April 12, 1932. E. E. RANDALL 1,853,377

LOOPING MACHINE

Filed April 15, 1930 2 Sheets-Sheet 1

Fig. 1.

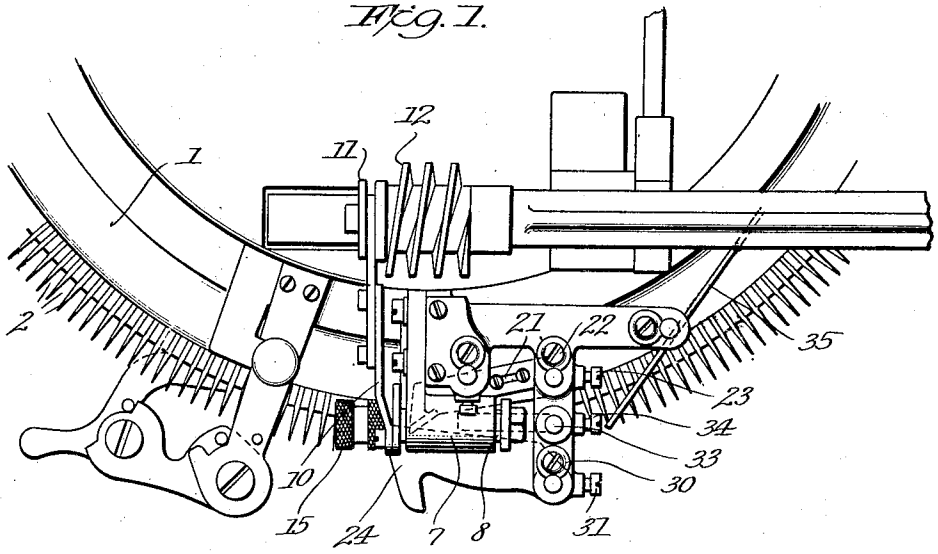

Fig. 2.

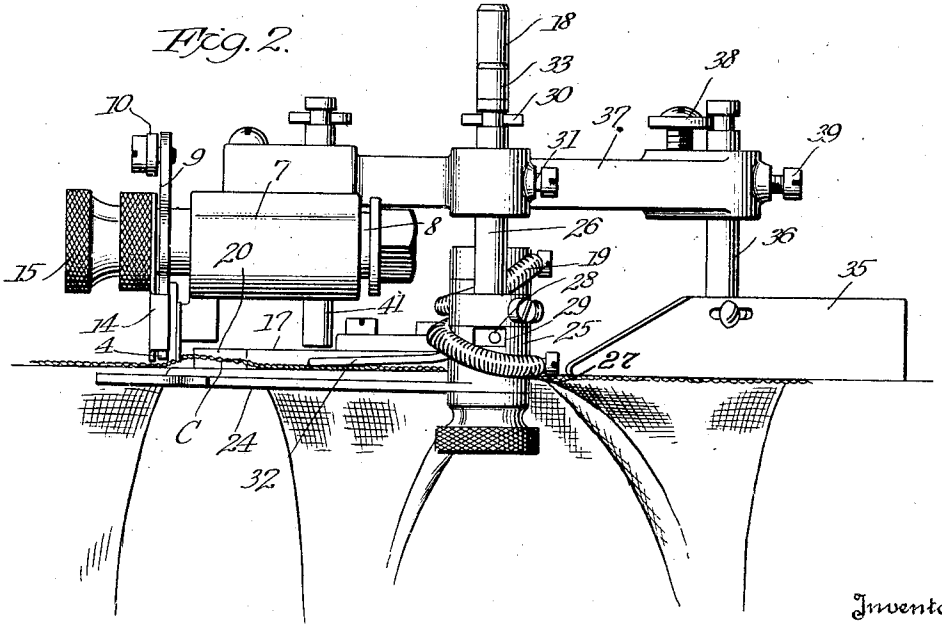

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Fig. 3.

