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[54] **DEVICE FOR AUTOMATICALLY WINDING UP THE INITIAL RESERVE YARN QUANTITY ON THE END OF A SMALL TUBULAR ELEMENT OF A BOBBIN IN THE TEXTILE INDUSTRY**
3 Claims, 2 Drawing Figs.

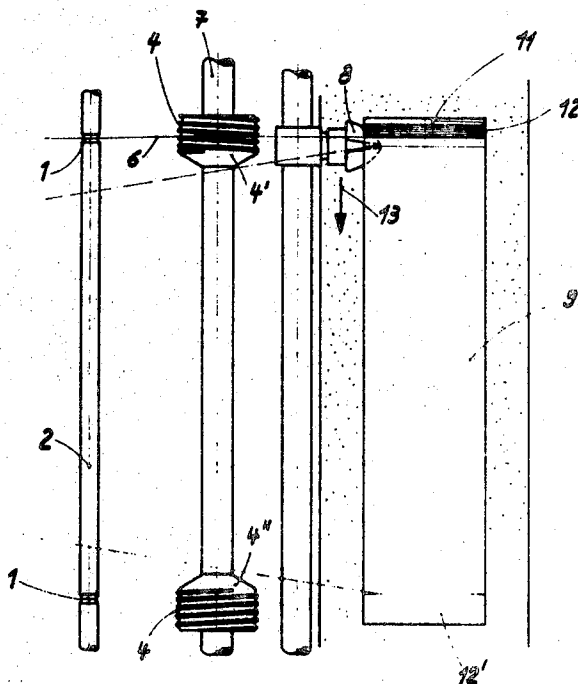
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 [50] Field of Search..... 242/18 (PW)

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ABSTRACT: Apparatus for forming a single helically wound layer of reserve yarn at one end of the multilayer yarn wound on a bobbin, comprising a rotatably helically grooved drum having a conical end, the thread passing under a slide bar in a groove of the slide bar and then over the helically wound drum and about the bobbin. As the helical groove rotates, the initial yarn is laid down on the bobbin, and when the yarn reaches the end of the helical groove and is cammed by the conical portion of the roller, the yarn is forced out of the groove in the slide bar and also descends into the usual traversing thread guide.



