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(54) WATER-RESISTANT WATCHCASE

(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-resistant watch case.

According to the present invention, there is provided a water-resistant watch case comprising a watch glass which is mounted on a support ring, a bezel having a portion which extends above the watch glass, the inner diameter of the bezel portion being less than the outer diameter of the watch glass, a body member which carries the support ring and the bezel, a first sealing member which seals the watch glass to the bezel and is radially compressed therebetween, and a second sealing member which seals the bezel to the body member and is disposed therebetween.

Preferably, the second sealing member is radially compressed between the body member and the bezel.

Preferably the bezel portion engages a surface of the watch glass, the said surface facing a surface of the watch glass which engages the support ring.

The support ring is preferably mounted radially inwardly of and engages the bezel.

The bezel may be secured to the body member by means of an interference fit.

The second sealing member may be disposed on the radially outer side of the bezel, the bezel being mounted in a recess in the body member.

The invention also comprises a 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 sectional view of a water-resistant watch case known to the Applicants, and

Figure 2 is a broken-away sectional view of a water-resistant watch case according to the present invention.

In Figure 1 there is shown a water-resistant watch case which is known to the Applicants

and which comprises a watch glass 1 which is mounted on a support ring 2, the support ring 2 being disposed radially inwardly of a bezel 3. The support ring 2 has an axially extending annular flange 2a which engages the periphery of the watch glass 1. The watch glass 1 is secured to the upper surface of the support ring 2 by means of a layer 4 of adhesive. The support ring 2 and the bezel 3 are both mounted on a body member 6, the support ring 2 being clamped to the body member 6 by the bezel 3. A gasket 5 effects sealing between the support ring 2 and the body member 6 and is disposed therebetween.

In the case of the structure illustrated in Figure 1, the watch glass 1 is both held in position and is sealed to the support ring 2 in a water-tight manner mainly by means of the layer 4 of adhesive. It is therefore necessary to ensure that this adhesive is strong and is suitable for sealing purposes, and it is necessary to apply the adhesive 4 over a wide area to ensure that the seal is effective.

Consequently, the layer 4 of adhesive is visible through the watch glass 1 and is unsightly. Moreover, in the course of securing the watch glass 1 to the support ring 2 by means of the layer 4 of adhesive, the adhesive is forced outwardly and the excess adhesive has to be removed, which entails a considerable amount of work. It is, moreover, by no means simple to arrange that the layer 4 of adhesive effects adequate binding.

Furthermore, if the watch glass 1 becomes broken or cracked, it is necessary in practice to replace not merely the watch glass 1 itself but also the support ring 2, and this involves unnecessarily high costs. It is therefore desirable to be able to secure the watch glass 1 in position without the use of any adhesive.

Accordingly, in Figure 2 there is shown a water-resistant watch case according to the present invention which comprises an inorganic watch glass 7 having a lower surface a which is mounted on and engages an upper surface 12a of a support ring 12. The watch glass 7 also has a bevelled upper surface 7b which faces the lower surface 7a and which is engaged by a portion 8a of a bezel 8, the bezel portion 8a extending above the

watch glass 7. The inner diameter of the bezel portion 8a is slightly less than the outer diameter of the watch glass 7.

The bezel 8 is provided internally with a recess 8c within which is mounted a radially compressed sealing ring 10 which engages both the outer periphery of the watch glass 7 and the support ring 12, the support ring 12 being mounted radially inwardly of and engaging the bezel 8 with an interference fit. Thus the sealing ring 10 effects sealing between the watch glass 7 and the bezel 8, between the watch glass 7 and the support ring 12, and between the support ring 12 and the bezel 8.

The bezel 8 is mounted in a recess 9a in a case ring or body member 9, the bezel 8 having a surface 8b which is an interference fit with a surface 9b of the body member 9. The body member 9 is also provided on its radially inner side with a recess 9c within which is mounted a flange 12a of the support ring 12. A radially compressed sealing member 11 is disposed in a recess 8d on the radially outer side of the bezel 8, the sealing ring 11 sealing the bezel 8 to the body member 9 and being disposed therebetween.

The sealing rings 10, 11 are resilient members which may be made of synthetic rubber, synthetic resin, or soft metal.

As will be appreciated, in the construction shown in Figure 2, the watch glass 7 is clamped between the bezel portion 8a and the support ring 12 so that both the lower surface 7a and the upper surface 7b of the watch glass 7 are held in position to prevent the watch glass 7 from falling out of the watch case. Since the sealing of the watch glass is effected by means of the sealing ring 10, it is not necessary for the upper surface 12a of the support ring 12 which engages the lower surface 7a of the watch glass 7 to be especially wide. Consequently the appearance of the watch case of Figure 2 is superior to that of Figure 1. Moreover, if the watch glass 7 becomes broken or cracked, it can be replaced without the need to replace the support ring 12 as well, thereby reducing costs.

The structure shown in Figure 2 may be assembled as follows:—

The sealing ring 10 is first mounted in the recess 8c of the bezel 8. The watch glass 7 is then inserted in the bezel 8 from beneath and is moved upwardly therein until it reaches the position shown in Figure 2. The sealing ring 11 is then mounted in the recess 8d in the bezel 8. The support ring 12 is then mounted on the body member 9. After this, the spot of the second set located on the card assembly of the watch glass 7, sealing ring 10, bezel 8 and sealing ring 11 is forced into the position shown in Figure 2 by introducing the lower portion of the bezel 8 into the recess 9a.

Thus in the case of the structure shown in

Figure 2 it is not necessary to use a specially controlled atmosphere as is necessary when using the layer of adhesive 4 employed in the Figure 1 construction.

