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COMBINATION HANDWHEELS AND HANDWHEEL CLUTCHES FOR SEWING MACHINES

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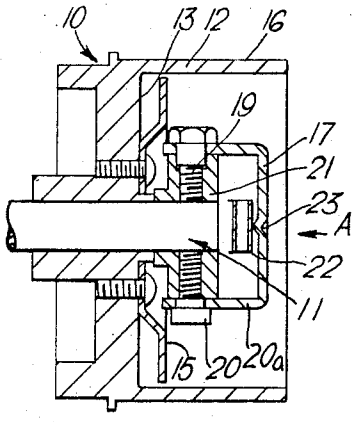


Fig. 1.

Fig. 2

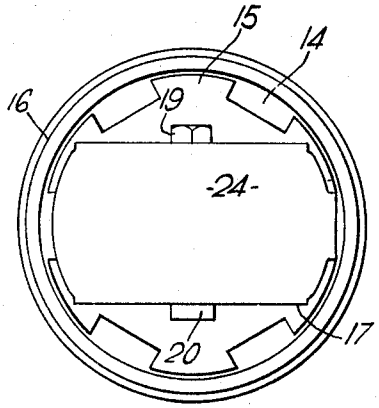
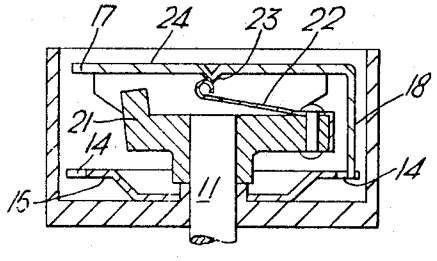


Fig. 3.



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COMBINATION HANDWHEELS AND HANDWHEEL CLUTCHES FOR SEWING MACHINES

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ABSTRACT OF THE DISCLOSURE

A device including a rotary member having a hollow cylindrical portion, a tiltable plate removably locked to a shaft of a sewing machine and closing the open end of the cylindrical portion, and an over-center blade spring for holding the tiltable plate selectively in a substantially perpendicular position relative to the shaft with a projection on the tiltable plate abutting abutment means inside the cylindrical portion to lock the rotary member to the shaft for driving the shaft and in an oblique position with the projection clearing the abutment means to permit the rotary member to rotate freely for driving a bobbin winder for example, without driving the shaft.

This invention relates to combination handwheels and handwheel clutches for the ends of sewing machine shafts and more particularly to a handwheel clutch for a sewing machine in which a handwheel can be declutched from a main drive shaft by light manual pressure on a tiltable member at the end of the handwheel.

In a typical sewing machine, a handwheel is provided which is rotated by a prime mover and in turn rotates a main drive shaft. In many instances, a bobbin winder is provided which is driven by frictional contact with the handwheel. Since the main drive shaft drives all of the other mechanisms in the sewing machine, when winding thread on a bobbin it is desirable to declutch the handwheel from the main drive shaft. Present handwheel clutches tend to detract from the aesthetic appearances of sewing machines.

It is, therefore, an object of the invention to provide an improved combination handwheel and handwheel clutch for the end of a sewing machine shaft.

Another object of the invention is to provide a combination handwheel and handwheel clutch for a sewing machine which is especially pleasing in appearance.

The main feature of the invention is the provision for a novel means for declutching a handwheel clutch by light manual pressure on a tiltable member at the end of the handwheel. The foregoing feature permits handwheel designs for sewing machines which are especially attractive.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims taken in conjunction with the accompanying drawings in which:

FIG. 1 is a side elevational view in vertical section of part of a combination handwheel and handwheel clutch according to the present invention,

FIG. 2 is a view in the direction of arrow A in FIG. 1, and

FIG. 3 is a plan view in horizontal section of FIG. 2.

