Dec. 9, 1941. J. SHAULSON 2,265,782

APPARATUS FOR ASSEMBLING BUCKLES AND TAPE

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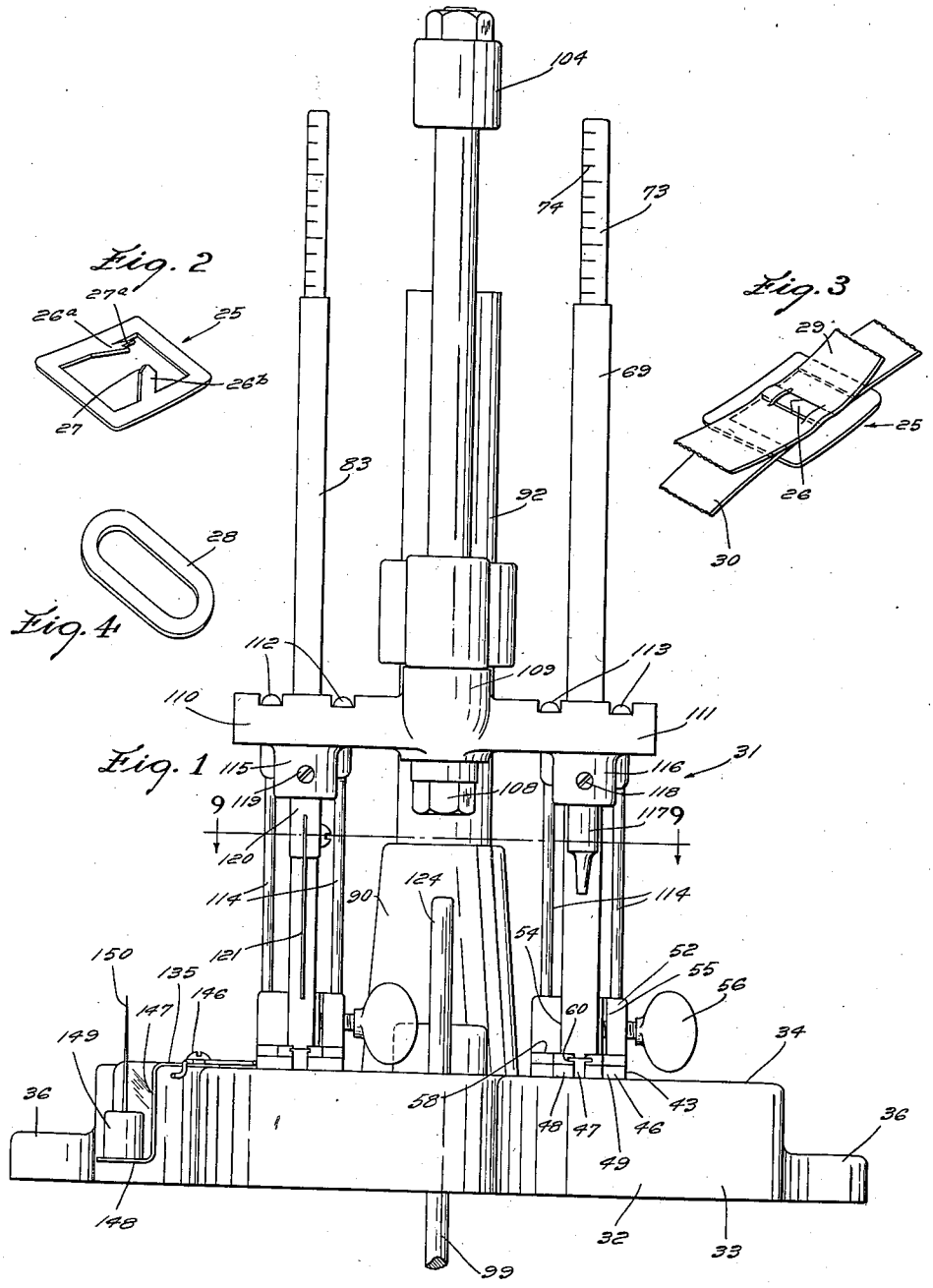


