Jan. 27, 1948. F. PIRON 2,435,157

DRAWING MECHANISM FOR TEXTILE FIBRES

Filed Aug. 29, 1945 2 Sheets-Sheet 1

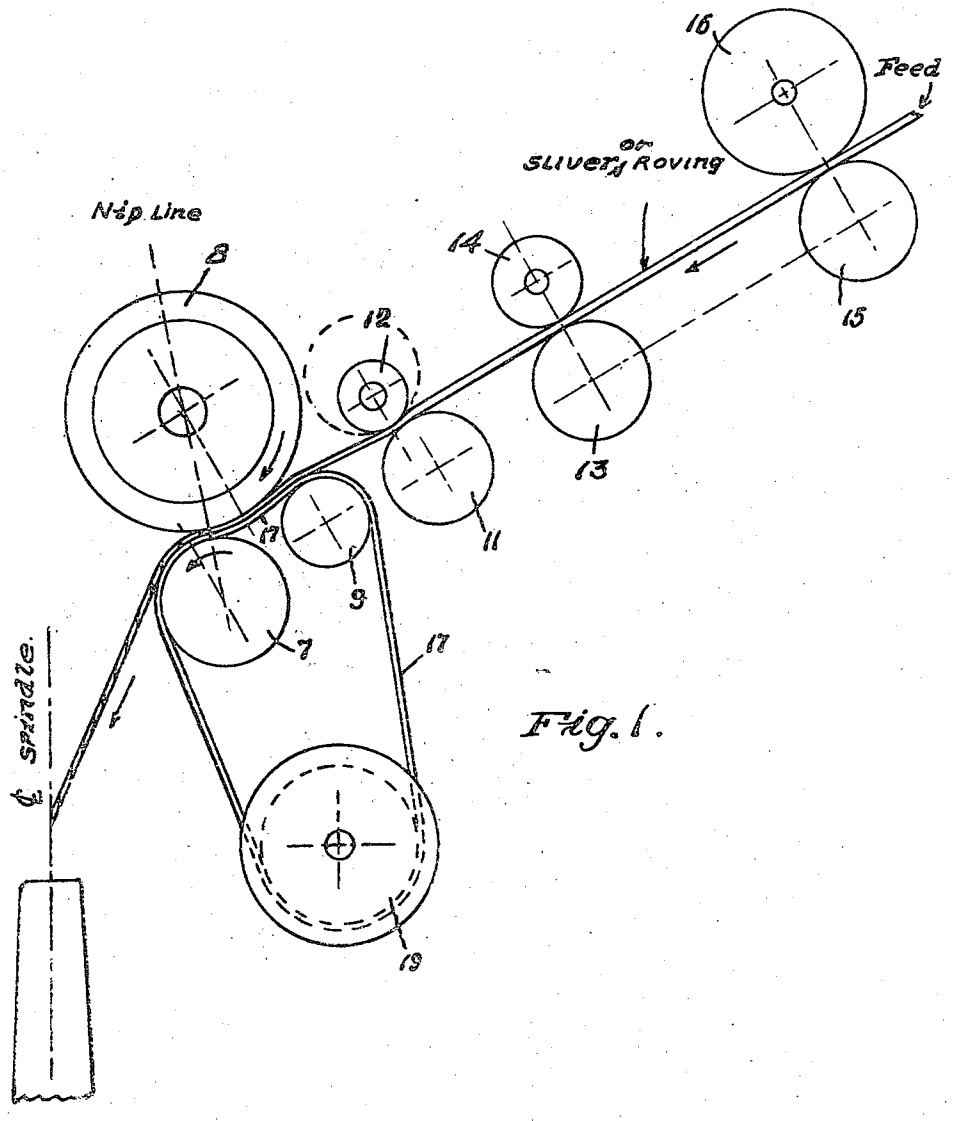


Fig. 1.

