Sept. 17, 1929. W. S. PARKER 1,728,303.

YARN CLAMP

Filed Dec. 14, 1925

Fig. 1.

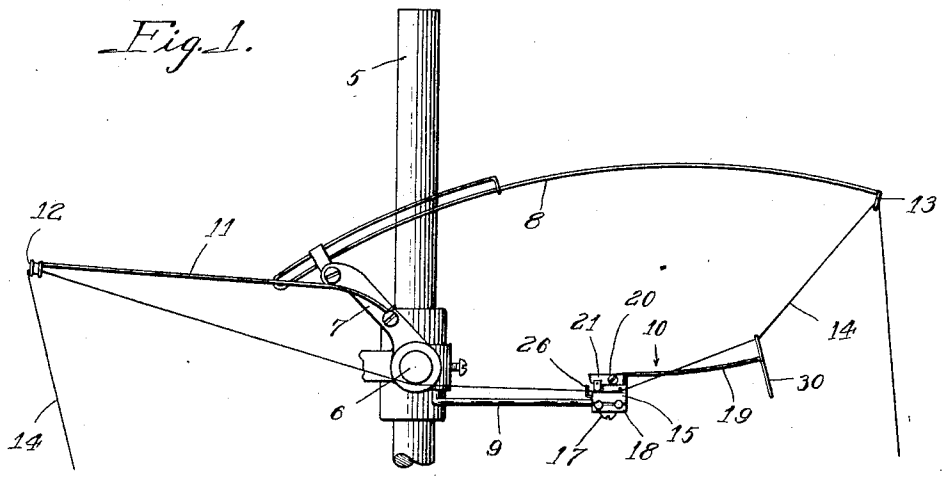


Fig. 2.

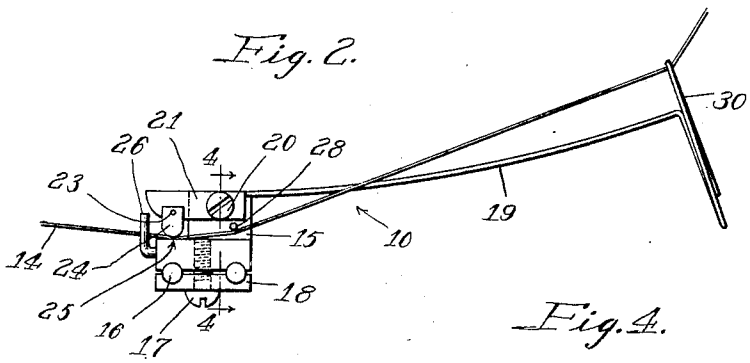


Fig. 4.

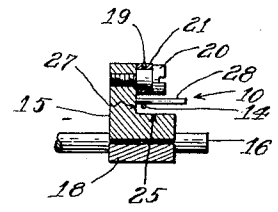
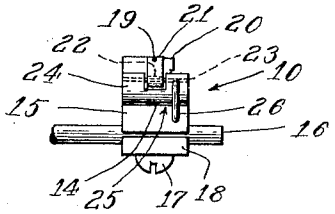


Fig. 3.



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UNITED STATES PATENT OFFICE

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YARN CLAMP

Application filed December 14, 1925. Serial No. 75,188.

This invention relates generally to tension devices for knitting machines and more particularly to a yarn clamp for checking and steadying the feeding of yarn.

One of the principal objects of the present invention is to provide a device to operate in connection with the tension or yarn take-up arms to replace devices known as yarn feed stops, shown in Patent No. 1,072,365, dated September 2, 1913.

Devices of the latter type have been subject to criticism for the reasons that they constituted considerable drag on the feeding of the yarn and placed the yarn under more than the desired amount of tension and small knots in the yarn would almost invariably be caught and result in the breaking of the yarn and the stoppage of the machine even though the knots were so small as to be unobjectionable if introduced in the knitting. These devices also failed to keep the yarn taut when the carrier to be fed thereby was out of action and, as a result, the take-up arms sometimes worked into positions where they interfered with the operation of other take-up arms in action.

The present invention eliminates these objectionable features of former devices and insures even and steady feeding of yarn at all times. It is furthermore less complicated in construction, more economical to manufacture and less apt to get out of commission.

In the accompanying drawing illustrating the invention—

Figure 1 is a side view of that part of the yarn feeding apparatus of a knitting machine which includes my improved yarn clamp;

Fig. 2 is an enlarged side elevation of the yarn clamp;

Fig. 3 is an end view of Fig. 2; and

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 2 looking in the direction indicated by the arrows.

Throughout the views the same reference numerals are applied to corresponding parts.

