Aug. 4, 1953 K. HOWIE 2,647,382

KNITTING MACHINE SINKER CONTROLLING MEANS

Filed Oct. 21, 1948

Fig. 1.

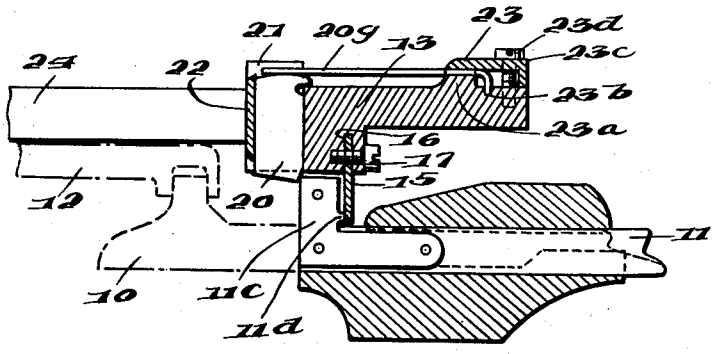


Fig. 2.

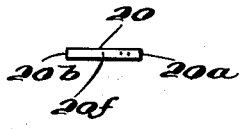


Fig. 3.

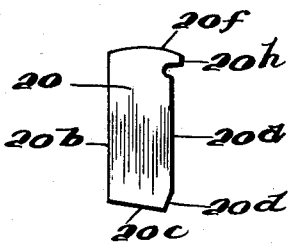
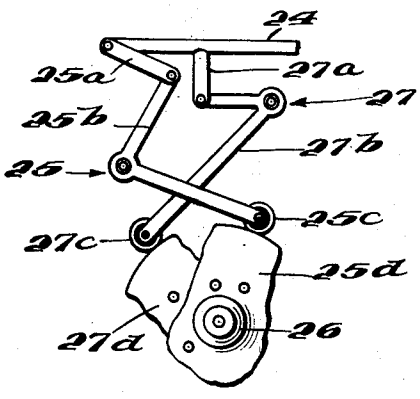


Fig. 4.



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KNITTING MACHINE SINKER CONTROLLING MEANS

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29 Claims. (Cl. 66—110)

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This invention relates to knitting machines and is particularly, but not exclusively, adapted to full fashioned knitting machines of the Cotton type, and aims generally to provide new and advantageous sinker controlling means for such machines.

A particular object of the invention is to provide sinker control means for such machines constructed and arranged to insure against the inaccuracies of stitch measurement frequently met with in the practical operation of prior machines.

More detailed objects, severally and interdependently, are to provide a cyclically movable verge plate which serves as a sinker retracting element; to provide a verge plate combined with the sinker retracting or catch-bar mechanism and moving therewith; to provide sinker latches carried by the sinker retracting or catch-bar mechanism and moving therewith; to provide unique sinker-latches which cam the sinkers against the verge plate; and to provide simple and efficient mountings for the verge plate and sinker-latch elements.

Other objects and advantages of the several features of the invention will be apparent from the following description of an illustrative embodiment thereof.

The invention comprises the new features of construction and the novel combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawings illustrative of a preferred embodiment of the invention.

Fig. 1 is a more or less diagrammatic side view showing an arrangement of jack-sinkers, with the catch-bar, verge plate and sinker-hooks or latches therefor, in association with a sinker head, dividing sinkers, and dividing sinker catch-bar, the latter being shown in dotted lines;

Figs. 2 and 3 are details in plan and side elevations of the sinker hook or latch element of Fig. 1; and

Fig. 4 is a diagrammatic side view illustrating one mode of operating the jack-sinker catch-bar and its associated parts.

Full fashioned knitting machines of the Cotton type employ jack-sinkers and dividing sinkers to sink the yarn between the needles and measure the stitches. For brevity these may be termed "sinkers" and "dividers," respectively.

The sinkers are advanced sequentially through the sinker head, usually between alternate pairs of needles, by the operation of the slur-cock as the yarn is fed to them. They come to rest

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against a verge plate or folding-bar, which heretofore, as shown in my prior Patent No. 1,958,823, has generally been adjustably mounted on the sinker head.

In full fashioned knitting machines of the type to which my Patent No. 1,958,823 pertains, the sinkers are held against the verge plate by sinker-hooks or latches carried by an adjustable latch-bar located above the verge plate. When (due to poor visibility, carelessness, or whim) the knitter operating the machine fails to properly align the verge plate or the latch-bar relative to the needle-bar in such machines, the stitches are not uniformly measured and vertical streaks are formed in the work, which are highly unsightly in fine gauge stockings.

