May 31, 1938. C. A. FLOOD 2,119,228

ATTACHING DEVICE

Filed Dec. 12, 1936 4 Sheets-Sheet 1

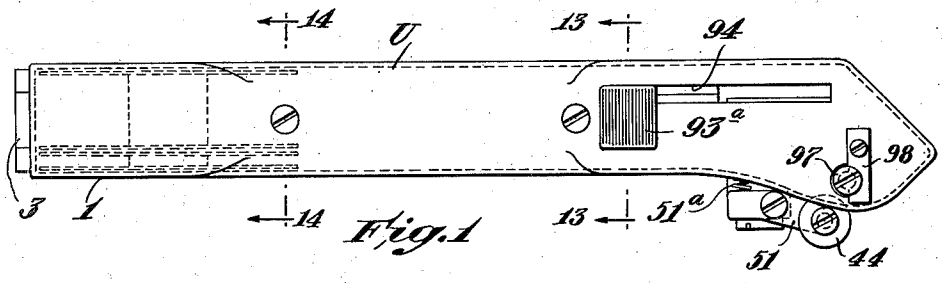
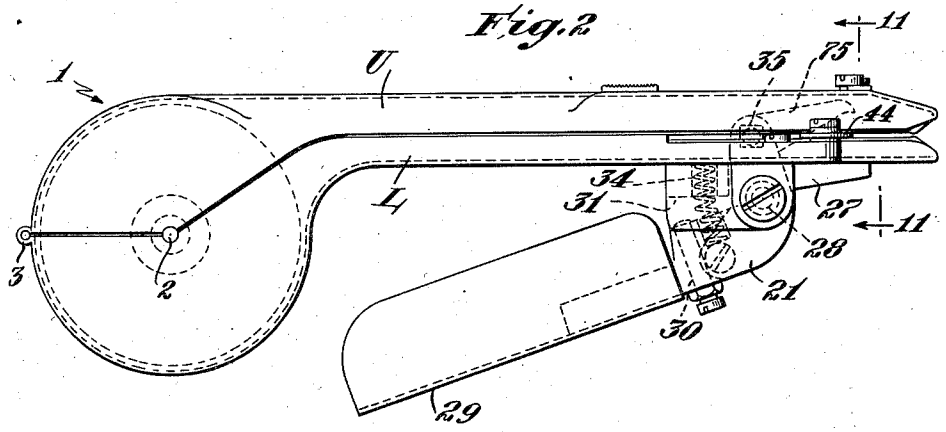


Fig. 1

Fig. 2



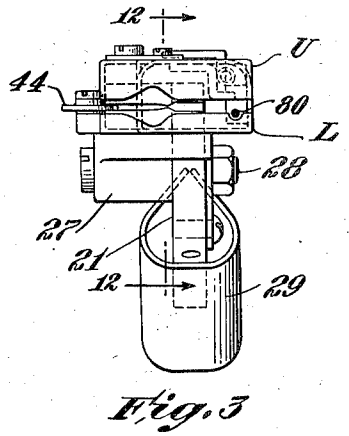
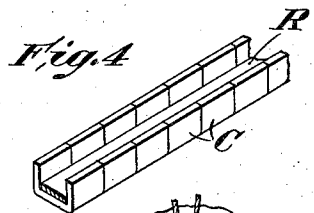


Fig. 3

Fig. 4



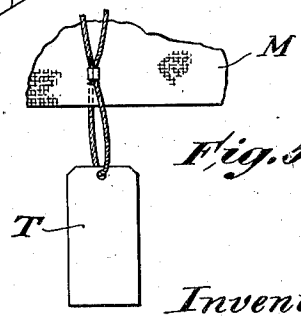


Fig. 5

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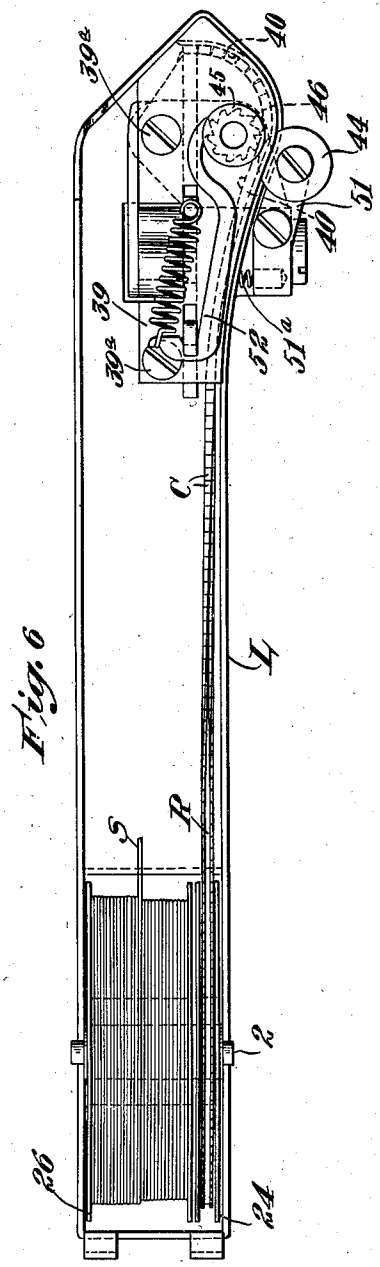