Fig. 2

Fig. 3

Fig. 4

Fig. 1

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Fig. 6

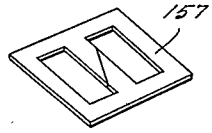


Fig. 7

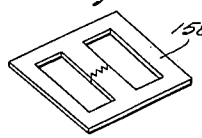


Fig. 8

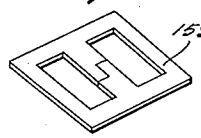


Fig. 5

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APPARATUS FOR ASSEMBLING BUCKLES AND TAPE

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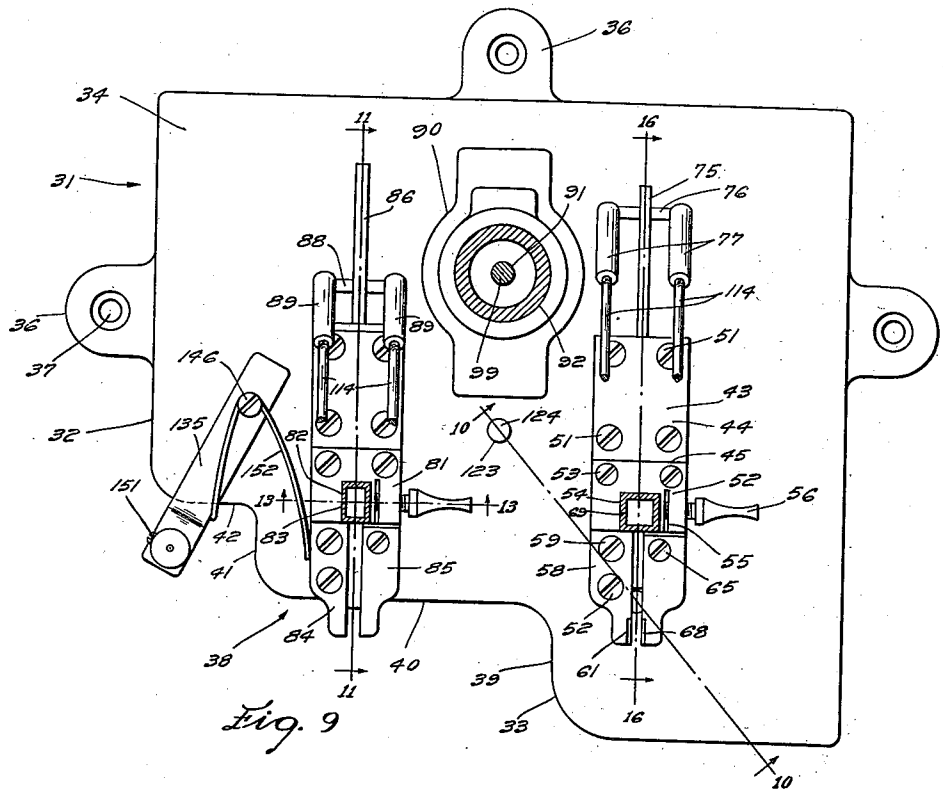


