April 30, 1940. F. REDMAN 2,198,950

APPARATUS FOR STACKING CLOSURE FASTENERS

Filed Oct. 8, 1938 2 Sheets-Sheet 1

Fig. 1.

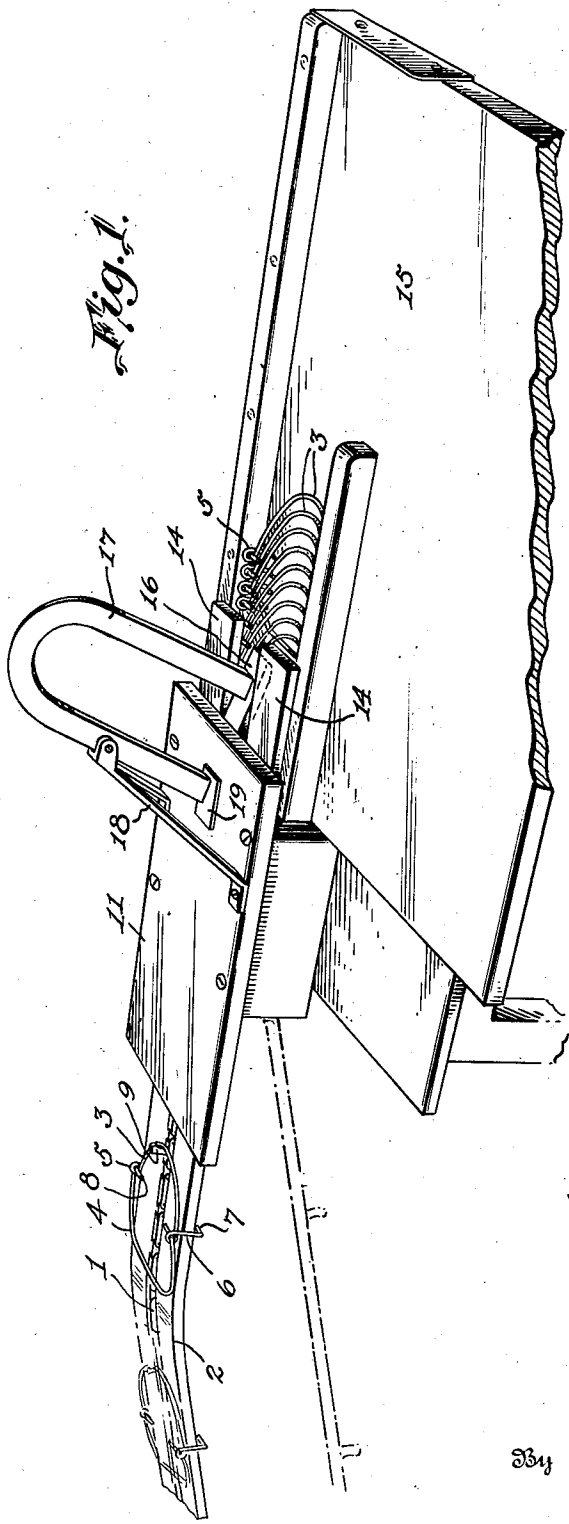
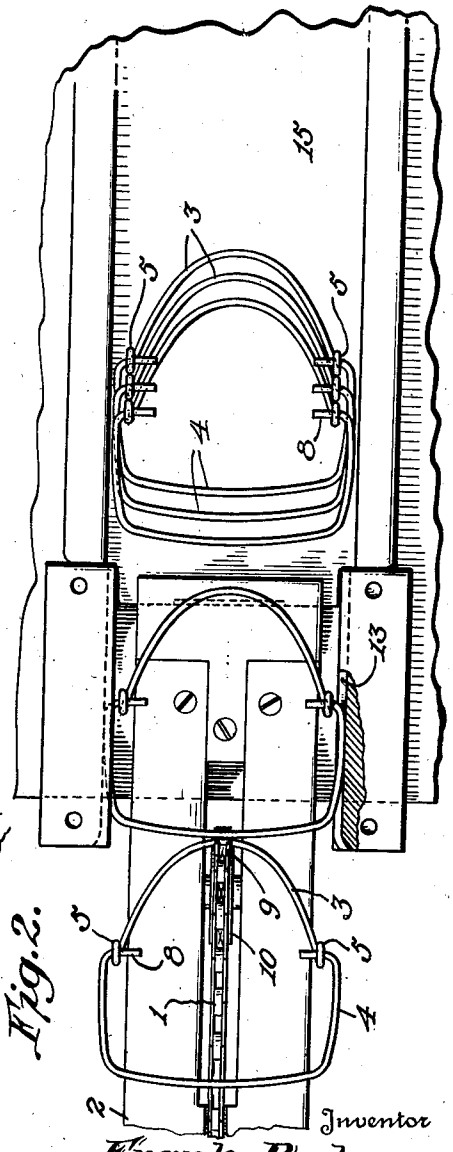


