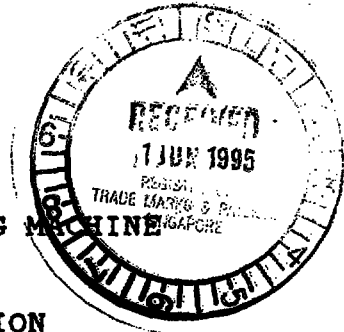




SINKER FOR A CIRCULAR KNITTING MACHINE

BACKGROUND OF THE INVENTION

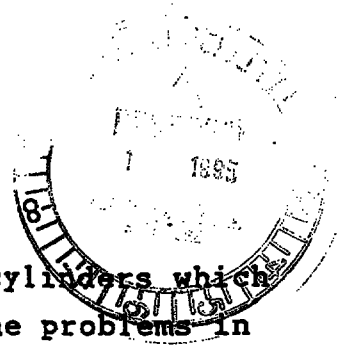
Generally, piles on the toweling or double plush are formed by separately guiding a pile yarn and a ground yarn to an upper and a lower part of a sinker in the course of knitting, so that loops of the pile yarn and the ground yarn formed on the sinker can not be pulled to the same height by a latch needle. Thereby, the pile yarn passing the upper part of the sinker forms the piles. No matter what knitting method is adopted to form the piles, the sinker is a necessary element.

There are many different structural designs made to improve the sinker so as to obtain better and desired knitting manner and to result in more beautiful patterns. The knitted fabrics can be structurally divided into fabric with thicker and thinner piles. Knitted fabrics with either thicker or thinner piles can have better quality only when the sinker is properly designed. Presently, most of the sinkers are designed to knit fabrics with thicker piles. But, there are also some sinkers improved from sinkers used to knit fabrics with thinner piles. However, all of these sinkers have some or other disadvantages. Fig. 1 illustrates a sinker C designed for knitting fabrics having thicker piles. The sinker C has two recesses C1 separately formed at either side of a front portion of the sinker C, such that the recesses C1 vertically extend the whole height of the front portion of the sinker and give that portion a thickness smaller than that of the remaining part of the sinker. When the sinker C moves forward or backward and the



latch needle B moves upward and downward to work alternately, the latch needle B shall have larger space to move due to the thinner front portion of the sinker between the two recesses C1. At this point, cotton dust produced during the knitting shall easily settles on a nose slot C3 defined between a nose C2 of the sinker C and the front portion thereof, instead of falling on the latch needle B. Then, when a next yarn passing the nose slot C3 to form another pile, the dust previously settled on the nose slot C3 shall be brought out of the nose slot C3 by the next yarn and falls along the recesses C1 to accumulate on the knitting machine.

As it can be clearly seen from Fig. 2, when the sinker C moves backward and out of a corresponding channel A1 on the knitting machine, it shall moves forward again. Cotton dust 3 shall follow the forward moving sinker C and enters the channel A1 and clogs the same. A clogged channel A1 has reverse influence on the operation of the sinker and even shortens the life of the sinker after a long period of time. A sinker with such vertically extended recesses at two sides indeed solves some problems found in the earlier stages, such as the smooth operation of the latch needle, it on the other hand allows the cotton dust to fall into the channel A1 because the thickness of the front portion of the sinker C (that is, the thickness between the two recesses C1) is smaller than the width of the channel A1 and the sinker C operates in the channel A1. The clogged channels A1 shall cause the individual sinkers C to move at different speeds and the piles so formed shall have inferior or crinkly texture. In addition, it is a time- and labor-consuming work to clean the needle cylinder and the channels A1.



There are many patents granted to needle cylinders which have improved or new structure to solve the problems in connection with the cotton dust. These improved or new needle cylinders may probably have the expected effect, but the cotton dust problem occurs on the sinkers has not yet been effectively resolved.

SUMMARY OF THE INVENTION

A primary object of the present invention is to provide a sinker for a circular knitting machine which may prevent cotton dust produced during the knitting process from falling into the channel of the needle cylinder in which the sinker operates to form piles. The sinker according to the present invention has two L-shaped recesses symmetrically formed at two lateral upper sides of a front portion thereof, giving the upper half of the front portion a narrower thickness than the remaining part of the sinker. Moreover, the narrowed upper half of the front portion of the sinker, that is, where the two L-shaped recesses locate, is above the channel of the needle cylinder when the sinker moves into the channel. With this arrangement, the cotton dust possibly produced during a fabric having thicker piles is knitted shall fall onto the lower edges of the two L-shaped recesses. When the sinker is moved back and forth at a considerably high speed in the course of knitting, the cotton dust settled on the L-shaped recesses shall be completely removed from the sinker without reversely affecting the pile texture and the quality of the knitted fabrics.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned and their objects of the present invention, as well as the structure and techniques adopted to achieve such objects can be better understood by referring to the following detailed description of the preferred embodiments and the accompanied drawings, wherein

Fig. 1 is a perspective view showing a conventional sinker;

Fig. 2 is a top plan view showing a conventional sinker moving into a needle cylinder;

Fig. 3 is a perspective view showing a first embodiment of the sinker according to the present invention;

Fig. 4 illustrates the position of a sinker of the present invention in a needle cylinder;

Fig. 5 is an enlarged, fragmentary, perspective view showing in more details the position of a sinker of the present invention in a needle cylinder;

Figs. 6 and 7 illustrate the manner in which cotton dust settled down on the sinker is removed therefrom; and

Figs. 8A and 8B illustrate another two embodiments of the sinker according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please refer to Figs. 3 through 8. In these drawings, like elements will be denoted by the same reference numerals.