Fig. 9

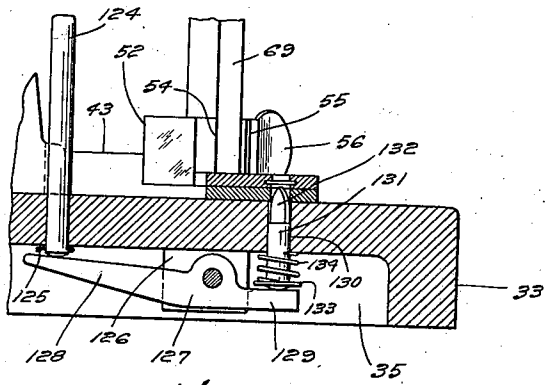


Fig. 10

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APPARATUS FOR ASSEMBLING BUCKLES AND TAPE

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Fig. 11

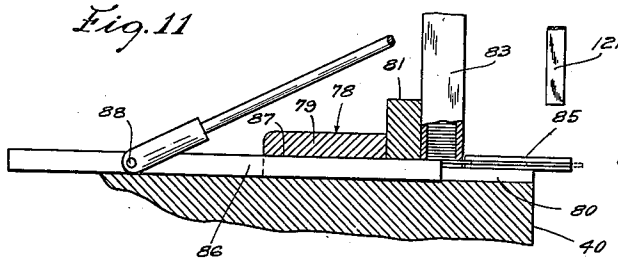


Fig. 12

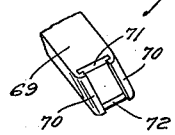


Fig. 13

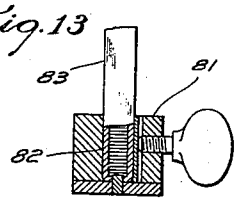


Fig. 14

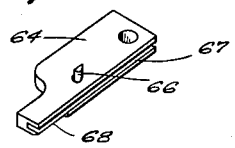


Fig. 15

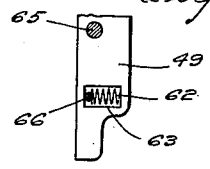


Fig. 16

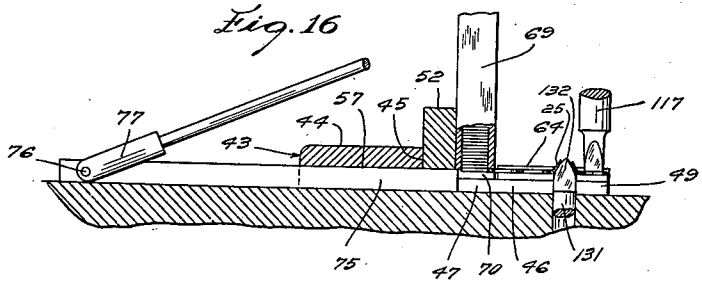


Fig. 17

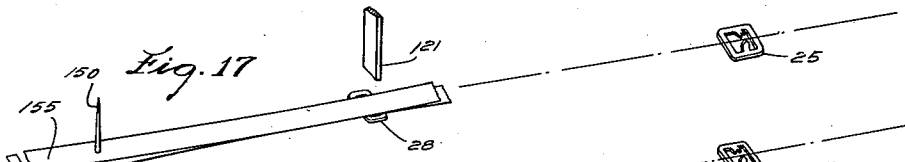


Fig. 18

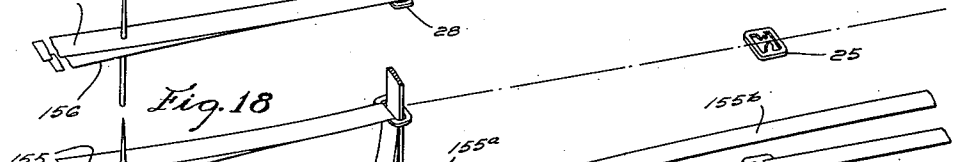


Fig. 19

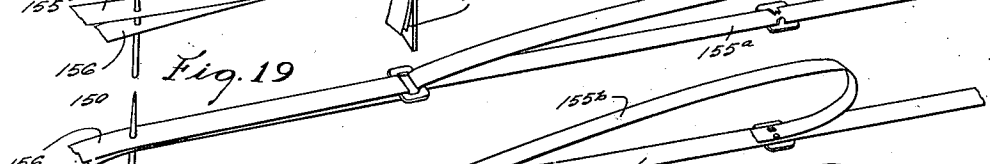


Fig. 20

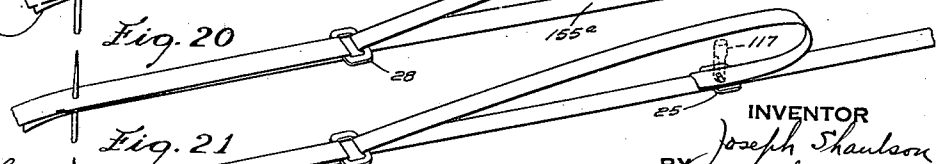


Fig. 21



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Patented Dec. 9, 1941

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UNITED STATES PATENT OFFICE

2,265,782

APPARATUS FOR ASSEMBLING BUCKLES AND TAPE

Joseph Shaulson, Providence, R. I.

Application July 18, 1938, Serial No. 219,934

16 Claims. (Cl. 223—49)

My present invention relates to the machine art with particular reference to a novel machine for feeding, threading, and fastening, buckles to ribbons, and particularly to tape.

The object of the present invention is to provide an apparatus for fastening buckles and links to tape without sewing, for rendering said tape or strap adjustable.

Another object of my invention is to provide an apparatus that will eliminate the necessity for threading tape or ribbon through an adjusting link and buckle by hand.

A further object of my invention is to provide an apparatus for handling buckles of the type disclosed in my copending application Serial No. 195,283, filed March 11, 1938, entitled Lingerie buckle.

