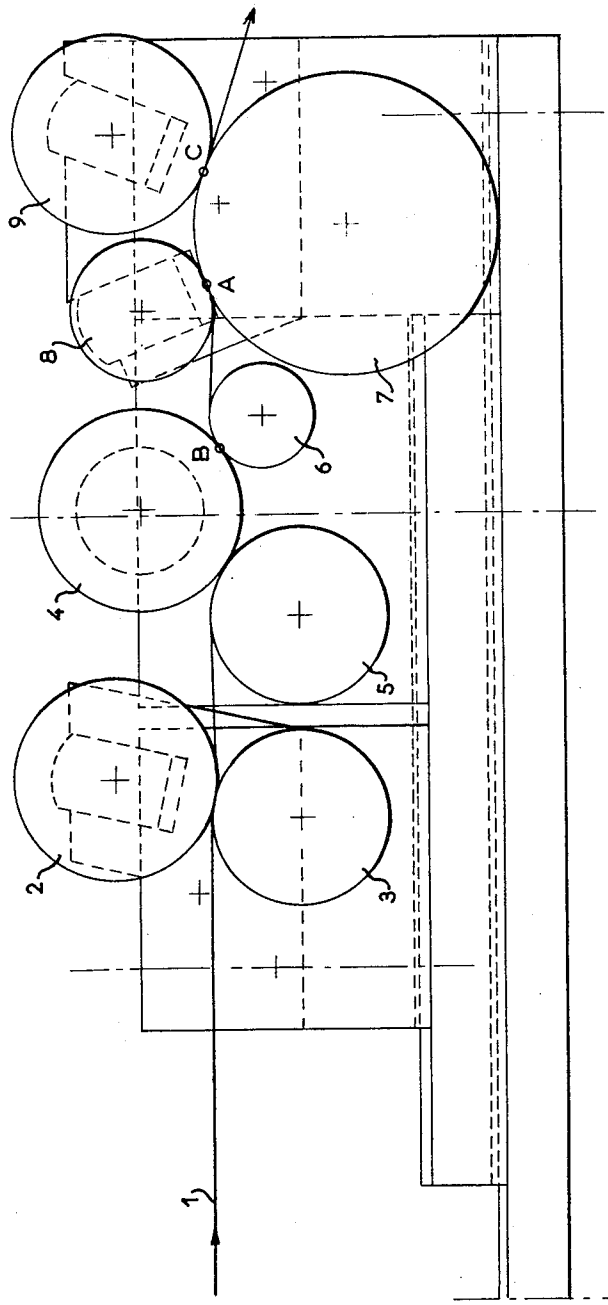
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TEXTILE FIBER DRAWING DEVICE

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TEXTILE FIBER DRAWING DEVICE

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The present invention relates to devices for drawing textile fibers of the type comprising a feed station, a gripping station and a drawing station proper, each of said stations comprising at least two rollers, namely: a lower positively driven roller and an upper pressure roller frictionally driven by the lower roller.

One object of the invention is to provide a drawing device of this type which is more reliable than the known devices and particularly one in which the danger of the fibers winding about the rollers is reduced to a minimum.

It is well known that the upper pressure roller of the drawing station should have a diameter at least equal to the mean length of the fibers in order to avoid the fibers winding about such roller which would be detrimental to the operation of the drawing device. Actually, it has been found that such windings are liable to occur should this roller have a diameter smaller than the mean length of the fibers.

Another object of the invention is to limit the diameter of the upper pressure roller of the drawing station to a value substantially equal to the mean length of the fibers to be drawn.

Another object of the invention is to make the driving lower roller of the drawing station as large as possible within the limits of the space available. Such a disposition reduces the danger of the fibers winding about the lower roller because the lower roller has a large diameter relative to the length of the fibers and, the lower roller is thus much larger than the upper roller. Nevertheless if some fibers should wind about one of the rollers of the drawing station, such winding would likely occur about the upper cylinder, which is much less inconvenient as is well known by those skilled in the art.

A further object of the invention is to provide a drawing device in which the point of contact of the upper pressure roller of the drawing station with the corresponding driving lower roller is spaced from the point of contact between both exit rollers of the gripping station by a distance substantially equal to the "pinching length" of the fibers to be drawn. This "pinching length" is a feature well known in the drawing field. It is substantially equal to the mean length of the fibers to be drawn. If the sliver of fibers to be drawn was pinched between two points spaced apart by a distance greater than the mean length of the fibers, the latter would be pinched at one end only and run the risk of being dissociated from the sliver subjected to the drawing operation. As a contrast, if the fibers were pinched at two points spaced apart by a distance less than the mean length thereof, they would break.

