

April 14, 1970

E. PIQUEREZ

3,505,807

WATERTIGHT TIMEPIECE CASE

Filed Feb. 23, 1968

2 Sheets-Sheet 1

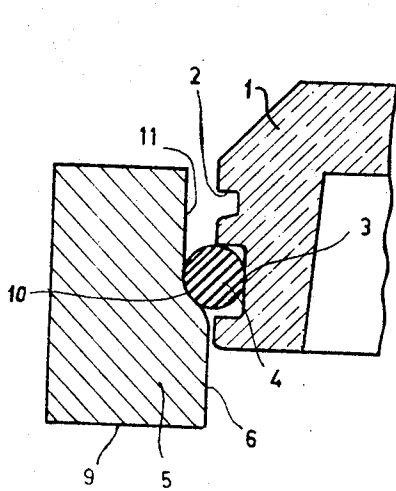


FIG. 1

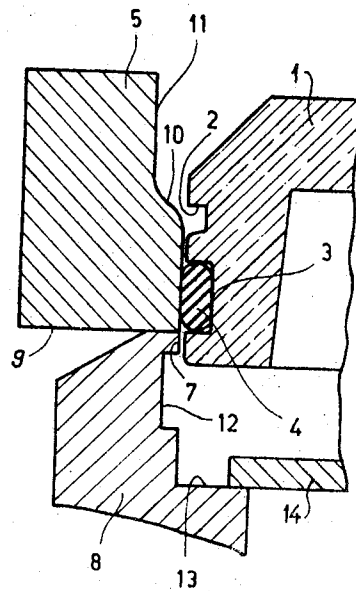


FIG. 2

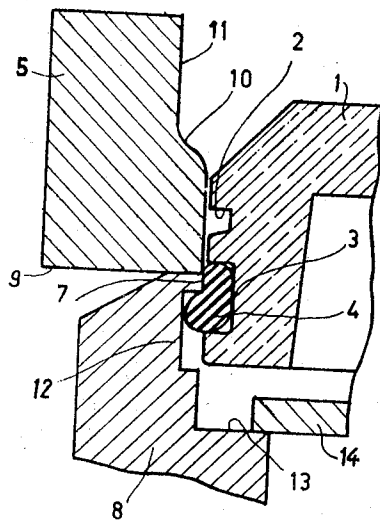


FIG. 3

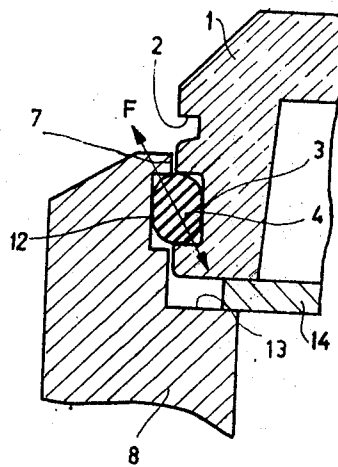


FIG. 4

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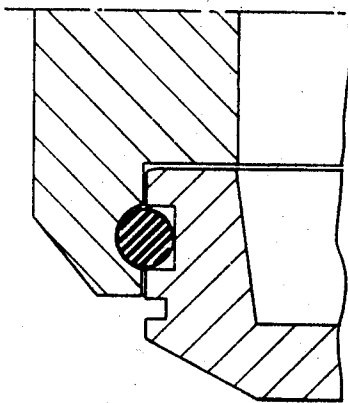
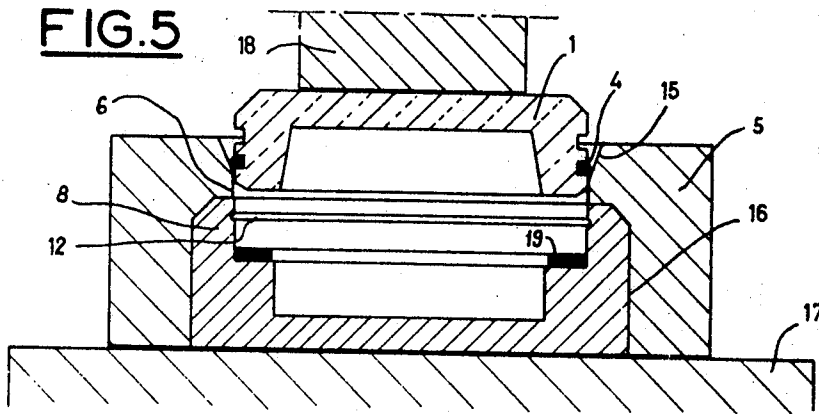


FIG. 6

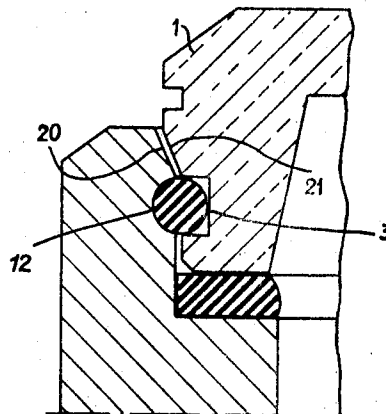


FIG. 7

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WATERTIGHT TIMEPIECE CASE

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U.S. Cl. 58—90

3 Claims

ABSTRACT OF THE DISCLOSURE

A watertight closure for a timepiece, such as a wrist watch, is described. Grooves placed in the casing and the crystal of the watch form a complementary rectangular enclosure in which an elastomeric ring of circular cross section is deformed, exerting a retaining force and, by virtue of its resiliency acts as a watertight seal.

