

DESCRIPTION

The present invention concerns a watch case formed by the assembly of an upper shell made of one piece, at least of portion of which is transparent in order to render visible the time display elements, a lower shell and a caseband arranged between the shells and in periphery thereof, said shells having a constant thickness over their entire extent, and defining with said caseband an interior space in which a movement is accommodated.

There have already been described timepieces in which the movement is mounted in a case comprising two shells, at least one of which is of transparent material, such shells being applied against one another. In particular, the timepiece described in patent CH 110 141 is of this type. In this patent however, the shells are assembled by means of an extensible metallic circle placed on the joint between the shells and gripping the latter in such a manner that such joint is no longer apparent once the circle is put into place. Such circle accentuates the outer contour of the watch and takes away therefrom the lightness of appearance which it could have if such circle were absent or at least invisible.

A solution permitting to confer to a wristwatch case the appearance of being substantially thinner than its real thickness, in particular to the wearer, while offering more wear resistance and rendering it less vulnerable vis-à-vis outer stresses, has already been set out in patent EP-B-0 168 010 (US-A-4 637 734). This solution consists in employing a crystal having the form of a substantially spherical cap, at least a part of the periphery of which is located at a level below that of the dial. In this patent, however, the back cover of the watch is flat, secured as it is onto a caseband which is visible and which includes bracelet attaching means, these also visible.

A watch case formed by two shells having a constant thickness over their entire extent is known from patent CH-A-49 936. However, in this document, the shells do not abut against each other so that the caseband of the watch is visible from the exterior. Moreover, the upper shell is not made of one piece but comprises a glass affixed to a bezel.

Patent CH-A-49 937 discloses a watch case of the type comprising two shells and wherein the glass through which the hands can be seen, is not part of a shell, this glass being fixed to a ring by means of a bezel.

A configuration where the two shells abut against each other is shown in the watch case disclosed in patents JP-A-5 322 370, FR-A-609 790, CH-A-671 493 and FR-A-1 175 500. These shells do not have however a constant thickness over their entire extent and as a result the edge of the watch case appears thick, this watch case not giving the impression of being thin as it will appear with the watch of the invention.

The purpose of the present invention is to give to the case the appearance of being thin, this impression being however more emphasized than in the watch described in the patent EP-B-0 168 010.

This purpose is obtained thanks to the watch case as defined in claim 1 of the patent.

On the other hand, the utilization of two shells, preferably made of sapphire, applied one against the other, gives according an embodiment of the watch case of the invention a new and original design aspect.

In a preferred embodiment of the invention, it is arranged to hide the points where the bracelet is attached on the interior of the case in a manner such that the bracelet

emerges from the case without having recourse to lugs or other visible hinges.

Other advantages and characteristics of the present invention will appear from reading the description which is to follow, of embodiments given by way of example with the help of the accompanying drawings in which :

- figure 1 is a perspective view of the watch case according to the invention and according to a first embodiment, in which have been shown only the essential constitutive parts;

- figure 2 is an elevational view of the case shown in figure 1, such case being closed;

- figure 3 is a cross-section at 6 o'clock through the case of figure 2;

- figure 4 is a cross-section at 9 o'clock through the case of figure 2;

- figure 5 is a plan view, partially broken away, of the case according to the arrow V in figure 3;

- figure 6 is a cross-section at 6 o'clock through the case of this invention according to a second embodiment thereof; and

- figure 7 is a cross-section at 6 o'clock through the case of the invention in accordance with a third embodiment thereof.

Figure 1 shows in perspective the essential parts of the watch case according to the invention. Such case includes an upper shell 1, a part at least of which is transparent in order to render visible the time displaying elements, for example a dial 20 and hands 18, such as shown on figure 3. The case further includes a lower shell 2 and a caseband 3 arranged proximate the periphery of the shells. As may be seen on figure 1, shells 1 and 2 and the caseband 3 define an interior space in which a movement is accommodated such as referenced 17 on figure 3.

As may be particularly well seen on figure 4 which is a cross-section at 9 o'clock through the assembled case, caseband 3 exhibits upper and lower faces arranged to match respectively the form of the lower and upper faces which are respectively presented by upper shell 1 and lower shell 2 in order to serve as support surfaces therefor. Figure 4 further shows that caseband 3 is entirely confined to the interior of shells 1 and 2 to the extent that in no manner does it project from the case. If one now refers to figure 2 which is an elevational view of the assembled case, it is seen that caseband 3 does not appear anywhere and that the edges 11 and 12 of shells 1 and 2 are visible and substantially abutting one another at least over a portion of their periphery, i.e. at the places which do not include either bracelet strands or crown.

There has thus been described the principal characteristic around which this invention turns, which has as a result a case composed of two shells having abutting edges, this conferring on the case a very special design marked by the absence of visible caseband or circle. There results therefrom a surprising effect, this giving the timepiece a simple stripped-down aspect which further accentuates the impression of thinness as suggested hereinabove.

