

March 14, 1944.

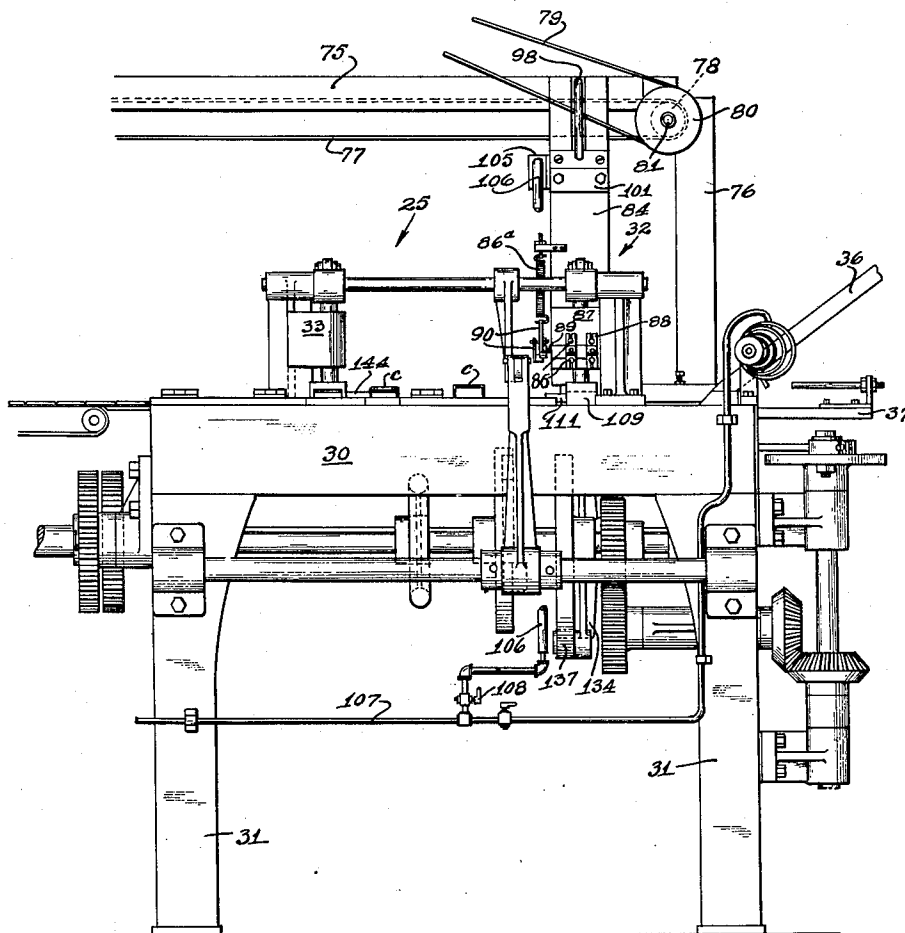
L. HERMANI

2,344,461

ORIENTING MECHANISM

Original Filed Sept. 28, 1940 4 Sheets-Sheet 1

Fig. 1.



