

# PATENT SPECIFICATION

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## DRAWINGS ATTACHED

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## (54) DATE CORRECTING DEVICE FOR A WATCH

(71) We, KABUSHIKI KAISHA DAINI SEIKOSHA, a Japanese company, of 31—1, 6-chome, Kameido, Koto-ku, Tokyo, Japan, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

10 The present invention relates to date correcting devices for watches, in particular, wrist watches.

15 In a conventional date correcting device for a watch with a calendar mechanism, date correction is effected by a date correcting wheel connected to an hour wheel. Consequently, with the conventional date correcting device the hands of the watch have to be rotated when effecting a date correction. This arrangement has the disadvantage that one cannot effect a date correction rapidly.

20 According to one aspect of the present invention there is provided a date correcting device for a watch comprising a date dial, a setting lever for moving the date dial, a date corrector means, and a date corrector spring, the date corrector means comprising a first corrector and a second corrector, said first corrector being spaced apart from an end of the setting lever when a winding stem is in a hand setting position and is rotated by the setting lever against the action of the date corrector spring when the setting lever is rotated, the second corrector being connected with the said first corrector to move the date dial on movement of the winding stem from the hand setting position to a date correcting position.

40 The first corrector and the second corrector may be so arranged that they are rotated against the action of the corrector spring when the winding stem is moved to the date correcting position.

45 The setting lever is, preferably, engaged in a notch provided in a clutch lever in order to prevent further rotation of the first corrector and the second corrector without

returning the winding stem to the hand setting position.

50 The date correcting device may include a pin upstanding from the first corrector and positioned in a substantially oblong aperture in the second corrector so that the first corrector is connected with the second corrector.

55 According to a further aspect of the present invention there is provided a watch having a date correcting device as recited above.

60 The invention is illustrated, merely by way of example, in the accompanying drawings, in which:

65 Figure 1 is a plan view of a date correcting device for a watch according to the present invention; and

70 Figure 2 is a plan view of part of the date correcting device of Figure 1 with the parts in such a position that a date correction may be effected.

75 Referring to the drawings, there is shown a date correcting device for a watch according to the present invention and comprising a winding stem 1 having a circumferential groove 1a and a square cross-section portion 1b. The groove 1a engages with an upstanding setting lever pin 2b on a setting lever 2 which is freely rotatable about a fixed setting lever axle 2a. Mounted about the winding stem 1 there is a freely rotatable winding pinion 3 and a clutch wheel 4, the latter being longitudinally displaceably mounted on the square cross-section portion 1b for rotation with the winding stem.

80 The clutch wheel 4 has a circumferential groove 4a in which is engaged an end 5b of a clutch lever 5 which is freely rotatable about a fixed clutch lever axle 5a. Rotation of the clutch lever 5 is caused by the setting lever 2 and, in turn, causes longitudinal movement of the clutch wheel 4 on the square cross-section portion 1b of the winding stem, so that the clutch wheel either engages the winding pinion 3 or engages a setting wheel 6.

[Price 25p]

Price 33p

A dowel 2c upstanding from the setting lever 2 is engaged in a notch 6a in a setting lever spring 6 when the winding stem 1 is in a winding position as illustrated in Figure 1. In the winding position, the lower end portion 2d of the setting lever 2 is located within a notch 5e (Figure 2) in the clutch lever 5 so that the latter does not move.

A first corrector 7 is rotatably mounted about a fixed axle 7a and has arms 7b1, 7b2 and 7b3. The arm 7b3 has a projection 7c which engages with a substantially oblong aperture 8a in a second corrector 8. The corrector 8 is pivotally mounted on a fixed axle 8b. A date corrector spring biases the arm 7b1 of the first corrector 7 in a clockwise direction about the axle 7a. When the winding stem 1 is in the winding position, the projection 7c on the arm 7b3 abuts against an edge of a stopper 11 which is recessed in a plate (not shown) of the watch movement (not shown). Consequently, the first corrector 7 is prevented from rotating in a clockwise direction by this edge. Moreover, the arm 7b2 of the first corrector is spaced apart from an end portion 2e of the setting lever 2, and is located nearer to the periphery of the watch movement than the setting lever.

