Nov. 19, 1940. C. H. INESON 2,222,033

STRAP AND BUCKLE ASSEMBLING APPARATUS

Filed Aug. 6, 1938 2 Sheets-Sheet 1

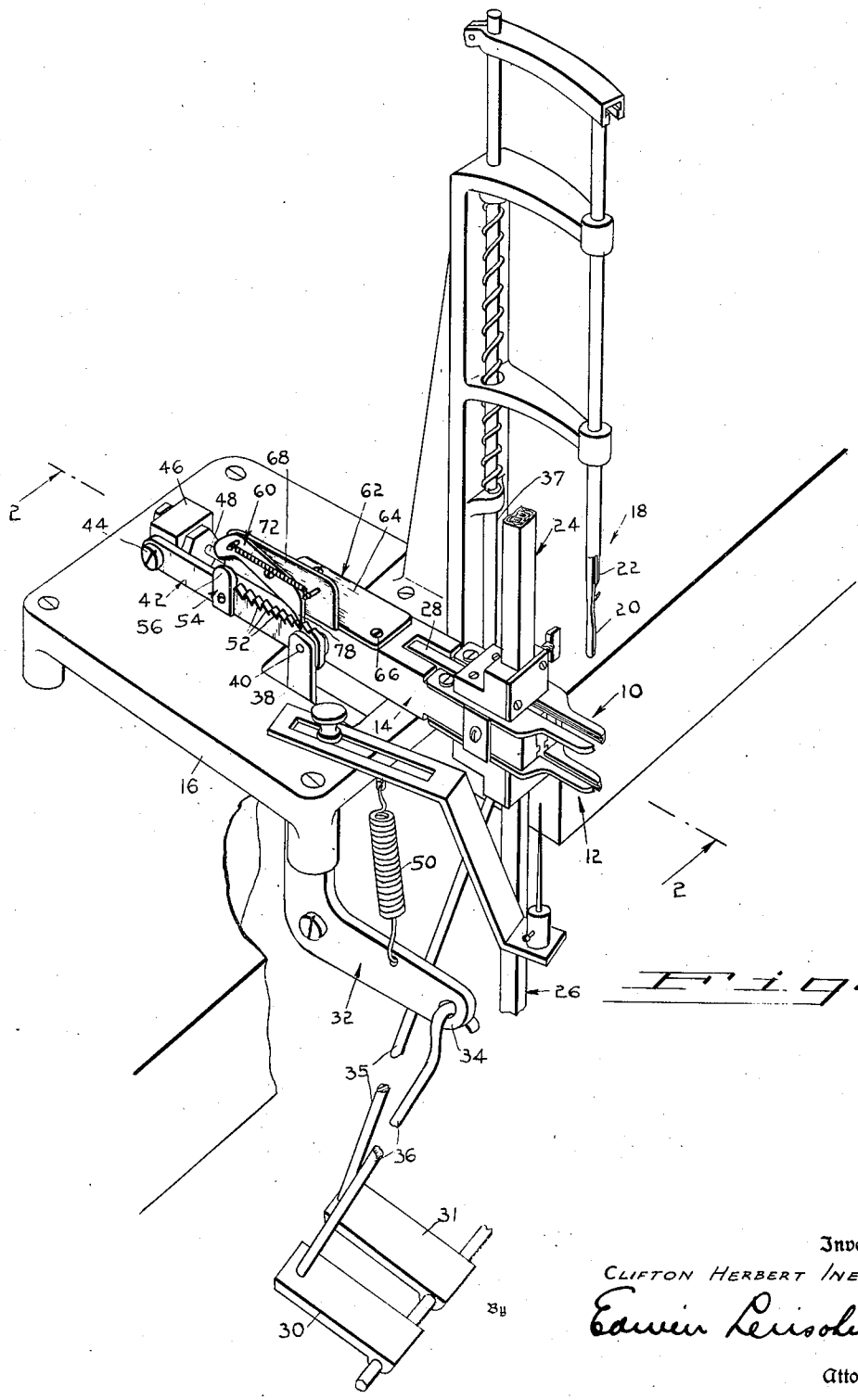


Fig. 1.

