United States Patent

Gluchowski

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[54] **CLOSURE FLANGE FEED APPARATUS**

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[73] Assignee: **American Flange & Manufacturing Co., Inc.,** New York, N.Y.

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[21] Appl. No.: **106,409**

[52] **U.S. Cl.** .....**29/208 B,** 29/211 D

[51] **Int. Cl.**.....**B23p 19/04,** B23q 7/10

[58] **Field of Search** ..29/208 B, 211 D, 208 R, 211 R

[56] **References Cited**

UNITED STATES PATENTS

3,571,891 3/1971 Roberts.....29/208 B

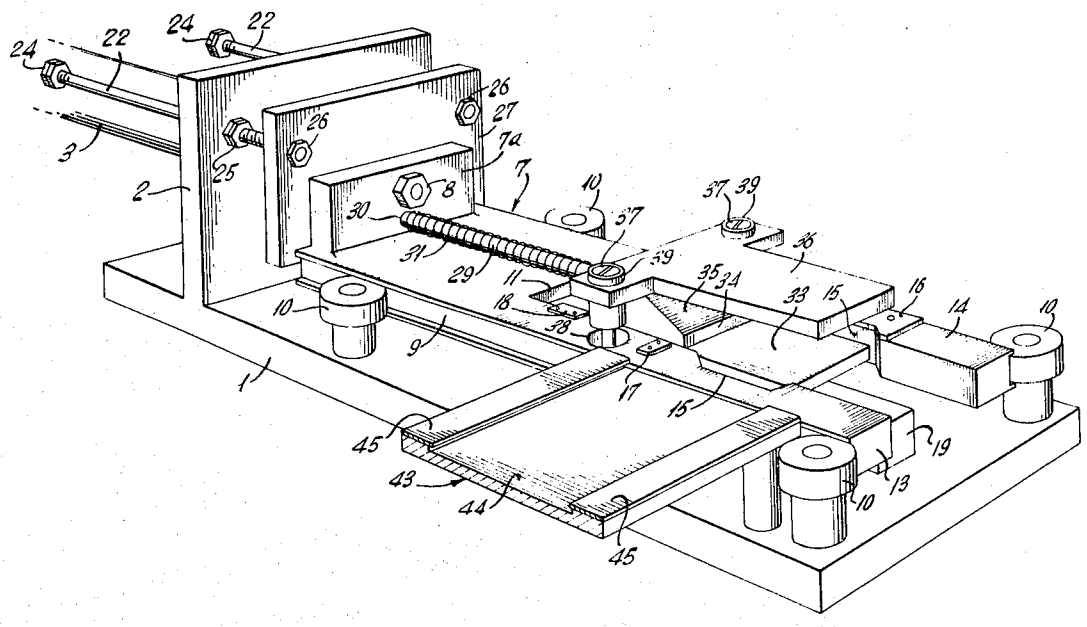
Primary Examiner—Thomas H. Eager

Attorney—Albert M. Parker

[57] **ABSTRACT**

A flange feed apparatus for feeding closure flanges into a metal working die which inserts flanges in container walls. A piston driven reciprocating pusher member receives and conveys an oriented flange into a flange insertion die. At the advanced position of the pusher member the flange is automatically urged downwardly into work receiving position within the die.