In the embodiment of my invention shown in the drawings, as is clearly disclosed in Fig. 1, the sinkers 11 are of the short nosed type disclosed in my Patent No. 2,436,171, have offset sinker-butts or tabs 11c, and in accordance with said Patent No. 2,436,171, are provided with a catch-bar 13 separate from the catch-bar 12 which controls the dividers 10.

In accordance with the present invention, the verge plate 15, against which the sinkers 11 are individually advanced, is carried by the sinker-bar or retractor 13, herein by suitably retaining the same in a fixedly positioned recess or slot 16 in the under side of the catch-bar in advance of the offset sinker-butts 11c, as by retaining-screws or clamp screws 17. In the form shown the verge plate 15 comprises a simple flat sheet of metal extending vertically from the vertical slot 16, and having a projecting depth substantially equal to the offset height of the sinker butt 11c. Adjacent the root end of the butt 11c, the sinker or sinker butt is provided with an abutment 11d which affords accurate bearing against the lower end of the verge plate. By this arrangement the verge plate is afforded a sufficient overhang to impart limited flexibility to it, governable by the material and thickness of the verge plate, to afford a shock absorbing action. The verge plate 15, in the form shown, also constitutes the sinker retracting element of the catch bar or retracting bar 13.

In the preferred form (Fig. 1) sinker latches 20 are provided, carried by the catch bar 13, for retaining the advanced sinkers against the verge plate 15. These latches 20 are mounted on the catch bar 13 in predetermined spaced relation to the verge plate 15. In the preferred form (Figs. 2 and 3) the latches 20 are relatively thin flat sheet metal slides having generally parallel

front and back edges 20*a*, 20*b*, a lower edge 20*c* positioned at an oblique angle to said front and back edges 20*a*, 20*b*, and a small portion 20*d* of the front edge adjacent said lower edge positioned obliquely, say at about right angles to the lower edge 20*c*. The edges 20*c* and 20*d* thus constitute camming elements, the one to be engaged by the top of the sinker butt 11*c* to raise the latch and allow the advancing sinkers to pass under it, and the other to engage the back of the sinker butt 11*c* and force the sinker firmly against the verge plate 15, as shown in Fig. 1.

Referring to Figs. 1 and 3, in the form there shown the latch plate 20 further has a rounded top edge 20*f*, to be engaged by the latch spring 20*g*, and has adjacent said top edge an overhanging stop element or abutment 20*h*, which, as shown in Fig. 1, contacts the upper surface of the catch bar 13 to limit downward motion of the latch.

As is apparent from Fig. 1, the catch-bar 13, rearwardly of the verge plate 15, is provided with vertical comb slots or guideways, the separating walls 21 of which extend above and rearwardly of the slide plates. The plates 20 are suitably retained in these comb-slots, as by a dove-tailed insert 22, and, together with the free ends of springs 20*g*, are guided thereby. The anchored ends of the springs 20*g* are retained by suitable clamping means 23, carried by the catch-bar 13, the means in the form shown comprising the aligned comb element 23*a*, spring tip receiving recesses 23*b*, clamp plate 23*c* and clamp screws 23*d*.

The catch bar 13 in accordance with this invention, is retracted to retract the sinkers 11, is raised to move the sinker latches to inoperative position, and is then moved forwardly and dropped to restore it to the position shown in Fig. 1, ready to align the sinkers as they are advanced to the position shown. Any suitable means may be employed to impart these motions. Merely by way of example a suitable arrangement is diagrammatically shown in Fig. 4, in which the catch-bar side arms 24 are moved longitudinally by a lever system 25 and are raised and lowered by a lever system 27. The lever system 25 comprises drag link means 25*a*, connecting the arm means 24 to a bell crank lever 25*b* having a cam roller 25*c* running on a cam 25*d* carried by main cam shaft 26. The lever system 27 comprises lifting link means 27*a*, bearing on the underside of arm means 24, and raised and lowered by a bell crank 27*b* having a cam roller 27*c* riding on cam 27*d* carried by cam shaft 26. Any suitable lever system, as one generally similar to the system 25, may be employed for operating the divider catch bar 12.

