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(54) 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 watch case.

According to the present invention, there is provided a watch case comprising a synthetic resin case body, a watch glass which is located radially inwardly of and engages an annular (as herein defined) portion of the case body and a metallic ring which is L-shaped in cross-section and one limb of which is at least partly embedded in the annular portion and extends axially thereof so as to reinforce the latter.

The term "annular" as used in this specification is not restricted to circular shapes.

The other limb of the metallic ring may extend radially inwardly of the annular portion and be engaged by the watch glass.

Thus the said other limb may have at least one aperture therein in which is located an integral portion of the synthetic resin case body.

Preferably the said one limb does not extend to the upper surface of the annular portion.

The case body may be cup-shaped.

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 drawing, in which:

Figure 1 is a broken-away cross-sectional view of a known watch case having a synthetic resin case body,

Figure 2 is a broken-away cross-sectional view of one embodiment of a watch case according to the present invention,

Figure 3 is a plan view of a reinforcement ring which is used in the watch case of Figure 2, and

Figure 4 is a broken-away cross-sectional view of the watch case of Figure 2 taken on

the line X-X of the reinforcement ring of Figure 3.

Conventional watch cases have been made of stainless steel or of metallic material such as plated brass. However, the manufacture of such watch cases involves the use of presses and lathes, entails considerable labour, and is thus very costly. Moreover, because the watch cases are made of metal, they are correspondingly heavy. A further disadvantage of such metallic watch cases has been that their colour was restricted, since the colour of stainless steel has been restricted to silver, while the colour of the plated brass has been restricted to gold.

In order to overcome the disadvantages discussed above, it is known to provide a watch case with a synthetic resin case body. Thus, in the case of the known watch case illustrated in Figure 1, the watch case comprises a synthetic resin case body 10 having an annular portion 11 which is engaged by a watch glass 12, the watch glass 12 being located radially inwardly of the annular portion 11. Since, however, it is necessary to ensure that the annular portion 11 and the watch glass 12 are very firmly in contact, the watch glass 12 has to be made an interference fit within the annular portion 11 with the result that the latter thus tends to be forced radially outwardly. Since the synthetic resin of which the annular portion 11 is made is of poor mechanical strength, it has been necessary to provide, at the outer periphery of the annular portion 11, a glass retaining ring 13 so as to prevent deformation of the annular portion 11 by the radial outward force imposed on it by the watch glass 12. The provision of the glass retaining ring 13 thus prevents the outer surface of the case being made wholly of synthetic resin, and this restricts the design possibilities. Moreover the glass retaining ring 13 has to be made very strong to resist the forces applied to it, and this in turn means that it has to be made very wide and deep, thus further restricting the amount of synthetic resin which can be used in the case body 10, and particularly the amount which is visible from the top of the watch.

Manufacturing the watch is also made difficult by virtue of the fact that great precision has to be employed in engaging the glass retaining ring 13 with the case body 10, and in spite of such precision their subsequent disengagement is very liable to occur. It is thus difficult to keep the watch water-protected for any length of time.

In Figures 2 to 4 there is therefore shown a watch case according to the present invention which comprises a cup-shaped synthetic resin case body 14 having an annular portion 15 radially inwardly of which there is located a watch glass 16 which engages and is an interference fit in the annular portion 15.

A metallic reinforcement ring 20, which is L-shaped in cross-section, has one limb 21 which, in the embodiment shown in the drawings, is completely embedded in the annular portion 15. As will be seen, the limb 21 extends axially of the annular portion 15 and thus parallel to an axially extending peripheral portion 22 of the watch glass 16, the portion 22 being engaged internally by a clamp ring 23. Thus the limb 21 reinforces the annular portion 15 against the radial outward forces imposed thereon by the watch glass 16.

The reinforcement ring 20 also has a limb 24 which extends radially inwardly of the annular portion 15 and is engaged both by the portion 22 of the watch glass 16 and also by the clamp ring 23.

As best shown in Figure 3, the limb 24 of the reinforcement ring 20 is provided with four equi-angularly spaced apart apertures 25 in which are located integral portions 26 (Figure 4) of the synthetic resin case body 14. That is to say, the case body 14 is made by placing the reinforcement ring 20 in a die, and moulding the synthetic resin material of or forming the case body 14 about the reinforcement ring, the synthetic resin material thus filling the apertures 25.

By reason of the fact that the reinforcement ring 20 is an insert in the synthetic resin case body 14 it cannot be dislodged therefrom, in contrast to the glass retaining ring 13 shown in Figure 1. Moreover, unlike the glass retaining ring 13, the reinforcement ring 20 does not extend to the upper surface 27 of the annular portion 15. The latter surface is therefore made wholly of synthetic resin and may therefore be made of any desired colour.

The embedding of the limb 21 prevents the annular portion 15 from being forced radially outwardly by the glass 16. Even, therefore, after a considerable period, the watertight connection between the glass 16 and the annular portion 15 will not be disturbed. Moreover, since the reinforcement ring does not extend to the upper surface 27,

the case body 14 appears as though it were made wholly of synthetic resin and the possibilities of using synthetic resin in a variety of different shapes and colours can be utilised to the maximum.

Since, moreover, the synthetic resin material passes through the openings 25, the strength of the portion of the case body 14 between the limb 21 and the portion 22 of the watch glass 16 is at its maximum, and the watch glass 16 can be removed therefrom without injuring the case body 14. Moreover, this feature provides a very positive lock between the ring 20 and the case body 14.

The L-shaped cross-section of the ring 14 assists its rigidity and thus helps to maintain the water-protected properties of the watch.

If desired, the limb 21 can extend to the upper surface 27 of the annular portion 15, but even in this case the present invention has advantages over the prior art shown in Figure 1, since the width of the limb 21 can be made much smaller than that of the ring 13 and a good top appearance of the watch can still be achieved.

WHAT WE CLAIM IS:—

1. A watch case comprising a synthetic resin case body, a watch glass which is located radially inwardly of an engages an annular (as herein defined) portion of the case body, and a metallic ring which is L-shaped in cross-section and one limb of which is at least partly embedded in the annular portion and extends axially thereof so as to reinforce the latter.

2. A watch case as claimed in claim 1 in which the other limb of the metallic ring extends radially inwardly of the annular portion and is engaged by the watch glass.

3. A watch case as claimed in claim 2 in which the said other limb has at least one aperture therein in which is located an integral portion of the synthetic resin case body.

4. A watch case as claimed in any preceding claim in which the said one limb does not extend to the upper surface of the annular portion.

5. A watch case as claimed in any preceding claim in which the case body is cup-shaped.

6. A watch case substantially as hereinbefore described with reference to and as shown in Figures 2 to 4 of the accompanying drawing.

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

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Manufacturing the watch is also made difficult by virtue of the fact that great precision has to be employed in engaging the glass retaining ring 13 with the case body 10, and in spite of such precision their subsequent disengagement is very liable to occur. It is thus difficult to keep the watch water-protected for any length of time.

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4. A watch case as claimed in any preceding claim in which the said one limb does not extend to the upper surface of the annular portion.

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