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(54) **Spool-changing on a spinning frame**

(57) A cylindrical body 20 for winding up a defined piece of yarn can be fixed to and removed from the end point of a spindle 7. The support 28 of the spindle 7 can be swivelled about an axis running at right angles to the spindle axis and can be fixed both in the operating position 28 and in the changing position 28' of the spindle 7.

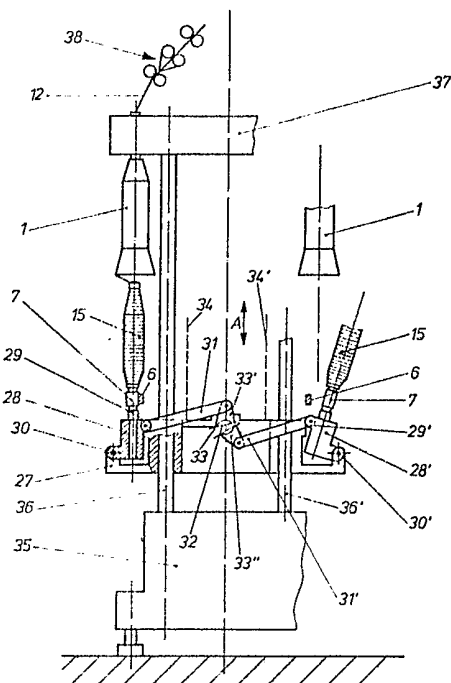


Fig. 1

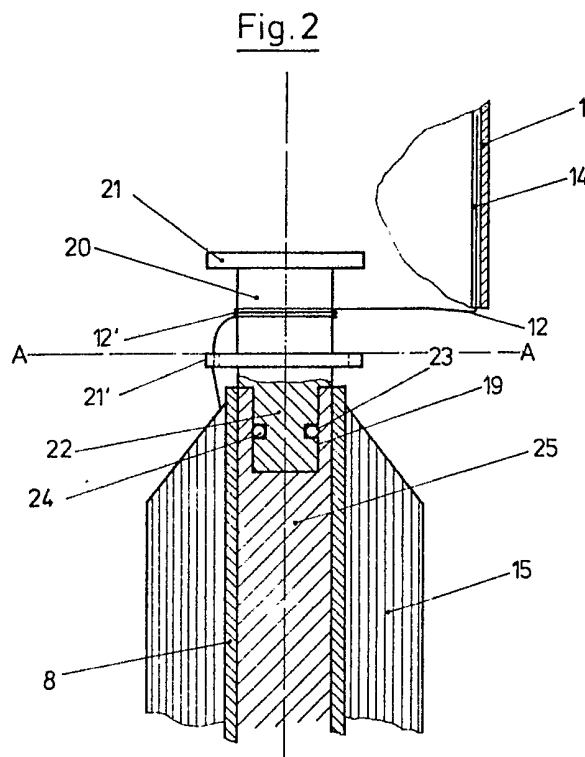
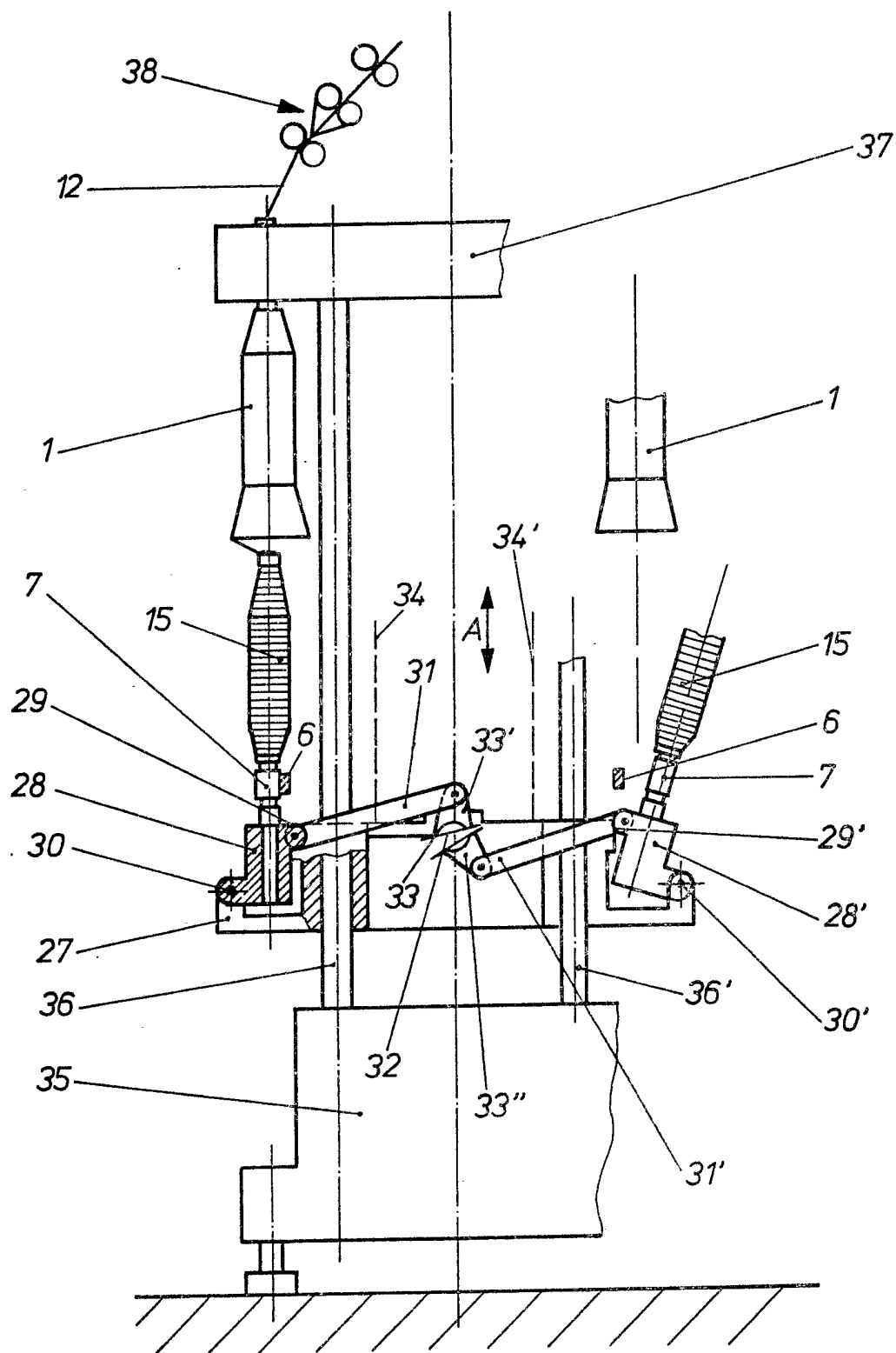


