Nov. 24, 1959 A. SCHLENKER 2,913,869

WATERPROOF WATCH CASE

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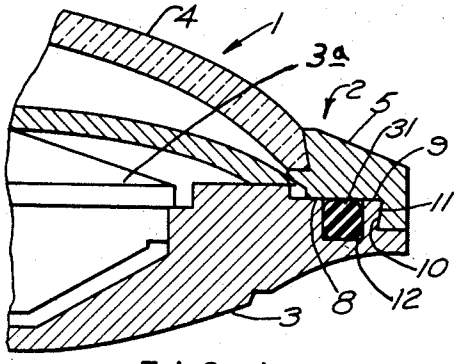


FIG. 1

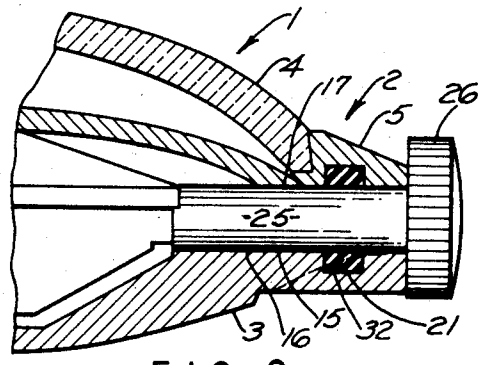


FIG. 2

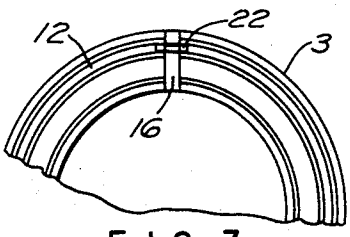


FIG. 3

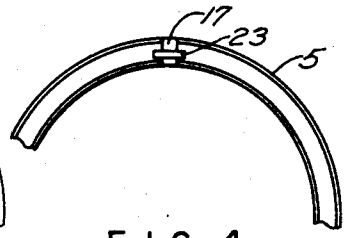


FIG. 4

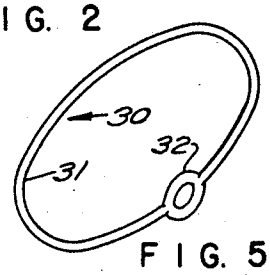


FIG. 5

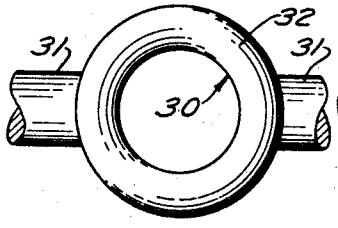


FIG. 6

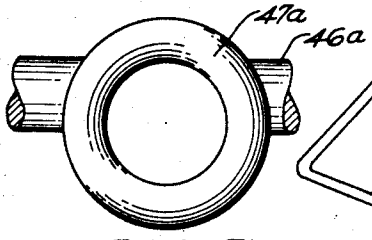


FIG. 7

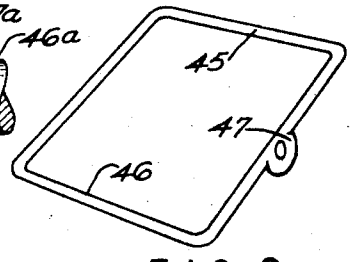


FIG. 8

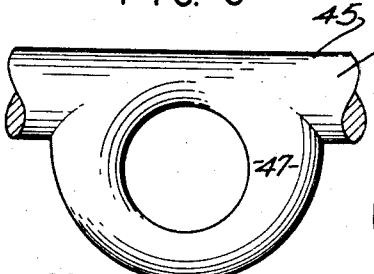


FIG. 9

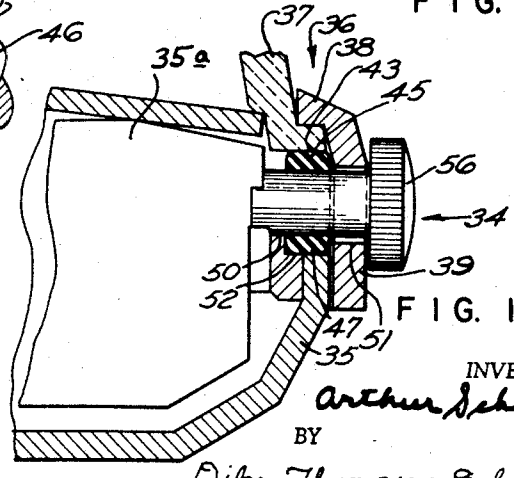


FIG. 10

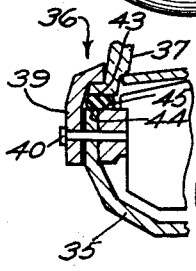


FIG. 11

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WATERPROOF WATCH CASE

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4 Claims. (Cl. 58—90)

This invention relates to waterproof watch cases and more particularly to means to improve the waterproof characteristics thereof.

