Oct. 31, 1933. T. P. ROONEY 1,933,222

TEXTILE DRAFTING MEANS

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Fig. 1.

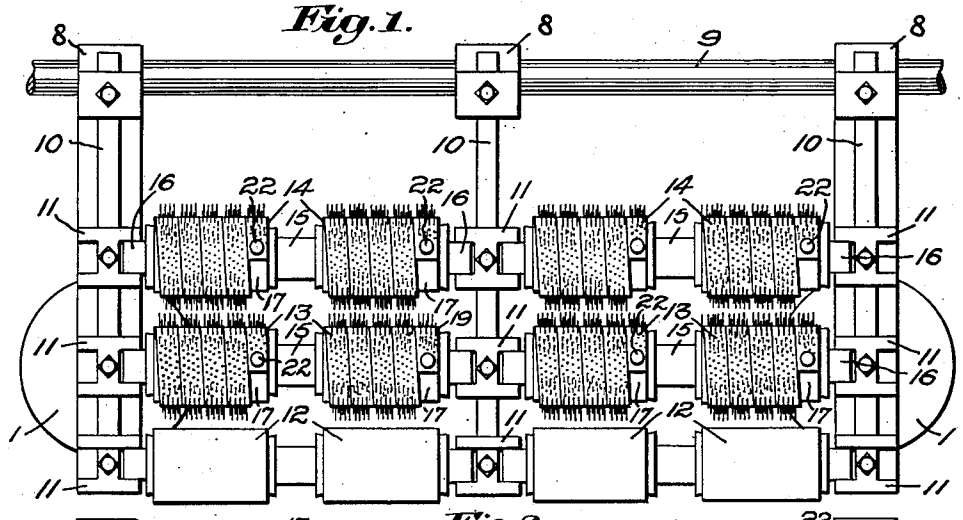

Fig. 2.

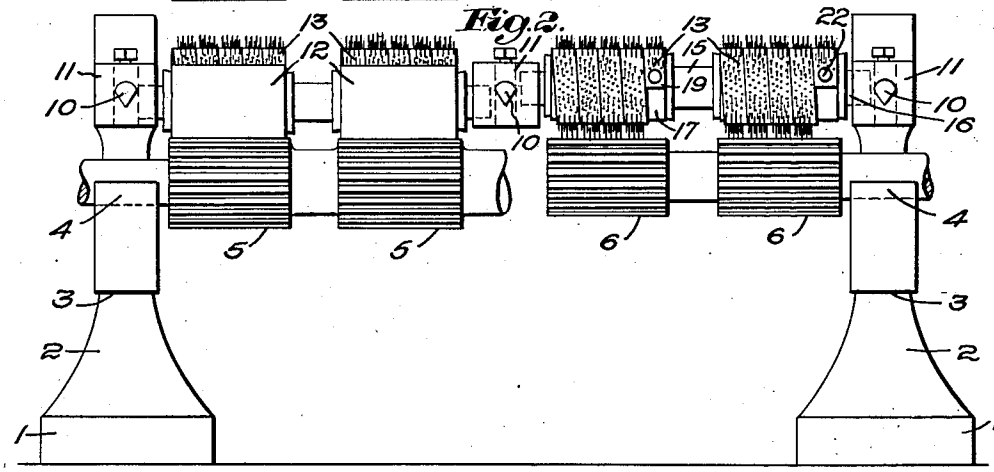

Fig. 3.

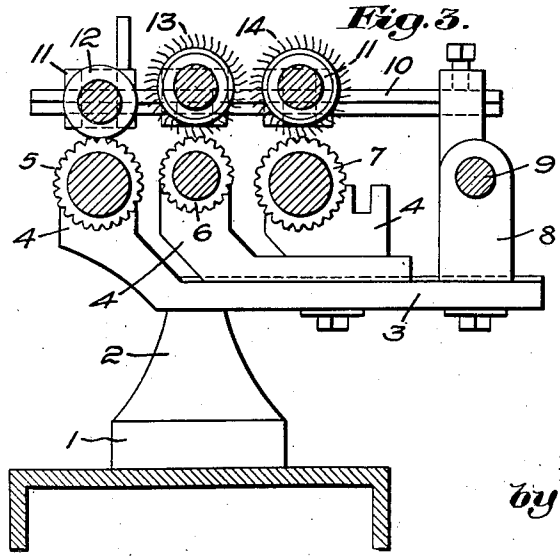

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Fig. 4.

