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(54) Watch winder

(57) A device for moving a watch comprises a holder (1) for holding the watch (9) and a drive (2). The drive (2) rotates the holder (1) for less than 360° degrees into a first rotating direction (L) and subsequently rotates the holder (1) for less than 360° degrees back into a second rotating direction (M) opposite the first rotating direction (L). Such back and forth rotation enables a better winding of the watch (9).

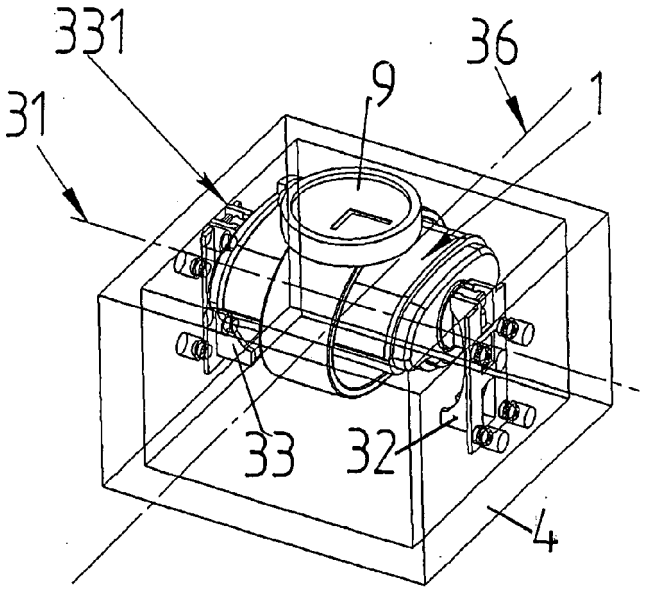

FIG. 3

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Description

Technical Field

[0001] The present invention relates to a device for moving a watch, and to a method for winding a watch.

Background Art

[0002] Self-winding watches, and in particular, self-winding wrist watches are popular watches for years since such watches do not need any batteries nor do they have to be manually wound up. A self-winding watch which is also denoted as an automatic watch comprises a centrifugal mass which becomes moved during the watch is worn at the arm of a user. Many arm movements may induce a rotation of the centrifugal mass by means of which rotation a spring may be wound up for storing such energy and finally for driving the clockwork which makes the watch hands run. By such means, the watch is driven without any external source of energy, and a power reserve generated by pure arm movements may allow the watch running for many hours even without any subsequent movement.

[0003] However, in case such self-winding watch is not moved for a longer period in time, the clockwork stops running and as a result the watch hands will stop moving. Afterwards, the watch may need to be manually wound up again or be exposed to a movement of the users arm again in order to continue running. However, in every such instance, the watch needs to be manually set to a then valid time. Setting watches manually may include additional efforts such as setting annular calendars or moon phase indicators if present.

[0004] In order to avoid such situations, automated watch winders are suggested for continuously rotating a watch in one direction.

[0005] However, such known watch winders typically require lots of space and may not stimulate the centrifugal mass in the watch at its best.

Disclosure of the Invention

[0006] The problem to be solved by the present invention is therefore to provide a watch winder that has a compact shape and improves stimulation of the centrifugal mass of a watch deposited on such watch winder.

[0007] This problem is solved by a device for moving a watch according to the features of claim 1. This problem is also solved by a method for winding a watch according to the features of claim 15.

[0008] Accordingly, it is suggested to rotate a watch deposited on such device back and forth instead of executing a continuous rotation in a single rotational direction only. For such purpose, an automatic drive of the device makes a holder for the watch rotate for a rotation angle of less than 360° degrees but more than 0° degrees, and preferably more than 10° degrees into a first rotating direction. After such rotation, the rotation direction is reversed, and the holder rotates back into a second rotation direction opposite to the first rotation direction for a rotation angle of less than 360° degrees but more than 0° degrees, and preferably more than 10° degrees. In this context, the rotation angle value is understood as an absolute value.

[0009] In a preferred embodiment, the rotation angle in both rotation directions shows the same absolute value such that a watch on the holder moves back and forth between a first end position and a second end position of the holder. In a very preferred embodiment, the rotation angle is less than 100° degrees but more than 0° degrees, and especially between 80° and 100° degrees. In the present context, the rotation angle denotes the rotation between the first end position and the second end position. In between the two end positions, the holder and correspondingly the watch on the holder may pass an idle position at half of the rotating angle which idle position may be the position at which the drive causes the holder to stop after deactivating the watch winder, for example, by means of an OFF button. Such idle position may also be taken prior to starting a new watch winding sequence, for example, by means of pressing an ON button. Still, in operation the device exploits the given rotation angle between the end positions.

