

SINKER OF CIRCULAR KNITTING MACHINES FOR PILE FABRICS

FIELD OF THE INVENTION

The present invention relates to a sinker of circular knitting
5 machines for pile fabrics, and more particularly to a sinker for
circular knitting machines that provides a yarn positioning
function during the weaving process.

BACKGROUND OF THE INVENTION

Please refer to FIG. 1 for a conventional sinker of circular
10 knitting machines for pile fabrics. The conventional sinker
31 comprises a nose section 32, a support surface 33 being a
horizontal surface disposed on the nose section 32, and when
the sinker 31 draws back in the final step of the weaving
process, the weaving needle 34 pulls the bottom yarn and the
15 binding yarn of a yarn loop 35 down. Since the support
surface 33 does not have an inclined angle it is difficult to
maintain the angle of a plating loop when the yarn loop falls.
In other words, the angle of the plating loop is changed very
easily when the yarn loop falls, and thus will cause low quality
20 of fabrics.

Further, the sinker cylinder containing the sinker is rotated
at a high speed for weaving. Therefore, the sinker moves
back and forth in the driving path of the cam during
high-speed rotation. When the sinker cylinder rotates at a
25 high speed, a centrifugal force is produced to give the sinker a

large outwards swinging force towards the exterior of the circular knitting machine, such that a protruded plate cannot move smoothly along the driving path. The contact surface and contact angle of the protruded plate and the driving path
5 form several stress focal points which are worn repeatedly by the centrifugal force. The wear between the sinker and cam shortens their lifetime, and also increasing the cost of manufacture which in turn passes to the consumer.. Furthermore, the sinker cylinder contains thousands of sinkers,
10 operators have to examine and replace them frequently, thus seriously affecting productivity.

It is necessary to improve the shortcomings of the aforementioned circular knitting machine which is not cost-effective or efficient. The design of the present
15 invention can overcome the foregoing shortcomings and improvements upon the prior art.

SUMMARY OF THE INVENTION

The primary objective of the present invention is to provide a sinker with a perfect plating loop whilst knitting pile fabrics.

20 By designing an aslant surface on the nose section of the sinker; a perfect angle for the plating loop can be achieved by separating the old yarn ring from the aslant surface of the nose section when the weaving needle pulls the binding yarn and the bottom yarn lower than the abdominal section of the
25 sinker.

Another objective of the present invention is to provide a sinker assembly for circular knitting machines.

The sinker comprises a first end surface disposed at its throat section and a second end surface disposed at its abdominal section. Since the contact surface between the cam and the sinker cylinder of the circular knitting machine is designed to be aslant, therefore the sinker is installed onto the circular knitting machine with an inclined angle. After the sinker is installed, the first end surface is horizontal and the second end surface is aslant.

As the weaving angle and yarn angle are taken into consideration for the weaving process, the sinker of the circular knitting machine designed with the aslant feature is redesigned according to the principle of weaving movements for operating with circular knitting machines.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view of the movement of the plating loop of a prior-art sinker.

FIG. 2 is a planar view of the appearance of the sinker according to the present invention.

FIG. 3 is a side view of the sinker according to a preferred embodiment of the present invention.

FIGS. 4A~4G are views of the movement of the sinker in the weaving process according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED

EMBODIMENTS

The detailed description and technical characteristics of the present invention are described together with the drawings as follows.

5 Please refer to FIG. 2 for a preferred embodiment of this invention. In the figure, a sinker 10 comprises a nose section 11, a protruded nose 22, a throat section 12, and an abdominal section 13; wherein the nose section 11 has an aslant surface 111; the throat section 12 has a first end surface 121; the
10 abdominal section 13 has a second end surface 131 on one side; and a limit groove 23 is disposed between the nose section 11 and the protruded nose 22.

Please refer to FIG. 3. The sinker 10 is installed on the driving path 24 (which is a track disposed between the take-up
15 cam and take-down cam for driving a weaving needle for the vertical movement of the needle) of a cam 19 of the circular knitting machine by the protruded plate 21. Since the contact surface between the cam 19 and the sinker cylinder is inclined to an angle α , therefore when the sinker 10 is installed onto
20 the contact surface, the sinker is also inclined to an angle α , and the first end surface 121 is in a horizontal position.

Please refer to FIGS. 4A~4G for the movements of the sinker 10 and the weaving needle 14 in the weaving process
Please refer to FIG. 4A first. A weaving needle 14 pulls a
25 yarn loop 17 composed of a binding yarn 20 and a bottom yarn

16 down (see FIG. 4B), while the sinker 10 is moving forward and the weaving needle 14 moves upwards for the take-up. Please refer to FIG. 4B. The weaving needle 14 hooks the wool yarn 18 and prepares for the downward pulling
5 movement. Then, the yarn loop 17 falls to the root section of the weaving needle 14, and opens a latch needle 141.

