

DESCRIPTION

The present invention concerns a watch case intended for automated assembly according to the preamble of claim 1 and including a caseband, a fitting frame inserted into said caseband, said frame being formed of solid elastically deformable material, a back cover, a bezel and a crystal secured in a sealed manner to the bezel in order to define an interior space in which a movement is confined, and a dial over which time indicating hands are moved.

A fitting frame formed of solid elastically deformable material and serving not only as a frame for adapting the movement to the case, but further for sealing said case, has been proposed for instance in patent CH-A-319 293 and in the utility model application JP-A-22 693/76 as well as in the application FR-A-2 017 168.

These documents however provide only a very partial solution to the problem which the present invention proposes to solve. In particular, the fitting frame shown in these documents is used only to assure sealing of the back cover or of the crystal, but not both simultaneously. Likewise, the fitting frame described in these same documents does not have as purpose, as is the case in this invention, to assure at one and the same time all the encasing functions, namely the sealed securing of a bezel and a back cover at the same time as the securing and positioning of the movement and the dial in the interior of the case, this construction enabling furthermore an automated assembly of the entire watch.

To effect such, the watch case according to the invention comprises the technical characteristics mentioned in the characterizing part of claim 1.

The invention will now be understood from reading the following description, such being given by way of example and illustrated by the drawings in which :

- figure 1 is a cross-section at 9 o'clock through the watch case according to a first embodiment of the invention;

- figure 1a is a cross-section at 3 o'clock through the watch case shown on figure 1;

- figure 2 shows a cross-section at 9 o'clock according to a second embodiment of the invention; and

- figure 3 shows a cross-section at 9 o'clock according to a third embodiment of the invention.

The watch case shown in cross-section on figures 1, 2 and 3 exhibits a caseband 1, a fitting frame 2 inserted in the caseband, a back cover 3, a bezel 4 and a crystal 5. These elements define an interior closed space which contains a movement 6 surmounted by a dial 7 and hands 8. The caseband 1 may be round or otherwise shaped. In the first instance, the frame 2 will be round with a central opening which is likewise round. In the second instance, the frame 2 will be shaped and its central opening will be preferably round in order to accommodate movement 6 which itself is generally of round form.

The caseband 1 may be of metal, steel or zamac for instance, or of hard plastic material. In order to form the fitting frame 2, there will be chosen a solid plastic material in order to assure good retention of the movement 6, such material being at the same time sufficiently elastic to fulfil the sealing functions which will appear hereinafter. Bezel 4 includes a seat which is annular or shaped in which there is inserted and glued crystal 5, itself round or respectively assuming a special shape.

Caseband 1 includes an inner face exhibiting a first vertical wall 9 and a second vertical wall 10. Such first and second walls are connected by a shoulder 11 which defines an undercut 12 in the inner face of the caseband extending from the shoulder 11 up to the top of the caseband 1.

As to the fitting frame 2, this extends over the entire height of the caseband 1 and the figures show that it exhibits an outer face shaped to match the form of the inner face of the caseband in a manner such that the frame 2 may be precision inserted and axially positioned relative to the caseband. In order to effect this, frame 2 includes a ledge 13 which is supported on shoulder 11 of the caseband when the frame is in place.

The internal portion of the fitting frame 2 includes four seats fulfilling precise functions which are now to be described.

Frame 2 exhibits a first seat 14 in which the bezel 4 is inserted. This seat 14, in addition to assuring centering of the bezel relative to the caseband, assures sealing of the case, as far as the portion bezel-caseband is concerned, by compression against the caseband of the material referenced 15 from which the frame 2 is formed. Frame 2 next exhibits a second seat 16 in which the dial 7 is inserted. The figures show that such dial is maintained in place by an overhang 17 provided on the bezel 4. Such dial, which is not attached to the movement 6 by means of feet for instance, may be angularly positioned by a stud which is fixed to the frame and inserted into a notch cut out in the dial. Frame 2 further includes a third seat 18 on which rests a bead 19 forming part of the movement 6. Thanks to this arrangement, the movement is axially held in place since on the one hand its bead is supported on seat 18 and on the other hand its upper face is retained

by dial 7, itself held by the overhang 17 of bezel 4. Finally, frame 2 exhibits a fourth seat 20 in which is inserted a flange 21 forming part of the back cover 3. When the back cover 3 is applied, the flange 21 will compress the portion of material 22 forming the frame 2 against caseband 2, thus assuring sealing of the case by its portion back cover-caseband.

The explanations which have just been given are generally applicable to the various embodiments shown by figures 1, 2 and 3. Such figures differ from one another initially by the type of movement 6 employed (calibre), then by various details which are now to be reviewed.

Figure 1 shows a construction employing an electronic movement 6, the height of which is 3 mm, this giving for the total height of the watch a value of 8.8 mm taking into account the space taken up by battery 28. In this model the lower part of the bezel 4 is rectilinear as is also rectilinear the horizontal portion of the seat 14 on which the bezel rests. The visible portion of bezel 4 shows a simple rounding off 29.