It will be apparent that the new construction has various advantages. For example, by mounting the verge plate 15 on the catch bar 13 the form of the verge plate may be simplified, it may also be employed as the sinker retracting element, and its position is predetermined and not left to adjustment by the operator. By mounting the sinker latches 20 in the catch bar 13 the structure is further simplified and strengthened, additional moving parts are eliminated, and the relation thereof to the verge plate is predetermined and possible misadjustment by the operator and consequent spoilage of product is avoided.

Moreover, the present invention affords a fully independent catch bar arrangement enabling the relative advance and retraction of the sinkers as a group to be controlled independently of the advance or retraction of the dividers as a group at any part of the cycle. This is in contrast to the arrangement of my prior U. S. Patent No. 2,436,171 in which the construction employs a divided or expansible catch bar in which the motions are only semi-independent, the sinkers not being advanceable en masse independent of the dividers. The completely independent dual catch bar arrangement of the present disclosure is of basic importance in enabling further improvements to be made in machines of the Cotton type.

The invention, of course, is not limited to the particular embodiment disclosed to illustrate the same, and is defined in the appended claims.

What is claimed is:

1. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, and a verge-plate for limiting the forward motion of said sinkers, said verge plate being carried by the underside of said catch bar and projecting downwardly therefrom and constituting the sinker-retracting element of said catch bar.

2. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head and having offset butts, a catch-bar for retracting said sinkers, and a verge-plate for limiting the forward motion of said sinkers, said verge plate projecting downwardly from the underside of said catch bar a distance nearly equal to the length of said offset sinker-butts and being contacted by portions of said butts adjacent the root-ends thereof, and constituting the sinker-retracting element of said catch-bar.

3. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, and a verge-plate for limiting the forward motion of said sinkers, said verge-plate being removably mounted in a fixedly positioned recess in the underside of the catch bar.

4. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, and a verge-plate for limiting the forward motion of said sinkers, said verge-plate being removably mounted in a fixedly positioned vertical slot in the underside of the catch bar.

5. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, and a verge-plate for limiting the forward motion of said sinkers, said verge-plate being a flat plate removably mounted in a fixedly positioned vertical slot in the underside of the catch bar.

6. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a retractor for retracting said sinkers, a verge-plate for limiting the forward motion of said sinkers, said verge-plate being carried by said retractor, and sinker-latches for retaining the advanced sinkers against said verge plate, said latches being carried by said retractor.

7. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, a verge-plate for limiting the forward motion of said sinkers, said verge-plate being carried by said catch-bar, and sinker-latches for retaining the advanced sinkers against said verge plate, said latches being mounted on said catch-bar in predetermined spaced relation to said verge plate.

8. In a knitting machine, a sinker head, a set

of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, a verge-plate for limiting the forward motion of said sinkers, said verge-plate being carried by said catch-bar, and sinker-latches for retaining the advanced sinkers against said verge plate, said latches being mounted on said catch-bar in predetermined spaced relation to said verge plate, said catch-bar being longitudinally movable to place said verge plate and sinker latches in stitch measuring position and to retract said sinkers, and said catch bar being transversely movable to move said sinker latches from and restore them to their operative relation to said sinkers.

9. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a retractor for retracting said sinkers, a verge-plate for limiting the forward motion of said sinkers, and sinker-latches for catching and holding the sinkers when they are advanced against the verge-plate, said latches being carried by said retractor.

10. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, a verge-plate for limiting the forward motion of said sinkers, and sinker-latches for catching and holding the sinkers when they are advanced against the verge-plate, said latches being spring pressed members reciprocable through said catch-bar.

11. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, a verge-plate for limiting the forward motion of said sinkers, and sinker-latches for catching and holding the sinkers when they are advanced against the verge-plate, said latches being spring pressed members reciprocable through said catch-bar, and having at their latching ends camming faces for engaging against the backs of said sinkers and forcing them tightly against the verge plate.

12. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, a verge-plate for limiting the forward motion of said sinkers, and sinker-latches for catching and holding the sinkers when they are advanced against the verge-plate, said latches being spring pressed members reciprocable through said catch-bar, and having at their latching ends two camming faces for engagement with the tops and backs of the sinkers, the one to raise the latch and allow entry of the sinker under it, and the other to engage against a backwardly facing surface of the sinker for forcing it tightly against the verge-plate.

