

DESCRIPTION

The present invention relates to manual control device for a watch movement intended to be housed in a case, comprising a shaft connected to said movement and movable in rotation and translation with respect to said movement and a crown comprising a wall defining a cylindrical housing coaxial with said shaft, said crown being releasably fixed to said shaft by fixation means comprising a pair of elastic claws fastened to the extremity of said shaft, a pair of notches disposed opposite to each other, each in one of said claws, and a retention element solid with said crown and elastically hold between said notches by said claws.

In cases with an independent, detachable back, casing up and uncasing the watch movement is effected without the shaft for setting the time and, possibly, the calendar. This is placed in position after the movement has been introduced into the case, or removed before withdrawing the movement from the case. The fastening of this shaft to the movement, in the first instance, and its release, in the second, are customarily effected by actuating a post which is integral with the pull-out piece and only accessible from the back of the movement. This operation is simple when the back of the case may be removed. In cases having a back cover which is integral with the case band, i.e. in cases where the back and the case band are manufactured in one piece, this operation is, however, no longer possible.

The means generally used for many years for allowing a watch movement to be cased up and uncased in a case having a back cover integral with its case comprises a "broken" shaft made of two pieces which may be coupled together in a disconnectable manner.

One of these pieces presents a pair of notched resilient claws and the other presents near to its extremity a transversely widened portion or a transverse pin.

One of these pieces is retained in the watch movement by the pull-out piece and is short enough not to engage in the hole provided in the case band permitting the passage of the shaft. This piece thus does not hinder the uncasing or casing up of the watch movement.

The other of these two pieces is fixed to the crown, for example by way of a thread provided at its extremity and screwed in a suitable threaded cylinder fitted to the bottom of the central hole of the crown.

These pieces interlock by firmly pushing the crown with its portion of shaft against the other part of the shaft in order to push the widened portion or the pin between the claws to introduce it into the notches of these latter. These two parts separate again by pulling the crown firmly towards the exterior of the casing.

Such broken shafts are described, for example, in patents CH-A-180 459 and CH-A-191 764.

The latter patent, in particular, describes a device in which the crown comprises a housing open in the direction of the watch case, and a threaded shaft disposed in the center of that housing. An intermediate piece is screwed by one of its extremities to that threaded shaft and comprises at its other extremity a transverse widened portion. The latter is tightened between notches provided in elastic claws fastened to the portion of the shaft that is solid with the watch movement. The above-mentioned intermediate piece may slide in a tube solid with the case band of the watch.

That device thus comprises a relatively high number of pieces, and the crown has a complicated shape. The manufacturing cost of that device is thus high.

The object of the present invention is to provide a device of the same kind as the one that has just been described, but that is cheaper than that one due to the fact that it comprises less pieces and that, further, none of that pieces has a complicated shape.

That object is reached by the device defined by claim 1.

Other objects and advantages of the invention will appear in reading the description of two of its embodiments that follows. These embodiments of the invention are only described as non limitative examples and are represented by the enclosed drawing in which :

- Fig. 1 is a diagrammatic diametrical section of the first embodiment;

- Fig. 2 is a diagrammatic elevation view along the direction of the arrow a of the crown of Fig. 1, and

- Fig. 3 is a diagrammatic diametrical section of the second embodiment.

The control device of the first embodiment depicted by Figs. 1 and 2 comprises a crown 1, of which the body 2, outside the case band 3 of the case, is manufactured in one piece with a cylindrical sleeve 5 and presents a cylindrical housing 4. A pin 6 is lodged in a hole 11 pierced in the body 2 of the crown 1, and crosses the housing 4 diametrically. The outer surface 7 of the sleeve 5 is carefully polished so as to slide and turn freely in a bore 8, pierced through the wall of the case band 3.