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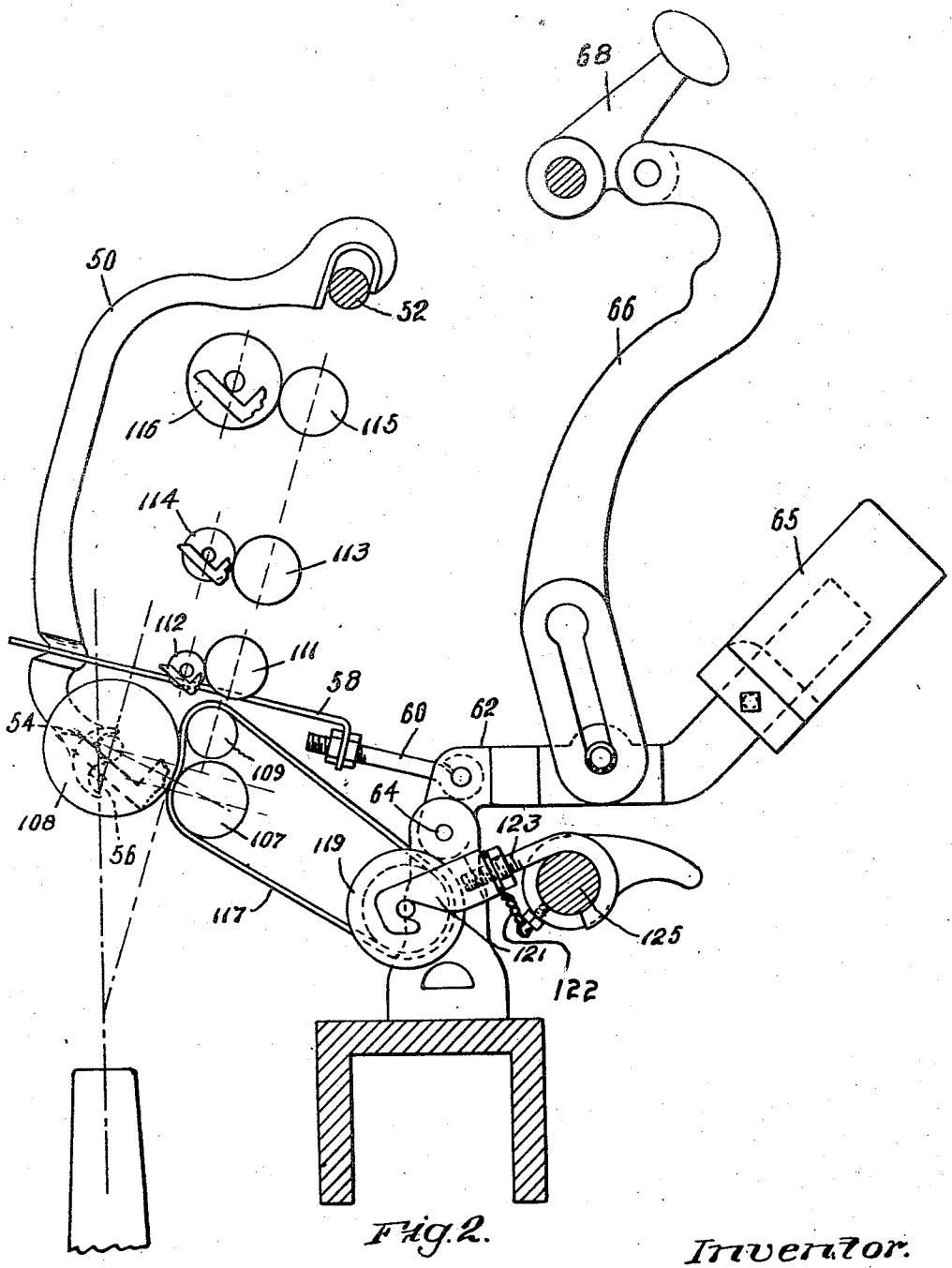


Fig. 2.

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DRAWING MECHANISM FOR TEXTILE FIBRES

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3 Claims. (Cl. 19—131)

1

This invention relates to drawing mechanisms for textile fibres such as cotton, rayon and wool, for example, and has for its general object the improvement of such mechanisms. The invention is particularly useful in connection with the drawing of textile fibres of relatively long lengths or staple, for example ⅞" to 3" or longer, and with the drawing of textile fibres of mixed lengths, or mixed staple, such as frequently encountered in the drawing of wools, rayons, and mixtures of wool and rayon or other artificial fibres. The improvement manifests itself in providing slivers, rovings and yarns of improved fibre distribution (long and short), evenness, strength, and regularity in weight per unit length. Also, in machine operation there are fewer ends down (yarn breaks) on the machines of the invention than in many if not most drawing, roving, and spinning frames, when applied to comparable textile fibres, slivers, rovings and yarns, which are therein drawn and twisted to finer products.

