July 15, 1941. D. J. DUNCAN ET AL 2,249,377

STRING FEED MECHANISM

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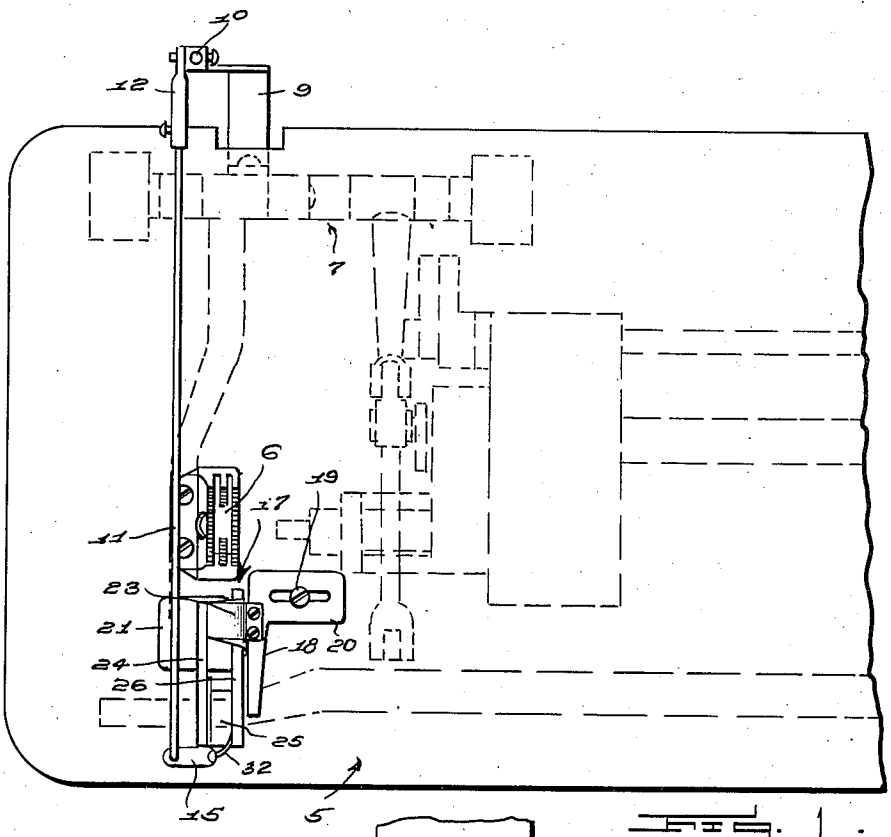


FIG. 1.

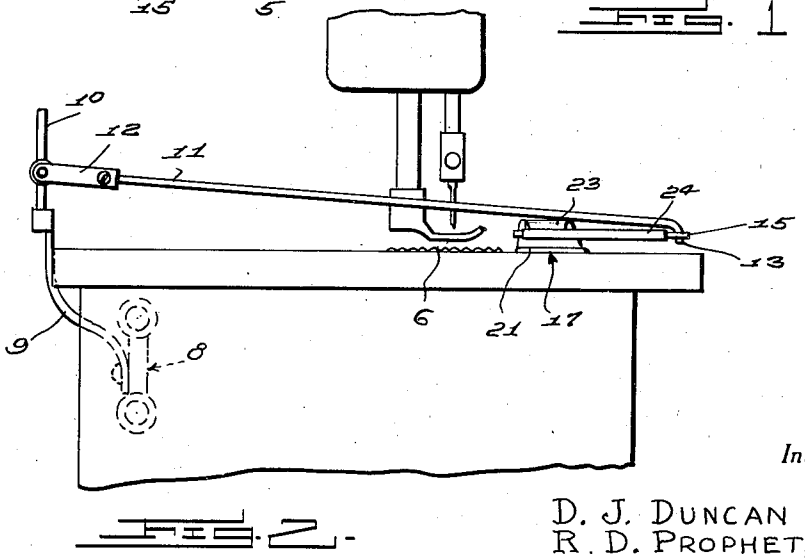


FIG. 2.