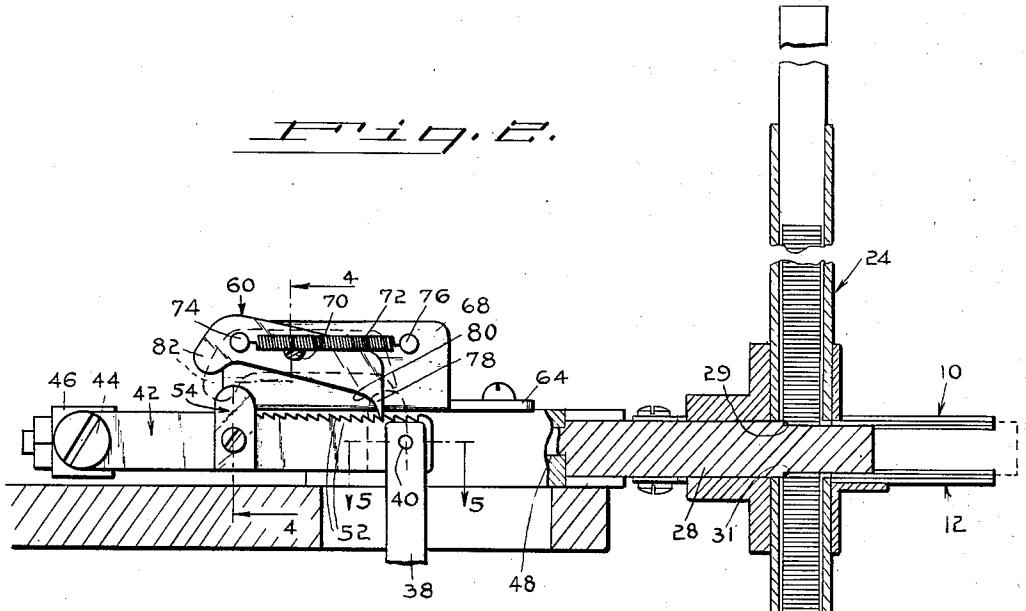
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STRAP AND BUCKLE ASSEMBLING APPARATUS

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Fig. 2.



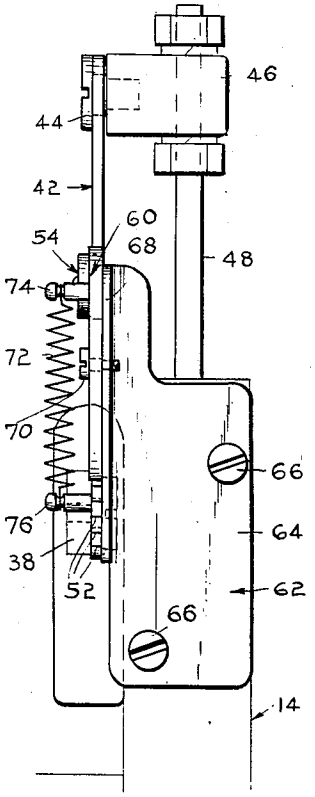
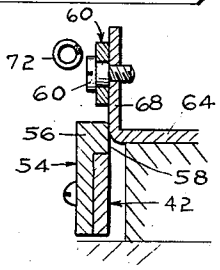


Fig. 4.



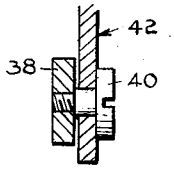


Fig. 3.

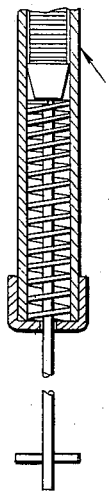


Fig. 1.

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Patented Nov. 19, 1940

2,222,033

UNITED STATES PATENT OFFICE

2,222,033

STRAP AND BUCKLE ASSEMBLING APPARATUS

Clifton Herbert Ineson, Oakville, Conn., assignor, by mesne assignments, to Harry Alfandre, New York, N. Y.

Application August 6, 1938, Serial No. 223,554

1 Claim. (Cl. 223—49)

This invention relates to apparatus for assembling buckles and straps in the manufacture of adjustable straps, and more particularly, to strap and buckle assembling apparatus of the type disclosed in United States Letters Patent Number 2,091,176 granted August 24, 1937, to Harry Alfandre.