6 Claims, 13 Drawing Figures



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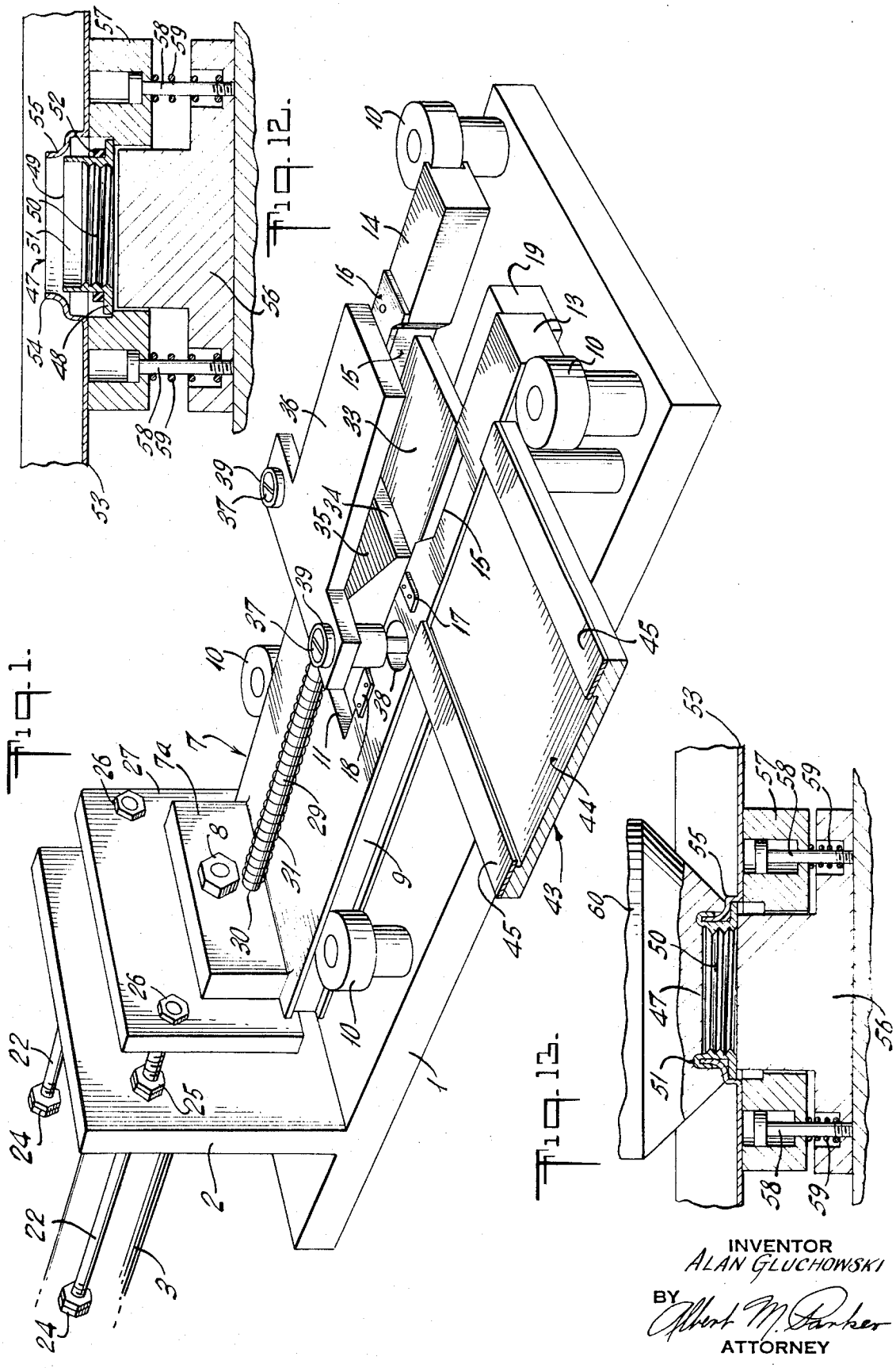

Fig. 1.

Fig. 12.

Fig. 13.

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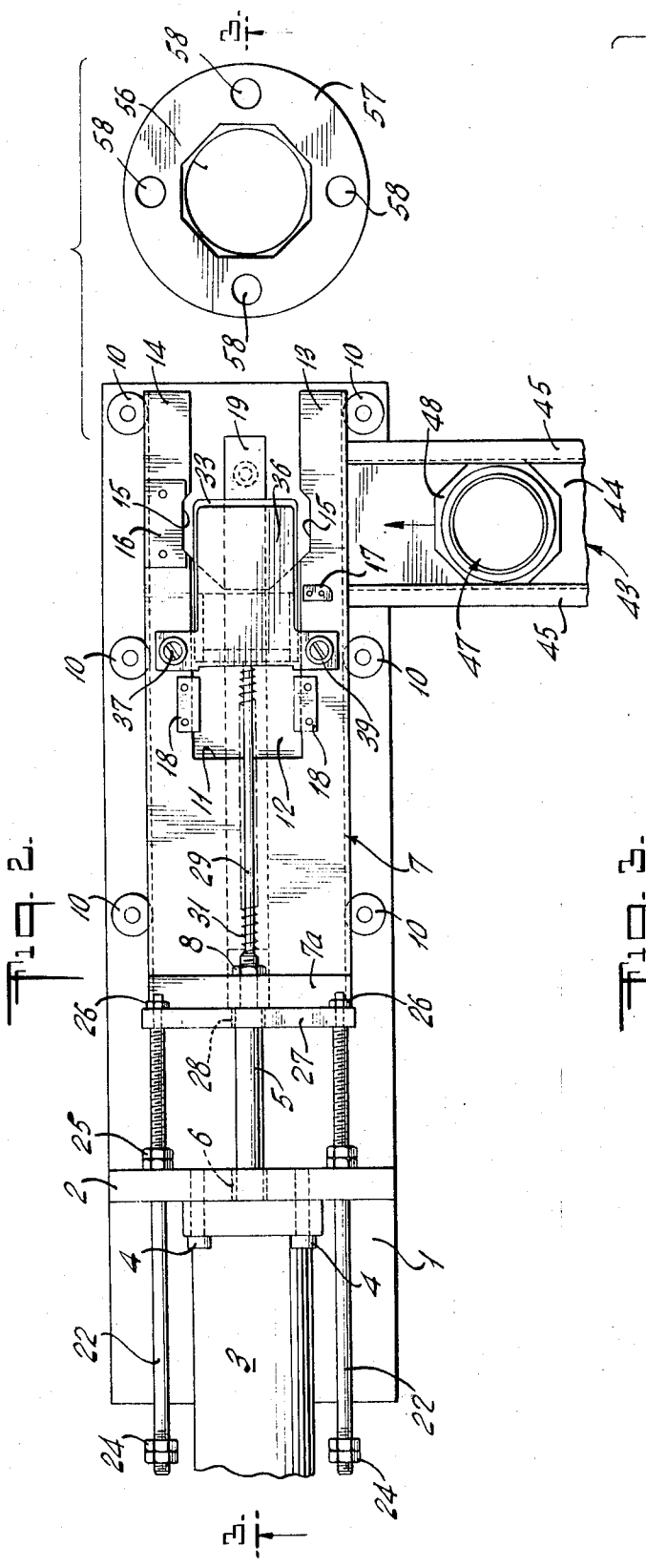

Fig. 2.

