

The present invention relates to a watch according to the preamble to patent claim 1.

It is known to provide quartz-controlled watch mechanisms with at least one contact disposed inside the housing and which serves for instance to establish the functions of the watch and/or to adjust the exact time.

In order to actuate such contacts, generally push members or push buttons are provided which can be actuated reliably and without aids. Such push members ought to have clearly defined minimum dimensions. For example, in the case of men's wrist watches, whereas the press stud or push member which projects laterally from the housing substantially in the manner of a conventional winder, will scarcely constitute an obstruction and can also be provided comparatively easily from a technical point of view, in the case of small and/or flat watch mechanisms such as those used for ladies' wrist watches, laterally projecting push buttons are not only aesthetically disturbing but by reason of the small format of the housing on the one hand and the minimum dimensions of the push member on the other, they are difficult to accommodate and actuate.

Therefore, a watch mechanism has become known which is particularly but not exclusively intended for ladies' wrist watches in which the push member which serves a plurality of functions, traverses the bottom of the watch casing and which is therefore invisible when the watch is

being worn. It is true that in this way certain disadvantages of an aesthetic and difficulties of a technical nature are overcome, but only at the expense of other disadvantages. For example, in the case of a wrist watch with a push button or a push member set in the bottom, this latter cannot be easily actuated while the watch is being worn. Furthermore, the push button is constantly in contact with the wearer's skin and is thus exposed to dirt. If the push member is flush with the outer surface of the bottom of the watch housing, then the risk of dirt is reduced but a pointed object is required in order to actuate the push member.

It is therefore an object of the invention to provide a watch of the type mentioned at the outset in which actuation of the contact is quite considerably facilitated particularly in the case of small and flat ladies' watches.

For this purpose, the watch suggested has the features embraced in the characterising part of patent claim 1.

Where a push member traversing the bottom of the housing is used for actuation of the contact, it can be actuated by a pressure on the housing without normally being visible.

The container may consist of an additional cup-shaped part after the fashion of an outer housing in which the watch casing is supported on a thrust spring. This cup-shaped part can completely enclose the actual watch case with the exception of the viewing window.

The container can however also be a depression adapted to the shape of the housing and formed in a base part, for example of glass, crystal or synthetic stone.

Since the watch has absolutely no laterally projecting parts, it is possible, so to speak, to refer to a "crownless" watch, because the push member which traverses the bottom of the housing or the flexible diaphragm which forms the bottom of the housing is not visible at all in the normal way.

Further features of preferred embodiments are disclosed in the dependent claims.

Purely by way of example, the invention is explained in greater detail hereinafter with reference to the accompanying drawings, in which:

Fig.1 is a diagrammatic cross-section through a first embodiment of watch incorporated into a base part, the push member not being actuated;

Fig.2 is a view similar to that in Fig. 1 showing the watch while the push member is being actuated, and

Fig.3 is a diagrammatic cross-section through a second embodiment.

The watch 10 shown in Figs. 1 and 2 comprises a housing 11 with a middle part 12, a bottom 13 which is snap-fitted onto the middle part 12 and with a watch glass 14 fitted into the opposite side. Disposed in the housing 11 is a battery operated quartz controlled watch mechanism 15.

This watch mechanism 15 which is equipped with a stepping motor, not shown, drives hands 16 which together with a

dial 17 form an analogue display which can be viewed through the glass 14.

Provided in the watch mechanism 15 for adjustment purposes is a contact spring 18 which can be actuated by a push member 19 which is displaceably mounted in a lining 20 which can be pressed into the bottom 13.

The entire housing 11 with the watch mechanism 15 is displaceably embedded in a container, which in this case takes the form of a depression 21 in a base part 22. The base part 22 can be constructed as a middle part of a decorative wrist watch but it may also be the base of a table clock. The container can however also be formed by a cup-shaped outer housing part (indicated by broken lines in Fig. 1 and designated 22'), which encloses the housing with the exception of the watch or clock glass 14.

The housing 11 is supported on the bottom 23 of the depression 21 through an annular and undulating leaf spring 24 which engages the periphery of the bottom 13. So that the housing remains secure in the depression 21 and so that its position of rest is defined, there is removably clamped in the depression 21 an abutment ring 25 which co-operates with a shoulder 26 (Fig. 2) constructed on the middle part 12. The abutment ring 25 is provided with an outwardly open peripheral groove 27 in which an O-ring 28 is disposed which furnishes the clamping force required for rigid clamping of the abutment ring 25.

In order to actuate the push member 19, for example in order to adjust the time, the housing can be displaced into the position shown in Fig. 2 solely by pressure on the watch glass 14. If it is necessary for the battery

compartment (not shown) of the watch mechanism 15 which is accessible from the bottom 13 in the usual way to be provided with a new battery, then it is necessary only to remove the abutment ring 15 and the housing 11 can be readily removed from the depression 21. Refitting of the abutment ring 25 presents no problem even without the aid of special tools.

If the watch mechanism is one which has an alarm device, which can likewise be switched on and off by means of a push member set in the bottom, then also this push member can for instance be disposed to traverse the bottom 13 at a location which is diametrically opposite the push member 19. Then, for actuation of one or other push member, it is only necessary to exert a pressure on the watch glass at the place corresponding to the push member which is to be actuated.