Another object of my invention is to provide an apparatus for performing the aforementioned functions that is simple in construction, and is quickly and economically manufactured and assembled.

With the above and other objects and advantageous features in view, my invention consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more specifically defined in the claims appended thereto.

Referring to the drawings:

Fig. 1 is a front elevation of an apparatus embodying my present invention;

Fig. 2 is an enlarged perspective view of a buckle blank for assembly in my machine, the prongs being opened;

Fig. 3 is a perspective view showing the buckle and tape assembly;

Fig. 4 is a perspective view of a link for assembly with the tape in my machine;

Fig. 5 is a side elevation, partly broken away, of the machine shown in Fig. 1;

Figs. 6, 7, and 8 are enlarged perspective views of other types of buckles which may be assembled to tape by my novel machine;

Fig. 9 is a sectional view taken along line 9—9 of Fig. 1;

Fig. 10 is a sectional view taken along line 10—10 of Fig. 9;

Fig. 11 is a sectional view taken along line 11—11 of Fig. 9;

Fig. 12 is a perspective view of the lower end of the buckle magazine;

Fig. 13 is a sectional view taken along line 13—13 of Fig. 9;

Fig. 14 is a perspective view of the spring actuated jaw;

Fig. 15 is a plan view of the base for the jaw shown in Fig. 14;

Fig. 16 is a sectional view taken along line 16—16 of Fig. 9; and

Figs. 17 to 21 inclusive are diagrammatic views showing the steps of assembly of the link and buckle to the tape.

Referring more in detail to the drawings illustrating my invention, the numeral **25** generally designates a buckle blank suitable for assembly in my novel machine. The buckle blank **25** is preferably of conventional form with ends and side bars, and with a transverse center bar intermediate the end bars, except that the central bar **26** is formed of two interlocking prongs, **26***a* and **26***b*, respectively tapering to a sharp point **27** and a V-shaped cut-out portion **27***a* with which the point interlocks upon completion of the assembly (Fig. 3).

In assembling an adjustable lingerie strap, a length of ribbon is threaded through a link, such as **28** (Fig. 4), and doubled back to form a loop. Another length of ribbon is then threaded through and looped in the opposite direction and adjustably attached to the buckle **25**, as shown in Fig. 3. One end **29** of the ribbon is fastened to the central bar **26** of the buckle (usually by sewing) and the other end **30** is slidably threaded through the buckle.

When performed by hand, the above described method is extremely slow and appreciably adds to the cost of the finished article. This is especially true because of the tiny size of the buckles and the links used and the narrowness of the tape.

The novel apparatus of the present invention is designed to perform the above manual operations mechanically, quickly and easily at minimum cost. This is accomplished by providing a buckle magazine from which the buckles are fed in sequence unidirectly to a working zone the buckles being successively propelled along a guideway until the working position is reached; the center bars are then separated, preferably by applying an opening force in a direction perpendicular to the buckle movement; after the tape has been inserted in the opened buckle the center bars are returned to the closed, locking position, preferably by applying a closing force in a direction opposite to the opening force.

The machine **31** is set on a base **32**, preferably of cast steel, which is of substantial height and comprises a top face **34** and an integral vertical side wall **33** extending around the periphery

thereof, (Fig. 10). When the base is set on a plane surface, such as a work table, the top portion 34 is spaced therefrom by the side wall 33 to provide a cavity or space 35. The two sides and the rear of the base 32 have integral laterally extending tabs 36 with openings 37 for bolting the machine to the work table, (see Fig. 9).

Referring to Fig. 9, the lower or front left corner of the base 32 is recessed as at 38, in an irregular line comprising a portion 39 extending rearwardly from the front wall to the right of the center, a substantially long portion 40 parallel to the front edge, a second rearwardly extending portion 41, and a comparatively short portion 42 parallel to the front and terminating at the left side edge of the base.

Mounted on the base 32, to the right of the center, is an elongated rectangular plate 43 having a comparatively thick rear portion 44 ending in an abrupt shoulder 45 and a forwardly extending thin portion 46. The thin portion 46 is split along the center thereof to form a central passageway 47 and two parallel portions 48 and 49. The plate 43 is bolted to the base 32 at the portion 44 by spaced screws 51.