The drawing shows a vertical post 5 supported on the bed of the machine carrying a horizontal supporting arm 6 to which is secured a bracket 7 for carrying a flexible wire tension or take-up arm 8. Another arm 9 is detachably supported by the arm 6 and carries at its outer end a yarn clamp 10. A spring tension arm 11 extends rearwardly from the bracket 7 and has a thread guiding eye 12 at its outer end. The yarn clamp 10, it will be seen, is interposed between the eye 12 of the tension arm 11 and an eye 13 on the take-up arm 8. Thus, yarn from the spool or bobbin, indicated by the numeral 14, is drawn through the eye 12, thence through the yarn clamp 10 and finally through the take-up eye 13 to the yarn carrier associated with the individual yarn feeding apparatus described. It is understood that a separate feeding apparatus similar to that just described is provided for each of several yarn carriers in a machine as is well-known to the art. A single trip rod (not shown) is commonly provided extending from the post 5 over the several take-up arms 8 which is sensitive to the slightest touch to set off or cause a stop mechanism on the machine to function and put the machine instantly out of operation. The arms 8 swing upwardly into engagement with the trip rod in the event the yarn breaks but are capable of touching the rod if allowed to relax sufficiently from the condition of stress in which the arm 8 in the drawing is shown as, for example, if considerable slack were to occur in the yarn leading from the eye 13 to the yarn carrier. This condition often arose from a failure of the yarn feed stops of the type previously used to hold the yarn when the carrier associated therewith was out of action and the take-up arm was allowed to relax by degrees until it finally came into engagement with the trip rod. This was, of course, an annoyance as it resulted in the unnecessary stopping of the machine. Where the arm relaxed even to a lesser degree it frequently fouled with the next adjacent arm in action and produced snarls. These and other objectionable features of the devices previously used are avoided by the yarn clamp of the present invention, as will presently appear.

The yarn clamp 10 comprises a block 15 generally of L-shaped cross-section, as shown

in Fig. 4, which is mounted on a pair of prongs 16 extending laterally from the arm 9. The block 15 is arranged for adjustment on the prongs 16 and is held by the tightening of a screw 17 against a clamping pad 18. The block 15 forms a support for the pivotal mounting of a flexible wire arm 19 on a screw 20. The inner end of the arm 19 is soldered or otherwise securely held in a block 21 through which the screw 20 passes, as shown in Fig. 4, to provide a bearing. The inner end of the block 21 is drilled transversely, as shown in Fig. 3, at 22 to receive a pin 23 for floatingly supporting a shoe 24 from the block 21 so as to have even contact with the surface 25 on the block 15 without the necessity for exact machining of the block 15 or precise mounting of the block 21 on the block 15 and also to avoid the condition of having the yarn 14 select a certain point on the block 15 or on the shoe 24 where a groove might eventually result after continuous use and make the operation of the yarn clamp uncertain and in any event unsatisfactory. The yarn 14 is guided through the clamp by a wire 26 engaged in the block 15 and extending vertically from the rear end thereof to a point somewhat above the surface 25 so as to confine the yarn between it and the vertical surface 27 on the block 15, as will be obvious. A pin 28 is also engaged in the block 15 extending laterally from the surface 27 parallel to the surface 25 to keep the yarn from engagement with the block 21 or screw 20 in which event there would be danger of binding in the joints between these elements and between the block 21 and the block 15. The pin 28, in addition, serves as a stop when the arm 19 is free to drop as, for example, when the yarn breaks or when the yarn supply fails. It is noted that the yarn is threaded through the clamp through an eye 30 of elongated form provided at the outer end of the arm 19 which gives considerable latitude for the movement of the yarn with the bobbing of the take-up arm 8. The yarn, however, when drawn up by the take-up arm, serves to swing the arm 19 and press the shoe 24 lightly or heavily against the yarn 14 depending on the degree to which the arm 19 is flexed. The pressure on the shoe is more or less yielding.