[0010] The movement of a watch being deposited on the present device is preferred over movements induced by prior art watch winders in that the suggested movement much better resembles the natural movements of a users arm. As a result, a watch deposited on such device will become wound up more efficiently. The centrifugal mass will better be triggered to move caused by acceleration and deceleration components occurring in response to the drive changing its rotation direction. In addition, a watch winder working along such concept may be built in small dimensions since no full turn movements of the holder needs to be implemented.

[0011] The described embodiments similarly pertain to the device and to the method. Synergetic effects may arise from different combinations of the embodiments although they might not be described in detail.

Brief Description of the Drawings

[0012] In the following description, embodiments of the invention are described in more detail with reference to the drawings in which the Figures show:

FIG. 1 a view on a front end of a device according to an embodiment of the present invention, in three different states,

FIG. 2 a lateral view on a device according to an embodiment of the present invention, in two different states,

FIG. 3 a perspective view on a device according to an embodiment of the present invention,

FIG. 4 a device according to an embodiment of the

present invention, in a view on a front end in diagram a), in a lateral cut along line B-B in diagram b), and in a zoom view on region D in diagram c),

FIG. 5 a device according to an embodiment of the present invention, in a view on a front end in diagram a), in a lateral cut along line B-B in diagram b), and in a zoom view on region E in diagram c),

FIG. 6 a perspective view on a device according to an embodiment of the present invention in diagram a), and a zoom view on region A in diagram b),

FIG. 7 a perspective view on a device according to an embodiment of the present invention in diagram a), and a zoom view on region B in diagram b),

FIG. 8 a lateral view on a device according to an embodiment of the present invention in diagram a), and a cross cut along line A-A in diagram b), and

FIG. 9 a lateral view on a device according to an embodiment of the present invention in diagram a), and a cross cut along line B-B in diagram b).

Modes for Carrying Out the Invention

[0013] Similar or relating elements in the several figures are provided with the same reference numerals.

[0014] FIG. 1 illustrates a view on a front end of a device according to an embodiment of the present invention. In diagram a), the device for moving a watch, and in particular for automatically winding a self-winding wrist watch is shown in which a wrist watch 9 is strapped around a holder 1 of the device. The holder 1 comprises a first casing element 13 and a second casing element 14 together building a casing of the holder 1 the interior of which will be described later on. A cushion 15 is attached to the outside of the holder 1, and specifically is attached to the outside of the second casing element 14. The cushion 15 may be made from elastic material such as foam in order to allow wrist watches with wristbands of different length to be attached to the holder 1.

[0015] The holder 1 is rotatable mounted to a support structure a support element 33 of which is visible in FIG. 1a). The support element 33 is attached to a frame 4 by means of screws 41. The support structure is rotatable mounted to a rotation axis of the support structure extending into the plane of projection. The state as shown in FIG. 1a) may represent an idle position of the holder 1 with respect to the frame 4, and as such an idle state of the watch put on the holder 1 of the device.

[0016] For a better illustration, the reference signs are omitted in Figures 1b) and 1c). In FIG. 1b), a different state of the device is shown in which the holder 1 including the watch 9 is rotated into a first direction denoted as M in FIG. 1c). With respect to the idle position shown in FIG. 1a), the holder 1 is rotated by 45 ° degrees in rotation direction M. The rotation is effected by means of an automatic drive arranged within the casing of the holder 1 as will be explained later on. Starting from the state as depicted in FIG. 1b), i.e. a first end position of the holder 1, the holder 1 is rotated by means of the drive in a second rotation direction L opposite to the first direction M such that a second end position of the holder 1 is reached which represents a second state as shown in FIG. 1c). After having reached the second position according to FIG. 1c) the holder 1 will be rotated back into the first rotation direction M by means of the drive until the first end position as shown in FIG. 1b) is reached again. An angle between the first end position and the end second position of the holder 1 is denoted as angle ß, see Figures 1b) and 1c). In the present case, the angle ß is ~ 90° degrees. Preferably, the rotation angle ß is smaller than 100° degrees.

[0017] Actuated by means of the drive the watch 9 on the holder 1 is tilted between the first and the second end positions back and forth. Once one of the end positions is reached, the drive evokes a reversal of the rotation direction, either immediately or, alternatively in a delayed fashion after a little rest in such end position. Hence, the watch 9 on the holder 1 becomes moved in a fashion similar to the movements of the arm of a user wearing the watch. Such movement of the watch supports a continuous winding of the watch when not worn by the user, wherein the movement is simulating a movement ideal for making a centrifugal mass within the watch move and thereby wind the watch. A stop in one of the end positions and a subsequent movement in the opposite rotation direction makes the centrifugal mass decelerate or accelerate and results in an improved movement of the centrifugal mass.

[0018] FIG. 2 illustrates a lateral view on a device according to an embodiment of the present invention in two different states. The device may correspond to the device shown in FIG. 1 or, alternatively, may illustrate a different device. The device again shows a holder 1 for a watch 9. The holder 1 is rotatable mounted with respect to a rotation axis 31. The rotation axis 31 comprises a stationary end 311 and a free end 312. The stationary end 311 is mounted to a support element 33 of a support structure 3. The free end 312 of the rotation axis 31 is mounted to a guide 32 of the support structure 3. Support element 33 and guide 32 each are mounted to a frame 4 by means of screws 41 or any other suitable mounting means.