Mounted on the plate 43 against the shoulder 45 is a rectangular steel block 52 held in place by screws 53 extending into the base 32 through plate 43.

The block 52 (Figs. 9 and 10) is provided with a rectangular vertical recess 54 extending through the central front portion of the block 52 and open at the front. The right wall of said recess is split, as at 55, and a thumb screw 56 is threadedly mounted horizontally through the block so that its end will bear against the inner section of the recess 54.

The bottom of the plate 43 is provided with a rectangular slot 57 extending through the thick portions 44 and forming a continuation of the passageway 47. The slot 57 is of greater height from the base than the thickness of the thin portions of the plate.

Mounted on the forward end of the portion 48 of the plate 43 is a jaw 58 of the same thickness, size and shape as the front end of the portion 48. The jaw 58 is bolted to the base 32 through the plate 43 by screws 59. The right edge of the jaw 58 (Fig. 9) is provided with a slot 60 (see Fig. 1) of a thickness to allow free sliding of the conventional buckle 25, and the forward portion of the right edge is bevelled, as at 61.

The forward end of the portion (see Fig. 15) of the plate 43 is provided with a rectangular cut out 62, near the forward end thereof, housing a coil spring 63. A jaw 64 shown reversed in Fig. 14, is mounted thereon of the same thickness, size and shape as the portion 49. The jaw 64 is pivotally mounted on the base 32 by a screw 65 extending through the upper left corner thereof through the plate 43. The jaw 64 is provided with a downwardly extending pin 66 extending into the left portion of the cut-out 62 when the jaw is in place, the coil spring 63 being tensioned to push the pin 66 and jaw 64 to the left toward the jaw 58 (see Fig. 15). The left edge of the jaw 64 is slotted, as at 67, in the identical manner as the slot 60 in the jaw 58, and bevelled in a similar manner, as at 68. The slots 60 and 67 are of such depth, that, together with the passageway 47 between the jaws, they will be slightly wider than the buckle 25.

A buckle magazine 69 is mounted in the recess 54 in the block 52, and is clamped therein by the turning of the thumb screw 56. The magazine 69 comprises an open ended rectangular tube having the two side walls (Fig. 12) turned under the bottom, as at 70, to form a T-slot 71. The rear wall 72 extends below the upper edge of the slot 71 for a purpose hereinafter to be described. When the magazine is in position, as shown in Fig. 16, the slot 71 becomes a continuation of slots 60 and 67 in the jaws 58 and 64. The buckles 25 are loaded into the magazine 69 with the central bars 26 parallel to the side edges of the base, and a weighted rod 73 is placed over said buckles to insure a gravity feed. The rod 73 may be graduated, as at 74, to provide a visible means for checking the number of buckles in the magazine.

Slidable in the slot 57 is a rectangular push rod 75 provided with a cross-bar 76 adjacent the rear end thereof, (Fig. 9). Pivotally mounted at each end of the bar 76, parallel to the rod 75, are a pair of internally threaded sleeves 77 whose purpose will be more fully hereinafter described.

Mounted on the base 32 (Fig. 9), to the left of the center line and parallel to the above described assembly, is a second assembly of similar structure. It comprises plate 78 having a thick portion 79 and a split thin portion 80 extending forwardly to the edge of the horizontal portion 40 of the cut out 38 in the base. A magazine block 81 is mounted thereon similar in all respects to the block 52 except that the magazine cut out 82 is slightly narrower to accommodate the magazine 83 for holding the link 28. The fixed jaw 84 and pivoted jaw 85 overhang the cut-out 38 in the base. This assembly is similarly provided with a rectangular push rod 86 slidable in the slot 87. The rear portion of the rod 86, some distance from the end, is provided with a cross bar 88 and pivoted sleeves 89 similarly to the bar 76 and sleeves 77.

Mounted on the base 32, at the rear central portion thereof (Figs. 1, 5 and 9) is a socket 90 communicating with a bore 91 extending through the base. A cylinder 92 is mounted in the socket 90 and is held therein by set screw 93. Clamped to the middle portion of the cylinder 92 is a collar 94 having an integral forwardly extending bar 95 terminating in a collar 96 having a vertical bore 97.

Vertically slidable in the cylinder 92 is a piston or rod 98 having a connecting rod 99 threadedly engaged with the bottom end thereof. The rod 99 extends through the base 91 and is connected to a suitable operating means (not shown) such as a foot pedal, motor, or the like. A heavy coil spring 100 surrounds the rod 99, one end resting on the base 32 and the other abutting the bottom end of the piston 98.

