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(54) WATER-PROTECTED WATCH CASE

(71) We, KABUSHIKI KAISHA SUWA SEIKOSHA, a Japanese company of 3-4, 4-chome, Ginza, Chuo-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 a water-protected watch case of generally non-circular shape.

According to the present invention there is provided a water-protected watch case of generally non-circular shape having a case body whose upper end portion is provided with a sealing surface, and a bezel whose top is sealed to a non-circular watch glass and whose bottom is provided with a sealing surface, the bezel being sealed to the case body by an annular packing which is interposed between the said sealing surfaces, the annular packing and the said sealing surfaces being circular in plan.

The said sealing surfaces are preferably constituted by an internal surface of the case body and an external surface of the bezel.

The bezel preferably has external and internal surfaces of non-circular shape.

The watch glass may be secured to and sealed to the bezel by means of adhesive.

The invention also comprises a water-protected watch provided with a watch case as set forth above.

The invention is illustrated, merely by way of example, in the accompanying drawings, in which:—

Figure 1 is a broken-away cross-sectional view of a known water-protected watch case of generally non-circular shape.

Figure 2 is a plan view of the watch case of Figure 1.

Figure 3 is a broken-away cross-sectional view of a water protected watch case of generally non-circular shape according to the present invention, the view being taken

on the line A-B of Figure 4.

Figure 4 is a plan view of the watch case of Figure 3, and

Figures 5 and 6 are plan views of other embodiments of water-protected watch cases according to the present invention.

In Figures 1 and 2 there is shown, for purposes of comparison, a known water-protected watch-case 10 of generally non-circular shape. The watch case 10 has a case body 11 having a generally elliptical shape in plan, the upper end portion of the case body 11 being provided internally with a sealing surface 12. The watch case 10 is provided with a watch glass 13 having a generally elliptical shape in plan. The watch glass 13 is provided with elliptical peripheral surfaces 14, 15, of which the latter constitutes the outside surface of a flange 16 of the watch glass 13.

The watch glass 13 is forced downwardly towards and secured to the case body 11 by means of a bezel 20 of generally elliptical shape in plan, the top of the bezel 20 being mounted over the flange 16 and being sealed to the latter by a soft ring 21. The bottom of the bezel 20 engages in an annular shoulder 22 of generally elliptical shape which is provided at the top of the case body 11.

The case body 11 is provided with an internal shoulder 23 in which is mounted a dial ring 24 which has inner and outer peripheral surfaces which are elliptical in plan. An O-ring packing member 25 of generally elliptical shape has an external surface engaging the sealing surface 12, an internal surface engaging the dial ring 24, an upper surface engaging the flange 16 of the watch glass 13, and a lower surface engaging the dial ring 24.

As will be appreciated from the above description, the known watch case 10 involves the use of a large number of parts which are provided with elliptical surfaces,

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with the result that manufacture is complicated and it is difficult to obtain the degree of high precision necessary to ensure effective sealing. This is especially so in the case of the bezel 20 whose elliptical surfaces need to be accurately formed if a stable degree of water protection is to be achieved. The complexity of manufacture makes the watch expensive to produce, while the structure also involves thin parts, such as the dial ring 24, which because of their thinness are liable to be easily deformed.

Although the known watch case 10, in the form shown in Figures 1 and 2, is generally elliptical in shape, other known watch cases of similar construction have generally square shapes, but the disadvantages mentioned above apply equally to all such non-circular shapes.

Referring now to Figures 3 and 4, a water-protected watch case 26 of generally non-circular shape has a case body 27 which is generally elliptical in plan and which is provided internally with a sealing surface 30 which is circular in plan.

The watch case 26 is provided with an annular bezel 31 having an external surface 32 and an internal surface 33 each of which is elliptical in plan. The bottom of the bezel 31 is also provided externally with a sealing surface 34. Which is circular in plan. The top of the bezel 31 is sealed to a watch glass 35 having an elliptical shape in plan, the watch glass 35 being secured and sealed to the bezel 31 by means of adhesive.

The bezel 31 is sealed to the case body 27 by an annular packing 36 of hard plastics material. The latter has external and internal surfaces which are circular in plan and which respectively sealingly engage the sealing surfaces 30, 34 between which the annular packing 36 is interposed.

It will be noted that whereas, in the case of Figures 1 and 2, an axially directed sealing force has to be used to produce the required water-protection, in the case of the watch case of Figures 3 and 4, the sealing force is radially directed.

In the case of the watch case 26, the annular packing 36 and the sealing surfaces 30, 34 are circular in plan and therefore can be produced by conventional manufacturing techniques enabling a high degree of precision to be obtained. Thus a high degree of water-protection can be achieved economically, in spite of the fact that the appearance of the watch-case is generally non-circular. Furthermore, in contrast to the arrangement of Figures 1 and 2, the number of parts employed in the watch case is small and their assembly and disassembly is therefore easy. In fact, the degree of water protection

which can be achieved in the watch case 26 can obviously be just as high as with an entirely circular watch case.

In Figures 5 and 6, there are shown water-protected watch cases according to the present invention whose construction is generally similar to that of the watch case 26 of Figures 3 and 4 and which for this reason will not be described in detail, like reference numerals indicating like parts.

In the case of the watch case 40 shown in Figure 5, however, a watch glass 41 is employed which is of approximately square shape in plan, and this watch glass 41 is sealed to a case body 42 of generally non-circular shape by means of a bezel 43 which is generally square in plan. Here again, however, the case body 42 is provided with a sealing surface 30 which is circular in plan, and the bezel 43 is provided with a sealing surface 34 which is circular in plan, a circular packing 36 being interposed between the sealing surfaces 30, 34.

