Aug. 24, 1937. H. ALFANDRE 2,091,176

STRAP AND BUCKLE ASSEMBLING APPARATUS

Filed Feb. 27, 1936 3 Sheets-Sheet 1

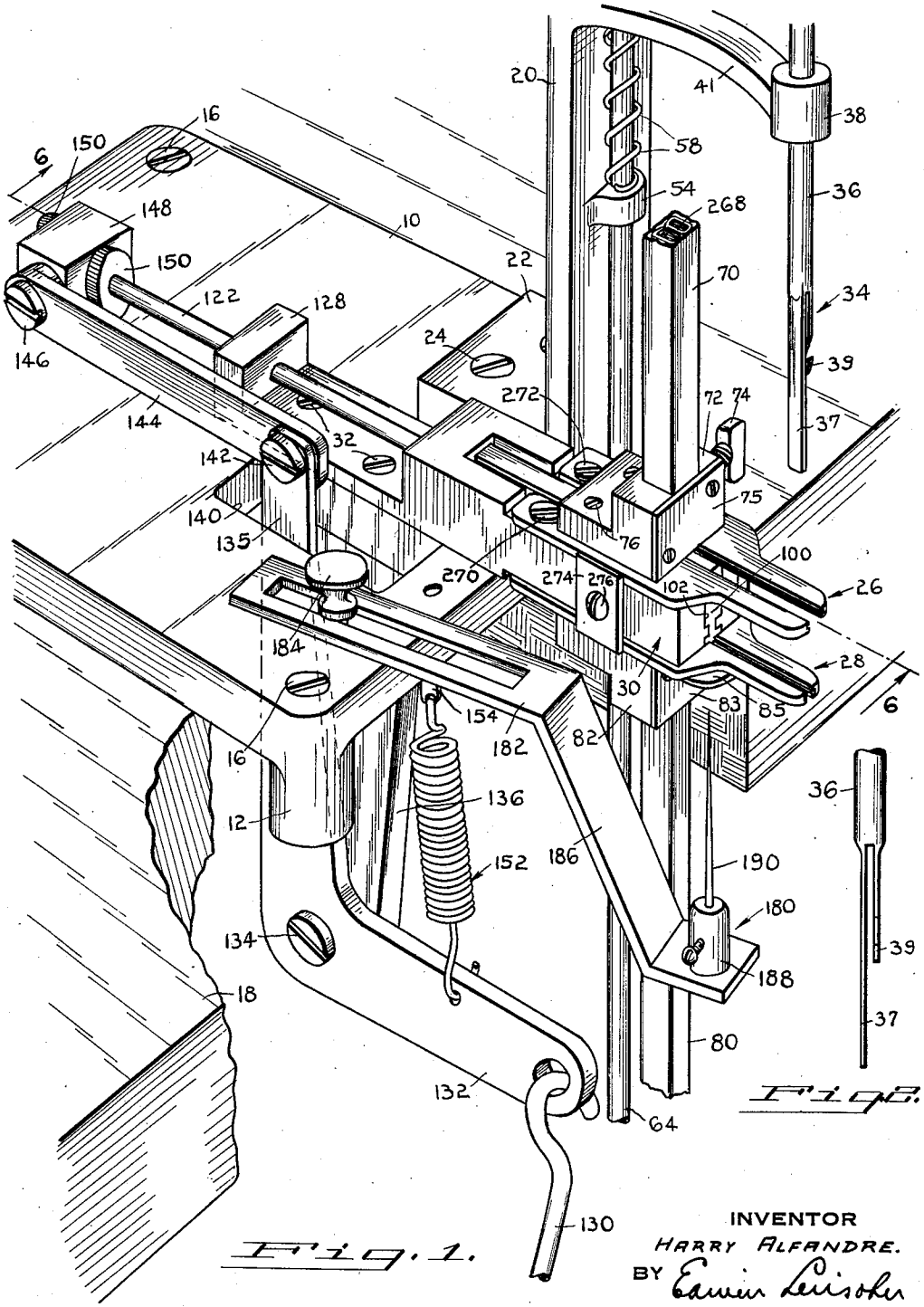



Fig. 1.

Fig. 2.

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STRAP AND BUCKLE ASSEMBLING APPARATUS

Filed Feb. 27, 1936 3 Sheets-Sheet 2

Fig. 2.