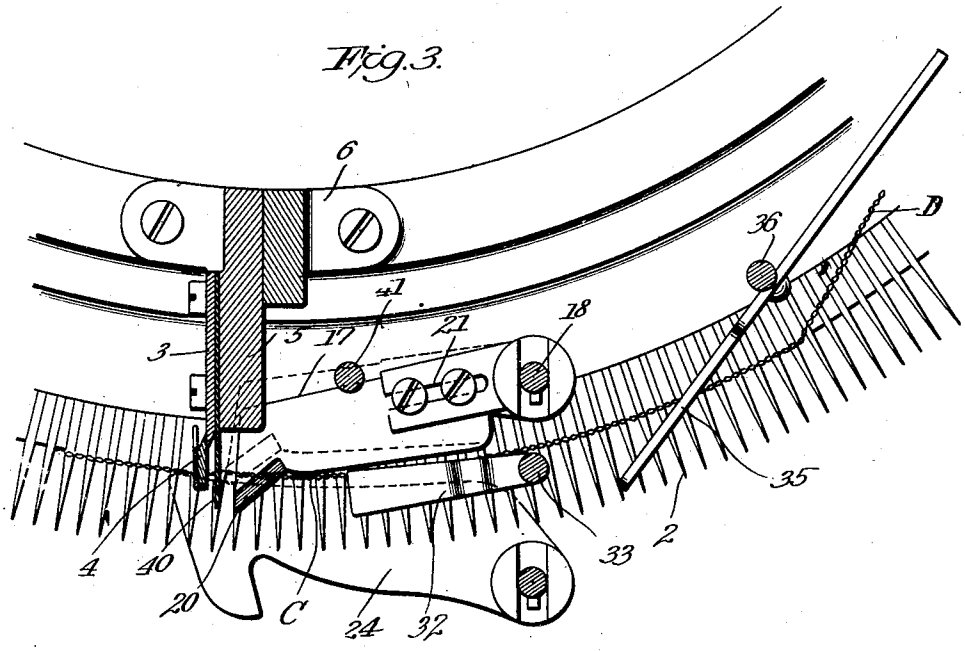


Fig. 4.

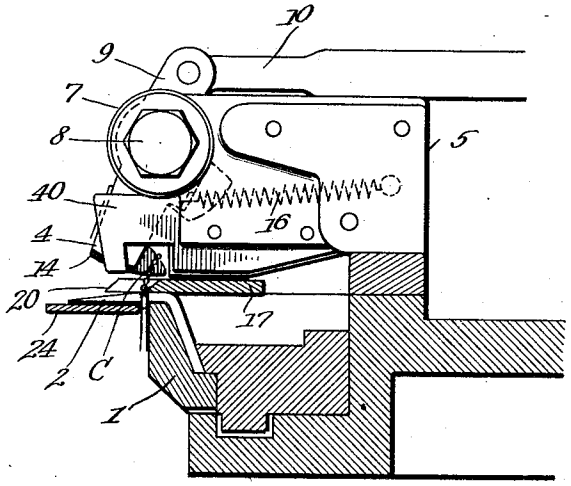
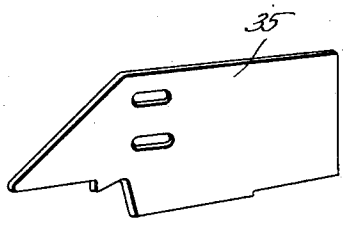


Fig. 5.



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Patented Apr. 12, 1932 1,853,377

UNITED STATES PATENT OFFICE

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LOOPING MACHINE

Application filed April 15, 1930. Serial No. 444,589.

This invention relates to improvements in looping machines and, more particularly, to the type of machine which is employed to unite the edges of knitted fabrics, such as stockings and the like.

