United States Patent

[11] 3,542,221

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[21] Appl. No. 734,721
[22] Filed June 5, 1968
Continuation-in-part of Ser. No. 564,077,
July 11, 1966, abandoned.
[45] Patented Nov. 24, 1970

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[32] Priority July 12, 1965
[33] Japan
[31] No. 40/57300

[54] APPARATUS FOR DONNING AND DOFFING BOBBINS FOR TEXTILE MACHINERY

1 Claim, 4 Drawing Figs.

[52] U.S. Cl. 214/91, 198/24; 57/53
[51] Int. Cl. B65g 47/34
[50] Field of Search 214/89, 91; 198/24, 25; 242/35.5, 35.6; 57/53, 52, 54

[56] References Cited

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2,208,930	7/1940	Kahlisch	242/35.6
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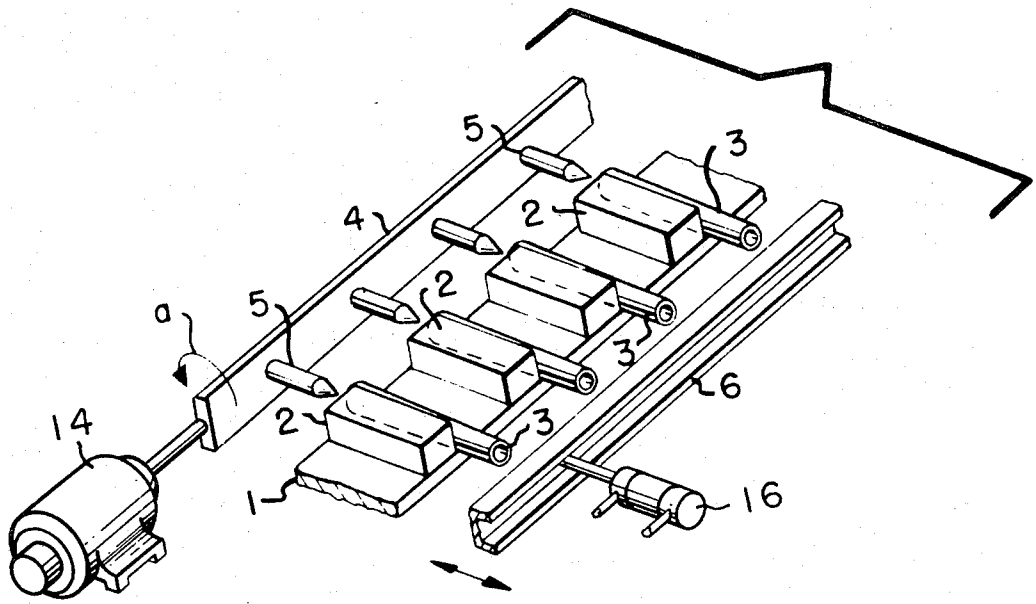
ABSTRACT: Loading station apparatus to receive full bobbins from a doffer and to provide empty bobbins to a doffer for placement on the spindles of a spinning frame that has been doffed. Specifically a system has been provided which transfers full bobbins from a vertical position to a horizontal position and empty bobbins from a horizontal position to a vertical position.