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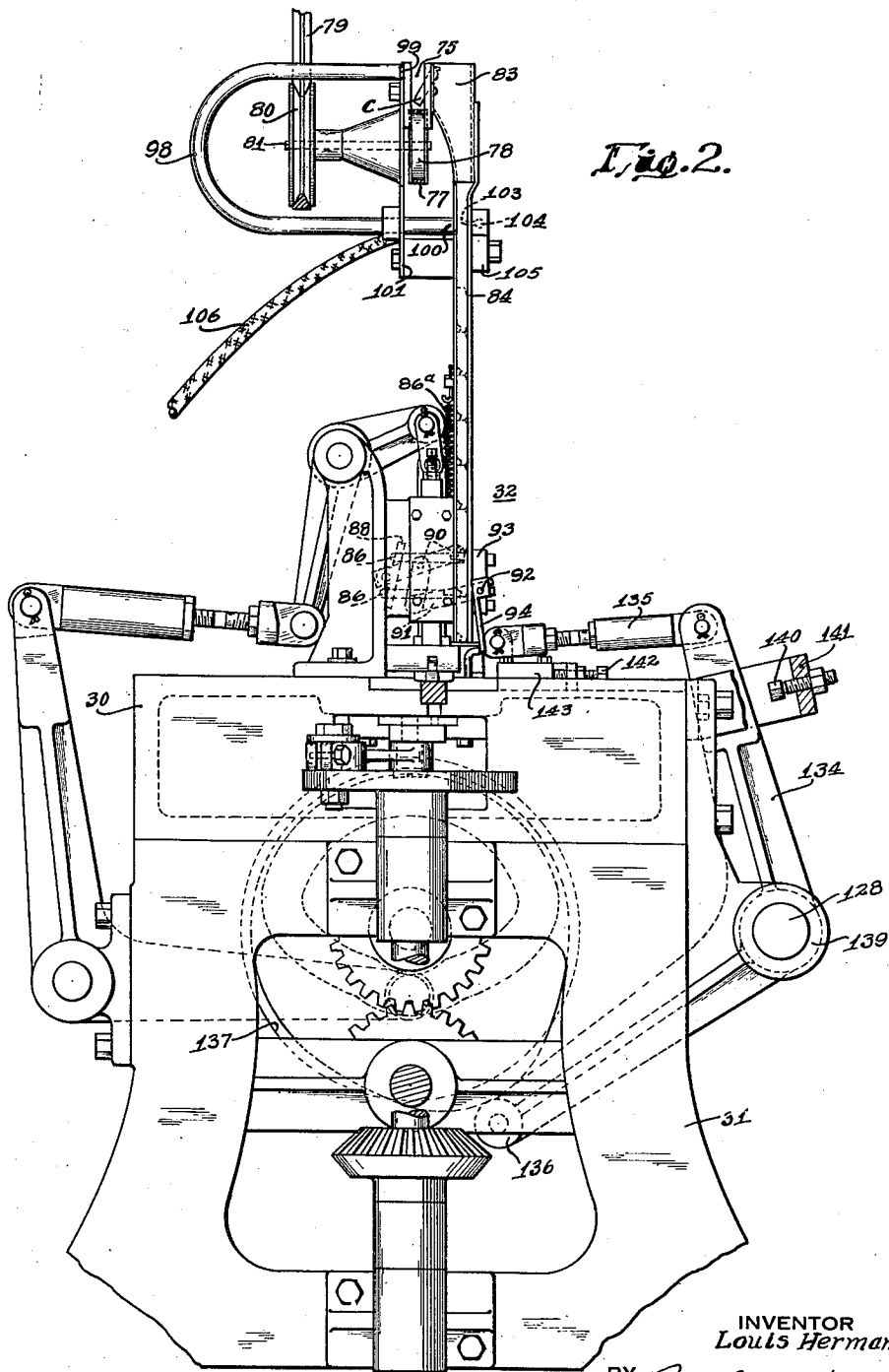
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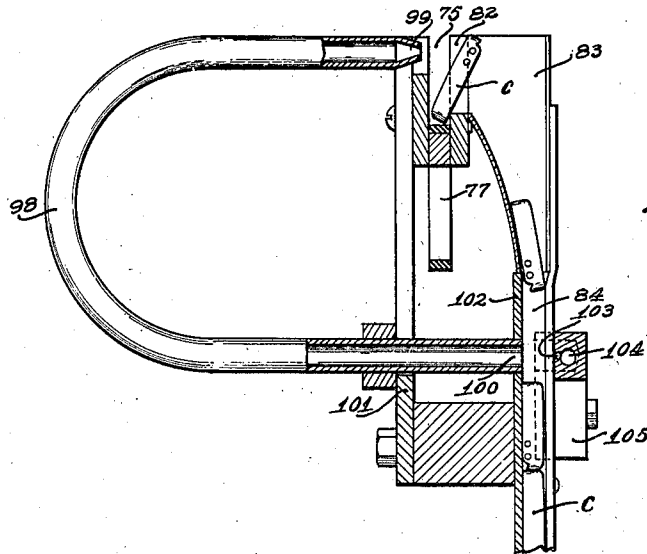


Fig. 5.

