

TIMEPIECE WITH A PIVOTING CASE

FIELD OF THE INVENTION

The present invention concerns a timepiece with a case carrying a movement that can pivot about the hinge of a stationary case, such as a wristwatch that may have a chronograph function.

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BACKGROUND OF THE INVENTION

In order to make it easier to read the time when the watch is worn on the wrist, or to enable it to be used as a table clock, it has long been proposed to have a first stationary case, attached to the wrist by the strands of a bracelet or wristband or able to be placed on a table, and a second
10 case, which contains the watch movement and is mobile and hinged in the first case, and which can take a first position in which it is locked in the stationary case and a second position in which it can adopt an inclined position.

US Patent No. 1 804 048 already discloses a device wherein the
15 mobile case can be unlocked by pressing a push-button passing through the middle part of the watch. In CH Patent No. 161 610, the display is concealed when the two cases nest inside each other, and made visible by pivoting the mobile case by gripping a lip arranged at 12 o'clock. In the device disclosed in CH Patent No. 343 946, one side of the middle part of
20 the stationary case is removed to allow a corresponding middle part portion of the mobile case to be gripped in order to unlock the latter against the bias of a spring and pivot said case. In US Patent No. 4 168 607, the mobile case is also brought into a raised position via the action of a strip spring

arranged in the back cover of the stationary case, by pressing a push-button as in the first document cited.

These devices of the prior art may protect or conceal the crown or another control member, but they have the drawback of either leaving a push-button or an unlocking lip visible, or of comprising a recess in the middle part, which, in both cases, is awkward to manipulate or unattractive.

Summary of the invention

It is thus an object of the present invention to overcome the drawbacks of the aforecited prior art by providing a timepiece and more particularly a watch including two cases nesting inside each other, the inner case carrying the movement being able to adopt an inclined position relative to the outer stationary case by the action of a finger on a mobile element and the external part in order to impart thereto a movement along the plane of the timepiece to cause the unlocking of the mobile case.

The invention therefore concerns a timepiece and more particularly a wristwatch including a stationary external case and a pivoting internal case carrying the movement and a display for time related data or non-time related data. The inner case is hinged about an axis parallel to the direction in which data is read and arranged in the bottom part of the display, i.e. at 6 o'clock in the case of an analogue display. The inner case is kept in the normal position in the stationary case by locking means and can occupy an inclined position via the action of a spring when said locking means are deactivated. The invention is characterized in that the locking means are formed by a mobile element of the external part that can be manipulated in the plane of the timepiece in rotation or in translation. In other words, the timepiece no longer includes push-button or lip type locking means.

This mobile element of the external part of the watch can form part of either the inner case or the outer case. When it forms part of the inner case, it is preferably formed by a rotating bezel. When it forms part of the outer

case, it is preferably formed by a sliding shutter arranged in the top part of the bezel-middle part.

With the exception of timepieces controlled entirely tactilely by means of sensors arranged on the glass, projecting control means, such as
5 a crown or pushers in the case of a chronograph watch, are necessary, but said control means can be damaged in the event of a shock and are not necessarily attractive.

According to another aspect of the invention, the outer case protects the control members, and the mobile element could conceal them.

10 According to a first embodiment, the mobile element is a rotating bezel secured to the inner case and may have an asymmetrical external contour if the timepiece is provided with control members to which easy access is necessary in the pivoting position, for example in the case of a chronograph watch. The mobile element may also be only one sector of a
15 bezel that is mobile in rotation.

According to a second embodiment, the mobile element is a sliding shutter arranged in the top part of the bezel-middle part of the external case. If the timepiece is provided with control means, the shutter may be arranged on said control members so that the latter can be concealed in the
20 normal position.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will appear in the following description of various embodiments given by way of non-
25 limiting illustration, with reference to the annexed drawings, in which:

- Figures 1 and 2 show in perspective a first embodiment of a wristwatch according to the invention respectively with the inner case in the normal position and in the pivoted position;

- Figures 3, 4 and 5 show schematically the manipulations to be carried out in order to make the inner case pass from the normal position to the pivoted position;

5 - Figures 6, 7 and 8 show the various parts to be assembled in order to obtain the watch of Figure 1;