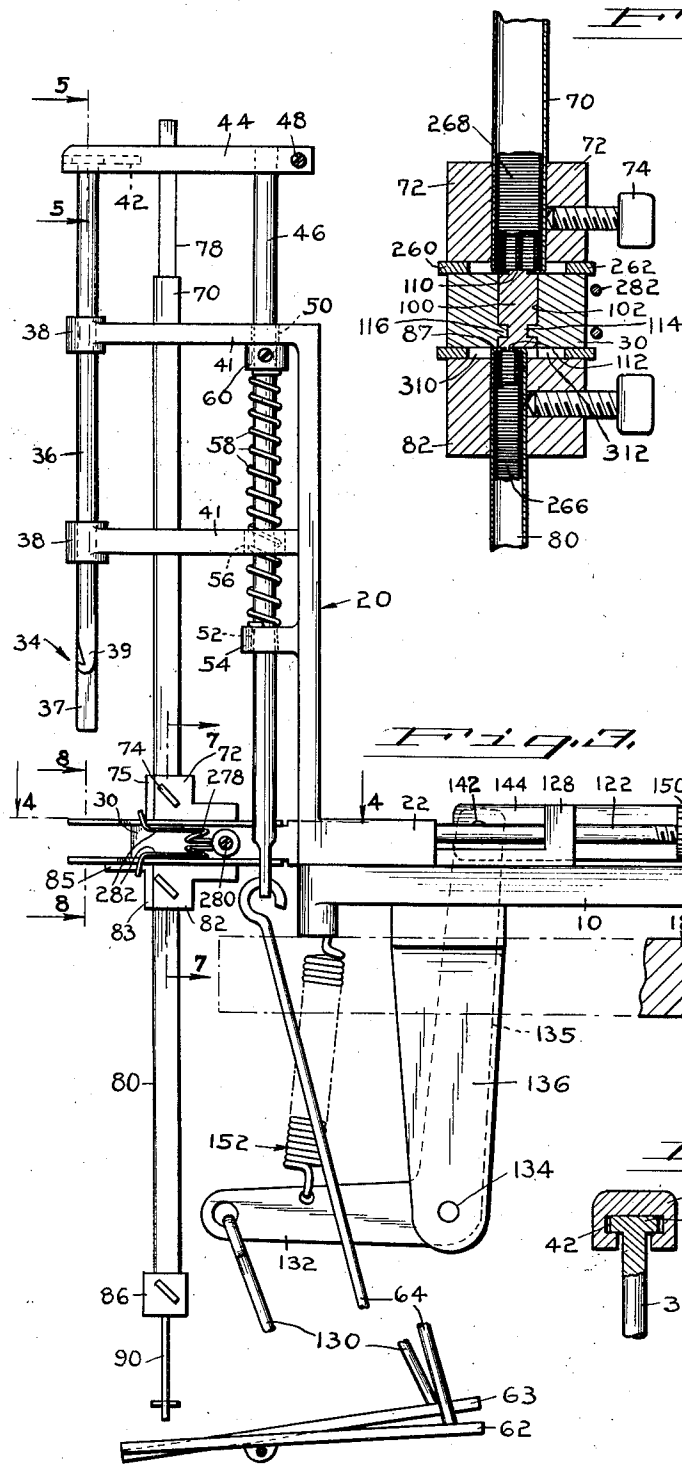



Fig. 3.




Fig. 4.

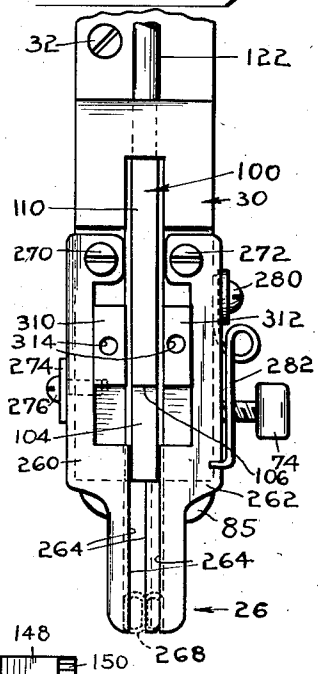



Fig. 5.




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Aug. 24, 1937. H. ALFANDRE 2,091,176

STRAP AND BUCKLE ASSEMBLING APPARATUS

Filed Feb. 27, 1936 3 Sheets-Sheet 3

Fig. 6a.

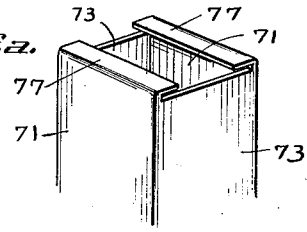



Fig. 6.

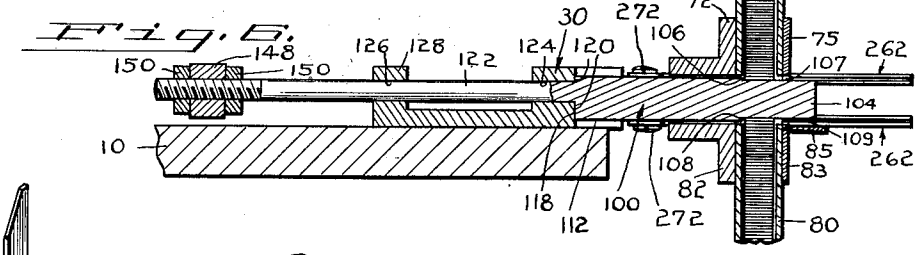
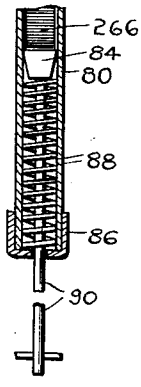



Fig. 9.



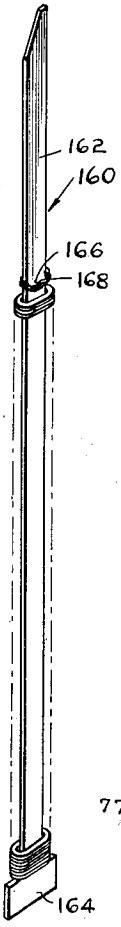




Fig. 10.