The present invention is in the nature of an improvement on the structure disclosed in my United States Letters Patent No. 1,462,378, granted July 17th, 1923. In the said patent the principal problem disclosed and solved is the proper raising of the chain of stitches to the severing mechanism so as to insure accurate and infallible cutting of the chain between adjacent fabrics looped on the machine.

As is well understood, machines of this character generally include a continuously rotating dial provided with impaling pins arranged thereon upon which the fabrics, such as stockings, are impaled, the dial rotating past a stitch-forming mechanism which sews the edges of the fabric together and which produces a chain of stitches between adjacent fabrics. In my said patent, mechanism is provided which operates on the chain to cause the same to curl up so as positively to insure engagement of the chain by a chain-lifter which, in turn, presents the thread to the severing mechanism.

The chain curling device of my said patent is not always satisfactory in operation because it does not positively raise the chain so that it may be engaged by the chain-lifter. Furthermore, in my prior patent the chain-lifter is so mounted that it is retarded in its oscillation by contact with the welt or looping seam and this has resulted in a marking of the fabric, especially where the fabric is of the light chiffon type.

My present invention aims primarily to provide in a looping machine having a chain severing attachment means for positively elevating the chain into the zone of operation of the severing mechanism.

It is a further object of my invention to provide a chain elevating device which is maintained normally in inoperative position by the fabric on the impaling pins as that fabric passes the elevating device and which becomes operative when the chain between adjacent fabrics comes into alinement with the device.

It is still another object of the invention to provide in a machine of the character set forth a chain-lifter which normally oscillates freely above the plane of the impaling pins and to which the chain is elevated by means controlled by the fabric being united.

A further object of the invention is to provide in combination with a chain elevating device a mechanism which operates in opposition to the elevating device whereby to insure that the fabric is maintained properly on the impaling pins.

Other objects of my invention and the many advantages thereof will in part be obvious and in part more fully brought out as the description proceeds.

In the accompanying drawings, I have illustrated a practical embodiment of my invention; but it is to be understood that the drawings are illustrative, merely, and that the invention is not limited to the details of construction therein disclosed. It will be readily apparent to those skilled in the art that the invention may be embodied in a wide variety of forms without departing from its salient features or sacrificing any of its advantages.

In these drawings:

Fig. 1 is a plan view of a portion of a looping machine showing the attachment of my invention mounted thereon;

Fig. 2 is a front elevation of the attachment illustrated in Fig. 1;

Fig. 3 is a view in horizontal section, parts being broken away for the sake of clearness;

Fig. 4 is a view, partly in elevation and partly in section, showing the details of my invention and the several parts in operative relation; and

Fig. 5 is a perspective view of a chain guide forming a part of my invention.

It is deemed unnecessary for the purposes of the present specification to describe in detail the construction and operation of a looping machine, inasmuch as the machine, itself, is old and well known in the art. It will suffice to state that the machine comprises a rotatable dial 1 about the periphery of which

is mounted a continuous series of impaling pins 2, which project radially from the dial. The fabric articles, such as stockings, which are to be united are impaled upon these pins while the dial is rotating and the articles thereupon pass successively through trimming mechanism and stitch-forming mechanism which may be of the usual construction and which it is not deemed necessary to illustrate here. It is understood that the fabric articles are usually impaled upon the pins at some distance apart so that as the articles pass through the stitch-forming mechanism, a chain of stitches is produced which connects adjacent articles.

My invention relates particularly to mechanism for severing the chain of stitches between adjacent fabric articles. The severing mechanism, proper, comprises a pair of relatively movable shearing blades 3 and 4, the blade 3 being stationary and adjustably mounted on a suitable bracket 5 which forms an extension on a bracket 6 by means of which the attachment, as a unit, may be mounted on the frame of the machine.