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STRING FEED MECHANISM

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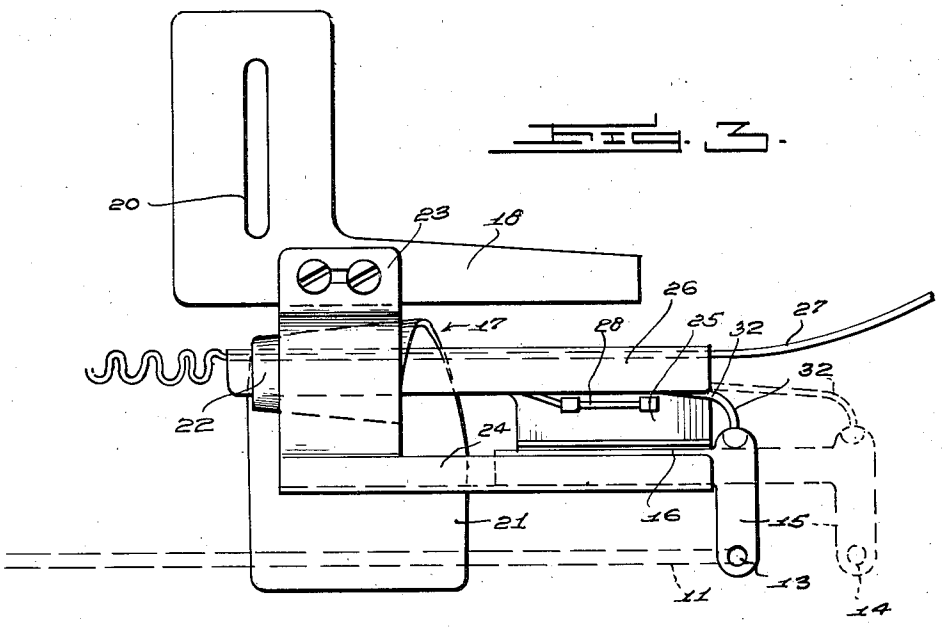


FIG. 3.

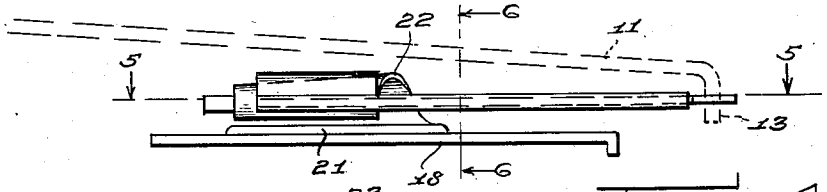


FIG. 4.

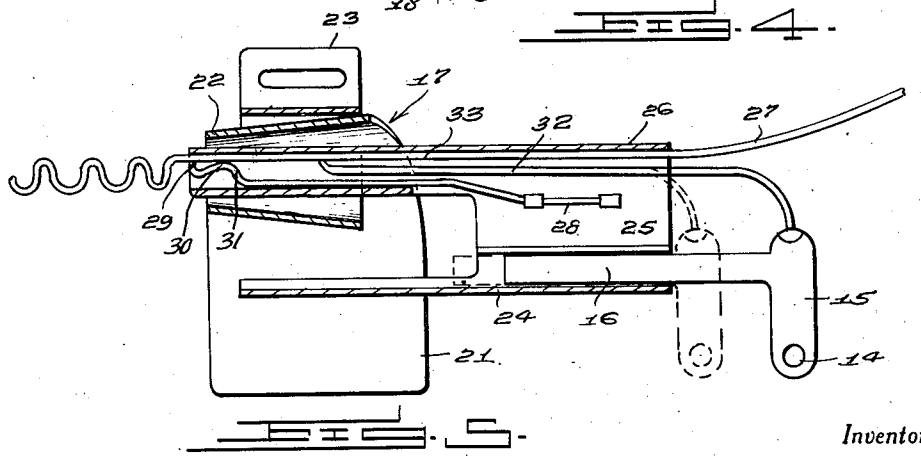


FIG. 5.

