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FIBER CONTROL FOR PILE FABRIC KNITTING MACHINES

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FIG. 1

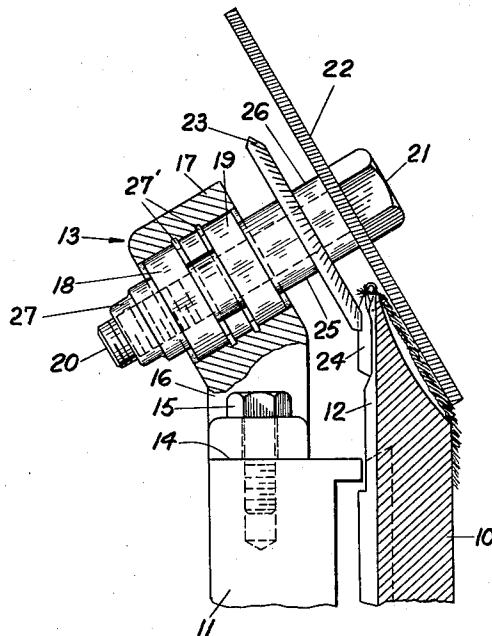
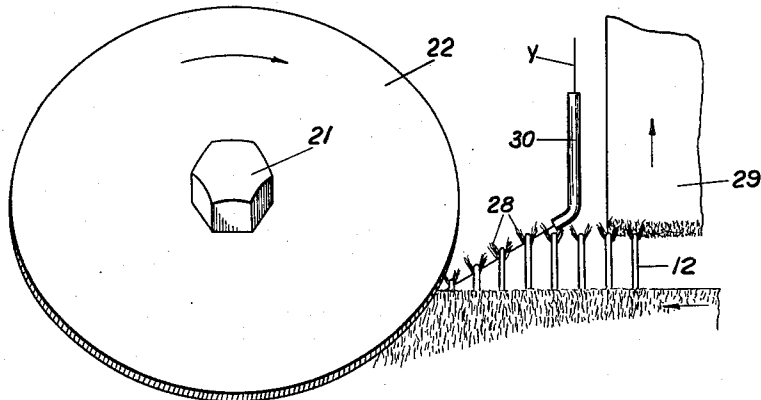


FIG. 2

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This invention pertains to knitting machines of the rotary cylinder type and, in particular, to a mechanism for controlling the free ends of fibers used in the production of so-called "high pile fabric."

It is a general object of the invention to provide a means functioning in timed relationship with the rotating cylinder of a high-pile knitting machine for controlling the direction of the free ends of fiber tufts as they are drawn into the stitches of a basic fabric.

A further object of the invention is to accomplish the first mentioned object without the use of compressed air to direct the free ends of the fibers.

Further objects of the invention will become apparent from the following more detailed disclosure.

A high pile fabric is one in which the base fabric is supplemented with tufts of fibers whose free ends when drawn into a stitch of the fabric, have a tendency to project outwardly from said base fabric.

Knitting machines used in present day production of so-called high pile fabric employ the use of air nozzles to project compressed air against the free ends of the outwardly projecting fibers thus causing said ends to assume a longitudinal position in relationship to the fabric and to appear cleanly at a single face thereof.

As is well known to those conversant with the art, employment of air in the production of high pile fabric presents many problems such as excessive attachments for directing the air to particular points on a knitting machine as well as facilities for disposing of lint and excess fibers carried into the machine by the streams of air directed thereon.

According to the invention of the instant case, fiber stock in the form of roving is fed to the knitting instrumentalities of a knitting machine by way of carding and doffer means at one or more feeding stations. The knitting instrumentalities take tufts of fibers from the doffer means in a known manner and draw said tufts of fibers into the loops of the stitches which form the base fabric. At a point where normally air nozzles would be located for directing these streams of air against the free ends of the fiber tufts, applicant has applied a rotary disc which functions in timed relationship with the revolving needle cylinder by means of a slotted second disc rotatable upon the same axis as said rotary disc and in meshing relationship with the vertical needle slots of said revolving needle cylinder. This rotary disc overlies the hooks of the knitting instrumentalities and being in close relationship thereto the angle at which said disc is positioned and directed or, the plane of rotation of said disc, is such that it intersects the axis of the revolving needle cylinder. Rotation of this disc therefore acts upon the outwardly projecting fibers by folding them inwardly causing them to assume a longitudinal position in relationship to the fabric as is the case when the pneumatic means is employed.