Again in Figure 6 there is shown a water-protected watch case 44 of generally non-circular shape employing a hexagonal watch glass 45 which is sealed to a case body 46 by a bezel 47 of hexagonal shape. As in the construction of Figures 3 and 4 and of Figure 5, however, the case body 46 is provided with a circular internal surface 30, and the bottom of the bezel 47 is provided with an external sealing surface 34, between which is interposed an annular packing 36 of circular shape.

WHAT WE CLAIM IS:—

1. A water-protected watch case of generally non-circular shape having a case body whose upper end portion is provided with a sealing surface, and a bezel whose top is sealed to a non-circular watch glass and whose bottom is provided with a sealing surface, the bezel being sealed to the case body by an annular packing which is interposed between the said sealing surfaces, the annular packing and the said sealing surfaces being circular in plan.

2. A watch case as claimed in claim 1 in which the said sealing surfaces are constituted by an internal surface of the case body and an external surface of the bezel.

3. A watch case as claimed in claim 1 or 2 in which the bezel has external and internal surfaces of non-circular shape.

4. A watch case as claimed in any preceding claim in which the watch glass is secured to and sealed to the bezel by means of adhesive.

5. A water-protected watch case substantially as hereinbefore described with reference to and as shown in any of Figures

with the result that manufacture is complicated and it is difficult to obtain the degree of high precision necessary to ensure effective sealing. This is especially so in the case of the bezel 20 whose elliptical surfaces need to be accurately formed if a stable degree of water protection is to be achieved. The complexity of manufacture makes the watch expensive to produce, while the structure also involves thin parts, such as the dial ring 24, which because of their thinness are liable to be easily deformed.

Although the known watch case 10, in the form shown in Figures 1 and 2, is generally elliptical in shape, other known watch cases of similar construction have generally square shapes, but the disadvantages mentioned above apply equally to all such non-circular shapes.

Referring now to Figures 3 and 4, a water-protected watch case 26 of generally non-circular shape has a case body 27 which is generally elliptical in plan and which is provided internally with a sealing surface 30 which is circular in plan.

The watch case 26 is provided with an annular bezel 31 having an external surface 32 and an internal surface 33 each of which is elliptical in plan. The bottom of the bezel 31 is also provided externally with a sealing surface 34. Which is circular in plan. The top of the bezel 31 is sealed to a watch glass 35 having an elliptical shape in plan, the watch glass 35 being secured and sealed to the bezel 31 by means of adhesive.

The bezel 31 is sealed to the case body 27 by an annular packing 36 of hard plastics material. The latter has external and internal surfaces which are circular in plan and which respectively sealingly engage the sealing surfaces 30, 34 between which the annular packing 36 is interposed.

It will be noted that whereas, in the case of Figures 1 and 2, an axially directed sealing force has to be used to produce the required water-protection, in the case of the watch case of Figures 3 and 4, the sealing force is radially directed.

In the case of the watch case 26, the annular packing 36 and the sealing surfaces 30, 34 are circular in plan and therefore can be produced by conventional manufacturing techniques enabling a high degree of precision to be obtained. Thus a high degree of water-protection can be achieved economically, in spite of the fact that the appearance of the watch-case is generally non-circular. Furthermore, in contrast to the arrangement of Figures 1 and 2, the number of parts employed in the watch case is small and their assembly and disassembly is therefore easy. In fact, the degree of water protection

which can be achieved in the watch case 26 can obviously be just as high as with an entirely circular watch case.

In Figures 5 and 6, there are shown water-protected watch cases according to the present invention whose construction is generally similar to that of the watch case 26 of Figures 3 and 4 and which for this reason will not be described in detail, like reference numerals indicating like parts.

In the case of the watch case 40 shown in Figure 5, however, a watch glass 41 is employed which is of approximately square shape in plan, and this watch glass 41 is sealed to a case body 42 of generally non-circular shape by means of a bezel 43 which is generally square in plan. Here again, however, the case body 42 is provided with a sealing surface 30 which is circular in plan, and the bezel 43 is provided with a sealing surface 34 which is circular in plan, a circular packing 36 being interposed between the sealing surfaces 30, 34.

Again in Figure 6 there is shown a water-protected watch case 44 of generally non-circular shape employing a hexagonal watch glass 45 which is sealed to a case body 46 by a bezel 47 of hexagonal shape. As in the construction of Figures 3 and 4 and of Figure 5, however, the case body 46 is provided with a circular internal surface 30, and the bottom of the bezel 47 is provided with an external sealing surface 34, between which is interposed an annular packing 36 of circular shape.

WHAT WE CLAIM IS:—

1. A water-protected watch case of generally non-circular shape having a case body whose upper end portion is provided with a sealing surface, and a bezel whose top is sealed to a non-circular watch glass and whose bottom is provided with a sealing surface, the bezel being sealed to the case body by an annular packing which is interposed between the said sealing surfaces, the annular packing and the said sealing surfaces being circular in plan.

2. A watch case as claimed in claim 1 in which the said sealing surfaces are constituted by an internal surface of the case body and an external surface of the bezel.

3. A watch case as claimed in claim 1 or 2 in which the bezel has external and internal surfaces of non-circular shape.

4. A watch case as claimed in any preceding claim in which the watch glass is secured to and sealed to the bezel by means of adhesive.

5. A water-protected watch case substantially as hereinbefore described with reference to and as shown in any of Figures



3 to 6 of the accompanying drawings.

6. A water-protected watch provided with a watch case as claimed in any preceding claim.

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