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FIG. 6.

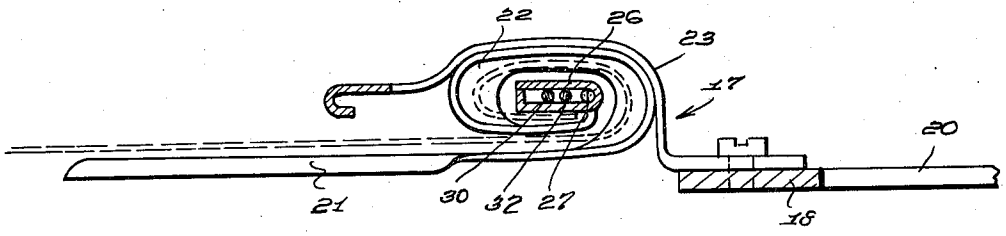


FIG. 7.

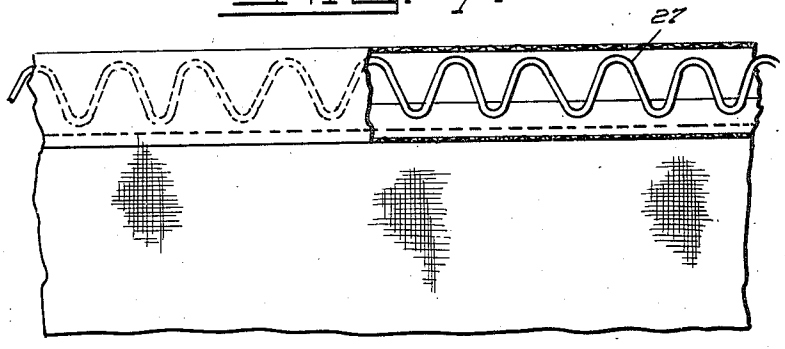


FIG. 8.

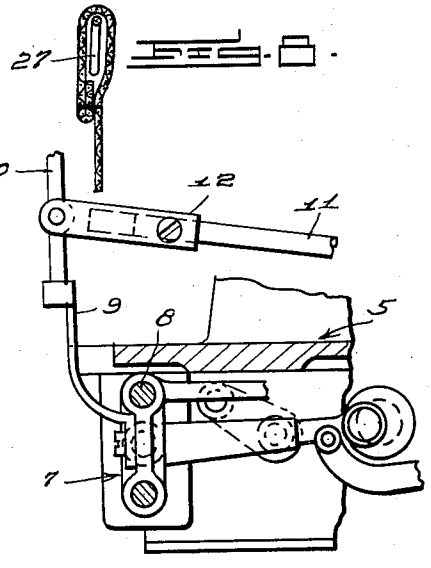


FIG. 9.

FIG. 10.

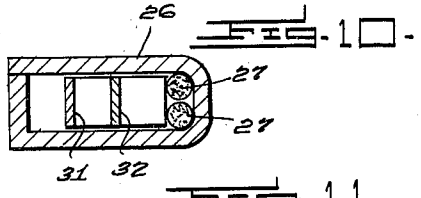
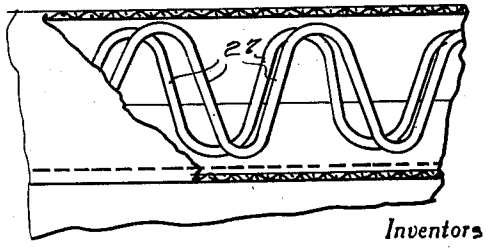


FIG. 11.



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UNITED STATES PATENT OFFICE

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STRING FEED MECHANISM

Dwight J. Duncan and Richard D. Prophet,
Dallas, Tex.