The bracket 5 terminates in a transversely extending tubular housing 7 in which is journaled a rock shaft 8 upon which the movable blade 4 is mounted. The movable blade 4 is provided with an extension 9 which is connected to an adjustable link 10 which, in turn, is connected to an eccentric 11 operated by a worm 12. The worm 12 receives its motion from the looping machine. By this arrangement the movable blade 4 is constantly oscillated and periodically brought into proper relation with the stationary blade 3 to cut the chain.

Operatively connected to the movable blade 4 is a chain-lifter 14 which is maintained in assembled relation with the movable blade by a suitable adjusting nut 15.

As will be noted from an inspection of Figs. 2 and 4, the chain-lifter 14 swings constantly in a plane above the chain of stitches on the machine and in this respect it differs from the construction disclosed in my earlier patent wherein the chain-lifter contacts with the chain and is retarded thereby.

A suitable coil spring 16 is secured to the bracket 5 and the chain-lifter 14, this spring assisting the movement of the chain-lifter and the movable blade 4 on the return stroke toward the stationary blade 3.

It will be understood from the foregoing description that the movable blade and the chain lifter are mounted together on the rock shaft 8 and are moved in unison toward and away from the stationary blade 3. Since the chain-lifter 14 oscillates freely above the plane of the impaling pins, the chain-lifter would not engage the chain unless some means were provided for elevating the chain above the plane of the pins.

The particular improvement of my present invention resides in the provision of a chain elevating device which will positively raise the chain so as to insure its engagement by the chain-lifter by which it is presented to the severing mechanism. This means comprises a blade 17 which is pivotally mounted on a post 18 to swing in a horizontal plane close to the impaling pins 2. The bearing for the blade 17 is provided with a suitable coil spring 19 which constantly urges the blade forward into engagement with the chain of stitches. The blade is provided with a beveled nose 20 which bears against the chain of stitches as the fabric articles on the impaling pins pass by the elevating device. Suitable adjusting mechanisms are provided for accurately positioning the blade 17 with respect to the work. For this purpose the blade is adjustable horizontally by a slot and pin connection 21 and the pivot post 18 is maintained in proper vertical position by suitable set screws 22 and 23.

By referring particularly to Fig. 3 the operation of the blade 17 will be quite clear. As the fabric articles rotate past the blade, the nose 17 engages the seam portions of the chain of stitches C by which it is maintained in retracted position against the action of the spring 19, as shown by dotted lines in Fig. 3. When the chain of stitches between adjacent fabrics comes into alinement with the beveled nose 20, this nose enters under the chain, it being no longer restrained in its movement by the seam in the fabric and consequently the spring 19 becomes effective to move the blade into its forward position as shown in Fig. 3. Thus, as is more clearly shown in Fig. 4, the chain C is elevated by the blade 17 to a position where it is positively engaged by the chain-lifter 14 by which in turn it is moved into the field of action of the cutting blades.

As has been above set forth the blade 17 bears constantly against the chain of stitches on the fabric articles by reason of the force of the spring 19. This action of the blade has a tendency to move the articles outwardly on the impaling pins. To overcome this tendency of the blade I have provided a member 24 which bears against the fabric below the impaling pins as is clearly shown in Fig. 4. The member 24 is provided with a collar 25 rotatably mounted on a post 26. A suitable coil spring 27 is secured to the post and the collar and is so mounted that it tends constantly to urge the member 24 into engagement with the fabric articles. A pin 28 on the post 26 operates in a slot 29 in the collar for the purpose of limiting swinging movement of the member 24. As in the case of the post 18, the post 26 may be accurately adjusted and is maintained in adjusted position by suitable set screws 30 and 31.

Thus, it will be seen that the blade 17 and

the member 24 operate in opposition to each other on the fabric articles, each being urged into contact with the articles by means of a suitable spring. By this arrangement, it is assured that the articles remain properly positioned on the impaling pins.

