

PATENT SPECIFICATION

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(54) AN IMPROVED TIMEPIECE CASE ASSEMBLY

(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.—

The present invention relates to an improved timepiece case assembly which includes a rotatable bezel.

Throughout this specification and claims the word "timepiece" as used for instance in phrases such as "timepiece case assembly" should be interpreted broadly as including wrist watches, pocket-watches and chronometers among others, and generally speaking it should be understood that the invention applies to any timepiece which has a rotatable bezel.

According to one aspect of the present invention, there is provided a timepiece case assembly including a case band and a rotatable bezel each formed with a groove to provide a space therebetween, and a packing element of elastic material having a substantially compressible cross-section received in said space formed by said grooves when the case band and the said bezel are assembled together.

The packing element may be in the form of an O-ring or a D-ring and in any case may be made of elastomeric material.

The timepiece may be a watch.

The invention will now be described, merely by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a partial sectional view of a known watch case assembly including a rotatable bezel section;

Figure 2 is a plan view on a smaller scale of the assembly shown in Figure 1;

Figure 3 is a view similar to Figure 1 but showing a watch case assembly in accordance with the present invention prior to the fitting of the rotatable bezel section to the case band; and

Figure 4 is a view similar to Figure 3 but showing the assembled together parts.

Referring first to Figures 1 and 2, there is shown a watch case assembly of known construction which includes a rotatable bezel 1 and a case band 2. The bezel 1 is provided with a channel section groove 6 having an outer wall 4 and a lower wall 9. The case band 2 is provided with a channel section groove 7 having a side wall 5 and a top wall 8. These grooves 6 and 7 are substantially aligned and define a space in which is located a spring 3. As can be seen more clearly from Figure 2, the spring 3 is almost completely annular and includes straight sections 10 and bent sections 11, the straight sections 10 being in frictional engagement with the walls 5 and 8 of the groove 7, while the bent sections 11 are in frictional engagement with the walls 4 and 9 of groove 6.

It will be appreciated that the force necessary for rotating the bezel 1 is controlled by the elasticity of the spring 3. Moreover, the mode of engagement of the spring 3 with the groove walls as described above prevents the bezel from becoming disengaged from the case band 2.

However, the actual shape and dimension of the straight and bent sections 10 and 11 of the spring have to be controlled to a high accuracy, but this is difficult to achieve in view of the elasticity of the spring. Moreover, after initial setting, the spring 3 is apt to become deformed in use, and a so deformed spring has to be set again after a certain time. However, resetting the spring 3 may cause a change in the force necessary for rotating the bezel 1. This in turn may increase the risk of disengagement of the bezel 1 from the case band 2. Accordingly, when resetting the spring 3, the operation has to be done with great precision and is time-consuming to ensure that the previously set properties of the spring do not change.

Rotatable bezels 1 have been used for waterproof watches, but if such a watch is immersed in the water, water is apt to come in through the gap between the bezel and the case band. This in turn was liable to cause rusting, even to the extent of immobilizing the bezel 1.

[Price 25p]

Also, in the prior art construction, the rotatable bezel 1, the case band 2 and the spring 3 are all made of metallic materials and this gives a somewhat uncomfortable feeling in the finger-tips of a person rotating the bezel 1 and diminishes the marketing value of a watch with a rotatable bezel.

The illustrated embodiment of the present invention seeks to eliminate the above defects and to provide an improved construction of a watch case assembly with a rotatable bezel. Referring now to Figures 3 and 4, the case band is shown at 16 and the rotatable bezel has the reference number 12. As before, respectively circumferentially outer and circumferentially inner substantially U-section grooves 14 and 15 are provided in the case band 16 and the bezel 12 respectively, the groove 14 having an upper wall 17 and a side wall 19, while the groove 15 has a lower wall 18 and a side wall 20.

In assembly, a packing ring 13 of substantially circular cross-section and of synthetic resin or natural or synthetic rubber is placed in the groove 14, and the diameter of this O-ring 13 is chosen to be greater than the width of the space provided by the grooves 14 and 15 when the case band 16 and the bezel 12 are fitted together. Accordingly, and as can be seen in Figure 4, when the bezel 12 and the case band 16 are so fitted together, the O-ring 13, which is, of course, elastic, and of substantially compressible cross-section is substantially compressed to fill nearly the entire space provided by the two grooves 14 and 15.

Instead of an O-ring 13, a D-ring could be provided, the planar face of the D engaging with the wall 19 of the groove 14. The dimensions of the D-ring are again so chosen that on assembly of the case band 16 and the bezel 12, the ring is compressed radially to expand axially of the case band 16.

A gutter for lubricant may be provided in the groove 15, but this gutter is not shown in the drawings.

It will be appreciated that in the embodiment according to Figures 3 and 4 rotation of the bezel 12 is controlled by the elasticity of the packing ring 13 and disengagement

between the bezel 12 and the case band 16 is prevented by engagement of the ring against walls 17 and 18. Thus both functions, i.e. the control of the rotation of the bezel 12 and the prevention of disengagement between the bezel and the case band are achieved by the packing element 13 and the need for a delicate and difficult process such as spring bending is eliminated. Moreover, all the parts can be easily adapted to appropriate dimensions. Additionally, since the packing element 13 is made of natural rubber or synthetic elastomeric materials, the joint between the bezel 12 and the case band 16 will be rendered substantially waterproof and rust-proof. Finally, owing to the inherent elasticity of the packing element 13, removal of the bezel 12 and its refitting to the case band 16 can be carried out easily and will not require delicate resetting.

WHAT WE CLAIM IS:—

1. A timepiece case assembly including a case band and a rotatable bezel each formed with a groove to provide a space therebetween, and a packing element of elastic material having a substantially compressible cross-section received in said space provided by said grooves when the case band and the said bezel are assembled together.
2. An assembly as claimed in claim 1 wherein said timepiece is a watch.
3. An assembly as claimed in claim 1 or 2 wherein the packing element is in the form of an O-ring.
4. An assembly as claimed in claim 1 or 2 wherein the packing element is in the form of a D-ring.
5. An assembly as claimed in any preceding claim wherein the packing element is made of elastomeric material.
6. A timepiece case assembly substantially as hereinbefore described with reference to Figures 3 and 4 of the accompanying drawings.

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