup the controller to transmit commands to identified ones of a plurality of different home appliances of different manufacturers as is disclosed and claimed in the '067 patent. In this regard, it is to be understood that, when a key of the Micromint controller is activated the Micromint controller will always transmit the same command signal, i.e., a BSR formatted message which always includes a house code (A through P) and the operation code assigned to the key

activated. (*see* pg. 9, Figure 1). For example, if key “10” and then key “on” of the keyboard of the Micromint controller are activated, the Micromint controller will always transmit a first BSR formatted command signal that includes the house code and the operation code assigned to the “10” key followed by a second BSR formatted command signal that includes the house code and the operation code assigned to the “on” key. Since the same BSR formatted command signal will always be transmitted in response to activation of a key of the Micromint controller, for a desired BSR X-10 module to respond to a BSR formatted command signal transmitted by the Micromint controller the desired BSR X-10 module must be matched to that command signal. For this purpose, a BSR X-10 module is provided with a thumbwheel which is used to setup the BSR X-10 module to respond to the BSR formatted command signal transmissions. (*see* pg. 8). Thus, it will be appreciated that the Micromint system functions in manner that is in direct contrast to that which is disclosed and claimed in the ‘067 patent as evidenced by the fact that, by merely changing the thumbwheel of a BSR X-10 module, a BSR X-10 module may at one point in time be setup to react to a command signal transmitted by the Micromint controller and at another point in time be setup to ignore that exact same command signal when it is transmitted by the Micromint controller.

From the foregoing, it will be appreciated that the Micromint system not only fails to disclose, teach, or suggest each and every element set forth in the claims of the ‘067 patent but, in fact, functions in a manner that is in direct contrast to that which is claimed in the ‘067 patent. Accordingly, it is respectfully submitted that Micromint is merely cumulative to the art of record and fails to raise any new question as to the patentability of the claims of the ‘067 patent.

At this time, it is respectfully noted that, by this response, the patent holder is making no admissions as to whether or not Micromint is, in fact, “prior art” to the ‘067 patent. In this

regard, it has not been substantiated that Micromint was actually in the public domain prior to the earliest filing date to which the '067 patent is entitled.

Conclusion

It is respectfully submitted that the claims of the '067 patent are patentable over Micromint. Should it be determined, however, that a telephone conference would expedite the prosecution of this reexamination, the Examiner is respectfully requested to contact the attorney undersigned.

The Commissioner is authorized to charge any fee deficiency or credit overpayment to deposit account 50-2428 in the name of Greenberg Traurig.

Respectfully Submitted;



Date: April 5, 2006

By: Gary R. Jarosik
Reg. No. 35,906
Greenberg Traurig, LLP
77 West Wacker Drive, Suite 2500
Chicago, Illinois 60601
(312) 456-8449



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 90/007,876 | 01/17/2006 | 6587067 | | 7865 |

7590 02/09/2006
GREENBURG TRAUIG PC
77 W WACKER DRIVE
SUITE 2500
CHICAGO, IL 60101

EXAMINER

ART UNIT PAPER NUMBER

DATE MAILED: 02/09/2006

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



DO NOT USE IN PALM PRINTER

(THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS)

Kenneth D'Alessandro
Sierra Patent Group, Ltd.
1657 Hwy 395, Suite 202
Minden NV 89423

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. 90/007,876.

PATENT NO. 6587067.

ART UNIT 3992.

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

| | | | |
|--|---|--|--|
| Order Granting / Denying Request For Ex Parte Reexamination | Control No. 90/007,876 | Patent Under Reexamination 6587067 | |
| | Examiner St. John Courtenay III | Art Unit 3992 | |

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

The request for *ex parte* reexamination filed 17 January 2006 has been considered and a determination has been made. An identification of the claims, the references relied upon, and the rationale supporting the determination are attached.

Attachments: a) PTO-892, b) PTO-1449, c) Other: _____

1. The request for *ex parte* reexamination is GRANTED.

RESPONSE TIMES ARE SET AS FOLLOWS:

For Patent Owner's Statement (Optional): TWO MONTHS from the mailing date of this communication (37 CFR 1.530 (b)). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**

For Requester's Reply (optional): TWO MONTHS from the **date of service** of any timely filed Patent Owner's Statement (37 CFR 1.535). **NO EXTENSION OF THIS TIME PERIOD IS PERMITTED.** If Patent Owner does not file a timely statement under 37 CFR 1.530(b), then no reply by requester is permitted.

2. The request for *ex parte* reexamination is DENIED.

This decision is not appealable (35 U.S.C. 303(c)). Requester may seek review by petition to the Commissioner under 37 CFR 1.181 within ONE MONTH from the mailing date of this communication (37 CFR 1.515(c)). **EXTENSION OF TIME TO FILE SUCH A PETITION UNDER 37 CFR 1.181 ARE AVAILABLE ONLY BY PETITION TO SUSPEND OR WAIVE THE REGULATIONS UNDER 37 CFR 1.183.**

In due course, a refund under 37 CFR 1.26 (c) will be made to requester:

- a) by Treasury check or,
- b) by credit to Deposit Account No. _____, or
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St. John Courtenay III
Primary Examiner
Art Unit: 3992

cc: Requester (if third party requester)

Response to Request for *ex parte* Reexamination

1. Reexamination has been requested for claims 1-6 of U.S. Patent number 6,587,067 ('067 patent).
2. A substantial new question of patentability affecting at least claim 1 of United States Patent number 6,587,067 is raised by the request for *ex parte* reexamination.
3. The '067 patent is currently assigned to Universal Electronics, Inc., 6101 Gateway Drive, Cypress, California 90630.
4. The '067 patent application filing date was Feb. 23, 2001 and the patent issued on July 1, 2003.
5. This 6,587,067 patent claims the priority date of U.S. application Ser. No. 09/408,729 filed on Sep. 29, 1999, now U.S. Pat. No. 6,195,033, which is a continuation-in-part of U.S. application Ser. No. 07/990,854, filed on Dec. 11, 1992, now U.S. Pat. No. 6,014,092, which is a continuation-in-part of U.S. application Ser. No. 07/913,523 filed on Jul. 14, 1992, now abandoned, which is a continuation-in-part of U.S. application Ser. No. 07/586,957 filed on Sep. 24, 1990, now abandoned, which is a continuation-in-part of U.S. application Ser. No. 07/127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810, which is a continuation-in-part of U.S. application Ser. No. 09/109,336 filed on Oct. 14, 1987, now abandoned.
6. The 6,587,067 patent contains the specification of U.S. application Ser. No. 07/127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810.

7. This 6,587,067 patent is also related to U.S. application Ser. No. 08/874,184 filed on Jun. 13, 1997, now U.S. Pat. No. 5,959,751, which is a continuation of U.S. application Ser. No. 08/706,794 filed on Sep. 3, 1996, now U.S. Pat. No. 5,689,353, which is a continuation of U.S. application Ser. No. 08/314,970 filed Sep. 29, 1994, now U.S. Pat. No. 5,552,917, which is a divisional of U.S. application Ser. No. 08/093,512 filed on Jul. 16, 1993, now abandoned, which is a continuation of U.S. application Ser. No. 07/586,957 filed on Sep. 24, 1990, now abandoned, which is a divisional of U.S. application Ser. No. 07/127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810, which is a continuation-in-part of U.S. application Ser. No. 07/109,336 filed Oct. 14, 1987, now abandoned.

8. In the request for reexamination, the requester alleges that '067 patent claims 1-6 are anticipated under 35 U.S.C. §102(b) by the following reference which was not of record in the file of the '067 patent and is not cumulative to the art of record in the original file:

(no author given) "Home Run Micromint's Home Control System User's Manual Rev. 1.0", The Micromint, Inc., 25 Terrace Drive, Vernon, Connecticut 06066, April 1, 1985, pages 1-159 (i.e., "Micromint Manual").

9. It is agreed that there exists a substantial likelihood that the "Micromint Manual" would have been considered important by a reasonable Examiner in deciding whether or not at least claim 1 was patentable, for the reasons discussed *infra*.

As per independent claim 1:

The Micromint Manual teaches, in a universal remote control comprising a keyboard having a plurality of pushbuttons [The home run control system employs a remote control described as a "cordless controller" (page 7). It is a "universal" remote control because it can control many different home appliances (page 1). The remote control includes a keyboard (page 7)] including a macro pushbutton [The remote control keyboard includes 16 "superkeys" (page 2). Each "superkey" is a macro pushbutton in that it may be programmed to cause a user-defined list of actions to be performed by one or more different home appliances by transmitting operating commands to the different home appliances (pages 2, 65-67, 84, 109)] and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers [The different home appliances, of course, may be marketed by different manufacturers. Depending on the appliance to be controlled, and the particular control function to be implemented in the appliance, a library of codes for each appliance is defined. For example "on" and "off" codes for the appliances are defined (page 1), as are 16 different dimming levels for lighting appliances (pages 2, 24). Operating codes are transmitted to the different home appliances. See, for example, manual control described at page 44] , a readable medium [The HCS system has a readable medium in the form of 16 K bytes of program-store ROM (page 12). The program-store ROM stores instructions for performing steps] having instructions for performing steps comprising:

- matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected

codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard [The home run control system is matched to the plurality of different home appliances such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard. See, for example, manual control described at page 44 wherein one or more different appliances may be controlled by activation of selected keys on the keyboard. Depending on the identity and functionality of the appliance, a set or library of codes is used in the commands sent to the appliance to control its different functions. Each different home appliance is matched by assigning to it an address that is used by the home run control system to send commands destined for the home appliance.], the pushbuttons of the keyboard being activated to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched [Selected pushbuttons on the remote control are used to send commands that are directed to the plurality of different home appliances. See, for example, the description of turning on the appliance at channel 10 at page 9] and

- assigning to the macro pushbutton a subset of the selected codes and data from the library [Each of the "superkeys" may be programmed by associating with them a subset of the selected codes and data from the library] whereafter activation of the macro pushbutton causes the universal remote control to use the subset of selected codes and data from the library to transmit a plurality of operating commands to one or more of the matched home appliances [Each "superkey" is a macro pushbutton in that it may be programmed to cause a user-defined list of actions to be performed by one

or more different home appliances by transmitting operating commands to the different home appliances (pages 2, 65-67, 84, 109)].

Conclusion

10. All claims are subject to reexamination.

11. Extensions of time under 37 C.F.R §1.136(a) will not be permitted in this proceeding because the provisions of 37 C.F.R. §1.136 apply only to "an Applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. §305 requires that *ex parte* reexamination proceedings "will be conducted with **special dispatch**" (37 C.F.R. §1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 C.F.R. §1.550(c).

12. The Patent Owner is reminded of the continuing responsibility under 37 C.F.R. § 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent number 6,587,067 throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

How to Communicate with the USPTO

ALL correspondence relating to this *ex partes* reexamination proceeding should be directed as follows:

Please mail any communications to:

Attn: Mail Stop "Ex Parte Reexam"
Central Reexamination Unit
Commissioner for Patents
P. O. Box 1450
Alexandria VA 22313-1450

Please FAX any communications to:

(571) 273-9900
Central Reexamination Unit

Please hand-deliver any communications to:

Customer Service Window
Attn: Central Reexamination Unit
Randolph Building, Lobby Level
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Reexamination Legal Advisor or Examiner, or as to the status of this proceeding, should be directed to the Central Reexamination Unit at telephone number (571) 272-7705.

Signed:

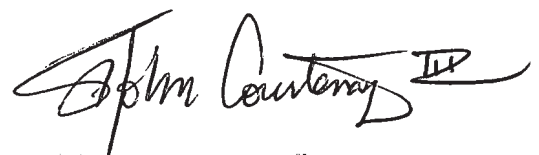
St. John Courtenay III (Monday - Friday 9:00 AM - 5:30 PM)
Primary Examiner
Central Reexamination Unit 3992
(571) 272-3761

Conferences:

McReinhart - SPRE-CRU - 3992



Primary Examiner



ST. JOHN COURTENAY III

Primary Examiner

90/007, 876

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| Form PTO 1449 (Rev. 2-32) | U.S. Department of Commerce Patent and Trademark Office | Atty. Docket No. | Serial No. 091791754 90/007, 876 |
| Information Disclosure Statement by Applicant | | Applicant: Darbee et al. | |
| (Use several sheets if necessary) | | Filed: February 23, 2001 Group: 3992 | |

U.S. Patent Documents

| Init. | Document No. | Date | Name | Class | Subclass | Filing Date |
|-------|--------------|------|------|-------|----------|-------------|
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Foreign Documents


| Init. | Document No. | Date | Country | Class | Subclass | Translation | |
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Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)

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|----|---|---|--|--|--|--|--|
| SC | 1 | "Home Run - Micromint's Home Control System Users Manual Rev 1.0", The Micromint, Inc., pp. 1-159, April 1, 1985. | | | | | |
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|----------|--------------|-----------------|----------|
| Examiner | S. COURTENAY | Date Considered | 2-8-2006 |
|----------|--------------|-----------------|----------|

Examiner: Initial if citation considered, whether or not citation is in conference with MPEP 609; Draw line through citation if not conformance and not considered. Include a copy of this form with the next communication to applicant.

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|---|--|---|
| Reexamination  | Application/Control No. 90/007,876 | Applicant(s)/Patent Under Reexamination 6587067 |
| | Certificate Date | Certificate Number |

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| Requester Correspondence Address: <input type="checkbox"/> Patent Owner <input checked="" type="checkbox"/> Third Party |
| Kenneth D'Alessandro Sierra Patent Group, Ltd. 1657 Hwy 395, Suite 202 Minden NV 89423 |

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| LITIGATION REVIEW <input checked="" type="checkbox"/> | STJC <small>(examiner initials)</small> | 2-8-2006 <small>(date)</small> |
| <small>Case Name</small> | <small>Director Initials</small> | |
| Westlaw search 2-8-2006 - no litigation found. | | |
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Litigation Search Report CRU 3999

Reexam Control No. 90/007,876

TO: St. John Courtenay
Location: CRU
Art Unit : 3992
Date: February 8, 2006

From: Patricia Martin
Location: CRU 3999
MDW 7D80B
Phone: (571) 272-7716

Case Serial Number: 90/007,876

Patricia.Martin@uspto.gov

Search Notes

U.S. Patent No – 6,587,067

- 1) I performed a KeyCite Search in Westlaw, which retrieves all history on the patent including any litigation.
- 2) I performed a search on the patent in Lexis CourtLink for any open dockets or closed cases.
- 3) I performed a search in Lexis in the Federal Courts and Administrative Materials databases for any cases found.
- 4) I performed a search in Lexis in the IP Journal and Periodicals database for any articles on the patent.
- 5) I performed a search in Lexis in the news databases for any articles about the patent or any articles about litigation on this patent.

No Litigation Found.

Westlaw.

Date of Printing: FEB 08,2006

KEYCITE

CUS PAT 6587067 UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND CAPABILITIES, Assignee: Universal Electronics Inc. (Jul 01, 2003)

History

- => 1 **UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND CAPABILITIES, US PAT 6587067, 2003 WL 21502724 (U.S. PTO Utility Jul 01, 2003) (NO. 09/791354)**

Assignments

- 2 Assignee(s): UNIVERSAL ELECTRONICS INC. 6101 GATEWAY DRIVE CYPRESS CALIFORNIA 90630, DATE RECORDED: Sep 06, 2001

Prior Art

- C** 3 US PAT 4665397 APPARATUS AND METHOD FOR A UNIVERSAL ELECTRONIC LOCKING SYSTEM, Assignee: Universal Photonics, Inc., (U.S. PTO Utility 1987)
- C** 4 US PAT 4599491 APPARATUS FOR CONVERTING DIRECT COUPLED DATA DEVICES TO ACOUSTIC COUPLED DATA DEVICES, Assignee: Novation, Inc., (U.S. PTO Utility 1986)
- C** 5 US PAT 4935870 APPARATUS FOR DOWNLOADING MACRO PROGRAMS AND EXECUTING A DOWNLOADED MACRO PROGRAM RESPONDING TO ACTIVATION OF A SINGLE KEY, Assignee: Keycom Electronic Publishing, (U.S. PTO Utility 1990)
- C** 6 US PAT 4200862 APPLIANCE CONTROL, Assignee: Pico Electronics Limited, (U.S. PTO Utility 1980)
- C** 7 US PAT 4823311 CALCULATOR KEYBOARD WITH USER DEFINABLE FUNCTION KEYS AND WITH PROGRAMMABLY ALTERABLE INTERACTIVE LABELS FOR CERTAIN FUNCTION KEYS, Assignee: Texas Instruments Incorporated, (U.S. PTO Utility 1989)
- C** 8 US PAT 4386412 CALCULATOR WITH EQUATION DISPLAY DEVICE, Assignee: Casio Computer Company, Ltd., (U.S. PTO Utility 1983)
- C** 9 US PAT 4028493 CALL PROGRESS SIGNAL DETECTOR, Assignee: International Business Machines, (U.S. PTO Utility 1977)
- C** 10 US PAT 4251805 CIRCUIT ARRANGEMENT FOR AN INPUT KEYBOARD, Assignee: ITT Industries, Inc., (U.S. PTO Utility 1981)
- C** 11 US PAT 4908612 COMPUTER INPUT-OUTPUT DEVICE, Assignee: Penguin Products, Inc., (U.S. PTO Utility 1990)
- C** 12 US PAT 4517564 CORDLESS REMOTE CONTROL APPARATUS, Assignee: Tokyo Shibaura Denki Kabushiki Kaisha, (U.S. PTO Utility 1985)
- C** 13 US PAT 4246611 DIGITAL CONTROL SYSTEM AND A METHOD OF TRANSMITTING CONTROL DATA IN SUCH A SYSTEM, Assignee: Texas Instruments Incorporated, (U.S. PTO Utility 1981)
- C** 14 US PAT 4177453 DIGITAL REMOTE CONTROL SYSTEM WITH IMPROVED NOISE IMMUNITY, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1979)
- C** 15 US PAT 4860390 DRAINAGE PLUG, (U.S. PTO Utility 1989)
- C** 16 US PAT 4766540 ELECTRONIC CASH REGISTER WITH PROGRAMMABLE MODE/FUNCTION KEY SETTINGS, Assignee: Casio Computer Co., Ltd., (U.S. PTO Utility 1988)
- C** 17 US PAT 4875096 ENCODING OF AUDIO AND DIGITAL SIGNALS IN A VIDEO SIGNAL, Assignee: Smith Engineering, (U.S. PTO Utility 1989)