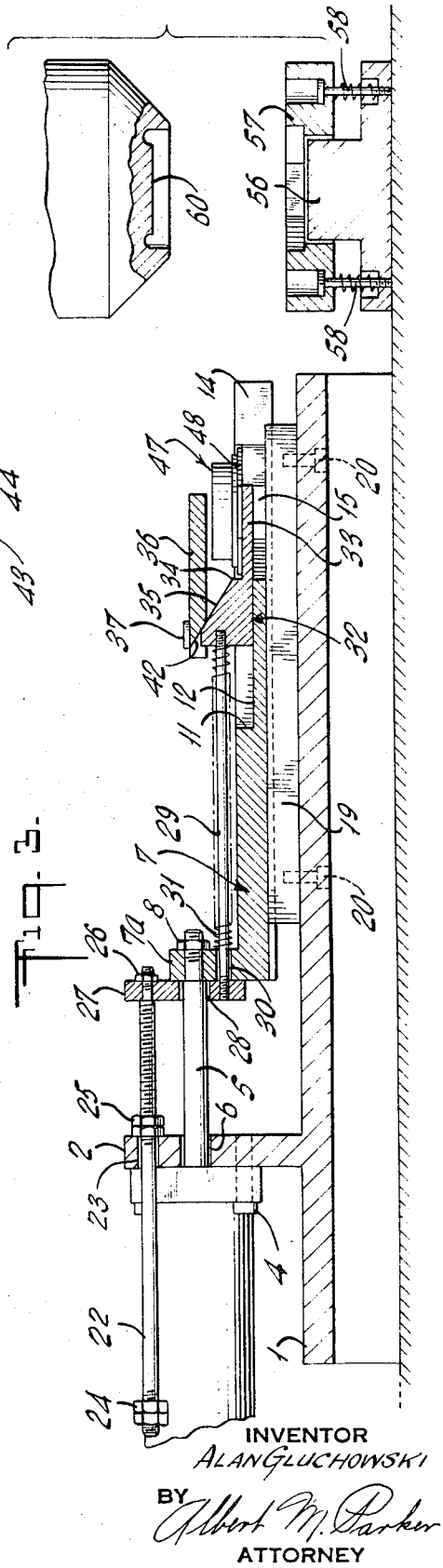

Fig. 3.

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FIG. 4.