This invention relates to watertight timepieces and means for effecting such watertightness.

It has already been proposed to achieve the watertightness of a crystal having an annular part encased on a shoulder of the middle by positioning a watertight packing placed in a housing formed between the crystal and the middle by peripheral grooves made in each of these. This packing has a sufficient mechanical resistance to ensure the securing of the two parts.

In an embodiment of the above type, the joint in its free state is placed mainly in the housing of the middle, the crystal having only a hollow nick intended for hooking the joint. This hooking is obtained by means of the mechanical resistance of the joint, the material used for its manufacture not being or being only slightly elastically deformable, the fastening being obtained to the detriment of the watertightness.

The present invention proposes to remedy this drawback and has for its object a watertight timepiece case in which at least one of the parts, crystal or casing, is encased on the middle with interposition of a coupling engaged in an enclosure formed between said part and the middle by peripheral grooves made in each of these members, this coupling comprising a ring of elastically deformable material.

The invention also has for its object a process for mounting the part characterized by the fact that the ring is compressed at least partially inside the groove made in the part before introduction thereof in the middle in such a way as to give to this ring dimensions substantially equal to the lateral dimensions of the opening of the middle.

It also has for object a device for carrying out this process characterized by the fact that it comprises a template having inwardly at least one tubular part having lateral dimensions equal to those of the opening of the middle and flaring out at its upper extremity, the whole in such a way that said ring can be compressed in the groove of said part during axial movement thereof towards the lower extremity of said template and that this part be maintained by said tubular part.

The accompanying drawing represents by way of example various embodiments of the invention.

FIGURES 1 to 4 are successive cross sectional views of a device for securing the crystal for a first embodiment.

FIGURE 5 is a cross sectional view of a device for securing a crystal according to another embodiment.

FIGURE 6 is a cross section of a case whose bottom is secured according to the process of the invention.

FIGURE 7 is a cross section of a case whose crystal is secured according to another modification.

In FIGURES 1 to 4, the part having the peripheral grooves is a crystal 1 which during the moulding process, is provided with an extraction retaining groove 2 and a groove 3. In the case of a polygonal part, there is provided a rectilinear groove 2 on the two opposite sides while if the same is a round or an oval piece, this groove can be made along the entire periphery of the part or only in certain parts thereof.

The compressible watertight ring 4 is of any cross section and is introduced in groove 3 which has a substantially rectangular cross section, these cross sections being substantially equal in order to permit the placing of the ring 4 in the groove 3 by compression.

This compression is obtained during axial movement of part 1 in frame 5. This frame has on its lower part a tubular surface 6 whose dimensions are equal to those of opening 7 of casing 8. Tubular part 6 is cut at its lower extremity by a plane surface 9 and has at its upper extremity a flared part 10 formed by two arcs of a circle tangent to one another, one of them being tangent in addition to tubular part 11 having dimensions greater than the first.

Casing 8 has on its lateral surface 7 a groove 12 of rectangular cross section and a shoulder 13 on which rests dial 14.

There can be seen on FIGURES 1 to 4 how ring 4 is compressed in groove 3 when crystal 1 is axially moved in frame 5. Once positioned, ring 4 remains compressed in the bottom of grooves 3 and 12, which on the one hand ensures watertightness and on the other hand secures the glass in the center. As can be seen on FIGURE 4, grooves 3 and 12 are slightly axially shifted and ring 4 bears against the lower edge of groove 3 and the upper edge of groove 12 creating two forces of opposite directions along double arrow F.

The depth of groove 3 equals about $\frac{2}{3}$ of the room necessary for ring 4 in order that the latter be driven by the crystal during its extraction by means of a tool engaging in groove 2. Alternatively, in order to maintain the joint in the groove of the crystal, this joint is positioned under strong pressure.

In FIGURE 5 is shown another device at a stage of the process corresponding to that of FIGURE 1 which differentiates thereof by the shape of frame 5 whose opening has a lower part 6 of dimensions corresponding to those of middle 8 and a flared out upper part 15. This frame also has a hollow 16 in which is positioned middle 8, the whole resting on a support 17. The crystal is pushed in by means of a pushing tool 18. There has also been shown a watertight packing 19 against which bears the lower edge of crystal 1.

FIGURE 6 shows a timepiece with a reset bottom according to the process of the invention.

FIGURE 7 represents a modification in which it is not necessary to use a frame, the middle itself having an inclined flank 20 permitting to compress the joint in groove 3 of the crystal when the same is put in place. In this case, the crystal also has an inclined flank 21 intended to mask flank 20 of the middle.

As can be seen in the different figures, groove 12 can be rectangular or rounded. The cross section of joint 4 is also of any shape.

What is claimed is:

1. A watertight closure for watches comprising a tubular annular casing member having an inner groove of rectangular configuration, a dome-shaped crystal member adapted to fit within said casing, said crystal having an outer groove of rectangular configuration, both said grooves being in complementary position upon insertion of said crystal, an elastomeric ring of circular cross sec-

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tion adapted to be placed in one of said grooves, said ring upon insertion of said crystal being deformed between said grooves into an ellipsoidal shape, its expanding force serving to retain both said members into firm engaging position and forming a fluid-tight seal between said members.

2. A watertight closure for watches in accordance with claim 1 wherein said crystal member has a second outer groove serving as anchorage for an instrument in prying apart the assembly.

3. A watertight closure for watches in accordance with claim 1 wherein said elastomeric ring is made of rubber.

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