The disposition which takes into account all three aforesaid features, is the only one allowing a lower roller much larger than the upper roller to be incorporated in the device without any detrimental effect upon the operation of the latter.

Still another object of the invention is to provide a drawing station further comprising a second upper pressure roller arranged downstream of the first roller and larger than such roller. Such an arrangement, which is known per se, combined with the disposition hereinabove indicated, improves the operation of the assembly because both pressure rollers pinch the sliver at two points respectively against the lower roller, so that even though one of them happens momentarily to move away from the lower roller during operation, the sliver is kept pinched at the drawing station.

These and other objects of the invention will become apparent to those skilled in the art from the following description, taken in connection with the accompanying drawing the only sole FIGURE of which shows diagrammatically and by way of example, one embodiment of a drawing device according to the invention.

In this drawing, 1 is a sliver of textile fibers to be drawn, principally cotton fibers, 2 the upper roller and 3 the lower roller of the feed station of a drawing device assembly. The sliver 1 passes first between both rollers 2 and 3 of the feed station with the roller 3 being the driving roller and the roller 2 a pressure roller frictionally driven by the roller 3. The sliver then passes to two rollers 5, 6 of a gripping station against which rollers it is applied by a pressure roller 4. At least one of both of the lower rollers 5, 6 is a driving roller, whereas the pressure roller 4 is an idle roller.

At the exit from the gripping station, the sliver 1 passes through a drawing station proper comprising a driving lower roller 7 and two upper pressure rollers 8, 9. The point of contact A of the upper pressure roller 8 with the lower driving roller 7 is spaced from the point B of contact between rollers 4, 6 of the gripping station, by a distance substantially equal to the pinching length of the fibers to be drawn. The diameter of the upper pressure roller 8 is substantially equal to the mean length of the fibers, and the diameter of the lower roller 7 is as large as possible within the space available. In the embodiment illustrated, the diameter of the lower roller is much larger than that of the upper roller 8 and, for instance, is substantially twice as long as the mean length of the fibers to be drawn.

It is known that drawing of the fibers is obtained by making the drawing rollers rotate with a surface speed greater than the surface speed of the gripping rollers. The ratio of these two speeds determines the drawing rate. The winding risks, it will be understood, are maximum in the drawing station; therefore it is particularly desirable to design this station in the manner hereinabove described so as to materially eliminate these risks.

Finally, in the embodiment illustrated, the drawing station furthermore comprises a second upper pressure roller 9, arranged downstream of the pressure roller 8 and of greater diameter than the latter.

Since the lower roller 7 of the drawing station cannot be increasingly large and since the diameter of the upper roller 8 cannot be reduced to a value shorter than the length of the fibers for the reason hereinabove indicated, it will be readily understood that the aforesaid requirements namely the distance between the contact points A and B and diameter of the pressure rollers 8 being substantially equal to the length of the fibers, and diameter of the lower roller 7 being as large as possible within the space available, are the only possible requirements for obtaining the most satisfactory results, as far as the reduction in the danger of the fibers winding about the rollers is concerned.

The second pressure roller 9 has been provided for ensuring the continuity of the drawing operation of the sliver, even though, for any reason whatever, the first roller should momentarily move out of engagement with the lower roller 7. At this moment, the fibers which are no longer pinched at point A would be pinched at point C.

As many changes could be made in the above construction, and many widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. In a sliver drawing mechanism having a positively driven lower feed roller, an upper feed roller with which said lower feed roller coacts, and an upper gripping roller, the combination with an upper drawing roller the diameter of which is smaller than the diameter of said upper gripping roller and is substantially equal to the mean length of the fibres of the sliver to be drafted, of a positively driven lower gripping roller coacting with said upper gripping roller and the diameter of which lower gripping roller is smaller than the diameter of said upper drawing roller, and a positively driven lower drawing roller coacting with said upper drawing roller and the diameter of which lower drawing roller is greater than the diameter of said upper gripping roller, said driven lower gripping roller contacting said upper gripping roller and said driven lower drawing roller contacting said upper drawing roller at such points that the distance between said contact points corresponds substantially to the mean length of the fibres to be drafted.

2. A sliver drawing mechanism as claimed in claim 1, wherein a second upper drawing roller is located downstream of the first upper drawing roller and has a diameter greater than the diameter of the first upper drawing roller.

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