Oct. 28, 1930. M. B. TROYER 1,780,049

FEED DEVICE FOR CAN BODY FORMING MACHINES

Filed Oct. 1, 1928

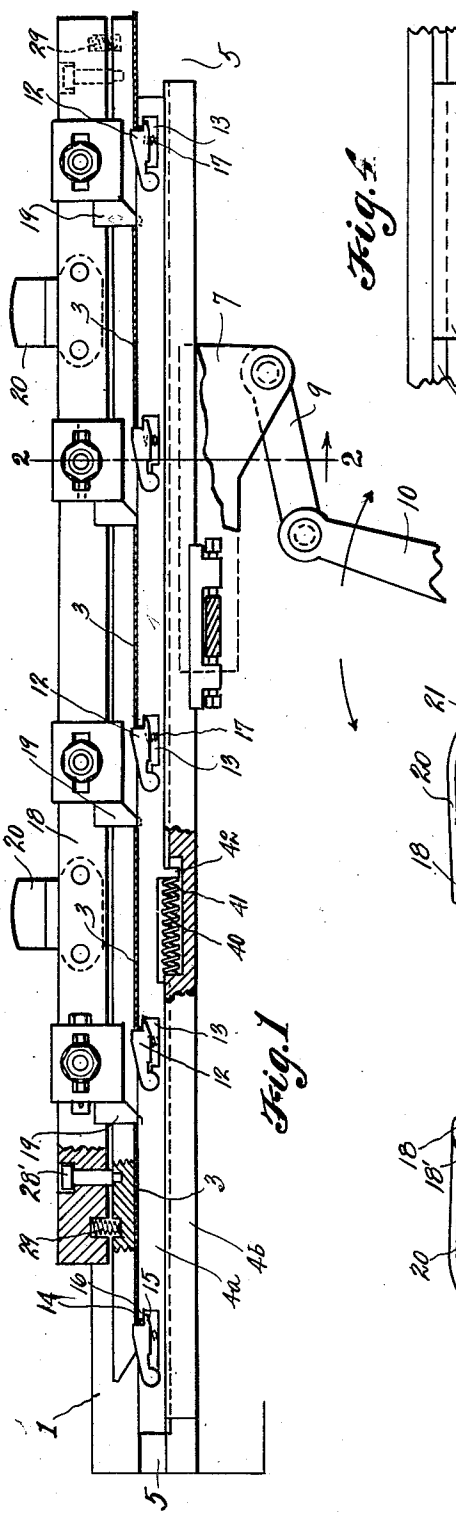


Fig. 1

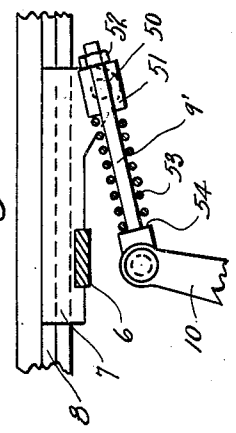


Fig. 4

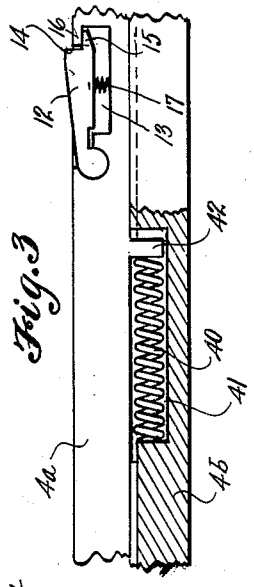


Fig. 3

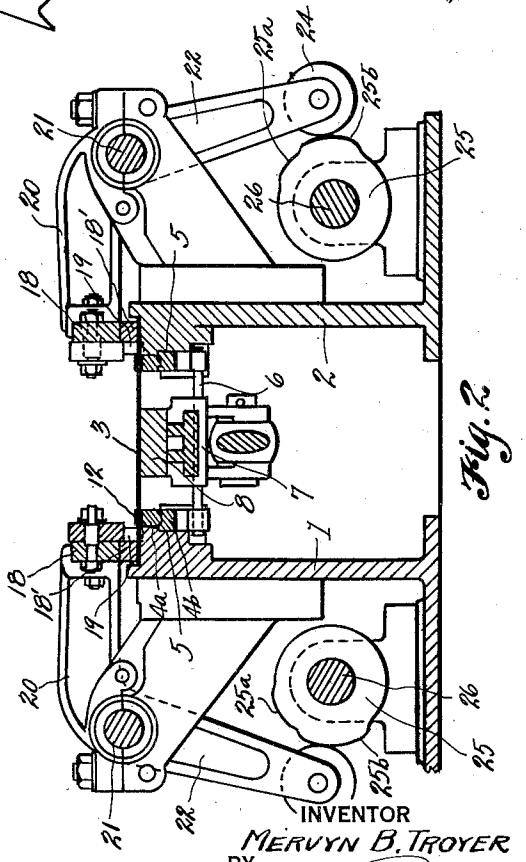


Fig. 2

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UNITED STATES PATENT OFFICE

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FEED DEVICE FOR CAN-BODY-FORMING MACHINES

Application filed October 1, 1928. Serial No. 309,395.

This invention relates to can body making machines, and has particular reference to machines of that character illustrated in United States Patent No. 1,543,460, issued to Nelson Troyer on June 23, 1925; the invention relating particularly to improvements in the feed mechanism whereby the flat blanks of tin, from which the can bodies are to be formed, are advanced in succession, by intermittent advance movements, along a guideway which carries them through the notching, edging, fluxing and body forming stations and finally delivers them to the soldering horn.

In the above machine, to which the present improvement is applied, the body blanks are advanced intermittently along a guideway adjacent which the several mechanisms for performing the notching, edging and fluxing operations are located and it is quite essential that the blanks, at the end of each advance movement, be accurately and properly positioned with respect to the various mechanisms before the operations take place and it is also quite important that the blanks be held firmly during the performing of the operations.

For the positioning and holding of the blanks, there has been provided, adjacent opposite sides of the guideway, clamping bars with which stops are associated and means is also provided, operating in synchronism with the feed mechanism, whereby the clamp bars are actuated toward the blanks at proper times to first move the stops into position for engagement by the blanks so as to locate the latter properly with respect to the operating mechanisms, and then to engage and clamp the blanks tightly against the guideway while the operations take place. In