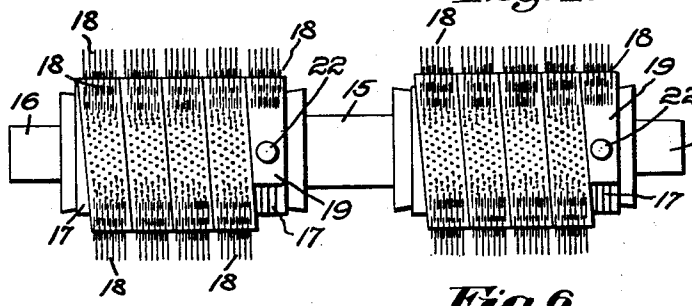


Fig. 5.

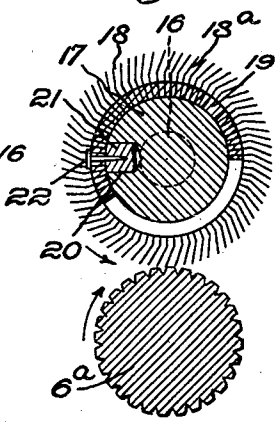


Fig. 6.

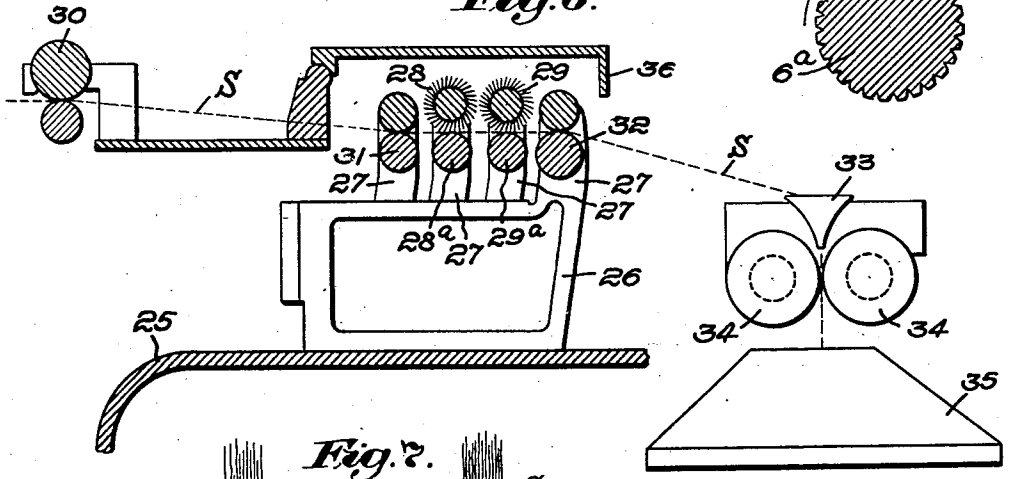
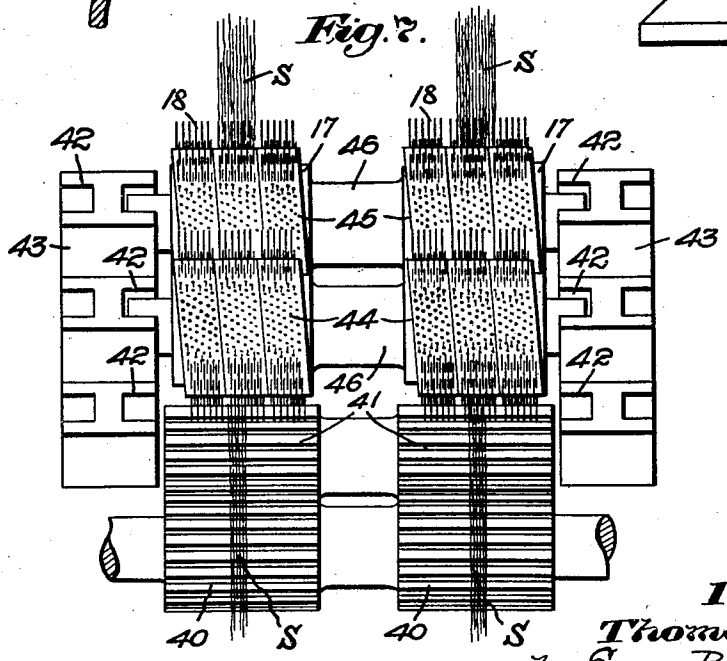


Fig. 7.