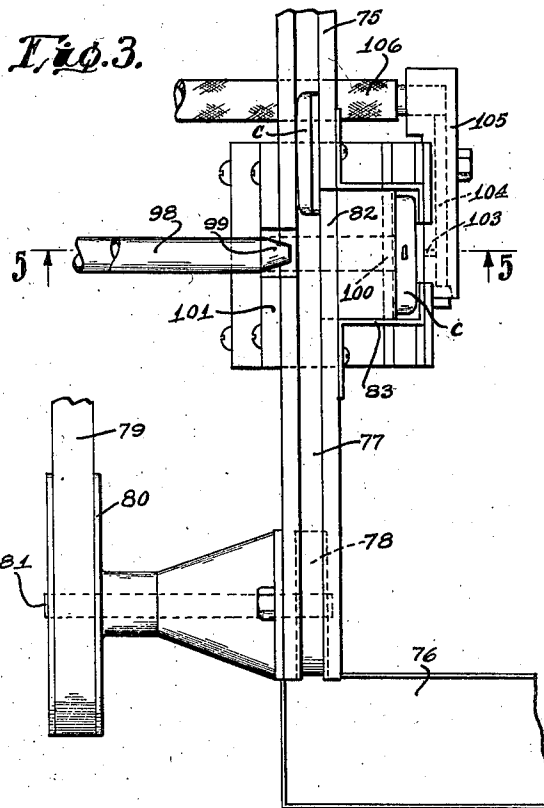


Fig. 3.

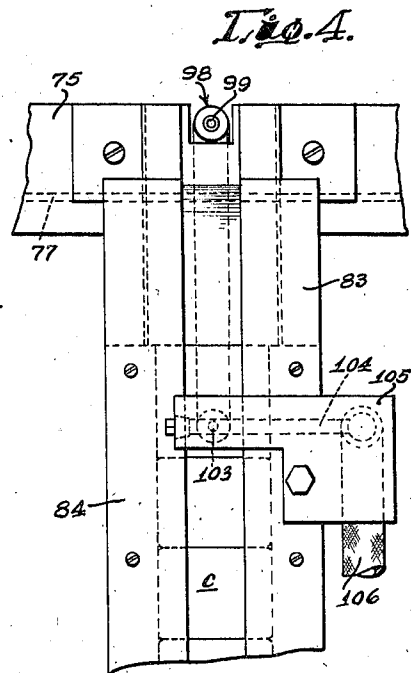


Fig. 4.

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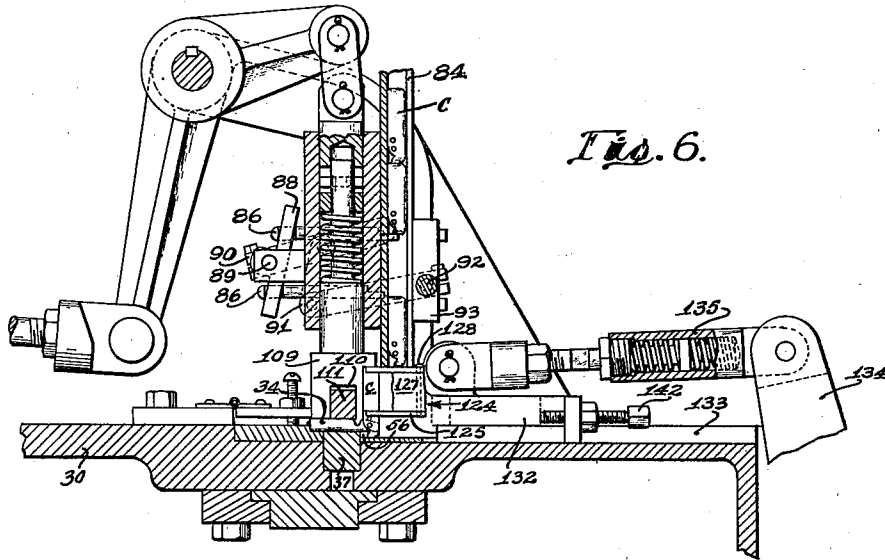


Fig. 6.