high speed machines of this type there would be a slight rebound of the blanks on striking the stops, if provision was not made for preventing this, and this rebound would result in improper positioning of the blanks with respect to the mechanisms and a resultant improper location of the notch or flange formed. Therefore, it is quite essential that the blanks, after being advanced against the stops, be retained there until the clamp bars have been brought into holding relation therewith.

In the machine referred to, the blanks are advanced by the action of a pair of reciprocating feed bars which are equipped with feed fingers for engaging the rear edges of the blanks to push them forwardly. Heretofore, the fingers have been mounted yieldingly for slight movement bodily in the longitudinal direction of the bars and have been held in advanced positions by individual compression springs which were placed there for the purpose of permitting a still further advance of the feed bars after the blanks had been pushed by the fingers up against the limiting stops so that, during this interval while the blanks were firmly held against the stops, the clamping bars could be brought down against them to avoid any possible rebound. While the mechanism of the prior device was very satisfactory insofar as operation was concerned, it was a rather expensive construction since each finger carried by the feed bar was equipped with a separate mounting slide and a separate spring for keeping the slide advanced and the finger in raised position.

In view of the above, it has been the principal object of this invention to simplify the construction and to provide one that is less expensive and more easily assembled, by an arrangement wherein the individual springs for each finger are omitted and the same result obtained by the use of a single, yieldable connection between the feed bar and its actuating means which will permit the farther advance movement of the actuating means after the blanks have engaged the stops and thereby consume an interval of time before retraction of the feed bars during which the clamp bars may be brought down against the blanks to hold them against rebound.

