April 5, 1932. E. ZINDEL 1,852,688

GRIPPING APPLIANCE FOR COP WINDING MACHINES

Filed Nov. 19, 1929

FIG. 1

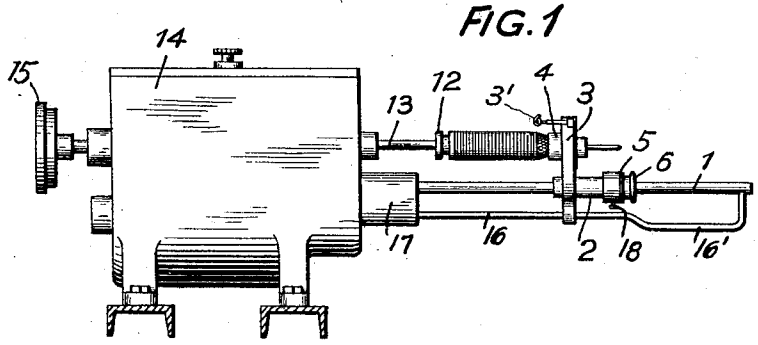


FIG. 2

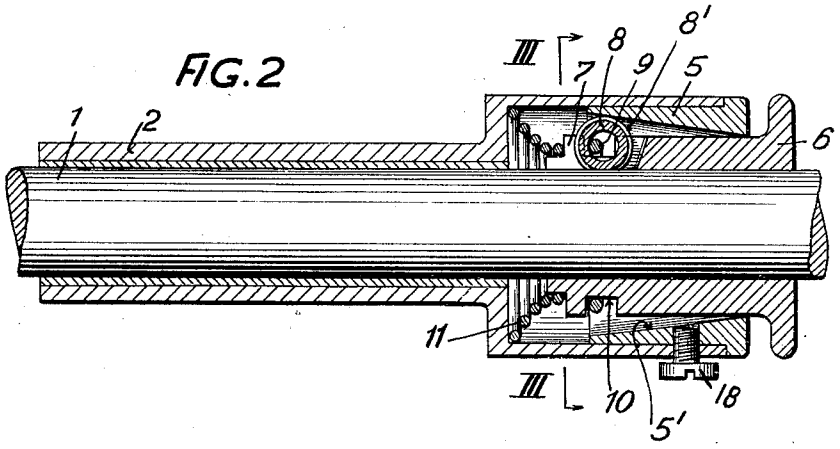
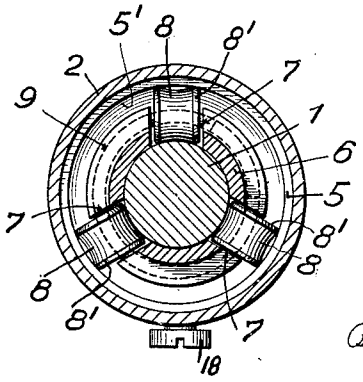


FIG. 3



INVENTOR:

Ernst Zindel,

By Henry Orth

Atty.

Patented Apr. 5, 1932

1,852,688

UNITED STATES PATENT OFFICE

ERNST ZINDEL, OF ERLENBACH, ZURICH, SWITZERLAND

GRIPPING APPLIANCE FOR COP WINDING MACHINES

Application filed November 19, 1929, Serial No. 408,372, and in Switzerland May 16, 1929.

This invention relates to a gripping appliance for cop winding machines wherein, for preventing an automatic rearward motion of the same, a spring is arranged between a rod-guided supporting member for a feeler device and for a thread guide, and a gripping boss, comprising friction rollers. In comparison with balls serving for the same purpose, rollers have the special advantage that, owing to the uniform wear of their circumferential surface, the bearing surface of the guide rod is preserved.

Instead of the known friction rollers having a convex bearing surface, in the gripping appliance according to the invention friction rollers of a concave circumferential surface adapted to the bearing surface of the guide rod are provided.