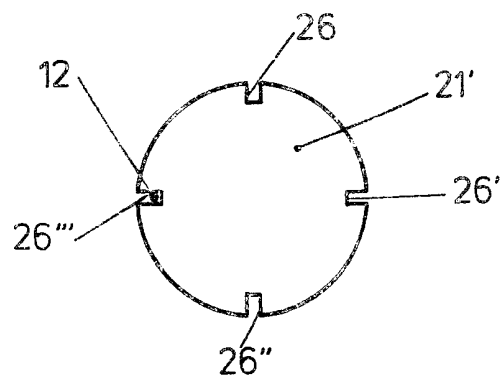
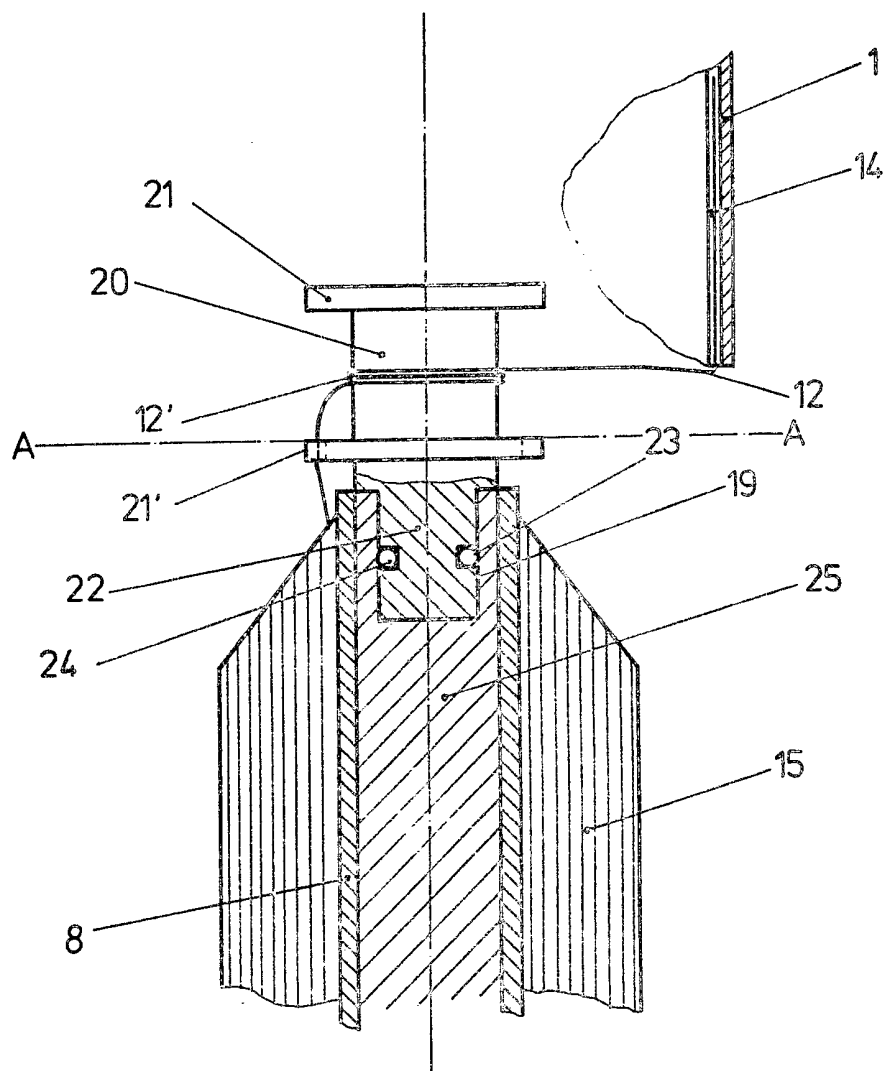
Fig. 2