In the apparatus disclosed in said patent, provision is made for feeding pairs of buckles in succession from supply magazines or containers to the companion jaws of spaced pairs of clamping jaws between which the buckles are releasably held, with openings thereof in alignment, so that the strap material may be threaded through said aligned openings in the process of forming the adjustable straps. The buckle feeding means comprises a reciprocable plunger which engages the endmost buckles at the delivery ends of the magazine and transfers said endmost buckle to the companion clamping jaws, the arrangement being such that two buckles, one from each of a pair of magazines, are transferred simultaneously to said pairs of clamping jaws.

In the operation of the apparatus referred to, it sometimes happens that the operator of said apparatus neglects to cause the plunger to complete its stroke from retracted position to projected position for ejecting the buckles from the magazines, with the result that the buckles are only partially ejected from the magazine. As a consequence of the incomplete displacement of the buckles from the delivery ends of the magazine, a subsequent delivery stroke or projection of the plunger is apt to cause buckles to partially overlap each other and jam at the delivery end of the magazines. It is, therefore, an object of the present invention to obviate this objection and disadvantage and more particularly to prevent the buckles from thus interfering with the proper ejection thereof from their respective supply magazines.

More specifically stated, the purpose of the present invention is to provide means for preventing the return stroke of the plunger, unless the projection thereof is first completed for ejecting the endmost buckles completely from the magazines.

Another object of the invention is to provide means for automatically retaining the plunger in any position of its delivery stroke short of the end thereof and upon the completion of said stroke to automatically release the plunger for return movement.

A further object of the invention is to provide a mechanism of simple construction for accomplishing the above mentioned objects of the invention, and further to provide such mechanism which is adapted to be readily attached to machines heretofore constructed, with little or no alteration of such machines.

The invention will be best understood from the following description considered in connection with the accompanying drawings which illustrate a preferred embodiment of my invention.

In the drawings:

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

Fig. 2 is a view partly in elevation and partly in section on the line 2—2 of Fig. 1, showing in full lines, the retracted position of the plunger;

Fig. 3 is a top plan view of the part of the strap and buckle assembling apparatus with which the mechanism embodying the present invention is directly associated;

Figs. 4 and 5 are detail sectional views on line 4—4 and 5—5, respectively, of Fig. 2.

Referring now to the drawings in detail, the apparatus to which the present invention is applied is constructed preferably, but not necessarily, substantially as shown in said above mentioned patent to Alfandre. As here shown, said apparatus comprises, two pairs of clamping jaws 10 and 12, respectively, carried by the guide block 14 which is fixed to the plate 16, the companion jaws of each pair being relatively movable as shown and described in said patent. Said pairs of jaws are arranged in vertically spaced relation below a strap threading device 18 which includes the strap threading blade 20 and the strap threading hook 22. The buckle magazines 24 and 26 are fixed to guide block 14 at the upper and lower surfaces thereof respectively in position to supply buckles to said pairs of jaws 10 and 12, respectively. The buckle ejecting means here shown as a plunger 28, provided with buckle-engaging shoulders 29 and 31, is mounted for reciprocation in guide block 14 and is operable by mechanism, actuated by a treadle 30, for ejecting a pair of buckles from the delivery ends of said magazines and for delivering said buckles to said jaws in strap-threading position. Said mechanism comprises a bell crank lever 32 connected at one end 34 thereof by a link 36 to said treadle. The other end 38 of said belt crank lever is connected by means of a pivot screw 40 to one end of a link 42. The other end of link 42 is connected by means of a pivot screw 44 to a block 46, adjustably mounted at the rear end of

stem 48 of plunger 28. It will be understood that plunger 28 is movable from retracted position to projected position and is moved in one direction, that is, toward the projected position thereof, by depressing pedal 30. The return stroke of said plunger is effected, under the control of the mechanism of the present invention, by a spring 50 which actuates belt crank lever 32, when treadle 30 is released, thereby to move the plunger to retracted position. Treadle 31 is connected by means of a link 35 to rod 37 for operating strap threading device 18. The apparatus as thus far described with the exception of the control mechanism referred to and presently to be described in detail, is of the same construction as that disclosed in said patent to Alfandre except that guide block 14 is lengthened to facilitate the attachment thereto of part of said control mechanism embodying the present invention.

