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(54) Device for preventing sinkers from picking up yarn in a double cylinder circular knitting machine.

(57) To avoid yarn picking up by the sinkers associated with sliders being progressively deactivated while knitting the heel portion of a stocking article, the sliders (1), at the end thereof far from the needle engaging end, are formed with a notch (10). This notch is designed to engage the yarn (11) and raise it as the sliders (1) are lifted by the slider lifting pickers upon removal from knitting of the associated needles (9). The sliders (1) may be lifted to a position such that the notch (10) is brought above the hook (7) of the respective sinkers (6) which, accordingly, cannot engage with the yarn during the withdrawal phase. Thus, the bluff sinkers and related ears on the sliders for lifting the bluff sinkers can be eliminated, and the machine made simpler and less expensive to build, as well as less liable to give trouble from breakage of the ears and bluff sinkers.

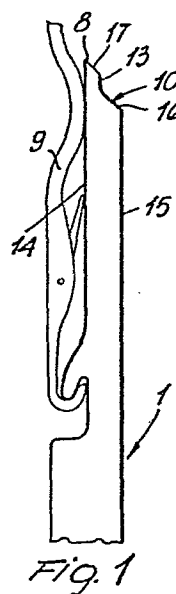


Fig. 1

"DEVICE FOR PREVENTING SINKERS FROM PICKING UP YARN
IN A DOUBLE CYLINDER CIRCULAR KNITTING MACHINE"

This invention relates to a device for preventing sinkers from picking up yarn in a double cylinder circular knitting machine.

It is known that in knitting the heel portion
5 of a stocking article, the sinkers associated with the needles being deactivated must be prevented from engaging, during withdrawal into the sinker ring, with the yarn being fed to the needles at work on the pocket of the heel portion. This is specially
10 true of those sinkers which happen to be adjacent the needles being progressively deactivated.

To that aim, prior machines are provided with a device comprising, for each sinker in the set associated with the ring of the deactivated needles,
15 a false sinker or bluff sinker located in the same groove as the respective sinker but hookless and formed with a smooth continuous upper corner edge. The bluff sinker, which is formed with a butt end similarly to its respective adjacent sinker,
20 substantially performs the same movement as the sinker proper, but in addition thereto, may be raised to cover the inlet to the recess underlying the sinker hook, thereby the yarn is held raised above the smooth continuous corner edge of the bluff sinker and
25 cannot be engaged by the sinker hook.

Lifting of the bluff sinkers, which during the home or rest phase extend beneath the sinkers, is effected by the associated sliders in the lower cylinder, which are appropriately provided with a

respective side ear projecting from the lateral plane of the sliders. Lifting occurs as the needles are being taken out of work by conventional slider lift pickers. Thus, it is the sliders themselves that
5 move out of work the associated needles which will cover the inlet to the sinker notches or recesses.

This device, which requires approximately that one half of the machine sliders be provided with a ear, and that respective bluff sinkers be associated
10 with about one half of the sinkers, involves additional manufacturing costs both on account of the ears to be formed partly on one side and partly on the other side of the sliders because removal of the needles from work takes place in either directions
15 of the needle cylinder reciprocation, and because of the grooves in the sinker ring having to be made wider where the bluff sinkers must be received.

Furthermore, considerable wear of the bluff sinkers and ears occurs due to mutual chafing. The
20 presence of the various parts just described also increases the risk of the knitting cycle being interrupted by failure of sinkers, bluff sinkers, or ears.

It will be appreciated that the expensive construction involved in this device is a significant
25 disadvantage if it is considered that the device is only operative for knitting the heel portion, and possibly the toe end of a stocking article, the bluff sinkers and ears being quite useless for most of a stocking article knitting.

It is a primary object of this invention to provide a device which can prevent sinkers from picking up yarn, through very simple and economical arrangements.

5 A further object of the invention is to provide such a device which can even do without the bluff sinkers and ears on the sliders, with the advantage that all the sliders can be made to the same design and the sinker grooves made all with the same width.