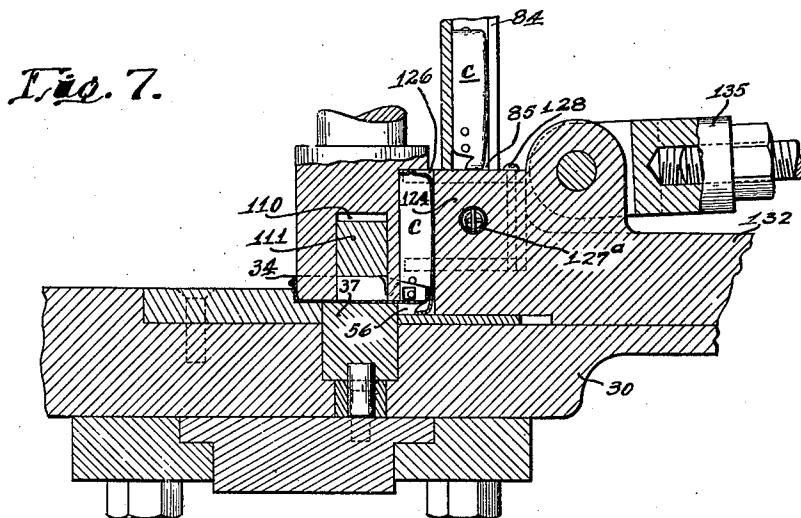


Fig. 7.

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UNITED STATES PATENT OFFICE

2,344,461

ORIENTING MECHANISM

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Original application September 28, 1940, Serial
No. 358,865. Divided and this application June
19, 1942, Serial No. 447,627

6 Claims. (Cl. 198—33)

The present invention relates to improvements in machines for assembling metal containers and more particularly is concerned with the assembly of containers of the type disclosed in Nyden Patent #2,197,481 issued April 16, 1940, wherein the hinge carrying portions of the body and cover are telescoped one within the other in such fashion as to interengage the hinge members.

An object of my invention is the provision of a completely automatic machine by means of which the container parts are formed and delivered to an assembly station, assembled at said station and immediately thereafter closed preparatory to packing in cartons or the like for shipment.

A further object of my invention is the provision of novel means for controlling the delivery of container covers or closures to the assembly station. To this end the covers are carried along a horizontal conveyor and at a predetermined point are discharged therefrom into a vertical guideway by a jet of air under pressure, the latter being interrupted at such times as the guideway has been substantially filled with the cover portions.

Other objects will be in part apparent and in part pointed out hereinafter.

In the drawings:

Fig. 1 is a side elevational view of the assembling machine embody my invention.

Fig. 2 is an end elevational view taken from the right hand end of Fig. 1.

Fig. 3 is a fragmentary plan view of the conveyor and vertical guide for the cover parts.

Fig. 4 is a fragmentary side elevational view showing the vertical guideway for the cover parts and the means for discharging such parts from the conveyor into the upper end of said guideway.

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 3.

Fig. 6 is a vertical sectional view with parts in elevation of the body and cover assembly mechanism.

Fig. 7 is a fragmentary detail sectional view illustrating the final assembling position of the parts shown in Fig. 6.

This application is a division of my copending application, Serial No. 358,865, filed Sept. 28, 1940, entitled Machine for assembling metal containers, allowed September 4, 1943.

Briefly, my invention (Fig. 1) includes an assembling machine 25 to which the cover and body portions of said metal containers are delivered in proper timed relation. The body portions are produced by a punch press (not shown)

and certain of the side walls are notched and slotted, such notches and slots constituting parts of hinge means through which the body and cover parts are finally connected together. A container of this type is disclosed in Nyden Patent #2,197,481 issued April 16, 1940.

The assembling machine 25 receives the body and cover portions and quickly assembles them in open position. Immediately thereafter the open assembled containers are automatically delivered to a closing device which cams the cover downwardly over the body portion and simultaneously therewith "sizes" the containers. This latter operation "sizing" involves squeezing inwardly any portions of the cover which may project outward abnormally and thereby insures uniformity of exterior dimensions and contour.