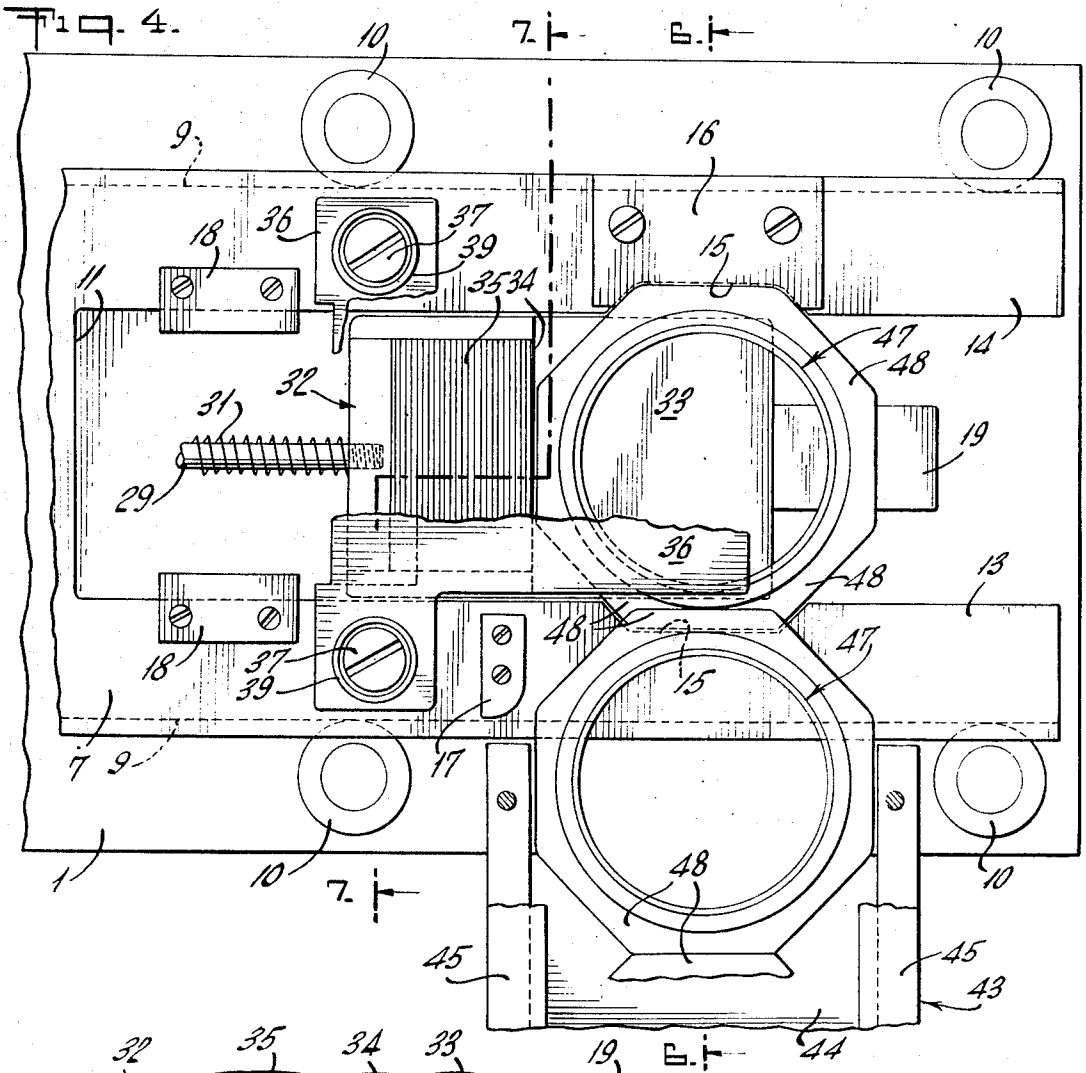

FIG. 6.

FIG. 5.

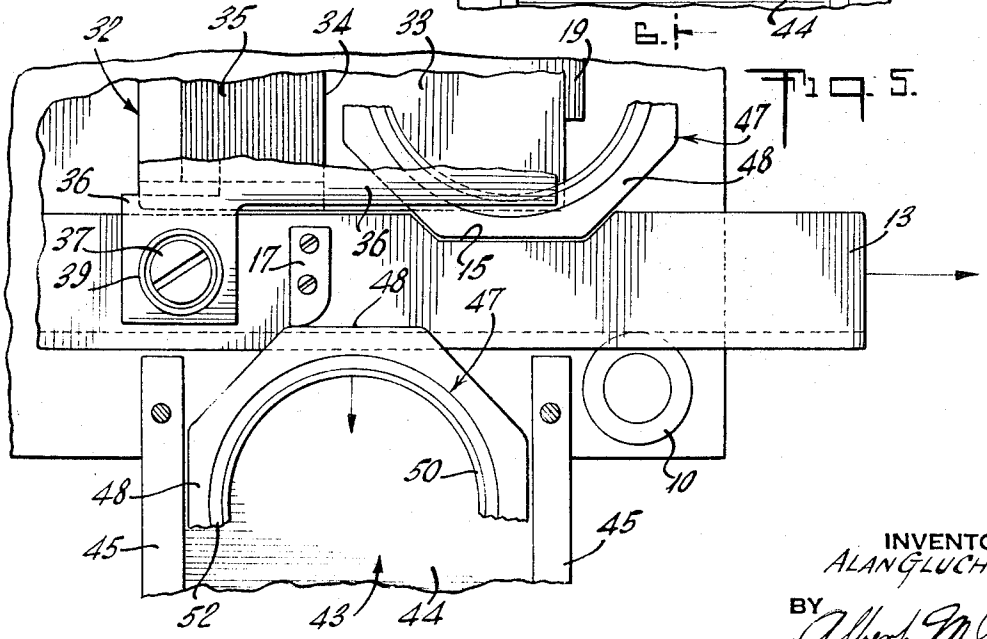

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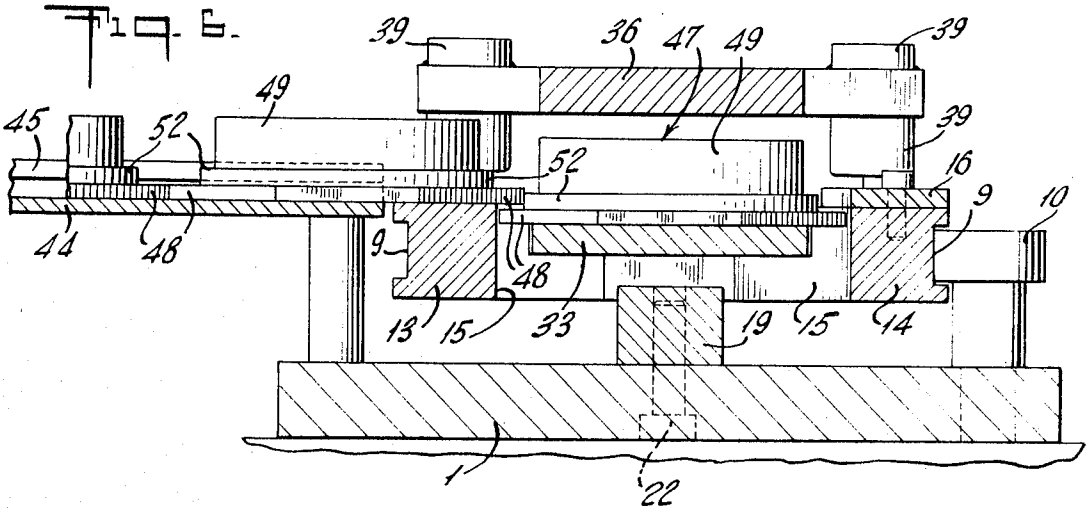
Fig. 6.



