(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 173 432**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **85304722.3**

(22) Date of filing: **02.07.85**

(51) Int. Cl.⁴: **D 01 H 13/30**, B 65 H 71/00

(30) Priority: **10.07.84 GB 8417589**

(43) Date of publication of application: **05.03.86 Bulletin 86/10**

(84) Designated Contracting States: **BE FR GB IT**

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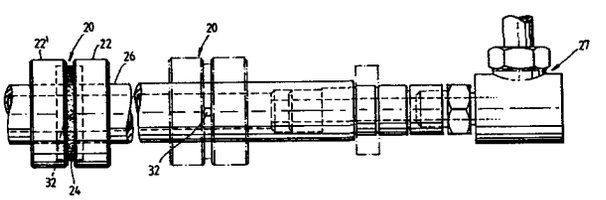
(54) Dampening roller for a spinning, twisting or winding apparatus.

(57) A damping roller 20, for example for a ring spinning frame, instead of dipping into a water trough, is mounted on a hollow shaft 26 supplied with water or other liquid via a rotating joint 27. Holes 32 through the wall of the shaft allow liquid to percolate into a core 24 of absorbent material such as felt. The core is sandwiched between outer collars 22 and 22' forming a channel for the yarn, which engages the moistened core 24 and is dampened thereby. The roller 20 preferably rotates so that its surface moves in the same direction as the yarn, but at a greater speed.



EP 0 173 432 A2

JAMES MACKIE & SONS LIMITED. GJE/10/2235/02

TITLE MODIFIED
see front page

Spinning, twisting or winding apparatus

In the spinning, twisting or winding of yarns, particularly the dry ring spinning of flax and flax blend yarns, the yarn may be caused to engage the surface of a dampening roller which helps to smooth the yarn and reduce its hairiness and which may also, if required, treat the yarn with a lubricant by means of liquid or an additive to the water so as, for example, to make it more receptive to weaving. In general, the roller needs to be located in advance of the rotary mechanism, i.e. the spinning, twisting or winding mechanism. In a ring spinning frame, for example, the roller may be located between the drawing rollers and a thread plate formed with an eye which guides the yarn to the traveller on the ring.

On a complete frame, dampening rollers are located at intervals on a common shaft which may extend for the whole length of the frame. The yarn normally makes only comparatively light contact with the front surface of the respective roller, i.e. over an arc of only a few degrees. In order to pick up liquid for application to the surface of the yarn, the lower part of the roller is immersed in a trough extending along the frame either in a single length or a number of shorter lengths.

As the surface of the roller emerges from the liquid, e.g. water in the trough, it carries a relatively thick film of water which tends to be thrown outwardly by centrifugal force. Accordingly, in order to reduce the proportion of water thrown off by the

roller before application to the yarn, the roller is driven in a direction such that the surface engaging the yarn moves upwardly so that engagement occurs approximately a quarter of a revolution after the surface of the roller has left the trough rather than after approximately three quarters of a revolution as would be the case for the opposite direction of rotation. Even with this arrangement, however, quite a lot of water is thrown off the roller and settles on surfaces at the front of the machine, thus causing loose fibres and dust to stick to these surfaces, leading to a dirty machine.

According to the present invention, the roller is mounted for rotation on a hollow shaft connected to a source of liquid and formed with at least one hole through its wall in register with the roller, for the passage of liquid through the structure of the roller to its yarn-engaging surface. This avoids the need for a liquid trough and greatly reduces the quantity of liquid thrown off the surface of the roller while ensuring adequate dampening of the surface of the yarn. This enables the machine as a whole to be kept much cleaner in operation.