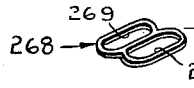



Fig. 11.

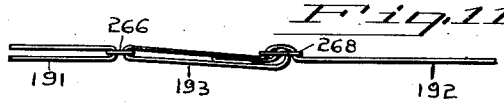



Fig. 12.

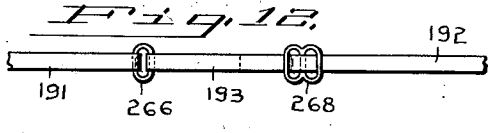
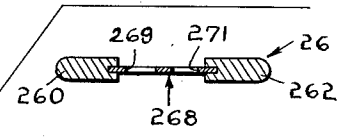



Fig. 8.



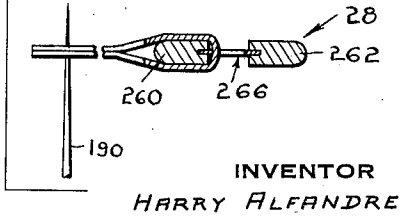




Fig. 14.

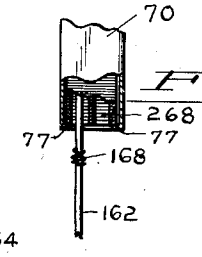



Fig. 13.

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Patented Aug. 24, 1937 2,091,176

# UNITED STATES PATENT OFFICE

2,091,176

## STRAP AND BUCKLE ASSEMBLING APPARATUS

Harry Alfandre, Brooklyn, N. Y.

Application February 27, 1936, Serial No. 65,977

24 Claims. (Cl. 223—49)

This invention relates to apparatus for assembling buckles and straps in the manufacture of adjustable straps. The apparatus is intended primarily for use in the manufacture of adjustable shoulder straps of the type extensively utilized in ladies' undergarments, but may be used generally for the manufacture of adjustable straps.

In one well known construction of adjustable shoulder or similar straps, two strips of tape are looped through openings in a pair of buckles, one buckle having a single eyelet and the other buckle having a double eyelet defined by the sides of the buckles and an intermediate bar. In the case of shoulder straps, the buckle eyelets are relatively small and it is difficult and time consuming to pass the ends of the tape through the eyelets, especially in the case of the double eyelet buckle because the strip of tape directly associated therewith for forming the adjustable loop is twice passed through the eyelets. Owing to these difficulties, the cost of the labor necessary to assemble the tapes with the buckles in forming the adjustable loop has been disproportionately large, and owing to the length of time necessary to assemble the buckles with the tapes, production of the garments in which the adjustable straps are used is frequently delayed. The main object of the present invention is to eliminate these difficulties and delays and to substantially reduce the cost of manufacture of adjustable shoulder straps or similar articles.

With this object in view, I have provided an apparatus which greatly facilitates the insertion of the tapes through the buckles, thereby considerably reducing the cost of producing adjustable shoulder straps and accelerating the production of the straps and the garments provided therewith. In accordance with the present invention, the buckles are automatically supplied and fed to the clamping jaws. The provision of an apparatus in which the buckles are automatically supplied and fed to the clamping jaws constitutes another object of the present invention.

Another object of the invention is to provide an apparatus in which the tapes are threaded through the buckle openings entirely by one or more elements of the apparatus.

A further object of the invention is to provide means for facilitating the loading of the buckle supply device constituting parts of the automatic buckle feeding means of the present apparatus.

A yet further object of the invention is generally to improve the art of manufacturing adjustable straps and to provide a highly efficient apparatus for that purpose.

For a complete understanding of the present invention, reference is to be had to the following description and to the accompanying drawings.

In the drawings:

Fig. 1 is a perspective view of the apparatus constituting one embodiment of the present invention, parts being broken away for the sake of clearness in illustration;

Fig. 2 is a front view of a portion of a strap-threading device constituting part of the apparatus;

Fig. 3 is a side view of the apparatus;

Fig. 4 is a sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3;

Fig. 6 is a sectional view on the line 6—6 of Fig. 1;

Fig. 6a is a perspective view of the delivery end portion of the buckle-supply tube;

Fig. 7 is a sectional view on the line 7—7 of Fig. 3;

Fig. 8 is a sectional view on the line 8—8 of Fig. 3;

Figs. 9 and 10 are perspective views on an enlarged scale of buckles which may be assembled with straps or tapes in accordance with the present invention;

Figs. 11 and 12 are end and plan views, respectively, of an adjustable shoulder strap of a well known form in which the buckles, shown in Figs. 9 and 10, are utilized;

Fig. 13 is a perspective view of a buckle holder carrying a plurality of buckles and utilized in accordance with the present invention for facilitating the loading of the buckle-supply devices constituting a part of the automatic buckle-feeding means of the present apparatus;

Fig. 14 is a side view of the delivery end of a buckle-supply tube illustrating the manner of loading said tube with a stack of buckles.