13. In a knitting machine, a sinker head, a set of sinkers movable to and fro in said head, a catch-bar for retracting said sinkers, a verge-plate for limiting the forward motion of said sinkers, and sinker-latches for catching and holding the sinkers when they are advanced against the verge-plate, said latches being carried by said catch-bar, and said catch-bar being raisable and lowerable to move said latches from and into operation relative to said sinkers.

14. In a knitting machine, a sinker-catch-bar, a verge-plate carried thereby and projecting therebelow, said catch-bar rearwardly of said verge plate comprising a series of comb-slots, sinker-latches slidable in said comb-slots, means retaining said latches in said slots, spring means carried by said catch-bar for urging said latches downwardly in said slots to their operative position, and means for raising said catch bar to raise said latches to inoperative position.

15. A sinker-latch element for knitting machines comprising a flat elongated plate having generally parallel front and back edges, a lower edge positioned at an oblique angle to said front and back edges, and a small portion of said front edge adjacent said lower edge positioned obliquely at about right angles to said lower edge.

16. A sinker-latch element for knitting machines comprising a flat elongated plate having generally parallel front and back edges, a lower edge positioned at an oblique angle to said front and back edges, and a small portion of said front edge adjacent said lower edge positioned obliquely at about right angles to said lower edge, said plate having a rounded top edge, and having adjacent said top edge an overhanging stop element.

17. In a knitting machine, in combination, a sinker head, a set of sinkers movable to and fro in said head, a sinker catch-bar movable adjacent thereto to advanced and retracted positions, a verge plate for limiting the forward motion of said sinkers, yieldable latch means carried by said bar movable for permitting advancing motion of said sinkers relative thereto and for retaining each advanced sinker against said verge plate, means for retracting said bar and sinkers, and means for releasing said bar-carried latch means when said bar is in a retracted position.

18. A combination according to claim 17 in which said latch means comprises vertically movable spring tensioned members.

19. A combination according to claim 17 in which said latch means comprises vertically movable spring tensioned members having camming surfaces for forcing said sinkers tightly against said verge plate.

20. A combination according to claim 17 in which the means for releasing said latch means comprises elements for lifting, advancing, and lowering said bar relative to said sinkers.

21. A knitting machine comprising a set of sinkers and a set of dividers, separate catch-bars for said sinkers and dividers, sinker latch means carried by said sinker catch-bar, and said sinker catch-bar being raisable in a retracted position thereof to release said sinkers from said latch means.

22. A knitting machine comprising a set of sinkers and a set of dividers, separate catch-bars for said sinkers and said dividers, sinker latch means carried by said sinker catch-bar, and means for releasing said sinkers from said latch means in a retracted position of said sinker catch-bar.

23. A knitting machine comprising a set of sinkers and a set of dividers, a reciprocable and raisable and lowerable catch-bar for said sinkers, a separate reciprocable catch-bar for said dividers, and means for raising and lowering said sinker catch bar for disengaging and engaging it with said sinkers.

24. A knitting machine of the class described comprising a set of sinkers and a set of dividers, a moving bar for said dividers continually engaging the same, a separate catch bar for said sinkers, said separate catch bar comprising means for securing said sinkers thereto for advancing and retracting movement therewith independent of the advancing and retracting movement of said dividers and means for releasing said sinkers therefrom to enable slurring thereof.

25. In a knitting machine, in combination, a sinker head, a set of sinkers and a set of dividers

mounted therein, means for moving said set of dividers to and fro in said head, and means for moving said set of sinkers to and fro in said head independently of the movement of said dividers, said sinker moving means being formed to free said sinkers for slurring.

26. A combination according to claim 25, said sinker moving means comprising a catch bar, a verge plate carried by the catch bar against which the sinkers are slurred, and means carried by said catch bar which, with said verge plate, secures the sinkers to the catch bar for to and fro movement therewith.

27. A combination according to claim 26, in which said last named means comprises sinker latches carried by said sinker catch bar.

28. A combination according to claim 27, said sinker catch bar being raisable and lowerable, and said combination further comprising means for raising said sinker catch bar to disengage said sinker latches from the sinkers and means for lowering said sinker catch bar to render said sinker latches effective for engaging said sinkers.

29. A knitting machine of the class described having, in combination, a set of sinkers movable to and fro, a set of dividers movable to and fro, and separate moving bar means, one for said set of sinkers and the other for said set of dividers, whereby said sets of dividers and sinkers may each be moved to and fro independently of the other, said sinker moving bar means being engageable with and disengageable from the set of sinkers to provide for slurring thereof.

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