The usual waterproof watch case has an O-ring or gasket surrounding the periphery of the watch to provide a waterproof joint between the front and back and also a stem gasket which is separate from the O-ring and which in normal practice is contained within the crown of the stem, the crown being the knurled knob external of the watch which is engaged between the thumb and index finger for winding and setting the watch. In such an arrangement, the stem gasket is arranged between an internal portion of the crown and the external portion of an insert or neck which protrudes from the hole occupied by the stem. Such construction requires numerous parts including not only the aforesaid insert but also a retaining ring for holding the gasket in the crown as well as drilling and finishing operations for preparing the watch case and the crown for receiving the parts. Such construction is not only expensive but also invites leakage between the insert and the case as well as between the relatively movable surfaces of the construction because of its complication.

Accordingly, it is a main object of this invention to simplify the design and construction of the gasketing features, to eliminate parts and machining operations and to improve the waterproof characteristics of waterproof watch cases.

Other objects will become apparent from the description of the invention taken with the accompanying drawings in which:

Fig. 1 is an enlarged partial cross section taken through the major axis of a round watch case embodying the invention.

Fig. 2 is an enlarged partial cross section taken on another plane through the major axis and the stem axis of the same round watch case.

Fig. 3 is a partial plan view of the inside of the back of the same round watch case from which the bezel has been removed.

Fig. 4 is a partial plan view of the inside of the bezel removed from the round watch case.

Fig. 5 is a perspective of one embodiment of the combined O-ring and stem gasket of the invention.

Fig. 6 is an enlarged partial view of the combined gasket of Fig. 5.

Fig. 7 is an enlarged partial view of a modified form of gasket of the invention.

Fig. 8 is a perspective view of a combined O-ring and stem gasket for a rectangular type waterproof watch.

Fig. 9 is an enlarged partial view of the gasket of Fig. 8.

Fig. 10 is a partial cross section view of a rectangular type watch case embodying the invention taken in a plane which includes the axis of the stem.

Fig. 11 is a partial cross section view of another portion of the watch shown in Fig. 10.

Referring to Figs. 1 to 5, a round waterproof watch

case indicated at 1 has a front indicated at 2 and a back 3, the front 2 including a crystal 4 and a bezel 5.

The back 3 and the bezel 5 have cooperating surfaces 8 and 9 respectively and cooperating undercut surfaces 10 and 11 by means of which the bezel 5 is snapped onto the back 3 in the usual manner. The back 3 has a movement 3*a* supported therein.

A radial hole 15, in this instance half of which 16 is in the back and the other half of which 17 is in the front or bezel 5 provides a stem journal from the inside to the outside of the case, the axis of the hole 15 lying on the plane of the abutting surfaces 8 and 9.

A circular groove 12 is provided in the surface 8 in the back 3 for receiving an O-ring type gasket 31.

The axis of the hole 15 crosses the groove 12 and the hole 15 has a circular expanded portion 21 on the groove 12 and half of which 22 lies in the back 3 and the other half of which 23 lies in the bezel 5 in this embodiment.

With the front 2 and the back 3 assembled, a stem 25 having a crown 26 is journalled in the hole 15. A combined O-ring and stem gasket indicated at 30 in Fig. 5, has a circular O-ring portion 31 which is seated in the groove 12 and a circular stem gasket portion 32 integral with the portion 31 and formed as a unit therewith and which is received in the expanded portion 21 of the hole 15. The gasket portion 32 surrounds the stem 25 and is compressed between the stem and the expanded portion 21 of the hole 15, and the gasket portion 31 is compressed by the surface 9 in the groove 12.

It is seen that by moving the stem gasket out of the crown 26 and into a position in line with the O-ring portion 31, the complication of machining and parts necessary to retain the gasket in the crown as in the old practice is eliminated and the structure simplified, while at the same time the waterproof characteristics of the watch are greatly improved by forming the stem gasket 32 and the O-ring 31 integrally as a unit 30.

Figs. 8, 10 and 11 show a modified version of the same invention as embodied in a rectangular type waterproof watch case indicated at 34 having a back 35 and a front 36 including a crystal 37 and a bezel 38. The back has a movement 35*a* supported therein.

The bezel 38 has a portion 39 which overlaps the back 35. The overlapping portion 39 of the front 36 is attached to the back by pins 40 one of which is shown in Fig. 11.

A pair of surfaces between the front 36 and the back 35, one 43 around the bottom edge of the crystal 37 and the other 44 along the top edge of the back 35 are arranged opposite each other for receiving an O-ring type gasket 45 around the periphery of the case.

A hole 50 in the periphery of the back 35 and a corresponding aligned hole 51 in the overlapping edge 32 of the front 36 provide a stem journal from the inside to the outside of the case. The axis of the holes 50 and 51 crosses the peripheral gasket surfaces 43 and 44. The hole 50 has a circular expanded portion 52 substantially on the gasket surfaces 43 and 44. A stem 55 having a crown 56 is journalled in the holes 50 and 51.