Referring to the drawings, in detail, the apparatus here shown comprises a frame including a bed plate 10 having corner legs 12 having openings therethrough for screws 16 by which said plate may be secured to the top 18 of a bench or table. A standard 20 projects above the plate 10 and is provided with a lateral portion 22 which is secured to said plate by screws 24. Two pairs of relatively movable jaws 26 and 28 are carried by a guide block 30 secured to the plate 10 by screws 32. Said jaws are arranged in vertically spaced relation below a strap-threading device

34, including the rod 36 which slides in bearings 38 provided at the free ends of bracket arms 41 integral with and projecting laterally from the standard 20. A strap threading blade 37 and a strap threading hook 39 are carried at the lower end of said rod, preferably integral therewith. The upper end of the rod 36 is provided with an enlarged portion or head 40 which is slidably received in a slot 42 formed at one end of a bar 44, the said slot being open at one end thereof to permit insertion of the rod head 40. Said head and slot are non-circular to prevent relative rotary movement therebetween. The other end of the bar 40 is split and clamped to the upper end of an actuating rod 46 by a clamping screw 48. Said rod passes through bearing openings 50 and 52 provided in the bracket arm 41 and in the lug 54, respectively, said lug being integral with the standard 20.

The rod 46 also extends through an opening 56 in the bracket arm 41 and is normally urged upwardly to hold the buckle-threading device 34 in retracted position. For that purpose a helical compression spring 58 encircles a portion of the rod 46, and extends through the opening 56, the latter being large enough to permit free movement of said spring therethrough. One end of the spring bears on the lug 54 and the other end of the spring bears on a collar 60 secured to said rod 46. Said collar constitutes a stop to limit the movement of the rod by said spring. The lower end of the rod is connected to a foot treadle 62 by means of a link 64 constituting mechanism for moving the rod 46 for moving the buckle threading device 34 to buckle-threading position.

Referring again to the pairs of jaws 26 and 28, each pair of jaws, as best shown in Figs. 1, 4 and 8, comprises opposed and spaced jaw members 260 and 262, respectively, having confronting slotted ends 264 between which the buckles 266 and 268 may be clamped. The upper pair of jaws 26 are carried on the upper surface of the guide block 30 and the jaws of the lower pair 28 are fixed to the lower surface of said guide block, all by means of screws 270 and 272 for the stationary and movable jaws of each pair respectively. The fixed jaws 260 are held against pivotal movement on the screws 270 by means of a clip 274 which is secured to the side of the block 30 by a screw 276 and which engages the outer side edges of said jaws. The movable jaws 262 are pivoted on the set screws 272 and are normally held in buckle-engaging position by a spring 278 which is secured to the side of the block 30 by a screw 280 and is provided with spring arms 282 which resiliently engage the outer side edges of said movable jaws. The inner side edges of the stationary and movable jaws of each pair bear against lugs 310 and 312, respectively, on the upper and lower surfaces of the guide block 30. The lugs 310 serve to properly position the fixed jaw of each pair, while the lug 312 constitutes stop members for the movable jaw of each pair and thus limits the movement of said movable jaws by the spring toward said fixed jaws.

In accordance with the present invention, means are provided for automatically feeding the buckles 266 and 268 to and between the pairs of jaws 28 and 26 respectively. The double eyelet buckles 268 are supplied to the upper pair of jaws 26, while the single eyelet buckles 266 are supplied to the lower pair of jaws 28. The supply means for these buckles comprises a vertically disposed tube 70 of rectangular cross section within which a plurality of double-eyelet buckles 268 may be stacked, the size and shape of the tube being such, in relation to the size and shape of the buckles 268, as to hold the buckles in stacked alignment and to prevent the buckles from turning in the tube. The bottom end of the tube 70 is detachably secured within a holder 72 by a wing set-screw 74. Said holder is secured in position on the block 30 by screws 76 which engage in threaded apertures 314 in the lugs 310 and 312. A solid rectangular rod 78 is slidable in the tube 70 and is adapted to rest on the uppermost buckle 268 and by its own weight to feed the buckles to the lower or delivery end of said tube.

As here shown, the holder 72 comprises a casting provided with an opening through which the lower end of the tube 70 extends and which is closed at its side by a metal plate 75, secured by screws. The delivery end of the tube 70 is constructed to support the stack of buckles 268 to permit the passage of but one buckle at a time from said end of the tube. For this purpose, opposite side walls 71 extend beyond the side walls 73 and are provided with inturned end portions 77 forming ledges which are spaced from the adjacent edges of the side walls 73, a distance approximately equal to the thickness of one buckle. The buckles 268 are inserted through the upper or inlet end of tube 70, the weight 78 being removable for that purpose.

The single eyelet buckles 266 are fed through a tube 80 of rectangular cross section conforming in size and shape to the size and shape of said single eyelet buckles. The upper or delivery end of said tube is secured within a holder 82, which is secured to the lower surface of the guide block 30 in the same manner as the holder 72. The holder 82 comprises a front closure plate 83 similar to the plate 75 on the holder 72, but in addition is provided with spaced forwardly reflexed portions 85 on which the jaws 260 and 262 have a bearing and are thereby supported. A spring pressed follower 84 bears on the lowermost buckle in the tube 80 and thereby acts to feed the buckles toward the delivery end of said tube. The delivery end of the tube 82 is constructed in the same manner as the tube 70 and, like the latter, is provided with inturned edges 87 which limit the movement of the buckles axially of the tube and permit the passage of but one buckle at a time from said delivery end of the tube. The buckles 266 are inserted through the lower or inlet end of tube 80, and for that purpose, the cap 86 on which the spring 88 bears, and through which the follower stem 90 extends is removably secured to said inlet end of the tube.