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- C 18 US PAT 5032983 ENTRY POINT MAPPING AND SKIPPING METHOD AND APPARATUS, Assignee: Tandem Computers Incorporated, (U.S. PTO Utility 1991)
- C 19 US PAT 5414426 FAVORITE KEY MACRO COMMAND AND CHAINED MACRO COMMAND IN A REMOTE CONTROL, Assignee: Universal Electronics Inc., (U.S. PTO Utility 1995)
- C 20 US PAT 4038533 INDUSTRIAL CONTROL PROCESSOR SYSTEM, Assignee: Allen-Bradley Company, (U.S. PTO Utility 1977)
- C 21 US PAT 4509211 INFRARED EXTENSION SYSTEM, Assignee: Xantech Corporation, (U.S. PTO Utility 1985)
- C 22 US PAT 4745402 INPUT DEVICE FOR A DISPLAY SYSTEM USING PHASE-ENCODED SIGNALS, Assignee: RCA Licensing Corporation, (U.S. PTO Utility 1988)
- C 23 US PAT 5088023 INTEGRATED CIRCUIT HAVING PROCESSOR COUPLED BY COMMON BUS TO PROGRAMMABLE READ ONLY MEMORY FOR PROCESSOR OPERATION AND PROCESSOR UNCOUPLED FROM COMMON BUS WHEN PROGRAMMING READ ONLY MEMORY FROM EXTERNAL DEVICE, Assignee: Hitachi, Ltd., (U.S. PTO Utility 1992)
- C 24 US PAT 4503288 INTELLIGENT TELEPHONE, Assignee: Novation, Inc., (U.S. PTO Utility 1985)
- C 25 US PAT 4965557 INTERACTIVE CONTROL OF ENTERTAINMENT ELECTRONICS APPARATUS, Assignee: Nokia Unterhaltungselektronik, (U.S. PTO Utility 1990)
- C 26 US PAT 4426662 IR REMOTE CONTROL DETECTOR/DECODER, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1984)
- ▷ 27 US PAT 4425647 IR REMOTE CONTROL SYSTEM, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1984)
- C 28 US PAT 6014092 KEY MOVER, Assignee: Universal Electronics Inc., (U.S. PTO Utility 2000)
- C 29 US PAT 6195033 KEY MOVER, Assignee: Universal Electronics Inc., (U.S. PTO Utility 2001)
- C 30 US PAT 4698618 KEYBOARD WITH ARRAYS OF FUNCTION KEYS, Assignee: American Telephone and Telegraph Company,, (U.S. PTO Utility 1987)
- C 31 US PAT 5005118 METHOD AND APPARATUS FOR MODIFYING MICRO- INSTRUCTIONS USING A MACRO-INSTRUCTION PIPELINE, Assignee: Tandem Computers Incorporated, (U.S. PTO Utility 1991)
- C 32 US PAT 4356509 MICROCOMPUTER-CONTROLLED TELEVISION/TELEPHONE SYSTEM AND METHOD THEREFORE, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1982)
- C 33 US PAT 4431988 MICROPROCESSOR-BASED KEYBOARD/DISPLAY UNIT FOR CONFIGURING CONTROL INSTRUMENTS, Assignee: Bristol Babcock Inc., (U.S. PTO Utility 1984)
- C 34 US PAT 4318130 MICROPROCESSOR CONTROL SYSTEM FOR TELEVISION RECEIVERS, Assignee: The Magnavox Company, (U.S. PTO Utility 1982)
- C 35 US PAT 4866434 MULTI-BRAND UNIVERSAL REMOTE CONTROL, Assignee: Thomson Consumer Electronics, Inc., (U.S. PTO Utility 1989)
- C 36 US PAT 4482947 MULTI-FUNCTION, MULTI-UNIT REMOTE CONTROL SYSTEM AND METHOD THEREFOR, Assignee: Zenith Electronics Corporation, (U.S. PTO Utility 1984)
- C 37 US PAT 4779079 MULTI-PURPOSE COMPUTER UTILITY ARRANGEMENT, (U.S. PTO Utility 1988)
- C 38 US PAT 4855746 MULTIPLE DEVICE REMOTE CONTROL TRANSMITTER, Assignee: Zenith Electronics Corporation, (U.S. PTO Utility 1989)
- C 39 US PAT 4245342 ONE-FOR-N MODEM CONTROL APPARATUS, Assignee: Intech Laboratories, Inc., (U.S. PTO Utility 1981)
- C 40 US PAT 4889370 PIPE REPAIR ASSEMBLY, (U.S. PTO Utility 1989)
- C 41 US PAT 4626848 PROGRAMMABLE FUNCTIONS FOR RECONFIGURABLE REMOTE CONTROL, Assignee: General Electric Company, (U.S. PTO Utility 1986)
- C 42 US PAT 3956745 PROGRAMMABLE KEYBOARD ARRANGEMENTS, Assignee: The Marconi Company Limited, (U.S. PTO Utility 1976)
- C 43 US PAT 4802114 PROGRAMMABLE REMOTE CONTROL TRANSMITTER, Assignee: General Electric Company, (U.S. PTO Utility 1989)
- C 44 US PAT 4481382 : PROGRAMMABLE TELEPHONE SYSTEM, (U.S. PTO Utility 1984)

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- C 45 US PAT 4179748 PROGRAMMER AND METHOD OF STORING INFORMATION THEREIN AND ACCESSING INFORMATION THEREFROM, Assignee: National Semiconductor Corporation, (U.S. PTO Utility 1979)
- C 46 US PAT 4688020 RECONFIGURABLE KEYBOARD, Assignee: United States Data Corporation, (U.S. PTO Utility 1987)
- C 47 US PAT 4623887 RECONFIGURABLE REMOTE CONTROL, Assignee: General Electric Company, (U.S. PTO Utility 1986)
- C 48 US PAT 4856081 RECONFIGURABLE REMOTE CONTROL APPARATUS AND METHOD OF USING THE SAME, Assignee: North American Philips Consumer, (U.S. PTO Utility 1989)
- C 49 US PAT 5552917 REMOTE CONTROL, Assignee: Universal Electronics Inc., (U.S. PTO Utility 1996)
- C 50 US PAT 4656655 REMOTE CONTROL ADAPTER OF ELECTRIC EQUIPMENT USING TELEPHONE LINES, Assignee: Hashimoto Corporation, (U.S. PTO Utility 1987)
- C 51 US PAT 4794371 REMOTE CONTROL APPARATUS, Assignee: Fuji Electric Company Ltd., (U.S. PTO Utility 1988)
- C 52 US PAT 4718112 : REMOTE CONTROL APPARATUS, Assignee: Sony Corporation, (U.S. PTO Utility 1988)
- C 53 US PAT 4918439 REMOTE CONTROL DEVICE, Assignee: CL 9, Inc., (U.S. PTO Utility 1990)
- C 54 US PAT 4771283 REMOTE CONTROL DEVICE, Assignee: Alpine Electronics Inc., (U.S. PTO Utility 1988)
- C 55 US PAT 4540851 REMOTE CONTROL DEVICE USING TELEPHONE CIRCUIT OF ELECTRIC APPARATUS, Assignee: Hashimoto Corporation, (U.S. PTO Utility 1985)
- C 56 US PAT 4885766 REMOTE CONTROL DEVICE USING A TELEPHONE LINE, Assignee: Sharp Kabushiki Kaisha, (U.S. PTO Utility 1989)
- C 57 US PAT 4712105 REMOTE CONTROL HAND APPARATUS FOR OPERATING DIFFERENT MODULES, Assignee: U.S. Philips Corporation, (U.S. PTO Utility 1987)
- C 58 US PAT 4251812 REMOTE CONTROL SYSTEM, Assignee: Sony Corporation, (U.S. PTO Utility 1981)
- C 59 US PAT 4121198 REMOTE CONTROL SYSTEM, Assignee: Matsushita Electric Industrial Co., Ltd., (U.S. PTO Utility 1978)
- C 60 US PAT 4231031 REMOTE CONTROL SYSTEM CAPABLE OF TRANSMITTING THE INFORMATION WITH THE AID OF AN INFRA RED BEAM USING PPM OR AN ULTRASONIC BEAM USING PDM, Assignee: U.S. Philips Corporation, (U.S. PTO Utility 1980)
- C 61 US PAT 4338632 REMOTE CONTROL SYSTEM FOR TELEVISION MONITORS, Assignee: Zenith Radio Corporation, (U.S. PTO Utility 1982)
- C 62 US PAT 4746919 REMOTE CONTROL SYSTEM WITH KEY FUNCTION DISPLAY PROVISIONS, Assignee: RCA Licensing Corporation, (U.S. PTO Utility 1988)
- C 63 US PAT 4566034 REMOTE CONTROL TRANSMITTER ARRANGEMENT FOR ONE OR MORE TELEVISION DEVICES, Assignee: RCA Corporation, (U.S. PTO Utility 1986)
- C 64 US PAT 4626847 REMOTE CONTROL TRANSMITTER SYSTEM, Assignee: Zenith Electronics Corporation, (U.S. PTO Utility 1986)
- C 65 US PAT 5689353 REMOTE CONTROL WITH TWO-WAY DATA COUPLING, Assignee: Universal Electronics Inc., (U.S. PTO Utility 1997)
- C 66 US PAT 4625080 REMOTE VIDEO RECORDER PROGRAMMING APPARATUS OPERATING OVER TELEPHONE LINES, (U.S. PTO Utility 1986)
- C 67 US PAT 4807052 REMOTELY CONTROLLABLE ELECTRONIC APPARATUS, Assignee: Sony Corporation, (U.S. PTO Utility 1989)
- C 68 US PAT 4823294 SINGLE-HAND COMPUTER KEYBOARD, (U.S. PTO Utility 1989)
- C 69 US PAT 4891786 STROKE TYPING SYSTEM, (U.S. PTO Utility 1990)
- C 70 US PAT 4580009 TELEPHONE MOUTHPIECE MODULAR COUPLER, Assignee: The Microperipherel Corporation, (U.S. PTO Utility 1986)
- C 71 US PAT 4841368 TELEVISION CUSTOMER CONTROL FUNCTIONS RESTORER, Assignee: North American Philips Corporation, (U.S. PTO Utility 1989)

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- 72 US PAT 4386436 TELEVISION REMOTE CONTROL SYSTEM FOR SELECTIVELY CONTROLLING EXTERNAL APPARATUS THROUGH THE AC POWER LINE, Assignee: RCA Corporation, (U.S. PTO Utility 1983)
- 73 US PAT 4488179 TELEVISION VIEWING CENTER SYSTEM, Assignee: Robert Bosch GmbH, (U.S. PTO Utility 1984)
- 74 US PAT 4631601 TIME PROGRAMMABLE CONTROL SYSTEM FOR A CONVERTER/VCR SYSTEM, Assignee: Zenith Electronics Corporation, (U.S. PTO Utility 1986)
- 75 US PAT 4754133 TRANSCEIVER CIRCUIT FOR MODULATED INFRARED SIGNALS, Assignee: Williams Electronics Games, Inc., (U.S. PTO Utility 1988)
- 76 US PAT 4529980 TRANSMITTER AND RECEIVER FOR CONTROLLING THE CODING IN A TRANSMITTER AND RECEIVER, Assignee: Chamberlain Manufacturing Corporation, (U.S. PTO Utility 1985)
- 77 US PAT 4535333 TRANSMITTER AND RECEIVER FOR CONTROLLING REMOTE ELEMENTS, Assignee: Chamberlain Manufacturing Corporation, (U.S. PTO Utility 1985)
- 78 US PAT 4769643 TRANSMITTER DRIVER FOR PROGRAMMABLE REMOTE CONTROL TRANSMITTER, Assignee: General Electric Company, (U.S. PTO Utility 1988)
- 79 US PAT 4959810 UNIVERSAL REMOTE CONTROL DEVICE, Assignee: Universal Electronics, Inc., (U.S. PTO Utility 1990)
- 80 US PAT 5959751 UNIVERSAL REMOTE CONTROL DEVICE, Assignee: Universal Electronics Inc., (U.S. PTO Utility 1999)
- 81 US PAT 5187469 UNIVERSAL REMOTE CONTROL INCLUDING QUICK TOUCH FUNCTION, Assignee: Tandy Corporation, (U.S. PTO Utility 1993)
- 82 US PAT 5872562 UNIVERSAL REMOTE CONTROL TRANSMITTER WITH SIMPLIFIED DEVICE IDENTIFICATION, Assignee: U.S. Philips Corporation, (U.S. PTO Utility 1999)
- 83 US PAT 4774511 UNIVERSAL REMOTE CONTROL UNIT, Assignee: NAP Consumer Electronics Corp., (U.S. PTO Utility 1988)
- 84 US PAT 4703359 UNIVERSAL REMOTE CONTROL UNIT WITH MODEL IDENTIFICATION CAPABILITY, Assignee: NAP Consumer Electronics Corp., (U.S. PTO Utility 1987)
- 85 US PAT 3911424 U.S. Utility Patent, (U.S. PTO Utility 1975)
- .. US PAT 1487784 U.S. Utility Patent, (U.S. PTO Utility 1924) (TEXT NOT AVAILABLE ON WESTLAW)

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791354 (09) 6587067 July 1, 2003

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July 1, 2003

Universal remote control with macro command capabilities

CERT-CORRECTION: September 14, 2004 - a Certificate of Correction was issued for this patent (O.G. October 5, 2004)

APPL-NO: 791354 (09)

FILED-DATE: February 23, 2001

GRANTED-DATE: July 1, 2003

ASSIGNEE-AT-ISSUE: Universal Electronics Inc., Cypress, California, 02

ASSIGNEE-AFTER-ISSUE: September 6, 2001 - ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS)., UNIVERSAL ELECTRONICS INC. 6101 GATEWAY DRIVE CYPRESS CALIFORNIA 90630, Reel and Frame Number: 12144/0163

CORE TERMS: button, infrared, remote control, pulse, pushbutton, port, connector, panel, pin, circuitry ...

Source: [Command Searching > Utility, Design and Plant Patents](#)

Terms: **patno=6587067** ([Edit Search](#) | [Suggest Terms for My Search](#))

View: **Custom**

Segments: Assignee, Cert-correction, Reexam-cert, Reexam-litigate, Reissue, Reissue-comment

Date/Time: Wednesday, February 8, 2006 - 3:26 PM EST



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Command Searching > Patent Cases from Federal Courts and Administrative Materials

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| <u>or</u> | or |
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| REEEXAM CONTROL NUMBER | FILING OR 371 (c) DATE | PATENT NUMBER |
|------------------------|------------------------|---------------|
| 90/007,876 | 01/17/2006 | 6587067 |

JONATHAN D. HANISH
 SIERRA PATENT GROUP LTD
 1657 HWY 395, SUITE 202
 MINDEN, NV 89423

CONFIRMATION NO. 7865


OC000000017863203

Date Mailed: 01/19/2006

NOTICE OF REEXAMINATION REQUEST FILING DATE
(Third Party Requester)

Requester is hereby notified that the filing date of the request for reexamination is 01/17/2006, the date the required fee of \$2,520 was received.

A decision on the request for reexamination will be mailed within three months from the filing date of the request for reexamination. (See 37 CFR 1.515(a)).

A copy of the Notice is being sent to the person identified by the requester as the patent owner. Further patent owner correspondence will be the latest attorney or agent of record in the patent file. (See 37 CFR 1.33). Any paper filed should include a reference to the present request for reexamination (by Reexamination Control Number).

cc: Patent Owner

GREENBURG TRAURIG PC
 77 W WACKER DRIVE
 SUITE 2500
 CHICAGO, IL 60101

Office of Patent Legal Administration
 Central Reexamination Unit 571-272-7705

PART 3 - OFFICE COPY


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| REEXAM CONTROL NUMBER | FILING OR 371 (c) DATE | PATENT NUMBER |
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| 90/007,876 | 01/17/2006 | 6587067 |

GREENBURG TRAUIG PC
 77 W WACKER DRIVE
 SUITE 2500
 CHICAGO, IL 60101

CONFIRMATION NO. 7865

REEXAM ASSIGNMENT NOTICE



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Date Mailed: 01/19/2006

NOTICE OF ASSIGNMENT OF REEXAMINATION REQUEST

The above-identified request for reexamination has been assigned to Art Unit 3992. All future correspondence to the proceeding should be identified by the control number listed above and directed to the assigned Art Unit.

A copy of this Notice is being sent to the latest attorney or agent of record in the patent file or to all owners of record. (See 37 CFR 1.33(c)). If the addressee is not, or does not represent, the current owner, he or she is required to forward all communications regarding this proceeding to the current owner(s). An attorney or agent receiving this communication who does not represent the current owner(s) may wish to seek to withdraw pursuant to 37 CFR 1.36 in order to avoid receiving future communications. If the address of the current owner(s) is unknown, this communication should be returned within the request to withdraw pursuant to Section 1.36.

cc: Third Party Requester(if any)

JONATHAN D. HANISH
 SIERRA PATENT GROUP LTD
 1657 HWY 395, SUITE 202
 MINDEN, NV 89423

Office of Patent Legal Administration
 Central Reexamination Unit 571-272-7705

PART 3 - OFFICE COPY

Patent Assignment Abstract of Title

Total Assignments: 1

Application #: 09791354 **Filing Dt:** 02/23/2001 **Patent #:** 6587067 **Issue Dt:** 07/01/2003

PCT #: NONE

Publication #: US20010010503 **Pub Dt:** 08/02/2001

Inventors: Paul V. Darbee, Richard E. Ellis, Louis Steven Jansky, Avram S. Grossman

Title: UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND CAPABILITIES

Assignment: 1

| | | | | |
|---|--------------------------------|--------------------------------|------------------------------|--------------------|
| Reel/Frame: <u>012144 /</u> <u>0163</u> | Received: 09/13/2001 | Recorded: 09/06/2001 | Mailed: 11/15/2001 | Pages: 4 |
|---|--------------------------------|--------------------------------|------------------------------|--------------------|

Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Assignors: DARBEE, PAUL V.

Exec Dt: 02/08/1988

ELLIS, RICHARD E.

Exec Dt: 02/08/1988

JANSKY, LOUIS S.

Exec Dt: 02/08/1988

GROSSMAN, AVRAM S.

Exec Dt: 02/08/1988

Assignee: UNIVERSAL ELECTRONICS INC.

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CHICAGO, ILLINOIS 60606

Search Results as of: 1/18/2006 1:49:50 P.M.

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REQUEST FOR EX PARTE REEXAMINATION TRANSMITTAL FORM

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Attorney Docket No.:

Date: January 13, 2006

1. This is a request for *ex parte* reexamination pursuant to 37 CFR 1.510 of patent number 6,587,067 issued July 1, 2003. The request is made by:
- patent owner. third party requester.
2. The name and address of the person requesting reexamination is:
- Kenneth D'Alessandro, Sierra Patent Group, Ltd.
1657 Hwy 395, Suite 202
Minden, NV 89423
3. a. A check in the amount of \$ 2,520.00 is enclosed to cover the reexamination fee, 37 CFR 1.20(c)(1);
- b. The Director is hereby authorized to charge the fee as set forth in 37 CFR 1.20(c)(1) to Deposit Account No. _____ (submit duplicative copy for fee processing); or
- c. Payment by credit card. Form PTO-2038 is attached.
4. Any refund should be made by check or credit to Deposit Account No. 50-0612 37 CFR 1.26(c). If payment is made by credit card, refund must be to credit card account.
5. A copy of the patent to be reexamined having a double column format on one side of a separate paper is enclosed. 37 CFR 1.510(b)(4)
6. CD-ROM or CD-R in duplicate, Computer Program (Appendix) or large table
 Landscape Table on CD
7. Nucleotide and/or Amino Acid Sequence Submission
If applicable, items a. - c. are required.
- a. Computer Readable Form (CRF)
- b. Specification Sequence Listing on:
- i. CD-ROM (2 copies) or CD-R (2 copies); or
- ii. paper
- c. Statements verifying identity of above copies
8. A copy of any disclaimer, certificate of correction or reexamination certificate issued in the patent is included.
9. Reexamination of claim(s) 1-6 is requested.
10. A copy of every patent or printed publication relied upon is submitted herewith including a listing thereof on Form PTO/SB/08, PTO-1449, or equivalent. 01/18/2006 KISALIANA 00333392 90337876
11. An English language translation of all necessary and pertinent non-English language patents and/or printed publications is included.

[Page 1 of 2]

This collection of information is required by 37 CFR 1.510. 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 2 hours 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 Ex Parte Reexam, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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12. The attached detailed request includes at least the following items:
- a. A statement identifying each substantial new question of patentability based on prior patents and printed publications. 37 CFR 1.510(b)(1)
 - b. An identification of every claim for which reexamination is requested, and a detailed explanation of the pertinency and manner of applying the cited art to every claim for which reexamination is requested. 37 CFR 1.510(b)(2)
13. A proposed amendment is included (only where the patent owner is the requester). 37 CFR 1.510(e)
14. a. It is certified that a copy of this request (if filed by other than the patent owner) has been served in its entirety on the patent owner as provided in 37 CFR 1.33(c).
The name and address of the party served and the date of service are:
- Greenburg Taurig
- 77 W. Wacker Drive, Suite 2500
- Chicago, IL 60101
- Date of Service: January 13, 2006; or
- b. A duplicate copy is enclosed since service on patent owner was not possible.

15. Correspondence Address: Direct all communication about the reexamination to:

The address associated with Customer Number: 28661

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16. The patent is currently the subject of the following concurrent proceeding(s):
- a. Copending reissue Application No. _____
 - b. Copending reexamination Control No. _____
 - c. Copending Interference No. _____
 - d. Copending litigation styled: _____
- _____
- _____

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 January 13, 2006
 Authorized Signature Date

Jonathan D. Hanish 57,821 For Patent Owner Requester
 Typed/Printed Name Registration No. For Third Party Requester

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Number: 6,587,067

Issued Date: July 1, 2003

Serial No. 09/791,354

Filed: February 23, 2001

In re Application of: Darbee et al.

For: UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND
CAPABILITIES*Certificate of Mailing*

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail, in an envelope addressed to Mail Stop Ex Parte Reexam, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

on 1/13/06

, Signed



Stephanie Davis

DETAILED REQUEST FOR EX PARTE REEXAMINATION

Mail Stop Ex Parte Reexam
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Reexamination under 35 U.S.C. §302-307 and 37 C.F.R. §1.510 is requested of United States Patent No. 6,587,067 which issued on July 1, 2003 to Paul V. Darbee, Richard E. Ellis, Louis Steven Jansky, and Avram S. Grossman. This patent is still enforceable.

I. Claims for which reexamination is requested

Reexamination is requested of claims 1 through 6 of the Darbee et al. patent in view of the following earlier prior-art document:

1. "Home Run Micromint's Home Control System" April 1, 1985;

This prior-art document is listed on the attached PTO Form 1449 and a copy of this document is enclosed.

