Aug. 12, 1958 D. M. CLYMER 2,846,964

TIE STRING LOOPER AND FOLDER

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Fig. 1.

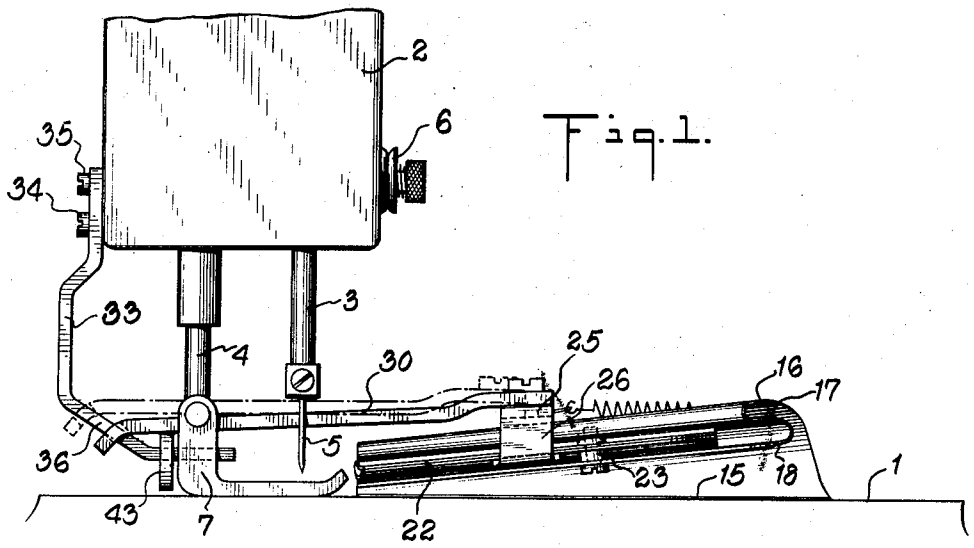
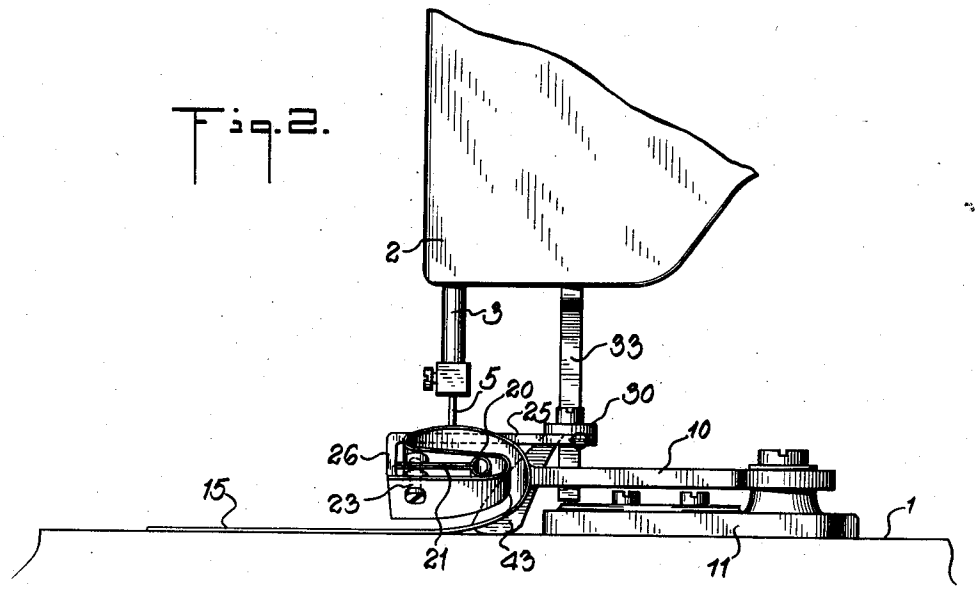


Fig. 2.



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Fig. 3.