- Figure 9 is a perspective view corresponding to Figure 2 at an angle showing one part of the locking mechanism;

- Figure 10 corresponds to Figure 9 without the outer case;

10 - Figure 11 is a broken cross-section of the watch shown in Figure 1, along the 2 o'clock- 6 o'clock axes;

- Figures 12 and 13 show in perspective a second embodiment respectively with the inner case in the normal position and in the pivoted position;

15 - Figures 14, 15 and 16 show schematically the manipulations to be carried out to make the inner case pass from the normal position to the pivoted position;

- Figures 17 and 18 show in perspective only the inner case and the shutter in the locked and unlocked position;

20 - Figures 19, 20 , 21 show in perspective only the shutter at three different angles, and

- Figure 22 is a cross-section of the watch shown in Figure 12, passing through the locking device.

DETAILED DESCRIPTION OF THE INVENTION

25 With reference first of all to Figures 1 to 11, we will describe below a first embodiment of a chronograph watch with a pivoting case, and the way in which the display passes from a normal position to a pivoted position allowing more convenient reading of the information displayed on the dial

and giving access to the control, time-setting, chronograph function or other members.

Figure 1 is a perspective diagram in the "normal" position, i.e. as a wristwatch is usually seen when worn on the wrist, with one exception: there are no control members visible on the middle part of outer case 1 which allows bracelet or wristband strands 3 to be attached.

The only visible part is a display 12, which in this example is an analogue display with a chronograph function, and a bezel 20 having an asymmetrical shape with, in particular, a recess 21 in the external contour thereof. Bezel 20 is a rotating bezel which can be manipulated in rotation in the plane of the watch.

The same watch is shown in the "pivoted" position in Figure 2, facilitating, when it is worn on the wrist, the reading of information on display 12 and uncovering the control members, such as a crown 14 and two push buttons 16, 18. The manner in which the passage from the normal position to the pivoted position is achieved will be better understood by referring also to the diagrams of Figures 3, 4 and 5. Starting from the normal position (Figure 3), a rotation of a certain angle (Figure 4) is imparted to rotating bezel 20 which will position recess 21 above the place where control members 14, 16 and 18 are located and which will cause, via the action of a helical torsion spring 7, not visible in these Figures, an inner case 10 to pivot, enclosing the watch movement with its display 12, and the control members 14, 16 and 18. This pivoting occurs about a pin 4, arranged at 6 o'clock and passing through extensions 5, 15 of cases 1 and 10.

Figures 6, 7 and 8 show a top view of the various parts to be assembled to obtain the watch shown in Figures 1 and 2.

Figure 6 shows that the outer case 1 includes a cavity 6 whose contour corresponds to that of the external contour of pivoting case 10 shown in Figure 7. The extensions 5a, 5b along the direction of bracelet

strands 3 include in particular housings 6a, 6b for receiving respectively control members 14, 16 and 18 and extension 15 of inner case 10. As Figure 8 shows, in the example shown, rotating bezel 20 has an asymmetrical shape with a recess 21. It is clear that the shape of bezel 20 is adapted to the contour of the stationary case, to any desired aesthetic effect and to the type of movement and control members integrated in said watch. It is, for example, possible to have a bezel with an oblong shape along the direction of the bracelet strands and an elongated part of which covers the control members in the locked position, and the narrow part of which uncovers said members in the pivoted position after rotation of said bezel.

In the case of a watch with purely tactile control via sensors arranged on the glass, and thus not provided with any control members located on the middle part of pivoting case 10, or a watch whose control members one wishes to leave permanently visible, it is even possible to have a perfectly circular ring-shaped bezel which is manipulated for the sole purpose of making the inner case pass from the normal position to the pivoted position or vice versa. In such an embodiment, it is even possible to limit the mobile element to a bezel sector that can be manipulated in rotation between each locked position.

Referring more particularly now to Figures 9, 10 and 11 we will describe below the locking/unlocking mechanism for passing from the normal position to the pivoted position.