[0019] It is noted that the rotation axis 31 is understood to denote both, the bare rotation axis orientation as well as the physical element the holder 1 is mounted at. As a physical element, the rotation axis 31 may not be implemented end-to-end but may be interrupted along the length of the holder 1. As such, the end sections of the rotation axis 31, i.e. the stationary end 311 and the free end 312 may serve as mounting elements for mounting the rotation axis 31 to other elements such as the guide 32 and the support element 33. Preferred shapes of the stationary end 311 and the free end 312 may become apparent from the drawings.

[0020] In FIG. 2, the rotation axis 31 is shown in a tilted state. In the presently tilted state the rotation axis 31 is tilted around a pivot in or near the stationary end 312,

and preferably is tilted with respect to a horizontal orientation of the rotation axis 31. Such tilt may be preferred for causing the centrifugal mass in the watch 9 to move. The diagrams in FIG. 2a) and 2b) show the device in different rotational states of the holder 1 with respect to the rotation axis 31, in FIG. 2a) in an idle position, and in FIG. 2b) in one of the end positions.

[0021] FIG. 3 shows a perspective view on a device according to an embodiment of the present invention. The frame 4 of the device is illustrated in a transparent way such that the inside elements may be visible. The device is shown in an idle state without the rotation axis 31 being tilted. However, a tilting axis 36 is indicated by reference sign 36 which tilting axis is aligned orthogonal to the rotation axis 31. The tilting axis 36 and the rotation axis 31 span a horizontal plane. In the present embodiment, in order to allow the holder 1 to tilt around the tilting axis 36 as depicted, both ends of the rotation axis 31 preferably are slidable arranged in respective guides, and preferably are moveable in vertical direction. In order to tilt the holder 1, the left end of the rotation axis 31 may move upwards in a vertical direction and the right end may move downwards in the vertical direction. Such embodiment differs from the embodiment of FIG. 2 in which one of the ends is a stationary end which basically is not moveable in a vertical direction and wherein the pivot point basically coincides with the stationary end, whereas in FIG. 3 the pivot point is defined in the middle of the holder 1 where rotation axis 31 and tilting axis 36 meet.

[0022] FIG. 4 illustrates a device according to an embodiment of the present invention. Diagram 4a) basically represents the device of FIG. 1a). In FIG. 4b), such device is shown in a lateral cut along line B-B. Again, the watch 9 is put onto the holder 1 which holder 1 is rotatable mounted with respect to the rotation axis 31, for example, by means of suited bearings. The ends 311 and 312 of the rotation axis 31 include extensions designed such that these extensions cooperate with a support element 33 and with a guide 32 respectively. The stationary end 311 is mounted with respect to the support element 33. The support element 33 basically has a shape identical to the guide 32 the free end 312 is mounted to, however, a vertical movement in the support element 33 is blocked by means of a barrier 333. In turn, a tilting of the stationary end 311 is allowed with respect to the support element 33.

[0023] A vertical sliding of the free end 312 in the guide 32 is allowed between two end positions. In a first end position, the free end 312 is arranged at the guide 32 on the same vertical level as is the stationary end 311 such that the rotation axis 31 is horizontally aligned and not tilted.

[0024] In FIG. 5, the device of FIG. 4 is illustrated in a tilted position in which the free end 312 is vertically moved towards a second end position at a vertical level lower than the level of the stationary end 311. In such position, the rotation axis 31 shows a non-horizontal orientation and now is tilted with respect to its horizontal alignment of FIG. 4. In such position it becomes apparent, that the stationary end 311 may preferably be mounted with respect to the support element 33 such that it may tilt but may not slide.

[0025] FIG. 4c) illustrates a zoom view on section D of the device as shown in FIG 4b). The free end 312 of the rotation axis 31 includes a recess 3121 at its front end which recess 3121 cooperates with a snap-fit 34 of the guide 32. In the present embodiment, the snap-fit 34 is integral part of the guide 32. In another embodiment, the snap-fit 34 may be an individual element. In the position as shown in Figures 4a) and b), the rotational axis 31 is mounted to the guide 32 such that it cannot rotate with respect to the guide 32. It is solely the holder 1 that may rotate on the rotation axis 31.