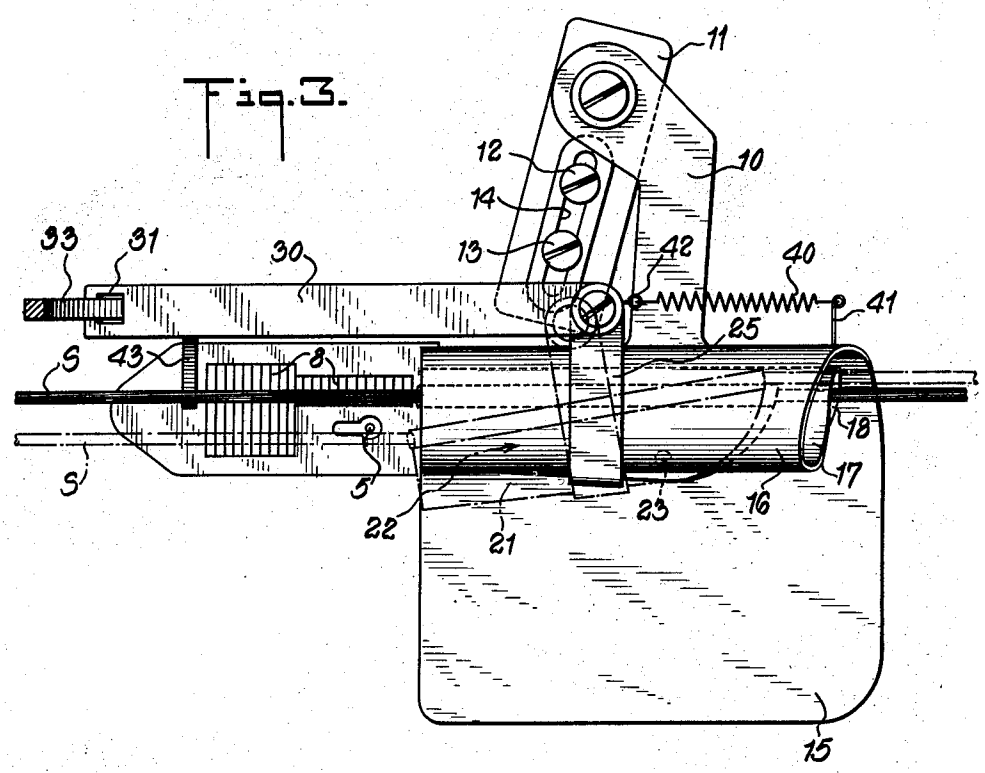
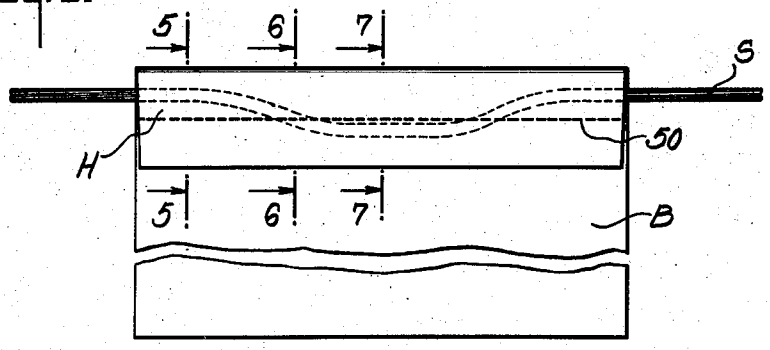


Fig. 4.



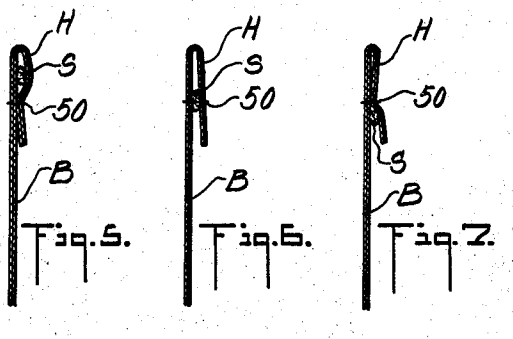


Fig. 5. Fig. 6. Fig. 7.

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TIE STRING LOOPER AND FOLDER

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Application April 23, 1954, Serial No. 425,126

6 Claims. (Cl. 112—2)

This invention relates to mechanical means for sewing a hem on a bag and at the same time incorporating therein a carrier string for supporting the bag and its contents.

An object of the invention is to create a mechanism which can be readily and conveniently attached to a standard sewing machine.

Another object of the invention is to produce a device which will turn over the hem on the bag when the bag is inserted so as to enable the operator to quickly and efficiently sew a hem in the bag.

Still another object is to manipulate the supporting string in the hem so that the seam of the hem will secure the supporting string in place so that the latter cannot be readily pulled out of the hem.

Still another object is to produce a device which will automatically move the supporting string from one side of the sewing needle to the other at a point intermediate the ends of the seam so that string will be on the outside of the seam near the mid-point of the seam, and to do this automatically upon movement of the bag under the needle from the front of the sewing machine toward the rear thereof.

