

March 17, 1936.

W. REINERS ET AL

2,034,355

COP WINDING MACHINE

Original Filed June 21, 1932 3 Sheets-Sheet 1

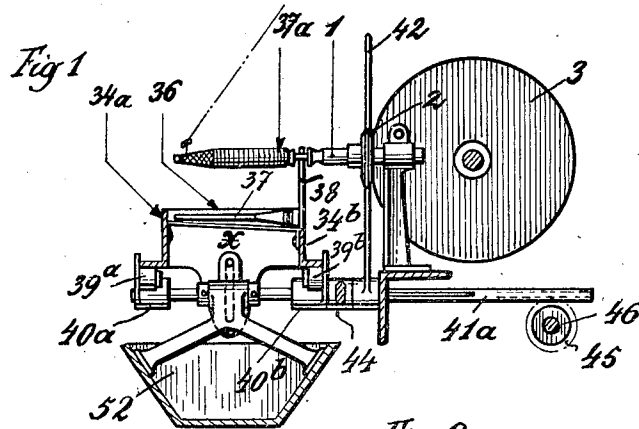


Fig. 2.

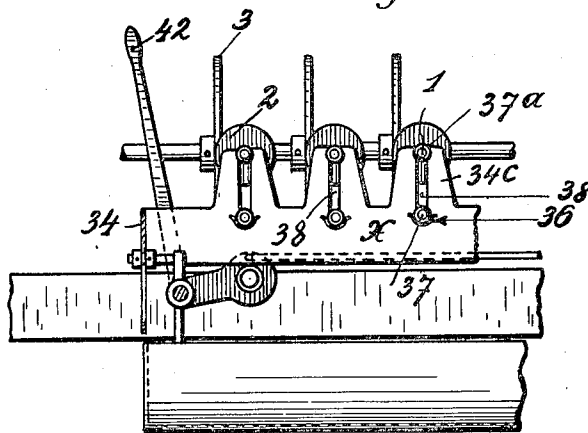
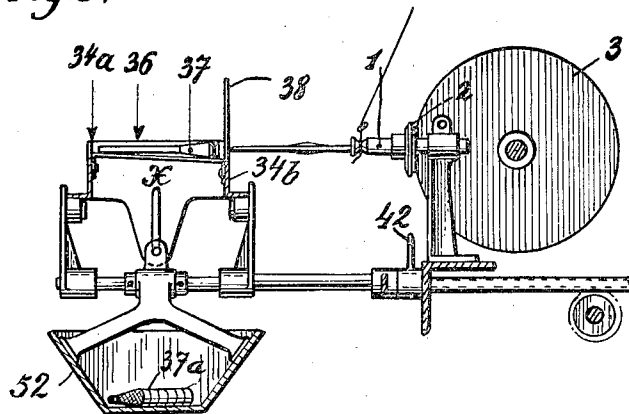


Fig. 3.



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Fig. 1^a

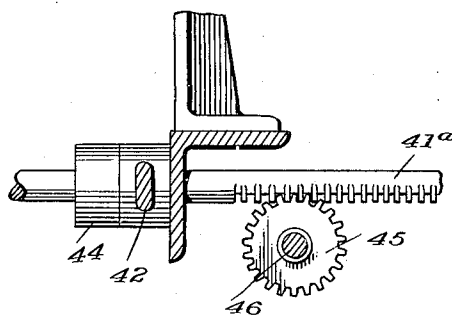
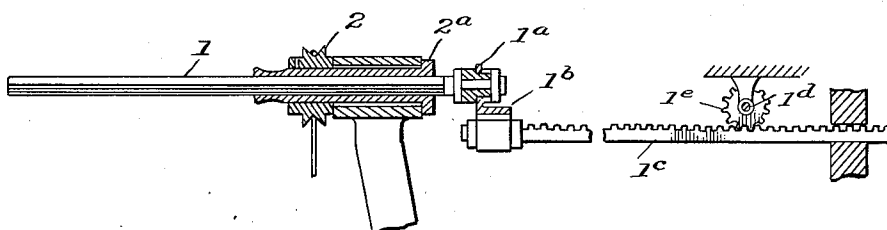