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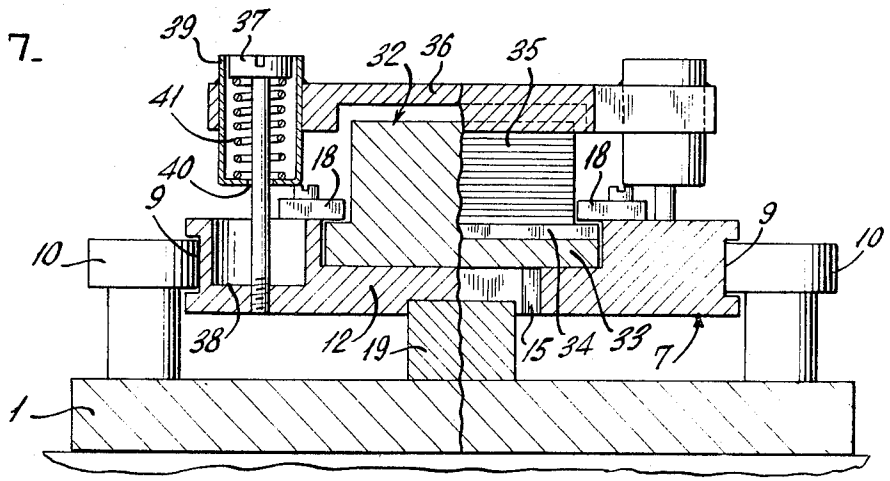

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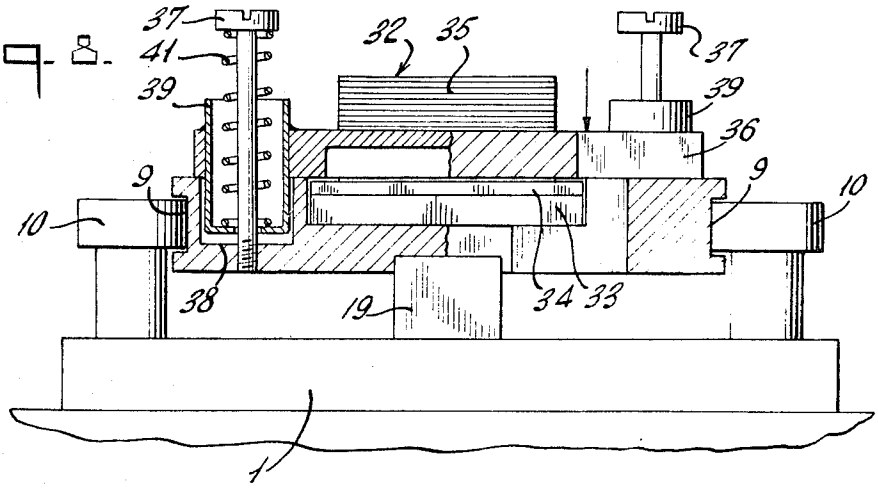

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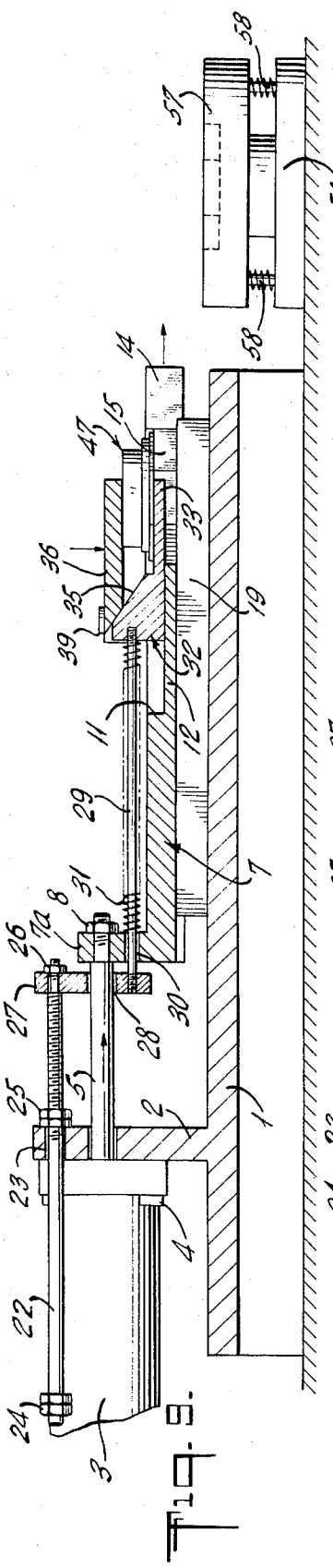

FIG. 9.

