March 17, 1936. W. REINERS ET AL 2,034,248

BOBBIN CHANGING DEVICE FOR PIRN WINDING FRAMES

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Fig. 1.

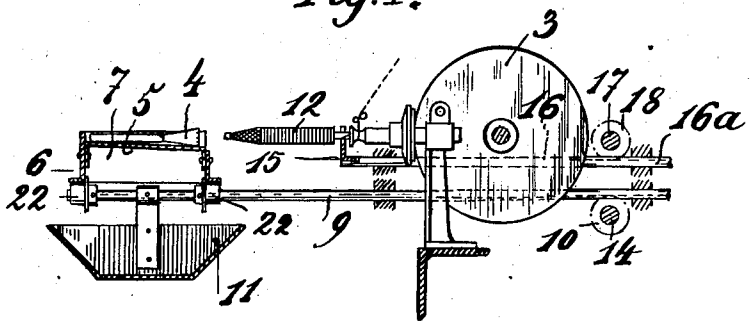


Fig. 2.

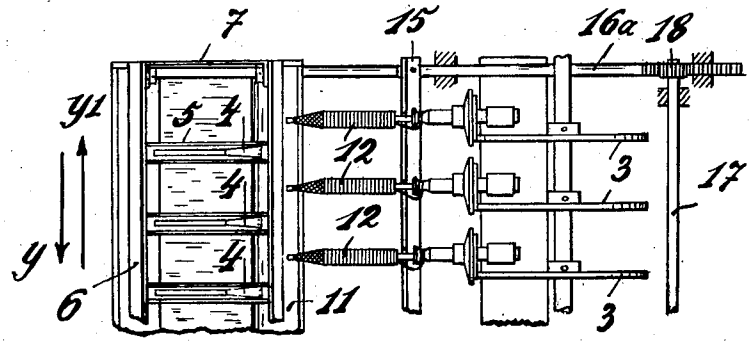
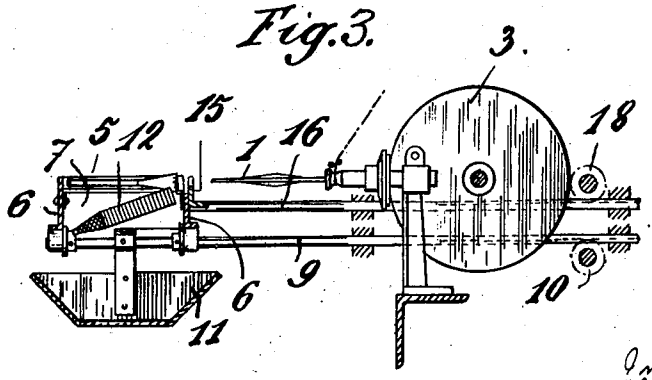


Fig. 3.



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Fig. 4.

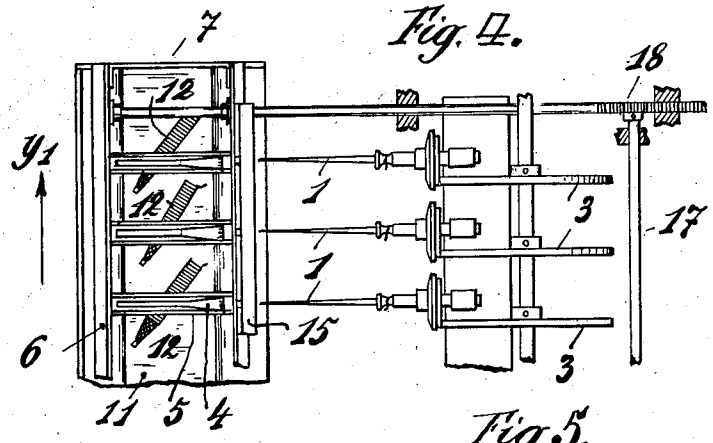


Fig. 5.

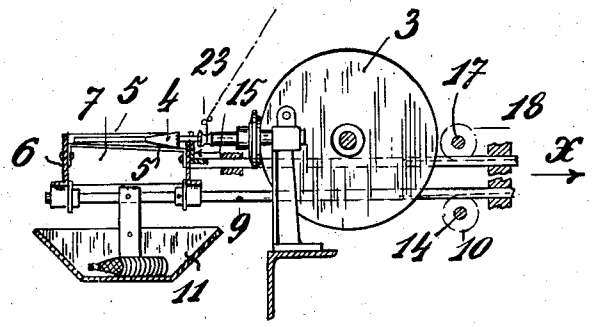
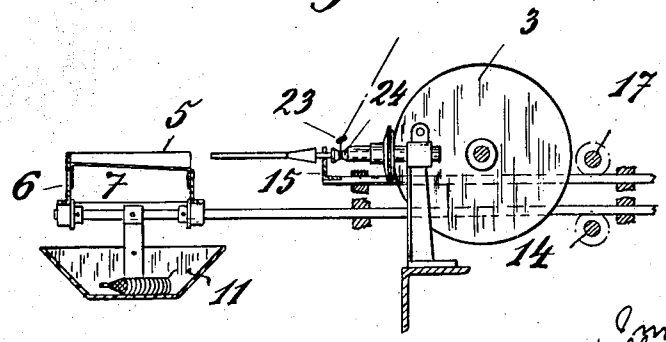


Fig. 6.