Fig. 6

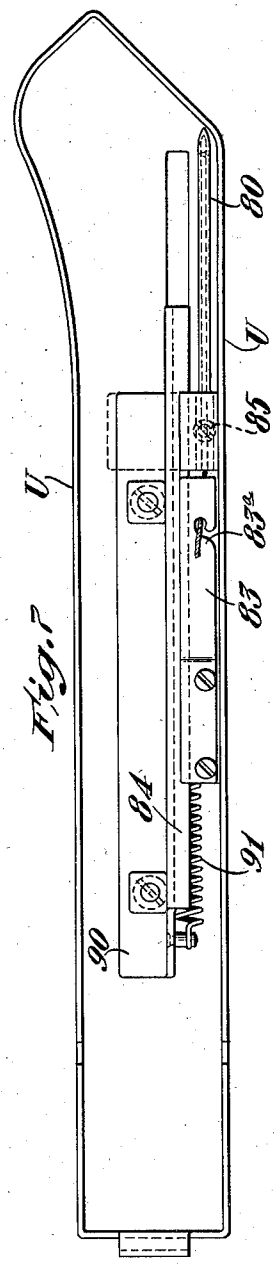


Fig. 7

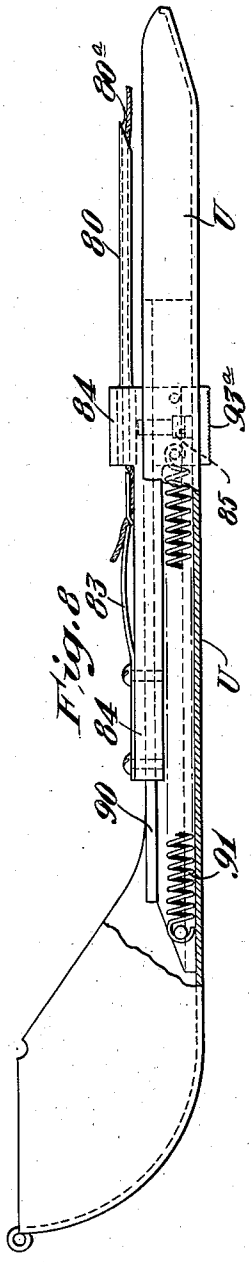


Fig. 8

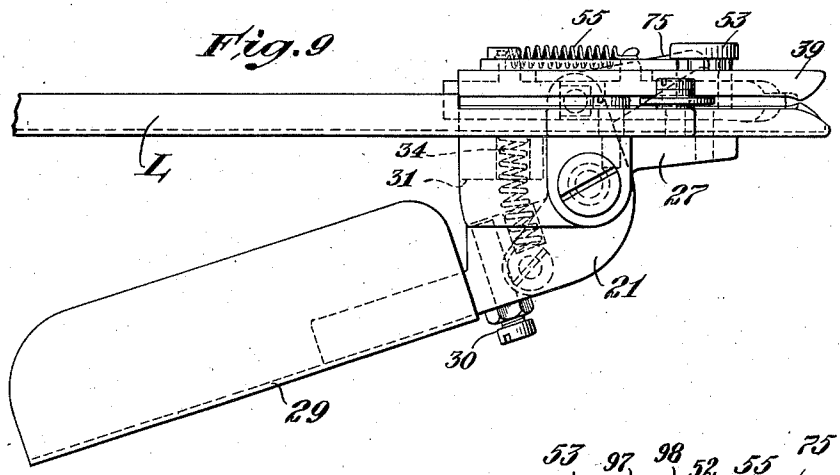
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ATTACHING DEVICE