While there is shown in the accompanying drawings a preferred embodiment of the invention, yet it is to be understood that the same is susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings:

Fig. 1 is an end view of the device of the invention attached to a standard sewing machine and looking toward the needle end of the sewing machine head;

Fig. 2 is a side view of the device shown attached to a sewing machine and looking from the front of the sewing machine;

Fig. 3 is a top plan view of the device;

Fig. 4 is a top plan view of a hemmed bag showing the supporting string in the hem and its relation to the seam which secures the hem;

Fig. 5 is a section through 5—5 of Fig. 4;

Fig. 6 is a section through 6—6 of Fig. 4; and

Fig. 7 is a section through 7—7 of Fig. 4.

Looking at the drawings, 1 represents the base of a sewing machine head, 2 the vertical portion of the head which carries the needle reciprocating mechanism and the presser foot support mechanism, 3 the reciprocating needle support, 4 the presser foot support, 5 the needle, 6 the tensioning device for the thread which forms the seam in the hem of the bag, 7 the presser foot and 8 the feed dogs. Herein the front of the sewing machine will be considered the side on which the operator sits and the right side the operator's right side.

The hemming attachment which is the subject matter of this invention is supported on bracket arm 10 (Figs. 2 and 3) which in turn is secured to adjustable supporting member 11 which is attached to the base of the head of the sewing machine on the front portion thereof by means of screws 12 and 13 which pass through a slot 14

in the member 11 and are threaded into suitable holes drilled into the base of the sewing machine head. This slotted arrangement permits a certain longitudinal adjustment of the supporting member 11 on the base of the sewing machine head.

Attached to the bracket 10 is a metal guide plate 15 which is curled around at its right end, as viewed from the front of the sewing machine when the hemming device is in place, so as to form a guide for the end of a bag blank, which guide will turn over the hem on the end of the blank. It will be seen (Figs. 1 and 3) that the right end of the guide plate is first turned over 180° to form the top surface 16, which surface is approximately an inch or an inch and a quarter wide. This, of course, will depend on the width of the hem it is desired to put on the bag. The sheet metal plate turns back toward the right, as viewed from the front of the sewing machine, to form a surface 17 immediately under the surface 16 and it is between these two surfaces that the hem of the bag is turned over as the bag is inserted by the operator, as will be more fully explained hereinafter.

The plate 15 is again turned back 180° on itself toward the left side of the mechanism to form still a third surface 18. All of these surfaces formed by bending the plate 15 back and forth are of approximately the same width. The surface 16 is somewhat wider than the others because surfaces 17 and 18 are underneath the surface 16 and there has to be sufficient room for the bag to pass between the right ends of surfaces 17 and 18 and the right end of the surface 16. Between surfaces 17 and 18 there is mounted a string carrier tube. As the name would indicate, this is designed to carry the string which passes through the hem. This tube is shown at 20. The cylindrical tube itself which actually receives the string is attached to a flat plate 21 so that the tube runs along one edge of the plate, as shown in Fig. 2. The flat plate and tube are integral and form a single string guide piece which will be called 22 (Fig. 3). This member 22 is supported between the surfaces 17 and 18 on a pivot pin 23 so that it can pivot through a limited arc, as shown in the dot-dash lines and the solid lines of Fig. 3.

Attached to the left hand edge of the flat member 21 of the member 22 is a bracket 25. At the left end this bracket is turned down, as shown at 26, and is firmly secured to the flat portion 21 of the string guide member 22 so that movement of the bracket will cause movement of the string guide member. The opposite or right end of the bracket 25 is pivotally secured to a link 30. The link 30 runs in the direction of front to rear of the sewing machine and substantially parallel to the path of travel of the bag as the hem seam is sewn. The rear end of link 30 is punched with a square hole 31 designed to receive a more or less vertical square rod supporting member 33. This member is attached to the sewing machine head 2 by suitable screws 34 and 35 (Fig. 1). This square rod supporting member is stationary and serves merely to guide the rear end of the link 30. It will be seen that rod 33 is equipped with a sloping portion 36. This slopes at approximately 45° and it is on this portion that the rear end of the link 30 rides. The solid lines of Fig. 1 show the link in its forward position and the dot-dash lines show it in its rearward position.

A coil spring 40 secured at one end to member 15 at 41 is attached at its other end to link 30, as shown at 42. This coil spring is designed to urge the link 30 toward the front of the sewing machine, that is, in the direction of the operator. The link 30 is also equipped with a downwardly extending toe member 43 designed to be engaged by the edge of the bag or end of the hem as the bag moves from the front toward the rear of the sewing machine through the sewing mechanism.

