

United States Patent

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[54] SELF-WINDING CHRONOGRAPH

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[51] Int. Cl.G04f 7/04

[58] Field of Search58/74-79, 82

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FOREIGN PATENTS OR APPLICATIONS

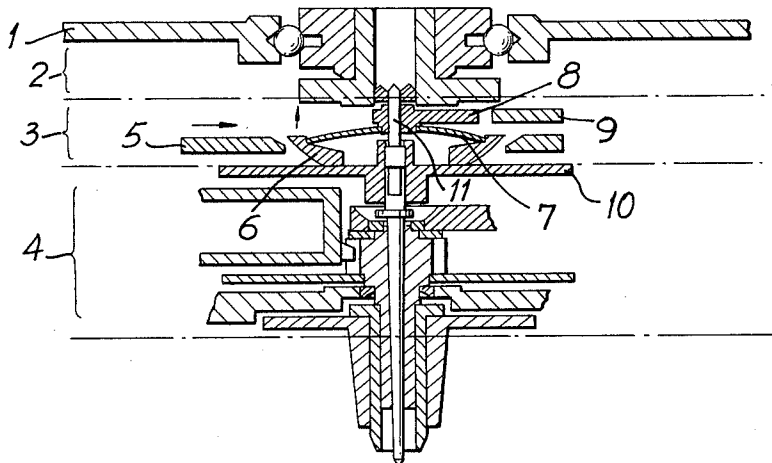
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[57] ABSTRACT

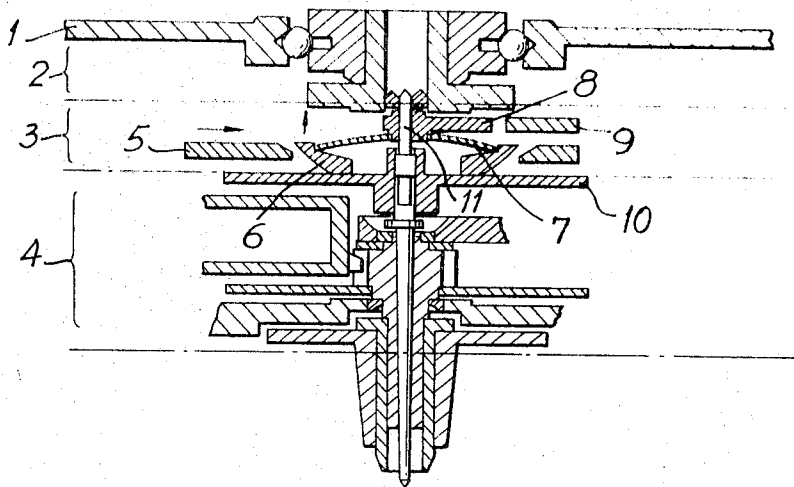
A self-winding chronograph timepiece having a clutch system positioned intermediate the self-winding system and the gear train, said clutch system having a clutch ring frictionally connected with a fourth wheel loosely fitted on the sweep second axle through the operation of a clutch spring secured to said axle. Said clutch ring is displaced out of engagement with said fourth wheel by means of a starting and stopping level responsive to the operation of a crown or button.

4 Claims, 1 Drawing Figure



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SELF-WINDING CHRONOGRAPH

The present invention enables one to construct a self-winding chronograph by means of disposing the chronograph system with a frictional clutch under the automatic system and over the gear train.

The usual chronograph system needs a large plane space because of the use of the clutch system, in which a first gear is moved on the same level in and out of engagement with a second gear. In the usual chronograph the entire surface of the bridge of the gear train must be used for the chronograph system. Therefore, even if the self-winding system could be disposed on the chronograph system, it is difficult to construct a self-winding chronograph because gears connecting the self-winding system and the gear train cannot be disposed over the bridge of the gear train.

The present invention enables one to construct a self-winding chronograph by the use of a frictional clutch system so as to minimize the level space required. The gear connecting the self-winding system with the gear train is disposed in the space thus freed.

SUMMARY OF THE INVENTION

Generally speaking, in accordance with the invention, a self-winding chronograph timepiece is provided having a self-winding system, a timepiece gear train, and a clutch system positioned between said self-winding system and said gear train, said clutch system including a sweep second axle, a fourth wheel loosely fitted on said sweep second axle, and a clutch spring mounted on said sweep second axle for selectively engaging a clutch ring against said fourth wheel to provide a frictional connection therebetween. A starting and stopping lever is provided for lifting said clutch ring in response to operating means extending outside of said timepiece.

The object of the arrangement according to the invention is to provide a compact self-winding chronograph timepiece.

BRIEF DESCRIPTION OF THE DRAWING

For a fuller understanding of the invention, reference is had to the following description taken in connection with the accompanying drawing, in which:

The figure is a cross-sectional view of portions of the timepiece in accordance with the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the figure, 1 represents the oscillating weight; 2, 3 and 4 represent respectively the self-winding system, the chronograph system and the gear train. In the chronograph system 3, 5 shows the starting and stopping lever which is operated by

the crown or button (not shown). 6 shows the clutch ring, which is connected with the fourth wheel 10 frictionally, by the influence of the clutch spring 7. 8 represents the second heart cam fixed to the sweep second axle 11. 9 is the hammer.

The following is an explanation of the operation of the clutch system.

In the usual state, the fourth wheel, loose-fitted on the sweep second axle, is driven by the third wheel (not shown), and the rotation of the fourth wheel is transmitted to the sweep second axle through the clutch ring 6.

When the second hand is to be stopped, the non-illustrated crown or the button is operated so as to lift the clutch ring 6 slightly by the operation of the starting and stopping lever 5. As a result, when the frictional binding of the clutch ring 6 and fourth wheel 10 is released, the second hand stops. The hammer 9 then hits heart 8, and the sweep second hand returns to the zero point without transmitting the rotation of the sweep second axle 11 to the fourth wheel 10.

As mentioned above, the present invention makes possible the production of a self-winding chronograph by means of disposing frictional clutch occupying a narrow space over the gear train. Therefore, gears connecting the self-winding system with the gear train can be disposed in the space thus freed.

What is claimed is:

1. A self-winding chronograph timepiece having a clutch system comprising a sweep second axle; a fourth wheel loosely fitted on said sweep second axle; a clutch ring; a clutch spring secured to said sweep second axle and positioned to selectively engage said clutch ring against said fourth wheel to provide a frictional connection therebetween for the selective driving of said sweep second axle in response to the rotation of said fourth wheel, displaceable starting and stopping lever positioned for selectively displacing said clutch ring out of engagement with said fourth wheel; and means for selectively displacing said starting and stopping lever from outside said timepiece.

2. A self-winding chronograph timepiece as recited in claim 1, wherein said clutch ring and clutch spring are positioned so that said clutch ring is displaced longitudinally relative to said sweep second axle in response to the displacement of said starting and stopping lever.

3. A self-winding chronograph timepiece as recited in claim 2, including a self-winding means and timepiece gear train means, said clutch system being positioned intermediate said self-winding means and gear train means.

4. A self-winding chronograph timepiece as recited in claim 3, wherein said sweep second axle is centrally positioned in said timepiece.

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