Fig. 2.



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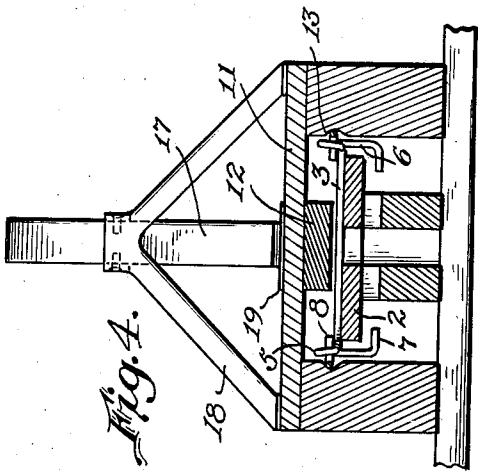


Fig. 4.

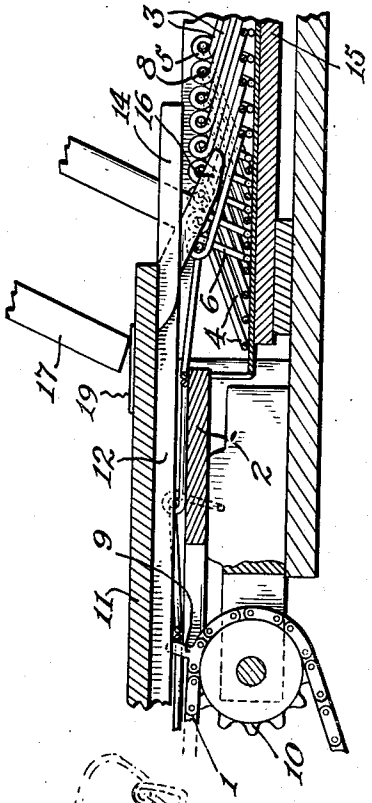


Fig. 5.