Preferably, the roller has a core of absorbent material sandwiched between a pair of end collars, through which the liquid can percolate to the yarn-engaging surface. This core, which may be, for example, of felt or flannel, is maintained in a saturated condition and can thus effectively dampen the yarn, but there is little or no excessive film of water on the surface, so that the quantity of water thrown off is very much reduced. Alternatively, the roller can be

made in one piece with fine holes or pores extending to the yarn-engaging surface of the roller. An annular recess may be formed in the surface of the roller which engages the shaft and which forms a small reservoir within the body of the roller into which water may flow from the shaft and from which water may flow to the yarn-engaging surface. The water may pass to the roller by gravity as the shaft rotates or a pump may be provided to pressurise the water to force it through the holes.

The fact that water is not picked up from a trough means that, from this point of view, there is no longer any significance in the direction of rotation of the roller, but detailed investigations have shown that the direction and speed of the roller relative to those of the yarn may in some circumstances significantly influence the quality of the yarn.

Therefore, in accordance with a further feature of the invention, the surface of the roller moves in the same direction as the yarn, preferably at a greater speed. This is found to increase the smoothing effect of the roller, the reason for this apparently depending on the observed fact that the majority of fibres responsible for the hairiness of the yarn lie with their free ends pointing in the direction of travel. Consequently, the effect of the normal direction of rotation of the smoothing roller is to bend these fibres back against their natural attitude and at least a proportion of such fibres inevitably spring out again. On the other hand, with the opposite direction of rotation, particularly when the surface

speed of the roller is greater than that of the yarn, the attitude of the fibres is maintained and they are merely pressed into the body of the yarn without major risk of springing out again.

An example of construction in accordance with the invention, as applied to a ring spinning machine, is illustrated in the accompanying diagrammatic drawings, in which:-

Figure 1 is an elevation showing the lay-out of the components of a single spinning head;

Figures 2 is a plan view showing rollers mounted on a common shaft; and

Figure 3 is a longitudinal sectional view of a modified construction of dampening roller.

As shown in Figure 1, sliver or rove 2 passes through a drawing head shown schematically as 4 and thence to drawing rollers 6,6'. From the drawing rollers the fibres now in the form of yarn pass a suction device 18 which takes up the fibres in the event of an end break, and then passes through the eye of a thread plate 8 to a traveller 10 rotating on a ring 12 to be wound onto a package 14 on a rotary spindle 16.

A dampening roller 20 is located between the drawing rollers 6, 6' and the thread guide plate 8 and, as shown by the arrow, rotates in an anti-clockwise direction so that its surface moves in the same direction as the yarn. As described in more detail in relation to Figure 2 , the roller 20 is mounted on a hollow tubular shaft 26 to the interior of which water is supplied and percolates outwardly to the surface of the roller where it is applied to the yarn. As

mentioned above, the surface speed of the roller is preferably faster than that of the yarn, and in a particular example, with a yarn speed of 20 metres per minute, the surface speed of the roller is 40 metres per minute. It is found that the frame as a whole is much dryer and hence cleaner, and the occasional drop of water which may fall, rather than be sprayed, from the roller 20 falls onto the top of the thread guide plate 8 and drains backwardly from there to be caught in a small drain trough 30 fitted to the reciprocating ring rail.

Details of the roller 20 and the shaft 26 are illustrated in Figure 2 , water or other liquid being supplied to the roller 20 from a reservoir (not illustrated) via a rotating joint 27. A pump (not shown) may be included to boost the water pressure. The shaft 26 extends along the length of the frame and carries a roller 20 for each spinning head, two such rollers being shown by way of example. In the vicinity of each roller, two small diameter holes 32 are drilled through the wall of the shaft and the water or other liquid fills the shaft to almost half its depth. The liquid percolates downwardly by gravity through the holes 32 at a rate which depends on the head of liquid within the shaft 26, augmented if necessary by a pump.

In the construction shown in Figures 1 and 2, the roller 20 is constructed of three parts, i.e. an inner core 24 sandwiched between two outer collars 22 and 22'. The core 24 is of an absorbent material such as felt and the collars are shaped to form a channel for the yarn so that it engages the surface of the absorbent material of the core. The collars 22, 22' are locked to the shaft 26 by means of socket-headed screws (not shown) and as the shaft rotates the moisture escapes

through the holes 32 in very small droplets onto the absorbent core 24, which is maintained in a saturated condition so as to dampen the yarn.