The angle at which the watch is shown in the pivoted position in Figure 9 shows that bezel 20 includes in the lower part thereof an L-shaped lug 22, the small arm of which is oriented outwards in order to cooperate with a groove 2 of external case 1, along the principle of a bayonet assembly, through a passage 2a between said groove 2 and the shoulder of the middle part of outer case 1.

It is clear that the length of groove 2 may be limited to the length that is merely sufficient to allow the rotation of bezel 20 between a position where recess 21 is above control members 14, 16, 18 and a position where the widest part of the bezel conceals them. In the case of a perfectly
5 circular bezel 20, either because the movement has no control members projecting onto the middle part of the pivoting case, or because one has chosen to leave the control members permanently visible, the length of groove 2 may be limited to the width of the small arm of L-shaped lug 22. Likewise, it is possible to provide more than one locking lug, for example by
10 arranging two lugs symmetrically relative to the centre of rotation of the rotating bezel.

It can also be seen that the pivoting case 10 includes a battery compartment 19, opposite a corresponding aperture 9 in stationary case 1, in order to facilitate battery replacement. The cover of compartment 19 is
15 actually quite inaccessible, even in the pivoted position.

Indeed, as can be seen in Figure 10, in which outer case 1 is not shown, the clearance of pivoting case 10 is limited by a stud 13 positioned in a lower part of extension 15 of the pivoting case. It is clear that other equivalent devices could be used to control the pivoting angle.

20 This Figure also shows the end of helical torsion spring 7, whose coils are contained in a housing 8 of extension 15 of pivoting case 10. The other end of spring 7 abuts against the back cover of stationary case 1.

Figure 11 is a broken cross-section passing through the centre of the dial and through the 2 o'clock and 6 o'clock positions. This cross-section
25 shows more clearly the location of housing 8 of helical torsion spring 7. As the location is in an extension 5a of stationary case 2 for securing the bracelet strands, it does not in any way change the thickness of the case and the overall aesthetic appearance of a watch that would not be provided with such a device. This cross-section also shows more clearly the location
30 of groove 2 in which lug 22 engages.

In the description of this first embodiment, the helical torsion spring 7 is given solely by way of example. It is in fact possible to use other types of spring, for example a strip spring, or other elastic means.

Figures 12 to 22 describe a second embodiment, relying on the same principle but which differs from the embodiment just described in the arrangement of the locking/unlocking device. Elements that are identical or similar to those of the first embodiment are designated by the same references.

Figures 12 and 13 show a chronograph wristwatch of rectangular shape whose control members, formed by a crown 14 and two push buttons 16, 18, are arranged in the upper part of display 12, substantially between the horns for securing the bracelet strands 3, with no other control member being visible on the middle part of outer stationary case 1.

Figure 12 shows this watch in perspective in the normal position, members 14, 16, 18 being visible but not accessible. Figure 13 shows the same watch in which the inner case 10 is in the pivoted position, i.e. a position allowing better reading of display 12 and providing access to control members 14, 16, and 18.

Referring also to Figures 14, 15 and 16 we will explain below how the passage from the normal position to the pivoted position is carried out. Starting from the normal position (figure 14), a finger is used to slide a shutter 25 (Figure 15) towards the exterior of the case, which, via the action of a spring that is not visible in the Figures, will cause an inner case 10 (Figure 16) to pivot enclosing the watch movement with its display 12, and the control members 14, 16 and 18, said pivoting occurring about pivoting points in the lower part of an outer case 1 for securing bracelet strands 3.

Figures 17 to 22 describe in more detail an embodiment that allows the sliding shutter to lock/unlock pivoting case 10.

Figures 17 and 18 show in perspective only pivoting case 10 and shutter 25, also shown at different angles in Figures 19, 20 and 21.

Shutter 25 is formed by a substantially rectangular plate 26 which, in the example shown in Figures 12 to 16 includes a recess 28 leaving control members 14, 16, 18 permanently visible in the normal position. As shown in Figure 20, plate 26 can also be provided without a recess if, conversely, one wishes to conceal the control members in the normal position.

Plate 26 includes, in the lower part thereof that has to slide over a shoulder of the middle part of stationary case 1, two parallel grooves 27 close to the edges of the small sides of plate 26.