In the drawings illustrating preferred typical applications of the invention;

Fig. 1 is a vertical elevational view showing the features of the invention as embodied in the drawing or drafting mechanisms in drawing, roving, and spinning frames, generally, though with various well-known parts omitted for purposes of clarity; and

Fig. 2 is a vertical elevational view showing a specific embodiment of the invention as incorporated in a well-known type of French worsted wool spinning frame, employed for wools, wool and rayon mixtures, etc.

Referring to the drawings, and particularly to Fig. 1, the preferred embodiment of the invention there shown includes a series of metallic bottom rolls with a front roll 7, and carrier rolls 9, 11, 13, and feed roll 15, all driven by suitable means (not shown but well known in the art) to provide at least so-called "break drafts" or "take-up" drafts, or somewhat greater drafts, between feed roll 15 and carrier roll 13, and between 13 and 11, as the sliver, roving, or yarn is fed in from the back and passes towards the front. The yarn is held down against the carrier rolls, so as to be thereby propelled, by a series of top rolls 16, 14 and 12 which may be either of weighted or self-weighted type, but in either event, preferably with at least the roll 12, not heavily weighted so as to permit a very slight slip-draft therethrough. This roll 12 may be of various sizes, for example as there indicated in dashed lines.

The yarn is subjected to its main and final draft, with which this invention is especially concerned, while passing from the nip of the rolls 11—12 to the nip of the top delivery roll 8 and the underlying belt 17 which passes over and is driven by one or both of the two bottom rolls 7 and 9, the belt being suitably tensioned by the flanged idler pulley 19 therebelow, the mounting of said pulley being omitted. The pulley may be weighted or spring-pressed.

2

It will be seen from the drawings that the sliver or roving in its final draft is supported and carried by the upper flight of the belt which is depressed to form a curved bight by the resilient-surfaced top delivery roll 8 which is sufficiently pressed downwardly (by means not shown) as to both nip the belt and yarn at their intersection with the dashed line marked "nip line," and to form the bight in the belt and hold the roving therebetween, the grip being initially very light and gentle but becoming progressively firmer as the sliver or roving in its movement with the belt approaches the nip line. Thus by the preferred rearward setting of the top roll 8 in conjunction with the belt carried over the bottom delivery roll and immediately preceding roll (or rolls), the sliver or roving being drawn is supported on the belt throughout its most loosened, delicate and critical condition, while the final and major draft is being applied thereto. Moreover, as previously mentioned, the initial contact of the sliver or roving with the roll is light and gentle because the top roll 8 is simply pushing against the belt (unbacked by a roll) where the light initial contact occurs, though the contact, and hence the grip on the fibres, as the wrap thereon increases in longitudinal extent, becomes increasingly firm, reaching a maximum and positive grip at the nip line where the belt is backed by the roll 7, and the interposed sliver or roving and belt are gripped directly and positively between the rolls 8 and 7.

This extended contact between the overlying roll and belt provides a similarly extended contact with, and hence control over the fibres, which, it is believed, are first somewhat straightened and then plucked in more orderly fashion from the mass because of the light initial contact and the gradually increasing firmness of the grip upon and acceleration of the fibres—all of which is conducive to their even flow and uniform handling to the end that the before-mentioned objects of the invention are achieved.

Referring again to Fig. 1, the spacing between the rolls 15—16 and 13—14, may be either as shown, or varied, as well understood in the art, and, similarly as to the spacing between

the pairs of rolls 13—14 and 11—12. The roll 12 as is preferred, may be so weighted as to permit some degree of slip-draft thereunder. In the latter event, it appears somewhat better to set the roll 12 slightly forward, as shown, and whether or not the belt encompasses roll 11. The rolls 12, 14 and 16 may be either steel rolls or resilient surfaced rolls, as preferred, but the roll 8 should be covered with some suitable synthetic or natural rubber material so as to provide a resilient though firm surface, for example, one having a Shore durometer reading of, say, 58. This roll 8 is of larger diameter in order to increase the longitudinal extent of contact with the underlying belt and interposed yarn, though it need not be as large as shown, nor need it be set so far rearwardly in order to obtain certain advantages of the invention, though it is preferred to have it set substantially as shown, and with the pressure applied thereto so that it firmly nips the belt and roving as a result. The pressure, however, need not be applied exactly in the direction of the nip line so long as the roll 8 is pressed and maintained in position to thrust the belt against and nip it between the rolls 8 and 7. Though the belt is shown as extending over only the lower rolls 7 and 9, the belt may also encompass the roll 11 as well.