The assembling machine comprises a horizontal table 30 supported upon legs 31. Near one end of the table an assembling unit 32 is mounted and in proximity to this unit there is arranged the aforementioned container closing and "sizing" device 33.

The body portions 34 of the containers are transferred to the assembling unit 32 from the punch press at regular time intervals by means of a conveyor (not shown), inclined chute 36 and a horizontal reciprocating feed bar 37, the latter being mounted in an upwardly facing channel 38 which is provided in the upper face of the table 30.

The container bodies are momentarily brought to a standstill as the assembly station and while so positioned, have the hinge end thereof telescoped into a cover C, which has previously been positioned at one side of the assembly station by automatic mechanism. This mechanism includes a horizontal guideway 75 which extends from a point in proximity to the cover punch press to an inclined chute 76 which is positioned between the assembling unit 32 and the aforementioned inclined chute 36 which delivers the container bodies 34 to the feed bar 37. The covers C are conveyed on edge along said channel 75 or guideway by means of an endless belt 77 which is trained over a pulley 78 near the aforementioned inclined chute 76, said pulley being driven by means of a belt 79 and a second pulley 80, the latter mounted upon the outer end of a shaft 81 which also carries the first mentioned pulley 78. Near one end of the channel a side wall thereof is in part cut away to provide a lateral discharge opening 82 which communicates directly with the open upper end of a substantially rectangular funnel guide 83, the latter being

directly connected with the upper end of a vertical guideway or passageway 84. This vertical guideway in cross-section and dimensions is such as to accommodate a stack of the container covers placed on edge and in abutting relationship. The bottom end 85 of the passageway is open whereby to permit gravity discharge and positioning of the covers preparatory to moving them one at a time into assembled relationship with the container body portions. The container covers C are released from the bottom of the stack in the guideway one at a time by mechanism including superposed pairs of horizontal stop pins 86 which are projected one pair at a time into the guideway in such fashion that the lower pair, during one stage of the operations, supports the complete stack whereas during a succeeding stage, the uppermost pair of pins supports the entire stack with the exception of the cover which previously was engaged by the lower pair of pins while the latter were functioning as the stack supporting medium. During this second stage the lower pins occupy a retracted position as shown in Fig. 6. A spring 86^a normally holds the lower pair of pins projected into the passageway 84. These pins are mounted in a guide block 87 and are operatively connected by means of a pivoted cross-head 88 to a short horizontal shaft 89, the latter in turn being connected through links 90 to a lever 91 which in turn is mounted upon a rock shaft 92. This rock shaft 92 is journaled in a pair of horizontal bearings 93 and at the end opposite said lever 91, carries a depending finger 94. This finger 94 or trigger is adapted to be rocked each time a container body moves to the assembly station whereby to insure the positioning of a cover at one side of the assembly station only in the event a container body has likewise been placed in position for assembly at said station.

The covers are discharged through the opening 82 into the funnel guide 83 by a stream of air under pressure which is directed transversely across the upper portion of the channel in such fashion as to invert the covers simultaneously with discharge thereof into said funnel guide. Thus the covers are properly positioned for movement later on into assembled relationship with the container bodies. This discharge device also includes means whereby feeding of the container covers to the funnel guide will be momentarily discontinued whenever a stack in the guideway 84 reaches a predetermined level. Under such circumstances the covers move to the open outer end of the channel 75 where they are automatically discharged into the inclined chute 76 and thereby directed into any suitable receptacle. The specific construction consists of an air conduit 98, the outlet or nozzle end 99 of which opens into the upper portion of the channel 75 directly opposite the side discharge opening 82 in the channel 75. The inlet end 100 of the conduit, which is mounted in a bracket 101, opens into the guideway 84 through the inner wall 102 thereof. Directly across from and coaxial with the inlet end 100 of the conduit is a port 103 which communicates by way of a passageway 104 in a block 105 with an air supply pipe 106, the latter being connected to a main supply line 107 through a valve 108. It will be apparent from the above that the accumulation of a predetermined number of covers C in the passageway will automatically interrupt the flow of air into the inlet end 100 of the conduit 98 and thereby cause a momentary cessation of

the discharge of covers into the funnel guide 83. Flow of air is resumed incident to dropping of the stack below the inlet 100.

