

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) SELF-WINDING CHRONOGRAPH

(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:—

This invention relates to self-winding chronographs.

In known chronographs an auxiliary wheel is provided between a fourth wheel which drives a seconds hand of the chronograph, and a third wheel which is driven by a watch movement. The third, fourth and auxiliary wheels and the watch movement are mounted on a bridge. The auxiliary wheel is moved into engagement with the third and fourth wheels to cause movement of the seconds hand, and is moved out of engagement with the third wheel when it is required to stop the seconds hand. Thus, the third, fourth and auxiliary wheels must be provided in the same plane.

The result of this is that the whole extent of the bridge is utilized. Therefore, it is impossible to provide a self-winding mechanism above the chronograph mechanism, because the drive from the self-winding mechanism to the watch movement will interfere with the chronograph mechanism. Even if it were possible to arrange a self-winding mechanism in this way, the drive between it and the watch movement could not be mounted on the bridge because there would be insufficient space.

According to the present invention there is provided a self-winding chronograph comprising a self-winding mechanism drivingly connected to a watch movement and a clutch member which is movable by a start/stop member between an operative position in which a fourth wheel of the watch movement drives a seconds hand of the chronograph and an inoperative position in which

the fourth wheel rotates independently of the seconds hand.

Preferably there is included a resilient member to bias the clutch member towards its operative position. Thus, the resilient member may be a spring.

Said start/stop member and the clutch member may have cooperating surfaces, which in the inoperative position are spaced apart and in the operative position are in abutment.

The self-winding chronograph may include a hammer and heart-shaped cam for returning the seconds hand to its zero position.

The invention is illustrated, merely by way of example, in the accompanying drawing, which shows, schematically, a part of a self-winding chronograph according to the present invention.

Referring to the drawing, a self-winding chronograph comprises an oscillating weight 1, a self-winding mechanism 2 drivingly connected to a watch movement 4 and a chronograph mechanism 3 disposed between the self-winding mechanism and the watch movement. The oscillating weight 1, self-winding mechanism 2, and watch movement 4 are of standard construction and thus will not be described in detail.

The chronograph mechanism 3 has a start/stop member 5 which is operated by a crown or button (not shown) provided on a casing of the chronograph (not shown). A clutch ring 6 is connected with a fourth wheel 10 of the watch movement 4 by a frictional drive. The drawing shows the clutch ring 6 in its operative position where a spring 7 urges the clutch ring into frictional engagement with the fourth wheel. The chronograph mechanism includes a heart-shaped seconds cam 8 which is fixed to an arbor 11 of the seconds hand (not shown) of the chronograph. For returning the seconds hand to its zero position, a hammer 9 is provided. The construction of

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the hammer 9 and the seconds cam 8 is also conventional.

5 The fourth wheel 10 is loosely fitted about the arbor 11 and is driven by a third wheel (not shown). The third wheel is disposed in the same plane or substantially in the same plane as the fourth wheel 10 and is driven from the watch movement 4 by a drive which is not shown, but which is conventional.

10 In the operative position of the clutch ring 6 the drive from the third wheel rotates the seconds arbor 11 of the chronograph via the fourth wheel 10, the clutch ring 6, the spring 7, and the arbor 11 to which the spring 7 is fixed.

15 When it is desired to stop the seconds hand, the crown or button is operated so as to move the clutch ring 6 to its inoperative position where it is spaced from the fourth wheel 10. It will be appreciated that the start/stop member 5 in the operative position of the clutch ring 6 is spaced therefrom, but, in the inoperative position of the clutch ring, 20 it is in abutment therewith, cooperating surfaces being provided on the start/stop member 5 and the clutch ring 6. When the clutch ring 6 is in its inoperative position, the drive from the third wheel is merely transmitted 25 to the fourth wheel 10 which freely rotates about the arbor 11. To return the seconds hand to its zero position, the crown or button is further operated, or an additional button (not shown) may be provided, to cause the hammer 9 to contact the cam 8. 30 In returning the seconds hand to its zero position, no rotation is transmitted from the arbor 11 to the fourth wheel 10.