[0026] It can be derived from FIG. 4b), that the stationary end 311 is mounted to the support element 33 by means of a snap fit 331, too. The snap-fit 331 may be an integral part of the support element 33 or may be an individual element. The snap-fit 331 cooperates with a recess 3111 in the front end of the stationary end 311. Both snap-fits 34 and 331 are adjusted such that the rotation axis 31 including the holder 1 may be released from the snap-fits 34 and 311 and as a result may be removed from the frame 4, for example, for attaching the watch 9 to the holder 1. The rotation axis 31 and the holder 1 may be removed manually by drawing the rotation axis 31 out of the snap-fits 34 and 331, or by any other mechanical support, for example, by pressing a button which evokes a release of the rotation axis 31 from the guides 32, 33. After having the watch 9 arranged on the holder 1, the holder 1 and the rotation axis 31 may be reinserted into the snap-fits 34, 331 by means of a manual push force.

[0027] Afterwards, the rotation axis 31 may be manually brought into a tilted position. For doing so the user may push on the free end 312 such that the holding forces of the snap-fit 34 may be overcome and the free end 312 slides vertically downwards in the guide 32. At the end of the guide 32, another snap-fit 35 may be arranged cooperating with the recess 3121 of the free end 312, see FIG. 5b). The zoom view on region E in the tilted position as shown in FIG. 5c) depicts a locked snap-fit 35 at the free end 312 representing a tilted rotation axis 31. Again, the rotation axis 31 may be released from such position manually or by any support tool in order to make the free end 312 slide upwards again into the first position representing a non-tilted rotation axis 31.

[0028] FIG. 6a) illustrates a perspective view on a device according to an embodiment of the present invention in a non-tilted state of the rotation axis 31. A zoom view on region A in diagram b) illustrates the mounting of the stationary end 311 at the support element 33. The support element 33 takes the shape of a guide, too, into which the extension of the stationary end 311 may be inserted. A snap-fit 331 is indicated which holds the stationary end 311 in such position. The support element 33 comprises a nose 332.

[0029] FIG. 7a) shows the device of FIG. 6 with a tilted rotation axis 31. In FIG. 7b), a zoom view on region B is

illustrated representing again the mounting area of the stationary end 311 now in the tilted state. It becomes apparent, that the extension of the stationary end 311 disengages from the snap-fit 331 when the rotation axis 31 is tilted around the stationary end 311. Hence, the snap-fit/recess combination allows for such tilting. Any tilting movement, however, is stopped by the nose 332 provided integrally with the support element 33. As a result, the nose 332 prevents any further tilting by means of a vertical nose section 3322, and prevents any vertical movement of the stationary end 311 in the tilted position by means of a horizontal nose section 3321. As a result, the nose 332 prevents the stationary end 311 from being released from the support element 33 and only allows a transition of the stationary end 311 back into the snap-fitted mounting as shown in Figures 6a) and 6b).

[0030] Generally, the rotation axis 31 may be tilted between 0° and 30° degrees with respect to its horizontal, non-tilted orientation. In a preferred embodiment, the rotation axis may take a position in which it is tilted by 25° degrees.

[0031] As mentioned above, a tilted orientation of the rotation axis 31 may be preferred for winding the watch, however, for presenting a watch the horizontal orientation may be preferred.

[0032] FIG. 8 shows a device according to an embodiment of the present invention in a lateral view in diagram a) and in a cross cut along line A-A in diagram b). The device presently only comprises the holder 1 without a cushion being rotatable with respect to the rotation axis 31 with its ends 311 and 312. The cross cut along line A-A illustrates the interior of the casing of the holder 1. The two casing elements 13 and 14 are attachable to each other in order to build the casing of the holder 1. By removing the second casing element 14, which may be snap-fit mounted to the first casing element 13, access may be gained to the interior of the holder 1. The interior includes a battery tray 11 for holding one or more batteries 12 a shown in FIG 8a). Next to the battery 12, a drive 2 is arranged. The drive 2 comprises a motor drive 21 represented by a spindle. An eccentric 22 is attached to the motor drive 21 including a disk 221 attached to the motor drive 21 and a pin 222 on the disk 221. The pin 222 is linked with another pin 242 of another eccentric 24 via a mechanical transmitter 23. The other eccentric 24 comprises the pin 242 on an associated disk 241 which disk is fixed to a spindle 243. The spindle 243 is attached to the holder 1.

[0033] In the present embodiment, the motor drive 21 is arranged stationary with respect to the frame 4 of Figure 1. The battery tray 11 and the spindle 243 are fixed to the holder 1 and as such rotate together with the holder 1 around rotation axis 31. As a result, when the motor drive 21 turns the disk 221 of the eccentric 22, such movement is transmitted via the mechanical transmitter 23 to the disk 241 of the other eccentric 24 which is rotatable mounted on the spindle 243. Such transmission makes the holder 1 rotate into a first direction as indicated in FIG. 9a) which shows a lateral view of the device of FIG. 8, now in a rotated state, e.g. according to FIG. 1b). The diagram in FIG. 9) illustrates the associated interior of the tilted holder 1 in such state in a cross cut.

