

Remote controller.

The invention relates to a remote controller, comprising a control code table in which groups of control codes for a plurality of target devices to be controlled are stored, and selection control means for selecting one of said groups of control codes for
5 controlling a target device.

Remote controllers as defined in the above opening paragraph are usually referred to as preprogrammed remote controllers. The control codes for a plurality of different manufacturers of controlled appliances are prestored in the controller. On example
10 of such a remote controller is disclosed in EP-A-0 331 257. In this remote controller, the user must enter a code in order to identify which group of prestored control codes is to be used. The code to be entered must be looked up in the controller's user manual. Another example is disclosed in US-A-4,703,359. This remote controller identifies the group of control codes to be used by successively transmitting a predetermined trial command from
15 each group until the controlled appliance correctly responds. While transmitting the trial commands, the user must carefully watch the controlled appliance, and immediately stop the transmission after the response evoking control code has been transmitted.

It is an object of the invention to further improve the convenience of a
20 universal remote controller.

To that end, the remote controller in accordance the invention is characterized in that the remote controller comprises means for receiving at least one control code from another remote controller, and in that the selection control means are arranged to recognize the target device corresponding with the received control code and select the group
25 of control codes corresponding with the recognized target device as control codes for controlling said target device.

The invention enables a user to easily replace a conventional dedicated remote controller by a universal remote controller. To that end, the conventional controller and the universal remote controller are placed face-to-face and an arbitrary key of the

conventional controller is pressed. The universal controller can then control all the functions of the target appliance.

The remote controller can replace a plurality of conventional dedicated controllers by providing the above feature for a plurality of target devices, such as a television, a video recorder, a compact disc player, etc.

Fig. 1 shows a block-diagram of the remote controller in accordance with the invention.

Fig. 2 shows an arrangement of a conventional remote controller and the remote controller in accordance with the invention.

Fig. 3 shows a flow-chart of operations carried out by the remote controller in accordance with the invention.

Fig. 1 shows a block-diagram of the remote controller in accordance with the invention. In Fig. 1, a photo diode 11 is a photo sensor for receiving an infrared remote control code from another remote controller. A pre-amplifier 12 amplifies a predetermined frequency signal selectively. A demodulating part 13 generates digital data of for the control code by demodulating the signal which is amplified by the pre-amplifier. A key matrix 14 comprises operational keys of the remote controller. A key encoder 15 generates a key code for each key by scanning the key matrix 14. A control circuit 16 controls the operation of the remote controller. ROM 17 is a control code table in which control code for one or more controllable appliances are stored. RAM 18 is SRAM or a flash memory in which control codes and macro programs for the actually controlled appliance are stored. The ROM 17 and RAM 18 may be realized as individual devices or as part of the control circuit 16. A display 19 is a LED or LCD display for displaying status and other data of the remote controller. An output buffer 20 applies each control code to be transmitted to an infrared light emitting device 21.

Fig. 2 shows an arrangement of a conventional remote controller 30 and a universal remote controller 10 in accordance with the invention. The controllers are positioned such that photodiode 11 of the universal remote controller 10 receives infrared control commands issued by the conventional controller 30.

The operation of the universal remote controller 10 is determined by a control program which is stored in and executed by the control circuit 16. Fig. 3 shows a flow-chart of operations carried out by said control program. In a step S1, the remote

controller is set into a recognition mode. In a step S2, the controller awaits reception of an infrared control code from the conventional controller 30. Such a control code is issued by the conventional controller in response to pressing an arbitrary key. In a step S3, the control code is received. More particularly, the control code is received by photo diode 11,
5 demodulated in demodulation part 13 after being amplified by pre-amplifier 12, and applied to control circuit 16.

In a step S4, the control circuit 16 checks whether the received control code corresponds with one of the control codes that are stored in ROM 17. If no corresponding control code can be found, or if more than one group of control codes in
10 ROM 17 has a corresponding control code, an invitation to press a different key is displayed on display 19 and the program returns to the step S2. Thus, in case that the target device cannot be recognized by a single control code, recognition is made on the basis of multiple control codes.

If the target device (i.e. the manufacturer and classification of control
15 codes) has been recognized, the control program proceeds to a step S5 in which the control circuit 16 reads out the control code group corresponding to the recognized controlled apparatus and stores them in RAM 18 for subsequent use. For example, in case that the received control code is recognized as a control code for a videorecorder of company A, the prestored control codes for A's videorecorder are used for the videorecorder mode of the
20 remote controller 10. The same procedure applies to other categories of controlled appliances such as television, compact disc players, etc. Finally, the remote controller assumes a standby mode in a step S6.

Disclosed is a preprogrammed universal remote controller. In order to identify which of the plurality of prestored groups of control codes are to be used for
25 controlling a given appliance, the controller requires one control command to be received from the appliance's dedicated remote controller. The controller recognizes the control code group comprising said control command and subsequently uses the control codes of said group for controlling the appliance.

**CLAIM:**

1. A remote controller, comprising:
 - a control code table in which groups of control codes for a plurality of target devices to be controlled are stored;
 - selection control means for selecting one of said groups of control codes for
- 5 controlling a target device;
- characterized in that the remote controller comprises means for receiving at least one control code from another remote controller, and in that said selection control means are arranged to:
 - recognize the target device corresponding with the received control code; and
- 10 select the group of control codes corresponding with the recognized target device as control codes for controlling said target device.

