

METHOD OF AND SYSTEM FOR PERFORMING TIME SETTING

This invention relates to a method of setting time in a digital timepiece, e.g. a clock, through a ten key keyboard.

A conventional digital clock having an alarm function in which time setting is performed through a ten key keyboard is shown in Figure 3. A lock switch 8 is normally in a locked state. When in a set state time data is entered through a ten key keyboard 9. Mode keys 10, select a function, e.g. time of day or alarm time, to be subject to time setting. A set key 12 takes in the time data from the ten key keyboard 9 to execute time setting.

When time setting is performed in such a conventional digital clock, first the lock switch 8 is moved to the set state to enable time setting to be performed. Next, selection as to which one of the time of day and alarm time should be subject to time setting is performed by the mode keys 10,11. Time data is then entered through the ten key keyboard 9. Upon completion of entry of the time data, the time data is taken in through the set key 12 to perform time setting.

In this method, it is necessary to select a time setting mode by operating the lock switch 8. This has the disadvantage of increasing the cost of the digital clock and the lock switch 8 takes up a considerable amount of space. Moreover, the operation is complicated.

The present invention seeks to provide a method of and system for performing time setting in, for example, a digital clock where no lock switch is required.

According to one aspect of the present invention,  
5 there is provided a method of performing time setting in a digital timepiece comprising the steps of: designating a function to be subject to time setting by operating a mode key; entering time data through a ten key keyboard; operating a set key for instructing execution of time setting; and performing time  
10 setting of said designated function on the basis of the time data entered by the ten key keyboard as long as both the condition that operation of one key of said ten key keyboard has been made within a first predetermined time from operation of said mode key and the condition that the entry of the time data by said ten key keyboard  
15 and the operation of said set key have been made within a second predetermined time from the operation of said one key, are satisfied.

According to a further aspect of the present invention there is provided a system for performing time setting in a digital timepiece comprising: a mode key for designating  
20 a function to be subject to time setting; a ten key keyboard for entering time data; a set key for instructing execution of the time setting of the designated function; counter means

for counting a period of time from the operation of said mode key; and means responsive to said counter means for performing time setting of said designated function on the basis of the tie data entered by said ten key keyboard when both the condition  
5 that the operation of one key of said ten key keyboard is made within a first predetermined time from operation of said mode key and the condition that the entry of the time data by said ten key keyboard and the operation of said set key are made within a second predetermined time from the operation of said one key, are  
10 satisfied.

The invention is illustrated, merely by way of example, in the accompanying drawings, in which:-

Figure 1 is a block diagram showing an embodiment of a system according to the present invention performing time setting;

15 Figure 2 is a flow chart for explaining the operation of the system of Figure 1; and

Figure 3 is an explanatory diagram showing a system for performing time setting in a conventional digital clock.

Referring first to Figure 1, an embodiment of a system  
20 according to the present invention for performing time setting in a digital clock will be described. The system is constituted by a keyboard 1 including a mode key for performing selection as to which function, e.g. time of day or alarm time should be subject to time setting, a ten key keyboard for entering  
25 time data, and a set key for taking in entered time data so as to perform time setting. A key discrimination circuit 2

discriminates the key operated from the three kinds of keys referred to above. A counter 3 counts the period of time from when the mode key is operated to when one of the keys of the ten key keyboard is first operated, the period of time required  
5 for the entry of the time data using the ten key keyboard, and the period of time required for operation of the set key. A data control circuit 4 is constituted by a CPU. A register 5 is provided for temporarily storing the time data. A check circuit 6 checks whether the data in the register 5 is valid  
10 or not. A clock circuit 7 is also provided.

Referring now to the flow chart of Figure 2, the operation of the system of Figure 1 will be described. When any one of the keys is operated, a decision is made by the key discrimination circuit 2 as to whether the key that has been  
15 operated is the mode key (step a in Figure 2). When the discrimination circuit 2 determines that the operated key is the mode key, the register 5 is cleared and set for performing the time setting of the time of day or the alarm time, and at the same time, the system is released from a locked state  
20 to a time-setting enable state (step b in Figure 2). A flag is set to be "1" and at the same time the content of the counter 3 is reset to zero (step c in Figure 2).

When the flag is set to be "1", the counter 3 is incremented by 1 each second (step d in Figure 2), and if one of the keys  
25 of the ten key keyboard is not operated within four seconds, the system reverts to the locked state again and a flag is

reset to "0", i.e. an initial state (step e in Figure 2).

On the other hand, if one of the keys of the ten key keyboard is operated before the counter 3 has counted four seconds, this data is set in the register 5, and at the same time, the  
5 flag is set to "2" and the counter 3 is reset to "0" (step f in Figure 2).

When the flag is set to "2", the counter 3 is incremented by 1 each minute. When the time data is not set before the counter 3 has counted two minutes, the system reverts to the  
10 locked state so that the flag is reset to be "0", i.e. to the initial state and the data in the register 5 is cleared (step g in Figure 2).

If time data is entered using the ten key keyboard and the set key is operated before the counter 3 has counted two  
15 minutes, the check circuit 6 checks if the time data is valid or not (step h in Figure 2). If the time data entered represents an invalid numerical value, the system returns to an initial state.

When the time data is valid, the data in the register  
20 5 is preset in the clock circuit 7 thereby to perform the time setting (step i in Figure 2). The data in the register 5 is cleared and the system reverts to the locked state, and at the same time, the flag is reset to the initial "0" state (step j in Figure 2).

25 In this system a lock switch for selecting a time setting mode and a normal mode is unnecessary, so that it is possible to provide a digital clock or other timepiece whose arrangement



22

-7-

CLAIMS

1. A method of performing time setting in a digital timepiece comprising the steps of: designating a function to be subject to time setting by operating a mode key; entering time data through a ten key keyboard; operating a set key for instructing  
5 execution of time setting; and performing time setting of said designated function on the basis of the time data entered by the ten key keyboard as long as both the condition that operation of one key of said ten key keyboard has been made within a first predetermined time from operation of said mode key and the  
10 condition that the entry of the time data by said ten key keyboard and the operation of said set key have been made within a second predetermined time from the operation of said one key, are satisfied.
2. A system for performing time setting in a digital timepiece  
15 comprising: a mode key for designating a function to be subject to time setting; a ten key keyboard for entering time data; a set key for instructing execution of the time setting of the designated function; counter means for counting a period of time from the operation of said mode key; and means responsive  
20 to said counter means for performing time setting of said designated function on the basis of the time data entered by said ten key keyboard when both the condition that the operation of said ten key keyboard is made within a predetermined time from operation of said mode key and the condition that  
25 the entry of the time data by said ten key keyboard and the operation of said set key are made within a predetermined



time from the operation of said one key, are satisfied.

3. A method of performing a time setting substantially as herein described with reference to Figures 1 and 2 of the accompanying drawings.

5 4. A system for performing time setting substantially as herein described with reference to and as shown in Figures 1 and 2 of the accompanying drawings.

---

10

15