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Fig. 9



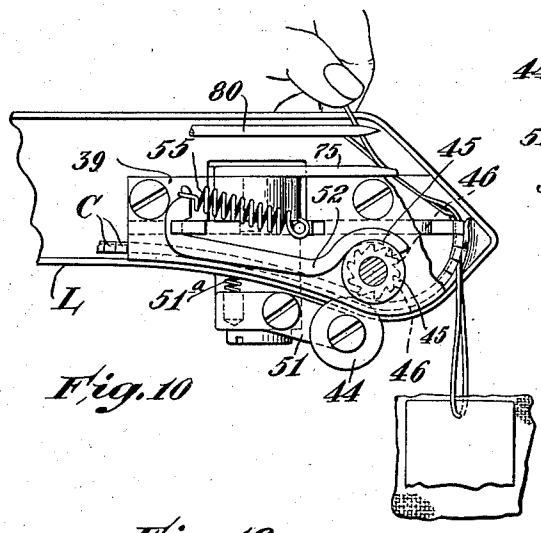


Fig. 10

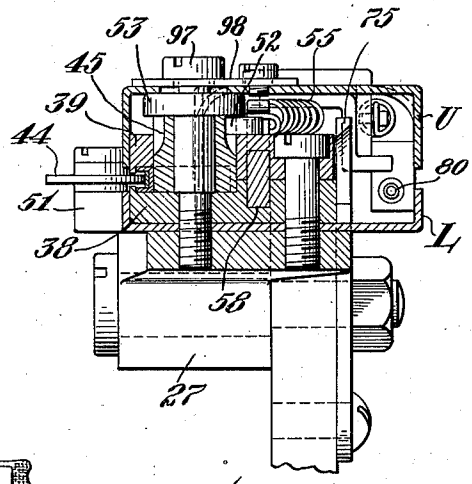
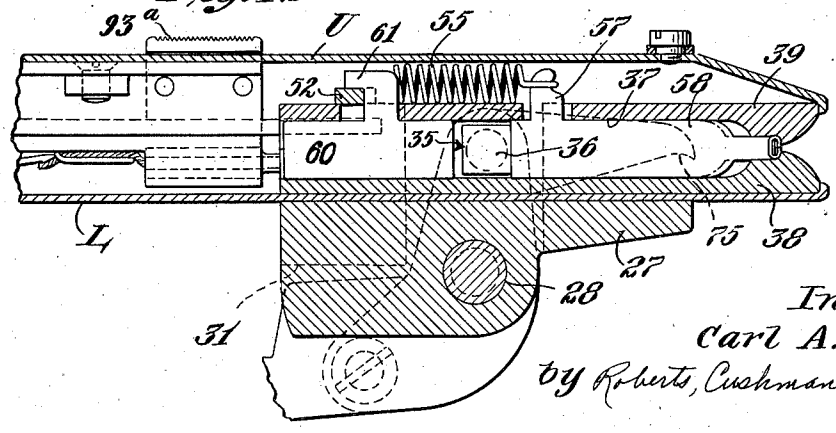


Fig. 11

Fig. 12



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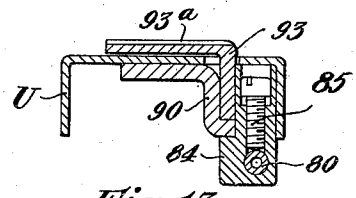


Fig. 13.

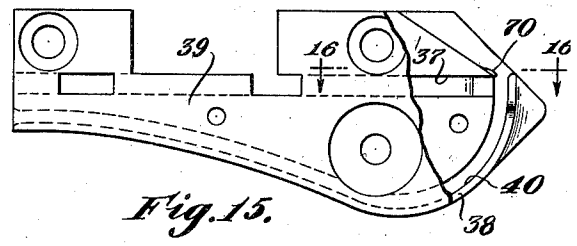


Fig. 15.

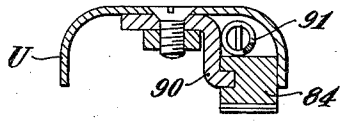


Fig. 14.

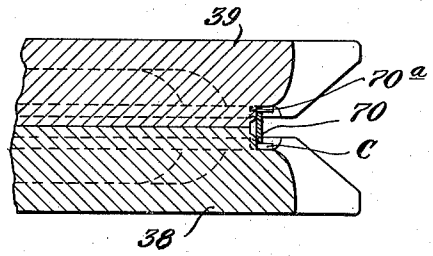


Fig. 16.

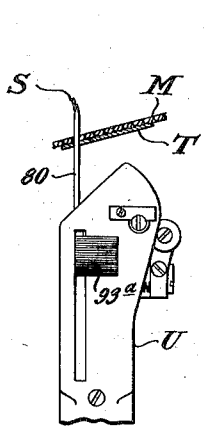


Fig. 17.