In the alternative construction of Figure 3, the roller is made as a single piece formed with a recess 34 forming a small annular reservoir in communication with the holes 32. Further small holes 36 extend radially from this reservoir 34 to the yarn engaging surface of the roller 20 which is situated within a locating groove 38.

Whereas the construction of Figure 3 leads to considerably improved results in comparison with the normal use of a water trough, the construction of Figure 2 is preferred, since it leads to a more even distribution and retention of the water on the surface of the roller and hence more effective and cleaner operation.

CLAIMS

1. A textile spinning, twisting or winding head including, in advance of the rotary mechanism, a dampening roller for engagement with the yarn to be treated, characterised in that the roller is mounted for rotation on a hollow shaft connected to a source of liquid and formed with at least one hole through its wall in register with the roller, for the passage of liquid through the structure of the roller to its yarn-engaging surface.

2. A textile spinning, twisting or winding head according to claim 1 characterised in that the roller has a core of absorbent material sandwiched between a pair of end collars, through which the liquid can percolate to the yarn-engaging surface.

3. A textile spinning, twisting or winding head according to claim 1, characterised in that the roller has a number of fine holes for the passage of liquid from its surface in contact with the shaft to its yarn-engaging surface.

4. A textile spinning, twisting or winding head according to claim 3, in which the holes extend from an annular reservoir in the surface of the roller in contact with the shaft.

5. A textile spinning, twisting or winding frame comprising a number of heads according to any one of the preceding claims and having their dampening rollers mounted at intervals on a common hollow shaft connected at at least one end to a source of liquid by way of a rotating joint.

6. A textile spinning, twisting or winding frame according to claim 5 and including a pump to pressurise the liquid supplied to the hollow shaft.

7. A textile spinning, twisting or winding frame according to claim 5 or claim 6 in which the drive to the hollow shaft is such as to cause the surface of each roller to move in the same direction as the yarn but at a greater speed.

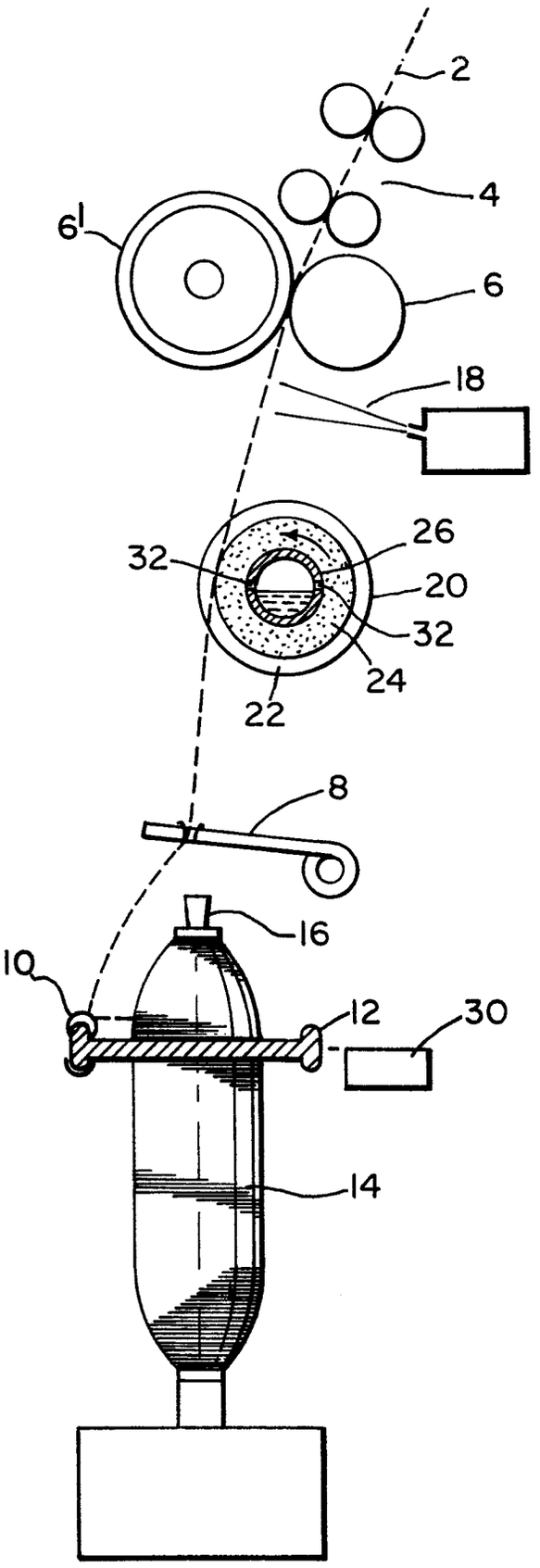
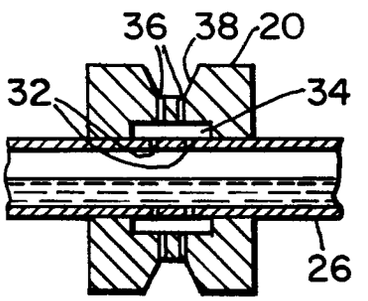