A collar 101 is bolted to the top of the piston 98 by a bolt 102 threadedly engaging the top of the piston. Integrally formed with the collar 101 and extending forwardly therefrom is a bar 103 terminating in a collar 104 having a vertical bore 105 therethrough in alignment with the bore 97 in the collar 96. A vertical rod 106 is anchored in the bore 105 by means of a bolt 107 and extends downwardly through the bore 97. Bolted to the bottom of the rod 106 as by a bolt 108, is a socket 109 having oppositely disposed integrally formed laterally extending angular flanges 110 and 111. Pivoted to each flange are a pair of internally threaded spaced sleeves 112 and 113. Each sleeve is in threaded engagement with a rod 114 the other ends of the rods being thread-

edly engaged to the sleeves 77 and 89. The under side of the laterally extending angular flanges 110 and 111 are provided, between the spaced sleeves with sockets 115 and 116. The socket 116 has retained therein a head 117 by means of a set screw 118, the head 117 being directly above the jaws 58 and 64. Mounted in the socket 115 by means of a set screw 119 is a retaining member 120 holding a flat elongated blade or tongue 121 disposed in a plane parallel to the sides of the base. Bolted to the under side of the socket 109 and extending laterally or rearwardly therefrom is a flat bar 122 whose purpose will be more fully hereinafter described.

The base 32 is provided with a bore 123 set in front of the socket 90 and a rod 124 is vertically slidably disposed in said bore in the vertical path of the laterally extending bar 122. The lower end of the rod 124 may be provided with a cotter pin 125 to prevent its jumping out of the bore. On the underside of the base 32, and within the hollow portion 35 is a depending flange 126 to which is pivoted a rocker arm 127. The arm 127 is disposed in a plane with the line 10—10 of Fig. 9 and comprises a long arm portion 128 extending beneath the rod 124, and a shorter arm portion 129 extending beneath a bore 130 through the base. The bore 130 communicates with the passageway 47 between the jaws at a point 1½ buckle lengths removed from the forward tip of the jaws. Slidable in the bore 130 is a short rod 131 having a wedge shaped head 132 and a flange 133 at its lower end. A coil spring 134 surrounds the rod 131, one end abutting the flange 133 and the other end abutting the underside of the base.

Mounted on the base 32, at the left side thereof (Fig. 9) is a flat bar 135 pivotally mounted at the top of the base as at 146. The bar 135 extends over the edge of the portion 42 in the base and is bent downwardly as at 147 and again horizontally as at 148. Mounted on the portion 148 is a socket 149 in which is held an upturned needle 150 by means of a set screw 151. The bar 135 is pivotally urged to the left by means of a spring 152 coiled around the pivot 146 and having one end thereof abutting the bar 135 and the other end abutting the plate 78 of the assembly to the left of the base.

This completes the description of the construction and assembly of the machine of the present invention. Its operation is as follows:

With all the elements assembled as hereinabove described and the magazine loaded with the buckle 25 and the link 28, the rod 99 is pulled downwardly by any suitable means such as a foot pedal, motor, or the like. This will cause the piston 98 to slide downwardly within the cylinder 92 against the action of the coil spring 100. This will cause the bar 103, collar 104, rod 106 to descend. In moving downwardly the rods 114 will push the rod 75 and the rod 86 back in their respective slots until, as in Fig. 16, the forward end of the rod frees the underside of the magazine and permits a buckle and a link to drop into the slot in the lower end of each magazine. As the bar 99 is released, the spring 100 will force the parts upwardly and will cause the rods 75 and 86 to slide forwardly and push respectively a buckle and a link along the slots between the jaws. As the mechanism is raised and lowered, with each stroke of the rods pushes a fresh buckle and link into the slot and each buckle and link pushes and propels the preceding one further along the slot through the working zone until they are finally pushed out completely from between the jaws. The assembly to the left, Fig. 9, is so set that the jaws will retain three links before the first link is pushed completely out of the machine. The assembly on the right is so set that the rod 75 will extend sufficiently forward to permit only two links to be retained between the jaws. The spring action of the right hand jaws will tend to keep the buckles and links in the position pushed into by the rod without sliding out of place or popping out of the machine. The lowered rear wall 72 of the magazine will prevent the buckles from being pulled rearwardly out of the magazine on the back stroke of the rod 86.

