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

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**FR-A- 785 988**  
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## Description

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.

US—A—3137117 discloses moistening a yarn, during drawing and twisting, by contact with annular disc-like elements of which at least one is porous and is mounted on a hollow shaft. The axes of rotation of the discs are parallel to the direction of the yarn.

According to the present invention, a textile spinning, twisting or winding frame comprises a plurality of heads each including, in advance of the rotary mechanism, a dampening roller for engagement with the yarn to be treated and connected to a source of liquid which can pass to and through the structure of the roller to its yarn-engaging surface; each 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, a roller as used in the present invention 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 surfaces, 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 appropriate 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;

Figure 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 frame comprising a plurality of heads each including, in advance of the rotary mechanism, a dampening roller (20) for engagement with the yarn to be treated and connected to a source of liquid which can pass to and through the structure of the roller to its yarn-engaging surface, characterised in that the rollers are mounted for rotation on a common hollow shaft (26) connected to the source of liquid and formed with at least one hole (32) through its wall in register with each roller, for the passage of the liquid.

2. A frame according to claim 1, characterised in that each roller has a core of absorbent material (24), sandwiched between a pair of end collars (22, 22'), through which the liquid can percolate to the yarn-engaging surface.

3. A frame according to claim 1, characterised in that each roller has a number of fine holes (36) for the passage of the liquid from its surface on contact with the shaft to its yarn-engaging surface.

4. A frame according to claim 3, in which the fine holes extend from an annular reservoir in the surface of the roller in contact with the shaft.

5. A frame according to any preceding claim, in which the common hollow shaft is connected at at least one end to the source of liquid by way of a rotating joint (27).

6. A frame according to any preceding claim, including a pump to pressurise the liquid supplied to the hollow shaft.

7. A frame according to any preceding claim, 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.

## Patentansprüche

1. Ein Spinn-, Zwirn- oder Spulrahmen für Textilien, bestehend aus einer Mehrzahl von Köpfen, von denen jeder vor dem Drehungsmechanismus eine Befeuchtungsrolle (20) zur Verbindung mit dem zu behandelnden Garn einschliesst, und mit einer Flüssigkeitsquelle verbunden ist, die sich zu und durch die Struktur der Rolle an ihre mit dem Garn verbundenden Oberfläche bewegt, dadurch gekennzeichnet, dass die Rollen zur Drehung auf einer gemeinsamen, mit der Flüssigkeitsquelle verbundenen Hohlwelle (26) befestigt sind, und die wenigstens eine Öffnung (32) in ihrer Wand zur Deckung mit jeder Rolle hat, um Flüssigkeit durchzulassen.

2. Ein rahmen nach Anspruch 1, dadurch gekennzeichnet, dass jede Rolle einen Kern aus absorbierendem Material (24) besitzt, der

zwischen einem Paar von Endmanschetten (22, 22') liegt, durch welchen die Flüssigkeit zu der mit dem Garn verbundenen Oberfläche durchsickern kann.

3. Ein rahmen nach Anspruch 1, dadurch gekennzeichnet, dass jede Rolle eine Anzahl von feinen Öffnungen (36) besitzt, um die Flüssigkeit von ihrer Oberfläche in Berührung mit der Welle zur ihrer mit dem Garn verbundenen Oberfläche durchzulassen.

4. Ein rahmen nach Anspruch 3, in dem die feinen Öffnungen von einem ringförmigen Behälter an der Oberfläche der mit der Welle in Berührung stehenden Rolle ausgehen.

5. Ein Rahmen nach einem der vorhergehenden Ansprüche, in dem die gemeinsame Hohlwelle wenigstens an einem Ende mittels einem sich drehenden Gelenk (27) mit der Flüssigkeitsquelle verbunden ist.

6. Ein Rahmen nach einem der vorhergehenden Ansprüche, worin eine Pumpe eingeschlossen ist, um die der Hohlwelle zugeführten Flüssigkeit unter Druck zu setzen.

7. Ein Rahmen nach einem der vorhergehenden Ansprüche, in dem der Antrieb zur Hohlwelle derart gestaltet ist, dass er die Oberfläche jeder Rolle dazu veranlasst, sich in dieselbe Richtung wie das Garn, aber mit einer grösseren Geschwindigkeit, zu bewegen.

#### Revendications

1. Machine textile, à filer, à retordre ou bobiner, comprenant une pluralité de têtes dont chacune comprend, en amont du mécanisme rotatif, un rouleau humidificateur (20) destiné à entrer en contact avec le fil à traiter et relié à une source de liquide qui fournit un liquide qui peut atteindre la

structure du rouleau et traverser cette structure pour atteindre sa surface de contact avec le fil, caractérisée en ce que les rouleaux sont montés rotatifs sur un arbre creux commun (26) relié à la source de liquide et muni d'au moins un trou (32) qui traverse sa paroi au droit de chaque rouleau, pour le passage du liquide.