Figure 2 shows a construction employing an electronic movement, the height of which is 2.50 mm which gives, taking into consideration the battery 28 which is here utilized, a total height of the watch of 7.20 mm. In this model, the lower part of bezel 4 shows a projection 27 introduced into seat 14 of frame 2, the lower part of this seat 14 being located at the same level as the lower part of seat 16 which accommodates dial 7. If the projection were not present, the portion of material 15 would not be sufficiently high to assure good sealing. Figure 2 shows the same rounding off 29 as on figure 1.

Figure 3 shows a construction employing a mechanical movement with automatic winding, the height of which is

of 5.05 mm, which gives an overall height of the watch of 9.95 mm. As in figure 2 and in order to economize room in overall height, here one finds again the bottom of bezel 4 provided with a projection 27. It will here be noted that the visible part of the bezel is decorated by two rounded off portions 25 and 26 exhibiting different radii.

The invention is not limited to the movements shown by way of example on figures 1, 2 and 3. Other movements, which differ in height and diameter, may also be employed.

Figure 1a is a cross-section at 3 o'clock of the watch case shown on figure 1 in cross-section at 9 o'clock. Figure 1a shows that passages 23 and 24 are provided respectively in the caseband 1 and the frame 2. Passage 23 provided in the caseband is arranged to accommodate a tube 30 driven into this passage. It is seen that the tube 30 projects from the caseband by its end 32 directed towards the interior of the case. This end 32 is inserted into a receptacle 31 provided in the frame 2. It will be understood that this arrangement enables a proper orientation of the frame relative to the caseband in a manner such that passages 23 and 24 will be aligned when the frame is assembled into the caseband. Tube 30 and passage 24 receive in a known manner a control stem (not shown). It will be understood that orientation means for the movement relative to the frame will likewise be employed in order that the entry of the stem into the movement is located facing passage 24 provided in the frame. Such means could consist in a stud projecting from the movement, such stud cooperating with a seat provided in the frame.

The assembly of the watch for which the case forms the object of this invention, is brought about by the succession of the following steps: one provides a caseband 1 in which there has just been inserted a fitting frame 2, one introduces a movement 6 into the frame, then a dial

7 on the movement. A bezel 4 is forced in and then the hands 8 are placed. A crystal 5 is glued to the bezel. It will be noted that all the described operations up to here are effected from above, which considerably simplifies the assembly of the watch on automatic machinery. The last operation consists in closing the watch by a back cover 3 which is generally effected following turning over of the case.

Thus, for the three embodiments shown, the encasing is always effected in the same manner since the characteristics of the invention are again shown in a common manner of handling the caseband and the frame 2, and a common manner of assembling the bezel 4, dial 7, movement 6 and back cover 3 on the frame. From this fact, several lines of products may be successively assembled by the same apparatus by means of minor modifications which require only little time in order to pass from one product line to the other. It will also be understood that, since the dial and the hands are not connected to the movement, one may rapidly change the type of dial and hands without stopping the production line. The same remark may be made in respect of the bezel which may exhibit various forms or decorations on its visible portion.



CLAIMS

1. Watch case intended for automated assembly defining an interior space within which a movement (6) is confined and a dial (7) over which time indicating hands (8) are displaced, and including a caseband (1), a fitting frame (2) inserted in the caseband, said fitting frame being formed from solid material so as to assure by itself a good retention of the movement (6) and elastically deformable material so as to assure a sealing function, and a back cover (3), a bezel (4) and a crystal (5) secured in a sealed manner to the bezel so as to define said interior space, characterized by the fact that the caseband (1) includes an inner face exhibiting first (9) and second (10) vertical walls connected by a shoulder (11), said shoulder (11) defining an undercut (12) on the inner face of the the caseband (1) extending up to the top of the caseband (1) and that the fitting frame (2) extends over the entire height of the caseband (1) and exhibits an outer face shaped to match the form of the inner face of the caseband (1) in a manner such that the fitting frame (2) may be inserted from above and positioned in the caseband (1) through support of a ledge (13) exhibited by the fitting frame (2) on the shoulder (11) of the caseband (1), said fitting frame (2) including a first seat (14) in which the bezel (4) is inserted, said bezel (4) compressing the material (15) forming the fitting frame (2) against the caseband (1) so as to form a first sealing joint, a second seat (16) in which the dial (7) is inserted, said dial (7) being retained in such second seat (16) by an overhang (17) on the bezel (4), a third seat (18) on which a bead (19) provided by the movement (6) rests and a fourth seat (20) in which a flange (21) exhibited by the back cover (3) is inserted, said flange (21) compressing the material (22) forming the fitting frame (2) against the caseband (1) so as to form a second sealing joint.



2. Watch case according to claim 1, characterized by the fact that passages (23, 24) are provided respectively in the caseband (1) and the frame (2), the passage (23) provided in the caseband (1) being arranged to receive a tube (30), the end (32) of the said tube directed toward the interior of the case being inserted into a receptacle (31) provided in the frame (2).