II. Explanation of pertinency and manner of applying cited prior art to every claim for which reexamination is requested based upon prior art

Claims 1 through 6 of the Darbee et al. patent are considered to be fully anticipated under 35 U.S.C. §102(b) by the prior-art document "Home Run Micromint's Home Control System" April 1, 1985. Claims 1 through 6 of the Darbee et al. patent are set forth below with an explanation of how the prior art document "Home Run Micromint's Home Control System" April 1, 1985 meets all of the recited features of these claims. Page number references in the right column of the claim comparison tables for each claim refer to the page numbers of the reference at which the features of the reference are described.

Darbee et al., claim 1:

"In a universal remote control comprising a keyboard having a plurality of pushbuttons"

The home run control system employs a remote control described as a "cordless controller" [page 7]. It is a "universal" remote control because it can control many different home appliances [page 1]. The remote control includes a keyboard [page 7].

"including a macro pushbutton"

The remote control keyboard includes 16 "superkeys" [page 2]. Each superkey is a macro pushbutton in that it may be programmed to cause a user-defined list of actions to be performed by one or more different home appliances by transmitting operating commands to the different home appliances [pages 2, 65-67, 84, 109].

"and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers"

The different home appliances, of course, may be marketed by different manufacturers. Depending on the appliance to be controlled, and the particular control function to be implemented in the appliance, a library of codes for each appliance is defined. For example, "on" and "off" codes for the appliances are defined [page 1], as are 16 different dimming levels for lighting appliances [pages 2, 24]. Operating codes are transmitted to the different home appliances. See, for

example, manual control described at page 44.

“a readable medium having instructions for performing steps comprising”

The HCS system has a readable medium in the form of 16 K bytes of program-store ROM [page 12]. The program-store ROM stores instructions for performing steps.

“matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard”

The home run control system is matched to the plurality of different home appliances such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard. See, for example, manual control described at page 44 wherein one or more different appliances may be controlled by activation of selected keys on the keyboard. Depending on the identity and functionality of the appliance, a set or library of codes is used in the commands sent to the appliance to control its different functions. Each different home appliance is matched by assigning to it an address that is used by the home run control system to send commands destined for the home appliance.

“the pushbuttons of the keyboard being activated to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched”

Selected pushbuttons on the remote control are used to send commands that are directed to the plurality of different home appliances. See, for example, the description of turning on the appliance at channel 10 at page 9.

“assigning to the macro pushbutton a subset of the selected codes and data from the library”

Each of the “superkeys” may be programmed by associating with them a subset of the selected codes and data from the library.

“whereafter activation of the macro pushbutton causes the universal remote control to use the subset of selected codes and data from the

Each superkey is a macro pushbutton in that it may be programmed to cause a user-defined list of actions to be performed by one or more different

library to transmit a plurality of operating commands to one or more of the matched home appliances.”

home appliances by transmitting operating commands to the different home appliances [pages 2, 65-67, 84, 109].

Darbee et al., claim 2:

“The readable medium as recited in claim 1, wherein the instructions further perform the step of using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton.”

The process of programming each superkey involves using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton. Programming of the superkeys is described at pages 65-67.

Darbee et al., claim 3:

“In a universal remote control comprising a keyboard having a plurality of pushbuttons”

The home run control system employs a remote control described as a “cordless controller” [page 7]. It is a “universal” remote control because it can control many different home appliances [page 1]. The remote control includes a keyboard [page 7].

“and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers”

The different home appliances, of course, may be marketed by different manufacturers. Depending on the appliance to be controlled, and the particular control function to be implemented in the appliance, a library of codes for each appliance is defined. For example, “on” and “off” codes for the appliances are defined [page 1], as are 16 different dimming levels for lighting appliances [pages 2, 24]. Operating codes are transmitted to the different home appliances. See, for example, manual control described at page 44.

“a readable medium having instructions for performing steps comprising”

“matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard”

“using activation of one or more pushbuttons of the keyboard to match the universal remote control to the plurality of different home appliances of different manufacturers”

“instructions further perform the step of using activation of one or more of the pushbuttons of the keyboard to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched.”

Darbee et al., claim 4:

The HCS system has a readable medium in the form of 16 K bytes of program-store ROM [page 12]. The program-store ROM stores instructions for performing steps.

The home run control system is matched to the plurality of different home appliances such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard. See, for example, manual control described at page 44 wherein one or more different appliances may be controlled by activation of selected keys on the keyboard. Depending on the identity and functionality of the appliance, a set or library of codes is used in the commands sent to the appliance to control its different functions. Each different home appliance is matched by assigning to it an address that is used by the home run control system to send commands destined for the home appliance.

Each different home appliance is matched by assigning to it an address that is used by the home run control system to send commands destined for the home appliance. The matching is performed by activation of keys on the remote control.

Selected pushbuttons on the remote control are used to send commands that are directed to the plurality of different home appliances. See, for example, the description of turning on the appliance at channel 10 at page 9.

“In a universal remote control comprising a keyboard having a plurality of pushbuttons”

“including a macro pushbutton”

“and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a method comprising”

“matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbutton of the keyboard”

“the pushbutton of the keyboard being activated to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched”

The home run control system employs a remote control. It is a universal remote control because it can control many different home appliances. The remote control includes a keyboard.

The remote control keyboard includes 16 “superkeys” [page 2]. Each superkey is a macro pushbutton in that it may be programmed to cause a user-defined list of actions to be performed by one or more different home appliances by transmitting operating commands to the different home appliances [pages 2, 65-67, 84, 109].

The different home appliances, of course, may be marketed by different manufacturers. Depending on the appliance to be controlled, and the particular control function to be implemented in the appliance, a library of codes for each appliance is defined.

The home run control system is matched to the plurality of different home appliances such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard. Depending on the identity and functionality of the appliance, a set or library of codes is used in the commands sent to the appliance to control its different functions. Each different home appliance is matched by assigning to it an address that is used by the home run control system to send commands destined for the home appliance.

Selected pushbuttons on the remote control are used to send commands that are directed to the plurality of different home appliances. See, for example, the description of turning on the appliance at channel 10 at page 9.

“assigning to the macro pushbutton a subset of the selected codes and data from the library”

“whereafter activation of the macro pushbutton causes the universal remote control to use the subset of selected codes and data from the library to transmit a plurality of operating commands to one or more of the matched home appliances.”

Darbee et al., claim 5:

“The method as recited in claim 4, further comprising using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton.”

Darbee et al., claim 6:

“In a universal remote control comprising a keyboard having a plurality of pushbuttons”

Each superkey is a macro pushbutton in that it may be programmed to cause a user-defined list of actions to be performed by one or more different home appliances by transmitting operating commands to the different home appliances [pages 2, 65-67, 84, 109].

After programming the superkey, it is used to send commands that implement the user-defined list of actions to be performed by one or more different home appliances by transmitting operating commands to the different home appliances [pages 2, 65-67, 84, 109].

Each superkey is a macro pushbutton in that it may be programmed to cause a user-defined list of actions to be performed by one or more different home appliances by transmitting operating commands to the different home appliances. The process of programming each superkey involves using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton.

The home run control system employs a remote control. It is a universal remote control because it can control many different home appliances. The remote control includes a keyboard.

“and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a method comprising”

“matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbutton of the keyboard”

“using activation of one or more pushbuttons of the keyboard to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched.”

The different home appliances, of course, may be marketed by different manufacturers. Depending on the appliance to be controlled, and the particular control function to be implemented in the appliance, a library of codes for each appliance is defined.

The home run control system is matched to the plurality of different home appliances such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard. Depending on the identity and functionality of the appliance, a set or library of codes is used in the commands sent to the appliance to control its different functions. Each different home appliance is matched by assigning to it an address that is used by the home run control system to send commands destined for the home appliance.

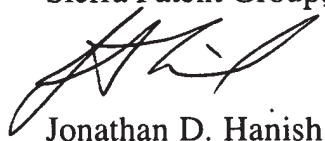
The matching is performed by activation of keys on the remote control.

Selected pushbuttons on the remote control are used to send commands that are directed to each of the plurality of different home appliances. See, for example, the description of turning on the appliance at channel 10 at page 9.

III. Statement pointing out substantial new question of patentability

The prior-art document referred to above was not of record in the file of the Darbee et al. patent. Since claims 1-6 of the Darbee et al. patent are not patentable over this prior-art document, a substantial new question of patentability is raised. Furthermore, this prior-art document is more pertinent to the subject matter claimed in the Darbee et al. patent than any prior art that was cited during the prosecution of the Darbee et al. patent.

Respectfully submitted,
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US006587067B2

(12) **United States Patent**
Darbee et al.

(10) **Patent No.:** US 6,587,067 B2
(45) **Date of Patent:** Jul. 1, 2003

(54) **UNIVERSAL REMOTE CONTROL WITH
MACRO COMMAND CAPABILITIES**

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(List continued on next page.)

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(*) **Notice:** Subject to any disclaimer, the term of this
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U.S.C. 154(b) by 64 days.

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(21) **Appl. No.:** 09/791,354

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(22) **Filed:** Feb. 23, 2001

(65) **Prior Publication Data**

US 2001/0010503 A1 Aug. 2, 2001

Related U.S. Application Data

Primary Examiner—Michael Horabik
Assistant Examiner—Albert K. Wong
(74) *Attorney, Agent, or Firm*—Mark R. Galis; Gary R.
Jarosik

(63) Continuation of application No. 09/408,729, filed on Sep.
29, 1999, now Pat. No. 6,195,033, which is a continuation-
in-part of application No. 07/990,854, filed on Dec. 11,
1992, now Pat. No. 6,014,092, which is a continuation-in-
part of application No. 07/913,523, filed on Jul. 14, 1992,
now abandoned, which is a continuation-in-part of applica-
tion No. 07/586,957, filed on Sep. 24, 1990, now abandoned,
which is a continuation-in-part of application No. 07/127,
999, filed on Dec. 2, 1987, now Pat. No. 4,959,810, which
is a continuation-in-part of application No. 09/109,336, filed
on Oct. 14, 1987, now abandoned.

(57) **ABSTRACT**

A universal remote control comprising a keyboard having a
plurality of pushbuttons including a macro pushbutton and a
library of codes and data for use in transmitting operating
commands to a plurality of different home appliances of
different manufacturers. Instructions within the remote con-
trol are used to match the universal remote control to a
plurality of different home appliances of different manufac-
turers such that selected codes and data from the library are
used to transmit operating commands to the matched home
appliances in response to activation of selected pushbuttons
of the keyboard. The instructions are also used to assign to
the macro pushbutton a subset of the selected codes and data
from the library whereafter activation of the macro push-
button causes the universal remote control to use the subset
of selected codes and data from the library to transmit
operating commands to one or more of the matched home
appliances.

(51) **Int. Cl.⁷** H04L 17/02
(52) **U.S. Cl.** 341/176; 341/173; 345/171;
345/169; 359/146; 359/148
(58) **Field of Search** 341/173, 176;
348/734; 340/825.52, 825.72; 359/146,
148; 345/168, 169, 172

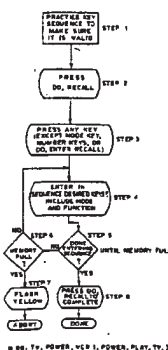
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6 Claims, 17 Drawing Sheets

SETTING A "MACRO" COMMAND MODE



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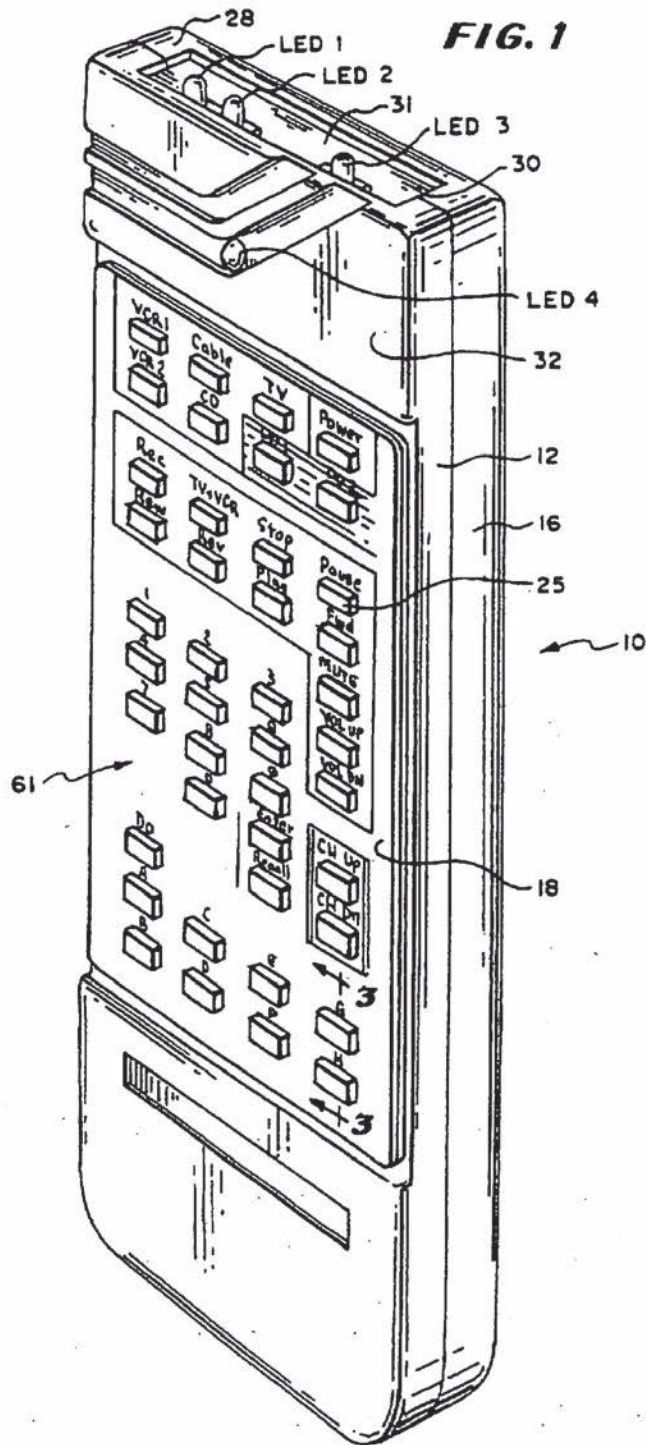
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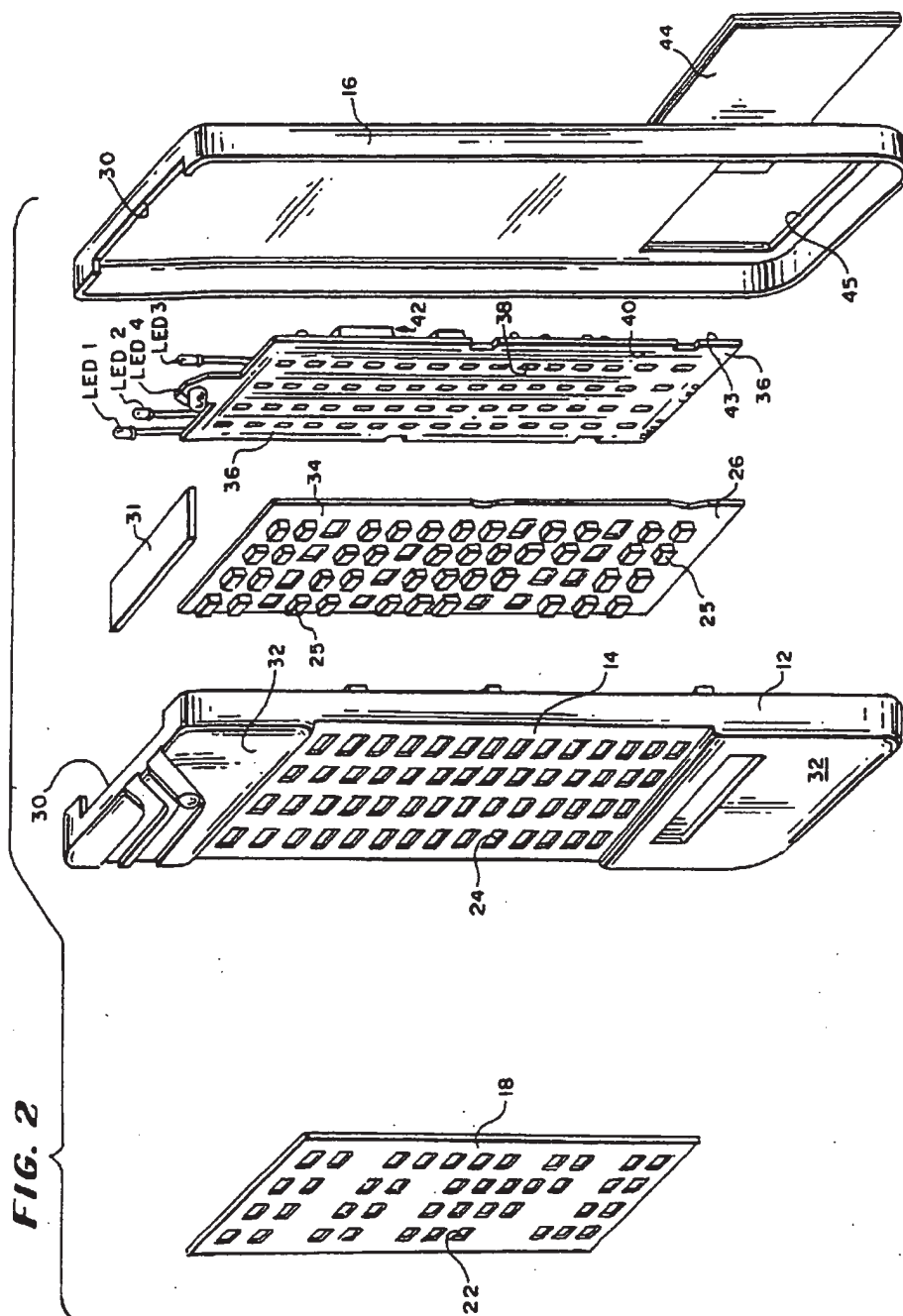
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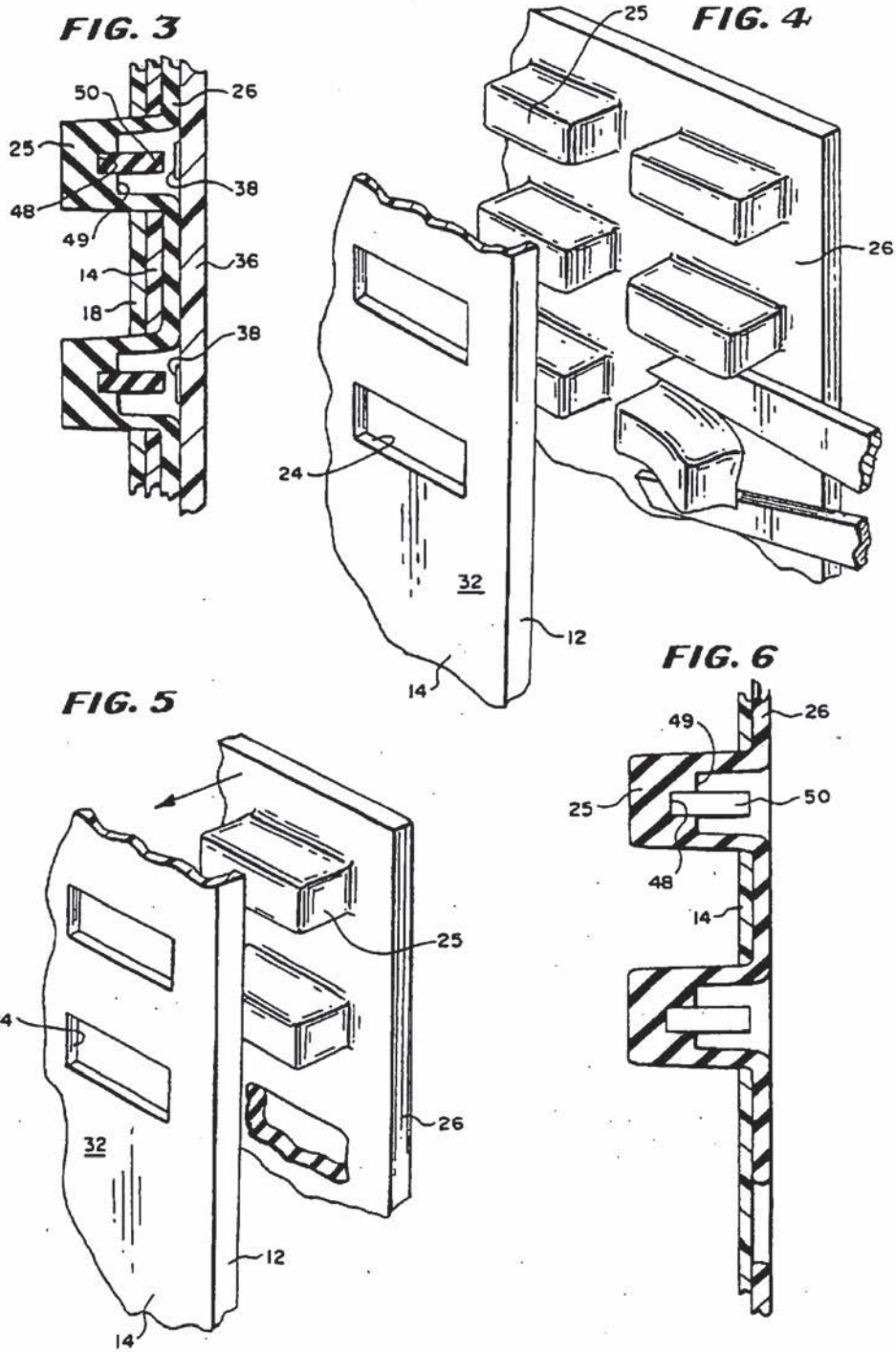