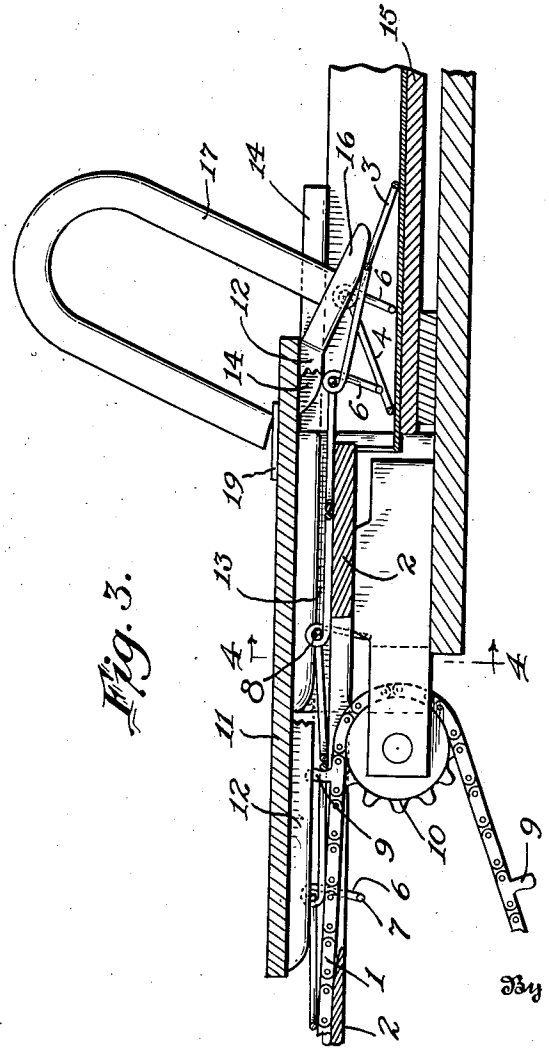


Fig. 3.

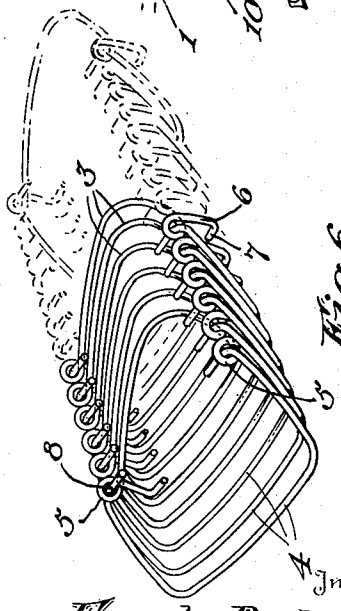


Fig. 6.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR STACKING CLOSURE FASTENERS

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Application October 8, 1938, Serial No. 234,057

11 Claims. (Cl. 214—6)

The invention relates generally to an apparatus for automatically stacking closure fasteners, and more particularly it relates to an apparatus for stacking a well known type of closure fastener, which comprises an eccentric and bail pivotally connected together.

If these closure fasteners are not stacked in an orderly fashion, they become entangled among themselves, and very considerable time is lost in untangling them when they are to be applied to the containers. Of course this difficulty is avoided if the fasteners are stacked in an orderly fashion at the time they are formed, but the hand stacking of these articles requires heavy expenditures for labor. The present invention, as previously indicated, provides automatic means for stacking the fasteners in an orderly fashion, thereby effecting a very material reduction in cost.

Various other objects and advantages of the invention will be apparent to those skilled in the art, from the following detailed description, when taken in connection with the accompanying drawings, in which,

Figure 1 is a perspective view of the apparatus.

Figure 2 is a plan view with the upper parts removed.

Figure 3 is a vertical, longitudinal sectional view of the apparatus.

Figure 4 is a transverse sectional view, taken on line 4—4 of Figure 3.

Figure 5 is a view similar to Figure 3, but more clearly illustrating the manner in which the fasteners are stacked; and

Figure 6 is a perspective view of a stack of the fasteners.

Referring to the drawings in more detail, numeral 1 indicates an endless conveyer, which is preferably continuously travelling. The upper run of the conveyer travels over a plate 2, and the closure fasteners are drawn along the plate, by the conveyer, in uniform position and in properly spaced relation.

The particular closure fasteners illustrated herein comprise an eccentric 3 and a bail 4. The eccentric is formed from a piece of wire which is bent to form eyes 5 at the end of a loop portion, and from the eyes the wire extends downwardly, as indicated by numeral 6, and the downwardly extending portions have inturned ends 7. The bails 4 have inturned ends 8 which fit loosely in the eyes 5 of the eccentrics. This form of closure fastener is well known. The bail passes over the glass or other closure on the container, and the eccentric is attached to the container by the inturned ends 7 thereof fitting into recesses in the container. The arrangement is such that when the eccentric is rotated downwardly to the locking position the bail is drawn downwardly, and it thereby forces the closure down and locks it securely in sealing position.