In consequence thereof, a so-called line contact of the friction rollers on the guide rod is effected, whereby the bearing surface of the latter remains permanently in perfectly smooth condition so that a good braking action of the gripping appliance is ensured at each point of the guide rod.

On the accompanying drawings an embodiment of the invention is shown by way of example in which:

Fig. 1 is a general view of the cop winding machine.

Fig. 2 of a longitudinal section of the gripping appliance, and

Fig. 3 a cross-section of the same on the line III—III in Fig. 2.

On the guide rod 1 of circular cross-section the supporting member 2 of known construction is displaceably arranged which carries the thread guide 3′ and the easily rotatable feeler device 3 which, for instance, is provided with a conical bore for the reception of the thread coil being formed on the spool 12 on the shaft 13 of a cop winding machine 14 the friction wheel 15 of which is driven in known manner, by means of a corresponding friction wheel on a main driving shaft, not shown.

Arranged below the guide rod 1 is a supporting rod 16, which supporting rod is attached to the bearing collar 17 extending outwardly from the cop winding machine 14, and supports the free end of the guide rod 1. The carrier 3 of the feeler is at the same time guided on the rod 16 adjacent the bobbin so that its vertical position is assured. The guiding of support 3 is stopped when the member 4 has finally left bobbin 12 (additional manual movement of member 3) and the member 3 has completely reached the downwardly offset portion 16′ of the supporting rod 16, whereupon the member 3 can tilt about the guide rod 1. This provides the necessary space for removing the full bobbin 12 from the bobbin shaft 13, and at which time an empty bobbin sleeve can be placed on the bobbin spindle 13. The support 3 is then moved back manually in the required manner on rod 16, and the feeler 4 thus is brought into operative position.

The supporting member 2 carries in an enlarged portion of its one end an inner sleeve 5 secured thereto by means of a screw 18 and having a conical inner circumference 5′. The gripping boss 6 which is also slidably arranged on the guide rod 1 projects in the enlarged end portion of the supporting member 2. The inner end portion of the gripping boss 6 is provided with three slots 7 which are equally distributed over its circumference and each of which accommodates a friction roller 8, of a concave profile, to be laterally held therein.

The profile of the individual friction roller 8 has a radius of curvature corresponding to that of the guide rod 1 so that, along the extent concerned, line contact takes place between the friction rollers and the guide rod. The exterior circumferential edges 8′ of the friction rollers 8 are rounded off in a manner to correspond to the oppositely disposed tapering surface 5′ of the supporting member 2 for the feeler device and threaded guide.

The actually present three friction rollers 8 are interconnected in the axial direction of the gripping boss by a common ring 9 passed through them. The said ring is inserted in a circumferential groove 10 of the gripping boss 6. The compression spring abutting on its one end against the supporting member 2 and on its other end against the gripping boss 6 effects that the friction rollers 8, on the one side, are pressed against the

guide rod 1 and, on the other side, against the tapering surface 5′ of the inner sleeve 5, whereby an automatic rearward motion of the gripping appliance on the guide rod 1 is prevented.

It is assumed that the winding spindle is parallel to the guide rod 1 and is adapted to effect a reciprocating motion simultaneously with its rotation. In consequence of the pressure exerted by the spool on the feeler device or on the supporting member 2 respectively, during the forward motion of the spool, the supporting member 2, every time when it occurs, is displaced to the right on the guide rod 1, whereby the spring 11 is compressed and, consequently, the gripping action of the friction rollers 8 on the boss 6 is released. As soon as the pressure of the spool on the supporting member 2 ceases, the displacement of the latter is also stopped and the supporting member 2 is then held fast in its new position on the guide rod in that the spring 11 expands and, thereby, presses the boss 6 outward so that the friction rollers 8 of the same are again firmly pressed against the guide rod 1 and the conical inner surface 5′ of the inner sleeve 5. The bearing surface of the guide rod 1 owing to the line contact of the friction rollers 8, revolving about their axes 9, remains perfectly intact without losing its smoothness. The braking action of the gripping appliance being permanently effective at every point along the guide rod is recognizable in that the gripping appliance even in the beginning of the winding operation, i. e. at the first impulse of the winding spindle on the feeler device, remains stationary so as to resist of being pushed away.

