

PATENT SPECIFICATION

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(54) ELECTRONIC ALARM WRIST WATCH

(71) We, KABUSHIKI KAISHA SUWA SEIKOSHA, a Japanese Company of 3—4, 4-chome, Ginza Chou-ku, Tokyo, Japan, do hereby declare the invention, for which 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 alarm wrist watch.

In a conventional electronic alarm wrist watch the case back is provided with holes so as to render audible the sound produced by the alarm buzzer. However, when the wrist watch is on the user's wrist, such holes are usually occluded by the wrist so that the sound of the alarm is difficult to hear. This is a particular problem because such electronic alarm wrist watches are conventionally driven by a small button-shaped battery so that it is not desirable for very much power to be used in producing the alarm sound.

If on the other hand the said holes in the case back are not provided in the flat portion of the case back which contacts the user's wrist but instead are provided in a bevelled portion of the case back, then although this may avoid the muffling of the sound of the alarm buzzer, it complicates the construction of the case back, especially if the case back incorporates a cover for the battery.

A further disadvantage of the known electronic alarm wrist watch has been that the display panel of the watch, the alarm buzzer, and the battery have overlapped each other with the result that the watch has been thick.

According to the present invention, there is provided an electronic alarm wrist watch having a watch case within which are mounted an electro-optical display device and an alarm buzzer, the watch case having on one side thereof a watch glass through which the electro-optical display device is visible, the opposite side of the watch case being adapted to contact the wrist of the user, the sound of the alarm buzzer being

audible through a portion of the said one side of the watch case, there being no overlap between the electro-optical display device and the alarm buzzer in the direction of a line passing through the centre of the watch glass and of the electro-optical display device.

In the case, thereof, of an electronic alarm wrist watch according to the present invention, the sound of the alarm buzzer is audible through a portion of the side of the watch case which is opposite to that which contacts the wrist of the user and therefore the sound of the alarm buzzer is not muffled. At the same time, the electro-optical display device and the alarm buzzer do not overlap in the said direction and consequently the thickness of the watch is reduced by comparison with that of the prior art.

The said portion preferably comprises an apertured buzzer cover, mounted in a case member which is provided at the said one side of the watch.

The alarm buzzer may be sealed within a housing in the watch case so that water entering the housing through the apertured buzzer cover cannot pass to the remainder of the watch case.

The said opposite side of the watch may be provided with a battery cover.

The invention is illustrated, merely by way of example, in the accompanying drawing, which is a cross-sectional view of the electronic alarm wrist watch according to the present invention.

Terms such as "upper" and "lower" as used in the description below are to be understood to refer to directions as seen in the accompanying drawing.

In the drawing there is shown an electronic alarm wrist watch having a watch case which comprises a case member 1, which is provided at the upper side of the watch, and a case back 2, which is provided at the lower side of the watch, the parts 1, 2 being interconnected by a spring 14.

Mounted in the case member 1 is a watch glass 3 of natural or synthetic glass material, the watch glass 3 being sealed in the case

member 3 by means of an annular gasket 4. The watch glass 3 is supported on an annular member 5, a liquid crystal or other electro-optical display panel 6 being visible through the watch glass 3 and annular member 5. The display panel 6 provides a digital display (not shown) of the time and may, if desired, also provide a display of the day and the date. The display panel 6 is operated by a circuit block 15 which is itself powered by a battery 7. The battery 7 can be introduced into and withdrawn from the watch case 1, 2 on removal of a battery cover 8 which is provided in the case back 2 and thus in the part of the watch case which is adapted to contact the wrist of the user. The battery cover 8 is sealed within the case back 2 by means of an annular gasket 9.

Mounted within the watch case 1, 2 is a cylindrical alarm buzzer 11 which is sealed by an annular gasket 10 within a housing 16 whose upper end is defined by an apertured buzzer cover 12, the latter being mounted in the case member 1. Thus water entering the housing 16 through the apertured buzzer cover 12 cannot pass to the remainder of the watch case, and thus cannot pass to the circuit block 15.

The alarm buzzer 11 is provided on its upper side with a thin plate (not shown) which is vibrated by the buzzer so as to produce the alarm sound, the latter being audible through the apertured buzzer cover 12 at the upper side of the watch where it will not be muffled by the user's wrist. The alarm buzzer 11 is electrically connected to the battery 7 by a spring terminal member 13.

As will be seen from the drawing, in the electronic alarm wrist watch shown therein, there is no overlap between the display panel 6 and the alarm buzzer 11 in the direction of a line L which passes through the centre of the watch glass 3 and through the centre of the display panel 6. Thus the construction is such as to enable the sound of the alarm buzzer to be easily heard while nevertheless ensuring that the watch may be made as thin as possible. The apertured buzzer cover 12 is thus disposed on the same side of the watch as that from which the display panel 6 is visible.

As indicated above, in a conventional electronic alarm wrist watch the watch is thick because the liquid crystal display panel, the buzzer alarm, and the battery all overlap each other, but in the case of the construction shown in the drawings, there is,

in the direction of the line L, overlap only between the display panel 6 and the battery 7 so that a thin alarm wrist watch can be produced.

The design of the wrist watch is such that the case back needs only to be arranged to provide a battery cover 8 so that the design of the case back 2 can be simple, while the provision of the apertured buzzer cover 12 at the upper side of the watch enables one to appreciate at a glance that it is an alarm wrist watch and this helps to give it a smart appearance.

WHAT WE CLAIM IS:—

1. An electronic alarm wrist watch having a watch case within which are mounted an electro-optical display device and an alarm buzzer, the watch case having on one side thereof a watch glass through which the electro-optical display device is visible, the opposite side of the watch case being adapted to contact the wrist of the user, the sound of the alarm buzzer being audible through a portion of the said one side of the watch case, there being no overlap between the electro-optical display device and the alarm buzzer in the direction of a line passing through the centre of the watch glass and of the electro-optical display device.

2. A wrist watch as claimed in claim 1 in which the said portion comprises an apertured buzzer cover, mounted in a case member which is provided at the said one side of the watch.

3. A wrist watch as claimed in claim 2 in which the alarm buzzer is sealed within a housing in the watch case so that water entering the housing through the apertured buzzer cover cannot pass to the remainder of the watch case.

4. A wrist watch as claimed in any preceding claim in which the said opposite side of the watch case is provided with a battery cover.

5. An electronic alarm wrist watch substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

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