

IMPROVED YARN FEEDER FOR CIRCULAR KNITTING MACHINE

FIELD OF THE INVENTION

The present invention relates to an improved yarn feeder for circular knitting machine and particularly a yarn feeder that has a jutting strut to facilitate delivering a yarn to a knitting needle for knitting fabrics.

BACKGROUND OF THE INVENTION

A lot of clothing people wearing these days is made from knitting fabrics produced by circular knitting machines. When a circular knitting machine proceeds knitting operations, there are yarn feeders feed yarns continuously to knitting needles. The knitting needles stitch or tuck the yarns to loops for forming the fabrics desired. When knitting knitted or stretch fabrics, an additional stretch yarn will be provided to go through the yarn feeder to blend with other yarns to produce the stretch or knitted fabrics (such as for making underwear). However conventional yarn feeders have a lot of problems when feeding the stretch yarn.

FIG. 1 shows a conventional yarn feeder 1 which includes a body 11 and a yarn feeding section 12 extending from a lower end of the body 11. The yarn feeding section 12 has at least one aperture 13,13' for yarns to pass through. The body 11

further has a slot 16 engaging with an adjusting element 2 for supporting a yarn roller 3. The yarn roller 3 guides the stretch yarn above the knitting needle to facilitate the knitting needle to pickup the yarn. However the yarn passing the roller tends to tremble and may cause the knitting needle missing or not completely picking the yarn. The resulting fabrics could have rough surface or voids, and have lower fabric quality.

To remedy the problems, some producers design the yarn feeding section 12 with a guide slot 17 as shown in FIG. 2. The yarn leaving the roller 3 is directed to the guide slot 17 which may eliminate yarn trembling. But the yarn tends to incur floss when sliding and scraping in the guide slot 17 for a long period of time. The floss will accumulate in the guide slot 17 and could eventually block the slot and make yarn difficult to pass through the slot, and could result in yarn broken, or the floss will be carried along the yarn and knitted in the fabric and form snarls on the fabric surface. This also will result in poor fabric quality.

SUMMARY OF THE INVENTION

The primary objective of the invention is to resolve the foregoing disadvantages.

The invention aims to provide an improved yarn feeder which has a jutting section located at one end of the yarn feeder. The jutting section has either a curved surface, a slating surface or a substantially flat yarn directing surface to allow the third yarn

sliding over in a friction contact without producing floss or having the floss retained on the jutting section so that the yarn may be fed smoothly to the knitting needle without rupturing and knitting operation can be proceeded smoothly.

According to an aspect of the present invention, it is to provide an improved yarn feeder for a circular, knitting machine for supplying at least one yarn to a knitting needle located below the yarn feeder when the feeder is used on the knitting machine, the said feeder comprising: at least a body mounting to the circular knitting machine; and a yarn feeding section extending from a lower end of the body when in use, having at least one aperture for threading a yarn above the knitting needle, and a jutting section located at an end portion of the yarn feeding section, the jutting section having an external yarn directing surface for allowing further yarn to slide thereover without forming floss or allowing any floss retained on the jutting section and so as to prevent the yarn from rupturing during feeding to the knitting needle; wherein the yarn feeder is arranged to feed the further yarn to the knitting needle without the further yarn passing through an aperture on the yarn feeder.

Such an arrangement allows the yarn to slide further over the yarn directing surface in a friction contact without producing floss or having the floss retained on the member so that the yarn may be fed smoothly without rupturing.

According to another aspect of the present invention, it provides replacement of the jutting section with a protruding member which may be integrally formed with the yarn feeding section. The protruding member has a curved yarn directing surface to allow the third yarn sliding over in a friction contact without producing floss or having the floss retained on the protruding member so that the yarn may be fed smoothly without rupturing.

According to a further aspect of the present invention, it provides a fastening section at one end of the protruding member while the yarn feeding section has a fastening aperture formed at one end thereof. The fastening aperture has a fastening surface to engage with the fastening section. Or the fastening section may run through the fastening aperture and fastened by a screw nut for anchoring the protruding member on the yarn feeding section. The protruding member has the curved yarn directing surface to allow the third yarn sliding over in a friction contact without producing floss or having the floss retained on the protruding member so that the yarn may be fed smoothly without rupturing.

Preferred feature of the invention are set out in claims 2-10.

The foregoing, as well as additional embodiments, features and advantages of the invention will be more readily apparent from the following detailed description, which proceeds with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a conventional yarn feeder.

FIG. 2 is a perspective view of another conventional yarn feeder.

FIG. 3A is a perspective view of a yarn feeder of the invention.

FIG. 3B is a fragmentary enlarged view of FIG. 3A.

FIG. 4 is a front view of the yarn feeder according to FIG. 3A.

FIG. 5 is a side view of the yarn feeder according to FIG. 3A.

FIG. 6 is a fragmentary schematic view of another embodiment of the invention.

FIG. 7 is a fragmentary schematic view of yet another embodiment of the invention.

FIG. 8 is a fragmentary schematic view of still another embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 3A and 3B, the yarn feeder 1 of the invention is mounted to a circular knitting machine above knitting needles

(not shown in the drawings) for holding a plurality of yarns to be picked up by the rising knitting needles.

The yarn feeder 1 includes at least a body 11 and a yarn feeding section 12 extending from a lower end of the body 11. The yarn feeding section 12 has at least one aperture 13, 13' for a yarn to pass through. Another end of the yarn feeding section 12 has a jutting section 14 which has a curved or slanting or substantially flat yarn directing surface 15 to facilitate the yarn passing. The body 11 further has a slot 16 formed at a selected location to engage with an adjustment element 2. There is a yarn roller 3 mounting on the adjustment element 2 for directing a knitting yarn below the jutting section 14 to feed the yarn for the circular knitting machine to use in the knitting operations.