FIG. 7

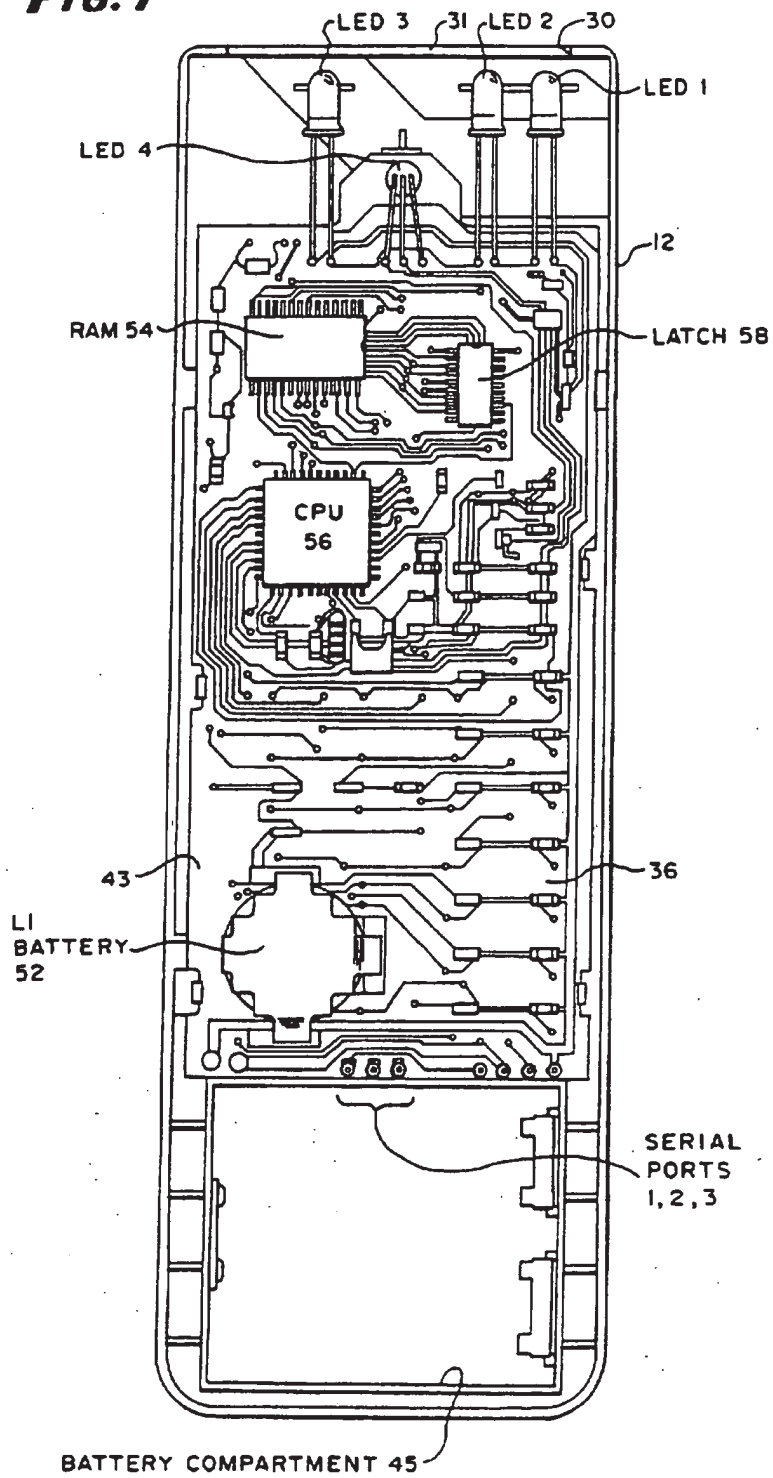


FIG. 8

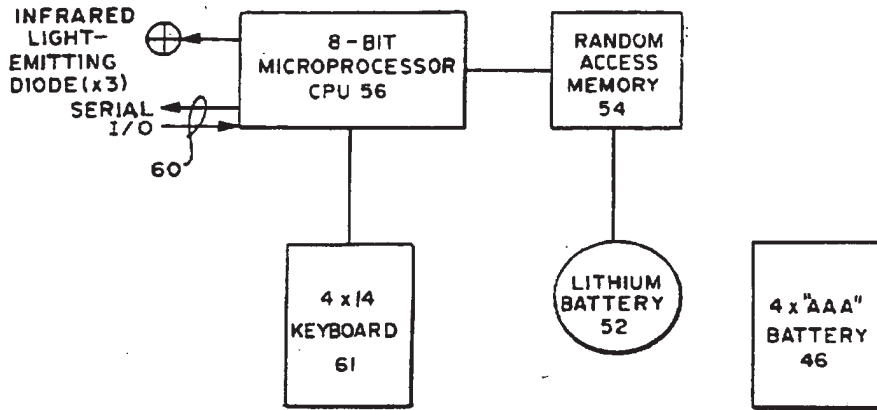
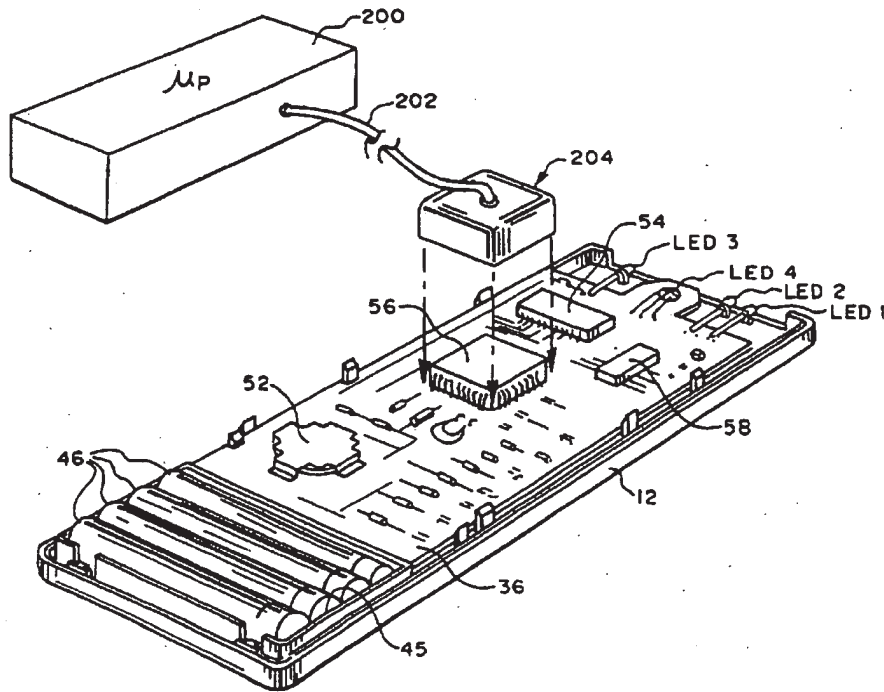


