

"TIMEPIECE"

This invention relates to timepieces including settable, time-initiated alarms and alarm stop devices therefor.

5 In the past, alarm stop devices for such timepieces included a switch whose opening and closing were controlled by a movable alarm stop member. Additionally, a separate snooze switch was provided to over-ride the alarm and repeat it after the lapse of a predetermined period of time. Such a separate snooze switch could be opened or
10 closed, irrespective of whether the alarm stop switch was open or closed.

A problem arises with circuit arrangements of such timepieces in that electric current is consumed when the alarm stop switch is opened with the snooze switch
15 closed. Particularly in the case of a portable thin watch which can be kept, for example, in an inner pocket of a business suit, unnecessary closure of the snooze switch may accidentally occur within the pocket, thus causing an unnecessary consumption of electricity. Moreover, because
20 such a snooze switch can be opened or closed irrespective of whether the alarm stop switch is open or closed, a mere

touch on the alarm stop member does not permit determination of whether the alarm stop switch is open or closed.

The invention seeks to overcome these problems and to provide an alarm stop device for a timepiece, in which the opening and closing of its snooze switch can be controlled depending on the open or closed state of the alarm stop switch, in order to avoid unnecessary consumption of electricity, and in which a mere touch on the alarm stop member permits determination with ease of whether the alarm stop switch is open or closed.

According to the invention, a timepiece has a settable, time-initiated alarm, an alarm stop device including an alarm stop member movable between an alarm stop position in which an alarm switch is opened and an alarm set position in which the alarm switch is released for closure, and a snooze switch, the alarm stop member in the alarm set position being movable in a direction other than that towards the alarm stop position, to close the snooze switch and in the alarm stop position being prevented from so moving.

Preferably, the alarm stop member is slidable between the alarm stop position and the alarm set position.

Conveniently, the movement of the alarm stop member in the alarm stop position to close the snooze switch is derived from pressure in a direction substantially normal to the sliding direction.

5 Advantageously, the snooze switch closure movement is pivotation of the alarm stop member.

For preference, a portion of the alarm stop member engages a fixed part of the timepiece in the alarm stop position to prevent snooze switch closure movement.

10 From another aspect, the invention includes an alarm stop device for a timepiece, comprising a slidable alarm stop member, an alarm stop switch actuatable by the alarm stop member, an engagement element on the alarm stop member, a control element which allows depression of the
15 engagement element when the alarm stop switch is not actuated by the alarm stop member, and which inhibits depression of the engagement element when the alarm stop switch is actuated by the alarm stop member, and a snooze switch closed by depressing the alarm stop member engagement
20 element.

Thus, when the alarm stop member is in the position in which it allows the operation of the alarm stop switch, the control element allows depression of the alarm stop member so that the snooze switch can be closed
25 by the depressing action.

Further, when the alarm stop member is slid to place the alarm stop switch in the non-operative condition, the alarm stop lever cannot be depressed and therefore the snooze switch cannot be closed.

5 A preferred embodiment of alarm stop device for a timepiece according to the invention, is hereinafter particularly described, merely by way of example with reference to the accompanying drawings, in which:-

10 Figure 1 is a sectional view of part of a timepiece incorporating an alarm stop device according to the invention; and

Figure 2 is a broken sectional view on the line II-II of Figure 1.

15 A timepiece having an alarm stop device according to the invention, has a case 1 (Figure 1) in which is provided a slot 11 to contain a button portion 21 of a movable alarm stop member 2. The button portion 21 is slightly shorter than the length of the slot 11, so that it is slidable in the slot from end to end. The member 2 has an integral
20 extension leg 22 in substantially the direction of sliding of the button portion 21. At its end, the extension leg 22 has an engagement nose 22b which engages a shaped projection 24, secured in the case 1. With the button portion 21 of the

member 2 in the alarm set position, as shown in full lines in Figure 1, the nose 22b engages one face of the projection 24. As the member 2 is slid to the alarm stop position, as shown in chain dotted lines in Figure 1, the nose 22b first passes over the projection 24, due to the resilience of the leg 22, and then engages another opposite face of the projection 24. This occurs with a click and provides against accidental sliding of the member 2, whilst permitting deliberate sliding. It will be appreciated that the leg 22 is thin in a direction transverse to the direction of sliding, and into the case 1.

The member 2 has an integral alarm stop actuator extension 23 projecting into the case 1 and being thin in a direction transverse to the direction of sliding, and across the case 1. At the end of the button portion 21 of the member 2 which leads into the extension 23, there are side arms 14 having part cylindrical peripheries on either side within the case 1. These arms 14 are engaged between an end wall of the case 1 and projections 13 from either side wall of the case 1. The projections 13 have flat faces opposite the flat face of the end wall, so as to guide the member 2 for sliding movement thereof. At the same time, the part cylindrical shape of the side arms 14 permits pivotation of the member 2

to a limited extent.

5 The settable time-initiated alarm includes a blade
spring 4 whose blade end 41 is soldered to a circuit pattern
(not shown) on a printed circuit board 5. At its other
end, the blade spring 4 has two side extensions. One side
extension 42 resiliently engages a settable alarm wheel
6. The wheel 6 is associated with a co-axial time wheel
7, so that at the set time for the alarm, the wheel 7
which rotates with time, engages with the wheel 6 in such
10 a manner as to permit the tip end of the blade spring
4 to move downwardly as viewed in Figure 2. On the other
side extension is a contact 43 aligned with a contact end
81 of an electrical connector 8 secured to the board 5.
In the alarm set position of the wheels 6 and 7, that is
15 when the actual time does not correspond with the alarm
time set, the tip end of the blade spring 4 is raised
so that the contact 43 is not in contact with the contact
end 81 of the connector 8, as shown in chain dotted lines
in Figure 2. When the actual time and alarm time set
20 correspond, the tip end of the blade spring 4 drops and the
contact 43 engages the contact end 81, as shown in full
lines in Figure 2.