I have also found that if pressure be applied to the chain of stitches to press the chain down upon the impaling pins, the chain will be straightened and at the same time will have a tendency to rise as it is relieved from this pressure. For this purpose I have provided a presser foot 32 secured to a post 33 which is vertically adjustable and is maintained in adjusted position by means of a suitable set screw 34. In practice the presser foot will be so adjusted as to bear down upon the chain of stitches with a sufficient degree of pressure to smooth the chain. As the chain leaves the presser foot, it has a tendency to rise and therefore the entry of the beveled nose 20 under the chain is materially facilitated.

Sometimes operators in impaling the fabric articles on the pins space them so far apart that after passing through the stitch forming mechanism a relatively long chain between adjacent articles is formed, as at D, Fig. 3. To insure that this long chain is properly and accurately presented to the severing mechanism, I have provided a guide plate 35 adjustably secured to a post 36 which, in turn, is adjustable in an extension 37 of the bracket 5. The post 36 is maintained in adjusted position by suitable set screws 38 and 39. This guide plate presses down upon the chain and thus also performs the function of removing from it any loose threads or clippings which may have been left after the trimming operation.

Operation.—From the foregoing description it is believed that my invention and its mode of operation will be perfectly clear to those skilled in the art. However, it is deemed desirable to summarize the operation, here. It is understood, of course, that the dial of the machine rotates clockwise and that the fabric articles impaled upon the impaling pins first pass through trimming mechanism and then through stitch-forming mechanism. It is after the edges of the fabric articles have been united that my invention comes into operation. The dial carrying the united fabrics first passes under the guide plate 35, which assures that the chain between adjacent fabrics will be properly presented to the severing mechanism. The chain thereupon passes under the presser foot 32 which has the effect of compressing the chain and straightening it and also causing it to rise slightly as it leaves the presser foot. At this time the blade 17 is maintained in inoperative position by reason of the fact that the nose 20 bears against the chain of stitches on the fabric articles. As that portion of the chain which extends between adjacent articles comes into alinement with the beveled nose 20, the chain rises thereon and the nose 20 enters under the chain, being moved by action of the spring 19. Thus, the chain is positively raised by the device described and is therefore readily engaged by the chain-lifter 14 which constantly oscillates freely above the plane of the chain. The lifter 14 carries the chain into the zone of operation of the cutter blades 3 and 4 where the chain is severed. A suitable guide 40 may be interposed between the blade 17 and the chain lifter 14 further to assist in the accurate presentation of the chain to the severing mechanism.

As stated, the blade 17 bears against the chain of stitches formed in the fabric articles and would have a tendency to move the articles outwardly on the impaling pins. This tendency on the part of the blade 17 is offset by the member 24 which operates in opposition to the blade and thus assures the proper positioning of the articles with respect to the pins. In order to prevent lifting of the blade 17 in the event that the chain should get under the same, a suitable stop 41 is provided which prevents vertical movement of the blade.

Thus, in my present improvement I have overcome certain defects in prior devices of this character and have provided an accurate, positive means for presenting the chain to the severing mechanism. In the present case the chain lifter oscillates freely above the plane of the pins and does not contact with the welt as in my prior construction and, therefore, there is no marking of the fabric. Furthermore, in my present invention the chain is positively raised so that it is engaged by the chain lifter and the operation does not depend solely upon any curling action induced in the chain.

It is believed, also, that the many advantages of my present construction will be readily appreciated by those skilled in the art.

I claim:

1. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, and means oscillative in a non-vertical plane and controlled by the articles for elevating said chain prior to its introduction to the severing mechanism.

2. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, and means oscillative in a non-vertical plane and adapted to move under said chain to elevate the same prior to its introduction to the severing mechanism, said means being restrained from movement by the articles.

3. In a machine for uniting the edges of looped fabric articles by forming a chain of

stitches, mechanism for severing the chain between adjacent articles, means oscillative in a non-vertical plane and adapted to move under said chain to elevate the same prior to its introduction to the severing mechanism, means for actuating said first-mentioned means, and means to restrain actuation thereof.

4. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, and means oscillative in a non-vertical plane and operative to elevate said chain prior to its introduction to the severing mechanism, said means being maintained in inoperative position by the articles.

5. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, means oscillative in a non-vertical plane and operative to elevate said chain prior to its introduction to the severing mechanism, said means being maintained in inoperative position by the articles, and means urging said elevating means into operative position.

6. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, spring-actuated means oscillative in a non-vertical plane and adapted to move under said chain to elevate the same prior to its introduction to the severing mechanism, and means to restrain actuation of said first-mentioned means.

7. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, and spring-actuated means oscillative in a non-vertical plane and adapted to move under said chain to elevate the same prior to its introduction to the severing mechanism, said means being restrained against movement by the articles.

8. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, a chain-lifter associated with said severing mechanism, and means oscillative in a non-vertical plane and controlled by the articles for elevating said chain prior to its engagement by said chain-lifter.

9. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, a freely oscillating chain-lifter associated with said severing mechanism and moving in a plane above said chain, and means controlled by the articles for elevating said chain into the zone of operation of said chain-lifter.

10. In a machine for sewing looped fabrics including a movable support, impaling pins for receiving fabric articles mounted on said support and movable therewith, stitch forming mechanism for uniting said articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, and means oscillative in a non-vertical plane and controlled by the articles for elevating said chain prior to its introduction to said severing mechanism.

11. In a machine for sewing looped fabrics including a movable support, impaling pins for receiving fabric articles mounted on said support and movable therewith, stitch-forming mechanism for uniting said articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, and means oscillative in a non-vertical plane for elevating said chain prior to its introduction to the severing mechanism, said means being restrained against movement by the articles.

12. In a machine for sewing looped fabrics including a movable support, impaling pins for receiving fabric articles mounted on said support and movable therewith, stitch-forming mechanism for uniting said articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, means oscillative in a non-vertical plane and adapted to move under said chain to elevate the same prior to its introduction to said severing mechanism, and means to restrain movement of said first-mentioned means.

13. In a machine for sewing looped fabrics including a movable support provided with radially projecting impaling pins adapted to receive fabric articles and stitch-forming mechanism for uniting the edges of said articles by a chain of stitches, a chain elevating device oscillative in a non-vertical plane and bearing against said chain, and means operating in opposition to said elevating device to maintain the articles properly positioned on the impaling pins.

14. In a machine for sewing looped fabrics including a movable support provided with impaling pins for receiving fabric articles and stitch-forming mechanism for uniting the edges of said articles by a chain of stitches, a spring-actuated chain elevating device bearing against said chain, and spring means operating in opposition to said elevating device to maintain the articles properly positioned on the impaling pins.

15. In a machine for sewing looped fabrics including a movable support provided with radially projecting impaling pins adapted to receive fabric articles and stitch-forming mechanism for uniting the edges of said articles by a chain of stitches, a chain elevating device oscillative in a non-vertical plane and bearing against said chain in a plane above the impaling pins, and means operating in a plane below said impaling pins and in opposition to said elevating de-

vice to maintain the articles properly positioned on the impaling pins.

16. In a machine for sewing looped fabrics including a movable support provided with impaling pins for receiving fabric articles and stitch-forming mechanism for uniting the edges of said articles by a chain of stitches, a chain elevating device oscillative in a non-vertical plane and bearing against said chain and adapted to move under the portion of the chain which extends between adjacent articles, and means to compress the chain prior to its engagement by said elevating device.

17. In a machine for uniting the edges of looped fabric articles by forming a chain of stitches, mechanism for severing the chain between adjacent articles, means coactive with said mechanism for introducing said chain to said severing mechanism, said means operating continuously above the looped seam, and means oscillative in a non-vertical plane and controlled by the articles for elevating said chain prior to its introduction by said first mentioned means to the severing mechanism.

In testimony whereof, I affix my signature.

EDISON E. RANDALL.