

A Rapid Method of Doffing or Changing Bobbins on Spinning or Doubling Frames

By *E. Toenniessen*, Engineer

Changing full bobbins or tubes on a spinning frame is still done by hand and from two to five minutes are required for a frame with 500 spindles according to the number of operatives and their dexterity. A properly managed spinning mill will not lose more time

than this, but if the operatives are not set about it properly, as is so often the case, twice as much time or even more may well be lost. As the usefulness of the machine is almost entirely dependent upon the pauses for doffing, this must be done as rapidly as poss-

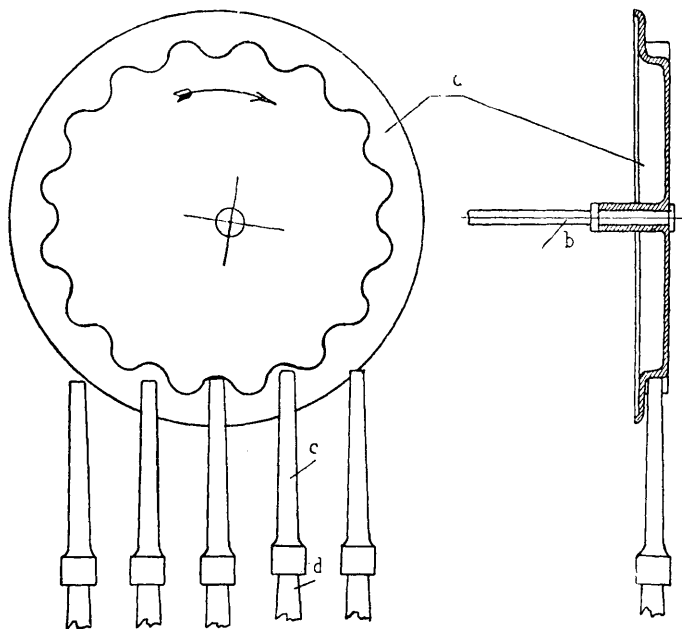


Fig. 1

ible, but at the same time, in spite of all haste, with care. It often happens, however, that a large number of the tubes or bobbins, in particular the heavy and Northrop bobbins, sit quite loosely on the spindles and consequently tend to slip during spinning, that is, they do not have the same rate of revolution as the spindle. This leads to trouble in the weaving shed owing to the yarn not being twisted in places. It is especially noticeable when the

tube or bobbin has about three quarters run off, because the thread must withstand an even stronger pull by slipping off over the bare tube and at once breaks owing to insufficient twist. This slipping of the tubes is also noticeable in the spinning frame itself by the large number of broken threads, particularly when starting spinning.

To remedy this state of affairs, it is the custom in many mills to press down by means of a long stick those tubes which are stuck loosely on the spindles, quite forgetting that the tubes are not all of the same diameter, that is to say, that they stick on the spindle at a higher or lower level. The stick accordingly presses down only those which sit highest up, that is, the narrowest, and damages them so that they are all the more difficult to doff later on, while

the wide tubes still slip on the spindles. Many mills are aware of this and forbid the use of the stick. To press on the tubes or bobbins by hand alone, however, takes up much time, a single worker, for example, taking on an average 60 seconds for one side of the frame. Consequently a press-on wheel has been constructed (German Patent No. 439 533, patents applied for abroad) by means of which a worker can press 250 tubes, the whole side of a frame, each onto its own spindle, in six seconds (see Figures 1 and 2). The wheel is preferably made of some light metal and is of such a size and so formed that it presses simultaneously upon two spindles only. The edge *a* is undulating and corresponds to the pitch of the spindles. A leather cover prevents the tubes from being damaged. After the full tubes have been taken from the spindles *c* and empty tubes have been loosely stuck upon them, the operative places the wheel upon the heads of the tubes and rolls it over them with quite a light pressure upon the axle *b*. The worker must take care to incline the wheel a little towards herself and move in the direction of the pigtail guides, so that they cannot be injured. The frame must be