The watertightness of the passage of the crown 1 through the case band 3 is ensured by a waterproof joint 9, of toroidal shape, which is disposed in a circular groove 10 of the case band 3. If the crown is solid, for example of gold, it will of course be necessary to ensure that the hole 11 pierced through the wall of its body 2 is perfectly filled by the pin 6 to prevent infiltration between these two pieces. On the other hand, if the crown 1 is made of base metal, it may be covered with a fine cap, for example of stainless steel, to seal the passage of the pin 6 through the wall of the body 2. In such a case, the pin 6 has obviously to be placed in position before that cap.

To control certain functions of the movement 12 of the watch, such as the setting of the time, the adjustment or correction of the calendar, a shaft 13 is mounted in the customary manner in the movement 12. It is retained in this latter by a pull-out piece stud (not shown) which penetrates a groove 14 of the shaft 13. The extremity of this latter that is outside the movement 12 presents a thread 15. A ferrule 16 is screwed firmly to that thread 15, so as to be solid with the shaft 13.

In another embodiment, not shown, the extremity of the shaft 13 is smooth and the ferrule 16 is driven onto and bonded to said extremity so as also to be solid with that shaft 13.

The outer surface 17 of the ferrule 16 is cylindrical. It engages freely in the sleeve 5. The exterior surface 18 of the extremity of the ferrule 16 is conical and presents a diametrical slot 19 so as to form two resilient claws 20. These claws 20 each have a notch 21. These notches 21 partially surround the pin 6 and hold it between them, so that the crown 1 is coupled mechanically to the shaft 13 and that this latter also moves with every rotatory or translation movement imparted to the crown 1.

Although the ferrule 16, solid with the shaft 13 extends up to the exterior of the case band 3, the movement 12 equipped with the shaft 13 provided with the ferrule 16 can be cased up without difficulty. Due to the absence of a tube in the bore 8 of the case band 3, the ferrule 16

passes, in fact, through the bore 8 when the movement 12 is presented in an inclined position with respect to the case band 3. Uncasing is effected by first withdrawing from the case the part of the movement 12 which is diametrically opposed to the shaft 13.

To fasten the crown 1 to the shaft 13 when the movement 12 is in the case, it suffices to put the crown 1 onto the ferrule 16 in such a way that the pin 6 is parallel to the slot 19, and to firmly push the crown 1 towards the case band 3.

The pin 6 then forces the claws 20 apart which let it pass between them. The conical form of the surfaces 18 of the claws 20 permits that displacement into the interior of the body 2. The pin 6 thus arrives between the notches 21. The resilience of the claws 20 then causes the latter to urge against each other, which thus firmly hold the pin 6 in the notches 21.

To facilitate positioning of the pin 6 in relation to the slot 19 and its introduction between the claws 20, a chamfer 22 is provided along the inside edge of each of the claws 20.

If the movement 12 has to be uncased, the crown must first be removed. For this purpose it is separated from the case band 3 with a force sufficient to allow the pin 6 to pass again between the claws 20, by separating them from one another.

The resilience of the claws 20 must clearly be determined as a function of the characteristics of the various pieces of the movement 12 which are linked to the shaft 13, in a manner such that the force necessary for removing the crown is greater than that which must be exerted to bring the crown 1 from its pushed in position to its pulled out position or positions, but inferior to that which the different pieces of the movement 12 can sustain without damage.

The second embodiment of the device according to the invention, depicted by Fig. 3, differs from the first solely in that the part 23 which replaces the ferrule 16 of the first embodiment is here manufactured as one integral piece with the shaft 24.

In this second embodiment the shaft 24 is thus manufactured at a specific length. But depending on the dimensions of the case designed to receive the movement, it is necessary to adapt the length of the shaft to the latter. To permit such adaptation it suffices to make the part 23 sufficiently long, the slot 19 sufficiently deep and to provide a row of notches 21 along this slot.

Instead of setting the pin 6 in the body 2 of the crown 1 it could also be set through the sleeve 5 in a place of the latter that, at least when the crown 1 is in its pushed in position, it is situated beyond the waterproof joint 9 towards the interior of the case. There are thus avoided all problems of tightness which could arise if the

pin 6 were not to completely fill the hole 11 in which it is placed. In this case it is of course necessary for the sleeve 5 to be sufficiently resistant to withstand the forces exerted on the pin 6 when the crown 1 is put into place or removed.

