May 17, 1932. I. W. GROTHEY 1,859,137

GAP CLOSING DEVICE FOR LATCH RINGS OF KNITTING MACHINES

Filed April 9, 1931

Fig. 1.

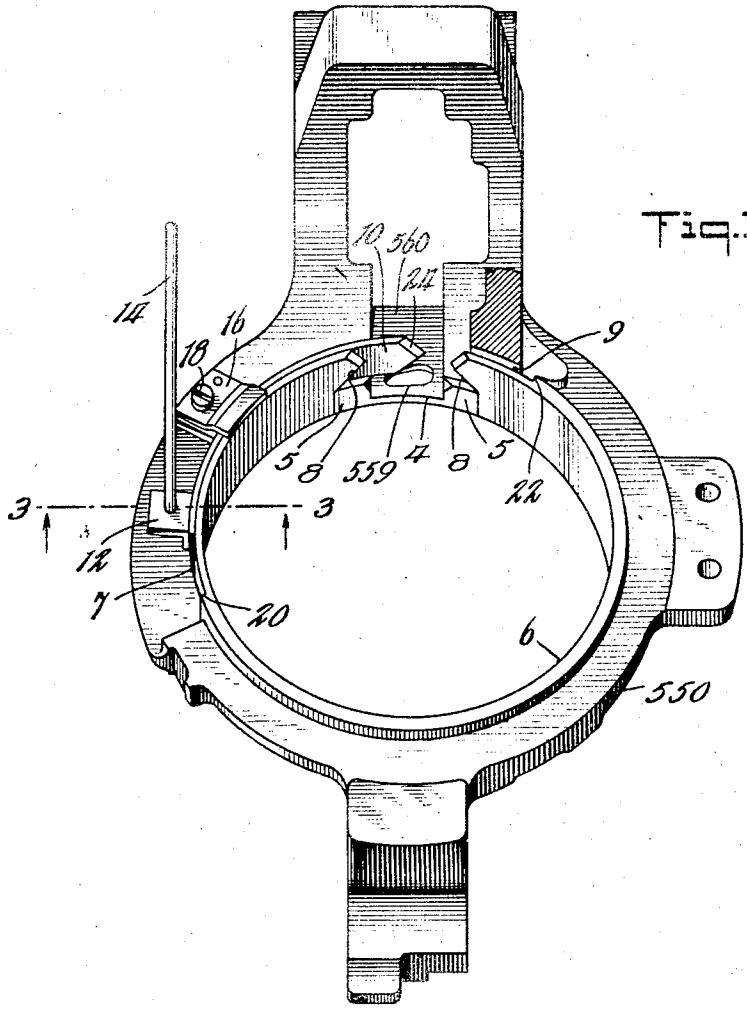
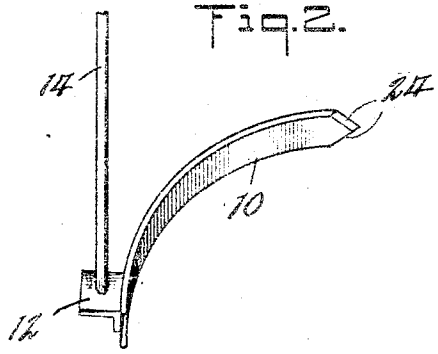


Fig. 2.



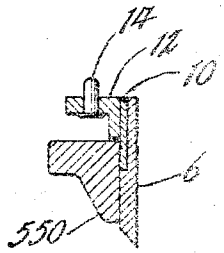


Fig. 3.

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UNITED STATES PATENT OFFICE

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GAP CLOSING DEVICE FOR LATCH RINGS OF KNITTING MACHINES

Application filed April 9, 1931. Serial No. 528,902.

This invention relates to circular knitting machines of the type in which a plurality of yarn guides are mounted on a convenient part of the machine, usually a latch guard ring, with the yarn delivery ends free to play in a gap in the ring, the width of the gap depending upon the number of yarn guides employed. The gap, if left open, would, when the needles are in a certain position with respect thereto permit the latches of the needles to swing out, from centrifugal force, into the gap and contact with the sides of the gap so as to be broken or injured thereby. It is an object of this invention to overcome this defect by providing a means whereby the gap can be closed when the needles are in a position in which their latches can enter the gap. It is also an object of this invention to provide a means forming a wear surface for the inner surface of the ring which will be free from any recesses or joints which might engage the needle latches and which cooperates with the means closing the gap in the ring to form a complete ring to retain the latches in position.

In the drawings—

Figure 1 is a perspective view of a latch guard ring with a wear surface and a gap closure applied thereto in accordance with this invention;

Figure 2 is a perspective view of the gap closure shown detached from the ring; and

Figure 3 is a vertical section taken on the line 3—3 of Figure 1.

In the drawings the invention is shown applied to a latch guard ring 550 of the type shown in the patent to Scott No. 1,238,052, issued August 21, 1917.

The ring 550 is formed with the usual throat or gap 560 to receive the usual yarn guides (not shown) and has a throat plate 559 which projects inwardly beyond the inner surface of the ring. The throat plate 559 has a lower or bottom portion 4 and sides 5 which extend above the bottom portion 4. To the inner surface of the ring 550 there is fitted a hardened steel insert or liner 6 secured thereto in any suitable manner as by set screws (not shown). The insert or liner 6 abuts the sides of the throat plate 559 and has tapering ends projecting thereover.