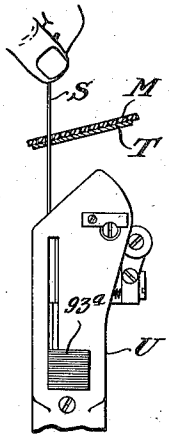


Fig. 18.

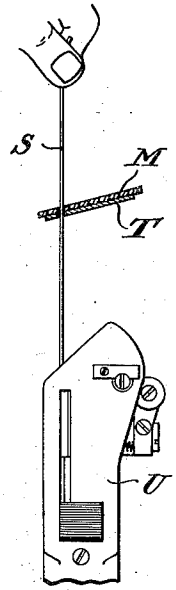


Fig. 19.

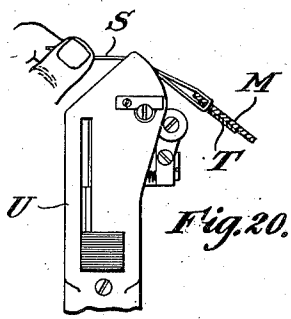


Fig. 20.

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Patented May 31, 1938

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UNITED STATES PATENT OFFICE

2,119,228

ATTACHING DEVICE

Carl A. Flood, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass., a corporation of Massachusetts

Application December 12, 1936, Serial No. 115,576

12 Claims. (Cl. 112—104)

This invention relates to an improved device for securing string loops or the like to other articles such as sheet articles. In general, the present invention affords an improved device of the general type disclosed in my copending application Serial No. 696,017, filed October 31, 1933, (now United States Patent No. 2,063,917) and it permits the securing of tags or the like to sheet articles by the method disclosed in my copending application Serial No. 736,691, filed July 24, 1934 (now United States Patent No. 2,063,918).

In accordance with the above-identified applications, a string loop may be secured to an article such as a garment by passing one end of the string through the article, retaining the end which has thus been advanced through the article and bringing this end into engagement with another portion of the string beyond the edge of the article, then uniting the juxtaposed string portions with a small metal clip or the like. My first above-identified application discloses a device which may be operative to hold the edge of the fabric article and a tag in superposed position, to advance the strand end through the fabric and tag, to grip the advanced strand end, to release the fabric and tag so that the same may be moved away from the gripped end and another portion of the strand may be juxtaposed to the gripped end. The device may then be operative in clenching a clip about the juxtaposed strands and cutting off one of the strands.

The present invention affords a simpler device which permits the more convenient handling of the materials and the more convenient control of the operations to suit different conditions. To this end, the present invention affords a clip-applying mechanism which operates automatically in response to an actuation of a handle and provides an independently movable needle to pass the strand end through the article and tag or the like while the same is positioned conveniently in somewhat spaced relation from the body portion of the device. Thus a string loop may be more conveniently secured to portions of an article which could not be received in the throat of a device such as shown in my earlier application. Furthermore, the controls of the present device are comparatively simple and the actuation of both the needle and the clipping mechanism by a single handle is avoided so that the operation of the needle is entirely independent of the operation of the clipping mechanism and cutter.

The present invention in general affords simple and rugged structural arrangements of parts which permit the convenient application of the clips to the string loops and the convenient advancing of the strand end through the material, also permitting convenient refilling of the device with strand material or with clips.

In the accompanying drawings:

Fig. 1 is a plan view of a device constructed in accordance with this invention;

Fig. 2 is a side elevation of the same;

Fig. 3 is an end elevation of such a device;

Fig. 4 is an isometric view of a strip of clips used with a device of this character;

Fig. 5 is an elevational detail view showing a tag secured to a sheet article by such a device;

Fig. 6 is a top plan view of the lower portion of the device;

Fig. 7 is a bottom view of the upper portion of the device;

Fig. 8 is a side elevational view of the upper part of the device in inverted position;

Fig. 9 is a side elevation of one end of the lower portion of the device shown in Figs. 1 and 2, parts being shown in dotted lines;

Fig. 10 is a plan view of the portion of the device shown in Fig. 9, the relation of the same to the strand and clips being shown;

Fig. 11 is a section indicated by line 11—11 of Fig. 2;

Fig. 12 is a central longitudinal section of a portion of the device indicated by line 12—12 of Fig. 3;

Fig. 13 is a section on line 13—13 of Fig. 1;

Fig. 14 is a section on line 14—14 of Fig. 1;

Fig. 15 is a plan view of certain parts of the device, one part being broken away;

Fig. 16 is a sectional detail of a portion of the clenching mechanism; and

Figs. 17 to 20 are schematic views illustrating the way in which the device may be used.