In order to avoid sideways movement of the ferrule 16 or the part 23 of the shaft 24 with respect to the crown 1 during its rotation, which would cause awkward variation of the torque to be exerted on the crown 1, it is appropriate to adjust the diameter of this ferrule 16 or this part 23 of the shaft 24 to that of the housing 4 of the crown.

It can be seen that in the device according to the invention which has just been described and as it is defined in claim 1, the crown is much more simple than in the known devices since it only presents a central cylindrical housing and a pin disposed diametrically in that housing. The part of the shaft that is solid with the crown in the known devices and its fixing means to said crown are therefore suppressed.

The part solid with the shaft, which carries the notched claws, can be manufactured in one piece with the shaft (claim 2). It can also consist of an independent piece, screwed to the extremity of the shaft (claim 3) or driven onto and bonded to this extremity of the shaft (claim 4). The special embodiments defined in claim 5 have the additional advantage of substituting the sleeve of the crown for the tube generally fixed to the case in water-

resistant watches. The space around the shaft in the bore of the case, which is free in the absence of the crown, makes it possible to case up and uncase the movement from the glass side of a case having a back cover integral with its case band. The movement can, indeed, be placed in an oblique position to the entrance of this case. The water-resistance of the passage of this shaft through the wall of the case band can be realized by a waterproof joint mounted in a housing in the case band in such a way as to surround the sleeve of the crown (claim 6). As for the pin gripped by the notches of the claws solid with the shaft, it can be set across the sleeve of the crown, beyond the waterproof joint, towards the interior of the case, if a leak is to be feared between this pin and the wall of the crown (claim 7). Finally, depending on the position of the pin solid with the crown or if the control device has to be capable of being mounted in cases of different dimensions, several notches can be provided in sufficiently long claws (claim 8). If necessary, the extremities of these claws can be removed.

Whilst the control device described is particularly advantageous in the case where the movement of the watch is intended to be mounted in a case having a back cover integral with its case band, there is of course nothing to prevent its use in cases where the movement of the watch is intended to be mounted in a case with an independent back.



CLAIMS

1. Manual control device for a watch movement (12) intended to be mounted in a case, comprising a shaft (13) connected to said movement (12) and movable in rotation and translation with respect to said movement (12) and a crown (1) comprising a wall defining a cylindrical housing (4) coaxial with said shaft (13), said crown (1) being releasably fixed to said shaft (13) by fixation means comprising a pair of elastic claws (20) fastened to the extremity of said shaft (13), a pair of notches (21) disposed opposite to each other, each in one of said claws (20), and a retention element (6) solid with said crown (1) and elastically held between said notches (21) by said claws (20), characterized by the fact that said claws (20) are at least partially engaged in said housing (4), and that said retention element is comprised of a pin (6) put in said wall and diametrically crossing said housing (4).

2. Control device according to claim 1, characterized by the fact that said claws (20) are manufactured in one piece with said shaft (13).

3. Control device according to claim 1, characterized by the fact that said claws (20) are integral with an independent ferrule (16) that is screwed onto the extremity of said shaft (13).

4. Control device according to claim 1, characterized by the fact that said claws (20) are integral with an



independent ferrule (16) that is driven onto and bonded to the extremity of said shaft (13).

5. Control device according to claim 1, characterized by the fact that a portion of said crown's wall (1) forms a cylindrical sleeve (5) that is intended to engage with a bore (8) in the case band (3) of the case.

6. Control device according to claim 5, characterized by the fact that it comprises a tightness joint (9) disposed in an annular groove (10) of the watch band (3) and surrounding the sleeve (5) of the crown (1).

7. Control device according to claim 6, characterized by the fact that said pin (6) is put across said sleeve (5).

8. Control device according to claim 1, characterized by the fact that said fixation means comprises a plurality of notches' pairs (21), the notches (21) in each pair being disposed opposite to each other, each in one of said claws (20).