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[54] **TIGHT CONTROL MEMBER FOR WATCH MOVEMENT**

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[51] **Int. Cl.**.....**G04b 37/08**

[58] **Field of Search**.....58/88 B, 90 B, 63, 73

[56] **References Cited**

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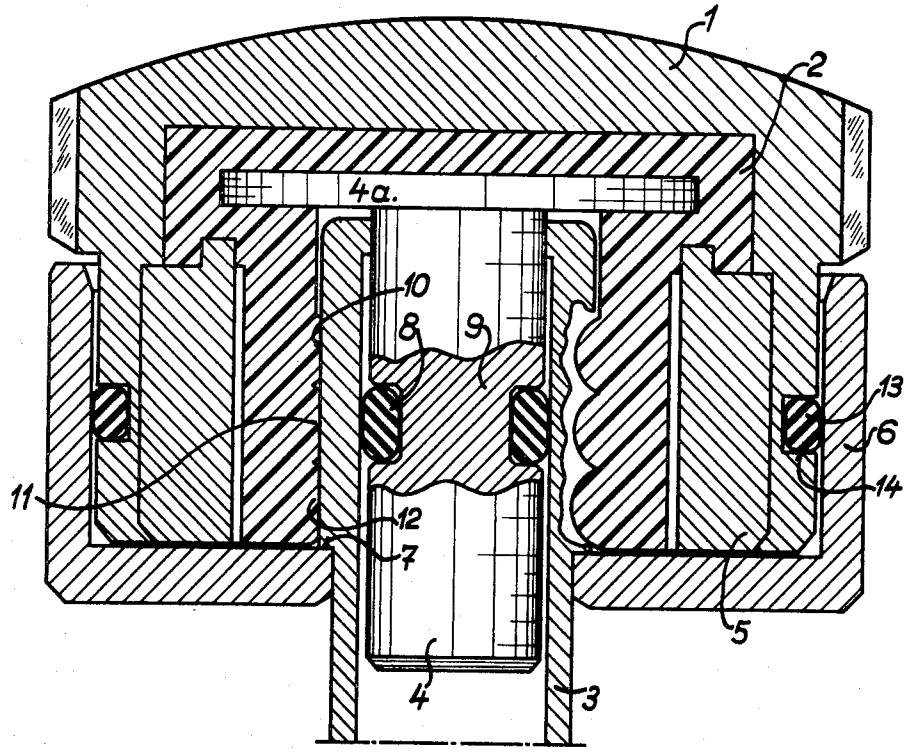
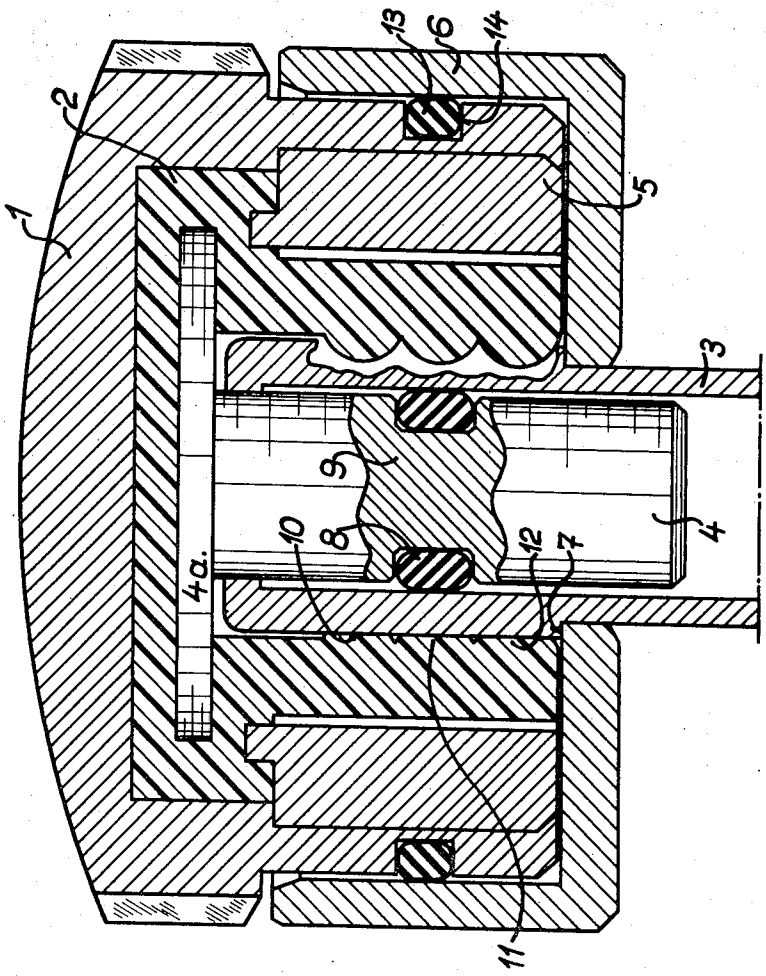
[57] **ABSTRACT**

This fluid-tight mounting for a control member for a watch movement or like mechanism comprises a winding button having a member of synthetic material fitted therein, in which the flange-shaped head of a shank for driving the associated part is embedded. Rigid with the case of the mechanism is a socket having a bottom through which said shank extends towards the mechanism to be controlled. The socket receives in smooth frictional contact the skirt of said button with the interposition of an O-ring, thus permitting both rotational and axial sliding movements of said button therein and protecting said member of synthetic material against any attack from external agents.

5 Claims, 1 Drawing Figure

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TIGHT CONTROL MEMBER FOR WATCH MOVEMENT

The present invention relates in general to fluid-tight watches and like mechanisms and has specific reference to improvements in the dust- and water-tight mounting of a control member for watch movements.