When the second corrector 8 rotates a toothed portion 12a of the date dial 12 engages with an end portion 8c of the second corrector 8 so that the date dial 12 is indexed in the clockwise direction by one tooth space. Further rotation of the date dial is prevented because a projecting end 14b of a date jumper 14, which is freely rotatable about a fixed axle 14a, is moved between adjacent teeth of the toothed portion 12a of the date dial by virtue of a jumper spring 13 acting upon the date jumper 14. In short, therefore, the date dial 12 is indexed by only one tooth space because of the reciprocating motion of the second corrector 8.

The setting wheel 6, a minute wheel 15 and an hour wheel 16 are the means by which rotation of the winding stem 1 is transmitted to the hands (not shown) of the watch when the winding stem is pulled radially outwardly (the terms "radially outwardly" and "radially inwardly" used herein are relative to the watch movement) by one step from the position shown in Figure 1 to a hand setting position. A clutch lever spring 17 is fixed on the plate of the watch by means of a screw 17a and biases the clutch lever 5 in a clockwise direction. The clutch lever spring 17, when the winding stem 1 is in the winding position, causes the clutch wheel 4, engaged with the end 5b of the clutch lever 5, to engage with the winding pinion 3 so that the clutch wheel transmits rotation of the winding stem 1 to the winding pinion 3.

The operation of the above date correcting device will now be described: when the winding stem is in the winding position, as shown in Figure 1, the setting lever 2 is rotated to the maximum extent about the setting lever axle 2a, the projection 2c is engaged with the notch 6a in the setting lever spring 6, the clutch lever 5 is disengaged from the end portion 2d of the setting lever 2 so that the clutch wheel 4 is biased radially outwardly by the clutch lever spring 17 and into engagement with the winding pinion 3. Subsequent rotation of the winding stem 1 is transmitted to the crown wheel, ratchet wheel and barrel drum (not shown) of the watch movement through the clutch wheel 4 and the winding pinion 3, so that the mainspring (also not shown) of the watch movement is wound up.

At this time, the first corrector 7 is urged by the date corrector jumper 9 to a position where the projection 7c contacts the stopper 11. The toothed portion 12a of the date dial 12 is spaced apart from the projecting end 8c of the second corrector 8.

When the winding stem is moved radially outwardly by one step to the hand setting position, as shown in Figure 2, the setting lever 2 rotates in a clockwise direction about the axle 2a as a result of the setting lever pin 2b being engaged with the groove 1a of the winding stem 1. This has the result that the dowel 2c on the setting lever 2, being freed from the notch 6a in the setting lever jumper 6, abuts a part 6b thereof. At the same time, the end portion 2d of the setting lever 2, freed from engagement in the notch 5e of the clutch lever 5, abuts a part 5a thereof. Then the clutch lever 5 rotates in a clockwise direction about the axle 5a and against the action of the clutch lever spring 17 and the end 5b, engaged in the circumferential grooves 4a of the clutch wheel 4, urges the latter radially outwardly. Consequently, the clutch wheel 4 disengages the winding pinion 3 and comes into engagement with the setting wheel 6. Subsequent rotation of the winding stem is transmitted to the hour wheel 16, the setting wheel 6 and the minute wheel 15 through the clutch wheel 4 so that the hands of the watch may be set. At this time, the end portion 2e of the setting lever 2 is connected with the lower end of the arm 7b2 of the first corrector 7.

When the winding stem is moved radially outwardly by a further step to a date correcting position shown in phantom lines in Figure 2, the setting lever 2 rotates in a clockwise direction about the axle 2a to a position where the end portion 2b abuts against a projecting end 5d of the clutch lever 5. At the same time, the end portion 2e of the setting lever engages the arm 7b2 of the first corrector 7 and causes the latter to

rotate in a counterclockwise direction about the axle 7a and against the action of the date corrector spring 9, i.e. the first corrector 7 moves from the position shown in full lines in Figure 2 to the position shown in phantom lines.

As the substantially oblong aperture 8a in the second corrector 8 is in engagement with the projection 7c of the first corrector 7, the second corrector 8 rotates in a clockwise direction about the axle 8b. Then the end portion 8c is engaged with the toothed portion 12a of the date dial 12 and indexes the latter by one tooth space so as to change a given date printed on the dial and shown in a window (not shown) to the next date. At this time, one of the teeth of the date dial 12 has already moved beyond a projecting end 14b of the date jumper 14.