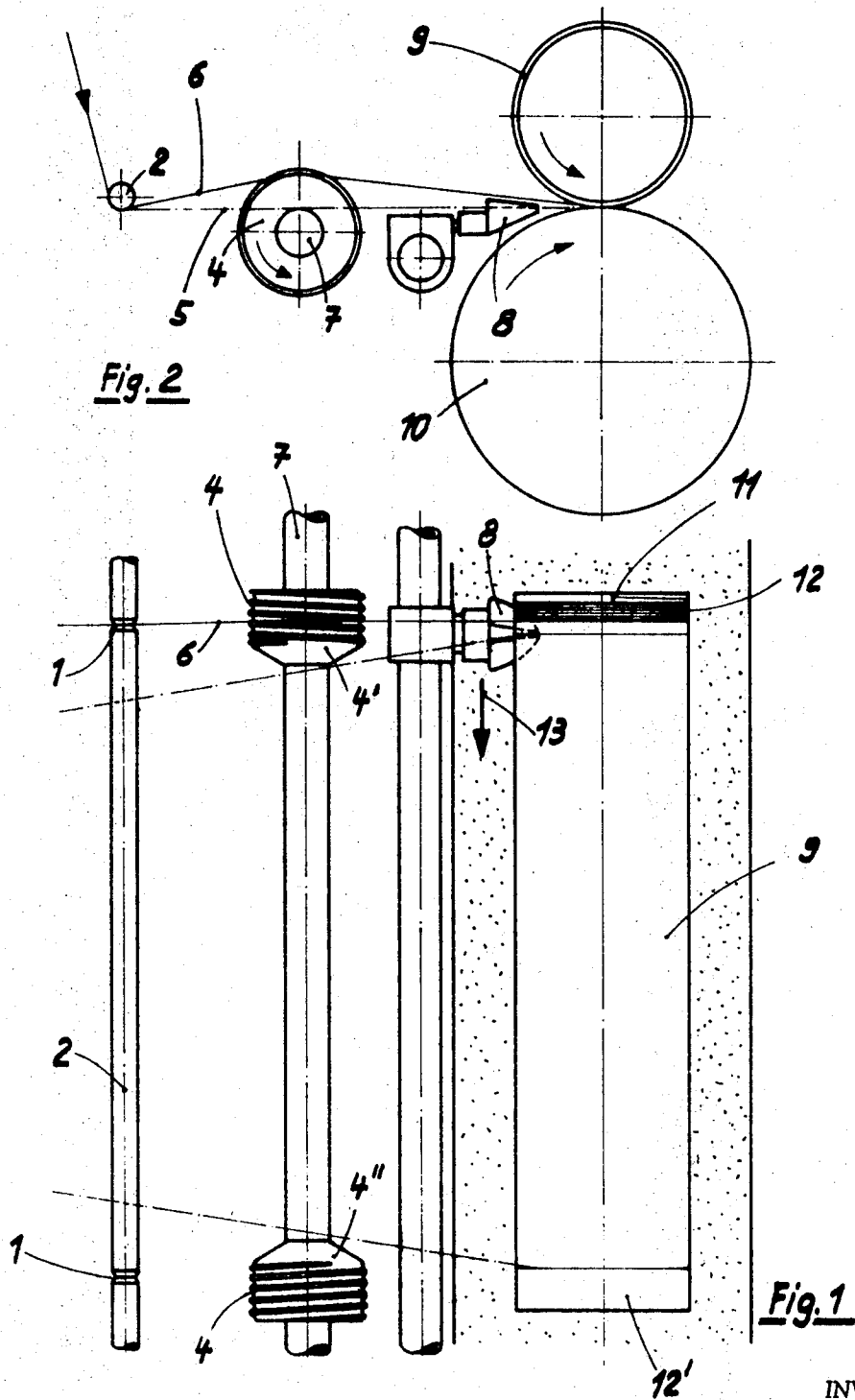


Fig. 1

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DEVICE FOR AUTOMATICALLY WINDING UP THE INITIAL RESERVE YARN QUANTITY ON THE END OF A SMALL TUBULAR ELEMENT OF A BOBBIN IN THE TEXTILE INDUSTRY

It is well known in the art that the bobbins used at present in the textile industry (distaffs and the like) comprise a small tubular element having the yarn winding thereon following a zigzag path in many superposed layers.

To readily get hold of the initial yarn end on the tubular element for connecting same to the yarn on the adjacent bobbin and thereby unwinding all the bobbins in series, it is common practice to wind an initial reserve yarn quantity on the end of the small tubular element, said reserve yarn quantity extending from and beyond the whole regular winding.

Before starting the winding of the yarn on the bobbin, this reserve yarn quantity is usually wound up by hand while holding the yarn so that it cannot be displaced by the thread guide member.

The present invention relates to a device for automatically winding up the above-mentioned yarn reserve quantity on the end of the tubular element so that said reserve yarn follows a perfectly helical path with no superposed turns and may therefore be easily and readily recovered without being damaged.

The apparatus of the invention which may be applied to winding machines is characterized by:

an intermediate shaft disposed in the winding path between the usual yarn slide bar and the usual yarn guide member; said shaft coaxially supporting in correspondence of the yarn guide member a drum having a surface with a helical groove thereon and a conical head portion converging towards the part bearing the bobbin, said drum being axially displaceable along the shaft and being apt to be fixed in the correct position with its helical groove aligned with the reserve yarn quantity;

a groove provided in the yarn slide bar and substantially aligned with the midplane of the helical groove on the drum and therefore also with the centerline of the reserve yarn quantity to be wound up; that is, the groove in the yarn slide bar lies substantially in a plane that is perpendicular to the axis of the intermediate shaft and that is disposed midway between the ends of the helical groove; the above-mentioned various components of the device being disposed in such reciprocal positions that, once the end of the yarn to be wound up is initially fixed in a recess of the tubular element, once the yarn is made to pass first into the groove of the yarn slide bar, successively into the fore end of the helical groove on the drum and finally on the tubular element at the starting point for the winding of the reserve yarn and once the small tubular element is moved downwards into contact with the dragging cylinder or roller, the yarn, while progressively moving along the helical groove on the drum, winds up on the tubular element to form the yarn reserve and, as it reached the end of said helical groove, is forced by the conical drumhead to move laterally so as to leave the groove of the yarn slide bar and to weigh on the yarn guide member thereby giving a start to the normal winding operation.