I claim:

1. In a gripping appliance for cop winding machines, in combination with a guide rod, a supporting member arranged on the said guide rod, a feeler device, a thread guide carried by said feeler device, the said feeler device and the said thread guide being connected to the said supporting member, a gripping boss carried by the guide rod, friction rollers arranged concentrically around the said gripping boss and guide rod, the circumferential surface of the said friction rollers being concave and conforming to the bearing surface of the said guide rod, of a spring, the said spring being inserted between the said supporting member and the said gripping boss so as to prevent an automatic rearward motion of the gripping device, a housing carried by the supporting member and into which the gripping boss extends and a conical surface within said housing and with which said rollers cooperate for gripping the guide rod upon movement in one direction.

2. In a gripping appliance for cop winding machines, in combination with a guide rod, a supporting member arranged on the said guide rod, a feeler device, a thread guide, the said feeler device and the said thread guide being connected to the said supporting member and movable therewith, a gripping boss mounted on the guide rod, friction rollers arranged on the said gripping boss and concentrically arranged around the guide rod, the circumferential surface of the said friction rollers being concave and conforming to the curved bearing surface of the said guide rod, a tapered sleeve carried by the supporting member and surrounding the gripping boss and rollers, the exterior circumferential edges of the said friction rollers being rounded off to correspond to and engaging oppositely disposed tapering surface of the said tapered sleeve for the said feeler device and the said thread guide, a spring, the said spring being inserted between the said supporting member and the said gripping boss so as to prevent an automatic rearward motion of the gripping device.

3. The combination with a gripping device for cop winding machines, a guide rod, a feeler device, a gripping boss carried by the guide rod, a member carried by the feeler device and housing the gripping boss, said member having a tapered bearing sleeve, of concentrically arranged rollers carried by the gripping boss and engaging the guide rod, said rollers having concave grooves conforming transversely to the curvature of the guide rod, said tapered sleeve being positioned whereby upon movement of the gripping boss and rollers in one direction, it will engage said rollers and force them into close engagement with the guide rod.

4. The combination with a gripping device for cop winding machines comprising a tapered sleeve axially movable, a guide rod extending through said sleeve, a gripping boss carried by the guide rod and within the tapered sleeve, spring means for normally forcing said sleeve and gripping boss in opposite directions, of concave concentrically arranged rollers carried by the gripping boss and engaging the guide rod at spaced points, said rollers having their outer portions in the path of the tapered sleeve.

5. The combination with the tapered sleeve and gripping boss of a cop winding gripping device, said gripping boss being carried by a guide rod, of concentrically arranged rollers having circumferential grooves conforming to and engaging the periphery of the guide rod, said rollers having their outer portions in the path of the tapered sleeve whereby upon movement of said sleeve and gripping member in one direction a gripping action takes place between the guide rod and tapered sleeve, and upon movement in the opposite direction said gripping action is released.

6. The combination with a tapered sleeve and gripping boss of a cop winding device, a guide rod on which said gripping boss is mounted, of concentrically arranged rollers

carried by said gripping boss, grooves in said rollers conforming transversely to the curvature of the guide rod and engaging the guide rod at spaced points, said rollers having their outer portions in the path of the tapered sleeve, said rollers having their outer edges chamfered according to the curvature of the tapered sleeve.

7. A device as set forth in claim 5, wherein the gripping boss is provided with an annular channel, and a split ring surrounds the gripping boss in the channel thereof and extends through the rollers.

In testimony whereof I have signed my name to this specification.

ERNST ZINDEL.