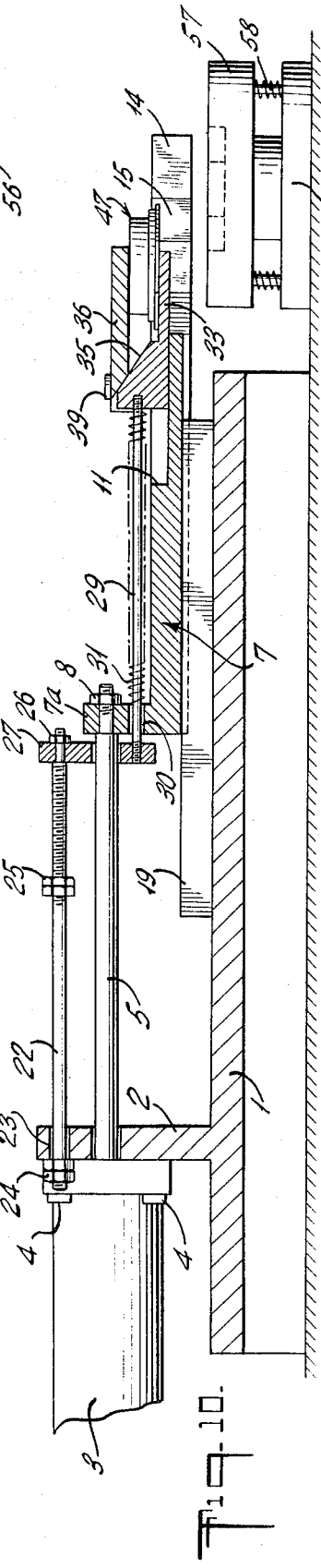

FIG. 10.

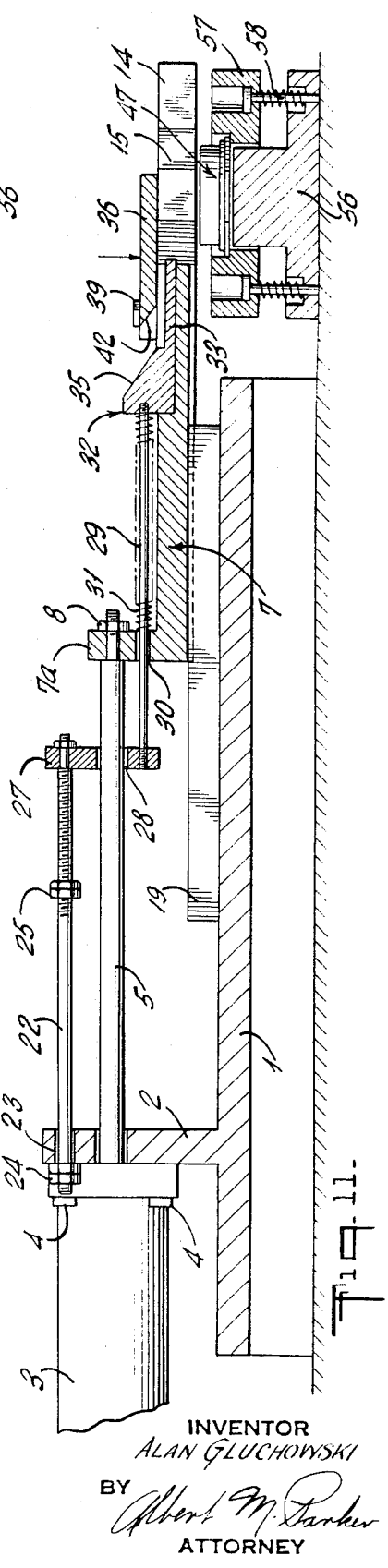

FIG. 11.

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CLOSURE FLANGE FEED APPARATUS

BACKGROUND OF THE INVENTION

This invention is directed to closure feeding apparatus and is particularly concerned with improved apparatus for feeding and positively positioning closure flanges in work receiving position within a flange insertion die.

The trend toward automation in the drum container industry has made it necessary to increase the speed and efficiency of container fabricating operations. One such operation is the insertion of closure flanges in the head and sidewall of drum containers, such flanges having a cylindrical internally threaded neck surrounded by a flat polygonal base. This operation involves feeding a properly oriented closure flange into a flange insertion die mounted in a metal working punch press. Upon cycling of the press the flange is permanently secured within a suitably formed opening in the container wall. Flange feeding arrangements heretofore employed in flange insertion operations are inadequate to meet the present and future needs of the container industry.