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Fig. 7.

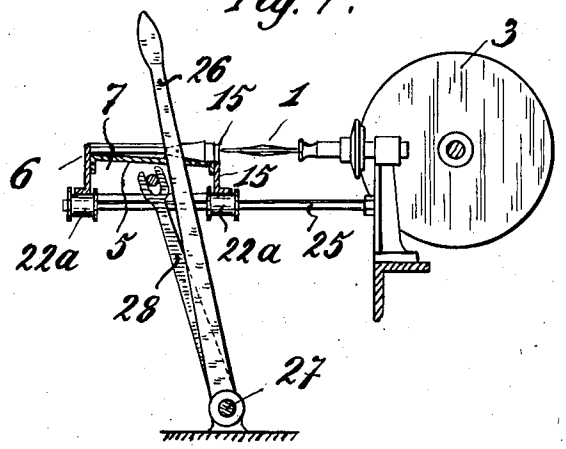


Fig. 8.

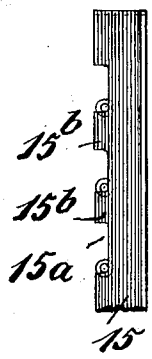
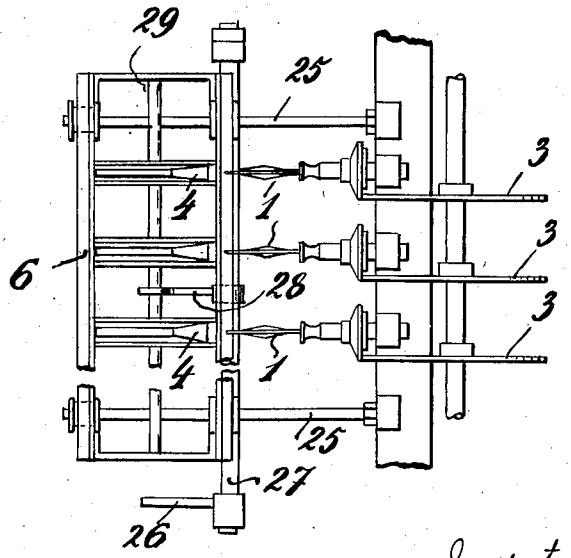


Fig. 9.



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UNITED STATES PATENT OFFICE

2,034,248

BOBBIN CHANGING DEVICE FOR PIRN WINDING FRAMES

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Application August 19, 1933, Serial No. 685,954
In Germany December 23, 1932

4 Claims. (Cl. 242—35.5)

We are aware of the spooling frames for sewing thread being fitted with devices for the simultaneous feeding of the empty spools to a plurality of spindles by means of an endless belt.

We are also aware that spinning, doubling and twisting frames have been fitted with devices intended to doff the full bobbins mechanically and to place the empty tubes on a plurality of spindles at a time.

However, the design of all these known devices is too complicated for use in winding frames generally and more particularly so for pirn winding frames on account of the comparatively short length of yarn in the pirn which is quickly wound on, and they are therefore too cumbersome in manipulation.

The present invention has for its object to effect the bobbin change in the pirn winding frames in a simple fashion. Therefore, the object of the invention is a bobbin changing device which doffs the full bobbins from a plurality of spindles simultaneously and places the empty tubes on the latter.

The invention consists of a rail placed across the spindles and arranged so as to be movable to and fro in the direction of the spindles. It has fork-shaped notches adapted close to the spindles and collaring the spindles behind the pirn tubes so that on the outward movement of the rail all the pirns are simultaneously doffed. We provide, in addition to the afore-mentioned rail, a frame carrying trays for holding the empty bobbin tubes, which is placed in front of and across the spindles, and in the direction of whose axis it is movable to and fro.

The two arrangements, namely the notched rail and the tube frame may also be united in a common body for doffing the full bobbins and for subsequently putting on the empty tubes.

Fig. 1 is a sectional view of the machine parallel to the spindle axes,

Fig. 2 is a plan view of Fig. 1,

Fig. 3 is a sectional view corresponding to Fig. 1, showing the elements in a different operative position,

Fig. 4 is a plan view of Fig. 3,

Fig. 5 is a sectional view corresponding to Figs. 1 and 3, showing the elements in a different operative position,

Fig. 6 is a sectional view corresponding to Fig. 5, showing the position of the parts after the empty bobbin tubes have been charged onto the spindles,

Fig. 7 is a sectional view of a modified form of the machine parallel to the spindle axes,

Fig. 8 is a plan view of Fig. 7, and

Fig. 9 is a fragmentary vertical sectional view showing the rear face of the doffing bar.