The inner surface of the liner 6 is flush with the inner surface of the throat plate 559.

The inner surface of the liner 6 provides a unitary inner or wear surface free from joints or recesses which might injure the needle latches and the tapered ends of the liner 6 at the gap are shaped so as to provide inclined guide surfaces 8 for any needle latch which is thrown out by centrifugal force while the needle is passing the gap. The liner 6 can be of any desired depth and, as shown in Fig. 3, projects both above and below the ring 550.

For a portion of the length of its outer periphery the liner 6 is cut away or recessed as at 7 and 9 to form, with the inner face of the ring 550, a groove or slot in which is placed the gap closer or gate 10. The gap closer 10 is formed of strip metal, bent to the curvature of the liner 6 so as to lie against the outer surface thereof when placed in the groove and extends substantially to the upper edge of the insert or liner 6. To the outer surface of the gap closer 10 adjacent the end thereof away from the gap 560 there is formed integral therewith or attached thereto in any suitable manner as by spot welding, a lug 12 in which is mounted a pin 14 to which suitable operating means are connected. The gap closer 10 is held in position in its groove by a clip 16 which has an edge resting on the liner 6 and is secured to the ring 550 by a screw 18. The gap closer 10 is free to move in its groove and is shifted therein by the actuation of pin 14 to open and close the gap 560. As shown in Fig. 1 the bottom of the groove is at the level of the upper surfaces of the side portions 5 of the throat plate 559 so that when the gap closer 10 is in position to close the gap 560 it rests on the side portions 5 and leaves, below it, an opening for the yarns or the feeding ends of the yarn guides.

With the gap closer 10 moved to closed position, there is presented to the needle latches a surface which extends to the upper edge of the liner 6 and is offset outwardly

from the inner surface of the liner 6 only by thickness of the reduced portion of the liner 6, a distance which is insufficient to permit of the needle latches swinging to a horizontal position. The end of the gap closer 10 is cut away, as at 24, to form inclined guides in case a needle latch should enter the gap while the gap closer 10 is moving across.

The gap closer 10 can be operated to open and close the gap 560 at the proper times by suitable connections from the pin 14 to an operating part of the machine, as the usual pattern drum, but as this connection forms no part of this invention it is not shown or described.

From the foregoing it is seen that this invention provides a latch guard ring having a unitary hardened insert or liner which presents an inner or wear surface which greatly reduces and renders more uniform the wear on the ring caused by the needles and provides a smooth surface without joints or recesses which might injure the needles. It is also seen that this invention provides a gap closer which is substantially a segment of the liner for the ring; which is offset the minimum distance from the wear surface of the insert; which closes the gap to the maximum extent permissible; and which presents a unitary vertical surface to the needle latches cooperating with the wear surface of the insert to present a substantially unbroken ring to the needle latches.

I claim—

1. In a knitting machine, the combination with a latch guard ring having a latch engaging surface and a gap for the operation of yarn guides of means for closing said gap presenting a surface to the needle latches concentric with the latch engaging surface of the ring, said means being movable to a position behind said latch engaging surface to open said gap.

2. In a knitting machine, the combination with a latch guard ring having a latch engaging surface and a gap for the operation of yarn guides of means for closing said gap presenting a surface to the needle latches parallel with the latch engaging surface of the ring, said means being movable to a position behind said latch engaging surface to open said gap.

3. In a knitting machine, the combination with a latch guard ring having a fixed latch engaging surface and a gap for the operation of yarn guides of means movable to open and close said gap and having a latch engaging surface concentric with said fixed latch engaging surface, said means being movable to a position behind said latch engaging surface to open said gap.

4. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides of a fixed liner for said ring and a liner segment movable to open and close said gap.

5. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides of a fixed liner for said ring and a segment concentric with said liner and movable to open and close said gap.

6. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides of a liner for said ring and a gap closer concentric with said liner and movable to open and close said gap.

7. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides of a liner for said ring and a gap closer mounted between said ring and liner.

8. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides of a liner for said ring and a gap closer concentric with said liner and mounted between said ring and liner.

9. In a knitting machine, the combination of a latch guard ring having a liner therein, said ring and liner having alined openings therein forming a gap for the operation of yarn guides and a member slidably mounted between said liner and ring and movable to open and close said gap.

10. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides, a liner for said ring, said ring and liner forming a groove therebetween, and a closer for said gap mounted in said groove.

11. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides, a liner for said ring presenting a continuous surface outside the gap, said ring forming a slot with said liner, and a member mounted in said slot and movable to open and close said gap.

12. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides of a fixed liner for said ring having a corresponding gap therein and forming a continuous inner surface for said ring outside said gap.

13. In a knitting machine, the combination with a latch guard ring having a gap for the operation of yarn guides, a throat plate at said gap extending inwardly of said ring and a fixed liner for said ring having its inner surface flush with the inner surface of said throat plate and forming a continuous inner surface for said ring outside said gap.

In testimony whereof I have signed my name to this specification.

IVAN W. GROTHEY.