FIG. 10



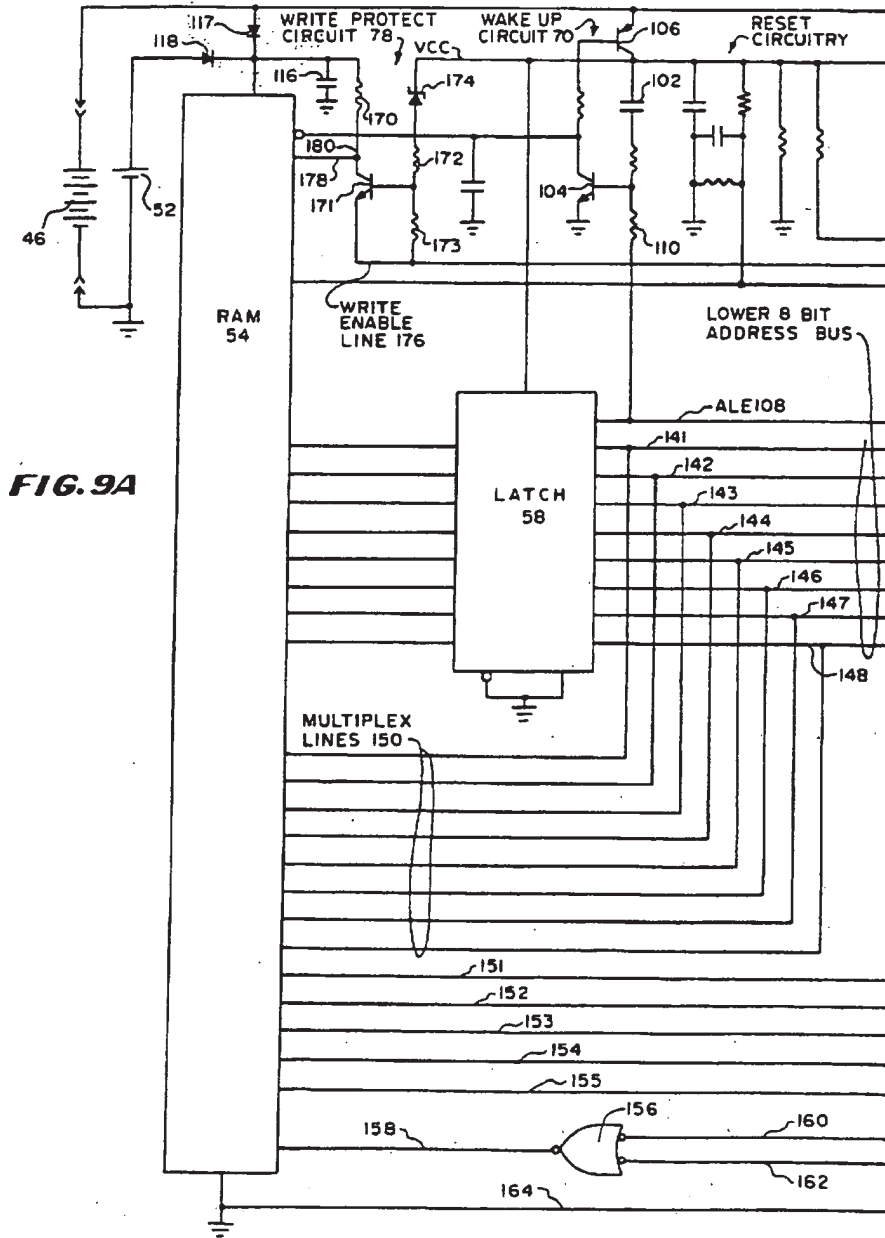


FIG. 9A

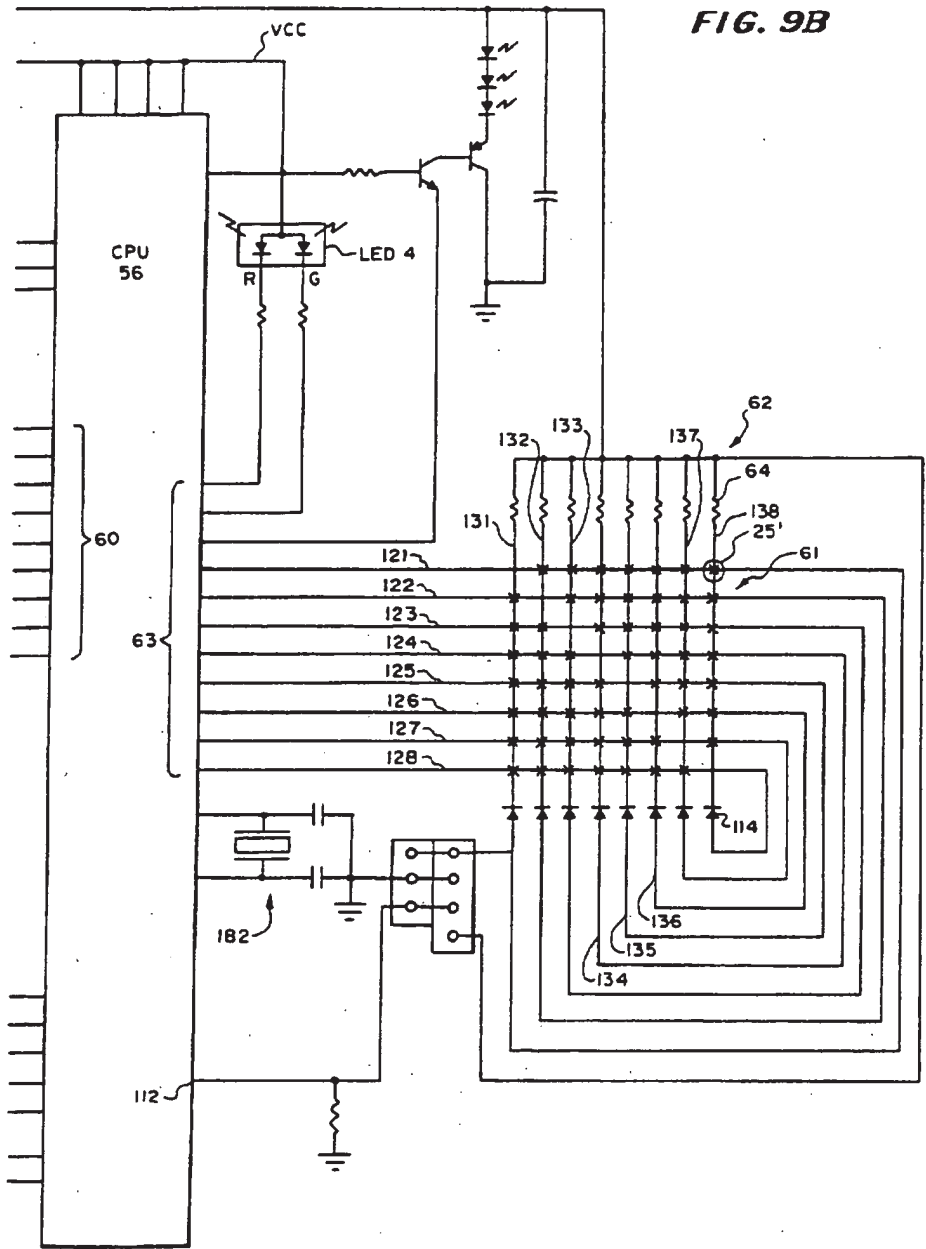


FIG. 9B

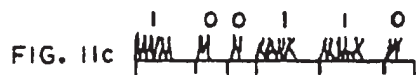
FIG. 11
MODULATION SCHEMES



FIXED BIT TIME,
FULL WIDTH BURST



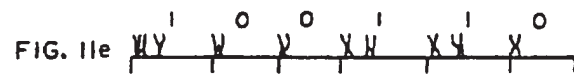
FIXED BIT TIME,
BURST WIDTH MODULATED



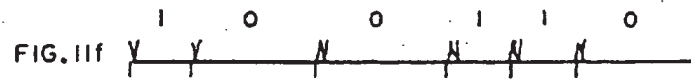
FIXED OFF TIME,
BURST WIDTH MODULATED



FIXED BIT TIME,
SINGLE / DOUBLE BURST



FIXED OFF TIME,
SINGLE / DOUBLE BURST



FIXED BURST
TIME, OFF TIME
MODULATED



RANDOM



ONE FREQUENCY
FOR EACH KEY



SINGLE / DOUBLE PULSE,
FIXED BIT TIME

FIG. 12A
CAPTURING IR CODE

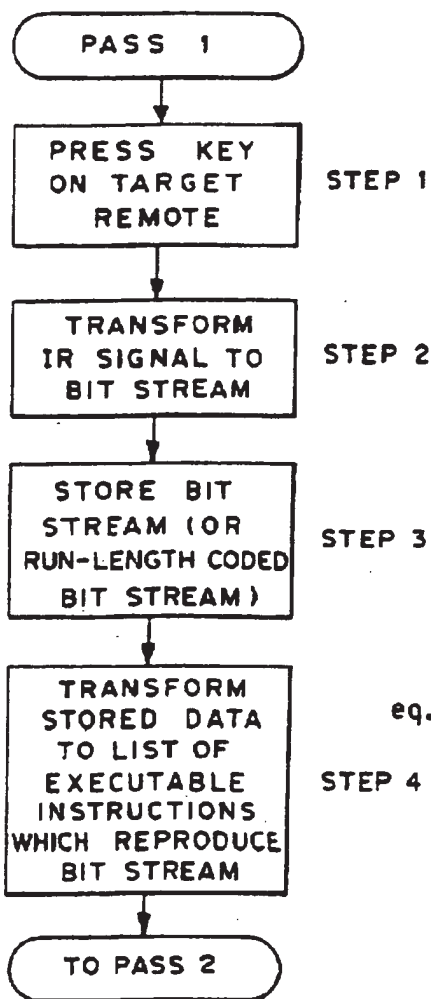


FIG. 12B

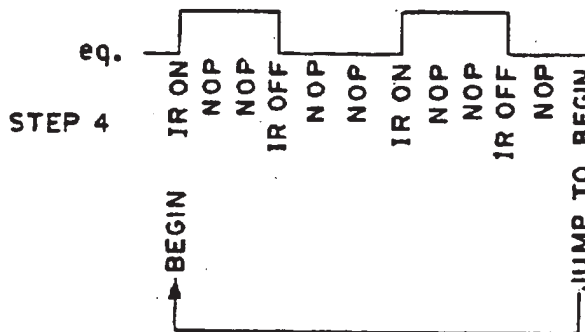


FIG. 13A
CAPTURING IR CODE

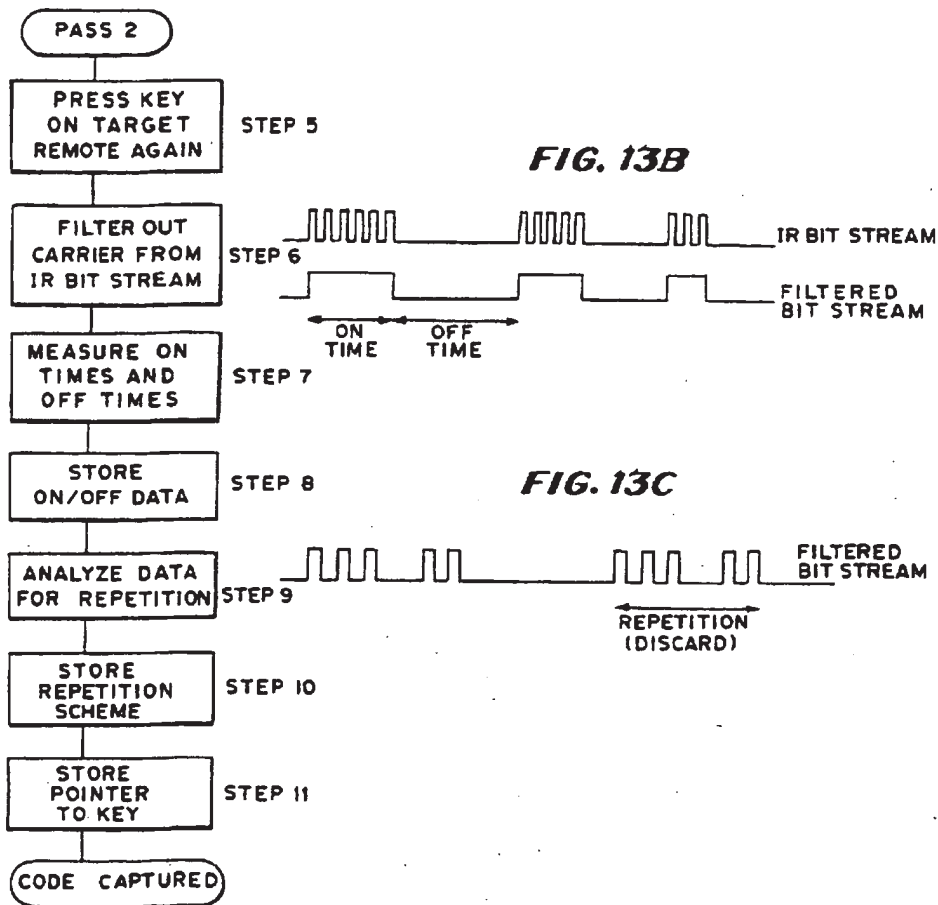


FIG. 14 GENERATING IR CODE

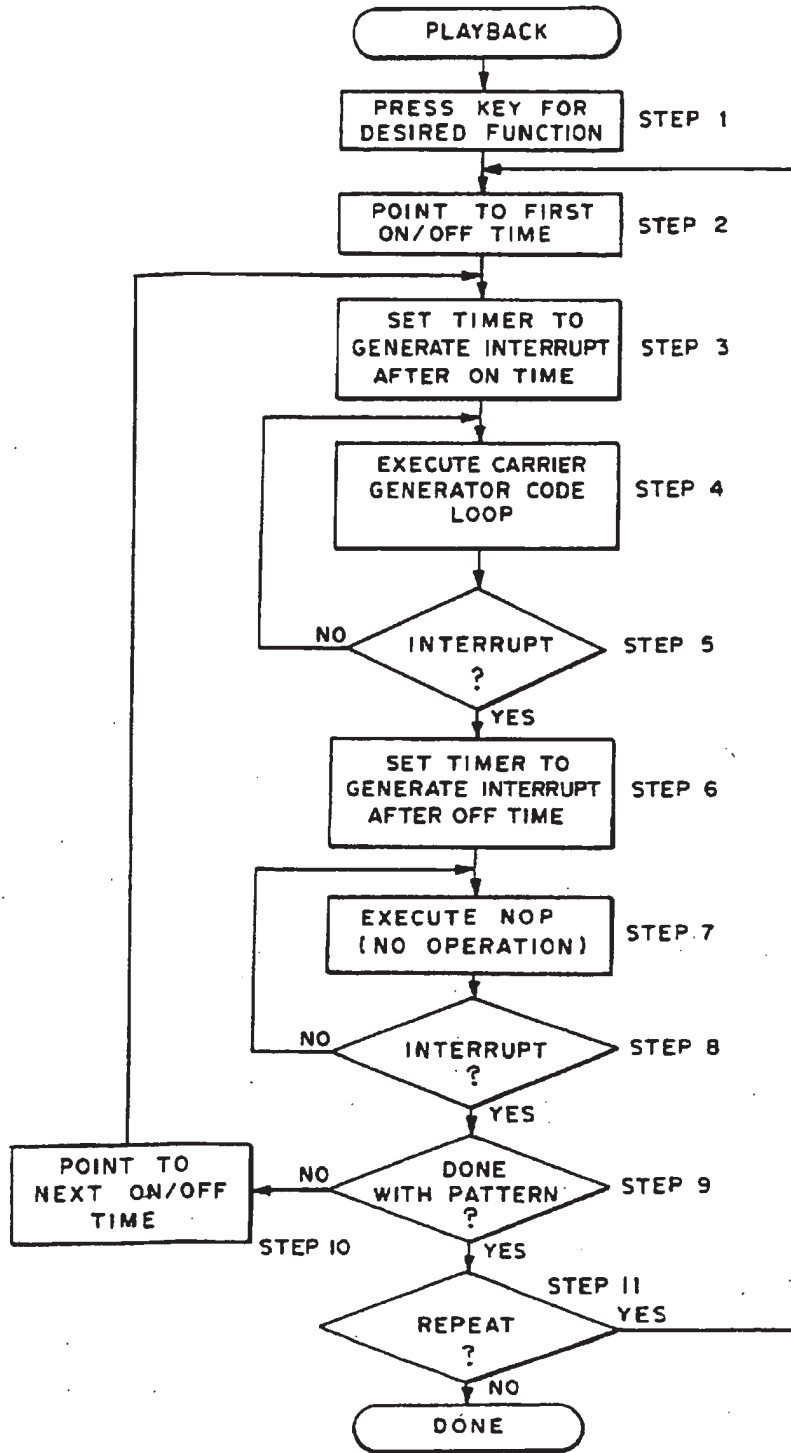


FIG. 15

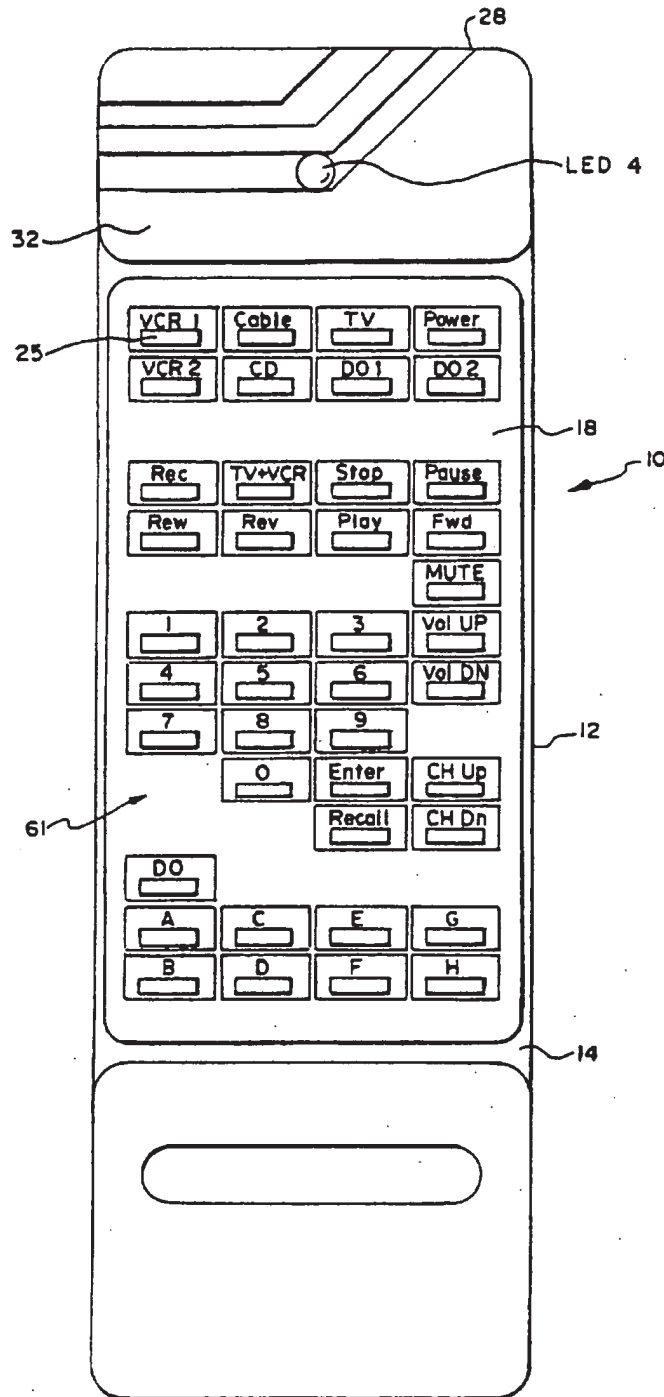


FIG. 16

STEP AND SET METHOD

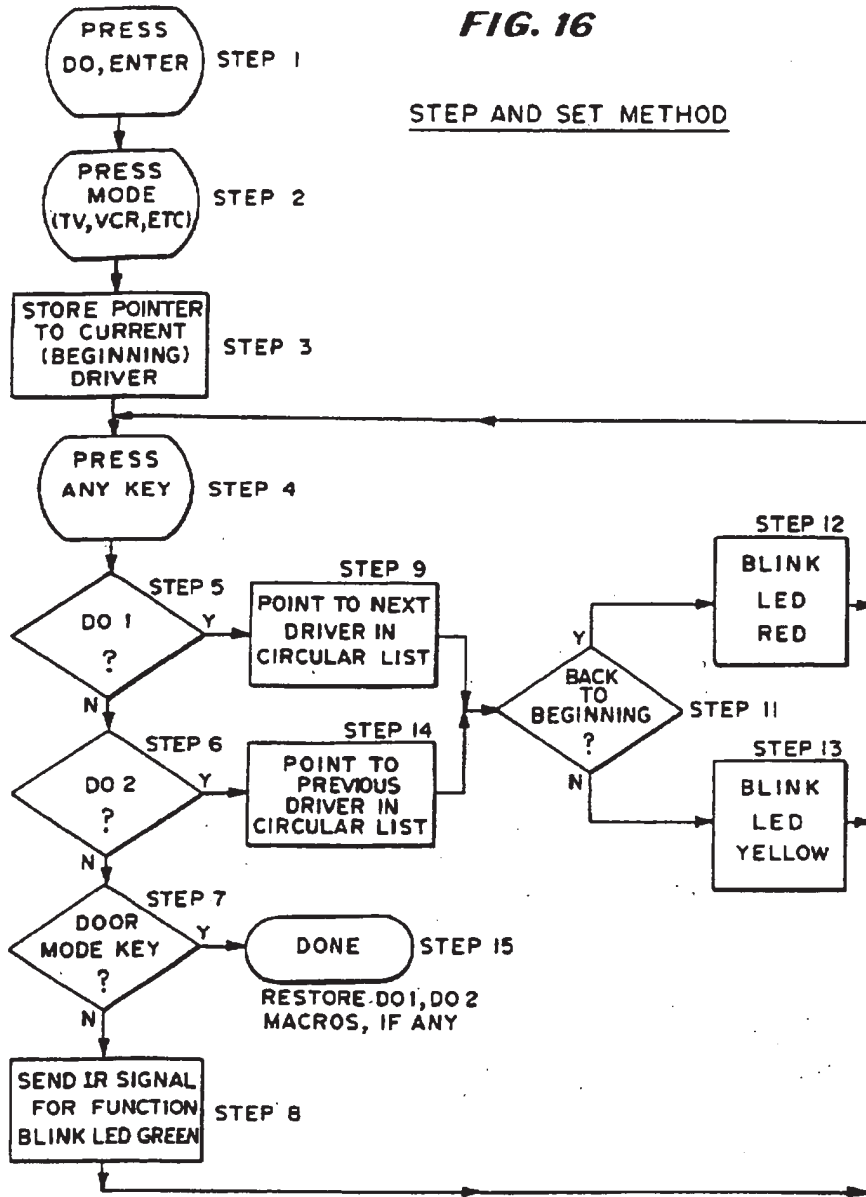


FIG. 17
DIRECT ENTRY-QUICK SET

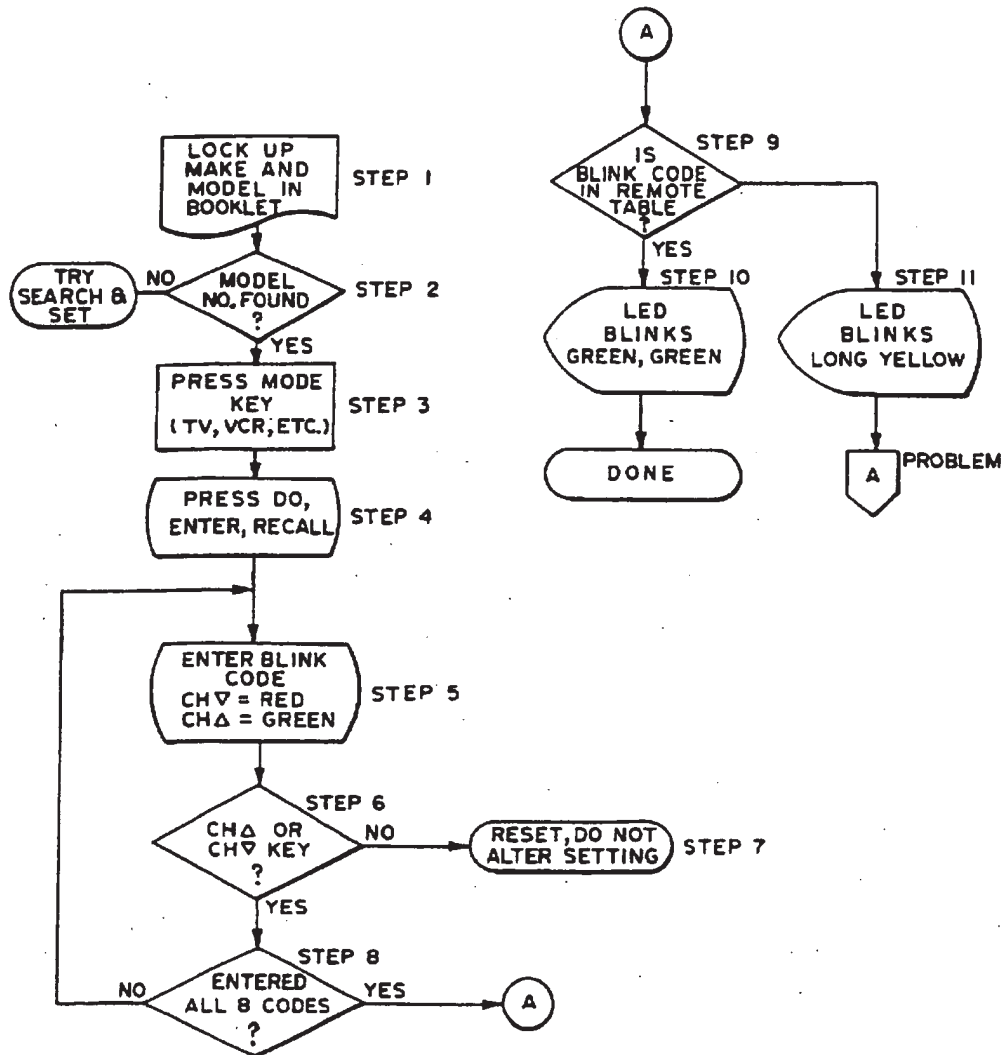
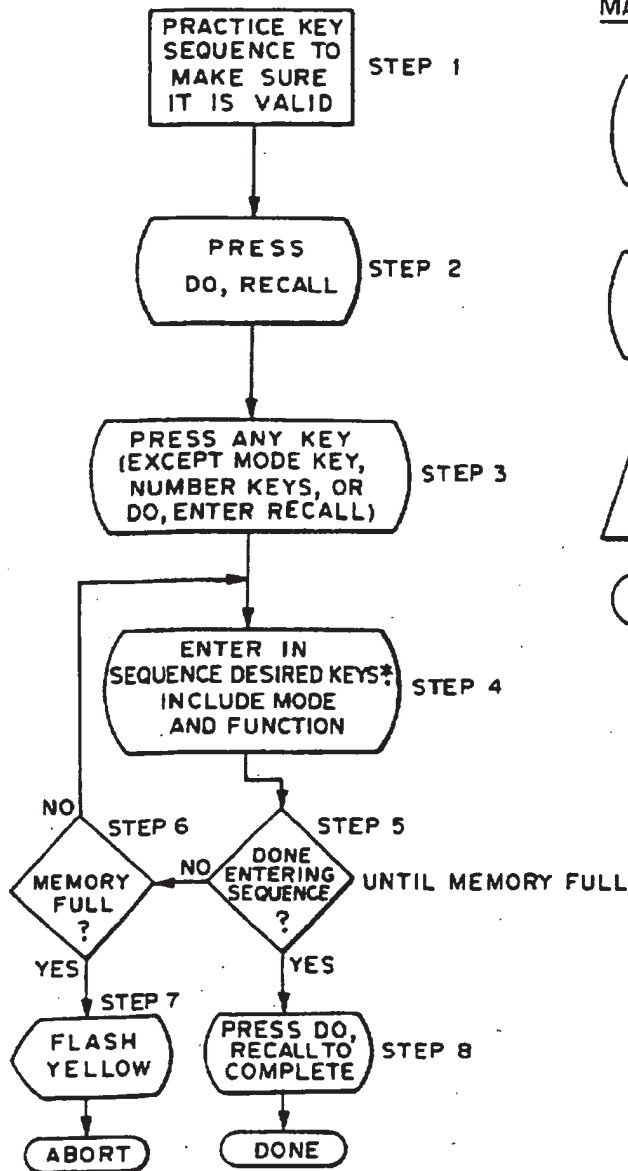


FIG. 18A
SETTING A "DO" COMMAND MACRO



* eq. TV, POWER, VCR 1, POWER, PLAY, TV, 3, ENTER

FIG. 18B
EXECUTING A MACRO "DO" COMMAND

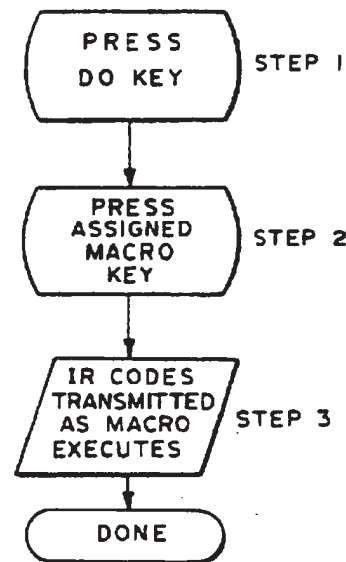


FIG. 19A

TO IDENTIFY WHAT DEVICE REMOTE IS SET FOR-BLINK CODE

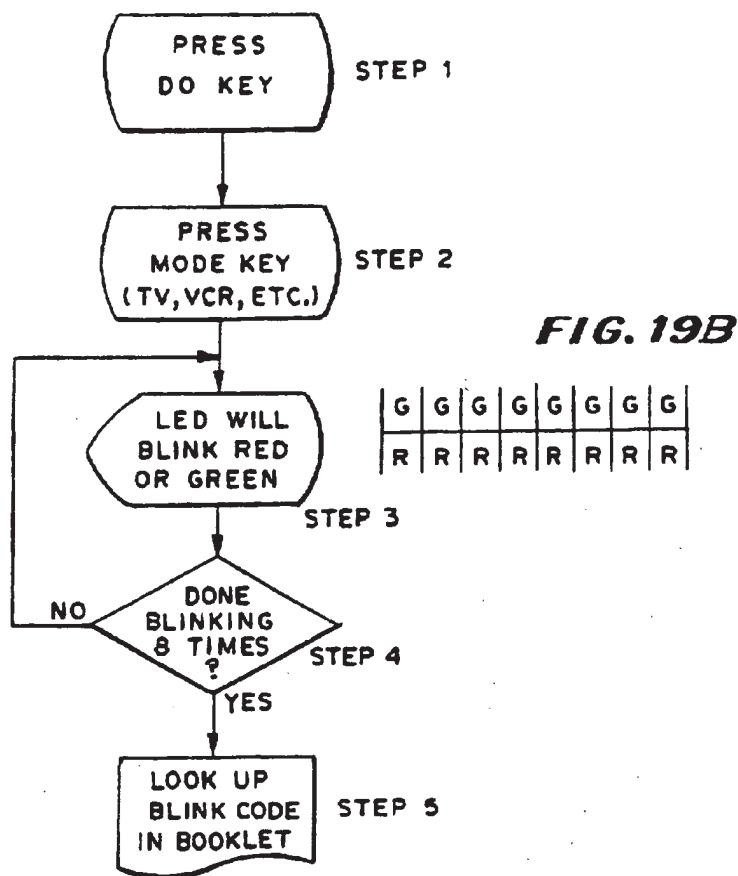


FIG. 19B

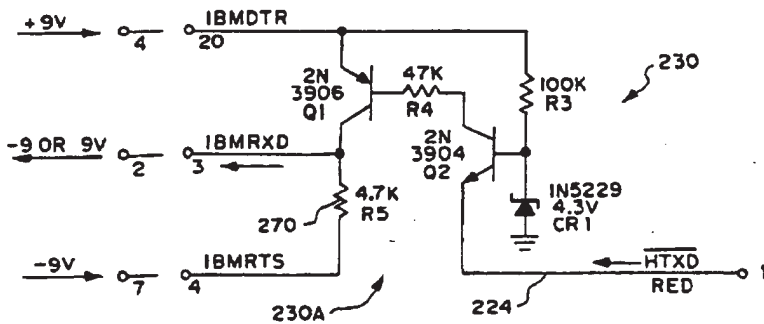
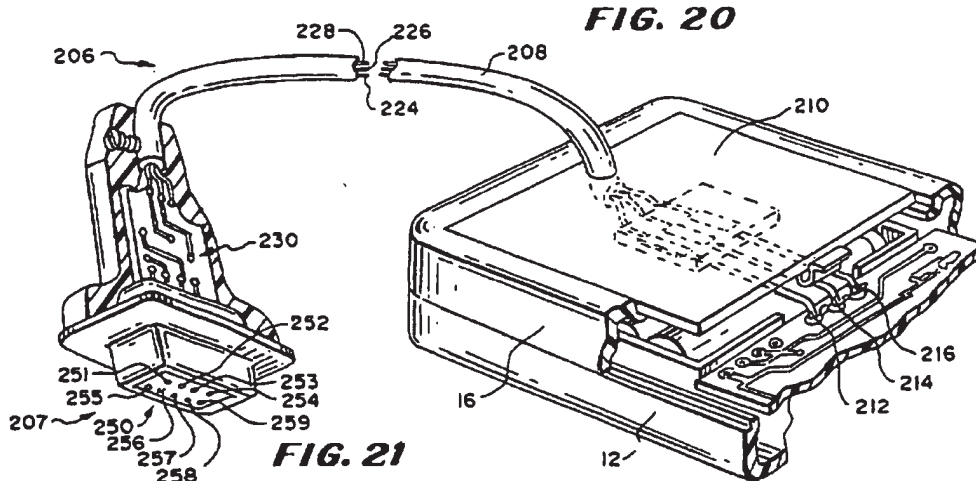
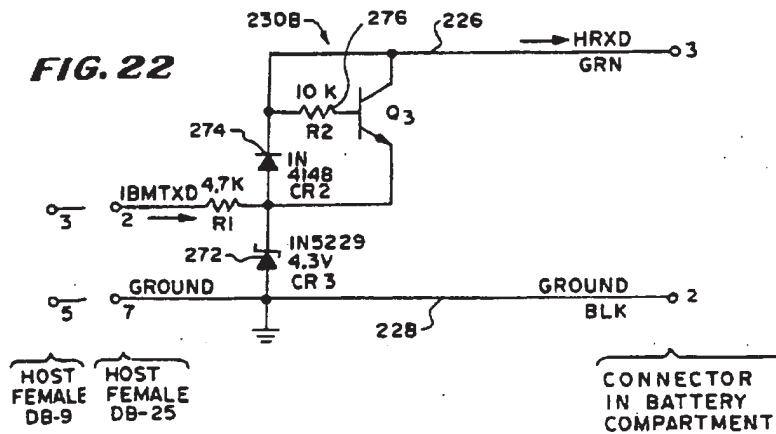


FIG. 22



UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND CAPABILITIES

CROSS-REFERENCE TO RELATED APPLICATIONS

This patent application claims the priority date of U.S. application Ser. No. 109,336 filed on Oct. 14, 1987, now abandoned, as a continuation of U.S. application Ser. No. 09/408,729 filed on Sep. 29, 1999 now U.S. Pat. No. 6,195,033 which is a continuation-in-part of U.S. application Ser. No. 07/990,854 filed on Dec. 11, 1992, now U.S. Pat. No. 6,014,092, which is a continuation-in-part of U.S. application Ser. No. 07/913,523 filed on Jul. 14, 1992, now abandoned, which is a continuation-in-part of U.S. application Ser. No. 07/586,957 filed on Sep. 24, 1990, now abandoned, which is a continuation-in-part of U.S. application Ser. No. 07/127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810, which is a continuation-in-part of U.S. application Ser. No. 09/109,336 filed on Oct. 14, 1987, now abandoned.