[0034] The device of Figures 8 and 9 may be suited for being inserted into a box by which the watch is sold. The box may be suited to accept the present device. As such, the present device may be integrated into a conventional watch box such that a customer may acquire a watch in a box containing the watch winding device, too. It is preferred, that the rotational axis then is mounted twist-proof into the box.

Claims

1. Device for moving a watch, comprising a holder (1) for holding the watch (9), and
a drive (2) for rotating the holder (1) less than 360° degrees into a first rotating direction (L) and for subsequently rotating the holder (1) less than 360° degrees back into a second rotating direction (M) opposite the first rotating direction (L).

2. Device according to claim 1,
wherein the drive (2) is adapted to rotate the holder (1) for less than 100° degrees in the first rotating direction (L), and for less than 100° degrees in the second rotating direction (M).

3. Device according to claim 1 or claim 2, wherein the holder (1) is pivot-mounted at a support structure (3).

4. Device according to claim 3,
wherein the support structure (3) comprises a rotation axis (31) for the holder (1) which axis (31) is tiltable mounted.

5. Device according to claim 4,
wherein the support structure (3) comprises a guide (32) for guiding a movement of a free end (312) of the rotation axis (31).

6. Device according to claim 5,
wherein the guide (32) includes a curved section.

7. Device according to any one of the claims 4 to 6,
wherein the support structure (3) comprises a first snap-fit (34) for holding the free end (312) of the rotation axis (31) in a first position representing a non-tilted orientation of the rotation axis (31), and
wherein the support structure (3) comprises a second snap-fit (35) for holding the free end (312) of the rotation axis (31) in a second position representing a tilted orientation of the rotation axis (31).

8. Device according to claim 5 or claim 6 in combination with claim 7,

wherein the first snap-fit (34) is arranged at one end of the guide (32) and the second snap-fit (35) is arranged at the other end of the guide (32).

9. Device according to any one of the preceding claims 4 to 8,
wherein the support structure (3) comprises a support element (33) for supporting a stationary end (311) of the rotation axis (31), and
wherein the support element (33) comprises a snap-fit (331) for holding the stationary end (311) of the rotation axis (31).

10. Device according to claim 9,
wherein the support element (33) comprises a nose (332) for preventing the stationary end (311) of the rotation axis (31) to disengage from the support element (33) in case of the rotation axis (31) being tilted around the stationary end (311).

11. Device according to any one of the preceding claims, wherein the holder comprises a housing and a flexible element attached to the housing.

12. Device according to any one of the preceding claims, wherein the drive (2) comprises a motor drive (21), an eccentric (22) connected to the motor drive (21), and a mechanical transmitter (23) connected to the eccentric (22) and acting on the holder (1),
wherein the drive (2) evokes a back and forth rotational movement of the holder (1).

13. Device according to any one of the preceding claims, wherein the holder (1) is adapted to hold one or more batteries (12).

14. Device according to any one of the preceding claims 4 to 13,
wherein the support structure (3) is mounted to a frame (4) of the device.

15. Method for winding a watch, comprising the steps of placing the watch (9) on a holder (1), and causing an automated rotation of the holder (1) of less than 360° degrees into a first rotating direction (L) and subsequently for less than 360° degrees back into a second rotating direction (M) opposite the first rotating direction (L).

