

**AN ASSEMBLED NEEDLE CYLINDER OF A CIRCULAR STRUCTURE
OF A CIRCULAR KNITTING MACHINE**

BACKGROUND OF THE INVENTION

The present invention relates to an assembled needle cylinder of a circular knitting machine.

The needle cylinder of a conventional circular knitting machine can be disassembled apart. The base seat of the main body is formed with an L-shaped annular groove on inner side and the upper seat of the main body is also formed with L-shaped annular groove on bottom end, whereby a movable cylinder block can be disposed in the two L-shaped annular grooves by an adjusting bolt. The distance between the base seat and the upper seat of the main body can be increased or decreased in order to remove accumulated cotton chips on the periphery of the movable cylinder block. Therefore, the knitting machine can be kept clean and the using life thereof can be prolonged. Moreover, in case the double-side needle cylinder is abraded, the same can be partially replaced.

However, some shortcomings still exist in the above arrangements. For example, the double-side needle cylinder includes transversely and longitudinally operated needles which pass across one another.

Therefore, the cotton chips produced during the knitting operation tend to accumulate on the upper body of the double-side needle cylinder. After a period of time, the cotton chips will such accumulate to affect the movement of the needles and thus the yarn will fail to be knitted in a straight pattern. Therefore, the quality of the product will be undesired.

SUMMARY OF THE INVENTION

It is therefore a primary object of the present invention to provide an improved assembled needle cylinder of a circular knitting machine, which includes an upper body (upper needle cylinder) and a main body (lower needle cylinder). The upper body is ring-like for the upper needles to operate thereon. A bottom face of outer periphery of the upper body is slant and several slightly inclined exhausting openings are formed on the outer periphery of the upper body. The base seat of the main body is formed with multiple needle channels on outer side and the upper side of the base seat is inclined and formed with L-shaped annular groove on which thread holes are disposed. The upper seat of the main body has an inclined bottom face corresponding to and parallel with the inclined upper side of the base seat. L-shaped annular groove is formed on the bottom face of the upper seat corresponding to the L-shaped

annular groove of the base seat and through holes are formed on the top face of the upper seat, whereby a bolt can pass through the through hole of the upper seat and the cylinder block into the thread hole of the base seat to movably dispose the cylinder block in the L-shaped annular groove of the upper seat and the L-shaped annular groove of the base seat. According to the above arrangements, the cotton chips produced during the knitting operation can drop down through the exhausting hole of the upper seat and from the movable cylinder block without remaining on the needle cylinder. Even after a long period of operation, the cotton chips accumulating on the needle cylinder can be easily removed so as to prolong the using life thereof. Moreover, the circular periphery of the movable cylinder block prevents the cotton chips from easily attaching thereon and the cylinder block can be easily disassembled from the base seat and upper seat to facilitate the removing of the cotton chips.

The present invention can be best understood through the following description and accompanying drawing, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a sectional view of a needle cylinder and

needles of a conventional circular knitting machine, showing the operation thereof;

Fig. 2 is a perspective sectional view of the main body of the needle cylinder of the present invention;

Fig. 3 is a perspective sectional view of the upper body of the needle cylinder of the present invention;

Fig. 4 is a sectional view of the upper body and the main body of the needle cylinder of the present invention; and

Fig. 5 is a sectional view according to Fig. 4, showing the operation of the needles on the main body of the needle cylinder.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Please refer to Figs. 2 to 5. The assembled double-side needle cylinder of the present invention includes a main body composed of a base seat 1 and an upper seat 2 and an upper body 3.

The base seat 1 and upper seat 2 are annularly shaped. The outer periphery of the base seat 1 is formed with multiple equally spaced vertical needle channels 11 each of which snugly receives one needle B and permits the needle B to vertically operate therewithin. The top face 12 of the base seat 1 is inclined from outer side to inner side and is formed with L-shaped annular groove

13. Several thread holes are formed on the annular groove 13. The upper seat 2 is disposed on the base seat 1. An outer half of the upper seat 2 is formed with an inclined bottom face 22 parallel to the top face of the base seat 1. Multiple needle channels 21 are formed on the outer periphery of the upper seat 2 in alignment with the needle channels 11 of the base seat 1. An inner half of the upper seat 2 is planely shaped and formed with multiple retaining holes 24 corresponding to the thread holes of the L-shaped annular groove 12 of the base seat 1. The bottom face of the upper seat 2 is formed with an L-shaped annular groove 23 corresponding to that of the base seat 1, whereby a cylinder block 4 is movably disposed in the L-shaped annular grooves 23, 13 by a bolt 5 which passes through the retaining hole 24 and the cylinder block 4 into the thread hole of the base seat 1 to confine the cylinder block 4 in the L-shaped annular grooves 13, 23.