Fig. 5^a



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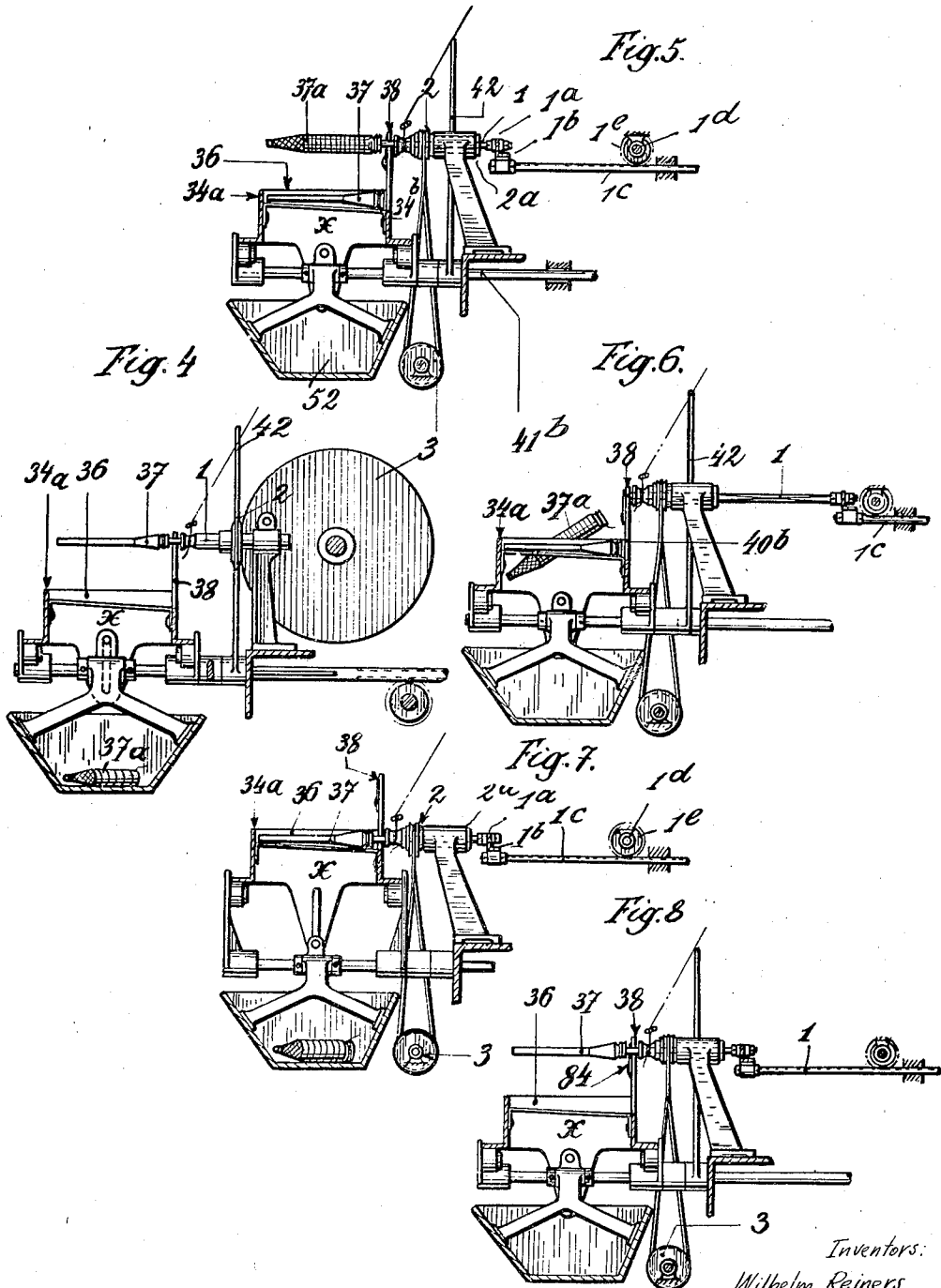
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UNITED STATES PATENT OFFICE

2,034,355

COP WINDING MACHINE

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Original application June 21, 1932, Serial No. 618,554. Divided and this application February 10, 1934, Serial No. 710,734. In Germany June 29, 1931

3 Claims. (Cl. 242—35.5)

This invention is one form of the invention set forth in the specification filed with our application Serial No. 618,554, relating to mechanism incorporated in a cop winding machine, for placing a plurality of cop tubes simultaneously on a group of spindles, and subsequently doffing the finished cops simultaneously.

This application is a division of the above application, Serial No. 618,554, filed June 21, 1932.

The apparatus includes a movable frame or carrier, with mechanism for raising and lowering it, and moving it horizontally. For doffing the cops from horizontal spindles the carrier, engaging behind the cops, is moved in the direction of the axes of the spindles. Then it is raised, and by this means places empty cop tubes in front of the spindles, whereupon it moves towards the spindles and pushes the tubes on to them. Then it is lowered to a position which it occupies while a fresh set of cops is being wound.

With the mechanism described in the specification filed with our application Serial No. 618,554 the carrier is first raised, then moved in the direction of the spindles, and then given a movement transversely of the spindles, through a distance equal to half the pitch of the spindles, in order to place the empty tubes which it carries opposite the spindles which are to receive them, whereupon the carrier is moved towards the spindles and then lowered. This cycle of operations comprises five movements of the carrier. Our present invention reduces the number to four.

The invention can be applied to machines in which the spindles are stationary, and also to machines in which the spindles are moved.