A combined O-ring and stem gasket 45 having a rectangular O-ring type portion 46 and a circular stem gasket portion 47 is seated with the portion 46 between the surfaces 43 and 44 and with the stem portion 47 surrounding the stem 55 in the expanded portion 52 of the hole 50 and is compressed between the surfaces 43 and 44 and between the expanded portion of the hole 52 and the stem 55 thereby providing a continuous waterproof joint.

As seen in Figs. 5 to 9 inclusive the construction of gaskets for, and of both the round and the rectangular cases may be varied according to the invention, the stem portions 32 being centered with the O-ring portions 31

as in Figs. 5 and 6, or the stem portions 47 or 47A slightly offset as in Fig. 7 or offset to a greater degree as in Figs. 8 and 9 with respect to the O-ring portions 46 and 46A, Fig. 7 being illustrative of slight offsetting in a watch construction the complete embodiment of which is not shown in the drawings.

A particular advantage of having the stem gasket portion 47 moved into the case in line with the O-ring portion 46 as illustrated in Figs. 10 and 11 is that by eliminating the gasket from the crown 56, the sleeve which goes with it in the old construction is eliminated, thus allowing the hole 51 in the overlapping portion 39 to be of smaller diameter, providing for stronger construction of the overlapping edge 39. Thus, also, a smaller crown may be used.

The term "stem" is used in the claims hereof in its broad sense to include not only what is conventionally referred to as a stem in the watch case industry, but also what is conventionally referred to as the crown post and which forms a continuation of the stem connecting it to the crown per se. For example, if the crown post extends through the hole in the gasket or sealing ring so that sealing is around the crown post rather than the stem per se the result is the same as when the stem per se extends through said hole, in the former case the crown post is in effect a part of the stem.

I claim:

1. In a watch case comprising at least two pieces, said pieces having opposing sealing surfaces, at least one of said sealing surfaces being in the form of a groove for receiving a sealing ring gasket, a stem receiving passage located between said sealing surfaces and crossing said gasket receiving groove, said passage comprising a stem receiving groove in at least one of said opposing surfaces and an oppositely disposed portion of the other surface spaced from the wall of said stem receiving groove, a stem received in said passage, and a combined ring and stem gasket, said gasket having a ring portion seated in said gasket receiving groove and a stem gasket portion integral with said ring portion, surrounding said stem and received in said stem receiving groove, said pieces comprising a back piece and a front piece, one of said sealing surfaces being an upwardly facing surface on said back and the other of said adjacent surfaces being a downwardly facing surface on said front, said stem receiving groove being located in the same sealing surface as said gasket receiving groove and intersecting said gasket receiving groove, said stem receiving groove being enlarged where it intersects said gasket receiving groove, said enlarged part of said stem receiving groove comprising a recess in the floor of said gasket receiving groove, said stem gasket portion being received in said enlarged portion of said stem receiving groove.

2. In a watch case comprising at least two pieces, said pieces having opposing sealing surfaces, at least one of said sealing surfaces being in the form of a groove for receiving a sealing ring gasket, a stem receiving passage at least a part of which is located between said sealing

surfaces and crosses said gasket receiving groove, said passage comprising a stem receiving groove in at least one of said opposing surfaces and an oppositely disposed portion of the other surface spaced from the wall of said stem receiving groove, a stem received in said passage, and a combined ring and stem gasket, said gasket having a ring portion seated in said gasket receiving groove and an enlarged stem gasket portion integral with said ring portion surrounding said stem and received in said stem receiving groove, one of said sealing surfaces being an upwardly facing surface and the other of said sealing surfaces being a downwardly facing surface, said stem receiving passage being enlarged where it crosses said gasket receiving groove, said enlarged stem gasket portion being received in said enlarged portion of said stem receiving passage, said gasket receiving groove and the portion of the sealing surface oppositely disposed to said gasket receiving groove forming a gasket receiving space in which said gasket is received, said stem passage intersecting said gasket space, said enlarged portion of said stem passage also comprising an enlarged portion of said gasket receiving space, said enlarged portion of said gasket receiving space being enlarged at least in height, said gasket being pressed between the wall of said gasket receiving groove and the portion of the sealing surface oppositely disposed to said gasket receiving groove, said stem being pressed between the floor of said stem receiving groove and the portion of the other sealing surface oppositely disposed to said stem receiving groove through said enlarged stem gasket portion.

3. A waterproof watch case according to claim 2, at least one of said sealing surfaces forming part of a wider surface facing in the same general direction as said sealing surface, said stem receiving groove extending across said wider surface and its sealing surface, said wider surface and said stem receiving groove extending inwardly from said sealing surface of said wider surface and from said expanded portion of said stem receiving passage.

4. A case according to claim 2, wherein the maximum average cross sectional height of at least the major portion of said gasket is substantially equal to the diameter of said stem.

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