The buckles are ejected from the tubes 70 and 80 by means of a plunger 100 which is slidable in a guide opening 102 formed in the guide block 30. The forward end 104 of said plunger is reduced in thickness to provide shoulders 106 and 108 which define the rear ends of recesses 107 and 109 in the upper and lower surfaces thereof, respectively, for receiving the buckles from the tubes when said shoulders engage the foremost buckles at the delivery ends of the tubes and move them beyond the tube. The shoulders constitute the forward ends of ribs 110 and 112, respectively, said shoulders and ribs being somewhat narrower than the space between the confronting ends of the inturned portions 77 and 87 of said tubes. Thus, a longitudinal movement of the plunger 100 in a direction toward the free ends of the jaws 26 and 28 is effective to eject one buckle 268 from the tube 70 and to propel

the same between the opposed jaws 264 to a position below the strap-threading device 34, and simultaneously to eject a buckle 266 from the delivery end of the tube 80 and to propel said buckle between the opposed jaws of the pair 28 to a position below the buckle 268, with the eyelet of the buckle 266 in alignment with the eyelet 269 of the buckle 268. The buckles 266 and 268 are preferably flat, as the mechanism necessary to feed such buckles is less complicated than that required for curved buckles.

The plunger 100 and the guide block 30 are formed with interengaging means for preventing movement of said plunger except in said longitudinal direction. For this purpose, the plunger 100 is provided with longitudinally extending grooves 114 into which longitudinally extending ribs 116, projecting from the inner side walls of the guide block 30, slidably fit, providing an accurate guide for the plunger 100. The rear end of the plunger is reduced, forming a peripheral shoulder 118 which engages a wall portion 120 formed on the guide block 30 when the shoulders 106 and 108 are just rearwardly of the delivery ends of the tubes 70 and 78, thereby positioning the plunger for engagement with the buckles. The reduced rear portion of the plunger 100 provides a stem 122 which extends through an opening 124 in the wall portion 120 and through the opening 126 in the integral lug 128.

The plunger 100 is operated by a treadle-actuated mechanism comprising a link 130 connected at one end to the treadle 63 and at its other end to one arm 132 of a bell crank lever which is pivotally mounted on a pivot screw 134 at the lower end of a bracket 136 which depends from and is secured to the lower surface of the bed plate 10. The other arm 135 of the bell crank lever extends through a slot 140 formed in the plate 10 in alignment with a similar slot in the bench 18 and is connected by a pivot screw 142 to a link 144. The other end of said link 144 is connected by a screw 146 to a block 148 adjustably mounted on the rear end of the stem 122 and secured in adjusted position by nuts 150. A tension spring 152, connected at its ends to one arm of the bell crank lever and to an apertured lug 154 on the under surface of the plate 10, is effective to hold the plunger 100 in retracted position and to resiliently oppose the forward movement of said plunger. Said plunger is moved forwardly toward the free ends of the jaws to eject and propel the buckles by actuating the link 130 of the bell crank 132 against the action of the spring 152.

To facilitate loading the tubes 70 and 80 with stacks of buckles, I have devised means for holding a relatively large number of buckles in stacked relation and for transferring the stacked buckles to said tubes. As the devices for stacking and transferring buckles 266 are of the same construction as the device for stacking and transferring buckles 268, only one of said devices will be described. Referring now to Fig. 13, the stacking and transferring device, designated generally by the reference character 160, comprises a strip 162 of any suitable material, such as steel, wood, cardboard, fibre board, etc., although fibre board is preferred. One end of said strip is provided with an enlarged portion 164 to prevent the buckles from moving off that end of the strip, and an aperture 166 is formed adjacent the other end of the strip, the buckles at said end of the strip being releasably retained in position by means of a piece of wire 168 threaded through said aperture and wound around the strip forming an enlargement which prevents the buckles from moving off the latter end of the strip.

In loading the tube 70 or 80 with a stack of buckles mounted on a strip 162, the tubes are first removed from their holders 72 and 82, respectively. In loading the tube 70, the weight 78 is removed from the tube and the strip 160 carrying a stack of buckles is inserted through the inlet end of the tube until the forward portion of the strip provided with the eyelet and the wire enlargement, extends beyond the delivery end of the tube, as illustrated in Fig. 14. Then, while the tube is held so that the buckles rest on the inturned edges 77, the wire 168 is removed to permit the strip to be withdrawn from the tube through the inlet end thereof, the strip being long enough to be grasped for that purpose when the portion projecting beyond the delivery end of the tube is pushed in the opposite direction. Then the tube is secured in its holder and the weight 78 inserted, thereby conditioning the tube for feeding buckles to the plunger 100. The tube 80 is loaded in the same manner as the tube 70, the spring pressed follower and cap being removable to permit insertion of the buckle-stacked strip. The free end 170 of the strip is preferably tapered as shown to facilitate the insertion of the strip through the tubes between the inturned edges at their delivery ends.