25 The other side extension of the tip end of the blade
spring 4 also has a bent out portion 44 with a cam-like
surface facing a complementarily shaped end face of the
alarm stop actuator portion 23 (Figure 2). If the button

portion 21 of the member 2 is slid to the alarm stop position, the end face of the actuator portion 23 engages the surface of the portion 44 and raises the tip end of the spring 4 to disengage the contact 43 from the contact end 81, as shown in chain dotted lines in Figure 2.

The electrical connector 8 is of generally flat shape and has the contact end 81 bent out through two bends (Figure 2) to lie in a plane substantially parallel with that of the connector 8. At its other end the connector is bent at right angles to form a contact piece 82, constituting a fixed element of a snooze switch 9. The other movable element of the switch 9 is a contact blade 10 connected to the board 5 at one end, and extending substantially parallel to the extension leg 22 of the member 2.

The extension leg 22, close to the button portion 21 of the member 2, has an internally facing semi-cylindrical projection 22a against which the blade 10 is resiliently pre-stressed so as to be out of contact with the contact 82. The projection 22a has its ends engaged within grooves 12 in the case 11 on either side of the blade 10. Each groove 12 has a wide portion in which the projection 22a is located with the member 2 in the alarm

set position and a narrow portion in which the projection 22a is located with the member 2 in the alarm stop position, as shown in chain dotted lines in Figure 1. In the former position, the button portion 21 may be pressed to pivot the member 2 about the side arms 14 and the projection 22a is free to move in the wide portion of the grooves 12 to press the blade 10 to contact the contact 82 and thus to close the snooze switch. This stops the alarm and repeats it after a predetermined lapse of time. In the alarm stop position, however, the projection 22a is in the narrow portion of the grooves 12, and the member 2 cannot be pivoted by pressure of the button portion 21.

In operation, the alarm stop member 2 is placed in the alarm set position as shown in solid lines in Figure 1, the alarm time is set by the wheel 6 and the timepiece is in the alarm set condition. When the actual time coincides with the alarm set time, the tip end of the blade spring 4 is released so that the contact 43 engages the contact end 81 of the connector 8, as shown in Figure 2, causing the sounding of an alarm. At that time, the projection 22a on the alarm stop member 2 is positioned in the wide portion of the groove 12, so that the button portion 21 of the alarm stop member 2 can be

pressed to pivot the member 2 in the clockwise direction in Figure 1. The snooze contact blade 10 then comes into contact with the contact 82, thereby closing the snooze switch 9. This stops the alarm and initiates a repetition of the alarm after the lapse of a predetermined period of time.

If the alarm stop member 2 is slid down to the position shown in chain dotted lines in Figure 1, the actuator portion 23 of the alarm stop member raises the tip end of the blade spring 4 as shown in Figure 2 so that the contact 43 is moved away from the contact end 81 of the connector 8, so that the alarm is stopped permanently until the member 2 is again slid to the alarm set position.

In the alarm stop position, the projection 22a is located in the lower narrow portion of the groove 12, so that the clockwise pivotation of the alarm stop member 2, due to pressure on the button portion 21, is prevented by the groove 12. Accordingly, the snooze contact blade 10 cannot be brought into engagement with the contact 82 to close the snooze switch 9.

Closure of the snooze switch by pressure on the alarm stop member, is impossible with the alarm stop position, thus avoiding unnecessary electric power consumption. The alarm set condition and the alarm stop

condition may be easily distinguished, depending on whether pressure on the alarm stop member results in pivotation or not.

C L A I M S

1. A timepiece having a settable time-initiated alarm, an alarm stop device including an alarm stop member movable between an alarm stop position in which an alarm switch is opened and an alarm set position in which the alarm switch is released for closure, and a snooze switch, the alarm stop member in the alarm set position being movable in a direction other than that towards the alarm stop position, to close the snooze switch and in the alarm stop position being prevented from so moving.
2. A timepiece according to claim 1, wherein the alarm stop member is slidable between the alarm stop position and the alarm set position.
3. A timepiece according to claim 2, wherein the movement of the alarm stop member in the alarm stop position to close the snooze switch is derived from pressure in a direction substantially normal to the sliding direction.
4. A timepiece according to claim 3, wherein the snooze switch closure movement is pivotation of the alarm stop member.
5. A timepiece according to any preceding claim, in which a portion of the alarm stop member engages a fixed part of the timepiece in the alarm stop position to prevent snooze switch closure movement.



* C L M S *

6. A timepiece having a settable time-initiated alarm, an alarm stop device and a snooze switch, substantially as hereinbefore particularly described with reference to the accompanying drawings.

5 7. An alarm stop device for a timepiece, comprising a slidable alarm stop member, an alarm stop switch actuatable by the alarm stop member, an engagement element on the alarm stop member, a control element which allows depression of the engagement element when the alarm stop switch is not
10 actuated by the alarm stop member, and which inhibits depression of the engagement element when the alarm stop switch is actuated by the alarm stop member, and a snooze switch closed by depressing the alarm stop member engagement element.



* C L M S *

9. An alarm stop device of a timepiece comprising:

a slidable alarm stop lever;

an alarm stop switch actuatable by said alarm stop lever

5 an engagement element provided on said alarm stop lever;

a control element which allows depression of such engagement element when said alarm stop switch is operative, and which inhibits depression of said engagement element

10 when said alarm stop switch is not operative; and

a snooze switch which can be opened and closed by depressing said alarm stop lever.



* C L H S *