Grooves 27 are closed at each end and limit the travel of shutter 25 and activate the system for unlocking pivoting case 10.

Each groove 27 is in fact provided for receiving the end of a stud 29 secured perpendicularly to a slide block 30, housed in a slide way 35 arranged in the middle part of stationary case 1, close to the back cover thereof, and open towards the interior of said stationary case 1. Stud 29 passes through the middle part via a sink 39 of oblong shape.

The end of slide block 30 directed towards the interior of stationary case 1 includes a bevel 31 and the other end directed towards the bottom of slide way 35 is provided with a helical compression spring 33 abutting on the bottom of slide way 35.

Referring to the normal position, shown in Figures 12, 14 and 17, it can be seen that spring 33 forces bevel 31 of slide block 30 to engage in a groove 11 of pivoting case 10, located close the back cover thereof, below control members 14, 16, 18.

In order to pass to the pivoted position, shown in Figures 13, 16 and 18, shutter 25 is made to slide outwards. In a first phase (Figure 15) the case remains in the normal position, the end of stud 29 sliding only in groove 27 to position shutter 25 beyond control members 14, 16 and 18.

When stud 29 reaches as stop at the bottom of groove 27, an additional thrust compresses spring 33, releases bevels 31 from groove 21 and thus pivots inner case 10 via the action of a spring that is not shown but that can have the same arrangement as the spring of the first embodiment. The
5 largest dimension of sink 39 of oblong shape must therefore match the necessary clearance of slide block 30 in order to totally release bevel 31 from groove 11.

For a shutter 25 whose plate 26, has a recess 28, which is the case of the example illustrated more particularly, it is clear that the stud may
10 simply be secured, for example by being driven into the base of plate 26.

Other variants may be envisaged, particularly as regards the shapes of the cases and the mobile element for locking/unlocking, without departing from the scope of this invention.

CLAIMS

1. Timepiece comprising:

a stationary outer case (1);

an pivoting inner case (10) carrying the movement;

a display (12) for time related data or non time related data, and on
5 the middle part thereof control members (14, 16, 18), the display (12) being
enclosed in said inner case (10), wherein

said inner case (10) is hinged around an axis parallel to the direction
in which the data is read and arranged in the bottom part of the display
while being held in a locked position in the stationary outer case (1) by
10 locking means and able to occupy, via the action of a spring (7), an inclined
position relative to the outer case (1) when said locking means are
deactivated, wherein

the locking means are formed by a mobile element (20, 25) of the
external part of the timepiece that can be manipulated in the plane of the
15 timepiece in order to protect said control members (14, 16, 18) in the outer
case in the locked position.

2. Timepiece according to claim 1, wherein the mobile element
(20) is associated with the inner case (10).

3. Timepiece according to claim 2, wherein the mobile element
20 comprises a rotating bezel (20) including at least one lug (22) able to be
positioned opposite a groove (2) formed in the inner wall of the outer case
(1) and to be engaged in said groove to lock said inner case (10) when said
bezel (20) is rotated.

4. Timepiece according to claim 1, wherein the mobile element
25 (25) is associated with the outer case (1).

5. Timepiece according to claim 4, wherein the mobile element comprises a sliding shutter (25) arranged in the top part of the outer case (1), said shutter (25) being able to lock the inner pivoting case (10) and unlock said inner case when said shutter (25) is made to slide.

5 6. Timepiece according to claim 1, wherein the mobile element (20, 25) has a contour that provides concealment and/or protection of the control members (14, 16, 18) in the locked position, and uncover said members in the unlocked position.

7. Timepiece according to claim 6, wherein the control members
10 (14, 16, 18) are arranged at 12 o'clock.

8. Timepiece according to claim 1, wherein it comprises an articulation pin (4) between the two cases (1, 10) that is merged with a bar for securing a bracelet strand (3).

9. Timepiece according to claim 8, wherein it comprises means for
15 securing said bar thereof, said means include a housing for the spring (7) causing the inner case (10) to pivot.

10. Timepiece according to claim 1, wherein the movement is powered by a battery, and wherein

the back cover of the outer case (1) includes an aperture (9) giving
20 access to a battery compartment (19) arranged in the back cover of the inner case (10).