Mechanisms designed for controlling dust-and-water-tight watches and the like are already known wherein the degree of tightness is obtained by the simple contact between a winding button and a the tubular piece extending through the watch case, without interposing any packing means. In some known constructions of this character, the button core engaging the tubular piece is provided with a bead of synthetic material, and in other constructions, the winding button comprises one or a plurality of beads of synthetic material surrounding the tubular piece.

However, in these constructions the winding button necessarily consists at least partially of synthetic material adapted to undergo a certain elastic deformation. Such synthetic material is more delicate than metal and the deformation of this synthetic material as a consequence of radial stress is transmitted through the distorted material to the shank and to the winding mechanism.

It is the essential object of the present invention to provide an improved construction capable of efficiently protecting the winding button as well as its portion of synthetic material and the button shank against radial shock and stress.

To this end, the present invention provides a fluid-tight control member for a watch movement, compromising a button for driving a shank of the watch movement and extending from the wall of the watch case through a tubular piece, the fluid-tightness being obtained at least by mutual contact between the button and the tubular piece, without interposing any packing therebetween. The fluid-tight control member the characterized in that the button engages a socket rigid with the tubular piece and receiving the tubular piece through its bottom. The button engages with the socket and is both rotatable and axially movable therein.

In addition to the mechanical protection against detrimental shocks which is provided by the socket associated with this fluid-tight control member arrangement, the socket includes an additional barrier for preventing the ingress of duct and water comprising an O-ring or a gasket interposed between the button and the socket.

In certain types of screw-in winding buttons, the latter is protected against shocks by the tapped projection in which it is screwed. However, this protection prevents the free rotation of said button except for unscrewing the button out from the projection. Thus, by using a simpler construction, without any screw-threads, the winding button of this invention provides the same advantageous features as a screw-in button by the interposition of a sealing gasket at the inlet end of the projection while avoiding certain inconveniences, such as, notably, the heretofore necessary slow actuation of the screwed button and the excessive compression of the O-ring or like gasket disposed at the inlet end of the projection. Moreover, in case of untimely screwing-in of the button, excessive compression may cause severe damages or even the destruction of the seal, not to mention the trouble for the wearer of the watch who must take care of properly re-screwing the button after each rewinding or hour-setting operation, since a mere oversight might lead to a deterioration or even a destruction of the movement.

A typical form of embodiment of the invention is illustrated by way of example in the single FIGURE of the attached drawing. In the drawing, showing on a considerably large scale and in axial section the winding-button arrangement of this invention, the mechanism controlled by this button is not shown, as it is no part of the present invention.

The winding button illustrated in the drawing comprises a metallic outer portion **1** in which a piece **2** of synthetic material is tightly fitted. This piece **2** contacts directly the tubular piece **3** extending through a wall of the watch casing (not shown). The button further comprises a metal core **4** of which the upper or outer portion **4***a* constitutes a flange embedded in the synthetic material **2**. This piece **2** of synthetic material is retained in the corresponding cavity of button **1** by an annular metal member **5** crimped therein. Moreover, the button **1** fits within a metal socket **6** which is rigid with the tubular piece **3**.

The fluid-tightness of the control device is obtained by using three successive barriers. The first barrier from the interior of the watch case consists of an O-ring **8** fitted in a groove **9** of the core **4** and engaging the inner wall of tubular piece **3**. The second barrier consists of three successive inner beads **10**, **11** and **12** formed in the synthetic member **2** and these beads are compressed against the outer wall of tubular piece **3**. In the right-hand half of the figure, these three beads are shown in their free condition, i.e. before their actual compression. The third barrier consists of another O-ring **13** of the same type as ring **8** but fitted in a groove **14** formed in button **1** and engaging the socket **6**. This O-ring **13** permits easy axial sliding movements of the button on socket **6** while safely protecting the synthetic material **2** constituting the main barrier protecting the interior of the watch case against the ingress of dust and water, notably sea-water salt likely to attack and damage the synthetic material **2**. In case of shock applied to the socket **6**, no stress is transmitted to the button **1**.

Similarly, when a shock is applied to the top of button **1** it is damped out by the outer portion of synthetic member **2** and therefore not transmitted, or at the most only very slightly, to the arbor (not shown) connecting the button **1** to the movement.

Of course, the invention should not be construed as being strictly limited to the specific embodiment illustrated herein, since it applies likewise to any other control member of which at least one portion consists of synthetic material and constitutes a fluid-tight seal both inside and outside the tubular piece.

What is claimed is:

1. A fluidtight winding mechanism for a watch movement and the like comprising: a socket member having in a bottom portion thereof means defining an opening; a tubular member extending through said opening and rigidly connected to said socket member; a button movably mounted within said socket member to undergo both manual rotational movement and manual axial sliding movement and having an inner portion

composed of deformable synthetic material in compressively deformed contact with said tubular member and cooperative therewith to establish a fluidtight connection therebetween; and a driving shank extending into said tubular member and having at one end a head portion embedded in and connected to said synthetic material and connectable at the other end to a member to be wound.

2. A fluidtight winding mechanism according to claim 1; including an O-ring type packing interposed between said button and said socket member establishing a fluidtight connection therebetween.

3. A fluidtight winding mechanism according to claim 1; wherein said inner portion of said synthetic material in compressively deformed contact with said tubular member includes a plurality of annular beads each encircling said tubular member and in compressively deformed contact therewith.

4. A fluidtight winding mechanism according to claim 1; including an O-ring type packing interposed between said driving shank and said tubular member establishing a fluidtight connection therebetween.

5. A fluidtight winding mechanism according to claim 4; including an O-ring type packing interposed between said button and said socket member establishing a fluidtight connection therebetween.

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