10 These and other objects, such as will be apparent hereinafter, are accomplished by a device for preventing sinkers from picking up yarn in a double cylinder circular knitting machine, wherein flat lateral surface sliders are associated with the sinkers, characterized in that the sliders are formed, at the
15 end thereof far from the needle engaging end, with a notch for engaging with the yarn, and that the sliders can be raised to a position whereat said notch is located above the level of the sinker hooks.

Advantageously, a device of this type requires
20 neither bluff sinkers nor ears on the sliders, because it is the sliders themselves that effect the raising of the yarn above the sinker hooks on withdrawal from work of the associated needles. Thus, the sinker ring can be made with a set of identical grooves, which
25 brings to an appreciable advantage in the manufacture of the sinker ring and also the slider construction is simplified, for improved manufacturing economy. The absence of bluff sinkers and ears also eliminates a source of wear and potential failure. The sliders according to the
30 invention may, of course, be used also throughout the lower cylinder. In fact, the notch at the tip end

will cause no trouble during normal knitting, it playing no role in it, and does not even affect conventional opening of the latches as the needles are being transferred between the cylinders.

5 Further details and advantages of the invention will be more readily understood from the following detailed description of a preferred, but not exclusive, embodiment thereof, with reference to the accompanying illustrative drawings, where:

10 Figure 1 is a fragmentary view of a slider according to the invention;

Figure 2 is a perspective view of one portion of the lower cylinder in a double cylinder machine, which illustrates the invention; and

15 Figure 3 is a diagrammatic developed view of the cylinder portion shown in Figure 2, also illustrating schematically the means of lifting the sliders and some typical cams.

A double cylinder circular knitting machine
20 incorporating a device according to the invention is provided conventionally with a plurality of sliders 1 which are movable in grooves 2 of the lower needle cylinder 3. Associated with the sliders 1, within grooves 4 interleaved in the ring 5 to the grooves 2,
25 are conventional sinkers 6 having a hook 7.

The sliders 1 have flat lateral surfaces because not formed with conventional side ears. The grooves 4 only accommodate sinkers 6, and no bluff or false

sinkers as well. Thus, the grooves 4 have all the same width, that is to say, the grooves 4, which accommodate the sinkers 6 associated with the needles being deactivated while knitting the heel portion of a stocking article, have all the same width dimension as the grooves 4 which accommodate the remaining sinkers 6.

The sliders 1 are formed, close to the tip 8, and at the opposite end to the end engaging with the needles 9, with a notch 10 adapted to engage the yarn 11, and may be raised to a position whereat the notch 10 is located at a higher level than the hooks 7 of the sinkers 6.

In that way, as one slider 1 is lifted by the slider lift picker 12 during the decrease phase in knitting the heel portion of a stocking article, the notch 10 will engage with the yarn 11 and take it along upwards, thus preventing it from being hooked up by the hook 7 of the adjacent sinker 6 as the sinker 6 is conventionally withdrawn toward the ring 5.

Likewise, the notches 10 in the previously lifted sliders 1, whereat those needles 9 which have been removed from work correspond, prevent the yarn 11 from returning back to the level of the hooks 7 of the sinkers 6.

According to a preferred embodiment of the invention, the notch 10 is defined by a section 13 extending substantially parallel to the longitudinal corner edges 14,15 of the slider 1, said section 13 merging into a section 16 which extends substantially

parallel to the sloping upper edge 17 of the slider 1 which converges into the tip 8. The notch 10 is, therefore, open toward the machine outside, i.e. on the opposite side of the slider 1 to that engaged by the needles 9. Thanks to the pull exerted on the yarn 11 by the last sinker 6 which hooked up the yarn 11, the configuration shown ensures correct raising of the yarn 11 without any risk of its slipping down along the notch 10. It also facilitates release of the yarn 11 as the sliders 1 are returned to the working track with the respective needles 9.

It may be appreciated that this slider design can do without the ears and bluff sinkers, and that the machine as a whole can have a simpler, and hence less expensive, construction, while affording reduced maintenance problems and freedom from trouble due to breakage of the ears and bluff sinkers by virtue of an improved mechanical drive of the sinkers 6 and sliders 1.

The sliders 1 described hereinabove may be used throughout the machine, i.e. throughout the lower cylinder or just at that portion which carries needles intended to be deactivated during the heel portion knitting as the work progresses.