Application September 29, 1939, Serial No. 297,166

4 Claims. (Cl. 112—2)

This invention relates to a string feed mechanism especially adapted for laying string into a hem of fabric employed in the making of cloth bags, so that each bag constructed from the hemmed fabric will be provided with a tying string for the closing of the bag. The primary object of the present invention is the provision of a device of the above stated character which operates in conjunction with a cloth folder or hemmer on a sewing machine and is operated in timed relation with the cloth feeding mechanism of said sewing machine so that a surplus amount of string will be laid in or arranged in the hem of the fabric whereby on the cutting of said fabric into pieces of selected lengths for the making of bags, each piece of fabric will have in the hem thereof string of sufficient length which when extended from the ends of the hem will be of a length to permit convenient tying of the ends of the string to close the mouth of the bag.

Another object of this invention is the provision of a device of the above stated character which will successfully lay in a surplus amount of string within the hem of the fabric employed in the making of bags and which amount of string laid in the hem may be varied through the adjustment of the device and further a device of this character will permit such work to be rapidly carried out and provide a large saving in time in the construction of finished bags heretofore requiring manual labor in the threading of the string through the hem after the making of the hem in the fabric.

With these and other objects in view, the invention consists in certain novel features of construction, combination and arrangement of parts to be hereinafter more fully described and claimed.

For a complete understanding of our invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a top plan view illustrating a string feed mechanism mounted on a fragmentary portion of a sewing machine and showing the same in combination with a hemmer on said sewing machine and operated by the cloth feed mechanism of the sewing machine and which is indicated in the major portion thereof by dotted lines.

Figure 2 is a side elevation illustrating the invention mounted on a fragmentary portion of a sewing machine.

Figure 3 is an enlarged top plan view showing the present invention in combination with a hemmer.

Figure 4 is an edge elevation illustrating the device.

Figure 5 is a sectional view taken on the line 5—5 of Figure 4.

Figure 6 is a transverse sectional view taken on the line 6—6 of Figure 4.

Figure 7 is a fragmentary plan view partly in section showing the hemmed fabric with a tying string laid therein.

Figure 8 is a transverse sectional view through the hem of the fabric and the tying string.

Figure 9 is an enlarged fragmentary sectional view showing the operating means for the cloth feed mechanism of the machine and showing the connection of the present invention thereto.

Figure 10 is a transverse sectional view showing a modification of the present invention wherein several strings are fed by the device into the hem.

Figure 11 is a fragmentary plan view partly in section of the hemmed fabric with the double strings arranged within the hem.

Referring in detail to the drawings, the numeral 5 indicates a fragmentary portion of a sewing machine used in the sewing of fabric employed in the making of fabric bags used for many purposes such as mailing bags, bags for containing articles of merchandise for sale, and the like. The sewing machine forms no part of the present invention and only a portion thereof is shown in the drawings for the purpose of illustrating the application of the present invention to a sewing machine. The cloth feed mechanism of the sewing machine is indicated generally by the character 6 and as well known in this art is for the purpose of feeding the cloth relative to the needle and presser foot of the sewing machine and has an operating mechanism indicated generally by the character 7, one portion of which has a rocking motion and this portion is indicated by the character 8. The primary purpose of the portion 8 is to reciprocate the cloth feed plate and has attached thereto a bracket 9 forming a part of the present invention and which extends above the bed plate of the sewing machine and has connected thereto a rod 10 which rocks back and forth with the portion 8 of the mechanism 7. A pitman rod 11 is provided at one end with a fitting 12 for pivotally and adjustably connecting the pitman rod on the rod 10. By adjusting the fitting 12 upwardly and downwardly on the rod 10 the length of the stroke of the pitman may be increased and decreased as desired. The other end of the pitman is in the form of a hook 13

which enters an opening or eye 14 of a head 15 forming an integral part of a slidable member 16 used in the feed mechanism of the present invention.