A device embodying the principles of the present invention, such as is illustrated in the accompanying drawings, may comprise a lower sheet metal housing L and an upper housing U. The ends of these housings may have cooperating portions which afford a substantially cylindrical casing assembly 1 supporting a spindle 2 having ends disposed in openings provided on opposite sides of the device by the juxtaposed edge portions of the housings L and U. The ends of these housings are connected by a hinge 3 at one side of the cylindrical casing portion 1 so that the upper housing member U may be swung upwardly away from the lower housing L to permit access to the interior of the device, including the cylindrical casing portion thereof.

This portion of the device may contain a spool

26 (Fig. 6) upon which suitable strand material, such as a fine string S, is wound, while a narrower spool 24 may support a winding of ribbon R comprising a paper strip extending along and secured to the inner surfaces of the bite portions of U-shaped clips C in the manner illustrated in Fig. 4. Adjoining the casing 1, the housings U and L may merge into portions having channel-like cross sections which extend for the major portion of the length of the device and which terminate in the nose portion of the device, which will be more fully disclosed.

A metal block 27 is secured to the nose portion of the housing L and provides a pivotal mounting 28 for a bell crank member 21. The longer, outwardly extending arm of this member is received in a sheet metal handle 29 (Figs. 2 and 3) and a set screw 30 is engageable with an abutment surface 31 of the block 27 to limit the inward movement of the handle.

A suitable compression spring 34 normally tends to swing the handle away from the housing L, as shown in Fig. 2. The inner end of the bell crank 21 projects through a slot in the lower casing L and carries an operating pin 35 having a substantially square portion 36 which fits loosely in a suitable guide passage 37 (Fig. 12) milled out of cooperating blocks 38 and 39 which are secured in the end of housing L. These blocks 38 and 39 are somewhat similar and conform to the general shape of the nose portion of the housings, as shown, for example, in Fig. 6. The blocks are normally secured to each other by screws 39a and not only cooperate to provide the passageway 37, previously referred to, but also provide a curved guideway 40 for the ribbon R. This ribbon R extends from the spool 24 through the intermediate portion of the housing assembly and into the guideway 40 which, as viewed from above, has the general shape shown in Fig. 6, curving about to an end portion which extends substantially transversely of the longitudinal extent of the device at the nose portion thereof. The ribbon R is twisted through a quarter turn as it passes from the spool 24 to the guideway 40.

Fig. 11 shows the cross-sectional shape of the passageway 40. As shown in this figure, it is evident that the blocks 38 and 39 provide a narrow slot through which a wheel or disk 44 extends. This disk is pivotally mounted on a swingable arm 51 which is controlled by a small compression spring 51a tending to swing the roller 44 inwardly so that its edge portion presses against the paper strip or ribbon R, pressing the clips C against an inner roller 45 which is provided with integral ratchet teeth 46 (Fig. 10). The rollers 44 and 45 are effective in feeding the strip R forwardly to the clenching station at the end of passageway 40.

A hook-like pawl 52 has an end portion engageable with the ratchet teeth 46 and rests on the upper block 39, a suitable collar 53 above the roller 45 preventing the upward movement of the pawl 52. The end of this pawl is connected to a tension spring 55, the opposite end of which is connected to a protuberance 57 on a slide or clenching rod 58. The latter is disposed in the outer end of the passage 37 to be actuated by the operating pin 36, while a slide 60 is disposed in the opposite end of this passageway to be operated by the same pin. The slide 60 is provided with an integral hook 61 engageable with the end of pawl 52.

A cutter 75 is secured to the bell crank 21 so that the cutter is actuated when the handle is operated. The cutting edge of this cutter is juxtaposed to the edge of the block 38 (Fig. 11) so that these parts cooperate to afford a shearing action at the end of the advance movement of the clenching rod 58.

The end portion of the guideway 40 is disposed in the path of the end portion of the clenching rod 58 and this part of the guideway is provided with curved surfaces (Fig. 16) opposite the rod. Accordingly, when the latter is impelled toward these surfaces, the end portions of the legs of a U-shaped clip have a cam-like engagement with these surfaces and are bent inwardly so that the rod may be effective in clenching the clip about the strand means extending therethrough. When the handle 29 is actuated, the pin 35 moves toward the right, as viewed in Fig. 12, thus advancing the rod 58 to clench a clip in the manner described. As this occurs, the pawl 52 slides forwardly on block 39 under the influence of spring 55 and the cutter 75 is actuated. When the handle is released, the spring 34 returns it to normal position and the rod 58 is retracted due to the action of spring 55.