It should be noted that the notch 10 bears no influence on the configuration of the slider tips 8, which can thus retain its function of conventionally opening the latches of the needles 9.

The invention as disclosed hereinabove is susceptible to many modifications and variations

without departing from the scope of the instant inventive concept. Thus, as an example, the notch 10 could be configured otherwise than shown, with non-parallel sections to the corner edges 14, 15 or 17.

CLAIMS

1 1. A device for preventing sinkers from picking
2 up yarn in a double cylinder circular knitting machine,
3 wherein flat lateral surface sliders (1) are associat-
4 ed with the sinkers (6), characterized in that the
5 sliders (1) are formed, at the end thereof far from
6 the needle engaging end, with a notch (10) for engag-
7 ing with the yarn (11), and that the sliders (1) can
8 be raised to a position whereat said notch (10) is
9 located above the level of the sinker hooks (7).

1 2. A device according to Claim 1, characterized
2 in that said notch (10) has a section (13) substantially
3 parallel to the slider longitudinal corner edges (14,
4 15), said section (13) merging into a portion (16)
5 substantially parallel to a sloping upper corner edge
6 (7) converging toward the slider tip (8).

1 3. A device according to either Claim 1 or 2,
2 characterized in that the sliders (1) can be lifted
3 to said raised position by slider lift pickers.

1 4. A device according to one or more of the
2 preceding claims, characterized in that the grooves
3 (4) accommodating sinkers (6) associated with deacti-
4 vated needles (9) during the knitting of the heel
5 portion of a stocking article have all the same width
6 as the grooves (4) accommodating the remaining
7 sinkers.

1 5. A slider for a double cylinder circular knitting
2 machine, having flat lateral surfaces (14, 15), char-
3 acterized in that, at the end thereof far from a
4 needle engaging end, it comprises a notch (10) for

5 engaging with the yarn (11) and raising it above the
6 level of sinker hooks (7).

1 6. A slider according to Claim 5, characterized
2 in that said notch (10) is substantially open upwardly
3 and toward the machine outside.

1 7. A slider according to Claim 5 or 6, characteriz-
2 ed in that said notch (10) has a section (13) substan-
3 tially parallel to the slider longitudinal corner edges
4 (14, 15), said section (13) merging into a portion (16)
5 substantially parallel to a sloping upper corner edge
6 (7) converging toward the slider tip (8).

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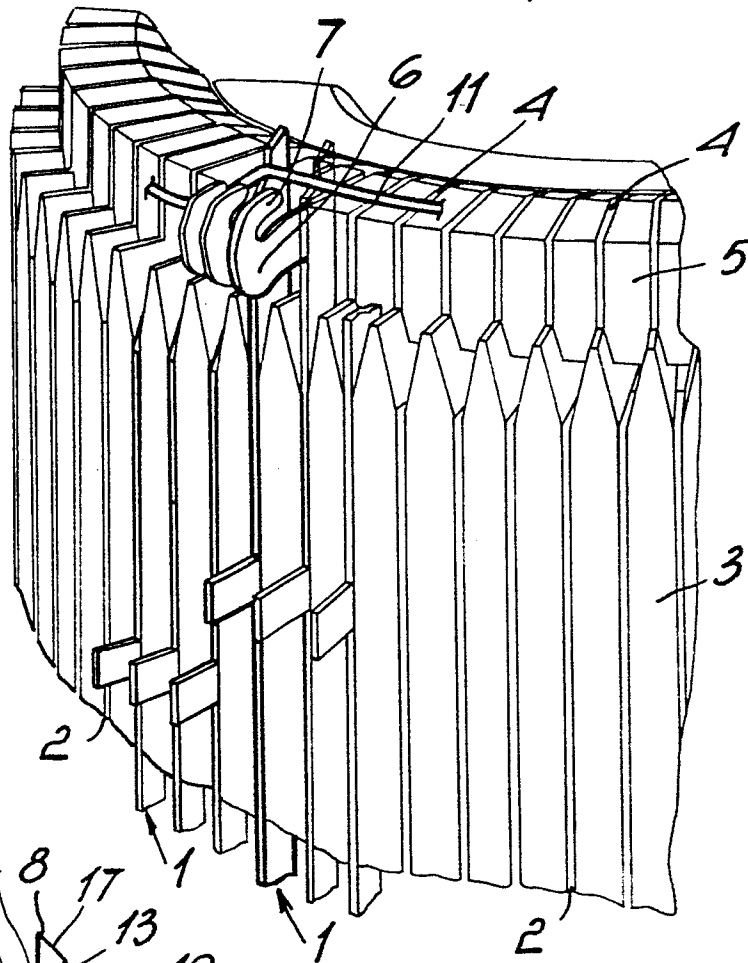