While this operation is going on, the blade 121, on its downward stroke slides into the first link, and the head 117 hammers upon the first buckle while the bar 122 pushes downwardly on the rod 124 and causes the rocker arm 127 to push the wedge shaped head 132 into the central bar 26 of the second buckle causing the bar portions to spread and lift upwardly, as shown in Fig. 2, thus opening the buckle.

Referring to Figs. 17 to 21 inclusive, a ribbon or shoulder strap is assembled in the following manner. Two strips of ribbon 155 and 156 are placed one above the other along the front of the machine with the right hand ends extending over the first link held between the jaws. The mechanism is lowered sufficiently so that the tongue 121 pushes the ends of the ribbon or tape through the link as shown in Fig. 18. This is insufficient to draw the rods 75 and 86 back far enough to engage another buckle and link. The mechanism is raised and the lower ribbon 156 is looped to the left and both strands thereof pressed over the point of the needle 150 so that the tension of the spring 152 will keep it in place in extended position. The lower strand 155*a* of the upper ribbon 155 is then stretched between the upturned prongs of the buckle 25 and the upper strand 155*b* is slipped over the pointed prongs after having first been reentrantly bent as in Fig. 20. The mechanism is now again sharply and completely lowered, the head 117 causing the prongs of the central bar 26 of the buckle to flatten out and interlock, thus closing the buckle and completing the assembly as shown in Fig. 3. In this position the rods 75 and 86 have now engaged successive buckles and links and the second buckle has had the central bar split by the rod 131, so that when the mechanism is released vertically the finished assembly will be pushed out of the machine and remain suspended on the needle 150 and a fresh link and buckle will have been pushed into operative position in the working zone.

In addition to Fig. 2, any other buckle having a split center bar may be used such as 157, 158 and 159 as shown in Figs. 6, 7 and 8. Where buckles of the type shown in Figs. 7 and 8 are used there is no sharp point or prong with which to pierce the tape. However, when the head flattens the central bar of this type of buckle, it will automatically pinch the ribbon or strap in interlocking position and thus effectively grip it.

This completes the description of the construction, assembly and operation of the machine of the present invention. It can readily be seen from the above that the machine is easy and economical to manufacture and assemble and is admirably adapted to perform its intended functions.

While I have described a specific embodiment of my invention, it is obvious that changes in the size, shape and position of the various parts may be made therein within the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In an apparatus of the type described, a base, means thereon for intermittently feeding buckles to a predetermined position, said buckles having separable center bar portions, means cooperating with said first named means for spreading the center bar portions of said buckles whereby a tape may be positioned in the spread buckle, and means for moving said portions to their center bar position and simultaneously locking said tape thereto.

2. In an apparatus of the type described, a base, means thereon for intermittently feeding a buckle and a link to respective predetermined positions in timed relation, said buckle having separable center bar portions, means cooperating with said feeding means for spreading the center bar portions of said buckle whereby one portion of a tape may be positioned in the spread buckle and the other portion over said link, and means for moving said center bar portions to their center bar positions to lock said tape thereto while simultaneously threading said tape through said link.

3. In an apparatus of the type described, a base, a buckle magazine on said base, said buckle magazine comprising a rectangular tube, means including a reciprocatable rod for intermittently feeding buckles from the lower end of said magazine to a predetermined position, said buckles having separable center bar portions, means cooperating with said feeding means for spreading the center bar portions of said buckles whereby a tape may be positioned in the spread buckle, and means operative in timed sequence to said spreading means for moving said portions to their center bar position and simultaneously locking said tape thereto.

4. In an apparatus of the type described, a base, a pair of spring-pressed retaining jaws on said base, means for intermittently feeding buckles to a predetermined intermediate position and from said intermediate position to between said retaining jaws, said buckles having separable center bar portions, means cooperating with said feeding means for spreading the center bar portions of said buckles when said buckles are in the intermediate position on said base, and means for moving said portions to their center bar position when said buckles are between said retaining jaws.