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Fig. 1

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Fig. 2Fig. 3

SPECIFICATION

Improvements relating to a device for spool-changing on a spinning frame

The invention relates to a device for spool-changing on a spinning frame.

One type of device for the continuous spinning of textile yarns (as devised by the same applicants), has spindles provided with drive means and a member for providing a twist, which encloses the spindle and is mounted independently of the spindle. The member is preferably bell-shaped and can be rotated about the extended spindle axis and is also provided with drive means.

Normally, after a winding sleeve has become full, a sub-winding step takes place wherein a defined piece of yarn is wound up underneath the sleeve, so that the full sleeve can be removed without the yarn breaking. With some spinning frames, particularly that described above, a sub-winding is impossible in certain cases, and winding-up of the piece of yarn must take place above the sleeve, especially in the case of yarn bodies with a cops winding. Furthermore, as the spindle in the operating state is at least partly inside the bell and the bobbin frame can be lowered only to a limited extent, the bell would have to be suitably raised for the fully wound spool to be removed and an empty sleeve to be inserted accordingly, which would necessitate a relatively costly auxiliary device.

It is an object of this invention to provide a simple device which makes it possible to change spools rapidly and reliably, especially on the

According to the invention, there is provided a device for changing a spool on a spinning frame, and comprising a spindle, drive means for rotating the spindle, a cylindrical body, which can be fitted to the free end of the spindle and removed from it, and is provided for winding up a defined piece of yarn, and a spindle support which can be swivelled about an axis extending in a direction at right angles to the axis of the spindle and can be fixed both in the operating position of the spindle and in the changing position.

Preferably the cylindrical body is provided with a disc-like rim both on its outer end and adjacent the part which is fitted to the spindle, the rim on said part being provided with at least two notches. The cylindrical body may incorporate an axial peg-shaped extension, which can be inserted into an axial bore in the free end of the spindle shaft, and this peg-shaped extension can have an annular groove into which an O-ring composed of elastic material is inserted.

A changeover device for swivelling the spindle support may have one end of a connecting rod fastened by means of a pivot joint to the swivellable spindle support the other end of the rod being fastened by means of a pivot joint to a hub provided with at least one lever arm, the hub being mounted on and firmly connected to a rotatable shaft which runs parallel to the

swivelling axis of the spindle support. Furthermore, where the device of this invention is applied to a spinning frame with a plurality of spindles which are each arranged in a bobbin frame on both sides of the spinning frame, the device may be so constructed that both bobbin frames can be swivelled about a respective axis, and that the connecting rod which is fastened to the one bobbin frame is flexibly fastened by its other end to a first lever arm of the hub, and the connecting rod which is fastened to the other bobbin frame is flexibly fastened by its other end to a second lever arm of the hub, which second lever arm is diametrically opposite to the first lever arm. Preferably also connecting rods will be arranged at regular intervals along the bobbin frames.

The invention may be performed in various ways and a preferred embodiment thereof will now be described with reference to the

accompanying drawings, in which:—
Figure 1 illustrates a side view of a spinning frame provided with the spool-changing device according to the invention;

Figure 2 illustrates the end of a spool spindle provided with a cylindrical body for winding up a defined piece of yarn, partly as a cut-away drawings and partly as a longitudinal central section; and

Figure 3 is a section along the lines A—A of Figure 2.