It will be seen that only a very slight drag is imposed on the yarn during normal feeding. The yarn passes relatively freely through the clamp and rides in mere contact with the shoe 24 and pin 28. It is only clamped when the take-up arm swings up to the extent shown in Figs. 1 and 2. More yarn is required at some reciprocations than at others because of the fashioning of the stocking and as a consequence the unused portion gives slack to the yarn leading from the take-up arm to the carrier which slack is taken up by the flexibility of the arm in an apparent manner. With the present device, it is impossible to arrive at a condition where a superfluous amount of yarn fed to the carrier would result in the relaxing of the take-up arm to too great an extent either to the point of fouling with an adjacent arm in action or stopping the machine because of a complete relaxation. If the arm relaxes to the extent shown in Figs. 1 and 2, the yarn is at once clamped and any slack in the yarn must be used up and the arm 8 brought back to its normal stressed condition before the normal feeding through the clamp will be resumed. The character of the knitting is, of course, improved by virtue of this regular feeding and the control of the feeding it will have been observed is not accompanied with any drag on the yarn. Furthermore small and unsignificant knots which would be caught in the old type of yarn feed stops and caused the breaking of the yarn and stopping of the machine, will pass relatively freely under the yielding shoe and through the yarn clamp into the yarn carrier. It is only where a knot or snarl of such appreciable size is encountered that the same cannot pass through that the yarn clamp of the present invention will catch the same and tear the yarn and stop the machine. When the yarn carrier associated with any one of the take-up arms is out of action it is impossible for the take-up arm to relax because the clamp holds the yarn under the stress of the arm tensioning the yarn. The more the take-up arm 8 relaxes, the closer the yarn comes to making a right angle with the arm 19 and will consequently impose a heavier pressure on the shoe 24. It thus becomes practically impossible for the yarn to creep because of a vibration of the machine or due to other causes. The take-up arm is held in stressed condition until the yarn carriers associated therewith go back into action.

It is believed that the foregoing description conveys a sufficiently clear understanding of the present invention so that anyone skilled in the art to which this invention relates could make and use the same to good advantage.

I claim:

1. A yarn clamp for the yarn feeding apparatus of a knitting machine comprising a block forming a support having a lateral extension providing an abutment over which yarn may be fed, a lever pivotally mounted on said block having a clamping member at its inner end arranged over said abutment, and a horizontal guide wire on said block for keeping the yarn out of contact with said lever at its pivotal connection on said block and serving as a stop to limit the swinging movement of said lever in one direction.

2. A yarn clamp for the yarn feeding apparatus of a knitting machine comprising a block forming a support having a lateral extension providing an abutment over which

yarn may be fed, a lever pivotally mounted on said block having a clamping member at its inner end arranged over said abumtent, a vertical guide wire for confining the yarn beneath said clamping member, and a horizontal guide wire for keeping the yarn out of contact with said lever at its pivotal connection on said block, at least one of the two guide wires serving as a stop for limiting the pivotal movement of said lever in one direction in addition to serving as a guide element.

3. A yarn clamp for the yarn feeding apparatus of a knitting machine comprising a block forming a support having a lateral extension providing an abutment over which yarn may be fed, a lever pivotally mounted on said block having a clamping member at its inner end arranged over said abutment, a vertical guide wire for confining the yarn beneath said clamping member, and a horizontal guide wire for keeping the yarn out of contact with said lever at its pivotal connection on said block, said last mentioned wire serving as a stop to limit the swinging movement of said lever from operative position.

4. A yarn clamp for the yarn feeding apparatus of a knitting machine comprising a support having a lateral extension to provide an abutment over which the yarn is arranged to feed, a lever pivotally mounted at one end on said support with the said end projecting over said abutment, the other end of said lever being provided with means to engage with the yarn to swing said lever, a clamping shoe element mounted on the pivoted end of said lever over said abutment and arranged to be operated by said lever element to clamp the yarn on said abutment, and a pin for joining the lever and shoe elements having a loose fit in the one of said elements whereby said shoe is floatingly supported on said lever.

5. A yarn clamp for the yarn feeding apparatus of a knitting machine comprising a support providing an abutment thereon for the yarn to pass over, a lever pivotally mounted on said support over said abutment having a remote end engaging and arranged to be moved by the yarn, and a clamping shoe having a floating connection with the inner end of said lever near the pivot point of the latter and disposed over said abutment, the connection being such that the shoe is arranged to be lifted off the abutment when the remote end of the lever is lowered by the yarn and being furthermore such that the shoe is free to assume its own position in bearing against the yarn on said abutment and is arranged to be pressed toward the abutment by the lever in any such self-assumed position when the remote end of the lever is raised by the yarn.

6. A yarn clamp for the yarn feeding apparatus of a knitting machine comprising a block forming a support having a lateral extension providing an abutment over which yarn may be fed, a lever pivotally mounted on said block having a clamping member at its inner end arranged over said abutment, a vertical guide wire at one end of said block for confining the yarn beneath said clamping member, and a horizontal guide wire at the other end of said block for keeping the yarn out of contact with said lever at its pivotal connection on said block, said last mentioned wire serving as a stop to limit the swinging movement of said lever from operative position.

In witness of the foregoing I affix my signature.

WILLIAM S. PARKER.