Other objects reside in the various details of construction and in the combination of parts as is hereinafter described.

In accomplishing the objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Figure 1 is a view showing in elevation

a feed mechanism embodying the present invention.

Figure 2 is a cross section on the line 2—2 in Figure 1.

Figure 3 is a detail, sectional view of a part of the feed bar.

Figure 4 is a detail view of an alternative arrangement.

Referring more in detail to the drawings—1 and 2 designate what, in machines of this type, are called the folder housings and which provide a guideway along which the flat blanks 3, of tin, from which the can bodies are formed, are advanced by the reciprocal action of a pair of parallel feed bars which, as shown, are slidably contained in guideways 5 formed therefor in the inner faces of the housings 1 and 2. The feed bars are connected by a cross bar 6 so as to reciprocate together, and this bar, in turn, is fixed to a feed slide 7 supported on a bar 8 that is located centrally beneath the guideway; the slide 7 being adapted to be reciprocally operated on the bar and it is connected, by means of a link 9, with an oscillating lever 10 which operates for this purpose.

As is shown best in Figure 1, the feed bars each comprise an upper and a lower section 4^a and 4^b respectively, which are slidably fitted one upon the other and held in proper alinement by a rib formed on one of the bars fitting within a longitudinal groove in the other and the feed bars are reciprocally actuated so as to advance the blanks 3 in succession, by a series of intermittent movements, along the guideway through the several stations at which, during their periods of rest, the blanks are operated on by certain mechanisms, not shown, which flange, notch, or form various other operations thereon at the various stations.

The advancing of the blanks is done by means of feed fingers 12 mounted in paired relation in the upper edges of the two feed bars. Each feed finger is contained within a pocket 13 provided therefor in the upper bar section 4^a and is pivotally supported so as to swing into and from the pocket. At the forward, or swinging, ends, the fingers are vertically shouldered, as at 14, so that, on forward movement of the feed bars, the blanks will be engaged at their rear edges by the shoulders of the fingers and they will be advanced thereby. Below the shoulder of each finger is an extended lip 15 adapted to engage a stop 16 formed in the pocket end as a means of limiting upward movement of the finger and coiled springs 17 are disposed between the fingers and pockets, which bear upwardly against the fingers to normally retain them in raised positions but which will permit the fingers yielding downwardly for passage beneath the blanks when the feed bars are retracted.

Overlying the opposite sides of the guideway, are the clamp bars 18, presently more fully described, which are adapted to be actuated against the end of the blanks to clamp them against movement during the performance of the operations thereon and which, also, have stops or abutments 19 mounted thereon against which the blanks are advanced to position them properly with respect to the mechanisms which perform the operations on the blanks. These clamp bars are supported by one or more arms 20 extended laterally from rotatably supported rocker shafts 21 to which are also affixed levers 22 which extend downwardly and, at their ends, are equipped with rollers 24 operatively engaging with cams 25 on shafts 26 that are rotatably driven in synchronism with movement of the feed bars. The cams 25 are so designed that they effect no movement of the clamp bars until near the end of each advance movement of the feed bars, at which time they are then given an initial, downward movement which brings the stops 19 into position to engage and stop the blanks but effects no clamping pressure by the bars; this initial movement being caused by slight rises 25^a on the cams. Following the stopping of the blanks, a farther movement of the cams brings the surfaces 25^b thereof into contact with the roller 24 and the clamp bars are then actuated tightly against the blanks to hold them for the interval of time during which the operations take place.

The clamp bars do not themselves come into contact with the blanks but seat against pressure bars 18′ carried along their under edges by supporting bolts 28′ slidably contained in the bars 18 so as to permit relative movement of the bars 18—18′ toward and from each other. Coiled compression springs 29 are disposed between the bars to urge them apart and the lower parts 18′ overlie the edges of the blanks and at all times exert a certain frictional pressure against them.