When the winding stem 1 is released, the first corrector 7 returns to the position shown in full lines in Figure 2 by the action of the date corrector spring. The second corrector 8 and the setting lever 2 likewise return to their respective positions shown in full lines in Figure 2. After the date dial has been indexed by one tooth space further movement of the date dial is prevented by the acting surface of the date jumper 14 biased towards the date dial by the jumper spring 13. Further date correction may be effected by repetition of the above-mentioned operation.

The above-described date correcting device can be summarised as follows: the setting lever 2 and the first corrector 7 are disposed separately on the same level; the end portion 2e of the setting lever 2 is connected with the arm 7b2 of the first corrector; the first corrector is enlarged; and the second corrector 8 which engages with the first corrector 7 is spaced apart from the axle 7a and is made smaller than the first corrector.

Accordingly, the above-described date correcting device has the following advantages.

1) a thinner watch can be made and the operation of the watch can be simplified.

2) The engagement between the clutch wheel 4 and the setting wheel 6' can be maintained because the clutch lever 5 does not move when the setting lever 2 is moved from the hand setting position to the date correcting position.

3) Consequently, the abrasion of the

clutch wheel and the setting wheel caused when date correction is effected can be lessened so that there is no incorrect movement of the hands of the watch.

4) A smaller number of parts are necessary so simplifying assembly of the watch and reducing the cost.

#### WHAT WE CLAIM IS:—

1. A date correcting device for a watch comprising a date dial, a setting lever for moving the date dial, a date corrector means, and a date corrector spring, the date corrector means comprising a first corrector and a second corrector, said first corrector being spaced apart from an end of the setting lever when a winding stem is in a hand setting position and is rotated by the setting lever against the action of the date corrector spring when the setting lever is rotated, the second corrector being connected with the said first corrector to move the date dial on movement of the winding stem from the hand setting position to a date correcting position.

2. A date correcting device as claimed in claim 1 in which the first corrector and the second corrector are so arranged that they are rotated against the action of the corrector spring when the winding stem is moved to the date correcting position.

3. A date correcting device as claimed in claim 1 or 2 in which the setting lever is engaged in a notch provided in a clutch lever in order to prevent further rotation of the first corrector and the second corrector without returning the winding stem to the hand setting position.

4. A date correcting device as claimed in any preceding claim including a pin upstanding from the first corrector and positioned in a substantially oblong aperture in the second corrector so that the first corrector is connected with the second corrector.

5. A date correcting device for a watch substantially as herein described with reference to and as shown in the accompanying drawings.

6. A watch having a date correcting device as claimed in any preceding claim.

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rotate in a counterclockwise direction about the axle 7a and against the action of the date corrector spring 9, i.e. the first corrector 7 moves from the position shown in full lines in Figure 2 to the position shown in phantom lines.

As the substantially oblong aperture 8a in the second corrector 8 is in engagement with the projection 7c of the first corrector 7, the second corrector 8 rotates in a clockwise direction about the axle 8b. Then the end portion 8c is engaged with the toothed portion 12a of the date dial 12 and indexes the latter by one tooth space so as to change a given date printed on the dial and shown in a window (not shown) to the next date. At this time, one of the teeth of the date dial 12 has already moved beyond a projecting end 14b of the date jumper 14.

When the winding stem 1 is released, the first corrector 7 returns to the position shown in full lines in Figure 2 by the action of the date corrector spring. The second corrector 8 and the setting lever 2 likewise return to their respective positions shown in full lines in Figure 2. After the date dial has been indexed by one tooth space further movement of the date dial is prevented by the acting surface of the date jumper 14 biased towards the date dial by the jumper spring 13. Further date correction may be effected by repetition of the above-mentioned operation.

The above-described date correcting device can be summarised as follows: the setting lever 2 and the first corrector 7 are disposed separately on the same level; the end portion 2e of the setting lever 2 is connected with the arm 7b2 of the first corrector; the first corrector is enlarged; and the second corrector 8 which engages with the first corrector 7 is spaced apart from the axle 7a and is made smaller than the first corrector.

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3) Consequently, the abrasion of the

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4. A date correcting device as claimed in any preceding claim including a pin upstanding from the first corrector and positioned in a substantially oblong aperture in the second corrector so that the first corrector is connected with the second corrector.

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