Fig. 2

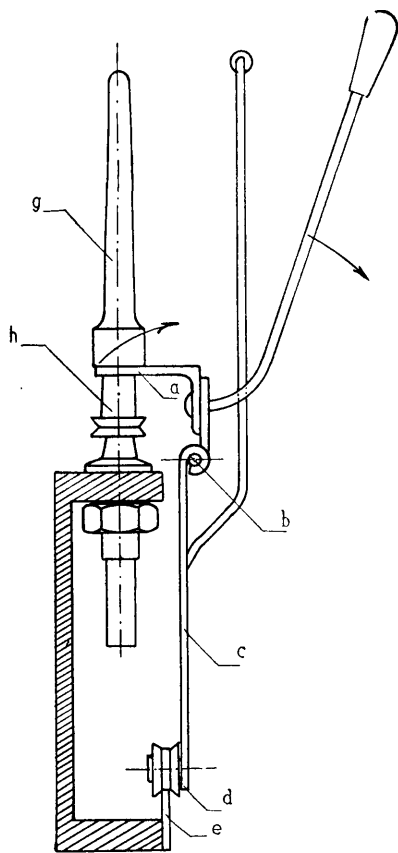


Fig. 3



Fig. 4

so arranged that the pigtail guides can be tipped up from the headstock of the machine, as is always the case with modern machines.

The press-on wheel affords other advantages besides this. The wheel does not miss a single tube or bobbin and cannot injure either these or the spindle itself, because pressure is always exerted vertically. In order to prevent an accumulation of yarn between the traveller and the drawing rollers, it is advisable to stop the machine quickly before applying the wheel; otherwise a loop of yarn might be caught and pinched by the bobbin as it slipped down. This can also be prevented by laying the yarn behind the spindles when putting the empty bobbins on the skewers, which can be done without loss of time. Care must further be taken that the upper tip of the tube is not lower than the tip of the spindle. These press-on wheels have been in use in a number of spinning mills for a year and have given the greatest satisfaction. It

has been found in practice that one wheel is enough for two or three machines.

But even today it still takes too long to remove the tubes from the spindles and a press-off device has accordingly been constructed (Patents applied for in Germany and abroad) to facilitate and accelerate this operation. It consists of a fork a, the prongs of which are adjusted to the distance of the skewers and is mounted in a frame c so that it can turn at the point b (see Figures 3 and 4). The frame runs by means of two small wheels d upon a rail e which is screwed onto the lower part of the spindle frame. The wheel usually lifts from 20 to 25 tubes g at a time from the spindles h. *This is done in the direction of the axis of the spindles so that no side pressure is exerted upon them, as happens when the tubes are removed by hand, which pressure is severe and very injurious both for the tube and the yarn.* The roller bearing spindles which have recently come into vogue are particularly sensitive to

lateral pressure. As soon as the first group of tubes has been removed by the spinner, she disengages it from the head of the tubes, rolls the frame to the next group, presses these off, and so on. The yarn cannot be pinched because the prongs of the fork push the yarn backwards when they are inserted under the tubes. One such device is generally enough for two machines. Practical trials have shown that the time taken to remove the tubes can be reduced by fifty per cent, through loosening them beforehand, which takes only a few seconds, because the operatives are not impeded in their work by tightly fitting tubes and are not made tired. It is evident that more or less time can be saved by the use of this contrivance, but the extent of the sav-

ing depends entirely upon the intelligence of the operatives and especially upon the overlooker who must direct systematically the work of the bobbin doffers.

The machine should be doffed in the following way. Two workers on each side of the frame start to press off the tubes and are at once followed by the bobbin doffers who lay the full bobbins orderly in trays. Then the empty tubes are lightly placed on the spindles and as soon as all have been set up the press-on wheel is passed over both rows of spindles, beginning at the headstock, passing along the right side towards the back and returning on the left side. The use of these two devices in this way effects a very important saving of time.