A holder 180 for adjustable straps, made according to the present invention, is mounted on the frame of the apparatus. Said holder comprises a bracket having a slotted portion 182 for engagement by a screw 184 by which said bracket may be adjustably secured in position, and an angularly related downturned portion 186 of the bracket carries a socket 188 within which there is removably secured an elongated rod 190 provided with a sharpened end on which the ends of the straps may be impaled.

In using the present apparatus for the purpose of assembling the buckles with the straps and in forming the adjustable loop in one of the straps, a single-eyelet buckle 266 and a double-eyelet buckle 268 are positioned in alignment with each other in their jaws by projecting the plunger 100 forwardly, as above described. One of the strap sections is then placed over the lower pair of jaws 28, over the opening in the buckle held thereby and the treadle 62 is actuated to depress the rod 36, causing the blade 37 to engage the strap and force the same through the opening in the buckle. The ends of the strap, which have in this manner been looped through the buckle, are then impaled upon the rod 190, as illustrated in Fig. 8, so that the intermediate folded portion of the strap is held at one side of the buckle opening. The other strap section is then threaded through the opening 271 of the double-eyelet buckle by positioning the strap below the pair of jaws 26 in position to be engaged by the hook 39. Thus, by depressing the rod 36 so that the hook 34 is projected through the eyelet opening 271 and positioning the strap so that the latter is over the free end of the hook, the upward movement of the rod 36 upon release of the treadle causes the hook to move the strap through said buckle opening 271. A suitable length of the strap thus threaded through the opening 271 is positioned over the buckle 268, after which the blade 37 is projected into engagement with said overlying strap, forcing the latter through buckle opening 269 and also through the buckle opening of the buckle 266. Then the por-

tion of the strap, thus passed through the buckle openings in the two buckles, is again threaded through the buckle opening 271 in the same way as before by means of the hook 39 and is again disposed in overlying relation with respect to the buckle opening 269. Finally, the blade 37 is again projected to engage the last mentioned overlying portion of the strap to force the latter through the buckle opening 269, but not through the opening in the buckle 266. In this manner the two buckles are assembled with the strap and an adjustable loop is formed in the strap section which is looped through both of the buckles. The buckles thus assembled with the straps are then removed from the jaws and may be left suspended on the rod 190.

A well known form of adjustable strap, which is produced according to the present invention, is illustrated in Figs. 11 and 12. This adjustable strap comprises a strap section 191 which is threaded through the opening of the single-eyelet buckle 266, in the manner described above, and a strap section 192 threaded through the openings in both buckles to provide the adjustable loop 193. It will be understood, however, that the present apparatus may be utilized with other types of buckles and other type of straps or tapes.

It is thus seen that the embodiment of the invention disclosed herein is well adapted to accomplish the objects of the invention. It will be understood, however, that the invention is capable of other embodiments and that in the present apparatus certain changes in the construction and arrangement of parts may be made and that certain parts may be used without others. Therefore, I do not wish to be limited to the precise construction herein shown or described, except as may be required by the appended claims and the prior art.

Having thus described my invention, what I desire to claim and secure by Letters Patent of the United States is:

1. Apparatus for attaching a buckle to a strap, said apparatus comprising a frame, a pair of relatively movable jaws positioned on said frame, means for supplying buckles to said jaws, means for threading straps through said buckles, said jaws having buckle-receiving portions and buckle-positioning portions to hold a buckle therebetween in position for threading the strap therethrough, and means for moving buckles from said buckle-receiving portions to said buckle-positioning portions.

2. Apparatus for attaching a buckle to a strap, said apparatus comprising a frame, a plurality of pairs of relatively movable jaws positioned on said frame with the jaws of one pair in substantially aligned spaced relation with the jaws of another pair, means for supplying buckles to be held in said jaws, means for threading a strap through a pair of buckles held between two of said pairs of jaws, and means for transferring buckles from said buckle-supplying means to and between each pair of jaws.

3. Apparatus for attaching a buckle to a strap, said apparatus comprising a frame, a pair of relatively movable jaws positioned on said frame, means for supplying buckles to said jaws comprising a tube adapted to hold a plurality of buckles in stacked relation, said tube having a buckle-delivery end, means for transferring the foremost buckle from the delivery end of said tube to and between said jaws, and means threading a strap through said buckle.

4. Apparatus for attaching a buckle to a strap, said apparatus comprising a frame, a plurality of pairs of relatively movable jaws positioned on said frame with the jaws of one pair in substantially aligned spaced relation with the jaws of another pair, means for supplying buckles to be held in said jaws comprising a plurality of tubes, each adapted to hold a stack of buckles and having a buckle delivery end, and means for transferring the foremost buckle in each tube from the delivery end thereof to and between each pair of jaws, respectively.

5. Apparatus for attaching a buckle to a strap, said apparatus comprising a frame, a plurality of pairs of relatively movable jaws positioned on said frame with the jaws of one pair in substantially aligned spaced relation with the jaws of another pair, means for supplying buckles to be held in said jaws comprising a plurality of tubes, each adapted to hold a stack of buckles and having a buckle delivery end, and means for transferring the foremost buckle in each tube from the delivery end thereof to and between each pair of jaws, respectively, comprising a member movable transversely of the delivery ends of said tubes and having portions for engagement with said buckles.