Patented Nov. 24, 1970 3,542,221

FIG. -1-

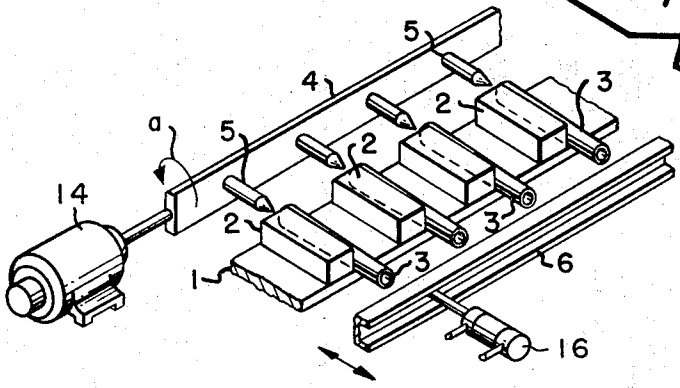


FIG. -2-

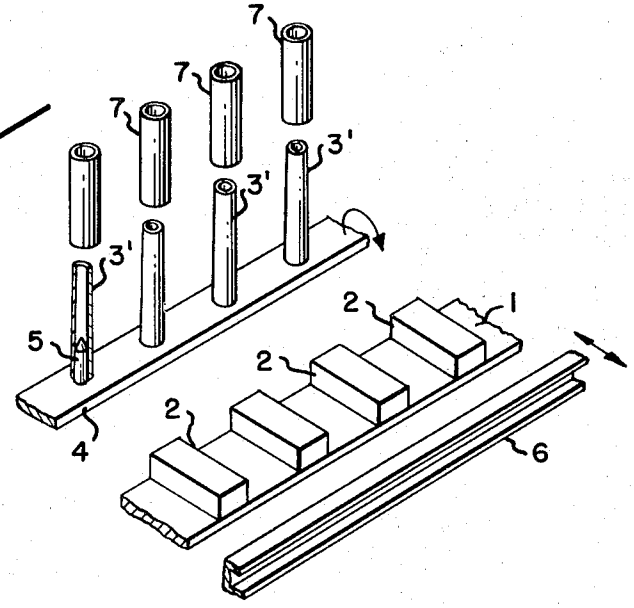


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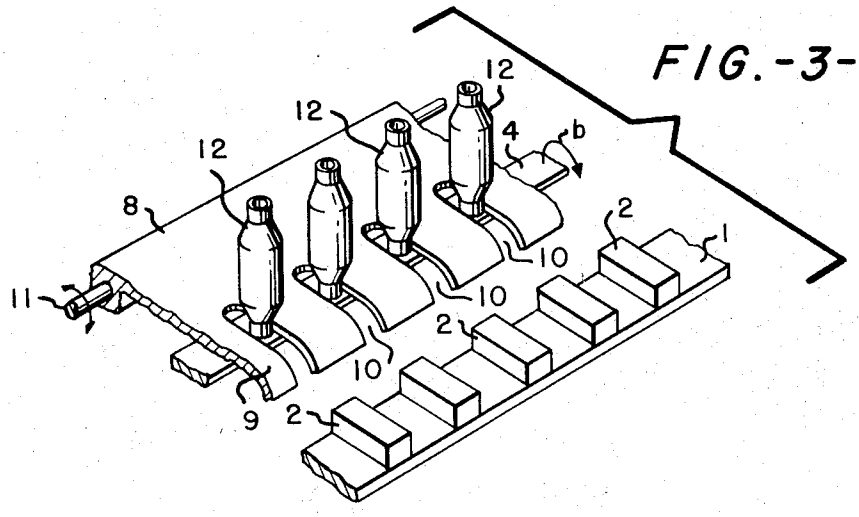
FIG.-3-



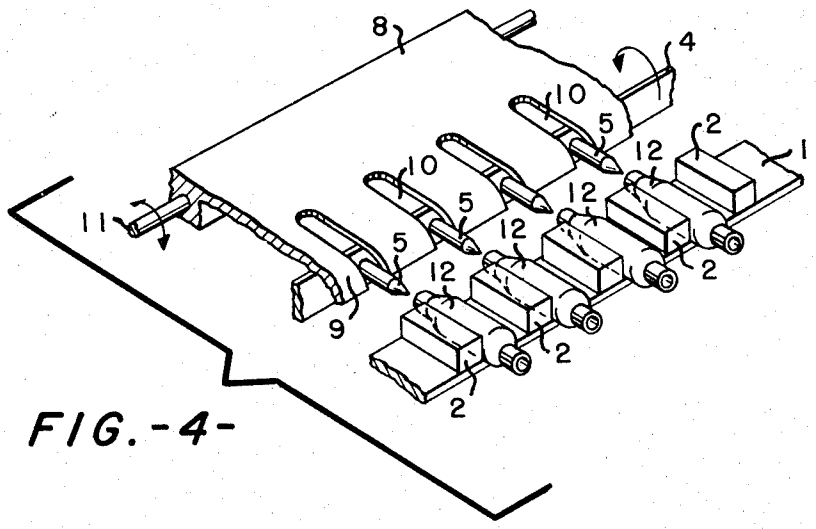


FIG.-4-

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APPARATUS FOR DONNING AND DOFFING BOBBINS FOR TEXTILE MACHINERY

This is a continuation-in-part of application Ser. No. 564,077, filed July 11, 1966, now abandoned.

The present invention relates to an automatic bobbin exchanging machine whereby when all the bobbins on a textile machine have become full, they are simultaneously removed therefrom and empty bobbins are placed thereon, said apparatus being so arranged that empty bobbins transferred by a conveyor are simultaneously donned on pegs at a bobbin arranging position, while full bobbins on the pegs are simultaneously pulled out and transferred to the conveyor.

It is therefore an object of the invention to provide an efficient and simple apparatus to doff and don full and empty bobbins from and on textile handling machines.

Other objects and advantages of our invention will become apparent as the specification proceeds to describe the invention in which:

FIG. 1 is a perspective view of an apparatus according to the present invention shown at the time of donning empty bobbins;

FIG. 2 is a perspective view showing the relation between empty bobbins donned on pegs and bobbin grippers;

FIG. 3 is a perspective view of full bobbins donned on the pegs; and

FIG. 4 is a perspective view of the full bobbins doffed from the pegs and transferred to a conveyor.