The upper body 3 is transversely disposed on the main body and is formed with multiple needle channels 31 for knitting needles to operate therewithin. A guide groove 32 is formed near a front end of the upper body 3 for the cotton chips C to rest thereon. Several equally spaced and slant exhausting holes 33 are disposed on the guide groove 32. The bottom face of the front end of the upper body 3 is inclined so that after the upper body 3

is assembled with the base seat 1 and upper seat 2, a fissure is defined thereby for facilitating exhaustion of the cotton chips C produced during the knitting operation.

Please refer to Fig. 4. After assembled, the upper body 3 is transversely disposed while the base seat 1 and upper seat 2 of the main body are longitudinally disposed to form a fissure. The cylinder block 4 is locked in the two L-shaped annular grooves 13, 23 by the fixing bolt 5 which passes through the retaining hole 24. The inclined faces 12, 22 in cooperation with the cylinder block 4 form a slide passage for the cotton chips to slide down. Other cylinder blocks 4 with different dimensions can be used instead of the original one to adjust the size of the slide passage.

After the knitting operation, the needles B in the needle channels 31 of the upper body 3 will return and pass through the guide groove 32 thereof. At this time, the cotton chips attaching on the needles B will drop through the inclined exhausting holes 33 so as not to affect the knitting operation.

Referring to Fig. 5, the movable cylinder block 4 is confined in the L-shaped annular grooves 13, 23 by the fixing bolt 5. The fixing bolt 5 can be tightened or

loosened as necessary. When tightened, the movable cylinder block 4 is prevented from moving. However, after a period of knitting operation, when a certain amount of cotton chips accumulate at the corners contained by the L-shaped annular grooves 13, 23 and the movable cylinder block 4, the knitting machine can be temporarily stopped and the fixing bolt 5 can be slightly loosened so as to rotate the movable cylinder block 4. Therefore, the cotton chips C can be rotated outward to drop outside the base seat 1 and the upper seat 2. In fact, the circular outer periphery of the cylinder block 4 makes the cotton chips not so easily accumulate on the inclined face 12 of the base seat 1. Therefore, the cotton chips are likely to continuously drop outside the base seat 1. In case the cotton chips still tend to accumulate between the inclined faces 12, 22, the cylinder block 4 can be replaced with a relatively high one to increase the space between the two inclined faces 12, 22. As a result, it will be more difficult for the cotton chips to accumulate thereon.

In conclusion, the cylinder block is disposed between the base seat and the upper seat to effectively exhaust the cotton chips. The dimension of the cylinder block can be increased or decreased in accordance with the condition of the knitting operation. In addition, the upper body is formed with an inclined exhausting

hole to facilitate the cleaning of the cotton chips and save the cost and time for cleaning the knitting machine. In addition, when the needle cylinder is abraded or damaged, only the damaged part needs to be replaced so that the knitting machine can be more economically used.

It is to be understood that the above description and drawings are only used for illustrating one embodiment of the present invention, not intended to limit the scope thereof. Any variation and derivation from the above description and drawings should be included in the scope of the present invention.

WHAT IS CLAIMED IS:



1. An assembled needle cylinder of a circular knitting machine, comprising a main body composed of a base seat and an upper seat and an upper body, said needle cylinder being characterized in that:

said base seat is annularly shaped, having an outer periphery formed with multiple equally spaced vertical needle channels, a top face of said base seat being inclined from outer side to inner side and formed with L-shaped annular groove, several thread holes being formed on said annular groove;

said upper seat is annularly shaped and disposed on the base seat, having an outer half formed with an inclined bottom face, multiple needle channels being formed on the outer periphery of the upper seat in alignment with the needle channels of the base seat, an inner half of the upper seat being planely shaped and formed with multiple retaining holes corresponding to the thread holes of the L-shaped annular groove of the base seat, said bottom face of the upper seat being formed with an L-shaped annular groove corresponding to that of the base seat;



a cylinder block is movably disposed in the L-shaped annular grooves of the base seat and upper seat by a bolt which passes through the retaining hole and the cylinder block into the thread hole of the base seat to confine the cylinder block in the L-shaped annular grooves; and

said upper body is transversely disposed on the main body and is formed with multiple needle channels, a guide groove being formed near a front end of the upper body, several equally spaced and slant exhausting holes being disposed on the guide groove.

2. A needle cylinder as claimed in claim 1, wherein said inclined bottom face of said upper seat is parallel to the inclined face of said base seat of said main body.

3. A needle cylinder as claimed in claim 1, wherein said upper body and main body are assembled to define a fissure which in cooperation with said exhausting hole of said upper body prevents the cotton chips from accumulating on said upper body.



4. A needle cylinder as claimed in claim 1, wherein said cylinder block can be replaced with a relatively high or low one to increase or decrease the dimension of a space between the inclined bottom face of said upper seat and the inclined top face of said base seat for the cotton chips to drop outside, said cylinder block being rotatable to exhaust the cotton chips attaching between the cylinder block and the L-shaped annular grooves.