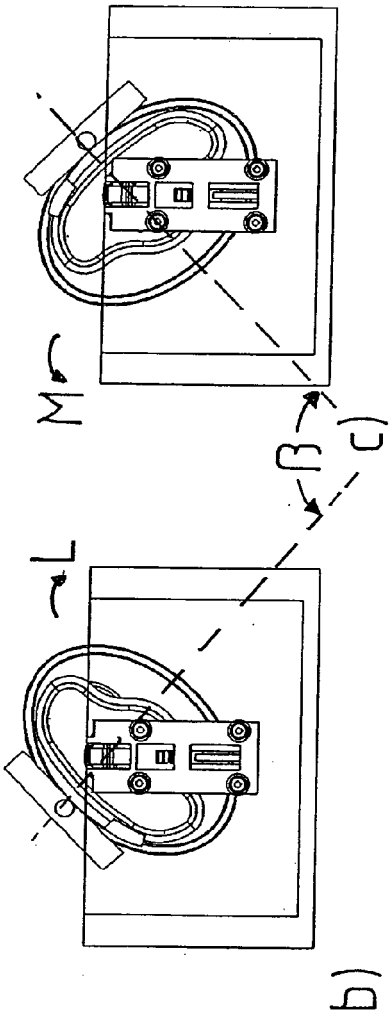


FIG. 1

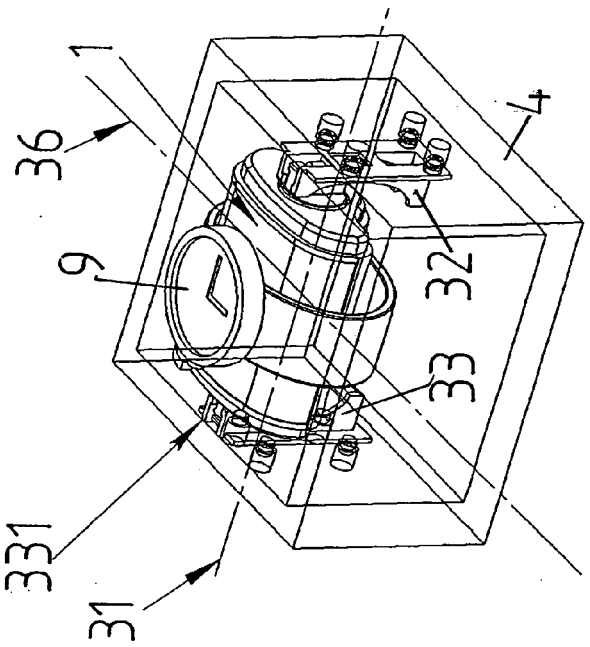
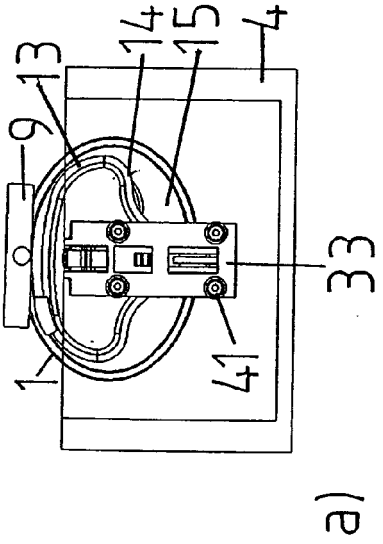


FIG. 3



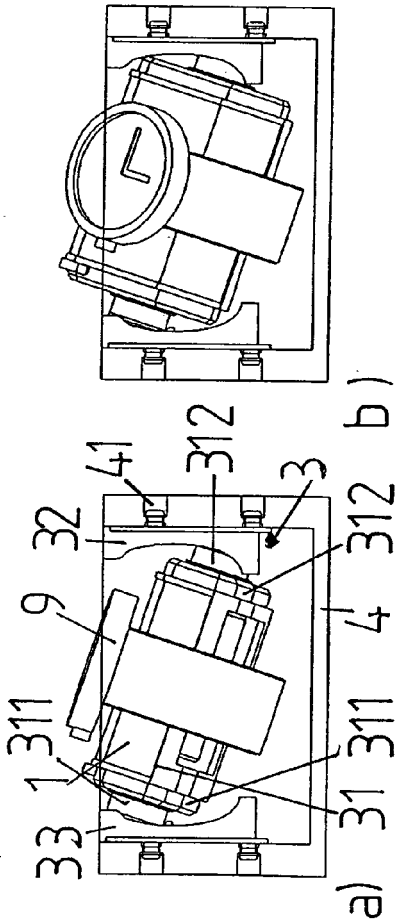


FIG. 2

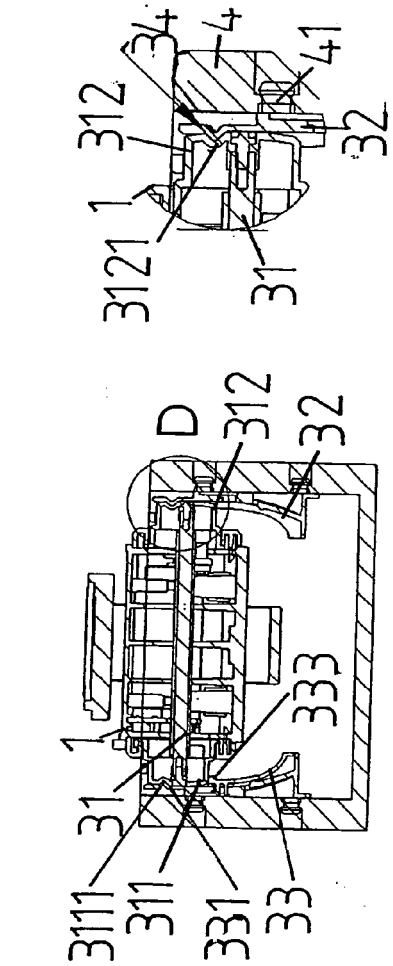
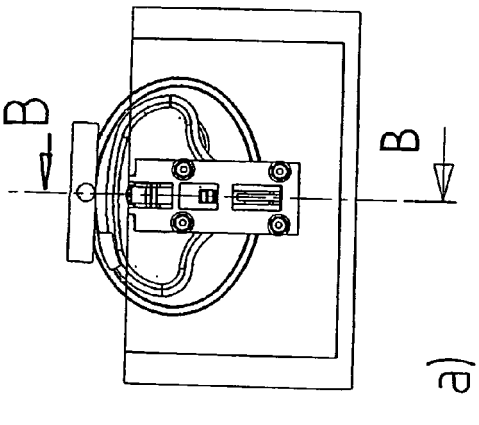

