(51) International Patent Classification 6 : H04B 1/20	A1	(11) International Publication Number: **WO 99/33192**
		(43) International Publication Date: 1 July 1999 (01.07.99)

(21) International Application Number: PCT/US97/23366

(22) International Filing Date: 19 December 1997 (19.12.97)

(71) Applicant *(for all designated States except US)*: THOMSON CONSUMER ELECTRONICS, INC. [US/US]; 10330 North Meridian Street, Indianapolis, IN 46290–1024 (US).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: TESKEY, John, Frederick [US/US]; 12320 Huntington Drive, Indianapolis, IN 46229 (US).

(74) Agents: TRIPOLI, Joseph, S. et al.; GE & RCA Licensing Management Operation Inc., P.O. Box 5312, Princeton, NJ 08543 (US).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).
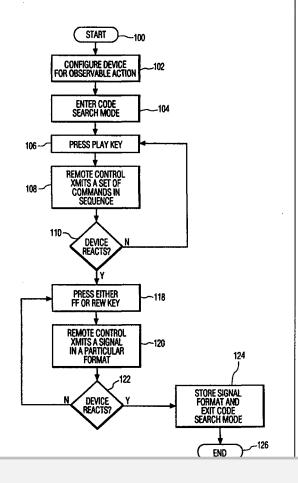
Published
With international search report.

(54) Title: REMOTE CONTROL CODE SEARCH METHOD AND APPARATUS

(57) Abstract

A universal remote control and a method for programming a universal remote control allows a user to quickly and easily identify a set of remote control signal formats that include a desired signal format and then individually test the signal formats in the identified set to identify the desired signal format. A reference code, or other identification information, associated with the desired signal format. In the code search mode of operation, the present universal remote control generates and transmits one of a plurality of sets of signal formats stored in a memory circuit (RAM, ROM) in response to the user pressing a first control key (76). The user repeatedly presses the first control key and observes the controlled device to identify a set of signal formats that includes the desired signal format. After the desired set of signal formats is identified, the user presses either a second or a third control key (74, 78) to individually transmit each signal format in the identified set of signal formats. The user repeatedly presses the second and third control keys and observes the controlled device to identify the desired signal format.

REMOTE CONTROL CODE SEARCH METHOD AND APPARATUS

The present invention relates to remote controls for operating electronic devices, and more particularly to universal remote controls

5 which can be programmed to operate one of a plurality of different types of electronic devices produced by different manufacturers.

Universal remote controls are well known devices which can be programmed by a user to operate one of a plurality of different types of electronic devices produced by different manufacturers. Universal

10 remote controls are often used to control audio/video equipment, such as TVs, VCRs, CD players and the like. Due to their programmability, consumers frequently use universal remote controls to replace lost remote controls and/or as a single control device for controlling a number of separate audio/video components.

15 Prior to use, a universal remote control typically must be programmed for operation with the electronic device being controlled. Programming a universal remote control generally involves identifying and storing a reference code, or some other identification information, associated with the correct signal format into a memory circuit of the

20 universal remote control. Once programmed, the universal remote control transmits control signals having a signal format that is appropriate for the device being controlled. The signal format is determined by characteristics which include, but are not limited to, carrier frequency, pulse width, pulse modulation and overall timing.

25 Several methods are available for programming a universal remote control to transmit control signals having the desired signal format. One method is to manually enter the reference code associated with the controlled device. In such a method, a list of reference codes for a variety of device models is included in the printed instruction set that

30 accompanies the universal remote control. The user finds the reference code associated with the device to be controlled and manually enters the code numbers using a numeric keypad disposed on the universal remote control. This method can be problematic for the user because the specific reference code numbers must be known in order to program the

35 universal remote control. Thus, the reference code list must be kept nearby and consulted whenever a new code must be entered or a particular code needs to be reentered.

Another method of programming a universal remote control is an automatic code searching and storing method. In this method, the

universal remote control automatically and continuously cycles through a set of signal formats by sequentially sending remote control signals based on each of the signal formats in a stored list until the user stops the signal format search sequence. The user initiates and maintains the automatic

5 search sequence by pressing a designated set of keys. During the cycling of the signal formats, the remote control pauses between each signal format allowing the user to observe whether the controlled device reacts to a particular signal format. When the controlled device reacts to the remote control signal in the desired manner, the user knows that the

10 correct signal format, and thus the correct reference code, has been identified and terminates the automatic search sequence. Terminating the search sequence causes the universal remote control to stop cycling through the signal formats and store the reference code, or other identifying information, associated with the most recently transmitted

15 signal format into a memory circuit.

A disadvantage of the automatic search method is that such a method requires the user to react within a predetermined pause period. The user must react within the allotted pause period when the device reacts as expected to a remote control signal in order to stop the cycling

20 of the signal formats and store reference code associated with the desired signal format into a memory circuit. If the user is distracted and/or reacts too slowly, the improper reference code will be stored in memory and the user must repeat the code search operation to find and store the correct reference code. It can be seen that this method becomes difficult

25 and frustrating to use if the user is repeatedly unable to react within the allotted pause periods.

Yet another method of programming a universal remote control is a semi-automatic code search method in which the user steps through a plurality of signal formats stored in a memory portion until the

30 desired signal format is found. In this method, the user steps through a set of signal formats stored in memory by transmitting a sequence of remote control signals, one at a time, wherein each transmitted remote control signal has a different signal format, by pressing a designated set of keys. After each remote control signal format is transmitted, the user

35 observes whether the device reacts to the transmitted signal, i.e., power ON/OFF or channel UP/DOWN. When the device reacts to the signal in the expected manner, the user knows that the appropriate signal format has been transmitted. At this point, the user presses another set of keys to terminate the code search operation and store the reference code, or

other identifying information, associated with the last transmitted signal format into a memory circuit.

A difficulty with the above-described method is that the user may be forced to step through a large number of signal formats before
5   identifying the correct signal format because there may be a large number of signal format possibilities stored in the memory circuit. In fact, the reference codes are getting longer, moving from two digits to three and four digits, due to the longer list of formats available. It can be seen that such a difficulty can make this method tedious and time
10 consuming. This is especially problematic if the desired signal format is stored near the end of the signal format list.

What is needed is an improved method of quickly and easily programming a universal remote control to transmit remote control signals in a desired signal format. In particular, it is desired to be able to
15 program a universal remote control without having to refer to a printed list of reference codes and manually enter a specific reference code into the universal remote control. It is also desired to be able to program a universal remote control by cycling through a set of stored signal formats wherein the user can quickly, easily and efficiently control the rate at
20 which the stored signal formats are transmitted and tested.

The present invention involves a universal remote control and a method for programming a universal remote control which allows a user to quickly and easily test a set of stored signal formats to identify the desired signal format and store a reference code, or other identifying
25 information, associated with the desired signal format into a memory circuit such that subsequent remote control signals will be transmitted in the desired signal format.

The present universal remote control comprises a signal transmitter, data entry means for allowing a user to enter data and one of
30 a plurality of code search commands, a memory circuit, and a controller. The controller generates and applies one of a plurality of sets of remote control signals to the signal transmitter in response to user entry of a first code search command. Each of the sets of remote control signals comprises a plurality of remote control signals and each of the remote
35 control signals has a respective signal format based on a list of signal formats stored in the memory circuit. The controller also generates and applies one of the remote control signals from the most recently transmitted set of remote control signals in response to user entry of a second code search command. The controller stores an identification

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.

fastcase®
Smarter legal research.