As shown in Figure 1, a base 35 has located thereon columns 36 and 36', on which a support member 27 for the bobbin frame 28 and 28' is located so as to be able to slide in appropriate bores. The support member 27 can be moved along the columns 36 and 36' in the direction of the double arrow A by means of the diagrammatically illustrated chains 34 and 34'. Spindles 7, carrying yarn bodies 15, are driven by means of a belt 6, and are seated on the bobbin frames 28 and 28'. Above the spindles there are the bells 1, whose drive means (not illustrated) is accommodated in a housing 37. The drawing frame which delivers the yarn is indicated at 38.

The bobbin frames 28 and 28' are arranged in runs along each side of the spinning frame and each bobbin frame can be swivelled about an axis 30 and 30', relative to the support member 27. Furthermore, there is a projection 29 and 29' on the other side of each of the bobbin frames 28 and 28', to which projection 29 and 29', the one end of a connecting rod 31 and 31' respectively, is fastened by means of a pivot joint. The other ends of the rods 31 and 31' are likewise fastened by means of pivot joints to a clamping hub 33 which is seated on a shaft 32. Here, the rod 31 is fastened to the lever arm 33' of the clamping hub 33 and the rod 31' is fastened to the diametrically opposite lever arm 33".

The shaft 32 runs along the entire spinning frame and is provided at the one end with a lever (not illustrated) for adjusting the position of the bobbin frames 28 and 28'. Furthermore, connecting rods (not illustrated) are fastened by

means of axle joints at regular intervals along the runs of the two bobbin frames to appropriate and likewise unillustrated clamping hubs which are mounted on the shaft 32.

- 5 As can be seen from Figure 1, the bobbin frame on the left hand side of the spinning frame is in the operating position, whilst the bobbin frame 28' on the right hand side of the spinning frame has been brought into the changing position by suitably rotating the shaft 32. Changing of all the spools can occur here by means of a doffer.

Figure 2 shows a winding sleeve 8 with the yarn body 15 seated on the partly illustrated spindle shaft 25. At the end of the spindle shaft 25 there is an axial bore 19 for fastening a cylindrical body 20. The front face and also the bottom part of the body 20 are provided with a disc-like rim 21 and 21' respectively, and also with an axial peg-shaped extension 22. This extension 22 has an annular groove 23, into which an O-ring 24 composed of elastic material, e.g. rubber, is inserted. The body 20 in this way can easily be mounted manually on the end of the spindle shaft 25 and removed again from the latter.

- 25 The disc-like rim 21', which is on the bottom part of the body 20, furthermore has four notches 26, 26', 26'' and 26'''. The purpose of these notches is to prevent the yarn 12, which is wound up on the sleeve 8, from slipping off. The defined piece of yarn 12' is wound onto the part which is between the two disc-like rims 21 and 21' of the body 20, when the fully wound sleeve 8 is changed.

- 35 In Figure 2 there is furthermore illustrated one part of the bell 1, on the inside wall of which a metal tube 14 is fixed as a drive element for the yarn 12.

CLAIMS

- 40 1. A device for changing a spool on a spinning frame, and comprising a spindle, drive means for rotating the spindle, a cylindrical body, which can be fitted to the free end of the spindle and removed from it, and is provided for winding up a

- 45 defined piece of yarn, and a spindle support which can be swivelled about an axis extending in a direction at right angles to the axis of the spindle and can be fixed both in the operating position of the spindle and in the changing position.

2. A device as claimed in claim 1, wherein the cylindrical body is provided with a disc-like rim both on its outer end and adjacent the part which is fitted to the spindle, the rim on said part being provided with at least two notches.

3. A device as claimed in claim 1 or claim 2, 55 wherein the cylindrical body incorporates an axial peg-shaped extension, which can be inserted into an axial bore in the free end of the spindle shaft.

4. A device as claimed in claim 3, wherein the peg-shaped extension has an annular groove into which an O-ring composed of elastic material is inserted.

5. A device as claimed in any one of claims 1 to 4, wherein the one end of a connecting rod is fastened by means of a pivot joint to the swivellable spindle support and the other end of the rod is fastened by means of a pivot joint to a hub provided with at least one lever arm, the hub being mounted on and firmly connected to a rotatable shaft which runs parallel to the 70 swivelling axis of the spindle support.

6. A device as claimed in claim 5, on a spinning frame with a plurality of spindles which are each arranged in a bobbin frame on both sides of the spinning frame, wherein both bobbin frames can be swivelled about a respective axis, and the connecting rod which is fastened to the one bobbin frame is flexibly fastened by its other end to a first lever arm of the hub, and the connecting rod which is fastened by its other end to a second 80 lever arm of the hub, which second lever arm is diametrically opposite to the first lever arm.

7. A device as claimed in claim 6, wherein connecting rods are arranged at regular intervals along the bobbin frames.

- 85 8. A device for changing a spool on a spinning frame and substantially as herein described with reference to the accompanying drawings.