The flange feeding apparatus of the invention is capable of operating at high speed and with a high degree of efficiency. The invention, by virtue of its simplicity, offers improved dependability and reduces maintenance costs to a minimum. The foregoing is accomplished by means of a piston driven pusher member which receives the base of an oriented flange from a gravity fed entrance chute. The oriented flange is then advanced by the pusher member and, simultaneously with that advancing, a presser foot acting in conjunction with the pusher member bears against the uppermost end of the flange neck and positively positions the flange in work receiving position within the insertion die. The pusher member and presser foot then retract for reception of another flange allowing the die to close and insert the positioned flange in the container wall in process.

It is accordingly a principal object of the invention to provide improved apparatus for feeding closure flanges in the fabrication of containers.

Another object is to provide improved apparatus for feeding closure flanges into work receiving position within a flange insertion die.

A further object is to provide simplified closure flange feeding apparatus having improved efficiency and high speed capabilities.

Other and more detailed objects of the invention will in part be pointed out in part be obvious as the invention taken in conjunction with the accompanying drawings proceeds. In that drawing:

FIG. 1 is a perspective view of the flange feed apparatus in accordance with the invention;

FIG. 2 is a top plan view of the flange feed and the flange lower insertion die being fed;

FIG. 3 is sectional view taken on line 3—3 of FIG. 2 looking in the direction of the arrows and showing the flange upper insertion die member;

FIG. 4 is enlarged top plan view of the pusher member in a retracted flange receiving position;

FIG. 5 is enlarged fragmentary top plan view with the pusher member in partially advanced position;

FIG. 6 is a sectional view taken on line 6—6 in FIG. 4 and looking in the direction of the arrows;

FIG. 7 is a sectional view taken on line 7—7 on FIG. 4 and looking in the direction of the arrows;

FIG. 8 is sectional view similar to FIG. 7 but with the pusher member in fully advanced position;

FIG. 9 is a sectional view showing the pusher member in retracted position;

FIG. 10 is a sectional view similar to FIG. 9 but with the pusher member in partially advanced position;

FIG. 11 is a sectional view similar to FIG. 9 but with the pusher member in fully advanced position;

FIG. 12 is sectional view showing a closure flange positioned in the lower insertion die prior to insertion within a container wall opening; and

FIG. 13 is a sectional view similar to FIG. 12 but with the upper die member performing the flange insertion operation.

The flange feed of the invention is seen to comprise in FIG. 1 a base plate 1 having affixed thereto an upstanding wall 2. An air cylinder 3 is secured to the wall 2 by bolts 4, as seen in FIGS. 2 and 3, and has a longitudinally reciprocating piston rod 5 extending through an aperture 6 in the wall 2. A movable shuttle 7 having an upstanding boss 7*a* at its inner end is connected by a nut 8 to the distal end of the piston 5 and is formed with guideways 9 along the side edges thereof. A series of guide rollers 10 are secured to the plate 1 and engage within the shuttle guideways 9. A longitudinally extending cutout section 11 is provided in the shuttle 7 having a bottom wall 12 extending throughout a portion of the cutout section length resulting in a pair of side rails 13 and 14. An enlarged flange receiving pocket 15 is formed in the cutout section 11 intermediate its length and above the bottom wall 12. A flange retaining member 16 is secured to the guide rail 14. A flange guide member 17 is secured to the side rail 13 rearwardly of the enlarged flange receiving pocket 15 and a pair of stop members 18 are secured to the side rails 13 and 14 adjacent the inner end of the cutout section 11. A longitudinally extending guide bar 19 is secured by screws 20 to the base plate 1 and is engaged within a central guideway 21 formed in the lower surface of the shuttle 7.

A pair of reciprocating rods 22 extend through spaced apertures 23 in the upper end of the wall 2 provided with adjustable stop nuts 24 threadedly engaged at their outer ends. A second pair of adjustable stop nuts 25 are threadedly engaged at an intermediate point along the length of the rods 2. The inner ends of the reciprocating rods 23 are secured by nuts 26 to a mounting plate 27 having a central aperture 28 surrounding the piston rod 5. A reciprocating supporting rod 29 secured to the mounting plate 27, extends through an aperture 30 in the shuttle boss 7a and is surrounded by a longitudinally extending compression spring 31. A flange receiving pusher member, generally indicated at 32, is secured to the inner end of the rod 29 adapted for reciprocating movement relative to the base plate 1 and within the confines of the shuttle cutout 11. The pusher member 32 comprises a horizontal flange supporting panel 33 joined by vertical wall 34 to an upwardly and inwardly facing inclined caming surface 35.

A horizontally disposed T-shaped presser foot 36 is positioned in vertically spaced relationship above the flange receiving pocket 15 and supported by a pair of

bolts 37 threadedly engaged to the shuttle 7 within cylindrical recesses 38 in the shuttle side rails 13 and 14. A pair of downwardly extending cups 39 are secured to the head of the T-shaped presser foot 36 for reception within the recesses 38, each of which is formed with an aperture 40 in its bottom wall surrounding the bolts 37. A coil compression spring 41 is housed within each of the cups 39 surrounding the bolts 37 and resiliently urges the presser foot 36 downwardly relative to heads of the bolts 37. The rearwardly disposed end of the pressure foot 36 is formed with a rearwardly and downwardly facing inclined cam surface 42 adapted for sliding engagement with the pusher member cam surface 35.