In order to provide a short interval of time after the blanks have been brought up against the positioning stops 19 and before the feed bars start on their retractive movements, during which time the clamp bars may be brought down against the blanks to hold them tight, there is provided a yieldable connection between the feed bars and their actuating means; this connection, in its preferred form of construction, being in the nature of coil springs 40 which are disposed within recesses 41 formed longitudinally in the feed bar sections 4^b in such manner that the springs will bear against the recesses at one end and against depending lugs 42 on the bars 4^a at the other end, so as to keep the latter bars normally in an advanced position on the bars 4^b. The springs 40 provide that, after the feed fingers 12 have advanced the body blanks against their stops,

farther advance of the feed slide is compensated for by the compression of the springs which, through the feed bars, maintain holding pressure against the blanks which prevents any rebound. During the intervals of compression of the springs, the clamp bars are brought down against the blanks to hold them secure.

As an alternative method of obtaining the same result, a yieldable connection could be provided in the connection between the feed slide 7 and the lever 10, as is shown in Figure 5, wherein the connecting link 9′ between these parts is pivotally attached to the lever 10 and is slidable through an opening 50 in a block 51 that is pivotally carried by the slide and a nut 52 is fixed on the link at the outside of the block and a coil compression spring 53 is disposed about the link against the inner side of the block and against a shoulder 54 on the link.

Assuming the construction to be as described, it is readily apparent that the compression springs in the feed bars will act to retain the feed fingers firmly against the blanks and the latter against the stops during the final advance movement of the feed slide and that, by proper timing of the action of the clamp bars, these can be made to come into action against the bars during this interval and that, by so doing, there is no chance for the blanks to rebound.

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

1. In a machine of the character described, the combination with a guideway along which articles may be advanced through the machine and stops for limiting the advance movements, of an advancing mechanism comprising a reciprocable bar, feed fingers on the bar for advancing the articles successively from one station to another in the machine; and means for actuating the bar and having a yieldable connection therewith.

2. In a machine of the character described, the combination with a guideway along which articles may be intermittently advanced and stops movable into and from the guideway for limiting their advance movements and clamps for holding the articles after they have engaged the stops, of means for advancing the articles comprising a reciprocable bar, feed fingers on the bar, and means for reciprocating the bar and a yieldable connection between said actuating means and the feed mechanism.

3. The combination with a guideway, a reciprocable feed bar with fingers thereon for advancing articles along the guideway incident to advance movement of the bar, stops movable into and from the guideway for limiting the advance movements of the articles, clamps adapted to be actuated against the articles after they have been advanced against the stops by the fingers and to hold them during retractive movement of the feed bar, of an actuating means for the feed bar; including a yieldable element whereby advancing pressure will be maintained by the fingers against the articles for a limited time interval after they have engaged the stops and during which interval the clamp bars are brought into engagement therewith.

4. In a machine of the character described, the combination with a guideway along which articles may be intermittently advanced in succession, stops adjustable into and from the guideway for limiting the advance movements and clamps adapted to be moved from and against the articles after they have engaged with the stops, of a reciprocable feed mechanism for advancing the articles along the guideway and comprising feed bars each embodying slidably associated sections with feed fingers on one of the sections for advancing the articles, and an actuating means operatively connected with the other section for reciprocating the feed mechanism, and compression springs interposed between the slidably associated sections and operatively connecting them and through which a holding pressure will be maintained against the articles by said fingers for an interval after they have engaged the stops and before retraction of the bars, during which interval the clamps will be actuated against the articles.

5. A device as in claim 4 wherein the springs are disposed between the slidably associated sections of the feed bars and bear at their opposite ends against shoulders formed on the two sections.

Signed at Seattle, Washington, this 5th day of January, 1928.

MERVYN B. TROYER.