Referring to the specific embodiment of Fig. 2, the description so far set forth is applicable thereto, and the numbered parts of Fig. 1 with "100" added, appear correspondingly in Fig. 2. In Fig. 2, however, the rolls 116, 114, and 112 are all self-weighted and supported by their respective inclined cap bars, as shown (unnumbered), and the roll 108 is externally weighted by the bar 50 with its upper end bearing upon the rod 52 and bosses 54 and 56 at the opposite end, the rearward one, 54, of which presses upon and holds the roll 108 in its position against its cap bar as shown, the other boss 56 being for the alternative mounting of the roll 108 in a more forward position with respect to the underlying roll 107. The bar 50, and with it the roll 108, may be stressed to press the roll downwardly and to the right (Fig. 2) by means of the stirrup 58 attached by the link 60 to the lever 62 pivoted at 64, the lever being pressed by an additional adjustable weight 65 at the right end thereof, the remaining elements 66 and 68 being simply for control and holding the weighted mechanism in inoperative position as desired during non-operation of the machine. Fig. 2 also shows means for mounting and holding the idler pulley 119 consisting of members 121 (only one being shown) hooked over the opposite ends of the central shaft of the flange pulley 119. The members 121, each pair of which may be weighted or spring-biased downwardly as by spring 122, are suitably joined together in pairs and held by a central mounting device 123, the rearward curved extension of which sufficiently surrounds a rod 125 so as to hold each pulley in the approximate position as shown, leaving it free, however, to seek by gravity its lowermost position and maintain a suitable tension on the belt 117 so as to hold it snugly against the roll 108 and grasp the roving therebetween.

For simplicity in the appended claims, the word "roving" has been used to designate the product drawn by the machine regardless of whether, strictly or technically, it be sliver or roving.

Having described my invention, I claim:

1. In a textile fibre drawing mechanism, in combination, pairs of rolls with said pairs arranged one in advance of the other for feeding a roving to be drafted and providing an initial draft therefor, and final draft means including a belt, a roll supporting the leading portion of said belt, a top delivery roll nipping said leading portion of said belt against said belt-supporting roll and driving said belt, means preceding said belt-supporting roll to support the portion of said belt back of said nip in resilient contact with said top delivery roll and without nipping the belt against said top delivery roll, and means for tensioning said belt whereby the roving is pressed gently between the belt and the top delivery roll until it reaches the nip between the top delivery roll and the belt-supporting roll at which nip the roving is firmly gripped.

2. In a textile fibre drawing mechanism, in combination, pairs of rolls with said pairs arranged one in advance of the other for feeding a roving to be drafted and providing an initial draft therefor, and final draft means, adapted to receive and hold said roving fed from an immediately preceding pair of said pairs of rolls and to draft the same, comprising a belt, a bottom delivery roll and rearward thereof a single carrier roll both of which support and at least one of which drives said belt, an idler roll around which said belt passes and by means of which said belt is tensioned, and a top delivery roll above and to the rear of said bottom delivery roll and forming therewith a nip and imparting to said belt a curved bight extending between said nip and said single carrier roll spaced rearwardly below and clear of said top delivery roll.

3. In a textile fibre drawing mechanism, a final draft means, adapted to receive and draft a roving fed from an immediately preceding pair of said pairs of rolls with said pairs arranged one in advance of the other and providing an initial draft for said roving, comprising a belt, a bottom delivery roll and rearward thereof a single carrier roll both of which support and at least one of which drives said belt, an idler roll around which said belt passes and by means of which said belt is tensioned, and a top delivery roll above and to the rear of said bottom delivery roll and forming therewith a nip and imparting to said belt a curved bight extending between said nip and said single carrier roll spaced rearwardly below and clear of said top delivery roll.

FERNAND PIRON.

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