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UNITED STATES PATENT OFFICE

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TEXTILE DRAFTING MEANS

Thomas P. Rooney, Fall River, Mass.

Application November 14, 1931
Serial No. 575,039

5 Claims. (Cl. 19—130)

My present invention relates to apparatus for drafting textile fibers and aims to provide simplified, inexpensive and otherwise improved mechanism for the purpose, and which is particularly adapted for high drafting of cotton in preparation for or during the process of spinning.

In the drawings illustrating, by way of example, certain embodiments of the invention,

Fig. 1 is a top plan view of a frame embodying one form of the invention, which frame may be considered as typical of those of the classes of slubbers, intermediate and roving frames;

Fig. 2 is a front elevation of the apparatus of Fig. 1, with the front rolls at the right broken away;

Fig. 3 is a vertical cross-section of said apparatus;

Fig. 4 is an elevation, upon an enlarged scale, of a roll as used at certain points in the frame of the preceding figures as well as in the apparatus of Figs. 6 and 7;

Fig. 5 is a cross-section upon the same scale through the roll of Fig. 4;

Fig. 6 is a view partly in elevation and partly in longitudinal vertical section illustrating my invention in connection with a drawing frame; and

Fig. 7 further illustrates the invention in connection with a ring frame.

Referring first to Figs. 1 to 3, the frame there shown for the purposes of illustration may be considered as representative of the various drafting frames included in the classes of slubbers, intermediate and roving frames. Suitable supports are provided at the frame ends, including the bases 1 and pedestals 2. Upon the latter are the roll stands 3, see particularly Fig. 3, carrying the roll brackets 4—4, etc. for the lower rolls 5, 6, 7. To the rear of the roll brackets are stands 8 for pivotally supporting, as at 9, the adjustable cap bars 10, three of which are illustrated in the present instance, at the opposite ends and at an intermediate point upon the frame; see particularly Fig. 1.

Upon the cap bars are the longitudinally adjustable bearings 11 for the top rolls, of which there are three in the present instance, disposed vertically over and in paired relation with the lower rolls. These top rolls include the front top roll 12, the intermediate top roll 13 and the rear top roll 14. The bottom rolls are preferably of the fluted construction clearly seen in Fig. 2. The front top roll 12 may be of the usual leather-covered form or otherwise constructed.

One or both of the other top rolls, including in the illustrative example of Figs. 1 to 3 both the intermediate top roll 13 and the rear top roll 14, are of the novel construction and arrangement as shown in more detail and upon a larger scale in Figs. 4 and 5.

Referring to said Figs. 4 and 5, the roll as there illustrated comprises a core or spindle 15 having suitable bearing portions 16—16 at its ends, intermediate which are one or more enlarged portions or bosses 17 of a length and spacing dependent upon the nature of the work with which the roll is to be used. In some instances the boss may extend substantially the entire length of the roll, while in other cases two or more shorter bosses may be provided, suitably spaced, as shown in connection with the mechanism of Figs. 1 to 3 and also Fig. 6.

Each such boss of the roll of my invention is surfaced with a multiplicity of pins, teeth, bristles or points 18 secured upon the roll in any suitable manner but preferably replaceably and substantially in the manner as illustrated. As shown, these points 18 are studded in the manner of staples or U-shaped pins along relatively narrow fillets or bands 19 of leather, textile or other suitable flexible material. At selected points the bosses are radially tapped, as at 20, and they are provided with wooden or other inserts or plugs 21. The fillets or bands carrying the points are wrapped circumferentially about the bosses, with the fillet end portion disposed in a plane substantially perpendicular to the axis of the roll, and anchored as by a tack or other fastener 22 received in one of the plugs 21. The succeeding turns are desirably in lateral contact, extending spirally from one end of the boss to the other, the extent of the inclination or angle of the spiral depending upon the width of the fillet. This width is carefully determined to afford the proper helical angle, for the reasons to be explained. The opposite end of the fillet is similarly anchored. Substantially the entire surface of the bosses is thus covered with the points, which may be steel wire members generally similar to those employed in card clothing. The outer portions 18^a of the points, see Fig. 5, desirably are directed at an angle to the radius of the roll, being inclined away from the direction of rotation of the roll and of the travel of the sliver or roving, indicated by arrows on said Fig. 5, wherein the lower steel fluted or other roller is shown at 6^a.