This patent application contains the specification of U.S. application Ser. No. 127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810.

This patent application is also related to U.S. application Ser. No. 08/874,184 filed on Jun. 13, 1997, now U.S. Pat. No. 5,959,751, which is a continuation of U.S. application Ser. No. 08/706,794 filed on Sep. 3, 1996, now U.S. Pat. No. 5,689,353, which is a continuation of U.S. application Ser. No. 08/314,970 filed Sep. 29, 1994, now U.S. Pat. No. 5,552,917, which is a divisional of U.S. application Ser. No. 08/093,512 filed on Jul. 16, 1993, now abandoned, which is a continuation of U.S. application Ser. No. 07/586,957 filed on Sep. 24, 1990, now abandoned, which is a divisional of U.S. application Ser. No. 07/127,999 filed on Dec. 2, 1987, now U.S. Pat. No. 4,959,810, which is a continuation-in-part of U.S. application Ser. No. 07/109,336 filed Oct. 14, 1987, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a universal remote control device of the type which is hand held and which can be coupled via coded infrared signals with a remote control receiver built into a television or other remotely controlled electrical apparatus to turn on the apparatus, such as the television, at a distance, to adjust the volume, tone and brightness, to change channels, and to turn the television off.

Additionally, the present invention relates to a method for acquiring the infrared codes for a controlled apparatus, such as a television, generating code data related to these infrared codes for storage in a remote control device and methods for using the remote control device for finding, in a library or table of code data for generating infrared codes for operating different electrical apparatus manufactured by different manufacturers stored in a RAM of the remote control device, the code data for generating infrared coded signals for operating a particular apparatus, such as a television, and then for using the stored code data for generating the coded infrared signals for operating the controlled apparatus.

2. Description of the Prior Art

Heretofore it has been proposed to provide a reconfigurable remote control device and programmable functions for such a remote control device which will enable one to learn, store and retransmit infrared codes that are emitted from the controller for a remotely controlled apparatus, such as a television.

For example, in the Welles II U.S. Pat. No. 4,623,887 and the Ehlers U.S. Pat. No. 4,626,848, there is disclosed a reconfigurable remote control device which has the ability to learn, store and repeat remote control codes from any other infrared transmitter. Such a reconfigurable remote control transmitter device includes an infrared receiver, a microprocessor, a non-volatile random access memory, a scratch pad random access memory, and an infrared transmitter.

According to the teachings of the Ehlers patent, the infrared signals received by the remote control device are in bursts of pulses and the device counts the number of pulses in each burst as well as the time duration of each pause in a transmission between bursts.

As will be described in greater detail hereinafter, the universal remote control device of the present invention utilizes a single non-volatile RAM does not provide a separate scratch pad RAM or, more importantly, a ROM.

In learning the infrared code and transforming same to code data which is then stored in a RAM of the control device and later used to generate infrared codes, a novel method is utilized wherein no counting of pulses takes place, and only the time duration of the pulses in a burst of pulses from the leading edge of the first pulse in a burst of pulses to the trailing edge of the last pulse in the burst as well as the time duration of the pause between bursts are sensed and used to learn and later to generate the infrared codes.

Additionally, unique methods for use of the remote control device are provided so that a number of infrared operation code sequences can be generated by the remote control device for operating various types of electronic apparatus.

SUMMARY OF THE INVENTION

According to the invention there is provided a universal remote control system having input means for inputting commands, signal output means for supplying infrared signals to a controlled device, a central processing unit (CPU) coupled to the input means and to the signal output means, a single non-volatile, read-write RAM (such as a battery-backed RAM) coupled to the central processing unit and data coupling means including terminal means coupled to the CPU for enabling new code data to be supplied from outside the system to, or retrieved from the RAM through the terminal means and the CPU.

Further according to the invention, there is provided a method of loading a RAM in a ROM-less microprocessor system comprising a central processing unit, a single non-volatile, read-write RAM, input means, output means, and means for coupling said central processing unit, said RAM, said input means, and said output means together, said method including the steps of:

- (a) disabling the central processing unit;
- (b) connecting a separate microprocessor system to said RAM;
- (c) transferring instructions and/or data to said RAM;
- (d) re-enabling the central processing unit to enable the central processing unit to execute the instructions so transferred.

Still further according to the present invention, there is provided a process of learning, storing and reproducing the remote control codes of any of a diverse plurality of remote control transmitters, comprising the steps of:

- (a) receiving a transmission of a train of pulses from a remote control transmitter;
- (b) recording the point-in-time of an edge of each pulse in a train of said pulses;

- (c) transforming the recorded point-in-time data into a list of instructions for generating a replica of said train of pulses;
- (d) timing the duration of a train of said pulses;
- (e) timing the period between trains of pulses;
- (f) associating a function key of a universal remote control device with said time duration of said train of pulses and said list of instructions for generating a replica of said train of pulses;
- (g) determining whether or not repetitions of the transmission of train of pulses is present;
- (h) ignoring repetitions of the train of pulses;
- (i) noting that repetitions are present; and
- (j) storing for use in a universal remote control device, the information acquired in steps (c), (d), (e), (f) and (i).

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front perspective view of the universal remote control device constructed according to the teachings of the present invention.

FIG. 2 is an exploded perspective view of the control device shown in FIG. 1.

FIG. 3 is an enlarged fragmentary sectional view through two of the push buttons of the control device shown in FIGS. 1 and 2.

FIG. 4 is a fragmentary corner view of a push button containing panel and a base panel.

FIG. 5 is a fragmentary corner view similar to FIG. 4 as the panels are brought together and shows one of the push buttons cut away from the push button containing panel.

FIG. 6 is a fragmentary sectional view of the assembly 15 formed by bringing the push button containing panel into engagement with the base panel.

FIG. 7 is a plan view of the circuit board assembly mounted inside the control device viewing the control device from the back side thereof with a back cover panel removed.

FIG. 8 is a block diagram of the operating circuitry in the control device.

FIGS. 9A & 9B are a detailed schematic circuit diagram of the operating circuitry shown in FIG. 8.

FIG. 10 is a perspective view showing the connection of a programming connector over the central processing unit of the operating circuitry in the control device, the programming connector being connected to a microprocessor, being operable to disable the central processing unit, and being used to program the random access memory (RAM) of the operating circuitry.

FIGS. 11a to 11i are graphical representations of several modulation schemes which are used in infrared remote control transmitters.

FIG. 12A is a flow chart of a first part of a method for capturing an IR code and FIG. 12B is a graph of the envelope of the code.

FIG. 13A is a flow chart of a second part of a method for capturing an IR code; FIG. 13B is a waveform of the IR bit stream and filtered bit stream; and FIG. 13C is a graph of the waveform of a filtered repetition of a filtered bit stream.

FIG. 14 is a flow chart of the method used for generating an infrared code.

FIG. 15 is a front plan view of the control device shown in FIG. 1 and shows the various pushbuttons of the device.

FIG. 16 is a flow chart of the search and set procedure followed in using the control device of the present invention.

FIG. 17 is a flow chart of a direct-entry/quick-set procedure followed in using the remote control device.

FIG. 18A is a flow chart of the procedure followed in setting a "DO" command and FIG. 18B is a flow chart of the method for executing a "DO" command.

FIG. 19A is a flow chart of the method used to identify what type of unit the remote control device is set for and FIG. 19B is a table of the identifying blink code.

FIG. 20 is a fragmentary perspective view with portions broken away of a connector with conversion circuitry therein and a special battery case cover for the control device by which new data can be inputted into the RAM of the operating circuitry of the control device.

FIG. 21 is a schematic circuit diagram of part of the conversion circuitry in the connector shown in FIG. 20.

FIG. 22 is a schematic circuit diagram of another part of the conversion circuitry in the connector shown in FIG. 20.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1 in greater detail, there is illustrated therein a universal remote control device 10 constructed according to the teachings of the present invention.

As shown, the device 10 includes a housing 11 including an upper housing member 12 having a base panel 14, and a lower housing member 16. An overlay face panel 18 is positioned over the base panel 14.

The two panels 14 and 18 have openings 22 and 24 (FIG. 2) therethrough for receiving elastomeric pushbuttons 25, all of which extend from and are fixed to or integral with an elastomeric body panel 26 as shown in FIG. 2.

The pushbuttons 25 are arranged in rows and columns and are identified as follows on the overlay face panel 18:

| | | | |
|-------|---------|--------|----------|
| VCR 1 | Cable | TV | Power |
| VCR 2 | CD | DO 1 | DO 2 |
| Rec | TV.VCR | Stop | Pause |
| Rew | Reverse | Play | Fast Fwd |
| 1 | 2 | 3 | Mute |
| 4 | 5 | 6 | Vol Up |
| 7 | 8 | 9 | Vol Dn |
| | 0 | Enter | CH Up |
| | | Recall | CH Dn |
| DO | | | |
| A | C | E | G |
| B | D | F | H |

This arrangement is shown in FIG. 15 and the manner in which these pushbuttons 25 are utilized in operating the control device 10 will be described in greater detail in connection with the description of FIGS. 15-19B.

At a top or forward end 28 of the device 10, there is provided an opening 30 for three light emitting diodes, LED 1, LED 2 and LED 3. The opening 30 is covered by an infrared-transport lens 31. Also, provided on a top surface 32 of the upper housing member 12 of the control device 10 is a light emitting diode, LED 4, by which information, in the form of red and green blink codes, is communicated to the user of the device 10.

FIG. 2 is an exploded view of the components of the device 10. As shown, the device 10 includes the overlay face panel 18 with pushbutton-receiving, generally rectangular openings 22, the upper housing member 12 with base panel 14 having a plurality of generally rectangular, pushbutton receiving openings 24, the elastomeric body panel 26 having

pushbuttons 25 extending from an upper surface 34 thereof, a printed circuit board 36 having conductive switches 38 on an upper surface 40 thereof and operating circuitry 42 (FIG. 7) mounted on the underside 43 thereof, the lower housing member 16, a cover 44 for a battery compartment 45 (FIG. 7) for receiving batteries 46 (FIG. 10) for the circuitry 42 of the control device 10, and the infrared-transport lens 31.

It will be noted that the base panel 14 of the upper housing member 12 has pushbutton openings 24 completely across each one of fourteen (14) rows across and four (4) columns down. However, not all of these openings or holes 24 have pushbuttons 25 extending therethrough, as noted by the lesser number of pushbutton-receiving openings 22, in the overlay face panel 18. Likewise, the body panel 26 initially has pushbuttons 25 arranged completely across the upper surface 34 thereof in fourteen (14) rows across and fourteen (14) columns down.

The printed circuit board 36 has conductive switches 38 aligned with each one of the pushbuttons 25 so that more switches 38 are provided than may be necessary for this particular control device 10.

The availability of additional pushbutton openings 24 in the base panel 14 will enable the control device 10 to be modified as necessary by the addition of further pushbuttons 25 to perform numerous other functions as called for.

This mechanical construction of the upper and lower housing members 12 and 16 and the panels 14 and 18 and circuit board 36 enable the control device 10 to be modified to include additional circuits in the operating circuitry 42 and pushbutton switches 25 for performing additional functions, if desired. In this respect, overlay face panel 18 is easily replaceable to modify the device 10 to include more or less pushbuttons 25 and associated switches 38.

The simplicity of the construction of the pushbuttons 25, the base panel 14 and the overlay panel 18 is shown in FIGS. 3-6. As shown in FIG. 3, the body panel 26 has a plurality of raised pushbuttons 25 formed thereon. Each raised rectangular button 25 has a recessed area or hollow 48 on the underside 49 of each button 25 in which is mounted a conductive plunger or puck 50 adapted to engage one of the conductive switches 38 on the circuit board 36. With the pushbuttons 25 and the panel 26 being formed from a sheet of elastomeric material it is an easy matter to remove the buttons 25 that are not necessary with a scissors or other cutting element, as shown in FIG. 4.

Then, the pushbutton body panel 26 is moved into engagement with the base panel 14, as shown in FIG. 5, to form the assembly shown in FIG. 6.

After the pushbutton body panel 26 and the base panel portion 14 have been assembled as shown in FIG. 6, the overlay face panel 18 is mounted on top of the base panel 14 and the circuit board 36 is mounted within the housing member 12.

Referring now to FIG. 7, there is illustrated therein the operating circuitry 42 of the control device 10 which includes batteries 46 (FIG. 10) mounted in the compartment 45 for providing power for the circuitry 42 and a lithium battery 52, which backs up a static RAM 54. A central processing unit (CPU) 56, is coupled through a latch 58 to the RAM 54. Three LEDs, LED 1, LED 2, and LED 3 are coupled to the circuitry 42 for communication with the apparatus to be controlled. All elements of the circuitry 42 are mounted on the circuit board 36 mounted in the upper housing member 12. A further LED, LED 4 is coupled to CPU 56 for communication with the user of the device 10 as will be described in greater detail below.

A block schematic circuit diagram of the operating circuitry 42 is shown in FIG. 8 and includes CPU 56, the

infrared light emitting diodes, LED 1, LED 2, and LED 3 coupled to the CPU 56, serial input/output ports 60 of CPU 56, the RAM 54 coupled to CPU 56 and backed up by lithium battery 52 and a 4x14 keyboard 61 coupled to CPU 56. The four AAA batteries 46 are also shown.

FIGS. 9A and 9B are a detailed schematic circuit diagram of the operating circuitry 42. The operating circuit 42 includes the central processing unit 56, the latch 58, the random access memory 54 and LED 1, LED 2, LED 3 and LED 4.

The operating circuitry also includes several subcircuits. One of those subcircuits 62 (FIG. 9B) includes the keyboard 61 having pushbuttons 25, each of which is connected to a port 63 of the CPU 56 shown in FIG. 9B and can be referred to as the keyboard circuit 62. The X's in FIG. 9B indicate the pushbuttons 25 and when one of those pushbuttons X is pressed, current flows through a resistor in a column line, e.g., when button 25' is pressed current flows through resistor 64 in column line 138 going to the button or key 25'. That raises the voltage on a supply line VCC to the CPU 56 of the microprocessor.

Accordingly, whenever a button 25 is pressed, it will increase the voltage on line VCC which initiates a switching process in a wake up circuit 70 for "waking up" or energizing the CPU 56 in the manner described below.

In addition to the keyboard circuit 62 and the wake up circuit 70, the subcircuits include a reset circuit 74, and a write protect circuit 78.

When the voltage on line VCC goes up, a signal is passed through capacitor 102, to the base of a transistor 104 in the wake up circuit 70. This turns on the transistor 104 which in turn turns on transistor 106. This turning on of the transistors 104 and 106 will bring voltage on line VCC to the full DC voltage of about 5½ volts. When the voltage on line VCC reaches 5½ volts, the CPU 56 begins to operate.

When operating, the CPU 56 establishes a signal on line ALE 108 which is passed through a resistor 110 and filtered by capacitor 102. Once the ALE signal is established, it causes a voltage to be generated at the base of transistor 104, maintaining transistor 104 turned on, which in turn maintains transistor 106 turned on, thus enabling the CPU 56 to continue to run. The CPU 56 can turn itself off by executing a HALT instruction which causes the ALE signal to cease, thus turning off transistors 104 and 106 and removing power via line VCC to the CPU 56.

It is to be noted that the wake up circuit 70 can be activated by depression of a key or button 25 or by an input signal at serial port 3 coupled to an input port 112 of the CPU 56.

The circuit elements described above form the wake up circuit 70 for activating the operating circuitry 42 of the device 10. This circuit uses substrate static-protection diodes 114 in a CMOS chip coupled to the keyboard 61. With this arrangement, source current is supplied to transmitter 104 via line VCC when a key or pushbutton 25 is depressed.

The RAM 54 is connected to the lithium battery 52 and, when the device 10 is not being used, draws about 20 nanoamps from the battery 52, which gives the device 10 a shelf life between 5 and 10 years. A backup capacitor 116 is coupled to the RAM 54 and has (at 20 nanoamps) a discharge time of about 10 minutes, providing ample time to change (if necessary) the battery 52 without losing the instructions and data stored in the RAM 54. Capacitor 116 is kept charged by battery 46 through diode 117 when the device 10 is operating and, at other times, by battery 52 through diode 118.

After the CPU 56 has been powered up, or awakened, the CPU 56 makes a scan of row lines 121-128 to the keyboard

61 by sequentially forcing each line 121-128 low and then polling the other lines to find out which button 25, such as button 25', has been pressed. As a result of pushbutton 25' being pressed, a low impressed upon row line 121 will cause a low on column line 128 and that will result in the row line 128 being low.

The CPU 56 first sets row line 121 low and then begins scanning, starting with the row line 122, for another row line having a low voltage thereon and by finding the row line with the low voltage, in the above example, row line 128, the CPU 56 knows that button 25' at the intersection of row line 128 and column line 138 has been depressed.

If the CPU 56 had not found a low on another row line, such as row line 128, after having set line row 121 low, line 121 is returned to its previous value and row line 122 is then set low, and the scan continued until a low row line is found to identify which button 25 has been depressed.

When the CPU 56 determines which pushbutton 25 has been depressed the CPU 56 will then know what function is to be carried out.

It is to be noted that the keyboard circuit 62 is uniquely designed to include only eight (8) row lines 121-128 and eight (8) column lines 131-138 each having a resistor 64 and a current directing diode 114 therein and each being arranged across the row lines 131-138 so that 56 switch positions are provided with only eight (8) lines.

All memory cycles exercised must involve the latch 58 because the CPU 56 has its data bus multiplexed with the lower 8 bits of the address bus on lines 141-148.

Coming out of the CPU 56 to the latch 52, is a group of nine (9) lines 108 and 141-148. One of the lines, line 108, carries the ALE signal. The eight (8) lines 141-148 between the latch 58 and the CPU 56 are the multiplexed data and address bus lines. These lines comprise the lower 8 bits of the address bus. A group of multiplex lines are identified with reference numeral 150. Five more lines 151-155 comprise the upper five bits of the address bus, making a total of 13 bits of address.