2. Machine selon la revendication 1, caractérisée en ce que chaque rouleau possède un noyau en matière absorbante (24), pris en interposition entre deux bagues d'extrémités (22, 22') et à travers lequel le liquide peut filtrer pour atteindre la surface de contact avec le fil.

3. Machine selon la revendication 1, caractérisée en ce que chaque rouleau possède un certain nombre de trous fins (36) permettant au liquide de passer de sa surface qui est en contact avec l'arbre à sa surface qui est en contact avec le fil.

4. Machine selon la revendication 3, dans laquelle les trous fins partent d'un réservoir annulaire formé dans la surface du rouleau qui est en contact avec l'arbre.

4. Machine selon une quelconque des revendications précédentes, dans laquelle l'arbre creux commun est relié à la source de liquide, au moins à l'une des extrémités, à l'aide d'un joint rotatif (27).

6. Machine selon une quelconque des revendications précédentes, comprenant une pompe servant à mettre sous pression le liquide envoyé à l'arbre creux.

7. Machine selon une quelconque des revendications précédentes, caractérisée en ce que la transmission de la force motrice à l'arbre creux est de nature à faire en sorte que la surface de chaque rouleau se déplace dans le même sens que le fil mais à une plus grande vitesse.

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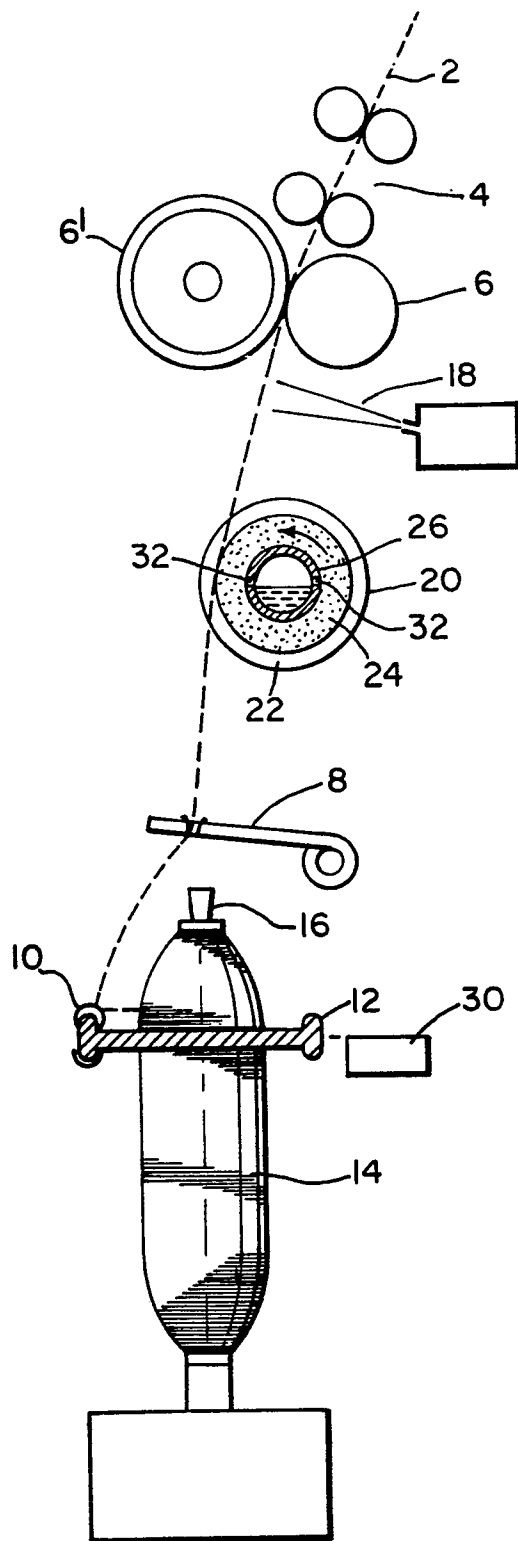


Fig. 1.

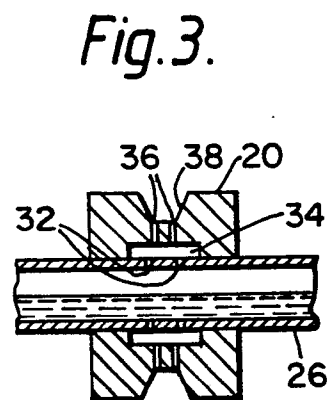


Fig. 3.

Fig. 2.