The described points or pins are of a gauge and density proportionate to the count of the material to be operated upon, the effect desired, the length of fiber and other factors. In actual

practice I have found that the following gauges and densities give excellent results: on slubbers, pins or wires of 100 gauge with 72,000 points per square foot; on intermediate frames, 110 gauge with 79,200 points per square foot; and on the fine frames, ring frames and the like, 120 gauge with 86,400 points per square foot. The references are to the English standard.

Referring again to Figs. 1 to 3, rolls such as those of Figs. 4 and 5 are preferably employed in the general combination and arrangement in slubbers, intermediate or roving frames as illustrated in Figs. 1 to 3, wherein they constitute the intermediate and rear top rolls 13 and 14. In some cases only the intermediate top roll may be of the construction of Figs. 4 and 5, both the front top and the rear top rolls being of the usual leather-covered, grooved or other construction. When employed in the combination as in Figs. 1 to 3, the intermediate top roll 13 may be of standard diameter overall, or of the somewhat larger size illustrated. The rear top roll 14 is also shown as of somewhat larger than regular diameter, in this instance approximately 1⅝".

The lower rolls may be of standard form and dimension but preferably the lower back roll 7 is of substantially the same or slightly smaller diameter than the top back roll 14, while the intermediate lower roll 6 is appreciably smaller in diameter. Such smaller diametered middle bottom roll is desirable to facilitate a somewhat closer than normal setting between the front and middle pairs of rolls, by which, with my novel rolls as described, both the shorter fibers and the longer fibers may be controlled. It is an important feature of my invention that with the use of my rolls a relatively large range of counts can be handled without the necessity of introducing a different roll for each variation in count.

The means of my invention is particularly useful for high drafting, as a result of which certain preparatory operations, such as those either of the intermediate or roving frames or both may frequently be dispensed with, with proportionate resultant saving in manufacturing cost. In high drafting, or in ordinary drafting, the fibers will be better brought into parallel relation if they are free to move relative to one another. This condition is obtained with my rollers, but adequate control of the fibers is nevertheless retained sufficient to prevent shorter fibers from slipping along in bunches with the longer ones.

In operation, the fibers or small groups of fibers are separated between the peripheral points or pins of the rolls, which thus spread the sliver or roving. A better control of the drawing-through operation is thus given, facilitating high drafting. At the same time each layer of fibers is held to an extent requisite for high drafting. This is due in part to the spiral disposition of the pin-carrying fillets upon the rolls, whereby the pins in any given line are offset axially of the roll at different points angularly about it and accordingly tend to engage the fibers laterally. This holding action, which is not sufficient to cause objectionable "plucking," is also contributed to by the flexibility or resiliency of the individual wires or points, which are adapted to yield lengthwise the rolls and to engage the fibers with just sufficient lateral pressure as the latter pass through between the pins. Thus my rolls not only afford a combing effect, by reason of the separation of the hairs or fibers by the pins, but the latter function to press gently upon the fibers in the direction axially of the rolls and to allow only small groups or units of fibers to pass between them, while permitting the fibers to be drawn through by the front rolls in the ordinary manner.

The described rolls of my invention are easily installed in existing frames, preferably with a relatively close setting between the front and middle rolls as previously referred to. Resetting of the rolls is unnecessary within considerable ranges of staple, a further advantage flowing from my invention. It will further be noted that the rolls as described may be self-weighted, in the proper diameters therefor. In any instance, additional weight may be applied, in the usual manner, if desired, but I have found it generally unnecessary in practice to employ any greater weighting than ordinarily used in a corresponding installation. When constructed as in Figs. 4 and 5 the points of the rolls may readily be removed for replacement or repair, or for substitution of points of different gauge or density, avoiding the necessity of providing entirely new rolls to replace worn ones or of keeping on hand a large stock of different size rolls.