Please refer to FIG. 4C. The weaving needle 14 pulls down the wool yarn 18 while the sinker 10 continues to move forward, such that the wool yarn 18 drives and hangs on a limit
10 groove 23 between the nose section 11 and the protruded nose 22 of the sinker 10. Please refer to FIG. 4D. The weaving needle 14 is protruded upward, such that the wool yarn 18 opens the latch needle 141 and casts off to fall to the bottom of the latch needle 141 of the weaving needle 14. The yarn loop
15 17 composed of binding yarn 20 and the bottom yarn 16 at the bottom of the latch needle 141 of the weaving needle 14 (as shown in FIG. 4A) further falls downward. Then, the weaving needle 14 hooks the binding yarn 20 and prepares to pull down the binding yarn 20.

20 Please refer to FIG. 4E. When the weaving needle 14 drives the binding yarn 20 to move downwards, the sinker 10 continues to move forward, and the latch needle 141 was closed by the upward movement of the yarn loop 17 to connect the wool yarn 18 and the binding yarn 20 into a string.

25 Please refer to FIG. 4F. The wool yarn 18 and the

binding yarn 20 still hook into the limit groove 23 between the nose section 11 and the protruded nose 22 of the sinker 10 after the wool yarn 18 and the binding yarn 20 are connected with each other into a string. Then, the weaving needle 14
 5 continues to move upward to halfway, so that the wool yarn 18 and the binding yarn 20 fall to open the latch needle 141, and the weaving needle 14 hooks a bottom yarn 16, and then the yarn loop 17 falls down further.

Please refer to FIG. 4G. The sinker 10 draws back to pull
 10 the weaving needle 14 down, and also pulls the binding yarn 20 and the bottom yarn 16 connected to the wool yarn 18 down. The yarn loop 17 composed of the binding yarn 20 and the bottom yarn 16 (as shown in FIG. 4A) binds the binding yarn 20 and the bottom yarn 16 together to form the yarn loop 17.
 15 As the sinker 10 draws back to let the yarn loop 17 composed of the binding yarn 20 and the bottom yarn 16 falls along the aslant surface 111 of the nose section 11 onto the second end plane 131 of the abdominal section 13 of the sinker 10. The aslant surface 111 allows the yarn loop 17 to have a better
 20 angle for the plating loop.

The above procedure is repeated to achieve the purpose of weaving fabrics with the sinker 10 and the weaving needle 14.

While the invention has been described by way of example and in terms of a preferred embodiment, it is to be understood that the
 25 invention is not limited thereto. To the contrary, it is intended to

cover various modifications and similar arrangements and procedures, and the scope of the appended claims therefore should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements and procedures.

What is claimed is:

1. A sinker of circular knitting machines for pile fabrics, being disposed on a circular knitting machine with an inclined angle for providing a positioning loop for a wool yarn, a bottom yarn, and a binding yarn, comprising:
a nose section, having a protruded nose coupled to one end of said nose section;
a throat section, disposed at a position adjacent to the another end of said nose section; and
an abdominal section coupled to said throat section, and said nose section having an aslant surface which provides a downward pulling on said bottom yarn and binding yarn in a knitting process to achieve a plating loop, the sinker being movable in an inclined direction during the knitting process.

2. The sinker of circular knitting machines for pile fabrics of claim 1, wherein said throat section comprises a first end surface, and said abdominal section comprises a second end surface, and said first end surface is coupled to said second end surface, and said first end surface is an aslant surface, such that said first end surface is a horizontal surface when said sinker is disposed in said circular knitting machine.

3. The sinker of circular knitting machine for pile fabrics of claim 1, further comprising a limit groove for positioning said wool yarn, bottom yarn, and binding yarn, and the limit groove being disposed at a position between said protruded nose and nose section.

4. The sinker of circular knitting machine for pile fabrics of claim 1, further comprising a limit groove positioned between the protruded nose and the nose section, the aslant surface of the nose section being a smooth, flat surface which extends from the limit groove.

5. The sinker of circular knitting machine for pile fabrics of claim 4, wherein the aslant surface of the nose section extends at an inclined, non-horizontal direction when the sinker is disposed in the circular knitting machine.

6. The sinker of circular knitting machine for pile fabrics of claim 5, wherein the throat section has a first end surface, the first end surface is a horizontal surface when the sinker is disposed in the circular knitting machine.

7. The sinker of circular knitting machine for pile fabrics of claim 1, wherein the nose section has a rounded end and wherein an undersurface of the nose section is a smooth, flat surface which extends from the rounded end to the throat section.

8. The sinker of circular knitting machine for pile fabrics of claim 1, wherein the throat section has a first end surface and the abdominal section has a second end surface, the second end surface extending from the first end surface and being a concave curved surface.