In FIGS. 1 and 2, indicated at 1 is a conveyor having a number of cleats secured thereto at predetermined intervals to receive empty bobbins 3 one in each space defined therebetween for conveying them to a bobbin arranging position. Indicated at 4 is elongated retainer plate provided at one lateral edge of the conveyor and having as many pegs 5 as the spindles of the textile machine secured thereto at fixed intervals, the pitch of the pegs being equal to that of the cleats. The retainer plate 4 is so arranged to be rotatable in the direction of arrows *a* and *b* by conventional means such as reversing motor 14 through 90° between a first position in which it can lay the pegs horizontal toward the conveyor and a second position in which it can erect the pegs. Indicated at 6 is a pusher plate located at the other lateral edge of the conveyor so as to be opposed to the retainer plate 4, said pusher plate being adapted to be suitably moved toward the conveyor by any conventional means such as double active piston 16 to simultaneously push out all the empty bobbins arranged thereon and don them on the pegs, whereafter the retainer plate is rotated through 90° to erect the empty bobbins. Indicated at 7 are rows of bobbin grippers extending above the erected empty bobbins 3' and suspended by lifter rails (not shown). The bobbin grippers are adapted to be simultaneously lowered to grip the empty bobbins and then lifted to pull them out from the pegs and convey them over the spindles of the textile machine. The grippers and the lifter rails are of known structure as related to an automatic bobbing exchanging machine for textile machines, and since they have no direct connection with the present utility model, a detailed explanation thereof is omitted.

Referring to FIGS. 3 and 4, indicated at 1 is a conveyor having a number of cleats 2 secured thereto at predetermined intervals. A retainer plate 4 having pegs 5 secured thereto at fixed intervals. These are the same as those described and shown in FIGS. 1 and 2. Indicated at 8 is a guide plate to be placed on the retainer plate 4 at a suitable time, and its lateral edge 9 facing the conveyor is downwardly curved and has notches 10 extending therefrom to the pegs, said guide plate being rotatable around a shaft 11 on its base end side to assume the illustrated position. Indicated at 12 are full bobbins conveyed by the aforesaid grippers from the textile machine and donned on the pegs by the lowering of the lifter rail.

With the present apparatus thus constructed, when the conveyor 1 carrying a large number of bobbins 3 is stopped by means of a limit switch (not shown) at the bobbin arranging position, the pusher plate 6 is actuated to push out the empty bobbins thereby simultaneously donning them on the pegs 5. The bobbins are guided into position onto the pegs 5 by use of suitable means such as a pair of ratchet guide plates as disclosed in U.S. Pat. No. 3,357,535, granted Dec. 12, 1967. Subsequently, the retainer plate 4 is rotated through 90° to erect the empty bobbins 3', whereupon the grippers 7 are lowered to simultaneously grip the thus erected empty bobbins and then lifted thereby pulling them out from the pegs to convey the same toward the textile machine. When all the bobbins of the textile machine have become full, the grippers pull them out from the spindles and carry them to the bobbin arranging position, where it is lowered. At this time, the guide plate 8 has already been placed on the retainer plate 4 and the full bobbins 12 are then donned on the pegs. Subsequently, the retainer plate 4 is rotated in the direction of an arrow *b* through 90°, and when the pegs are moved in the notches 10 toward the conveyor, the guide plate 8 pushes out the full bobbins by means of its curved edge 9, so that the full bobbins are simultaneously pulled out from the pegs and transferred onto the conveyor 1. Since the pitch of the pegs 5 is so made as to coincide with the pitch of the cleats 2, the empty bobbins, when pushed out, are simultaneously donned on the pegs, and the full bobbins, when pulled out from the pegs, enter the spaces between the cleats. In addition, the guide plate 8 has no connection with the pushing out action of the empty bobbins, and the pusher plate 6 has no connection with the pulling out, so that the guide plate is omitted in FIGS. 1 and 2 and the pusher plate is omitted in FIGS. 3 and 4.

With the recent advancement of the automation of textile machinery, apparatus for simultaneously exchanging all the bobbins on a textile machine have been put to practical use. However, the conventional type of automatic bobbin exchanging apparatus has the great disadvantage that since pegs are attached to a chain moving in a circular path and empty bobbins are to be donned on said pegs, it is difficult to establish alignment between the pegs and bobbin conveying grippers and hence it is impossible to attain the smooth operation of simultaneously pulling out all the empty bobbins donned on the pegs by means of the rows of grippers. On the contrary, according to the present invention, since the pegs are secured to the retainer plate, the correct alignment between the pegs and grippers can be attained and, as a further advantage, the arrangement wherein the guide plate having its lateral edge curved is placed on said retainer plate, provides convenience in that the pegs can be used both for the donning of empty bobbins and for the pulling out of full bobbins, thus contributing to the simplification of the entire apparatus.

Although we have described in detail with particular reference to the preferred embodiment, it is contemplated that other advantages and modifications will become obvious to those skilled in the art and therefore we desire to be limited only to the scope of the invention as defined in the claims.

We claim:

1. Bobbin handling apparatus comprising: a conveyor, said conveyor having a plurality of cleats thereon forming pockets therebetween, plate means supported adjacent the lateral edge of said conveyor, pegs on said plate means with one peg corresponding to each pocket on said conveyor, means to rotate said plate means, means operably associated with said pockets to push empty bobbins onto said pegs at a predetermined time and guide means operably associated with said plate means to guide full bobbins into said pockets, said guide means having a notch for each peg opening toward said pockets, said guide means being curved downwardly adjacent the lateral edge of said conveyor to guide said full bobbins into said pockets when said plate means is rotated toward said pockets.