A laterally extending closure flange feed chute 43 is secured to the base plate 1 with its leading end juxtaposed the shuttle side rail 13 and in line with the pocket 15 with the shuttle 7 in retracted position as seen in FIG. 1. An upwardly opening channel 44 is formed in the upper surface of the feed chute 43 extending throughout the length thereof. An elongated flange retainer strip 45 is secured to the upper surface of each of the side edge portions of the feed chute 43.

The closure flange, which the invention is designed to feed, is generally indicated at 47, and, as clearly shown in FIG. 12 prior to insertion in a container wall, is seen to comprise a cylindrical neck 49 surrounded by an octagonal base 48. The interior of the flange neck 49 is provided with a lower threaded portion 50 and an upper unthreaded portion 51. An annular gasket 52 surrounds the flange neck 49 immediately above the flange base 48. The container wall 53 within which the flange 47 is inserted is formed, prior to the insertion operation, with an opening 54 surrounded by an upstanding neck 55.

The closure flange insertion die, which the invention is designed to feed flanges into, has a lower flange supporting anvil 56 surrounded by an annular compression ring 57. The compression ring 57 is supported by a series of bolts 58 surrounded by compression springs 59 which act between the lower surface of the ring 57 and the lower anvil 56. An upper die member curling anvil 60 is vertically aligned above the lower flange supporting anvil 56.

In operation, closure flanges 47 are fed down the feed chute 43, across the shuttle side rail 13 and into the pocket 15 where the flange is supported on the pusher member panel 33. Movement of the flange 47 beyond the shuttle side rail 14 is prevented by the retaining member 16. The air cylinder is then activated, prior to cycling of the flange insertion press, causing the piston rod 5 to advance carrying with it the shuttle 7, the pusher member 32 together with a flange 47, and the presser foot 36 disposed in closely spaced relationship above the flange neck 49. As the shuttle advances, the flange guide member 17 prevents entry of the following flange in the feed chute 43 from entering the shuttle pocket 15 as seen in FIG. 5. As the piston rod 5 continues its movement, the stop nuts 24 on the rod 23 come in contact with the wall 2, terminating the forward movement of the presser foot 32. The shuttle member 7 continues to advance under the influence of the piston rod 5, resulting in compression of the spring 31 about the now stationary rod 29. As seen in FIG. 11 continued advancement of the shuttle 7 causes the presser foot 36 to move downwardly in contact with the top of the flange neck 49 as the presser foot cam surface 42 moves down along the pusher member cam surface 35 under the influence of the springs 41. Upon termination of the stroke of the piston rod 5, the shuttle member pocket 15 is brought into vertical alignment with the lower anvil 56 of the flange insertion die. At this point the rearward end of the shuttle recess 11 contacts the pusher member 32 and the flange 47 is pulled off of the pusher member panel 33 and urged into the compression ring 57 by the overlying presser foot 36. The travel of the piston rod 5 is then reversed causing retraction of the shuttle 7 and subsequent raising of the presser foot 36 along the pusher member cam surface 35. Continued retraction of the shuttle 7 restores the parts to their initial position as shown in FIG. 1. The flange insertion press is then cycled causing the upper curling anvil 60 to lower on the flange neck 49, forcing the flange base 48 against the lower supporting anvil 56, and causing the container wall 53 to depress the compression ring 57. Continued downward movement of the curling anvil 60 curls the upper portion 51 of the flange neck outwardly about the upper end of the container wall opening neck 55 compressing the gasket 52 between the juncture of the flange neck and base and the surrounding container wall neck. Upon opening of the insertion press the container wall is removed with the inserted flange and the complete cycle as above described is repeated.

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

1. Apparatus for feeding closure flanges into a flange insertion die for permanently securing flanges within container wall openings, comprising a stationary base plate mounted adjacent a metal working punch press, a shuttle slidingly mounted on said base plate, drive means mounted to said base plate for imparting reciprocating movement to said shuttle, a flange receiving member mounted on said shuttle, means for moving said flange receiving member relative to said shuttle, a laterally extending flange feed chute connected to said base plate adapted to feed closure flanges to said flange receiving member with said shuttle in retracted position, a presser foot operatively connected to said drive means and urging means responsive to movement of said shuttle for forcing said flange downwardly into a flange insertion die member at the fully advanced position of said shuttle.

2. Apparatus as in claim 1, wherein said drive means comprises an air cylinder having a piston rod drivingly connected to said shuttle.

3. Apparatus as in claim 2, wherein said flange receiving member includes a drive mechanism operatively connected to said piston rod.

4. Apparatus as in claim 3, wherein said flange receiving member drive mechanism includes stop means for terminating the forward movement of said flange receiving member adjacent the advanced position of said shuttle.

5. Apparatus as in claim 4, wherein said urging means includes spring means operative in response to said stop means.

6. Apparatus as in claim 1, and including a closure flange guide member mounted on said shuttle for preventing feeding of said flanges in said flange feed chute during advancement of said shuttle.

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