35 It will be appreciated that the chronograph mechanism does not utilize the whole of a bridge (not shown) on which the watch movement 4 is mounted. Thus, there is sufficient space for the drive from the self-winding mechanism to be mounted on the 40 bridge. The drive from the self-winding

mechanism to the watch movement by-passes the chronograph mechanism and thus there is no interference.

WHAT WE CLAIM IS:—

1. A self-winding chronograph comprising a self-winding mechanism drivingly connected to a watch movement and a clutch member which is movable by a start/stop member between an operative position in which a fourth wheel of the watch movement drives a seconds hand of the chronograph and an inoperative position in which the fourth wheel rotates independently of the seconds hand. 50
2. A self-winding chronograph as claimed in claim 1 including a resilient member to bias the clutch member towards its operative position. 55
3. A self-winding chronograph as claimed in claim 2 in which the resilient member is a spring. 60
4. A self-winding chronograph as claimed in any preceding claim in which said start/stop member and the clutch member have cooperating surfaces, which in the inoperative position are spaced apart and in the operative position are in abutment. 65
5. A self-winding chronograph as claimed in any preceding claim including a hammer and heart-shaped cam for returning the seconds hand to its zero position. 70
6. A self-winding chronograph substantially as herein described with reference to and as shown in the accompanying drawing. 75

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the hammer 9 and the seconds cam 8 is also conventional.

The fourth wheel 10 is loosely fitted about the arbor 11 and is driven by a third wheel 5 (not shown). The third wheel is disposed in the same plane or substantially in the same plane as the fourth wheel 10 and is driven from the watch movement 4 by a drive which is not shown, but which is conventional.

In the operative position of the clutch ring 6 the drive from the third wheel rotates the seconds arbor 11 of the chronograph via the fourth wheel 10, the clutch ring 6, the spring 7, and the arbor 11 to which the spring 7 is fixed.

When it is desired to stop the seconds hand, the crown or button is operated so as to move the clutch ring 6 to its inoperative position where it is spaced from the fourth wheel 10. It will be appreciated that the start/stop member 5 in the operative position of the clutch ring 6 is spaced therefrom, but, in the inoperative position of the clutch ring, it is in abutment therewith, cooperating surfaces being provided on the start/stop member 5 and the clutch ring 6. When the clutch ring 6 is in its inoperative position, the drive from the third wheel is merely transmitted to the fourth wheel 10 which freely rotates about the arbor 11. To return the seconds hand to its zero position, the crown or button is further operated, or an additional button (not shown) may be provided, to cause the hammer 9 to contact the cam 8. In returning the seconds hand to its zero position, no rotation is transmitted from the arbor 11 to the fourth wheel 10.

It will be appreciated that the chronograph mechanism does not utilize the whole of a bridge (not shown) on which the watch movement 4 is mounted. Thus, there is sufficient space for the drive from the self-winding mechanism to be mounted on the bridge. The drive from the self-winding

mechanism to the watch movement by-passes the chronograph mechanism and thus there is no interference.

WHAT WE CLAIM IS:—

1. A self-winding chronograph comprising a self-winding mechanism drivingly connected to a watch movement and a clutch member which is movable by a start/stop member between an operative position in which a fourth wheel of the watch movement drives a seconds hand of the chronograph and an inoperative position in which the fourth wheel rotates independently of the seconds hand.

2. A self-winding chronograph as claimed in claim 1 including a resilient member to bias the clutch member towards its operative position.

3. A self-winding chronograph as claimed in claim 2 in which the resilient member is a spring.

4. A self-winding chronograph as claimed in any preceding claim in which said start/stop member and the clutch member have cooperating surfaces, which in the inoperative position are spaced apart and in the operative position are in abutment.

5. A self-winding chronograph as claimed in any preceding claim including a hammer and heart-shaped cam for returning the seconds hand to its zero position.

6. A self-winding chronograph substantially as herein described with reference to and as shown in the accompanying drawing.

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