Considering now the mechanism provided in accordance with the present invention for accomplishing the objects thereof, it will be observed that link 42 has a ratchet 52 carried thereby, said ratchet being preferably formed in a portion of the upper edge of said link at one side of a cam member 54 secured to said link intermediate the ends thereof. Said cam member 54 has a projecting upper portion 56 which overlies the upper edge of link 42 and is flush at its side 58 with the adjacent side of said link. A pawl lever 60 is pivotally mounted, intermediate the ends thereof, above ratchet 52 in position to engage said ratchet and the projecting portion 56 of cam member 54. Lever 60 is carried by a mounting plate 62 secured to guide block 14. Said mounting plate has a horizontal portion 64 secured to the upper surface of guide block 14 by any suitable means, here shown as screws 66. Said mounting plate is also provided at one edge thereof with a vertical upstanding portion 68 to which pawl lever 60 is secured, being pivotally mounted on a pivot screw 70 threaded into said vertical plate portion 68. A tension spring 72 is connected at one end thereof to one end of pawl lever 60 by means of a pin 74 fixed to said end of the lever and at its other end to mounting plate portion 68 by means of a pin 76 fixed to said plate portion. Spring 72 is effective to bias lever 60 for movement in a clockwise direction, viewing Figs. 1 and 2. Said pawl lever has a pointed end portion 78 which releasably engages ratchet 52, being held in such engagement by spring 72. It will be understood that the teeth of ratchet 52 are so designed that when the end 78 of pawl lever 60 is in engagement therewith movement of link 42 for moving plunger 28 to projected position is permitted, but movement of the link to move said plunger to retracted position is prevented. Accordingly, until the plunger has been projected for completely ejecting the buckles from the magazines, pawl 60 is held by spring 72 in engagement with ratchet 52 and thereby prevents the return movement of the plunger.

In accordance with the present invention, provision is made for disengaging pawl 60 from ratchet 52 when the delivery stroke of the plunger has been completed. For this purpose cam member 54 hereinbefore described is arranged on link 42 for engagement with the rounded lower surface portion 80 of pawl lever 60 adjacent pointed end portion 78 thereof whereby to move said pointed end portion out of engagement with ratchet 52. Also, the arangement of the parts is preferably such that pawl lever 60 when disengaged by cam member 54 from ratchet 52, remains out of engagement with said ratchet until the end of the return stroke of plunger 28. This is accomplished by locating the pivot 70 of lever 60 in such relation to the ends of spring 72 and connecting pins 74 and 76, respectively, whereby spring 72 is effective, when lever 60 has disengaged ratchet 52, to bias said lever in a counter-clockwise direction (viewing Fig. 2). Lever 60 is provided with a downwardly projecting rear end portion 82 which, when said lever has been disengaged from the ratchet at the end of the delivery stroke of the plunger, has been moved by spring 72 into the path of cam member 54. Accordingly at the end of the return stroke of the plunger 28, cam member 54 engages said end portion 82 of the lever, thereby breaking the toggle effect between lever 60 and spring 72 and to move lever 60 in a clockwise direction for moving pointed end portion 78 of said lever into engagement with ratchet 52.

Thus it is seen that the device embodying the present invention and applied to the strap and buckle assembling apparatus as described above is well adapted to accomplish the several objects of the present invention. It will be understood, however, that certain changes in the construction and arrangement of parts may be made and will occur to those skilled in the art in view of the present disclosure. Therefore, I do not wish to be limited precisely to the embodiment of the invention herein shown or described, except as may be required by the scope of the appended claim.

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

In apparatus of the class described, a magazine for holding a plurality of buckles or similar elements in stacked relation, said magazine having a delivery opening, a plunger mounted for reciprocation between retracted and projected positions and operable in successive movements from retracted position to projected position to eject said elements in succession from said magazine through said opening, a ratchet pivotally connected to said plunger and mounted for reciprocation therewith, a lever pivoted between its ends on a fixed pivot adjacent said ratchet, a spring for holding one end of said lever releasably in engagement with said ratchet when said plunger is short of projected position to prevent return movement of the plunger prior to completion of its movement to projected position, having its opposite ends connected to said lever and to a stationary part at opposite sides, respectively, of the pivot point of the lever, a member movable with said ratchet and engageable with one end of said lever, in the projected position of said plunger, to disengage said lever from said ratchet to permit return of the plunger to retracted position, means including said spring to hold said lever out of engagement with said ratchet during the movement of said plunger from projected position to retracted position, and means including said member movable with said ratchet and engageable with the other end of said lever for again engaging said first end of the lever with said ratchet when the plunger has returned to its retracted position.

CLIFTON HERBERT INESON.