

PATENT SPECIFICATION

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(54) ELECTRONIC TIMEPIECE

(71) We, KABUSHIKI KAISHA SUWA
 SHIKOSH, a Japanese company of 3-4,
 4-chome, Ginza, Chuo-ku, Tokyo, Japan,
 do hereby declare the invention for which
 5 we pray that a patent may be granted to
 us, and the method by which it is to be
 performed to be particularly described in
 and by the following statement:—

This invention concerns an electronic
 10 timepiece.

According to the present invention, there
 is provided an electronic timepiece having
 digital indicating means for numerically in-
 dicating the hour and the minute only of
 15 the time, and at least one flickering display
 member which is arranged to flicker at a
 visibly discernible rate.

The use of such a flickering display
 member or members enables one to check
 20 readily whether the electronic timepiece is
 operating or not.

The or each flickering display member is
 preferably arranged to flicker periodically
 on and off with a period whose duration is
 25 between one fifteenth of a second and five
 seconds. Thus with this feature one may
 quickly determine whether the timepiece is
 operating satisfactorily or not.

The or each flickering display member
 30 may be arranged to flicker periodically on/
 off with a period of one second. Alter-
 natively, two flickering display members
 may be provided which are arranged to
 flicker alternately, the periodic time of the
 35 flickering of each display member being
 two seconds.

The or each flickering display member
 may be disposed between the hour and the
 minute indicating means.

40 The timepiece is preferably a wrist
 watch.

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

45 Figures 1 and 2 illustrate portions of
 [Price 25p]

known electronic timepieces, and

Figures 3 and 4 show alternative em-
 bodiments of portions of electronic
 timepieces according to the present in-
 vention.

In Figure 1 there is shown a part of a
 known electronic timepiece having a liquid
 crystal or a luminous diode for numerically
 indicating the time, the two numerals 10
 representing the hour indication and the
 55 two numerals 11 representing the minute
 indication.

Since in the construction of Figure 1
 only the hour and the minute of the time
 are shown, the circuitry required (which is
 not shown) is simple. However, it may take
 a whole minute to discover whether the
 watch is working or not, and this period is
 too long for convenience.

In the case of the known electronic
 65 timepiece indicated in Figure 2, in addition
 to being provided with the numerals 10
 and 11 representing the hours and minutes
 respectively, the timepiece is also provided
 with two numerals 12 representing the
 70 seconds.

This gives a clear display whose
 numerals 12 representing the seconds
 change at one second intervals, so that it
 can easily be seen whether the watch is
 75 working or not. However, the circuitry re-
 quired is complicated and the number of
 electrical connections which are necessary
 is increased. Thus in the case of two
 numerals 12 each comprising seven seg-
 80 ments, $7 \times 2 = 14$ connections will be
 needed. Consequently the construction is
 not convenient for practical and wide use.

In the construction according to the
 present invention which is shown in Figure
 85 3, the numerals 10 for indicating the hour
 and the numerals 11 for indicating the
 minutes are provided in the same way as
 in the Figure 1 construction, but no
 numerals 12 are provided for indicating the
 90

seconds, in contrast to the Figure 2 arrangement. Between the hour numerals 10 and the minute numerals 11 there are disposed two flickering display cells 13, 14 which are connected in a circuit (not shown) such that they are caused to flicker by means of a signal obtained from an intermediate stage of a divider. This signal is arranged to cause the display cell to flicker on and off at a visibly discernible rate, e.g. at regular intervals whose duration is between one fifteenth of a second and five seconds. Thus the period of a complete ON-OFF cycle will normally be in excess of one tenth of a second. This will enable the operation of the watch to be easily checked, so that the disadvantages of the Figure 1 construction are avoided without requiring the complicated circuitry and multiplicity of connections necessary in the Figure 2 construction.

If the display cells 13, 14 are arranged to flicker at one second intervals, then the second can be readily ascertained, and the circuitry will be almost the same as that of Figure 1 with the addition of only one or two extra electrical connections. This is the arrangement shown in Figure 3 which is therefore very practical.

Alternatively, as indicated in Figure 4, the flickering display cells 13, 14 may be arranged to flicker alternately on and off repetitively at 2 second intervals. That is to say, the cell 3 is ON when the cell 4 is OFF and vice versa, the ON periods of a cell commencing at 2 second intervals. Such an arrangement provides an attractive design and a clear display.

If the rate at which the display cells 13, 14 flicker is one or two seconds as described above, a second can be readily ascertained and the arrangement is more re-

liable and less costly than the arrangement shown in Figure 2 in which the seconds are displayed by means of the numerals 12.

WHAT WE CLAIM IS:—

1. An electronic timepiece having digital indicating means for numerically indicating the hour and the minute only of the time, and at least one flickering display member which is arranged to flicker at a visibly discernible rate.

2. A timepiece as claimed in claim 1 in which the or each flickering display member is arranged to flicker periodically on and off with a period whose duration is between one fifteenth of a second and five seconds.

3. A timepiece as claimed in claim 2 in which the or each flickering display member is arranged to flicker periodically on/off with a period of one second.

4. A timepiece as claimed in claim 2 in which there are two flickering display members which are arranged to flicker alternately, the periodic time of the flickering of each display member being two seconds.

5. A timepiece as claimed in any preceding claim in which the or each flickering display member is disposed between the hour and the minute indicating means.

6. A timepiece as claimed in any preceding claim in which the timepiece is a wrist watch.

7. An electronic timepiece substantially as hereinbefore described with reference to and as shown in Figure 3 or Figure 4 of the accompanying drawings.

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5 are connected in a circuit (not shown) such that they are caused to flicker by means of a signal obtained from an intermediate stage of a divider. This signal is arranged to cause the display cell to flicker on and
10 off at a visibly discernible rate, e.g. at regular intervals whose duration is between one fifteenth of a second and five seconds. Thus the period of a complete ON-OFF
15 cycle will normally be in excess of one tenth of a second. This will enable the operation of the watch to be easily checked, so that the disadvantages of the Figure 1 construction are avoided without
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35 OFF and vice versa, the ON periods of a cell commencing at 2 second intervals. Such an arrangement provides an attractive design and a clear display.

If the rate at which the display cells
40 13, 14 flicker is one or two seconds as described above, a second can be readily ascertained and the arrangement is more re-

liable and less costly than the arrangement shown in Figure 2 in which the seconds are displayed by means of the numerals 45 12.

WHAT WE CLAIM IS:—

1. An electronic timepiece having digital indicating means for numerically indicating the hour and the minute only of the time, and at least one flickering display member which is arranged to flicker at a visibly discernible rate. 50

2. A timepiece as claimed in claim 1 in which the or each flickering display member is arranged to flicker periodically on and off with a period whose duration is between one fifteenth of a second and five seconds. 55

3. A timepiece as claimed in claim 2 in which the or each flickering display member is arranged to flicker periodically on/off with a period of one second. 60

4. A timepiece as claimed in claim 2 in which there are two flickering display members which are arranged to flicker alternately, the periodic time of the flickering of each display member being two seconds. 65

5. A timepiece as claimed in any preceding claim in which the or each flickering display member is disposed between the hour and the minute indicating means. 70

6. A timepiece as claimed in any preceding claim in which the timepiece is a wrist watch. 75

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