5. In an apparatus of the type described, a base, a buckle magazine on said base, said buckle magazine comprising a rectangular tube having the lower edge of one wall extending below the bottom of the tube, a pair of spring-pressed retaining jaws on said base, means including a reciprocatable rod for intermittently feeding buckles from the lower end of said magazine to a predetermined intermediate position and from said intermediate position to between said retaining jaws, said buckles having separable center bar portions, means cooperating with said feeding means for spreading the center bar portions when said buckles are in the intermediate position on said base, and means for moving said portions to their center bar positions when said buckles are between said retaining jaws.

6. In an apparatus of the type described, a base, means thereon for intermittently feeding buckles to a predetermined position, said buckles having separable center bar portions, means cooperating with said feeding means for spreading the center bar portions of said buckles, said spreading means being operative only when said feeding means is in non-feeding position, and means operative in timed sequence to said spreading means for moving said portions to their center bar positions.

7. In an apparatus of the type described, a base, means thereon for intermittently feeding a buckle and a link to respective predetermined positions in timed relation, said buckle having separable center bar portions, means cooperating with said feeding means for spreading the center bar portions of said buckle whereby one portion of a tape may be positioned in the spread buckle and the other portion over said link, said spreading means being operative only when said feeding means is in non-feeding position, and means for moving said center bar portions to their center bar positions to lock said tape thereto while simultaneously threading said tape through said link.

8. In a machine of the class described, a magazine for holding a plurality of buckles, means actuable to move buckles in sequence from said magazine to a working position, means for releasably holding each buckle so moved in said working position, means actuable to open a buckle held by said last mentioned means in said working position, and means actuable to reclose said buckles.

9. In a machine of the class described, a magazine for holding a plurality of buckles, means actuable to move buckles in sequence from said magazine to a working position, means actuable to open a buckle located in said working position by bending the central bar portion thereof, and means actuable to reclose said buckle by restoring said central bar portion to the closed position.

10. In a machine of the class described, a magazine for holding a plurality of buckles, a guideway, means actuable to move buckles in sequence from said magazine to a working position along said guideway, means actuable to open a buckle located in said working position by bending the central bar portion thereof away from the other portions of said buckle, and means actuable to reclose said buckle by restoring said central bar portion to the closed position.

11. In a machine of the class described, a magazine for holding a plurality of buckles, a guideway, means actuable to move buckles in sequence from said magazine to a working position along said guideway, resilient means for releasably holding each buckle moved to said working position, means actuable to open a buckle located in said working position by bending the central bar portion thereof, and means actuable to reclose said buckle.

12. In a machine of the class described, a magazine for holding a plurality of buckles, a guideway, means actuable to move buckles in sequence from said magazine to a working position along said guideway, said guideway being defined by opposed slots formed in two spaced members and at least one of said members being resiliently biased toward the other for releasably holding said buckle moved to said working position, means actuable to open a buckle located

in said working position by bending the central bar portion thereof away from the other portions of said buckle, and means actuable to reclose said buckle by restoring said central bar portion to the closed position.

13. The method of applying to a length of tape a buckle having end bars, side bars integrally connecting said end bars, and a transverse center bar intermediate said end bars, which center bar is capable of being separated into two spaced portions so as to admit the tape, the said two portions normally being arranged with their ends contiguous so as to close said space, which consists in feeding such a buckle unidirectionally through a working zone, then, while the buckle is in said working zone, separating said center bar portions by force applied perpendicular to the direction of buckle movement, inserting the tape through the said space so formed, and then returning said center bar portions to their normal unspaced relation by force applied in the opposite direction.

14. A machine for operating upon buckles of the class described, which includes a guideway, a means for propelling a buckle along said guideway, a reciprocable member normally located on one side of said guideway for spreading apart the separable parts of the center bar of the buckle, and a reciprocable member on the other side of said guideway for restoring said center bar portions to their normal closed position.

15. A machine for operating upon buckles of the class described, which includes a guideway, a feed member for propelling a buckle along said guideway, a reciprocable member normally located on one side of said guideway for spreading apart the separable parts of the center bar of the buckle, a reciprocable member on the other side of said guideway for restoring said center bar portions to their normal closed position, and a single actuator for operating both of said reciprocable members.

16. A machine for operating upon buckles of the class described, which includes a guideway, a reciprocable feed member for propelling buckles successively along said guideway, a plunger normally located on one side of said guideway for spreading apart the separable parts of the center bar of the buckle, a plunger on the other side of said guideway for restoring said center bar portions to their normal closed position, and a single actuator for operating both of said plungers.

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