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Leinek et al.

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[54] **DEVICE FOR FEEDING LAP OF FIBRES TO CARDING MEMBER OF RINGLESS SPINNING APPARATUS**

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[51] **Int. Cl.** **D01g 15/40**

[58] **Field of Search** 19/105, 86, 128, 96; 57/58.95

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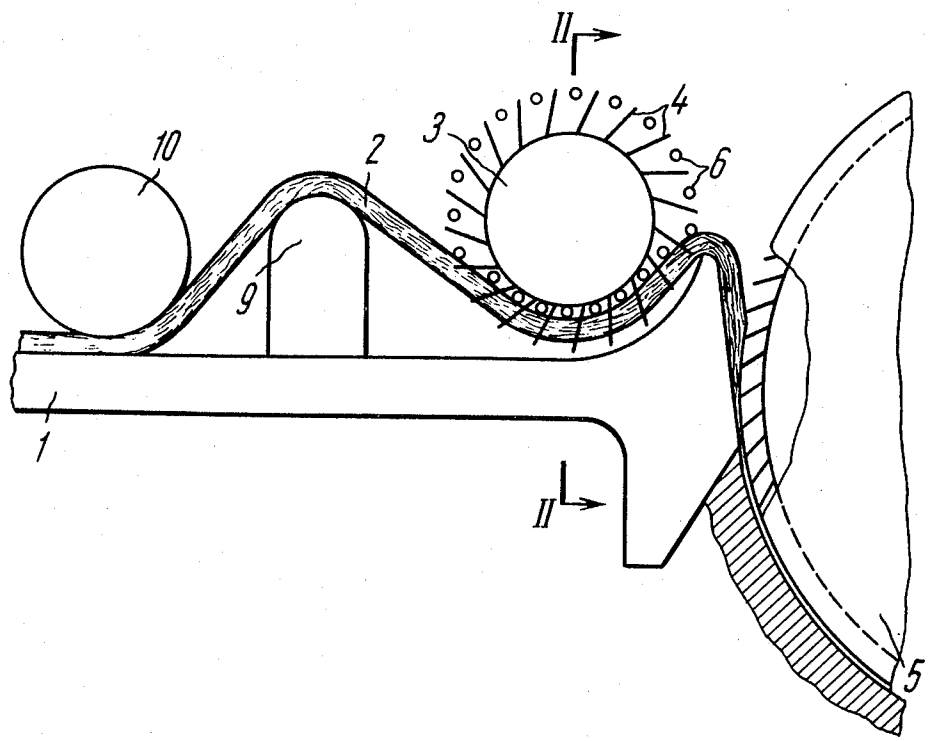
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[57] **ABSTRACT**

The device includes a feed-in couple made up by a feed plate adapted to support the lap and a feed roller with needles, arranged above the feed plate, the feed roller having a plurality of resilient rods extending along the generatrix of the roller intermediate of the needles thereof, the rods being supported between a pair of supports so that each rod has one end rigidly secured in one of the supports, while the other end of the rod is supported by the other support so that it may be freely displaced longitudinally of the roller to provide for gradual bending in of the rod upon engagement thereof with the lap, which produces an effort tending to remove the lap off the needles of the roller. The provision of the rods minimizes the possibility of the lap becoming wound about the needles of the roller and thus raises the efficiency of the spinning apparatus.