A hemmer or cloth folding device 17 is detachably secured on a bracket 18 and the latter is adjustably secured on the bed plate of the sewing machine by a set screw 19 threaded in the bed plate and passing through a slot 20 in said bracket. The hemmer 17 is supported by the bracket over the bed plate in front of the presser foot and needle of the sewing machine and also in front of the cloth feed mechanism 6 of said sewing machine. The purpose of the hemmer is that when cloth is to be hemmed by the sewing machine the cloth first passes through the hemmer which folds one edge of the cloth upon itself so that on the cloth being acted upon by the needle, presser foot and cloth feeding mechanism of the sewing machine the folded cloth will be stitched into a hem.

In the making of cloth bags of the character heretofore mentioned it is the practice of hemming a strip of cloth in many yards of length and after the strip of cloth has been hemmed it is the practice to cut the strip of cloth into many pieces of a length so that a bag of a predetermined size may be made from the piece of cloth. After the cutting of the strip of the cloth into many pieces and the sewing of said pieces into bag formation or just prior to the sewing of the pieces into bag formation, it has been the practice to thread through the hem of the piece a tying cord. This threading has been done manually requiring considerable time on the part of the operator. Through the employment of the present invention, a portion of which has been heretofore described and the remaining portion which will now be described, operating in conjunction with the hemmer and will lay the string into the hem as the latter is formed in the strip of fabric with a surplus amount of string so that when the fabric is cut into pieces to make the bags sufficient string will be in the hem of each piece to provide a tying string of sufficient length for the closing of the bag after the construction of the bag from the piece cut from the strip of fabric.

The present invention being timed with the cloth feed mechanism and operating in conjunction with the hemmer will lay into the hem a selected amount of string as fast as the strip of fabric is hemmed by the sewing machine.

The hemmer 17 includes in its construction a plate 21 which has a portion bent upon itself to form a substantially conical shaped throat 22 through which the cloth passes on its way to the presser foot and needle of the machine to bring about folding of one edge of the cloth upon itself. The plate 21 is further bent to form the attaching portion 23 which is secured onto the bracket 18 and has formed thereon a channeled supporting member 24 which slidably supports the reciprocal feed member 16. Formed integrally with the guide member 24 and in advance of the plate 21 is a connecting plate 25 which also is formed onto a string guide 26 for supporting a portion thereof centrally of the throat 22 of the hemmer and spaced from the walls of the throat with one end projecting a limited distance beyond the restricted end of the throat for the discharge of the string from the guide. The string is indicated by the character 27 and is received from a suitable supply (not shown) and passes into the guide at one end thereof and is fed from the other end of the guide by a feed mechanism of which the member 16 forms a part. A spring rod 28 is mounted on the connecting plate 25 and extends into the string guide and terminates at the discharge end of the guide in the form of a sharpened hook-shaped portion 29. The spring rod 28 includes a substantially straight portion 30 which parallels one wall of the string guide to bear against the string and force the string against said wall of the guide.

The spring rod 28 further includes an angularly related portion 31 acting as a cam member engaged by a string feed dog 32 in the form of a spring rod having one end fixed on the head 15 of the member 16 and its other end angularly disposed and sharpened, as shown at 33, to engage the string for feeding the string through the string guide in one direction or toward the discharge end of the string guide by the sliding movement of the member 16 in one direction. The movement of the dog 32 in this direction of feeding the string outwardly of the discharge end of the guide engages the cam face 31 of the holding dog 30 and flexes the latter to free the holding dog 30 from the string so that said string may move outwardly of the discharge end of the string guide. A movement of the feed dog 32 in a reverse direction it is disengaged from the cam face 31 of the holding dog 30 and the latter springs into engagement with the string and grips the latter to prevent a reverse movement of the string by the feed dog 32 moving in the reverse direction.

It will be seen from the foregoing description when taken in connection with the drawings that the string 27 will be fed through the string guide in a step by step movement with the string leaving the discharge end of the guide in a crimped form due to the action of the holding dog 30 on the string. It further will be seen that in order to produce this crimped portion in the string that the holding dog 30 holds the string in the string guide during a portion of the stroke of the feed dog 32 toward the discharge end of the string guide so that on the feed dog releasing the holding dog 30 from the string, the latter on leaving the guide will be in crimped formation.