During the rearward movement of the pin 35, which corresponds to the return movement of the handle 29, to its normal position, the hooked extension 61 of the slide 60 is effective in sliding the pawl 52 rearwardly, thus causing the movement of the ratchet wheel 45 through one step and advancing the ribbon a distance sufficient to bring another clip into the clenching station adjoining the end of rod 58. Preferably the parts are so designed that the wheel 45 has a tendency somewhat to overdrive and the blocks 38 and 39 adjoining the clenching station may be provided with small nubs 70 and 70a which project into the path of the unclenched clip to prevent its movement past the path of the rod 58, these nubs, however, permitting the remaining portion of the opening to have an adequate size to allow a clenched clip to move out of the opening.

It is evident that the assembly as so far described is effective in feeding successive clips to the clenching station, in clenching the same, and in cutting a strand or strands extending from a clip which is being clenched.

The device is also provided with a needle 80 through which the strand extends from the spool 26. The needle 80 may conveniently be hollow, as indicated in Fig. 7, and may be provided with a beveled point 80a or, if preferred, a conventional needle of the sewing machine type may be used. The opposite end of the needle is received in a socket in a block 84 which is provided with a set screw 85 to clamp the needle end in place. The strand preferably extends under a portion of a friction spring 83 between the spool 26 and the end of the needle 80. The part 83 may conveniently be in the form of a leaf spring having an eye portion 83a spaced from its free end through which the strand extends so that a portion of the strand is pressed upwardly by the end of the spring 83 against a part of the block 84.

The block 84 has a grooved portion slidable along one flange of a bar 90 of substantially Z-shaped cross section, the other flange of this bar being secured to the bite portion of the channeled part of the upper housing U. A tension spring 91 is connected to the block 84 and to the bar, thus tending to move the needle toward its retracted position. An L-shaped actuator 93 (Fig. 13) extends through a slot 94 in the upper

part of the housing section U (Fig. 1) and provides a thumb piece 93a whereby the needle may be advanced, the retraction of the needle being automatically effected by the spring 91 when the thumb piece is released.

A screw 97 is arranged to provide a shaft for the ratchet wheel 45, the threaded end of this screw being received in the block 38 and 27, as shown in Fig. 11, and the collar 53 being integrally formed on the screw. The head of this screw is disposed above an opening in the upper housing U and a latch 98 is pivotally mounted on this housing to engage under the head of the screw, thereby to secure the housings in normal juxtaposed relation. When the end of the latch 98 is swung away from the screw 97, the housing U may be swung about the hinge 3, the opening in the housing U permitting its movement past the head of screw 97. Thus access is readily afforded to the interior of the device and particularly the casing portion I thereof wherein the clips and strand material are housed.

One important feature of this invention involves the arrangement of the needle so that there may be room about its point to permit manual grasping of the strand end. For this purpose the point of the needle may be advanced away from the remainder of the device, although a needle which is fixed relative to the remainder of the device may be arranged so that there is sufficient clearance about its point to permit the strand end readily to be grasped.

When a device of this character is to be used, the spools 26 and 24 are disposed in the spool casing and the strand run extending from the spool is threaded through the opening 83a in the leaf spring 83 and through the tubular needle, with an end projecting beyond the point of the needle. The ribbon run R is given a quarter turn and then threaded into the passageway 40 until the first clip on the ribbon engages the nubs 70 and 70a at the end of the passageway 40, i. e., this clip is disposed in the clenching station. Thereupon the upper and lower casing members are brought into normal juxtaposition, the fastening means 98 being actuated to hold these parts together. A tag T and a piece of material M to which the tag is to be applied are then brought into juxtaposition to the nose portion of the device and the thumb piece 93a is actuated to advance the point of the needle 80 and the end of the strand through the tag and material (Fig. 17), whereupon the advanced strand end is manually gripped at the side of the material remote from the device and the thumb piece 93a is released to permit the retraction of the needle by spring 91 (Fig. 18). Thereupon the gripped strand end is manually pulled away from the device, the strand sliding through the tubular needle as this operation takes place (Fig. 19). The strand end portion is then brought into juxtaposition to a portion of the strand between the material and the end of the retraced needle, the device being manipulated to bring the strand portions into juxtaposition within the open clip at the clenching station (Fig. 20). Thereupon the handle 29 is actuated to clench the clip about the juxtaposed strand ends, and as the clenching operation is being completed, the strand section between the station and the retracted needle is severed, thus leaving a projecting strand end ready for the next attaching operation.