3121
1
312
34
4
41
32
31
c)
D
312
32
1
31
333
3111
311
331
33
b)

FIG. 4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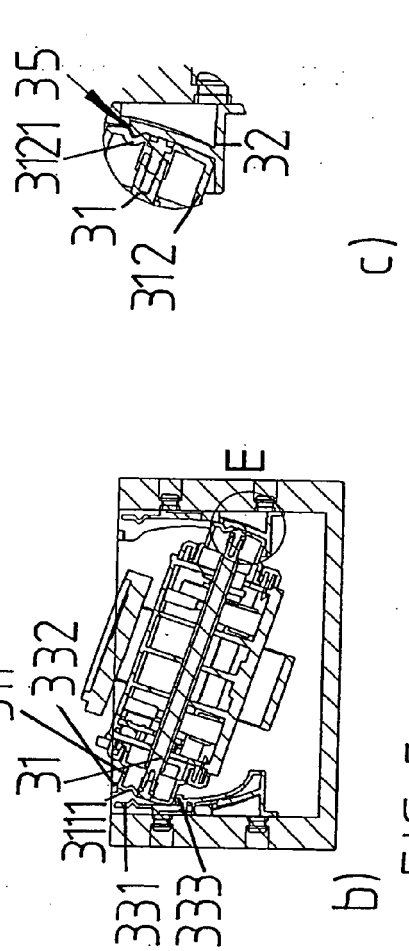
B
a)


3121
35
31
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32
c)
E
311
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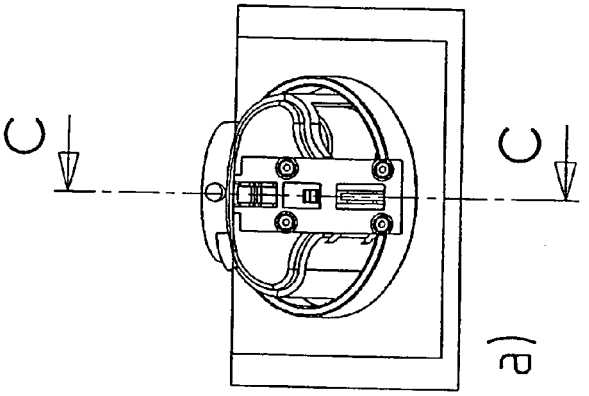
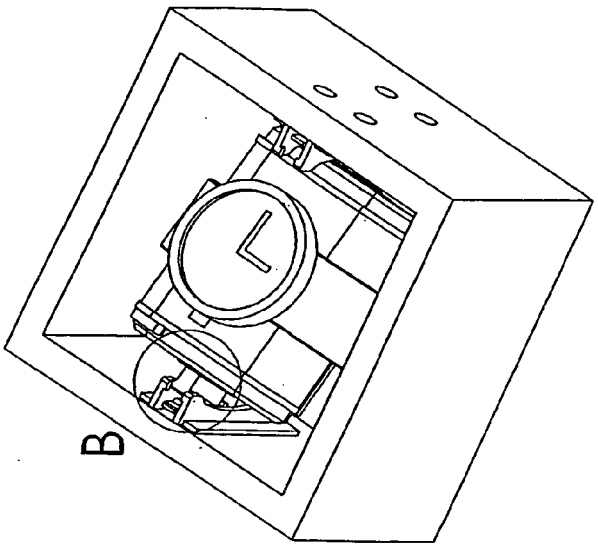
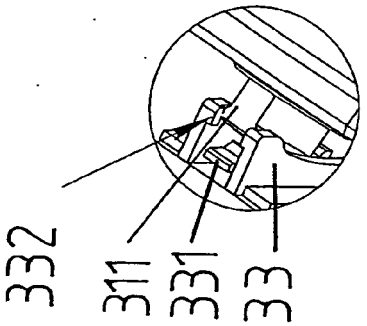
31
3111
331
333
b)

FIG. 5


C
C
a)

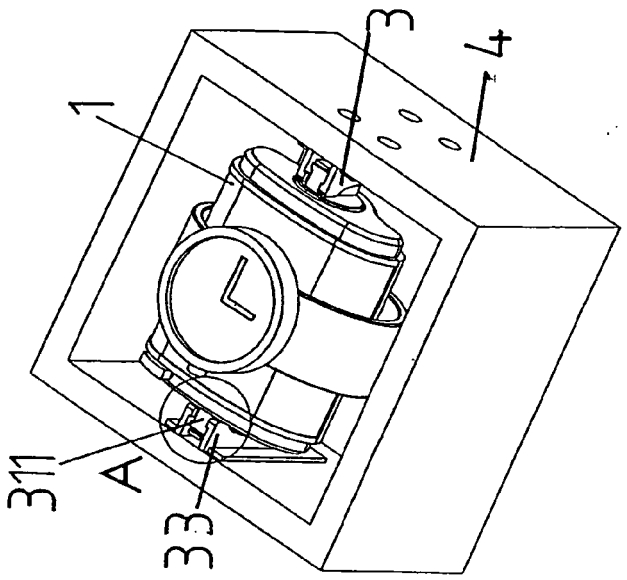


a)