Further, it will be seen that through the adjustment of the fitting 12 on the rod 10 the stroke of the pitman 11 can be varied in length, consequently varying the length of movement of the feed dog and thereby permit the amount of string ejected from the guide during each feed stroke of the feed dog to be varied.

The string feed mechanism of the present invention as shown and described in the drawings operates in timed relation with the cloth feed mechanism 6 of the sewing machine so that as the cloth is advanced in the hemming of said cloth the string will be injected into the hem of the cloth as said hem is formed and stitched.

It is preferable that the string guide or the portion thereof extending into the conical shaped throat of the hemmer be of substantially oblong shape in cross section or end view and when it is desired to pass two strings into a hem as the latter is formed in the fabric it is only necessary to increase the size of the string guide to accommodate the two strings, as shown in Figure 10, and to increase the width of the holding and feeding dogs. The laying of double strings into the hem of the fabric is clearly shown in Figure 11 with each string crimped to provide the surplus amount of string in the hem sufficient to permit, when the fabric is cut to form a bag,

sufficient length to the end portions of the strings to permit them to be tied together to form draw strings for the mouth of the bag.

By referring to Figure 6 it will be noted that the hemmer 17 is really constructed from two plates secured together, one being the attaching plate 23 and the other the plate 21, the latter being bent upon itself to form the substantially conical-shaped throat, the receiving end of the throat being shown in Figure 5 with the string guide located therein. Also this view shows the cloth being folded by the hemmer with the cloth passing over the plate 21 and through the conical shaped throat and under the plate 23. The plates 21 and 23 are welded or otherwise secured together in the constructing of the hammer.

It is believed that the foregoing description, when taken in connection with the drawings, will fully set forth the construction and advantages of this invention to those skilled in the art to which such a device relates, so that further detailed description will not be required.

Having thus described our invention, what we claim is:

1. In combination with a hemmer having a substantially conical shaped throat, a channeled string guide extending through the throat and adapted to receive string from a supply, a feed dog operating in the string guide to engage and feed the string from the discharge end of the string guide, a spring type holding dog engaging the string in the guide adjacent the discharge end of the latter and having a cam face to be engaged by the feed dog on the latter moving on its string feeding stroke to disengage the holding dog from the string, and means for operating the feed dog.

2. In combination with a hemmer having a substantially conical shaped throat, a channeled string guide extending through the throat and adapted to receive string from a supply, a feed dog operating in the string guide to engage and feed the string from the discharge end of the string guide, a spring type holding dog engaging the string in the guide adjacent the discharge end of the latter and having a cam face to be engaged by the feed dog on the latter moving on its string feeding stroke to disengage the holding dog from the string, a supporting member connected to the string guide and supported by the hemmer, an operating member slidably mounted in the supporting member and having a feed dog connected thereto, and means for reciprocating said member.

3. In combination with a hemmer having a substantially conical shaped throat, a channeled string guide extending through the throat and adapted to receive string from a supply, a feed dog operating in the string guide to engage and feed the string from the discharge end of the string guide, a spring type holding dog engaging the string in the guide adjacent the discharge end of the latter and having a cam face to be engaged by the feed dog on the latter moving on its string feeding stroke to disengage the holding dog from the string, a supporting member connected to the string guide and supported by the hemmer, an operating member slidably mounted in the supporting member and having a feed dog connected thereto, a pitman connected to said member, a rod having said pitman pivotally and adjustably connected thereto for imparting reciprocation to said pitman, and means for connecting said rod to a reciprocating mechanism of a fabric feed device of the sewing machine.

4. In combination with a hemmer having a substantially conical-shaped throat, a channeled string guide extending through the throat and adapted to receive string from a supply, a feed dog operating in the string guide to engage and feed the string from the discharge end of the string guide, a spring type holding dog including a hook-shaped end engaging the string in the guide adjacent the discharge end of the latter and having a cam face to be engaged by the feed dog on the latter moving into its string feeding stroke to disengage the holding dog from the string, and means for operating the feed dog.

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