Referring now to Fig. 6, I have there illustrated the roll or rolls of my invention in connection with a drawing frame. The main frame is indicated at 25, supporting the stands 26 for the roll brackets 27. In this instance four pairs of rolls are shown. The intermediate top rolls 28 and 29, in accordance with my invention, are of the special construction as previously described in connection with Figs. 1 to 3 and shown in detail in Figs. 4 and 5, with the exception that in this type of frame longer bosses are generally desirable and the described pins or points may extend substantially the full length of the rolls or may be of other longitudinal extent, generally somewhat greater than as shown in Figs. 4 and 5. The sliver S travels through the feed rolls 30 and through the four pairs of rolls illustrated, including the front rolls 31, the described intermediate rolls 28 and 29 and their cooperating rolls 28^a, 29^a, and the back rolls 32, whence it passes through the trumpet 33, between the compacting rolls 34 and through the coiler to the can, not shown, the coiler cover being indicated at 35. The clearer cover overlying the series of drafting rolls is indicated at 36. As in the preceding figures, I preferably employ a relatively close setting between the front rolls and the rolls next behind them. In some cases my roll may be employed only at the point corresponding either to the intermediate top roll 28 or 29, but preferably two intermediate top rolls, such as shown in said Figs. 4 and 5, are used.

In Fig. 7 similar rolls of my invention are illustrated in conjunction with a ring frame, in which the pairs of rolls from which the roving or yarn passes to the ring and spindle generally have their axes disposed in an inclined plane. Fig. 7 is a view in elevation looking horizontally at such inclined series of rolls, from the front. The lower front rolls, which may be of the usual fluted type, are shown at 40, behind which are seen the upper portions of the intermediate lower rolls 41, the front top rolls having been removed. The upper rolls are rotatably positioned in the bearings 42—42, etc. of the usual cap bars 43. In the intermediate top position I have shown

a roll 44 studded with pins or points 45 and which may be constructed as previously described in connection with Figs. 4 and 5. The rear top roll 46 may be of similar construction as the intermediate top roll 44 or may be of the ordinary leather covered or other form. The front top roll has been removed so that the sliver S may be seen passing through between the wires or points 45 of the intermediate top roll 44, with the resultant holding, sorting and spreading effect as previously described.

It will be understood that the rolls of my invention are equally adaptable to mule spinning, but, as pointed out, they are peculiarly adapted for the production of a practical high drafting effect, in the various combinations and arrangements herein set forth.

My invention is not limited to the particular embodiments thereof herein shown and described, its scope being set forth in the appended claims.

I claim:

1. In a yarn drafting or spinning frame, in combination, a support, roll stands thereon, brackets having bearings for a series of lower rolls, a cap bar having a corresponding series of bearings for upper rolls, lower rolls in said bearings, front and rear top rolls in the appropriate bearings of said cap bar, and a roll in intermediate bearings of the cap bar including a spindle having end bearings and having substantially radially projecting flexible wire points regularly disposed in spiral arrangement over its operative peripheral surface and of such density and so arranged as to afford a combined spreading, sorting and holding effect upon the fibers, sliver or roving passing through said series of rolls, whereby an increased paralleling of the fibres, allowing a higher draft, is obtained between the rear rolls and said intermediate wire-pointed roll which in turn enables a still higher draft between said intermediate roll and the succeeding rolls.

2. In a yarn drafting or spinning frame, in combination, a support, roll stands thereon, brackets having bearings for a series of lower rolls, a cap bar having a corresponding series of bearings for upper rolls, and cooperating pairs of rolls rotatively positioned in the respective lower and upper bearings, at least that top roll next behind the front rolls having its drafting portion covered with relatively fine card-clothing, the front pair of rolls and the pair next behind them having a closer than normal setting, and the lower roll of said pair behind the front rolls being of smaller than normal diameter, to facilitate said setting.

3. In a yarn drafting or spinning frame, in combination, upper and lower rolls disposed in pairs, and means for rotatably supporting the rolls, at least one upper roll rearward of the foremost pair having upon its operative portion or portions a multiplicity of resilient wire points regularly disposed spirally thereon.

4. A drafting roll for yarn-drafting in slubbers, intermediate, roving and spinning frames, comprising a spindle having end bearings, and a circumferential, drafting portion composed of a multiplicity of resilient wire points regularly spirally disposed about the circumference of said drafting portion of the roll substantially radially thereof, said points being of such resiliency, density and arrangement as to spread, sort and hold yieldingly the fibers of the material to be drafted, thereby affording a high degree of fiber parallelization and enabling a high draft, said roll being of standard or approximately standard diameter overall.

5. A drafting roll for yarn-drafting in slubbers, intermediate, roving and spinning frames, comprising a spindle having end bearings, and a circumferential, drafting portion having a multiplicity of resilient wire points regularly disposed spirally thereon, said points having substantially radial base portions and angularly disposed outer portions, the outer ends of said points defining a cylindrical surface of a diameter approximating that of standard fluted or other drafting rolls in corresponding drafting positions.

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