An inverting OR gate 156 having an output line 158 and two input lines 160 and 162 together with ground line 164 are coupled between the CPU 56 and the RAM 54. The line 158 defines an output enable for the RAM 54.

Accordingly, when the CPU 56 wants to do a read, it actuates either of the two input lines 160 or 162 going into the OR gate 156. Line 160 is a PSEN line for telling the RAM 54 that it is to be enabled to receive data and line 162 in a Read Output line to tell the RAM 54 that the CPU is going to read the information stored in the RAM 54. With OR gate 156 the two lines and functions are combined on one line 158. In other words, the CPU 56 tells the RAM 54, through the OR gate 156, that it wants to read information stored in the RAM 54.

The circuitry 42 also includes the write protect circuit 78 which has the double duty of being a low battery indicating circuit. The circuit 78 includes a resistor 170, a transistor 171, two resistors 172, 173 and a Zener diode 174 connected as shown.

A write enable line 176 is connected between the transistor 171 and the CPU 56.

When the CPU 56 desires to write information into the RAM 54, it places the address on the address bus lines 141-148 and 151-155, strokes the lower 8 bits of the address bus on lines 141-148 into the latch 58 using ALE line 108, places the information on the data bus lines 141-148, and then brings the write enable line 176 low.

When the write enable line 176 goes low, unless the transistor 171 is turned on by virtue of the battery voltage

being more than 4.3 volts, a line 178 going into the RAM 54 at the collector 180 of the transistor 171 (which is the "write enable" for the RAM 54), is prevented from going low, maintaining the RAM "Write Protected". This condition also is created when the battery 48 is low. The "write enable" line 176 also functions as a low battery detector because, during execution of the program, a check is made to see whether writing to the RAM 54 is enabled. If it is not, this shows that the batteries are weak and a signal is sent to the user by flashing the red LED, of LED 4, 5 times.

Note that LED 4 includes a red LED and a green LED incorporated into one package so that when both LEDs are turned on, a yellow light is emitted, making LED 4 a tricolor LED. Such tricolor LED 4 enables the device 10 easily to communicate to the user by way of the color, number and sequence of light blinks.

A clock circuit 182 including a crystal resonator is coupled to the CPU 56.

Three serial ports 1-3 are coupled to the CPU 56 and include port 1 which is a transmitting port, port 2 which is ground and port 3 which is a receiving port. Serial port 1 is connected to row line 121 so that data can be serially transmitted in the form of highs and lows by CPU 56 from the RAM 54 over row line 121 to serial port 1. Incoming data is received serially at serial port 3 and conveyed to input port 112, when it is desired to update the code data and/or instructions in the RAM 54.

The three infrared-emitting LEDs, LED 1, LED 2, and LED 3 are connected in the circuitry 42 as shown.

The reset circuit 74 includes two resistors and a capacitor connected as shown and coupled between line VCC and a reset line 184.

As will be described in greater detail in connection with the description of FIGS. 11-14, the manufacturer of the device 10, using known methods or the method described herein with reference to FIGS. 12A-13C, will decipher the infrared codes for operating various pieces of equipment, such as a TV, a VCR, a CD, a Cable Converter or other equipment which is controlled by a remote infrared transmitting device.

After the infrared code is deciphered, the code data therefor and instructions for generating such code (see the flow chart in FIG. 14) are stored in a programming computer 200 (FIG. 10) and the device 10 is programmed as explained below.

It is to be noted that the circuitry 42 has no ROM and all instruction codes and code data are loaded directly into the RAM 54. This allows for infinite upgradability in the field via the serial ports 1, 2, 3.

FIG. 10 is a perspective view of a programming computer 200 coupled by a cable 202 to a special connector 204 which is adapted to be received over the CPU 56 in the operating circuitry 42 for disabling the CPU 56 and for enabling the RAM 54 to be programmed by the programming computer 200. Essentially this is done by tri-stating the CPU 56 and placing the RAM 54 into the address space of the computer 200 which writes initial instruction code including code for the serial port driver, and subsequently serially, other instruction code and code data into the RAM 54. For this purpose the programming computer 200 has instruction codes such as serial port driver instructions and data relative to the infrared codes for operating a multiple number of electronic apparatus, such as televisions, VCR's, etc stored therein. Signals from the programming computer 200, via the connector 204 causes the inputs and outputs 60 of the CPU to be disabled so that instruction codes and data can be input into the RAM 54 quickly and efficiently from the

programming computer after the operating circuitry 42 is mounted in the control device 10.

Later, after the device 10 has been in use for some time and the RAM 54 needs to be updated with instruction codes and data relative to new equipment on the market, the control device 10 can be simply and easily updated at a service outlet having an ordinary personal computer with a serial port using a novel nine pin to three pin, 9 volt to 5 volt, signal coupling and converting assembly 206 (FIG. 20). The updating can be done by adding to the data in RAM 54 or by rewriting (writing over) the data in RAM 54. The assembly 206 is described in greater detail hereinafter in connection with the description of FIGS. 20-22.

The infrared codes to be learned include a wide range of different codes for operating different electrical apparatus manufactured by the same or different manufacturers. In FIG. 11, which is identical to FIG. 1 in U.S. Pat. No. 4,623,887, there are illustrated several modulation schemes for infrared codes. FIGS. 11a-11g illustrate different types of gated carrier frequencies. Typical carrier frequencies for infrared remote transmitters are 20 Khz to 45 Khz, with the majority being at 38 Khz and 40 Khz. The gating schemes illustrated include both fixed and variable bit periods, non-return to zero (NRZ), variable burst widths, single/double burst modulation schemes, and a final catch-all category called random because there is no readily distinguishable pattern of ones and zeros.

In addition to these schemes, there is also a transmitter which puts out a different continuous frequency (CW) for each key as represented in FIG. 11h.

Finally, several new types of transmitters do not use a carrier frequency at all but instead send a stream of pulses where the data is encoded in the spaces between the infrared pulses as shown in FIG. 11i.

Data modulation schemes for most transmitters have a higher level of data organization which may be called a keyboard encoding scheme which causes different data to be sent depending upon the transmitter and the key pressed. This will be described in greater detail hereinafter in connection with FIGS. 15-19.

The code data for the infrared codes may be obtained from vendor information sheets and specifications, can be determined using the methods disclosed in U.S. Pat. Nos. 4,623, 887 and 4,626,848, or by the method disclosed herein.

In the method for learning or acquiring code data for infrared codes disclosed herein, no counting of pulses is carried out. Instead the method involves the following steps:

- (a) receiving a transmission of a train of pulses from a remote control transmitter;
- (b) recording the point-in-time of an edge of each pulse in a train of the pulses;
- (c) transforming the recorded point-in-time data into a list of instructions for generating a replica of the train of pulses;
- (d) timing the duration of a train of the pulses;
- (e) timing the period between trains of pulses;
- (f) associating a function key of the universal remote control device 10 with the time duration of the train of pulses and the list of instructions for generating a replica of the train of pulses;
- (g) determining whether or not repetitions of the transmission of train of pulses is present;
- (h) ignoring repetitions of the train of pulses;
- (i) noting that repetitions are present; and
- (j) storing for use in a universal remote control device, the information acquired in steps (c), (d), (e), (f) and (i).

Typically, each pulse has a fixed duty cycle and in carrying out the above described method it can be assumed that each pulse has a fixed duty cycle.

The manual and computer steps followed in practicing this method are set forth in FIGS. 12A and 13A.

FIG. 12A is a flow chart of the first part of this method for capturing an IR code and FIG. 12B is a graph of a pulse train comprising a portion of the code.

There is shown in FIG. 12B, adjacent the transforming step in FIG. 12A, a graph of the waveform of the captured, and later recreated, infrared codes, showing when the infrared signal is on and when it is off. When the CPU 56 executes the instructions set forth below the waveform in FIG. 12B, infrared-emitting LEDs, LED 1, LED 2, and LED 3 are turned on when the instruction IR-ON is executed and turned off when the instruction IR-OFF is executed. No operation is performed when the instruction NOP is called for. In this way the infrared codes are transformed into a bit stream of 0's and 1's.

FIG. 13A is a flow chart of a second part of the method for capturing an IR code.

FIG. 13B shows the IR infrared bitstream and an envelope of the filtered bitstream.

FIG. 13C shows the filtered waveform that is analyzed for repetition. The repetition scheme and a pointer to indicate, upon regeneration of the infrared code, which key will generate that code are stored in a memory for later inputting into the RAM 54.

FIG. 14 is a flow chart of a sequence of eleven (11) steps that a user initiates to generate a specific IR code for performing a specific function, namely, for generating a captured IR code stored in the remote control device 10. The code data is stored in the RAM 54 of the remote control device 10 and the sequence of steps the circuitry 42 goes through to take the code data in the RAM 54 and generate the infrared code therefrom is set forth in this Figure.

FIG. 15 is a plan view of the keyboard 61 and shows the different keys or pushbuttons 25 of the control device 10 extending through the base panel 14 of upper housing member 12 and the face panel 18 where the label or identification for each pushbutton or key 25 is shown. The light emitting diode, LED 4, is also indicated.

FIG. 16 is a flowchart of the steps initiated by a user of the device 10 in a step and set procedure for searching for code data in the device 10 for the infrared code needed to operate the user's specific apparatus and to set the device 10 for that code data.

FIG. 17 is a flow chart of the steps initiated by a user in carrying out a direct-entry/quick-set procedure for matching the user's equipment or apparatus to the device 10.

The steps of this procedure include:

- STEP 1. Look up make and model number of the controlled apparatus in a table provided to the user in an instruction booklet.
- STEP 2. Model number is found and matched with a series of 8 "R"s and "G"s.
- STEP 3. Here the operator presses the desired mode button or key.
- STEP 4. Press DO, Enter, Recall. This tells the device 10 to do a Quick-Match.
- STEP 5. Next enter the sequence of eight red and green blinks found in TABLE I (set forth below) provided in the instruction booklet. This is done by pressing Channel Down for "R" and Channel Up for "G".
- STEP 6. Here a determination is made if a key other than Channel Up or Channel Down, was pressed.
- STEP 7. The device 10 tricolor LED 4 will flash red or green depending on what button is pushed.
- STEP 8. When all eight codes are entered, the program goes on to STEP 9.
- STEP 9. Here a check is made to see if the blink code is in the table in the RAM 54 of the remote control device 10.

STEP 10. If the device 10 has successfully Quick-Matched to the controlled apparatus, the LED 4 will flash green twice.

STEP 11. If it did not match, it will flash yellow indicating that codes for that controlled apparatus are not loaded into the RAM 54.

TABLE I

| DEVICE BLINK CODES AND SPECIAL FEATURE BUTTONS | |
|--|--|
| Blink Code | A B C D E F G H |
| TELEVISION SETS | |
| RRRR RRRR | Display |
| | MTS Pict + Pict - Sleep TV/Video Ant Tone |
| 25 = Col Up | |
| 26 = Col Dn | |
| 27 = Brt Up | |
| 28 = Brt Dn | |
| 29 = Hue Up | |
| 30 = Hue | |
| 31 = Mtx | |
| 32 = Reset | |
| | Dn |
| RRRG RRRG | Screen Sp-Phne/ Auto On/AutoOff/ Ant Stereo |
| | Dn Prnt Cl Data Ent Data Clr |
| RRRG RGRG | Add Clear |
| RRRG GRRR | A Ch Hi Fi |
| RRRG GRGR | Ant/Aux Time/Ch Program TV/VCR |
| RRRG GGGG | Ant/Aux Time/Ch |
| RRRG GGGG | Pwr On Pwr Off Display Ant |
| GRRG RRRG | Aux Last Ch Timer |
| GRRG RRRG | Fine Up Fine Dn L Cl R Cl OBC Func Review BiLing |
| 25 = Stereo | |
| 26 = TimeFa | |
| 27 = Timer | |
| 28 = TimeSl | |
| 29 = TV/AV | |
| GRRG RGRG | Fine Up Fine Dn L Cl R Cl OBC Func Review BiLing |
| 25 = Stereo | |
| 26 = TimeFa | |
| 27 = Timer | |
| 28 = TimeSl | |
| 29 = TV/AV | |
| GRRG RGGG | Tint R Tint L Color R Color L Contr R Contr L Timer Stereo |
| 24 = SAP | |
| 25 = Reset | |
| 26 = Q/V | |
| 27 = EXP | |
| 28 = Disp | |
| 29 = Mono | |
| 30 = Lock | |
| 31 = TV | |

TABLE I-continued

| DEVICE BLINK CODES AND SPECIAL FEATURE BUTTONS | |
|--|--|
| Blink Code | A B C D E F G H |
| 32 = Ext 1 | |
| 33 = Ext 2 | |
| 34 = Ant | |
| GRRG RRRG | TV/Video Time |
| GRRG GRGR | TV/Video Wide Lvl Up Lvl Dn Memory Func MTC Stereo |
| 25 = Timer | |
| 26 = 100 | |
| 27 = BiLing | |
| GRRG GRGG | 10 11 12 13 |
| GRRG GGRR | RF12 Ch Rtn Str SAP Mono Timer T Set TV/CATV TV/Vid |
| 26 = 100 | |
| 27 = Audio | |
| 28 = CCC1 | |
| 29 = CCC2 | |
| 30 = CCC3 | |
| 31 = 32 = 33 = | |
| 34 = Pict | |
| 35 = Reset | CCC4 ContDn ContUp |
| GRGG RRRR | Sleep Review |
| GRGG RRRG | K L |
| GRGG RRGR | SAP Sleep TV/Video Program Q Rev SAP Sleep TV/Video Add Delete |
| GRGG RGRG | Sleep St/SAP TV/Video |
| GRGG RGGR | 11 12 13 14 15 16 |
| GRGG RGGG | K L |
| GRGG GRRR | K L |
| GRGG RRGR | VIDEO CASSETTE RECORDERS |
| RRRR RRRR | Nse Cncl |
| RRGR RRRG | Ant |
| RRGR RRGR | Ant |
| RRGR RRRG | Frm Adv Slow Slow Up Slow Dn Srch Fwd Srch Rev |
| RRGR RGRG | A B C D E F Slow |
| RRGR GGGR | Slow |
| RRGR RGGG | Slow + Slow - Eject CM Skip Program Input Mode AM/PM |
| 28 = Shift | |
| 29 = Reset | |
| 30 = Mem/PS | |
| 31 = SR | |
| RRGR RGGG | Forward |
| RRGR RRGR | FlashBack |
| RRGR RRGR | Ant Vol + Vol - Reverse Sp Phne PC |

TABLE I-continued

| DEVICE BLINK CODES AND SPECIAL FEATURE BUTTONS | |
|--|--|
| Blink Code | |
| A | B C D E F G H |
| RRGR GRRR | Ant/Aux |
| RRGR GRRG | 11 12 13 14 15 16 |
| RRGR GRGR | Frm Adv |
| | Memory Reset Chg Time |
| RRGR GRRR | Pwr On Pwr Off |
| RRGR GGGG | Slow Slow Up Slow Dn Set Up Set Dn Timer Clear Display |
| | 29 = Frame |
| | 30 = Memory |
| | 31 = Prog |
| | 32 = Qtr |
| | 33 = QtrStr |
| | 34 = Quick |
| | 35 = 36 = Rst |
| | 37 = Clock |
| | 38 = APS |
| | 39 = 100 Remain |
| GGRG RRRR | K L |
| GGRG RRRG | CFM Slow |
| GGRG RRGR | Slow OSP Shift L Shift R |
| | SlowDn |
| | Slow Up |
| | St + St - |
| | 28 = Timer |
| GGRG RRRG | 11 12 13 14 15 16 Slow |
| GGRG RRGR | Slow Dn |
| | Slow Up Slow |
| CABLE CONVERTERS | |
| RRRR RRGR | A/B Add Delete Set Lock Last Ch |
| RRRR RRRG | A B Event(*) |
| | # Arrow Up |
| | Arrow Dn |
| | AP Delete |
| | 25 = F26 = K 27 = Learn |
| | 28 = PGM |
| | 29 = TCP |
| | 30 = Enter |
| RRRR RRGR | Skew L Skew R Audio SAT Ant East |
| | Ant West |
| RRRR RRRG | Plus Minus Dot Box Str Clear Time Auth |
| | 22 = C/R |
| | 23 = # |
| RRRR RRRG | Prog Auth |
| RRRR RGGG | Auth |
| RRRR GRRR | Auth Prog |
| RRRR GRRG | Plus Minus Rcp * M1 M2 M3 M4 |
| RRRR GRGR | A-B Dot1 Dot2 * Am Dm F |
| RRRR GRRG | Arrow Up |
| | Arrow Dn |
| COMPACT DISK PLAYERS | |
| RRRR RRRR | CD Fwd CD BckUp |

TABLE I-continued

| DEVICE BLINK CODES AND SPECIAL FEATURE BUTTONS | | | | | | | |
|--|---|------|-------|----|------|----|--|
| Blink Code | | | | | | | |
| A | B C D E F G H | | | | | | |
| GRRG GRGG | Fwd Indx | | | | | | |
| | Rev mdx | | | | | | |
| | Repeat Memory | | | | | | |
| 10 | For numbered functions, press "DO" then the two digit number. | | | | | | |
| | For numbered functions, press "DO" then the two digit number. | | | | | | |
| 15 | FIG. 18A is a flow chart of the steps for setting a "DO" command macro, for achieving a function that normally requires the actuation of several buttons, by programming one particular button to perform the functions required of the several buttons to achieve a specific function. | | | | | | |
| 20 | FIG. 18B is a flowchart of the simple two pushbutton steps required for executing the "DO" macro command created in FIG. 18A. | | | | | | |
| 25 | FIG. 19A sets forth the steps initiated by a user to determine the various blink codes which identify what equipment or apparatus the remote control device 10 is set for. | | | | | | |
| 30 | FIG. 19B illustrates a sample blinking grid of eight red and green blinks which will be presented to the user. Once a particular pattern of eight red or green blinks has taken place, the user of the device 10 will look up the blink pattern or code in TABLE I included in a user handbook. This table shows the user which pushbuttons 25 labeled A-H are associated with additional functions stored which may be stored in the RAM 54. Additional functions beyond the eight supported by pushbuttons A-H are performed by pushing "DO", and then the two-digit sequence shown in TABLE I. | | | | | | |
| 35 | The instructions for using the control device 10 which are supplied to a purchaser thereof in an instruction booklet are set forth below. | | | | | | |
| 40 | Matching the Device to Your Equipment | | | | | | |
| | The device 10 can control most remote controlled TV's, VCR's, cable converters, and CD players, but it needs the user's input to match it to your particular equipment. The easiest way to do this is to STEP-and-SET your device 10. You will only need to do this once for each different type of device you have. | | | | | | |
| 45 | 1. To STEP-and-SET your device 10, first press DO, Enter. | | | | | | |
| 50 | 2. Press one of the following equipment selection buttons to tell the device 10 what kind of equipment to match. | | | | | | |
| | <table border="1"> <thead> <tr> <th>VCR1</th> <th>Cable</th> <th>TV</th> </tr> </thead> <tbody> <tr> <td>VCR2</td> <td>CD</td> <td></td> </tr> </tbody> </table> | VCR1 | Cable | TV | VCR2 | CD | |
| VCR1 | Cable | TV | | | | | |
| VCR2 | CD | | | | | | |
| 55 | 3. Aim the device 10 at the equipment and try various function buttons to see if the equipment responds correctly. Make sure you are reasonably close to the equipment and that nothing is blocking the path. The light (LED 4) at the top of the device 10 will shine green whenever it is sending an infrared code, or it will not light at all if it does not send a code for a particular button. | | | | | | |
| 60 | 4. If your equipment did not respond correctly or did not respond at all, press DO1 to change the device 10 so that it will send the next set of infrared codes in its | | | | | | |
| 65 | | | | | | | |

library, or press DO2 to change it so it will send the previous set of codes.

5. When you use DO1 or DO2 to step the device 10 setting forward or back, its light will blink yellow each time you step it. The settings step around in a circle. Whenever you get back to the setting where you started the device 10 light will blink red to notify you.
6. Use DO1 and DO2 to step through the sets of codes and keep trying out functions until your equipment responds correctly. The device 10 will then be set to send the proper infrared codes for operating your particular equipment.
7. When you are satisfied that the device 10 is properly matched, press DO, or any of the equipment selection buttons to restore the DO1 and DO2 buttons to their normal functions.
8. If your equipment is responding to your device 10 but some buttons are causing the wrong thing to happen, keep going. Some equipment responds to the infrared codes of other brands of equipment.
9. If you try out all of the codes in the device 10 library and your equipment still does not respond, it is probably because the code data for generating the infrared codes for operating your equipment is not in the library of your control device 10.