3 Claims, 2 Drawing Figures



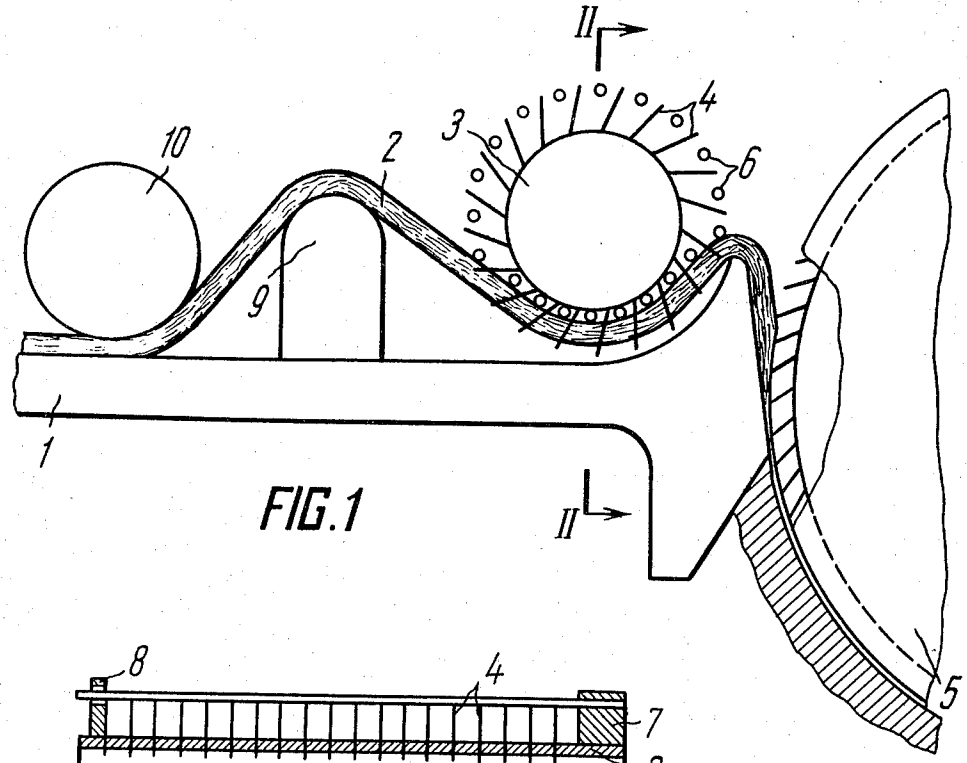


FIG. 1

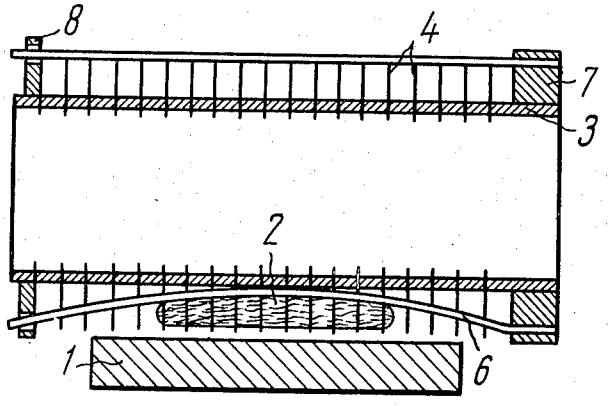


FIG. 2

DEVICE FOR FEEDING LAP OF FIBRES TO CARDING MEMBER OF RINGLESS SPINNING APPARATUS

The present invention relates to apparatus for ringless spinning of fibres and, more particularly, to devices for feeding a lap of fibres to the carding member of such apparatus.

The present invention may be utilized with utmost effectiveness for production of medium and low count yarn from chemical stable fibre, flax fibre, as well as from blends of the above fibre with woollen fibre and with one another.

A device is known for feeding fibres to the carding member of a ringless fibre spinning apparatus, comprising a feed-in couple made up by a feed plate adapted to support a lap of the fibres and a feed roller with either a needle clothing or a saw-toothed clothing, adjustable along as arc relative to this feed plate, to provide for adjustment of the spacing between the point where fibres are gripped off the lap and the point where they are doffed by a stripper roller, in accordance with the type of fibre being treated.

However, this known device is devoid of any means preventing a possibility of the fibres taken from the lap becoming wound about the feed roller with either a needle clothing or a saw-toothed one, which leads to an increased breakage rate and wasting time to remedy the situation when the fibres are wound about the roller.

Furthermore, the known device does not provide for increasing the number of either needles or projections of a saw-toothed clothing, cooperating with the fibres, to offer an improved control over the fibres taken in the from the lap.

It is an object of the present invention to provide a device for feeding a lap of fibres, which would minimize the possibility of the lap becoming wound about the needles of the driven feed roller.

It is an important object of the present invention to provide a device for feeding a lap of fibres, which would raise the efficiency of the ringless fibre spinning apparatus.

These and other objects are attained in a device for feeding a lap of fibres to the carding member of an apparatus for ringless spinning of these fibres, comprising a feed-in couple made up by a feed plate adapted to support a tensioned lap and is driven feed roller with needles, arranged above this feed plate and adapted to cooperate with the lap and to feed it by rotation of this feed roller to the carding member, in which device, in accordance with the present invention, the feed roller has thereon, intermediate of these needles, a plurality of resilient rods extending along the generatrix of the roller and alternating with the needles, also adapted to cooperate with the lap and supported between a pair of supports. The rods are mounted on these supports so that each rod has one end thereof rigidly secured in one of the supports, while the other end thereof is supported by the other support for free displacement along the generatrix of the roller to provide for gradual bending-in of the rod upon cooperation thereof with the lap, whereby an effort is produced to move the lap off the needles of the feed roller. The device thus makes the lap be moved off the needles of the feed roller by the energy stored by the bent-in resilient rods, which minimizes the possibility of the lap becoming wound about the needle roller and thus raises the efficiency of the device.

To increase the number of the needles and of the rods simultaneously engaging the tensioned lap, there is mounted on the feed plate upstream of the feed roller in the direction of the advance of the lap a strip with a rounded apex over which the lap is made to slide, whereby the angle of engagement of the feed roller with the lap is increased. To step up the tension of the lap on account of greater friction between the lap and the feed plate, there is arranged upstream of said strip a weight roller pressing the lap against the feed plate, which increases the number of the needles and rods simultaneously engaging the fibrous lap.

The increased number of the rods and needles simultaneously engaging the lap is essential for firmer gripping of the fibres by the needles of the feed roller, as well as for better separation of the fibres at carding. It is particularly essential in the case of chemical fibres which are less wavy than natural ones. Better separation of such fibres, in turn, reduces nonuniformity of the yarn produced by the associated spinning apparatus, and, consequently, reduces the eventuality of breaking of this yarn, which also makes for higher productivity.