Fig. 2

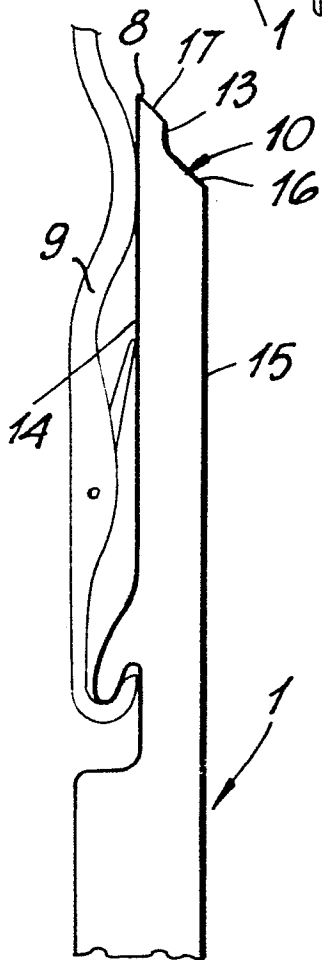


Fig. 1

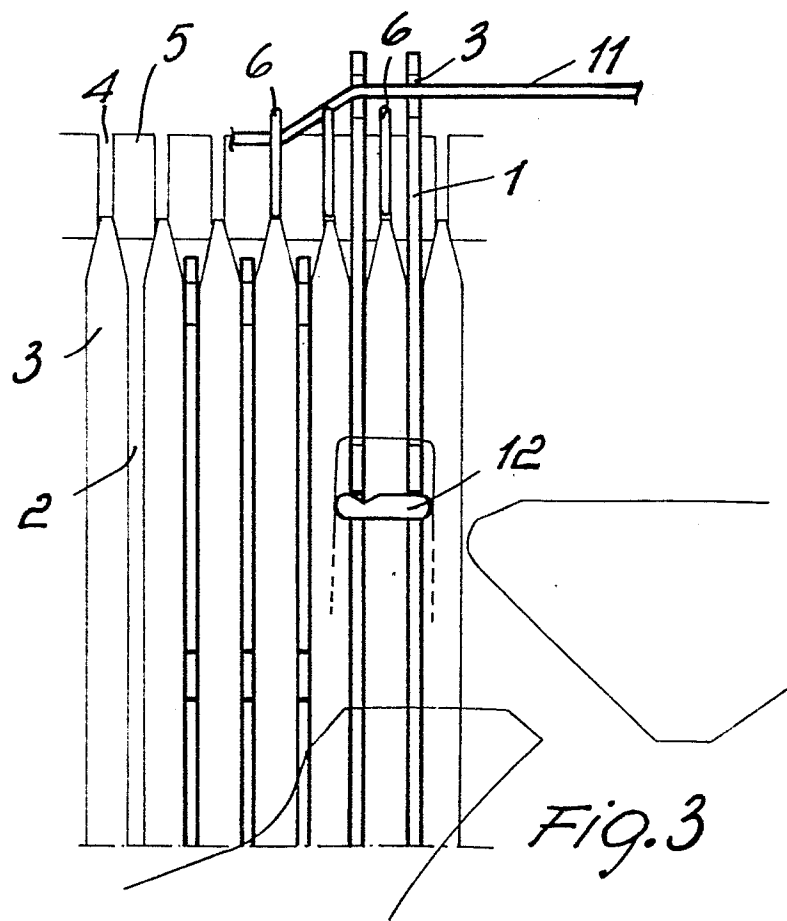


Fig. 3