Of course the bails and eccentrics are fabricated separately, and are then united by snapping the inturned ends 8 of the bails into the eyes 5 of the eccentrics. The fasteners, after having been formed by uniting the bails and eccentrics, are engaged by upwardly projecting fingers 9 on the conveyer 1. These fingers, which are spaced the desired distance on the conveyer, engage the loop portion of the eccentric and carry the fasteners along the plate 2. The downwardly extending portions 6 and the inturned ends 7 of the eccentric maintain the fasteners properly positioned on the plate while they are being carried forward by the conveyer, as clearly shown in the drawings.

The forward portion of the plate 2 is bifurcated or slotted to permit the endless conveyer to turn downwardly about a sprocket wheel 10. After a closure fastener has been carried forward to a certain point it is released from the conveyer finger 9 by reason of the downward travel of the conveyer about the sprocket wheel, and after being so released the fasteners are continuously pushed forward by the following fasteners, as shown in Figures 2 and 3.

The fasteners now pass under a cover 11, and in the specific embodiment illustrated, this cover carries a centrally arranged, longitudinally extending hold-down plate 12. Also in the specific embodiment illustrated, the sidewalls supporting the cover are grooved, as indicated by numeral 13. The side portions of the bails 4 travel loosely in these grooves, to further assist in maintaining the parts in proper position. Extending forwardly from the cover are spaced guide plates 14, which overlie the fasteners and prevent any undue buckling of the fastener parts, while they are being stacked. Of course the invention is not limited to any such specific construction as here described.

The fasteners are being continuously carried along the guide plate 2, and they are delivered from this plate to a receiving table 15. As they are delivered one by one to the receiving table, they are automatically stacked together in uniform relation, as will now be described.

Numeral 16 refers to a magnetized finger which may be mounted in any desired manner. In the

specific form illustrated this finger is attached to the hold-down plate 12. It will be noted that the finger extends forwardly and downwardly. This magnetized finger 16 is preferably rather narrow, and is centrally arranged, as shown in Figure 1.

Any desired arrangement may be employed for magnetizing the finger. In the present embodiment a magnet 17 is carried by a bracket 18 mounted on the cover 11. A brass plate 19 insulates one end of the magnet from the cover and associated parts, and the other end of the magnet is in contact with the finger 16.

The manner in which the fasteners are stacked by this apparatus, will now be described.

As the leading fastener is pushed forward, the central portion of the eccentric loop engages the magnetized finger 16, and this contact occurs before the eccentric passes entirely off the plate 2. Thus the eccentric loop does not drop down onto the receiving table, but is maintained in a substantially horizontal position until the leading central portion of the loop engages the magnetized finger.

The contact between the eccentric loop and the magnetized finger prevents the loop from falling, and in the continued forward movement of the fastener the loop travels downwardly along the finger. In Figure 3 one of the fasteners is shown in position after it has been delivered to the receiving table, and another fastener is shown in the position where it is about to be delivered to the table. The eccentric loop of the latter fastener is still held up by contact with the magnetic finger, and the depending portions 6 of the eccentric are still elevated above the receiving table by reason of the fact that the bail 4 has not yet been released from the plate 2 and associated parts. As the fastener continues its forward travel, the eccentric loop will pass free of the end of the magnetic finger, and the loop will then drop down onto the receiving table, just behind the eccentric loop of the preceding fastener. The eyes 5 and the downwardly extending portions 6 of the eccentric will also be properly nested with respect to the similar parts of the preceding fastener. Preferably, however, there is a small portion of the bail 4 still resting on the plate 2. The resulting slight further forward movement of the bail will cause the fasteners to be tightly nested together, just as the bail drops from the plate 2 onto the receiving table in proper relation with the preceding bail.

It only remains to explain why the eccentric is held elevated until it has about reached its nesting position with respect to the previously delivered fasteners. This is best explained by reference to Figure 5 which illustrates the formation of a stack of fasteners. If the eccentric loop were permitted to drop before it approached its nesting position, the loop would engage the bails of the fasteners already delivered in stacking relation, and such engagement would cause the entire stack to be moved forward, before the parts reached the position of nesting relation, which of course would prevent the formation of a stack. The same thing could happen if the downwardly extending portions 6 dropped too early, so that they might engage the bails before the fastener reached its stacking position.