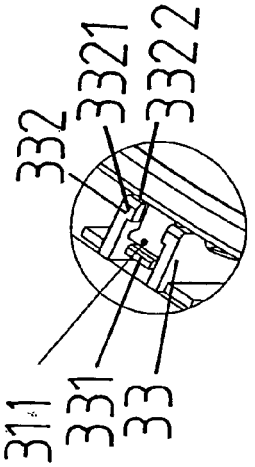


b)

FIG.7



a)



b)

FIG.6

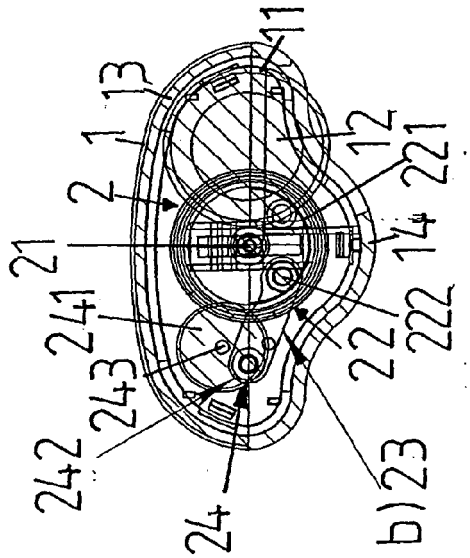

11
13
1
12
2
221
21
14
241
222
221
243
242
24
23
b)

FIG.8

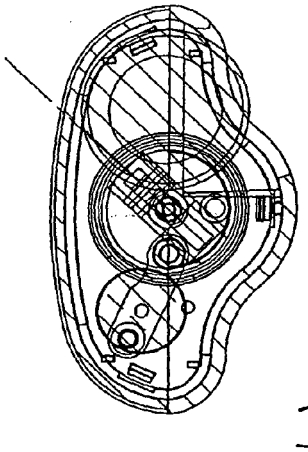
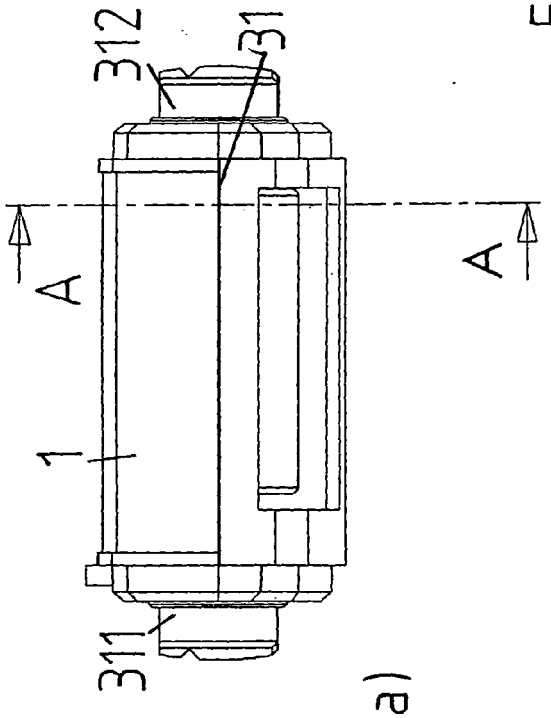
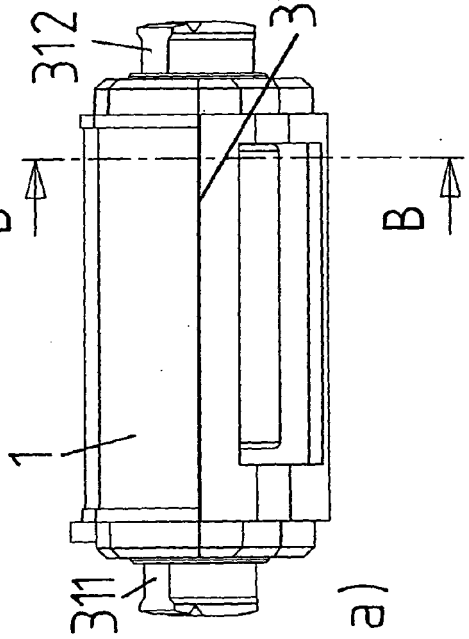

b)

FIG.9


312
31
A
A
1
311
a)


312
31
B
B
1
311
a)

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EUROPEAN SEARCH REPORT

Application Number
EP 11 00 2946

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	18 October 2011	Bream, Philip

CATEGORY OF CITED DOCUMENTS

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18-10-2011

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