The Keyboard 61

Take a look at the keyboard. There are four groups of buttons:

1. Equipment Selection Buttons tell the device 10 which equipment is to be controlled:

| | | |
|------|-------|----|
| VCR1 | Cable | TV |
| VCR2 | CD | |

2. Basic Function Buttons are used to control your TV, VCR, CABLE and CD. They work in much the same way as in older remotes which typically have the following buttons.

| | | | |
|----------------|-------------------|-----------------|--|
| Rec. Rewind | TV,VCR Reverse | Stop Play | Power Pause Fast Fwd Mute Vol.Up Vol.Dn |
| 1 | 2 | 3 | |
| 4 | 5 | 6 | |
| 7 | 8 | 9 | |
| | 0 | Enter Recall | Chan.Up Chan.Dn |

3. Extended Function Buttons perform any special functions your equipment may have, such as color control, picture control, tint control, etc. These buttons are identified with the following alphabet letters.

| | | | |
|---|---|---|---|
| A | C | E | G |
| B | D | F | H |

4. DO Buttons are used to perform very powerful DO Commands which are explained below.

Special Features

Besides the basic functions such as channel up/down and volume up/down that most TV remote controls have, there could be special features as well, for example:

- Color up/down.
- Picture up/down.
- Tint up/down.
- Sleep.

- 5 Your VCR's remote control can also have special features such as:

- Frame advance
- Channel up/down

- 10 Your cable converter remote control can also have additional features such as:

- Channel recall
- Delete

- 15 Your CD player remote control can have special features such as:

- Repeat
- Track programming

- 20 Once you have matched the device 10 to your TV, VCR, Cable Converter and CD player, all functions that were controlled by your old remote control devices can now be controlled by the device 10. You may even notice some extra features that weren't controlled by your old remote.

Since the device 10 can control such a wide range of equipment, there is not enough room on it for buttons for every possible feature of every remote control. Instead, there are eight extended function buttons at the bottom labelled A through H. To find out what these eight buttons control for your particular TV, VCR, cable converter and CD player:

1. Get your pen and paper ready.
2. Press DO and then the button (TV VCR1 VCR2 Cable CD) of the device you want to know the special features of.
3. The device 10 will blink "red" or "green" 8 times. Every time it blinks "red" write down an "R". Every time it blinks "green" write down a "G". When you're finished writing it should look something like this:

RRRGRRRG

This is the "Blink Code" for your device. If you miss it the first time around, just press DO and the device button a second time.

4. Look at TABLE I and find the sequence of "R"s and "G"s that matches the one you wrote down.
5. Read the special features chart next to your Blink Code sequence which tells you what functions the A through H buttons control for your particular device.

For example, the feature chart of your TV might read:

| | |
|---------------|-----------------|
| A: Color Up | C: Picture Up |
| B: Color Down | D: Picture Down |

6. To turn the color up in this example, you would press TV (of course if the device 10 is already set to control your TV, you do not have to press TV again but it doesn't hurt if you do so), then A.

7. To turn the color back down, you would just press B.

8. Write down what special functions are controlled by the A through H buttons on the handy stick-on labels enclosed with the control device 10.

9. After writing down the special functions on the labels, stick them on to the back of the control device 10 for quick and easy reference.

If The Controlled Equipment Has More Than 8 Extended Functions

Usually, the eight A through H buttons are enough for most controlled equipment. If they're not, don't worry. If

your controlled equipment has more than eight special features these too are controlled by the device 10.

Beyond the A through H function buttons, any additional functions are performed by pressing DO then two of the 0-9 number buttons. For example, your TV's feature chart may show additional functions like these:

| | | |
|-------------|-----------|------------|
| 25: SAP | 26: Reset | 27: Q/V |
| 28: Display | 29: Mono | 30: Stereo |

If you did have these features and wanted to use them, you would press DO and then the two-digit number for that feature. For example, you might:

Press DO,3,0. This would turn your TV's stereo broadcast feature on.

If you use a feature like this frequently you may want to assign it to a DO command, our next topic of discussion. Setting DO Commands

DO Commands give you the power to perform a multitude of different functions with the push of just one or two buttons. DO Commands let you assign any of the following buttons to tell the device 10 to automatically perform a series of keystrokes you use often:

| | | | |
|--------|----------------|--|-----------|
| Rec | DO1 | DO2 | Pause |
| Rewind | TV,VCR Reverse | Stop Play Mute Vol.Up Vol.Dn Chan.Up Chan.Dn | Fast Fwd. |
| | Enter | | |
| A | C | E | G |
| B | D | F | H |

To tell the device 10 to do what you want, you must teach it. As an example, you can teach the device 10 to turn your whole system on and set the TV to channel 4 by doing the following:

1. Press DO, Recall. This tells the device 10 that you want to teach it something to do.
 2. Next, you must assign a button 25 you will use to DO whatever you teach it. You can use any of the device 10's buttons 25 set forth above. For example, let's use DO1 at the top of the keyboard: Press DO1.
 3. Now, you must tell the device 10 what button sequence you would press to turn your whole system on and set the TV to channel 4.
 4. Press TV Power. This tells the device 10 to turn your TV on.
 5. Press 4, Enter (pressing Enter may not be required for your TV). This tells the device 10 to set your TV to channel 4.
 6. Press VCR, Power. This tells the device 10 to turn your VCR on.
 7. Press Cable, Power. This tells the device 10 to turn your cable converter on.
- Now you have pressed all the buttons you want the device 10 to learn for this example.
8. Press DO, Recall. This tells the device 10 that you are finished teaching it and to remember what you have taught it.

Now the device 10 knows how to turn your TV, VCR, and cable converter on and set the TV to channel 4, just by pressing one button.

9. Aim the device 10 at your equipment and press DO1. Make sure you keep the device 10 pointed at your equipment while the light is flashing.

Now that you know how DO Commands work, you can teach the device 10 to "DO" practically any sequence of keystrokes. Just remember to keep the following in mind:

To perform a DO Command, press DO then the button you assigned to remember the DO Command. However, if you assigned the DO1 or DO2 buttons to remember a DO Command, you do not have to press DO first, just press DO1 or DO2.

If the device 10 light (LED 4) starts blinking green, yellow, red while you are trying to teach it, it is telling you that RAM 54 is full. The DO command you are teaching is automatically erased. You can teach the device 10 a shorter DO command, or erase some other DO command you have already taught the device 10 to obtain more memory space.

After the DO Command is finished, the last apparatus 10 selected within the DO Command will be the apparatus the device 10 will work with next.

Erasing a DO command

If you just want to change a DO Command, you do not have to erase it first—just set up the new DO Command in its place. However, to get rid of a DO Command without replacing it with a new one:

1. Press DO Recall.
2. Press the button you have assigned to the DO command that you want to erase. For example, to erase the DO command you taught the device 10 in the above example: Press DO1.
3. Press DO, Recall again. The old DO Command is now erased.

QUICK-MATCHING To Your Equipment

There is a quicker way to match your equipment to the device 10 by Quick-Matching. Quick-Matching is a way to set the device 10 directly to match any controlled equipment in its library. Follow the steps below to do a Quick-Match:

1. Match the device 10 to your equipment using STEP-and-SET.
2. Press DO, then the desired device button (TV, VCR1, VCR2, Cable or CD). The device 10 light will blink red or green eight times.
3. Write down the sequence of red and green blinks. This is the "Blink Code" for the particular device.
4. Press DO Enter Recall. This tells the device 10 to do a Quick-Match.
5. Enter the correct sequence by pressing Ch Dn for "R" and Ch Up for "G". The device 10 light (LED 4) will flash "red" or "green" depending on what button you push. The Ch Dn and Ch Up buttons 25 are labelled with the correct color for each.
6. When the device 10 has successfully Quick-Matched your equipment it will automatically flash green twice. If it did not match, it will flash yellow. If it fails to Quick-Match, it is probably because the requisite code data is not stored in the library in your device 10.

QUICK-MATCHING Between Controlled Equipment

One of the great benefits of Quick-Matching is that you can switch the device 10 functions between the remote controlled TVs, VCRs and cable converters you may own. This is done by using "Quick-Match" within a "DO command".

Let's suppose you have two TVs in your house and only one device 10. Here's how to switch between them:

1. Press DO Recall. the button you want to use to switch to your other TV set.

For example, press DO2. This tells the device 10 that you want to teach it a DO Command.

2. Press DO Enter Recall. This tells the device 10 that you want to do a Quick-Match.

3. Enter the R and G blink sequence of the second TV you want to control by pressing Ch Dn for "R" and Ch Up for "G".

4. Press DO, Recall. This tells the device 10 that you are finished teaching it a "DO command".

Now, to set the device 10 to control your second TV, press DO2. This tells the device 10 that you will be controlling your second TV.

To go back to controlling your first TV, simply teach device 10 another "DO command". Just repeat the steps above, except use a different button and the correct R and G sequence for your first TV.

The device 10 can easily be taught to control a whole houseful of infrared remote controlled equipment—just teach the device 10 a DO Command to QUICK-MATCH each additional piece of equipment.

In FIG. 20 is shown a unique signal coupling and converting assembly 206 which includes a connector assembly 207, a cable 208 and a special cover plate 210 for the battery compartment 45. The cover plate 210 has on the underside thereof three pins 212, 214 and 216 which are positioned to connect with the three serial ports 1, 2 and 3. The pins 212, 214 and 216 mounted to the cover plate 210 are connected by three wire conductors 224, 226 and 228 in cable 208 to connector assembly 207 which has conversion circuitry 230 therein. The connector assembly 207 has a nine pin array 250 of sockets 251-259 for receiving nine pins and the conversion circuitry 230 which enables one to use some of the nine sockets 250 of the connector assembly 207 for communication with the three pins 212, 214, 216 that are connected to the serial ports 1, 2 and 3 as shown in FIGS. 21 and 22.

FIGS. 21 and 22 are a schematic diagram of the conversion circuitry 230.

In FIG. 21 is shown circuit portion 230A. In this circuit portion, plus nine volts goes into pin 4 of connector DB-9 or pin 20 of connector DB-25 and minus 9 volts goes into pin 7 of DB-9 or pin 4 of connector DB-25, which are connected to the circuit portion 230A of the conversion circuitry 230. This provides a constant source of positive and negative voltage and is used as the power supply for the circuit. Note that two different types of personal computer host female connectors can be used, namely, female connector DB-9 or female connector DB-25 in the connector assembly 207.

Serial information is transmitted by the hand held control device 10 via line HTXD at serial port 1 and is level translated by the operating circuitry 42 from a range of from plus 5 volts to zero volts to a range of from minus 9 volts to plus 9 volts.

In this respect, when 0 volts is present at serial port 1, transistors Q1 and Q2 are turned on such that +9 volts is supplied from pin 4 of connector DB-9 or pin 20 of connector DB25 through transistor Q1 to pin 2 of connector DB-9 or pin 3 of connector DB-25.

Then, when +5 volts is present at serial port 1, the emitter-base of transistor Q2 is reverse biased, turning off transistor Q2 which turns off transistor Q1. As a result, the 9 volts at pin 7 of connector DB-9 or pin 4 of connector DB-25 is supplied through resistor 270 to pin 2 of connector DB-9 or pin 3 of connector DB-25.

The circuit portion 230B is shown in FIG. 22 and performs a receiving function for the control device 10. When pin 3 of connector DB-9 or pin 2 of connector DB-25 is at

-9 volts, its normal resting state, then HTXD at serial port 3 is at 0 volts. When pin 3 of connector DB-9 or pin 2 of connector DB-25 goes to +9 volts, HTXD at serial port 3 goes to plus 5 volts. Pin 5 of connector DB-9 or pin 7 of connector DB-25 is directly connected to serial port 2 and always stays at ground.

In transmitting data to the control device 10, the programming computer supplies +9 v or -9 v to pin 3 of connector DB-9 or pin 2 of connector DB-25. When +9 v is present on IBMTXD, 4.3 volts established by Zener diode 272 is passed through diode 274 to serial port 3.

When -9 v is present on IBMTXD, the Zener diode 272 clamps to -0.6 volts resulting in conduction through transistor Q3 pulling serial port 3 to 0 volts.

The diode 274, the transistor Q3 and a resistor 276 connected as shown are provided to allow pressing a key 25 on keyboard 26 to "wake up" CPU 56 (actuate the wake up circuit 70) even though circuit portion 230B is connected to the control device 10.

From the foregoing description, it will be apparent that the universal remote control device 10, the signal coupling and converting assembly 206, the disclosed methods of learning and storing infrared codes, and the methods for operating the control device 10 of the present invention have a number of advantages, some of which have been described above and others of which are inherent in the device 10, assembly 206 and the methods of the invention disclosed herein. For example:

- (1) With no ROM in the circuitry 42, the instruction codes and code data in the RAM 54 can be upgraded at any time via the serial ports 1, 2 and 3.
- (2) By loading the instruction codes and initial code directly into the RAM 54 by tri-stating the CPU 56, the circuitry 42 is enabled to function without a ROM.
- (3) The serial ports 1, 2 and 3 together with the signal coupling and converting assembly 206 enable new data to be input into the circuitry 42 from an RS-232 interface device to the serial ports 1, 2 and 3.
- (4) The visible LED 4 providing red/green/yellow/off blink code provides a means for communicating to the user where the device 10 has "landed" after searching for codes to control a specific apparatus. The user can then look up in the instruction booklet what extended functions are available via the letter keys A-H or number keys, plus the DO key for that particular apparatus or equipment.
- (5) The write-protect circuit 78 prevents corruption of the operating program or data in the RAM 54 during transient states when the microprocessor is being turned on or turned off.
- (6) The multiplexing of the address and data lines between the RAM 54 and the CPU 56 enables scrambling of the instruction codes and the code data so that the memory image in the RAM 54 is encrypted.
- (7) The construction of the keyboard 61 enables one to have 56 keys which can be decoded using only 8 bidirectional input (and output) ports 63.
- (8) The keyboard 61 including the keyboard circuitry 62 plus the wakeup circuit 70 provides a system whereby pressing any key turns on power to the CPU 56.
- (9) The provision of three infrared LEDs 1, 2 and 3 with no current-limiting resistors enables the device 10 to use maximum energy to create the infrared control pulses with a minimum amount of energy wasted.
- (10) The DO keys together with the numeral and letter keys allow a number of DO functions to be performed with the device 10 by a user.

(11) Any combination of products can be controlled with the universal remote control device 10.

(12) The step-and-set method for locating the code data for generating the infrared code necessary to operate the user's equipment or for the user to learn that such code data is not present in the library in the RAM 54.

Also modifications can be made to the device 10, the assembly 206 and the described methods of the present invention without departing from the teachings of the present invention. Accordingly, the scope of the invention is only to be limited as necessitated by the accompanying claims.

What is claimed is:

1. In a universal remote control comprising a keyboard having a plurality of pushbuttons including a macro pushbutton and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a readable medium having instructions for performing steps comprising:

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard, the pushbuttons of the keyboard being activated to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched; and

assigning to the macro pushbutton a subset of the selected codes and data from the library whereafter activation of the macro pushbutton causes the universal remote control to use the subset of selected codes and data from the library to transmit a plurality of operating commands to one or more of the matched home appliances.

2. The readable medium as recited in claim 1, wherein the instructions further perform the step of using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton.

3. In a universal remote control comprising a keyboard having a plurality of pushbuttons and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a readable medium having instructions for performing steps comprising:

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbuttons of the keyboard; and

using activation of one or more pushbuttons of the keyboard to match the universal remote control to the plurality of different home appliances of different manufacturers;

instructions further perform the step of using activation of one or more of the pushbuttons of the keyboard to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched.

4. In a universal remote control comprising a keyboard having a plurality of pushbuttons including a macro pushbutton and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a method comprising:

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbutton of the keyboard, the pushbutton of the keyboard being activated to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched; and

assigning to the macro pushbutton a subset of the selected codes and data from the library whereafter activation of the macro pushbutton causes the universal remote control to use the subset of selected codes and data from the library to transmit a plurality of operating commands to one or more of the matched home appliances.

5. The method as recited in claim 4, further comprising using activation of one or more pushbuttons of the keyboard to assign the subset of the selected codes and data from the library to the macro pushbutton.

6. In a universal remote control comprising a keyboard having a plurality of pushbuttons and a library of codes and data for use in transmitting operating commands to a plurality of different home appliances of different manufacturers, a method comprising:

matching the universal remote control to a plurality of different home appliances of different manufacturers such that selected codes and data from the library are used to transmit operating commands to the matched home appliances in response to activation of selected pushbutton of the keyboard; and

using activation of one or more pushbuttons of the keyboard to directly identify each of the plurality of different home appliances of different manufacturers to which the universal remote control is to be matched.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,587,067 B2
DATED : July 1, 2003
INVENTOR(S) : Paul V. Darbee et al.

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:

Column 22,


Line 5, insert -- wherein the -- before "instructions"

Line 20, the second "pushbutton" should be -- pushbuttons --

Line 46, "pushbutton" should be -- pushbuttons --

Signed and Sealed this

Fourteenth Day of September, 2004

A handwritten signature in black ink on a grid background. The signature reads "Jon W. Dudas" in a cursive style.

JON W. DUDAS

Director of the United States Patent and Trademark Office

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| Form PTO 1449 (Rev. 2-32) U.S. Department of Commerce Patent and Trademark Office | Atty. Docket No. | Serial No. 09/791,354 |
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| Information Disclosure Statement by Applicant | Applicant: Darbee et al. |
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| (Use several sheets if necessary) | Filed: February 23, 2001 Group: |
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U.S. Patent Documents

| Init. | Document No. | Date | Name | Class | Subclass | Filing Date |
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Foreign Documents

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Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)

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| | 1 | "Home Run – Micromint's Home Control System Users Manual Rev 1.0", The Micromint, Inc., pp. 1-159, April 1, 1985. |
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Examiner: Initial if citation considered, whether or not citation is in conference with MPEP 609; Draw line through citation if not conformance and not considered. Include a copy of this form with the next communication to applicant.



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Bib Data Sheet

CONFIRMATION NO. 7865

| SERIAL NUMBER | FILING OR 371(c) DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. |
|---------------|-----------------------|-------|----------------|---------------------|
| 90/007,876 | 01/17/2006 RULE | 341 | 3992 | |

APPLICANTS
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 JONATHAN D. HANISH, MINDEN, NV

**** CONTINUING DATA *******
 This application is a REX of 09/791,354 02/23/2001 PAT 6,587,067
 which is a CON of 09/408,729 09/29/1999 PAT 6,195,033
 which is a CIP of 07/990,854 12/11/1992 PAT 6,014,092
 which is a CIP of 07/913,523 07/14/1992 ABN
 which is a CIP of 07/586,957 09/24/1990 ABN
 which is a CIP of 07/127,999 12/02/1987 PAT 4,959,810
 which is a CIP of 07/109,336 10/14/1987 ABN

**** FOREIGN APPLICATIONS *******


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|---|----------------------|----------------|-------------------|-------------------------|
| Foreign Priority claimed <input type="checkbox"/> yes <input type="checkbox"/> no | STATE OR COUNTRY | SHEETS DRAWING | TOTAL CLAIMS 6 | INDEPENDENT CLAIMS 4 |
| 35 USC 119 (a-d) conditions met <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Met after Allowance | | | | |
| Verified and Acknowledged | Examiner's Signature | Initials | | |

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 CHICAGO ,IL 60101

TITLE
 UNIVERSAL REMOTE CONTROL WITH MACRO COMMAND CAPABILITIES

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| FILING FEE RECEIVED 2520 | FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following: | <input type="checkbox"/> All Fees |
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| Application Number  | Application/Control No. 90/007,876 | Applicant(s)/Patent under Reexamination 6587067 | |
| | Examiner *** | Art Unit 3992 | |

Index of Claims



Application/Control No.

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Examiner

Applicant(s)/Patent under Reexamination

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Art Unit

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| Issue Classification  | Application/Control No. 90/007,876 | Applicant(s)/Patent under Reexamination 6587067 | |
| | Examiner *** | Art Unit 3992 | |

| ISSUE CLASSIFICATION | | | | | | | | | | |
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| ORIGINAL | | | | CROSS REFERENCE(S) | | | | | | |
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| <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 | |
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| Reexamination  | Application/Control No. 90/007,876 | Applicant(s)/Patent Under Reexamination 6587067 |
| | Certificate Date | Certificate Number |

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| Requester Correspondence Address: <input type="checkbox"/> Patent Owner <input checked="" type="checkbox"/> Third Party |
| JONATHAN D. HANISH SIERRA PATENT GROUP LTD 1657 HWY 395, SUITE 202 MINDEN, NV 89423 |

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