After the number of fasteners has been delivered to form a stack of the desired length, they are simply lifted by hand, while remaining in stacked relation, and placed in a suitable receptacle for storing or shipping.

It will be apparent from the foregoing description that I have devised a very simple apparatus by which closure fasteners are automatically stacked in nesting relation, ready for subsequent use without any danger of the fasteners becoming entangled among themselves, and that a very material cost reduction is accomplished thereby.

While the specific embodiment of the invention has been described in considerable detail, it will be understood that numerous changes and modifications may be made without departing from the spirit of the invention, and all such changes and modifications are intended to be included within the scope of the appended claims.

What I claim is:

1. An apparatus of the character described, including a stacking table, means for delivering closure fasteners to a point at a higher level than the stacking table, said closure fasteners comprising two parts pivotally connected, and means for temporarily maintaining only the forward pivotally connected part elevated while the two-part fastener is passing from the higher delivery level to the lower stacking level, until the fastener closely approaches stacking position.

2. An apparatus for stacking closure fasteners formed of a bail and an eccentric pivotally connected, which includes a stacking table, fastener delivery means arranged at a higher level than the stacking table, and means for temporarily maintaining only the eccentric elevated while the fastener is passing from the higher delivery level to the lower stacking lever, until the fastener closely approaches stacking position.

3. An apparatus for stacking closure fasteners formed of two parts pivotally connected, which includes a stacking table, means for delivering the fasteners to the table, and means for temporarily holding only one of the pivotally connected fastener parts in elevated position while it is passing from the delivering means to the stacking table.

4. An apparatus for stacking closure fasteners formed of a bail and an eccentric pivotally connected, which includes a plate, means for delivering the fasteners along said plate with the eccentrics in advance, and means for gradually lowering the eccentrics as they pass off said plate, while the bails are held in elevated position.

5. An apparatus for stacking closure fasteners, including a stacking table, means for delivering the fasteners to the table, and a stationary and non-rotatable magnetized member making sliding contact with the fasteners as they are delivered to the table.

6. An apparatus for stacking closure fasteners, including a stacking table, means for delivering the fasteners at a higher level then the table, and a downwardly and forwardly inclined magnetized member making sliding contact with the fasteners while they are passing from the higher level of the delivery means to the lower level of the stacking table.

7. An apparatus for stacking closure fasteners formed of two parts pivotally connected, which includes a stacking table, means for delivering the fasteners to the table, and a stationary magnetized member so positioned and constructed as to contact only one of the pivotally connected fastener parts as the fasteners are delivered to the table.

8. An apparatus for stacking closure fasteners formed of a bail and an eccentric pivotally connected, which includes a stacking table, means for delivering the fasteners to the table, and a

stationary magnetized member so positioned and constructed as to contact only the eccentrics as the fasteners are delivered to the table.

9. An apparatus for stacking closure fasteners formed of a bail and an eccentric pivotally connected, which includes a stacking table, means for delivering the fasteners to the table with the eccentrics in advance, and a relatively narrow stationary magnetized member so positioned and constructed as to contact only the leading portion of the eccentrics as the fasteners are delivered to the table.

10. An apparatus for stacking closure fasteners formed of a bail and an eccentric pivotally connected, which includes a stacking table, means for delivering the fasteners to the table with the eccentrics in advance, and a downwardly and forwardly inclined magnetized member contacting the leading portion of the eccentrics as the fasteners pass from the delivering means to the stacking table.

11. An apparatus for stacking closure fasteners formed of a bail and an eccentric pivotally connected, which includes a delivery plate, a conveyer associated with the plate and continuously delivering the fasteners along the plate with the eccentrics in advance, a stacking table at a lower level than said delivery plate, and a stationary magnetized member in the path of the eccentrics as the fasteners pass from the plate to the stacking table, said magnetized member being so positioned and constructed as to contact only the eccentrics.

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