In the embodiment according to Figs. 1–6, a rail 15 extending across the spindles is rigidly connected to two or more toothed racks 15, the teeth 16a of which engage with wheels 18 on their common shaft 17, so that on turning the shaft 17 in clockwise direction, the rail 15 is moved outward whereby it draws all the pirns 12 from the spindles, whence they are transferred to a collecting container 11. The rail 15 has notches 20 in its upper edge, the number of notches 20 corresponding to the number of the spindles, every one of which is engaged by a notch collaring the spindle behind the respective pirn 12. It would be possible to employ a rail without notches and to bring it quite near to the spindles, but in this case the pirns would not be sufficiently controlled. Below the shafts 16 are a second set of shafts 9 having at their inner ends teeth engaging toothed wheels 10 fixed on shaft 14. At the outer ends of shafts 9 are rollers 22, upon which is mounted a tube rest unit comprising longitudinal bars 6, cross bars 7 and tube rests 5 for holding empty pirn tubes 4. The tube rest unit is movable in a direction parallel to the spindle axes by rotation of shaft 14 and is movable transverse to the spindle axes for a short distance by the rolling of the tube rest unit upon rollers 22. This is necessary in order to permit the transferring of the full pirns through the interstices between the tube rests to the collecting container 11 which is in this case suspended on the toothed racks 9, and to get the empty bobbin tubes in front of the spindles afterwards.

The sequence of operation is in this case as follows:

A pirn tube is placed in every tray 5 while the pirns 12 are being wound. When all the pirns 12 are full as shown in Fig. 1, the rail 15 is shifted to the left, by turning the shaft 17, and all the bobbins are doffed from their spindles so that they can fall into the collecting-container 11 as shown in Fig. 3. When this is done, the tube rest unit 6, 7 is moved so far in the direction y^1 (Figs. 5 and 7) that the pirn tubes 4 are brought in front of the spindles. Thereupon the two shafts 14 and 17 are turned so that the tube rest unit 6, 7 together with the rail 15 are transferred from the position shown in Fig. 4 to the one shown by Fig. 5, which means that they move in the direction of the arrow x. All the pirn tubes are thereby placed on the spindles. The cradle 6, 7 with the collecting container 11 is then brought back in the posi-

tion shown in Fig. 6 by turning the shaft **14** in the opposite direction.

In the embodiment shown in Figs. 7 to 9, the rail **15** is made to form part of the tube rest unit **6**, **7** in a fashion integrally interconnecting the two parts. The framing carries two or more rods **25** with slidable and easily movable double-flanged rollers **22***a*, between the flanges of which the tube rest unit is displaceable for a short distance transversely to the spindle axes exactly the same as in the embodiment shown in Figs. 1–6. The to and fro movement in direction of the shaft is herein effected by means of a lever **26** fitted to a shaft **27** which simultaneously carries two or more fork-levers **28**, the fork of which engages a rod **29** secured to the tube rest unit. On moving the lever **26** to the right, the bobbin changing device is also shifted to the right and the pirn tubes **4** are placed on the spindles. When this is done, the tube rest unit is shifted transversely to the spindle axes and the device remains in this position until the pirns are full. When the pirns are full, the lever **26** is moved back into the position as shown in Fig. 7, whereby the pirns are doffed and deposited in a container placed below them, which is not shown in the illustration. To permit the tube rest unit to be shifted in the direction across the bobbins, the right hand side wall **15** of same must have oblong recesses **15***a*, according to Fig. 9, to permit this side wall to remain with its stripping faces **15***b* behind the pirn.

We claim:

1. In combination with a group of parallel spindles, a doffing bar common to the spindles and having notches collaring the spindles, a frame bearing a tube rest unit movable with respect to said frame in a horizontal direction transverse to the axes of the spindles, said doffing bar and said frame being mounted so as to be movable only parallel to the axes of the spindles.

2. Apparatus as described in claim 1, wherein said doffing bar and said frame are movable independently of each other.

3. In combination with a group of parallel spindles, a frame mounted so as to be movable only parallel to the axes of the spindles, a tube rest unit movable with respect to said frame in a direction transverse to the axes of the spindles, and means for stripping the spindles simultaneously.

4. In combination with a group of parallel spindles, a frame mounted so as to be movable only parallel to the axes of the spindles, a tube rest unit movable with respect to said frame in a direction transverse to the axes of the spindles, and a doffing bar fixed to said tube rest unit and having elongated notches to receive the spindles, said notches being adapted to permit said tube rest unit to move transversely to the spindle axes while said doffing bar remains behind the bobbins on the spindles.

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