In Figure 2 the sealing ring 11 is shown as being disposed on the radially outer side of the bezel 8 so that it is radially compressed. Alternatively, however, the sealing member 11 may be so disposed between the bezel 8 and the body member 9 as to effect axial compression of the sealing ring 11.

WHAT WE CLAIM IS:—

1. A water-resistant watch case comprising a watch glass which is mounted on a support ring, a bezel having a portion which extends above the watch glass, the inner diameter of the bezel portion being less than the outer diameter of the watch glass, a body member which carries the support ring and the bezel, a first sealing member which seals the watch glass to the bezel and is radially compressed therebetween, and a second sealing member which seals the bezel to the body member and is disposed therebetween.
2. A watch case as claimed in claim 1 in which the second sealing member is radially compressed between the body member and the bezel.
3. A watch case as claimed in claim 1 or 2 in which the bezel portion engages a surface of the watch glass, the said surface facing a surface of the watch glass which engages the support ring.
4. A watch case as claimed in any preceding claim in which the support ring is mounted radially inwardly of and engages the bezel.
5. A watch case as claimed in any preceding claim in which the first sealing member seals the support ring both to the bezel and to the watch glass.
6. A watch case as claimed in any preceding claim in which the bezel is secured to the body member by means of an interference fit.
7. A watch case as claimed in any preceding claim in which the second sealing member is disposed on the radially outer side of the bezel, the bezel being mounted in a recess in the body member.
8. A water-resistant watch case substantially as hereinbefore described with reference to and as shown in Figure 2 of the accompanying drawings.
9. A watch provided with a watch case as claimed in any preceding claim.

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watch glass 7. The inner diameter of the bezel portion 8a is slightly less than the outer diameter of the watch glass 7.

The bezel 8 is provided internally with a recess 8c within which is mounted a radially compressed sealing ring 10 which engages both the outer periphery of the watch glass 7 and the support ring 12, the support ring 12 being mounted radially inwardly of and engaging the bezel 8 with an interference fit. Thus the sealing ring 10 effects sealing between the watch glass 7 and the bezel 8, between the watch glass 7 and the support ring 12, and between the support ring 12 and the bezel 8.

The bezel 8 is mounted in a recess 9a in a case ring or body member 9, the bezel 8 having a surface 8b which is an interference fit with a surface 9b of the body member 9. The body member 9 is also provided on its radially inner side with a recess 9c within which is mounted a flange 12a of the support ring 12. A radially compressed sealing member 11 is disposed in a recess 8d on the radially outer side of the bezel 8, the sealing ring 11 sealing the bezel 8 to the body member 9 and being disposed therebetween.

The sealing rings 10, 11 are resilient members which may be made of synthetic rubber, synthetic resin, or soft metal.

As will be appreciated, in the construction shown in Figure 2, the watch glass 7 is clamped between the bezel portion 8a and the support ring 12 so that both the lower surface 7a and the upper surface 7b of the watch glass 7 are held in position to prevent the watch glass 7 from falling out of the watch case. Since the sealing of the watch glass is effected by means of the sealing ring 10, it is not necessary for the upper surface 12a of the support ring 12 which engages the lower surface 7a of the watch glass 7 to be especially wide. Consequently the appearance of the watch case of Figure 2 is superior to that of Figure 1. Moreover, if the watch glass 7 becomes broken or cracked, it can be replaced without the need to replace the support ring 12 as well, thereby reducing costs.

The structure shown in Figure 2 may be assembled as follows:—

The sealing ring 10 is first mounted in the recess 8c of the bezel 8. The watch glass 7 is then inserted in the bezel 8 from beneath and is moved upwardly therein until it reaches the position shown in Figure 2. The sealing ring 11 is then mounted in the recess 8d in the bezel 8. The support ring 12 is then mounted on the body member 9. After this, the spot of the second set located on the card assembly of the watch glass 7, sealing ring 10, bezel 8 and sealing ring 11 is forced into the position shown in Figure 2 by introducing the lower portion of the bezel 8 into the recess 9a.

Thus in the case of the structure shown in

Figure 2 it is not necessary to use a specially controlled atmosphere as is necessary when using the layer of adhesive 4 employed in the Figure 1 construction.

In Figure 2 the sealing ring 11 is shown as being disposed on the radially outer side of the bezel 8 so that it is radially compressed. Alternatively, however, the sealing member 11 may be so disposed between the bezel 8 and the body member 9 as to effect axial compression of the sealing ring 11.

WHAT WE CLAIM IS:—

1. A water-resistant watch case comprising a watch glass which is mounted on a support ring, a bezel having a portion which extends above the watch glass, the inner diameter of the bezel portion being less than the outer diameter of the watch glass, a body member which carries the support ring and the bezel, a first sealing member which seals the watch glass to the bezel and is radially compressed therebetween, and a second sealing member which seals the bezel to the body member and is disposed therebetween.

2. A watch case as claimed in claim 1 in which the second sealing member is radially compressed between the body member and the bezel.

3. A watch case as claimed in claim 1 or 2 in which the bezel portion engages a surface of the watch glass, the said surface facing a surface of the watch glass which engages the support ring.

4. A watch case as claimed in any preceding claim in which the support ring is mounted radially inwardly of and engages the bezel.

5. A watch case as claimed in any preceding claim in which the first sealing member seals the support ring both to the bezel and to the watch glass.

6. A watch case as claimed in any preceding claim in which the bezel is secured to the body member by means of an interference fit.

7. A watch case as claimed in any preceding claim in which the second sealing member is disposed on the radially outer side of the bezel, the bezel being mounted in a recess in the body member.

8. A water-resistant watch case substantially as hereinbefore described with reference to and as shown in Figure 2 of the accompanying drawings.

9. A watch provided with a watch case as claimed in any preceding claim.

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