6. A device of the class described comprising a frame, a plurality of pairs of jaws positioned on said frame, one of the jaws of each pair being movable with respect to its companion jaw, spring means associated with each movable jaw to yieldingly oppose its movement in one direction, the jaws of each pair being adapted to hold a buckle having an opening therethrough with an opening of the buckle held by one pair of jaws in alignment with the opening in a buckle held by another pair of jaws, a separate buckle-supply means for each pair of jaws, means for ejecting a buckle from each of said supply means and for inserting said buckle between the jaws of one of said pairs, and means for actuating said buckle-ejecting means.

7. A device of the class described comprising a frame, a plurality of pairs of jaws positioned on said frame, one of the jaws of each pair being movable with respect to its companion jaw, spring means associated with each movable jaw to yieldingly oppose its movement in one direction, the jaws of each pair being adapted to hold a buckle having an opening therethrough with an opening of the buckle held by one pair of jaws in alignment with the opening in a buckle held by another pair of jaws, said jaws of each pair being spaced from each other at their rear portions, means for inserting a buckle between said jaws of each pair at said spaced rear portions and for moving said buckle longitudinally of said jaws toward their forward ends to the positions in which the openings of the buckles held by different pairs of said jaws are in alignment.

8. A device of the class described comprising a frame, a plurality of pairs of jaws positioned on said frame, one of the jaws of each pair being movable with respect to its companion jaw, spring means associated with each movable jaw to yieldingly oppose its movement in one direction, the jaws of each pair being adapted to hold a buckle having an opening therethrough with an opening of the buckle held by one pair of jaws in alignment with the opening in a buckle held by another pair of jaws, said jaws of each pair being spaced from each other at their rear portions, a separate buckle-supply tube for each pair of jaws, each of said tubes having its delivery end positioned adjacent said rear jaw portions, and

means for feeding a buckle from said end of the tube to a position between said rear jaw portions and for advancing said buckle to a position in buckle-opening alignment with the buckle in the other pair of jaws.

9. Apparatus for facilitating the assembly of a plurality of apertured members with strips of tape to form an adjustable strap, said apparatus comprising means for releasably holding two apertured members in spaced relation with apertures in the two members in alignment, means for inserting said apertured members in said holding means, means adapted to engage a strip of tape and force the same through the aligned apertures of the two members, and means for actuating said member-inserting means and said tape-engaging means.

10. Apparatus for facilitating the assembly of a plurality of apertured members with strips of tape to form an adjustable strap, said apparatus comprising means for releasably holding two apertured members in spaced relation with apertures in the two members in alignment, two holders for said apertured members, means for ejecting apertured members from each of said holders and for inserting the ejected members in said holding means in said spaced relation, means adapted to engage a strip of tape and force the same through the aligned apertures of the two members in said holding means, and means for actuating said ejecting means and said tape engaging means.

11. In a device of the class described, a frame, a pair of opposed relatively-movable buckle-holding jaws positioned on the frame and extending forwardly in spaced relation providing at the free ends of the jaws a front opening for the removal of the buckle, means for inserting an eyelet buckle between said jaws, means for threading a strip of tape through the eyelet of said buckle, and means for actuating said buckle-inserting mechanism and said tape-threading means.

12. A device of the class described comprising a frame, a plurality of pairs of jaws positioned on said frame, one of the jaws of each pair being movable with respect to its companion jaw, spring means associated with each movable jaw to yieldingly oppose its movement in one direction, the jaws of each pair being adapted to hold a buckle having an opening therethrough with an opening of the buckle held by one pair of jaws in alignment with the opening in a buckle held by another pair of jaws, means for inserting a buckle between each pair of jaws and for moving said buckles longitudinally thereof to said position of alignment, and means for actuating said buckle-inserting means.

13. Apparatus for facilitating the assembly of a plurality of apertured members with strips of tape to form an adjustable strap, said apparatus comprising means for releasably holding two apertured members in spaced relation with apertures in the two members in alignment, means for inserting apertured members in said holding means, and means adapted to engage a strip of tape and force the same through the aligned apertures of the two members.

14. Apparatus for facilitating the assembly of a plurality of apertured members with strips of tape to form an adjustable strap, said apparatus comprising a frame, means on the frame for releasably holding two apertured members in spaced relation with apertures in the two members in alignment, means for feeding apertured members to said holding means, and means mounted on said frame and movable therein adapted to engage a strip of tape and force the same through the aligned apertures of the two members.

15. A device of the class described comprising a frame, a holder positioned on said frame and adapted to support a double-eyelet buckle, said holder comprising spaced jaws having confronting edges between which the buckle is held, and means for threading a strap through said eyelets comprising a member movable between and transversely of said confronting edges adapted to engage the strap and force the same in one direction through one of the buckle eyelets and a second member movable between and transversely of said confronting edges to engage said strap and force the same in an opposite direction through the other of said buckle eyelets.

16. A device of the class described comprising a frame, a holder positioned on said frame and adapted to support a double-eyelet buckle, said holder comprising spaced jaws having confronting edges between which the buckle is held, and means for threading a strap through said eyelets comprising a movable rod carrying at one end thereof in laterally spaced relation two members movable between and transversely of said confronting edges to engage a strap and force the same through the buckle eyelets.