The invention will now be described with reference to the accompanying drawings, in which

Fig. 1 is a sectional view of the machine with certain parts in elevation, along one of the spindle stations,

Fig. 1a is an enlarged view of a detail of Fig. 1, Fig. 2 is a front view of Fig. 1,

Fig. 3 is a sectional view corresponding to Fig. 1 showing the parts in a different operative position at the conclusion of the stripping operation and preparatory to the charging operation,

Fig. 4 is a view corresponding to Fig. 1 showing the position of the parts at the conclusion of the charging operation,

Fig. 5 is a sectional view of the second embodiment of the machine, with certain parts in elevation, along one of the spindle stations,

Fig. 5a shows an enlarged view of details of Fig. 5,

Fig. 6 is a view corresponding to Fig. 5 showing the position of the parts at the conclusion of the stripping operation,

Fig. 7 is a view corresponding to Fig. 5 showing the position of the parts at the conclusion of the mounting operation, and

Fig. 8 is a view corresponding to Fig. 5 showing the position of the parts when the machine is in readiness for the winding operation.

As regards the principle of the invention it is quite immaterial whether the spindles are stationary or movable.

According to Figs. 1 to 4 the spindles are driven by friction wheels 2 and 3; according to Figs. 5 to 8 they are driven by belts and pulleys 2, 3.

In the case of the movable spindles each spindle is in well known manner axially slidable in the bearings 2a of its pulley 2, and its rear end is mounted in a bar 1b extending transversely of the bank of spindles, the bar being movable parallel with the spindle axes by means of racks 1c and pinions 1e on a shaft 1d. (Figs 5 to 7).

In each of the embodiments shown the carrier, designated X, consists of frame members 34, 34a, 34b carried by cranks 40a, 40b provided with rollers 39a, 39b. The cranks are fixed in pairs on rods 41a, which are rotatable and axially movable, and for which bearings 44 are provided. There must be at least two such rods for the carrier, or more if the carrier is long. The rods 41a have teeth, and each of them is engaged with a pinion 45, both or all the pinions 45 being fixed to a single shaft 46, by rotation of which the rods are moved axially. For rotating the rods 41a the same have arms, not shown in the drawing, the arms being connected to each other by a connecting rod or rods, and one of the rods having a handle 42, if the rotation is to be imparted manually. The rods have suspended therefrom a receptacle 52 for the doffed cops.

All this mechanism is similar to that described in the specification of application Serial No. 618,554.

A novel feature introduced by our present invention consists in upwardly extending the wall or frame member 34b of the carrier X so that the slots 38 in the extensions 34c, which push the cops 37a off the spindles, engage the spindles when the carrier is in its lowered position, as shown in Figs. 1, 2, 4, 5, 6 and 8. At the lower end of each slot there is a trough 36, into which a fresh cop tube 37 is laid when required.

Referring first to Figs. 1 to 4, when tubes have been placed in the troughs 36, and a set of cops 37a has been wound on the spindles, the shaft 46 is rotated anticlockwise, as viewed in Fig. 1, causing the carrier X to be moved to the position shown in Fig. 3. By this means the cops are doffed and are caused to fall into the receptacle 52.

Referring to the embodiment shown in Figs. 5 to 8, anti-clockwise rotation of the shaft 1d causes the spindles to be moved to the position shown in Fig. 6. The cops 37a are stripped off the spindles by the upwardly extending frame parts 34b, and drop into the receptacle 52. Rods 41b are rocked for raising and lowering the frame supporting the empty cop tubes.

In both embodiments of the invention shown, rotation is imparted to the rods 41a or 41b for lifting the carrier X so that the empty tubes are raised to the level of the spindles Figs. 3 and 7. The rods 41a are axially movable as well as rotatable in the embodiment shown in Figs. 1 to 4, and the rods 41b are not axially movable in the embodiment shown in Figs. 5 to 8. When the tubes have been lifted the shaft 46 (Figs. 1 to 4) or the shaft 1d (Figs. 5 to 8) is rotated clockwise, and the tubes are thus pushed on to the spindles or the spindles are pushed into the tubes. Then the rods 41a or 41b are rotated for lowering the carrier, and a fresh set of cops is wound.

We claim:—

1. In a cop winding machine, a plurality of juxtaposed winding spindles; a cop handling unit adjacent said spindles having thereon upstand-

ing slotted plates defining stripping faces embracing said spindles at the tops thereof for stripping the finished cops, and a frame for supporting the empty cop tubes at the bottom of said stripping plates; means for relatively moving said winding spindles and said cop handling unit including movements in a direction parallel to the spindle axes for stripping simultaneously the finished cops and for subsequently charging simultaneously the empty cop tubes on said plurality of spindles; and means for moving said cop handling unit transversely of the spindle axes to set the unit for its charging operation.

2. In a cop winding machine, a group of horizontal spindles, a cop handling unit comprising a group of cop tube rests movable vertically to bring said rests into and out of alinement with said spindles, a group of stripping faces on said unit embracing said spindles respectively when said rests are out of alinement with said spindles, and means for relatively moving said spindles and said cop handling unit in a direction parallel to the spindle axes for stripping and charging said spindles.

3. In a cop winding machine, a group of horizontal spindles, a cop handling unit mounted below said spindles so as to be movable between high and low positions, said unit comprising stripping means having slots embracing said spindles in both high and low positions, a tube rest at the base of each slot, and means for relatively moving said spindles and cop handling unit parallel to the spindle axes.

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