For the sake of a better understanding of the invention the accompanying drawing shows diagrammatically and by way of example only the various components of the device to be described hereinafter.

In the drawing:

FIG. 1 is a plan view of the apparatus of the invention.

FIG. 2 is a side elevational view of the same.

The apparatus according to the present invention comprises: the usual yarn slide bar 2, the usual yarn guide member 8 and the small tubular element 9 which is adapted to receive, at one end, the initial reserve yarn quantity before the winding of the whole bobbin is started.

According to the present invention, the yarn slide bar 2 and the yarn guide member 8 have an intermediate shaft 7 inserted therebetween which rotates in the direction of the adjacent

arrow in FIG. 2 and which carries, in correspondence with each yarn guide member 8, a drum 4 having a surface with a helical groove therein and a conical head portion 4' or 4'' converging towards the midplane of the small tubular element 9.

The drum 4 is axially displaceable along the shaft 7 and may be fixed in correct position with its helical groove aligned with the yarn reserve quantity 12 on the tubular element 9.

Further according to the invention, the yarn slide bar 2 has provided therein a groove 1 aligned with the midplane of the helical groove of the drum and therefore with the midplane of the reserve yarn quantity 12.

Operation takes place as follows:

The end of the yarn to be wound up is fixed in a recess 11 in the tubular element 9 (FIG. 1), the yarn itself is made to run in the groove 1 of the yarn slide bar 2 and is placed in the fore end of the helical groove, which is the upper end of the upper drum 4 as seen in FIG. 1, and finally to the surface of the tubular element 9 at the starting point for the winding of the reserve yarn.

By having the tubular element 9 bear against the dragging cylinder 10 (FIG. 2) movement in the direction of the arrows is started and the yarn, moving gradually from the beginning to the end of the helical groove carried by the rotating shaft 7, winds up with a regular spacing on the tubular element 9 thereby forming the reserve yarn quantity 12.

When the yarn reaches the end of the rotating helical groove, it encounters the conical head portion 4' of the drum which permits it to move downwardly and laterally from its full line position shown at 6 to its phantom line position shown at 5 in FIG. 2, so as to leave the groove 1 of the yarn slide bar 1 and to move down as seen in FIG. 2 and engage the yarn guide member 8 which reciprocates in the direction of the arrow 13 and oppositely thereto, whereby the regular and normal winding process of the bobbin following a zigzag path in superposed layers is started while the reserve yarn quantity 12 is left uncovered at the end of the tubular element 9.

Should the reserve yarn quantity be wound up on the other end of the tubular element 9 i.e. at 12' (FIG. 1) there will be used a drum with a conical head portion 4'' oppositely directed with respect to the head portion 4', as it is clearly shown in FIG. 1.

The axial displacement of the drum 4 and its fixing to the intermediate shaft 7 may be obtained by a single friction mechanism. For instance the sleeve having the drum 4 mounted thereon may have such a diameter and be made of such a material as to exert a suitable frictional resistance on the shaft 7.

I claim:

1. Apparatus for forming an initial quantity of reserve yarn in the form of a single helically wound layer at one end of a bobbin, comprising a yarn slide bar parallel to the bobbin and having a first groove therein, a rotatable shaft parallel to and disposed between the yarn slide bar and the bobbin, a drum mounted nonrotatably on said shaft and having a helical peripheral groove thereon and a tapered surface on the same side of the drum as the midplane of the bobbin, said first groove lying substantially in a plane perpendicular to the axis of said shaft and disposed midway between the ends of said helical groove, and a yarn guide that reciprocates parallel to the bobbin along a path disposed between the bobbin and the rotatable shaft, whereby the yarn passing on one side of said slide bar through said first groove passes on the opposite side of said drum through said helical groove and thence to the bobbin, and traverses upon rotation of said helical groove to form said initial quantity of reserve yarn while remaining in said first groove, and then leaves said first groove when urged laterally by said tapered surface and enters said yarn guide.

2. Apparatus as claimed in claim 1, said drum being slidable axially on said shaft.

3. Apparatus as claimed in claim 2, said drum being frictionally fixed against rotation on and relative to said shaft under the torsion imparted to said drum by the yarn.