It is self-evident that the proposed watch will have furthermore to satisfy the standard rules governing dust and water tightness. In the same manner, there will be sought to render the bracelet strand attachments as little visible as possible whilst assuring fastening of such strands which is simple and safe by easy assembly and disassembly from the lower shell.

To this end there will now be discussed several possible embodiments taking note that here the examples concerned are non-limiting.

Figures 1 to 5 show a first embodiment of the invention in which, as moreover for the other embodiments described subsequently, the caseband 3 includes securing means for the bracelet strands. In the special case of figures 1 to 5, such securing means include two housings 40 and 41 provided in the caseband 3 and a lug arranged in each of these housings, only the lug 13 being shown on the figures. Around such lug is articulated strand 4 of the bracelet as may readily be seen on figures 1 and 3. To allow the strand 4 to come out, the same figures show that the lower shell is provided with an opening or notch 8. In the same manner strand 5, arranged opposite strand 4, emerges from the case by the opening 9 shown on figure 1. This manner of execution causes the complete disappearance of the bracelet strand attachments on the interior of the two shells in a manner such that the periphery of the upper shell 1 is continuous without the interruption, which would be due to fastening lugs for instance. This effect is visible on the right hand part of figure 5.

As is seen on figures 3 and 4, the case contains a movement 17 surmounted by a dial 20 and hands 18, the movement being secured to the caseband by conventional means (not shown). Such movement includes at least one time setting stem terminated by a crown 10 (figures 2 and 5). The crown is housed half within a notch 6 provided in the upper shell 1 and half within a notch 7 provided in the lower shell 2 as is seen on figures 1 and 2. The control stem emerges through a hole 42 provided in caseband 3.

Figures 3 and 4 further show that in addition to the lower shell 2 the case includes a back cover 14 fixed to caseband 3. A seal 15 is interposed between the back cover and the caseband. Figure 4 shows that the lower face of the back cover 14 and the lower face of the caseband

3 exhibit a perceptible gap in a manner such that the lower shell 2 may be fixed either to the back cover by means of a single central screw 19 or to the caseband by means of a plurality of screws 26 shown in dotted outline on figure 4. In this version including a back cover, and in order to have access to the movement and eventually to the battery which energizes it, initially the lower shell 2 is removed, then the back cover 14. One may next take out the movement from below the case. As to the upper shell 1, it is simply glued onto the upper face of the caseband, the gluing by itself assuring the required sealing.

A second embodiment is shown on figure 6 which is a cross-section at 6 o'clock through the case of the invention. Here the bracelet attachment means consist of a boss 24 adjoining the caseband 3 or integrally formed therewith as shown by the figure. Such boss extends under the upper shell 1 and is provided with a bore 43 which receives a lug 44. The ends of the lug emerge from the bore and each includes a threaded blind hole 25 in order to receive a screw (not shown). The bracelet, which is not shown on figure 6, surrounds the ends of the lug 44 around which it may pivot. It is self-evident that also in this embodiment the lower shell 2 is provided with openings 45 in which the boss 24 is accommodated as well as lug 44. In this embodiment figure 6 shows that the upper shell 1 is glued onto the caseband 3. The lower shell 2 could, as in the example which has been explained with respect to figure 4, be secured by means of screws fastened into the caseband or onto a supplemental back cover. Here there has been shown a variant of the fastening which employs a foot 22 which presses the lower shell 2 onto the caseband by means of a screw 23. In this case, the figure shows that the case is not provided with a back cover as regularly understood and that sealing is assured thanks to a seal 21 interposed between the lower shell

2 and the caseband 3. This arrangement renders the disassembly of the case still more simple, such simplicity being however at the cost of a construction which is perhaps more cumbersome with bracelet attachments more visible.

A third embodiment is shown on figure 7 which is a cross-section at 6 o'clock through the case of the invention. Here the bracelet attachment means consist in a projection 30 emerging under the lower shell 2 and extending outside the periphery. Such projections are integrally formed with the caseband, but could be separately attached thereto. Projection 30 is provided with a bore 46 intended to receive a lug (not shown) around which a bracelet strand may pivot. In the same manner as in the preceding embodiment, shell 2 is provided with openings 48 in order to allow the passage of the projection 30. Such shell 2 is secured to the caseband by means of feet 32 pressed on by screws 33 in the same manner as that which has been described for figure 6. Such third embodiment brings out a new manner of fastening the upper shell 1 to the caseband 3. To this effect a foot 47 is secured to projection 30 by means of a screw 31. Such foot presses the shell onto the caseband, a seal 35 being interposed between the shell and the caseband. In this construction the movement is cased up from above and dial 30 is held in place by a flange 34. In order to proceed with movement repairs, feet 47 will be removed while in order to change the battery feet 32 will be removed. Figure 7 shows that this embodiment enables reduction to the maximum of the thickness of the watch since the bracelet is attached thereto outside the periphery thereof. This advantage is however obtained at the cost of visible bulges located at 6 o'clock and at 12 o'clock.