The present invention will be better understood from a description of an embodiment thereof with reference to the accompanying drawings, wherein:

FIG. 1 is a schematic side view of a device for feeding a lap of fibres to the carding member of a ringless spinning apparatus;

FIG. 2 is a sectional view along line II——II of FIG. 1.

Referring now to the appended drawings, the device for feeding a lap of fibres to the carding member of an apparatus for ringless spinning of these fibres includes a feed-in couple made up by a feed plate **1** (FIG. 1) adapted to support thereon a tensioned fibrous lap **2** and a driven feed roller **3** with needles **4**, mounted above the feed plate **1** and adapted to feed the lap **2** to a carding member **5**.

Arranged intermediate of the needles **4** of the feed roller **3** are resilient rods **6** (FIG. 2) extending along the generatrix of the feed roller **3**, each rod **6** having one end thereof rigidly secured in a support **7** and the other end supported by another support **8** so that the latter end is free to slide in this support **8** along the generatrix of the feed roller **3** to provide for gradual bending-in of the rod **6** upon engaging the lap **2** and for subsequent straightening of this rod **5**, to move the lap **2** off the needles **4** of the feed roller **3**. Also mounted on the feed plate **1** (FIG. 1) is a strip **9** with a rounded apex, over which the lap **2** is made to slide, the provision of this strip **9** increasing the number of the needles **4** of the feed roller **3** and of the rods **6** simultaneously engaging the lap **2**. Mounted upstream of the strip **9** in the direction of the advance of the lap **2** is a weight roller **10** pressing the lap **2** to the feed plate **1** and thus increasing friction between the lap and the plate, whereby the tension of the lap is raised, which also increases the number of the needles and rods simultaneously engaging the fibrous lap **2**.

To vary the number of the needles and rods simultaneously engaging the lap **2**, the strip **9** is easily removable and replaceable with a similar strip of a different height.

OPERATION OF THE DEVICE

The feed roller **3** is rotated, the needles **4** of the feed roller **3** pierce the lap **2** of fibres passing intermediate of the roller and the feed plate **1** and forward this lap to the carding member **5.** The clothing of the carding member **5** takes elementary fibres from the lap and supplies them to the associated ringless spinning apparatus (not shown). Rotation of the feed roller **3** and of the carding member of cylinder **5** is effected in any suitable known manner.

Upon engaging the tensioned lap **2,** the rods **6** supported by the two supports **7** and **8** resiliently bend in (FIG. **2**), and, when the lap is being doffed off the needles by the carding effort, the bent resilient rods **6** help to move the lap off the needles, and, which is more important, help to remove from the needles foreign matter stuck thereon from the lap **2** which the needles have pierced. Thus, when the lap includes woollen fibres, it is also liable to include burrs, and when the lap includes flax fibres, it is liable to include chaff.

To increase the number of the needles and rods simultaneously engaging the lap, it is necessary to increase the angle or arc of the engagement of the driven needle cylinder **3** with the lap, which is effected by mounting the easily replaceable strip **9** with a rounded apex (FIG. **1**), over which the lap is made to slide.

The lap **2** is initially tensioned by its own weight and by the resistance thereof to being paid off the known lap supply means (not shown). To increase the tension of the lap, the weight roller **10** is placed thereon upstream of the strip **9,** the weight of this roller **10** increasing friction between the lap and the feed plate **1,** which additionally tensions the lap, which increases the angle or arc of engagement of the needle roller **3** and the lap **2.**

What is claimed is:

1. A device for feeding a lap of fibres to the carding member of an apparatus for ringless spinning of fibres, comprising: a feed plate adapted to support thereon a tensioned lap of fibres; a driven roller with needles, arranged above said feed plate and defining therewith a feed-in couple, said needles being adapted for cooperation with said lap to feed said lap at rotation of said feed roller toward said carding member; a plurality of resilient rods arranged adjacent to the external surface of said feed roller, extending along the generatrix thereof intermediate of said needles; a pair of supports mounted on said feed roller and supporting said resilient rods therebetween; each said rod having one end thereof rigidly secured in one of said supports and having the other end thereof supported by the other one of said supports for free displacement thereof along the generatrix of said feed roller, to provide for gradual resilient bending in of said rod upon engagement thereof with said lap, whereby there is produced an effort tending to move said lap off said needles of said feed roller.

2. A device as claimed in claim **1,** further comprising a vertical strip with a rounded apex over which the lap slides to engage said feed roller at an angle, said strip being mounted on said table upstream of said feed roller in the direction of the advance of said tensioned lap, adapted for cooperation with said lap and having a sufficient vertical height relative to the feed roller to change the angle of engagement with the roller and increase the number of said needles and of said rods simultaneously engaging said lap.

3. A device as claimed in claim **2,** further comprising a weight roller arranged on said feed plate upstream of said strip, adapted to press said tensioned lap to said feed plate.

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