Fig. 3 illustrates a sinker 1 formed according to the present invention. The sinker 1 includes a main body and a nose 11 formed at a front top portion of the main body. The nose 11 has a ridge portion extending upward and forward to merge in a curve-profiled front end. Behind the front end there is a backward extended lower portion of the nose 11, which together with an upper front portion of the sinker 1 below the nose 11, define a nose slot 12 therebetween. The upper front portion of the sinker 1 further has a thinner upper half, such that two substantially L-shaped recesses 13 are symmetrically formed at either side surface of the upper front portion of the sinker 1 to extend along a longitudinal axis of the sinker 1. The L-shaped recesses 13 have chamfered and rounded corners and are formed on the upper front portion of the sinker 1 at such a height that, when the sinker 1 is moved into a needle cylinder 2 with its front upper portion extended into and located at one of the channels 21 formed on top of the needle cylinder 2, the recesses 13 shall be sufficiently higher than a top plane of the channels 21. Multiple pieces of sinker 1 are separately located in the channels 21 side by side and moved in and out the channels 21 in a synchronous manner, and therefore, description of the movement of only one individual sinker 1 shall be made herein.

As shown in Figs. 4 and 5, there are multiple channels 21 provided on the needle cylinder 2. Cam plates 6 for controlling the movement of latch needles B are fixed onto a base 8 so that they are located at outer side of the needle cylinder 2 to surround the latter. The sinker 1 each is seated on a sinker ring 4 surrounding the needle cylinder 2 and is movably received in one of the beds formed on a top portion of the sinker ring 4. A cover 5 is disposed above.

the sinker ring 4 to control the movement of the sinkers 1. A yarn feeding means 7 is fixed to an outer end of the cover 5 to feed pile yarn and ground yarn for forming piles by the sinkers 1 and the latch needles B.

As it can be more clearly seen from Fig. 5, the main body of the sinker 1 has a thickness the same as the width of the channel 21, and the narrowed upper half of the sinker 1 at where the L-shaped recesses 13 are formed upward projects beyond the channel 21. When the latch needles B work together with the sinkers 1 to knit piles, the knitting operation is always done within an area defined by the nose 11 and the nose slot 12. When viewing from the front end of the sinker 1, steps are formed between the L-shaped recesses 13 and the top plane of the channels 21, leaving an operating distance between the two elements.

Figs. 6 and 7 illustrate how cotton dust falls onto the L-shaped recesses 13 when the sinker 1 works with the latch needle B to knit piles, especially when the piles are densely knitted. When the sinker 1 is moved forward toward the needle cylinder 2 for forming a pile, or, when the latch needle B is moved downward to knit the pile, most of the dust 3 from the yarn shall fall and settle to attach to the nose 11 and the nose slot 12. When the sinker 1 and the latch needle B return to their respective original position to knit the next pile, the sinker 1 is moved forward again to form a pile, and the latch needle B is moved upward to pull the pile. When the latch needle B is moved downward again, dust on the nose 11 and the nose slot 12 is brought down from the nose 11 and the nose slot 12 along with the pile and falls on the two L-shaped recesses 13 on either side of the sinker 1. At this point, the pile is

continuously pulled by the latch needle B to a proper position and the sinker 1 keeps moving forward until it reaches a foremost front position it is allowed to. Since the L-shaped recesses 13 are laterally formed on two sides of the sinker 1, they form a barrier to prevent the dust from falling down into the channel 21, at least not falling in large quantity. A blower nozzle (not shown) disposed outside the channel 21 is used to help blowing any dust 3 away from the sinker 1 and out of the channel 21. By this way, dust settled on the sinker 1 can be brought away without cumulating on the L-shaped recesses 13 due to the forward and backward movements of the sinker 1 at a considerably high speed. It is therefore not required to shut down the whole knitting machine for the purpose of cleaning the channels 21.

What to be noted is the sinker 1 with two L-shaped recesses 13 on either side thereof as disclosed by the present invention is designed mainly for knitting a textile having thicker piles. There are, of course, other sinkers designed to knit thinner piles.

Figs. 8A and 8B illustrate another two embodiments of the sinker 1 of the present invention for use in different knitting manners. In Fig. 8A, the L-shaped recess 13 has a centrally upward curved bottom. In Fig. 8B, the L-shaped recess 13 has a bottom edge slightly declines forward and downward. In either case, the recesses 13 laterally formed on two sides of the sinker 1 are designed to prevent dust 3 from cumulating on the sinker 1 and/or the channel 21 so as to avoid any reverse influence on the pile textures and the quality of knitted fabrics.



What is claimed is:

A sinker for a circular knitting machine, comprising a main body, a nose formed on a front top portion of said main body, and a nose slot defined between said front top portion of said main body and said nose; said sinker having an upper front portion having a thinner upper half than the remaining part of said sinker, such that two recesses each having a substantially L-shaped cross section are symmetrically formed at either side of said upper front portion of said sinker to extend along a longitudinal axis of said sinker, said L-shaped recesses receiving cotton dust attached to said nose and said nose slot and falling down during the forward and backward movements of said sinker to form piles, and permitting said dust to be removed either from a front end or from a rear end of said sinker when said sinker is reciprocated back and forth at a considerably high speed.