A sewn bag B is shown in Figs. 4 to 7. The sewing

operation has formed hem H. The supporting string is shown at S and the sewn seam is shown at 50. It will be seen by the sectional drawings 5, 6 and 7 and by the dotted lines of Fig. 4 that the supporting string S in the hem is engaged by the seam 50 midway between the two sides of the bag and that actually the string S dips down (as shown in Fig. 4) below the seam 50 for a short distance near the center of the bag hem. This serves to securely hold the supporting string S in place so that it cannot inadvertently be pulled out.

In operation, after the hemming device is properly adjusted in relation to the needle of the sewing machine, which adjustment can be readily obtained by means of the slot 14 and screws 12 and 13, the operator moves an open ended bag blank to the right along the plate 15 until the end is forced upwardly and backwardly to the left between the surfaces 16 and 17, thus turning over a hem on the end of the bag blank. This operation is accomplished with the rear edge of the bag blank forward of the needle which would make it substantially in registry with the rear edge of the metal guide plate 15. The operator then advances the bag blank from the front toward the rear of the sewing machine and brings the hem under the presser foot and reciprocating needle. During this part of the operation the string S is in the position shown in the solid lines of Fig. 3, that is, the string holder is in a position with its rear end farthest to the right or, in other words, with the string projecting in a more or less straight line through the hem of the bag to the right of the seam which the needle commences to sew. As the bag moves under the needle advanced by the cooperation of presser foot and feed dog of the sewing machine, the rear edge of the hem comes in contact with the depressed toe 43 of the link 30 and begins to move the link 30 toward the rear of the sewing machine, that is, to the left, as viewed in Fig. 3.

Through bracket 25 this motion of link 30 causes string carrier 22 to pivot about 23 which in turn means that the rear end of the string supporting member moves to the operator's left or downwardly, as shown in the dot-dash lines of Fig. 3. This carries the string to the left of the seam which is being sewn by the needle 5 so that a portion of the string is to the left of the seam, as shown in Figs. 3 and 4. As the bag continues to advance toward the rear of the sewing machine, the rear edge of the hem which has engaged the depressed toe 43 slips under that toe as it rises because the link 30 rides up the inclined surface 36 of the bracket 33. This permits the link 30 with the depressed toe 43, of course, to be drawn to the front ot the sewing machine by the coil spring 40 which in turn brings the string carrying member back to its normal position, as shown in solid lines in Fig. 3, with the result that the string goes back to the right side of the needle and is sewn inside the hem, as shown at the right side of Fig. 4. Upon completion of the seam and hem it is only necessary for the operator to cut off the seaming thread and a suitable length of supporting string and the bag is then ready to be filled from the opposite end with the contents thereof.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a cloth folding and hem sewing attachment for a sewing machine having a hem turning guide plate secured to the sewing machine proximate to the needle, a string guide for feeding string into said hem and means for moving said string guide across the path of the needle, the improvement comprising contacting means for engaging and moving with the advancing forward edge of the cloth being sewn, connecting means attached to said contacting means and to said string guide for transforming linear motion of said contacting means into motion of said string guide across the path of the needle from inside the hem to outside the hem, disengaging means connected to said contacting means for disengaging said contacting means from the advancing forward edge of the cloth being sewn after a predetermined linear distance of travel of said contacting means, and spring means for restoring upon such disengagement said contacting means to its original position and said string guide to its original position inside the hem.

2. In a cloth folding and hem sewing attachment for a sewing machine having a guide plate turned over at one end to form upper and lower guide surfaces for a bag blank and so designed that upon insertion of said blank between said guide surfaces a hem will be turned over on one edge of said blank, and having a movable string guide normally positioned to guide a string through the hem of the bag blank formed by the guide plate, the improvement comprising pivot means forming a center of rotation of said string guide, rotating means attached to said string guide adapted to move said guide about said pivot means from a normal position in which it feeds a string inside the hem to an outside position on the other side of the needle path, engaging means adapted to engage and be moved by the bag blank as it moves past the needle during the sewing of the hem seam, connecting means adapted to transmit the motion of said engaging means to said rotating means and thus move said string guide from its normal to its outside position, and spring means adapted to return said guide to its normal position upon disengagement of said engaging means from said bag blank.