There is an anchor member 4, which has a mounting section 41 for fastening to the circular knitting machine. The mounting section 41 has one end extended to form a support section 42 which has a sliding slot (not shown in the drawing) formed thereon. The body 11 of the yarn feeder 1 is vertically mounted to the sliding slot of the support section 42. Hence the elevation of the yarn feeder 1 may be changed and adjusted on the anchor member 4.

Referring to FIGS. 4 and 5, when in use, the yarn feeder 1 is mounted to the circular knitting machine through the anchor member 4. The first yarn 5 and the second yarn 6 are threaded

respectively through the apertures 13 and 13'. The stretch third yarn 7 runs over the yarn roller 3, sliding over the yarn directing surface 15 of the jutting section 14.

During knitting operations, the first, the second and the third yarn 5, 6, 7 are moved respectively above the knitting needles. Then the knitting needles may be raised upwards to pick up the first yarn, the second yarn and the third yarn 5, 6, 7 for knitting the fabric. When the third yarn 7 slides over the yarn directing surface 15 of the jutting section 14, the third yarn 7 maintains a friction contact with the yarn directing surface 15. The third yarn 7 thus will be prevented from forming floss, or the floss will be retained on the jutting section 14. Hence rupturing of the third yarn 7 during feeding process can be prevented or minimized. The third yarn 7 thus may be delivered effectively above the knitting needle to facilitate smooth knitting operation and achieve better quality of the knitting fabric.

Referring to FIG. 6 for another embodiment of the invention, the jutting section 14 may be substituted by a protruding member 8, which may be integrally formed with the yarn feeding section 12. The protruding member 8 has a curvy yarn directing surface 81. When the third yarn 7 slides over the yarn directing surface 81 of the protruding member 8, the third yarn 7 maintains a friction contact with the yarn directing surface 81 and prevents the yarn from forming floss, or the floss will be retained on the protruding member 8. Hence rupturing of the

third yarn 7 during feeding process can be prevented or minimized.

Referring to FIG. 7 for yet another embodiment of the invention which is largely constructed like one shown in FIG. 6. The main difference is the construction of the protruding member 8. In this embodiment, the protruding member 8 has one end formed to a fastening section 82 with screw threads. The yarn feeding section 12 has a fastening aperture 121 formed at one end with a screw thread fastening surface 122 to engage with the fastening section 82. Another alternative is to have the fastening section 82 running through the fastening aperture 121 and engaging with a screw nut (not shown in the drawing) for fastening the protruding member 8 to the yarn feeding section 12. When the third yarn 7 slides over the yarn directing surface 81 of the protruding member 8, the third yarn 7 maintains a friction contact with the yarn directing surface 81 and prevents the yarn from forming floss, or the floss will be retained on the protruding member 8. Hence rupturing of the third yarn 7 during feeding process can be prevented or minimized.

Referring to FIG. 8 for still another embodiment of the invention, the jutting section 14' located on the yarn feeding section 12 is thinner than the jutting section 14 set forth in the previous embodiments. The jutting section 14' has a normal yarn directing surface 15' formed on one side thereof. The third yarn 7 may form a friction contact with the yarn directing surface 15' and prevent the yarn from forming floss, or the floss may be

retained on the jutting section 14'. Hence rupturing of the third yarn 7 during feeding process can be prevented or minimized.

While the invention has been described with reference to the preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made without departing from the spirit and scope of the invention.

CLAIMS

1. An improved yarn feeder for a circular, knitting machine for supplying at least one yarn to a knitting needle located below the yarn feeder when the feeder is used on the knitting machine, the said feeder comprising at least:

a body mounting to the circular knitting machine; and

a yarn feeding section extending from a lower end of the body when in use, having at least one aperture for threading a yarn above the knitting needle, and a jutting section located at an end portion of the yarn feeding section, the jutting section having an external yarn directing surface for allowing further yarn to slide thereover without forming floss or allowing any floss retained on the jutting section and so as to prevent the yarn from rupturing during feeding to the knitting needle;

wherein the yarn feeder is arranged to feed the further yarn to the knitting needle without the further yarn passing through an aperture on the yarn feeder.

2. An improved yarn feeder of claim 1, wherein the yarn directing surface has either a curved surface, or a slanting surface or a substantially flat .

3. An improved yarn feeder of claim 1, wherein the jutting section is a protruding member with a curved yarn directing surface.

4. An improved yarn feeder of claim 3, wherein the protruding member is integrally formed with the yarn feeding section.
5. An improved yarn feeder of claim 3, wherein the protruding member has a fastening section formed at one end thereof to engage with a fastening aperture formed on the yarn feeding section.
6. An improved yarn feeder of claim 5, wherein the fastening section is a screw.
7. An improved yarn feeder of claim 5, wherein the fastening aperture has a screw fastening surface.
8. An improved yarn feeder of claim 5, wherein the fastening section runs through the fastening aperture to engage with a screw nut.
9. An improved yarn feeder of claim 1, wherein the body has a slot formed to engage with an adjustment element, the adjustment element having a yarn roller mounted thereon for directing the yarn to pass under the jutting section.
10. An improved yarn feeder of claim 1, further having an anchor member adapted to be fastened to the circular knitting machine, the anchor member having a mounting section, the mounting section having one end extended to form

a support section which has a sliding slot formed thereon for fastening the body of the yarn feeder and allowing the yarn feeder moving on the anchor member for adjusting the elevation of the yarn feeder.

11. A yarn feeder for a circular knitting machine, substantially as described and illustrated herein with reference to Figs. 3A, 3B, 4-8.