Referring to the drawings, a combination handwheel and handwheel clutch is provided for a sewing machine for releasably connecting a rotary member **10** to a driven shaft **11**. By way of explanation, the shaft, when incorporated in a sewing machine, drives feed and loop-forming mechanisms and also drives (through a belt from said

shaft) a shaft for actuating the needle mechanism of the machine. The said rotary member **10**, in this embodiment, also serves as a handwheel and as a drive member for a bobbin-winding device in the sewing machine, and includes a hollow cylindrical portion **12** extending from a front end wall **13** which is provided with a central bearing aperture and which is provided at its interior face with abutment means in the form of a plurality (for example, six) of circumferentially-spaced slot-like openings **14**. Conveniently, said openings are recesses formed by securing a peripherally-notched sheet-metal insert plate **15** against said end wall. The curved peripheral outer surface **16** of said cylindrical portion on the rotary member, when fitted in a sewing machine, is engaged by a drive belt from a motor, and is frictionally engageable by a drive wheel of the bobbin-winding device, when the latter is in an operative position. The aforesaid driven shaft **11** of this clutch device freely (that is, non-drivingly) engages into the central bearing aperture in the end wall **13**, and said shaft **11** projects rearwards from said wall, and has mounted on its rear end a tiltable plate **17** having a dog projection **18** and constituting the driven member of the clutch. Said plate **17** is disposed inside the aforesaid cylindrical portion **12** and is connected to the driven shaft by a set-screw **19**, which may serve as a pivot pin, and a pivot pin **20**. The set-screw **19** is disposed at right angles to the driven shaft axis and is journalled in a bearing hole in a bracket **20***a* on the tiltable plate and threaded into a tapped hole in a block or collar **21** secured to the shaft. Holding means, in the form of an over-centre spring, such as a blade spring **22**, acts between the block or collar **21** and a V-shaped part **23** of the plate **17**, and the arrangement is such that the plate **17** can, by manual pressure on its rear face **24**, be tilted, about the aforesaid pivot pin, against the action of the spring **22**, between an operative position, in which the dog projection **18** drivingly engages one of the slot-like apertures **14** in the drive member, and an inoperative or de-clutched position, in which the dog projection lies clear of said apertures. The spring is arranged so that a dead-center position is passed when moving the plate from its operative to its inoperative position, and vice-versa.

Thus, when the clutch device is fitted in a sewing machine as aforesaid and it is desired to wind the bobbin and disconnect the drive to the needle and feed and loop-forming mechanisms the dog-carrying plate **17** is tilted manually about the axis of its pivot, that is, about an axis at right angles to the axis of the driven shaft, to disengage the dog projection. When the bobbin is wound, the plate can be moved back to cause the dog projection to re-engage the drive member.

In the particular embodiment described, the plate, when in its engaged position, is at right angles to the shaft axis, and when in its de-clutched position is oblique to the shaft axis.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made by ways of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention.

I claim:

1. A combination handwheel and handwheel clutch for the end of a sewing machine shaft comprising a rotary member having a hole for rotatably mounting on the end of the sewing machine shaft, a hollow cylindrical portion extending from the outer end of the rotary member, a collar, a tiltable plate having a diameter slightly less than the inner diameter of the hollow cylindrical portion of the rotary member, a bracket protruding from

the reverse side of the tiltable plate, pivot means for pivotally connecting the bracket to the collar, locking means for locking the collar to the sewing machine shaft so that the tiltable plate closes the open end of the hollow cylindrical portion on the rotary member, abutment means on the end of the rotary member from which the hollow cylindrical portion extends, a projection also protruding from the reverse side of the tiltable plate, and an over-center blade spring between the collar and the reverse side of the tiltable plate for holding the tiltable plate after light manual pressure on the obverse side selectively in a substantially perpendicular position relative to the sewing machine shaft with the projection on the tiltable plate abutting the abutment means to lock the rotary member to the sewing machine shaft and in an oblique position relative to the sewing machine shaft with the projection on the tiltable plate clearing the abutment means to permit the rotary member to rotate freely on the sewing machine shaft.

2. The combination handwheel and handwheel clutch of claim 1 which includes an insert plate having openings and connected to the end of the rotary member from which the hollow cylindrical portion extends, and in which the abutment means are formed by the openings in the insert plate.

3. The combination handwheel and handwheel clutch of claim 1 in which the collar has a radial tapped hole, the bracket on the tiltable plate has a clearance hole, and the pivot means and the locking means are a screw which extends through the hole in the bracket on the tiltable plate into the tapped hole in the collar for removably locking the collar to the sewing machine shaft.

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