Fig.1.

Fig.3.



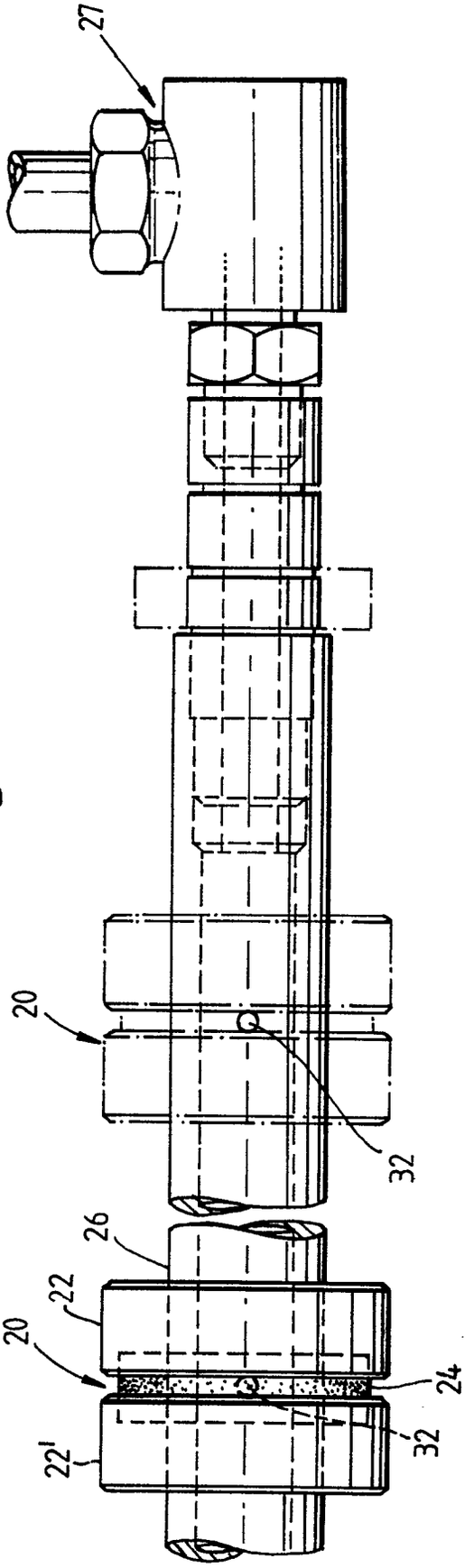


Fig. 2.