Some remarks remain to be made as to the shells themselves. On the figures, the upper and lower shells are spherical caps. The radii of curvature may be equal

or unequal according to the appearance which one wishes to give to the watch.

The invention however is not limited to spherical caps, certainly more easily formed than most other shells provided that these shells exhibit abutting edges at least over a portion of their periphery.

All the shells shown on the figures are formed preferably of mineral material, for instance sapphire. There have already been mentioned in patent document EP-B-0 168 010 cited hereinabove, the advantages brought by such a material. In the cited document, only the upper portion of the case, i.e. the crystal, is formed of sapphire. Here the back cover or lower shell may be likewise of sapphire which increases the interest of this invention. Thus, when given that the crystal and the back cover are preferably of a hard material, practically the entire watchcase is formed of an unscratchable material. In addition, thanks to the spherical cap form, the crystal and the back cover enable better absorption of shocks which they may undergo through transmission thereof to their seat situated on the caseband onto which they are secured (giving rise to a vault effect). Thus, in addition to the new design effect, the case of the invention offers excellent protection in respect of 'shocks and pressures to which a wristwatch is exposed. While extra-flat wristwatches have generally been de-luxe watches of a relatively fragile nature, the proposed solution enables allying the robust character to great elegance. It is thus that such a watch, well resisting pressure and exterior attacks, may be worn without fear of deterioration in all circumstances of modern life and even in severe conditions which one may encounter in submarine diving, although it is not particularly conceived to this effect.

It is however clear that the lower shell could be formed of a material other than sapphire, steel for instance. The interest of a transparent back cover resides however in the fact that it enables one to see the watch mechanism and if this is of the automatic winding type, the oscillating mass.

CLAIMS

1. Watchcase formed by the assembly of an upper shell made of one piece, at least of portion of which is transparent in order to render visible the time display elements (18, 20), a lower shell (2) and a caseband (3) arranged between the shells and in periphery thereof, the caseband, associated to a movement, having upper and lower faces respectively arranged to match the form of the respective lower and upper faces exhibited by the upper and lower shells so as to serve as support surfaces therefor, characterized in that said shells have a constant thickness over their entire extent, and in that the edges are visible and abut at least over a portion of their periphery so as to define a closed interior space in which the caseband is entirely accommodated.

2. Watch case according to claim 1, characterized in that at least a portion of the lower shell (2) is transparent.

3. Watch case according to claim 1, characterized in that the upper (1) and lower (2) shells are spherical caps.

4. Watch case according to claim 1, characterized in that the caseband includes means for securing the strands (4, 5) of a bracelet.

5. Watch case according to claim 4, characterized in that said securing means include two housings (40) formed in the caseband (3) and a lug (3) around which a strand may pivot arranged in each of the housings, the lower shell being provided with openings (8, 9) from which said strands (4, 5) emerge.

6. Watch case according to claim 4, characterized in that said securing means include two bosses (24) adjoining



the caseband (3) and arranged beneath the upper shell (1) and a bore (43) formed in each of said bosses so as to accommodate a lug (44) around which a strand may pivot, the lower shell (2) being provided with openings (45) in each of which the boss and the lug are placed.

7. Watch case according to claim 6, characterized in that under the caseband and at the location of each opening there emerges a foot (22) serving as securing means for the lower shell (2) onto the caseband (3), a seal (21) being interposed between said lower shell and said caseband.

8. Watch case according to claim 4, characterized in that said securing means include two projections (30) emerging under the upper shell (1) and extending outwards from the periphery thereof and a bore (46) formed in each of said projections to accommodate a lug around which a strand may pivot, the lower shell (2) being provided with openings (48) for the passage of said projections.

9. Watch case according to claim 8, characterized in that a foot (47) is fastened onto each of said projections (30) to serve as means for securing the upper shell onto the caseband, a seal (35) being interposed between said upper shell and said caseband.

10. Watch case according to claim 1, characterized in that the upper shell (1) is glued to the upper face of the caseband (3).

11. Watch case according to claim 1, characterized in that a back cover (14) is fixed to the caseband, a seal (15) being interposed between the back cover and the caseband, the lower face of said back cover showing a perceptible gap with the lower face of the caseband, the lower shell (2) being secured, either to the back cover by means of a central screw (19) traversing the lower shell, or to the caseband by means



of a plurality of screws (26) traversing said lower shell in its peripheral region.

12. Watch case according to claim 1, characterized in that the upper (1) and lower (2) shells are formed from mineral material.