The invention will be described in greater detail in the following disclosure wherein reference is made to the accompanying figures of drawing in which:

FIG. 1 is an elevational view of the invention showing the rotary disc in relationship to the knitting instrumentalities as seen looking outwardly from the center of a knitting machine.

FIG. 2 is a side elevation partially in section showing the various components comprising the invention.

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Now referring to FIGS. 1 and 2, the invention is shown as applied to a knitting machine having a cylinder 10, circular base 11 and needles indicated by the numeral 12. There is mounted on the upper surface of the circular base 11, and immediately adjacent to each feeding station a bearing housing generally indicated by numeral 13. Housing 13 comprises a horizontal mounting surface as at 14 and assembles to the upper surface of base 11 by one or more cap screws 15 as shown in FIG. 2. A vertical arm 16 extends upwardly from the mounting surface 14 and has integral therewith an angularly disposed bearing housing 17 which is adapted to receive anti-friction bearings or bushing type bearings as at 18 and 19 for the rotary support and guidance of bolt 20 assembled therein. Beneath the head 21 of bolt 20 and rotatable therewith there is clamped or otherwise held a fiber controlling disc 22 which receives its means of motion through bolt 20 from a slotted or gear-like, second disc 23. This second disc is in meshing relationship with the vertical needle slots 24 situated on the outer periphery of the revolving needle cylinder 10. The slotted disc 23 being rotatable with bolt 20 and in mesh with vertical slots 24 assumes its proper location on bolt 20 by means of spacing collars 25 and 26 and is firmly retained in that position by tightening nut 27 against the inner race of bearing 18 which is spaced from bearing 19 by snap rings such as at 27'.

The indicating arrows shown in FIG. 1 indicate the direction of rotation of the various components.

In operation the needles 12 are raised for the purpose of taking a quantity of fibers 28 from a rotating doffer roll 29, which is a component of a carding mechanism such as shown in United States Patent 2,953,002 and well known to those familiar with the art. As the needle cylinder revolves, the needles 12 then take the knitting yarn Y to form the base fabric. This yarn is continuously fed through tube 30. The needles as they are drawn downwardly to knit with their tufts of fibers and the base yarn, then approach the revolving fiber controlling disc 22 which overlies the knitting instrumentalities and being in very close relationship thereto the free ends of the fiber tufts contact the outer periphery of said disc which is preferably roughened as by knurling or the like. This disc is so timed as to be revolving at a speed considerably greater than that of the needle cylinder; therefore, the ends of said fibers are folded downwardly as they pass beneath the disc causing them to assume a longitudinal position in relationship to the base fabric.

Although only one means of rotating the fiber controlling disc has been illustrated and disclosed, it is to be understood that various types of drives would be applicable.

By way of example, the peripheral speed of the disc may be about twice that of the driving disc 23. Of course, this speed may vary for several reasons, but, in general, a point on the peripheral surface of the disc should move along with a point on the fabric which it is affecting. The outer edge, at least, of the disc 22 is preferably roughened as by knurling or the like and thus it will influence the fibers more positively. The inner flat surface of the disc runs smoothly over the fibers and serves to iron them down and hold them in flattened condition.

For cylinders of larger diameter a flat disc is effective, but for small cylinders a convex surface for the disc at the side next the fabric may be used to iron the fibers in place more effectively.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details de-

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scribed, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. In a knitting machine of the rotating cylinder type having in combination knitting instrumentalities for drawing yarn into loops to form a base fabric, fiber carding and doffer means for parallelizing and delivering to the hooks of the knitting instrumentalities tufts of fibers for forming a high pile fabric, the improvement which comprises a rotary fiber controlling disc, said disc being mounted in overlying relation with the hooks of said instrumentalities and in close relationship thereto, said disc

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further being adapted to be driven from said cylinder in a manner so as to impart a greater peripheral speed to said disc than that of said cylinder.

2. The structure of claim 1 wherein the plane of rotation of said disc intersects the axis of said cylinder, and wherein said disc is driven from a member of lesser diameter than said disc and coaxially mounted therewith, said member being in meshing relationship with said instrumentalities.

References Cited in the file of this patent

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