In this connection, it should be noted that an important feature of the invention involves the arrangement of the clenching station, the cutter and the needle so that this strand portion is readily severed by the cutter and so that a strand end of suitable length is left projecting from the needle. Furthermore, it should be noted that the strand end which is first advanced by the needle and gripped by the operator may be held in the position illustrated in Fig. 20 or in the position shown in Fig. 10. In the former case, the experienced operator may approximately gauge the length of the string that he pulls out from the device so that when the strand sections are juxtaposed and the strand section extending from the needle is cut, the free strand ends projecting from the clip may have approximately the same length. In the latter case, the strand ends may both be severed by the cutter and obviously have the same length. It is evident that the arrangement of the clenching station, of the point where the strand or strands are severed, and of the needle in convenient juxtaposition and preferably in substantially a straight line, is particularly advantageous in facilitating the use of the device in the manner described.

The clenched clip can move out of the passage 40 past the nubs 70, 70a and the tag is thus secured to the material by a string loop in the manner illustrated in Fig. 5, it being obvious that the paper of the ribbon R may be broken to permit the clenched clip to be detached from the ribbon. As the handle returns to normal position, the pin 35 is effective in causing the pawl 52 to advance the ratchet wheel 45 one step, thus advancing the ribbon until the next clip of the series is brought into engagement with the nubs 70 and 70a, i. e., is positioned in the clenching station. The parts are then positioned so that another tag may be similarly attached to another piece of material.

It is evident that this invention affords a simple, sturdy, compact device to facilitate the securing of string loops to articles or material and particularly to facilitate the connection of tags to fabric articles.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A device of the class described, comprising a frame, a needle slidably mounted on the frame, a manual control for advancing the point of the needle beyond the frame, means for directing a strand to the needle, means for clenching successive clips about juxtaposed strand sections in the region of the needle, a handle to operate said last-named means, the handle being movable to operate said means irrespective of the position of the needle, whereby the needle may advance a strand end through sheet material, the strand end may then be gripped and the needle retracted, whereupon the strand end may be brought into juxtaposition to another strand portion beyond the edge of the material, and the juxtaposed strand portions may be secured to each other by a clip.

2. A device of the class described, comprising a frame, a needle slidably mounted on the frame, a manual control for advancing the point of the needle beyond the frame, a spring for retracting the needle, means for clenching successive clips about juxtaposed strand sections in the region of the needle, a handle to operate said last-named means, a second spring yieldably oppos-

ing operation of said handle, and a cutter operated by said handle, the needle being retractable by said first-named spring irrespective of the position of said handle, whereby the needle may advance a strand end through sheet material, the strand end may then be gripped and the needle retracted, whereupon the strand end may be brought into juxtaposition to another strand portion beyond the edge of the material, and the juxtaposed strand portion may be secured to each other by a clip, and the strand between the needle and clip may be severed.

3. A device of the class described comprising a frame, a pair of spools mounted on one end of the frame, means providing a passage in the opposite end of the frame for a ribbon bearing a series of clips so that such a ribbon may extend from one of said spools through said passage, a needle having a point to receive a strand extending from the other spool, a manually controlled element to advance the needle relative to the frame, a clenching mechanism to clench a clip at the end of said passage, a handle for operating said mechanism, and a cutter operated by said handle for severing a strand section extending between the needle and said end of the passage.

4. A device of the class described comprising a frame, a pair of spools mounted on one end of the frame, means providing a passage in the opposite end of the frame for a ribbon bearing a series of clips so that such a ribbon may extend from one of said spools through said passage, a needle having a point to receive a strand extending from the other spool, a manually controlled element to advance the needle relative to the frame, a clenching mechanism to clench a clip at the end of said passage, a handle for operating said mechanism, a cutter operated by said handle for severing a strand section extending between the needle and said end of the passage, and means for advancing the ribbon and clips through the passage in response to movements of said handle.

5. A device of the class described comprising a frame, a pair of spools mounted on one end of the frame, means providing a passage in the opposite end of the frame for a ribbon bearing a series of clips so that such a ribbon may extend from one of said spools through said passage, a needle having a point to receive a strand extending from the other spool, a manually controlled element to advance the needle relative to the frame, a clenching mechanism to clench a clip at the end of said passage, a handle for operating said mechanism, a cutter operated by said handle for severing a strand section extending between the needle and said end of the passage, and means for advancing the ribbon and clips through the passage in response to movements of said handle, the end of said passage providing an opening through which a clenched clip may pass, but being dimensioned to prevent the movement of an unclenched clip out of the passage.