A further advantage which the watch described has over watches with laterally projecting push members resides in the fact that the push member 19 is, so to speak, invisible and can be readily actuated in spite of its minimal dimensions. If the base part is of a decorative transparent or translucent but very brittle material, for example glass, crystal, or of some semi-precious stone, into which a depression such as the depression 21 can be machined without any great difficulty, then in the case of the proposed watch, there is no need for drilling a bore or the like which opens out into the depression and which might be used for passage of the push member.

The undulating leaf spring 24 can be secured against being lost by being anchored, for example by adhesion, at a

point on the bottom 23 of the depression or of the bottom 13 of the housing 11.

In the case of the watch 10 shown in Fig. 3, corresponding components are identified by the same reference numerals as in Figs. 1 and 2.

One difference in respect of the embodiment shown in Figs. 1 and 2 resides in the fact that the housing 11 is disposed in a two-part outer housing 22' consisting of an annular part 29 which engages over the middle part 12 of the housing and a bottom part 30 which is snap-fitted onto the annular part 29. Furthermore, for the most part, the bottom 13 of the housing is formed by a resiliently bendable diaphragm 31 which is rigidly clamped on the under side of the middle part 12 by a circlip 32. The outside diameter of the circlip 32 corresponds to the outside diameter of the middle part 12 and is in any case so chosen that the housing 11 is mounted with a sliding fit in the depression 21 formed by the outer housing 22'. The diaphragm 31 has its middle portion resting on a raised portion 33 extending from the bottom part 30 into the interior of the depression 21. Finally, there is constructed on the periphery of the middle part 12 a longitudinal groove 34 engaged by a pin 35 which is impressed into the peripheral wall of the annular part. Thus, the housing 11 is secured against rotation in respect of the outer housing 22' and "wiper movements" of the diaphragm 31 on the raised portion 33 are avoided. If it is intended to actuate the contact 18 which is shown only diagrammatically here, then a pressure in the direction of the arrow 36 is sufficient to overcome the effect of the spring 24: the diaphragm 31 is depressed and its side which is towards the watch mechanism 15

actuates the contact 18 which is indicated only diagrammatically.

In addition to the advantages already mentioned in connection with Figs. 1 and 2, the embodiment shown in Fig. 3 has the advantage that it permits of a flatter construction if it is intended for instance for a wrist watch.

It will however be understood that the housing 11 of the embodiment in Fig. 3 can also be fitted into a depression in a base part subject to the bottom of this depression being provided with a raised portion which, when pressure is applied to the housing, is capable of sufficiently deflecting the diaphragm 21 that the contact 18 is actuated.

Patent claims

1. A watch with quartz controlled mechanism (15) accommodated in a housing (11) and with a display (16, 17) covered by a viewing window (14) and with, disposed inside the housing and serving controlling functions, at least one contact (18) which can be actuated from the bottom (13) of the housing (11), characterised in that the housing (11) is mounted in a container (21) for displacement against spring action so that by pressure on the housing or on the viewing window (14), the contact (18) can be actuated.
2. A watch according to patent claim 1, characterised in that the container (21) is cup-shaped and encloses the housing (11) with the exception of the viewing window (14).
3. A watch according to patent claim 1, characterised in that the container is formed by a depression (21) in a base part (22) into which the housing (11) is embedded.
4. watch according to one of patent claims 1 to 3, characterised in that the bottom (13) of the housing (11) is braced by a thrust spring (24) on the bottom (23) of the container (21).
5. A watch according to one of patent claims 1 to 4, characterised in that the container (21) is provided with an abutment (24) which establishes the inoperative position of the housing (11) in the container (21).



6. A watch according to patent claim 4, characterised in that the thrust spring is an undulating leaf spring (24).
7. A watch according to patent claim 5, characterised in that the abutment (24) is annular and is removably clamped on the upper edge of the container (21).
8. A watch according to patent claim 7, characterised in that the annular abutment (24) comprises an outwardly open annular groove (27) in which there is disposed a sealing element (28) which presses against the inside wall of the container (21).
9. A watch according to patent claim 3, characterised in that the base part (22) is of a transparent or translucent material, for example glass, crystal, synthetic stone or semi-precious stone.
10. A watch according to one of patent claims 4 to 9, characterised in that the thrust spring (24) is at one location anchored either on the bottom (13) of the housing (11) or on the bottom (23) of the container (21).
11. A watch according to patent claim 1, characterised in that the bottom (13) of the housing (11) is formed by a flexible diaphragm and in that the container is formed by an outer housing with a removable bottom which is on its side facing the diaphragm is provided with a raised portion so that the pressure on the housing (11) or on the viewing window (14) causes the diaphragm to be depressed and this in turn actuates the contact.



12. A watch according to one of patent claims 1 to 11, characterised in that the housing is secured against rotation in the container.
13. A watch according to one of patent claims 1 to 10, characterised in that the contact (18) can be actuated by means of a push member (19) which displaceably traverses the bottom (13) of the housing (11).

Two sheets of drawings