3. In a cloth folding and hem sewing attachment for a sewing machine having a guide plate turned over at one end to form upper and lower guide surfaces for a bag blank and so designed that upon insertion of said blank between said guide surfaces a hem will be turned over on one edge of said blank, and having a movable string guide normally positioned to guide a string through the hem of the bag blank formed by the guide plate, the improvement for moving said string guide so that the string is moved from its normal position inside the hem through the seam of the hem to an outside position and then back again while the seam is still being sewn on the hem comprising link means having a depressed toe member adapted to engage and move with one end of the hem as the bag blank goes past a sewing machine needle sewing the seam on the hem, connecting means for translating the motion of said link means into motion of said string guide from said normal position to said outside position, disengaging means connected with said toe member for disengaging said toe member from said end of the hem after a predetermined movement of said toe member and permitting said string guide to return to said normal position.

4. In a cloth folding and hem sewing attachment for a sewing machine having a guide plate turned over at one end to form upper and lower guide surfaces for a bag blank and so designed that upon insertion of said blank between said guide surfaces a hem will be turned over on one edge of said blank, and having a movable string guide normally positioned to guide a string through the hem of the bag blank formed by the guide plate, the improvement comprising pivot means forming a center of rotation of said string guide, a movable link attached to the string guide and adapted to rotate the string guide about said pivot means, a spring biasing said link so as to place the string guide in its normal position, a depressed toe member on the link positioned to intercept and move with the edge of the bag blank as the bag blank advances under a sewing needle which is sewing the seam in the hem and adapted by transmitting its movement to the movable link to rotate the string guide about the pivot means, and guide means for said link.

5. In a sewing machine for folding over and sewing a hem in a cloth edge having a frame, a horizontal feed table attached thereto, a vertically reciprocating needle piercing said feed table and carried by said frame, a hemmer guide plate for folding over said cloth edge attached to said feed table adjacent said needle, said guide plate being a horizontal plate with one edge bent over

to create a J-shaped cross-section when cut by a plane perpendicular to the direction of travel of cloth under the needle and being oriented to feed the folded-over cloth edge to said needle, and a string guide horizontally movable between the two layers of said folded-over cloth edge across the path of the needle from a normal inner position on the side of the needle path toward the fold to an outer position on the other side of the needle path, the improvement which shifts the guide from the inner to the outer position comprising a substantially vertical pivot supporting said string guide and rigidly fixed with respect to the frame, thereby forming a center of rotation for said string guide, a toe member normally positioned in the path of the advancing edge of the cloth which has been sewn, link means connecting said string guide and said toe member for transforming linear rearward motion of said toe member to rotary motion of said string guide, said rotary motion bringing the string exit point from the normal inner position to the outer position, guiding means guiding said link means and allowing linear rearward motion of the toe member from its normal position under pressure from said advancing edge, disengaging means for disengaging said toe member from said advancing edge after it has advanced far enough to bring said string guide to the outer position, and spring means for returning said toe member to its normal position and said string guide to its normal inner position also.

6. In a sewing machine for folding over and sewing a hem in a cloth edge having a frame; a horizontal feed table attached thereto; a vertically reciprocating needle piercing said feed table and carried by said frame; a hemmer guide plate for folding over said cloth edge attached to said feed table adjacent said needle, said guide plate being a horizontal plate with one edge bent over to create a J-shaped cross-section when cut by a plane perpendicular to the direction of travel of cloth under the needle and being oriented to feed the folded-over cloth edge to said needle; and a string guide horizontally movable between the two layers of said folded-over cloth edge across the path of the needle from a normal

inner position on the side of the needle path toward the fold to an outer position on the other side of the needle path; the improvement which comprises a vertical pivot attached to and depending from the bent-over portion of said guide plate and supporting said string guide, thereby forming a center of rotation for said string guide; a first horizontal link rigidly attached to said string guide and substantially perpendicular to the direction of travel of cloth under the needle; a second horizontal link substantially parallel to the direction of travel of cloth under the needle pivotally attached at one end to said first horizontal link at a point lying on the same side of said vertical pivot as the bend in the guide plate and having a hole at the other end; a cam rod rigidly fastened to the frame and slidably piercing said hole; cam surfaces on said cam rod contacting the walls of said hole and inclined up and to the rear of the machine; upper and lower end positions on said surfaces such that with the second link at the lower end position the string guide lies on the same side of the path of the needle as the bend in the guide plate and with the second link at the upper end position the string guide lies on the opposite side of the path of the needle, and said second link lies higher above said feed table than in the first position; spring means biasing the second link toward the lower end position; and a toe member attached to said second link and extending downward therefrom proximate to the surface of said horizontal feed table at a point lying in the path of cloth emerging from under the needle when said second link is so biased, said toe member participating in said second link's rise from said first to said second position and thus said toe member rising from said point in the path of cloth emerging from under the needle.

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