6. A device of the class described comprising a frame, a pair of spools mounted on one end of the frame, means providing a passage in the opposite end of the frame for a ribbon bearing a series of clips so that such a ribbon may extend from one of said spools through said passage, a needle having a point to receive a strand extending from the other spool, a manually controlled element to advance the needle relative to the frame, a clenching mechanism to clench a clip at the end of said passage, a handle for operating said mechanism, a cutter operated by said handle for severing a strand section extending between the needle and said end of the passage, and means for advancing the ribbon and clips through the passage in response to movements of said handle, said last-named means comprising a pair of cooperating rolls and ratchet mechanism to cause rotation of one of said rolls.

7. A device of the class described comprising a frame including two housing portions cooperating to provide a cylindrical casing at one end, said housing portions being movable relative to each other to afford access to the interior of said casing, means associated with said casing to support a spool of strand material and a spool of ribbon to which a plurality of clips are secured, a handle pivotally connected to one of said housing portions, clenching mechanism supported by said housing portion for clenching a clip carried by said ribbon about strand material, said clenching mechanism being operable in response to actuation of said handle, a needle movably mounted on the other housing portion and arranged to receive a strand extending from the spool of strand material in said casing, and a manual control to advance said needle relative to the frame.

8. A device of the class described comprising a frame, a handle pivotally connected to the frame, clenching means actuable in response to movement of the handle, said means providing a passage for a ribbon to which a plurality of U-shaped clips are secured, the end of the passage being shaped and dimensioned so that an unclenched clip cannot pass out of the passage, but so that a clenched clip can pass out of the passage, and means also actuable in response to the movement of the handle for advancing the ribbon to supply successive clips to the clenching station, whereby the handle may be actuated to clench one clip in the station, and the ribbon may then be advanced to bring an unclenched clip to the station while the preceding clenched clip is advanced out of the passageway.

9. A device of the class described comprising a frame, a handle pivotally connected to the frame, clenching means actuable in response to movement of the handle, said means providing a passage for a ribbon to which a plurality of U-shaped clips are secured, the end of the passage being shaped and dimensioned so that an unclenched clip cannot pass out of the passage, but so that a clenched clip can pass out of the passage, and means also actuable in response to the movement of the handle for advancing the ribbon to supply successive clips to the clenching station, said last-named means comprising a pair of cooperating rolls between which the ribbon is fed, and ratchet mechanism to cause rotation of one of said rolls, whereby the handle may be actuated to clench one clip in the station, and the ribbon may then be advanced to bring an unclenched clip to the station while the preceding clenched clip is advanced out of the passageway.

10. A device of the class described comprising a frame, a handle removably mounted on the frame, said frame providing a passageway through which successive U-shaped clips are fed on a ribbon, the frame also providing a passage, a clenching rod slidably mounted in said passage to clench a clip at a clenching station at the end of said passageway, the handle being movable from its normal position to advance said rod to

clench a clip, means for advancing the ribbon to bring successive clips to the clenching station, said means including a slide actuable by said handle as it returns to normal position after having actuated the clenching rod, and a spring to return said handle to normal position.

11. A device of the class described comprising a frame, a handle removably mounted on the frame, said frame providing a passageway through which successive U-shaped clips are fed on a ribbon, the frame also providing a passage, a clenching rod slidably mounted in said passage to clench a clip at a clenching station at the end of said passageway, the handle being movable from its normal position to advance said rod to clench a clip, a spring to return said handle to normal position, means for advancing the ribbon to bring successive clips to the clenching station, said means including a slide actuable by said handle as it returns to normal position, said slide being disposed in said passage, a pawl actuated by said slide, and a wheel operated by said pawl to advance the ribbon through the passageway.

12. A device of the class described comprising a frame, a needle mounted on the frame and having a point from which a strand end may project, the needle and frame being arranged so that the strand end may be manually grasped, clip clenching mechanism supported by said frame and providing a clip clenching station, a handle movably mounted on said frame and operatively connected to said mechanism, and a cutter operated by said handle, said cutter being arranged to sever a strand portion extending from the clenching station to the needle while leaving a strand end projecting from the needle, whereby the needle may advance the strand end through a sheet of material, the strand end may then be manually drawn away from the needle and material and brought into the clenching station in juxtaposition to a strand portion extending from the needle to the material, the handle then being actuated to secure the juxtaposed strand portions together by a clip and to sever the strand portion extending between said station and the needle.

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