17. Apparatus for facilitating the assembly of a plurality of apertured members with strips of tape to form an adjustable strap, said apparatus comprising means for releasably holding two apertured members in spaced relation with apertures in the two members in alignment, means for inserting apertured members in said holding means, means adapted to engage a strip of tape and force the same through the aligned apertures of the two members, means for actuating said member-inserting means, and means for actuating said strip-engaging means.

18. Apparatus for facilitating the assembly of a plurality of apertured members with strips of tape to form an adjustable strap, said apparatus comprising a frame, means on the frame for releasably holding two apertured members in spaced relation with apertures in the two members in alignment, means for supplying apertured members, means for transferring apertured members from said supplying means to said holding means in said spaced relation and alignment, and means mounted on said frame and movable therein adapted to engage said strip and force the same through the aligned apertures in the two members.

19. In combination, a stack of uniform buckles and means for transferring said stack of buckles to a supply container of an apparatus for assembling buckles with straps, said buckles being non-circular and having non-circular eyelets and said container having a non-circular cross section corresponding approximately in size and shape to the buckle periphery for holding the buckles against displacement in their own planes but permitting movement of said buckles longitudinally of the container, said means comprising an elongated strip of suitable material having a cross section corresponding in size and shape substantially to the size and shape of the buckle eyelets, said buckles being removably stacked uniformly on said strip and held by the latter against substantial movement transversely of the strip, and said strip having enlarged portions at opposite ends of the stack of buckles to hold the latter on said strip, at least one of said enlargements being removable to permit said buck-

les to be assembled on said strip and to be removed therefrom, said removable enlarged portion being spaced from the adjacent endmost buckle of said stack whereby said enlarged portion will project beyond one end of said container when said stack of buckles is inserted in said container and said endmost buckle is positioned at said end of the container.

20. In apparatus of the class described for assembling buckles with straps, a container for a stack of uniform buckles, said buckles being non-circular and having non-circular eyelets and said container having a non-circular cross section corresponding approximately in size and shape to the buckle periphery for holding the buckles against displacement in their own planes but permitting movement of said buckles longitudinally of the container, said container having an opening at one end thereof and having a seat adjacent said opening engaged by the endmost buckle of the stack, a stack of buckles, and means for transferring said stack of buckles to said container, said means comprising an elongated strip of suitable material having a cross section corresponding in size and shape substantially to the size and shape of the buckle eyelets, said buckles being removably stacked uniformly on said strip and held by the latter against substantial movement transversely of the strip, and said strip having enlarged portions at opposite ends of the stack of buckles to hold the latter on said strip, at least one of said enlargements being removable to permit said buckles to be assembled on said strip and to be removed therefrom, said removable enlarged portion being smaller than said opening in the container and being spaced from the adjacent endmost buckle of said stack whereby said enlarged portion will project beyond said end of said container when said stack of buckles is inserted in said container and said endmost buckle is positioned at said end of the container in engagement with said seat.

21. Apparatus for attaching a buckle to a strap, said apparatus comprising a frame, a pair of relatively movable jaws positioned on said frame, means for supplying buckles to said jaws, means for threading straps through said buckles, said jaws having buckle-receiving portions and buckle-positioning portions to hold a buckle therebetween in position for threading the strap therethrough, said strap threading means including a member normally free from engagement with the strap and movable in one direction to engage the strap and force the same through the buckles and movable in the opposite direction away from said strap without retracting the latter through said buckles, and means for moving buckles from said buckle-receiving portions to said buckle-positioning portions.

22. Apparatus for attaching a buckle to a strap, said apparatus comprising a frame, a plurality of pairs of relatively movable jaws positioned on said frame with the jaws of one pair in substantially aligned spaced relation with the jaws of another pair, means for supplying buckles to be held in said jaws, means for threading a strap through a pair of buckles held between two of said pairs of jaws, said strap threading means including a member normally free from engagement with said strap and movable in one direction to engage the strap and force the same through said pair of buckles and movable in the opposite direction away from said strap and without retracting the latter through said buckles, and means for transferring buckles from said buckle-supplying means to and between each pair of jaws.

23. Apparatus for facilitating the assembly of a plurality of apertured members with strips of tape to form an adjustable strap, said apparatus comprising means for releasably holding two apertured members in spaced relation with apertures in the two members in alignment, means for inserting said apertured members in said holding means, means adapted to engage a strip of tape and force the same through the aligned apertures of the two members including a member normally free from engagement with said tape and having a dull free end, said member being movable in one direction for engagement of said dull end with the tape for forcing the latter through said aligned apertures and movable in the opposite direction away from said tape and without retracting the latter through said apertures, and means for actuating said member inserting means and said tape engaging means.

24. Apparatus for facilitating the assembly of a plurality of apertured members with strips of tape to form an adjustable strap, said apparatus comprising means for releasably holding two apertured members in spaced relation with apertures in the two members in alignment, two holders for said apertured members, means for ejecting apertured members from each of said holders and for inserting the ejected members in said holding means in said spaced relation, means adapted to engage a strip of tape and force the same through the aligned apertures of the two members in said holding means including a member normally free from engagement with said tape and having a dull free end, said member being movable in one direction for engagement of said dull end with the tape for forcing the latter through said aligned apertures and movable in the opposite direction away from said tape and without retracting the latter through said apertures, and means for actuating said ejecting means and said tape engaging means.

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