The assembling unit 32 which interengages the hinge portions of the bodies and covers of the containers effects such assembly while the latter are momentarily held stationary. The assembly mechanism includes a presser foot 109 which has a horizontal slot 110 in the lower side thereof to accommodate a guide bar 111, the latter in part providing an upper wall for the channel 56 along which the container bodies are carried by the feed bar 37. This presser foot during the actual assembling operation is yieldingly forced into the body 34 in firm engagement with the bottom of the latter. Thus the container body is rigidly supported during the short period of time required to move a cover C into engagement therewith.

Movement of the covers one at a time from a position immediately below the discharge opening 85 of the vertical guideway 84 to a position in which the hinge portion thereof engages a corresponding portion on the bodies, may well be effected by the mechanism clearly shown in Figs. 2, 6, and 7. This mechanism includes a cover holder 124 which is mounted for horizontal reciprocation between a position in which it receives covers one at a time from the guideway 84 to a position in which the hinge portions of the cover and body are interengaged. This cover holder comprises a rectangular block 125 having a recess 126 in its forward face to accommodate a container cover in an "on-edge" position. A pair of jaws 127 which are arranged at the opposite vertical ends of said block and yieldingly held in engagement with the latter by a coil spring 127^a and mounted upon vertical hinge pins 128 operate to retain a cover part in said recess 126 during the advancing movement of the holder.

The cover holder 124 is attached to the forward end of a horizontal slide 132 which is mounted in a slideway 133 extending transverse to the length of the upper side of the table 30, said slide being connected to a bell crank lever 134 by means of a yielding connecting rod 135. This bell crank lever carries a cam roller 136 which rides upon a rotary cam 137, the latter being mounted upon and rotating with the aforementioned countershaft 71. This cam is so shaped that it rocks the lever 134 in a fashion to reciprocate the cover holder 124 in proper timed relation to the delivery of the cover and body parts to the assembly station and vertical reciprocation of the presser foot 109. The bell crank lever 134 is mounted upon a horizontal rod 138 extending longitudinally along one side of the table 30 and supported at its ends in brackets 139. The arc through which the upper arm of the bell crank lever 134 may swing, is regulably controlled by means of an adjustable stop screw 140 carried by a U-shaped frame 141 through which said arm extends and a pair of adjustable stop screws 142 which are carried by the slide 132 and engageable with plates 143 which are attached to the upper side of the table 30 inwardly from the margin thereof. The latter stop screws 142 limit the extent of forward motion of the cover holder while the first named stop screw 140 is utilized in effecting accurate alignment of the cover holder with the discharge opening of the vertical guide 84.

Immediately upon completion of the assembling operation, the feed bar 37 moves the as-

sembled body and cover with the latter still standing substantially vertically in a step-by-step fashion to a cam 144 which projects into the path of movement of the cover portions and overlies the normal path of the body portion. Thus the covers are partly closed. Immediately following such partial closing of the containers, they enter the "sizing" die 33 which functions to complete the closing operation and impart a predetermined standard of dimensions and contour to the side walls of the container.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. In apparatus of the character described, a vertical guideway having an open upper receiving end and a discharge opening at its lower end, said last named opening being located adjacent to one side of a container parts assembling station, means for delivering container parts to the upper end of said vertical guideway including a horizontal conveyor arranged in proximity to the upper end of said guideway, means for directing a stream of air under pressure across the conveyor just above the vertical guideway to thereby discharge the container parts one at a time from the conveyor into the receiving end of said guideway, and means whereby the accumulation of a predetermined number of container parts in said vertical guideway automatically shuts off the flow of air under pressure.

2. In apparatus of the character described, a vertical guideway for directing container parts to an assembling station, a horizontal conveyor operable to carry the parts in succession to the upper end of said vertical guideway, means for discharging the container parts from said conveyor into the upper end of the guideway including an air conduit having a discharge nozzle positioned to direct a stream of air under pressure laterally over the conveyor in proximity to the upper end of the guideway, and means for directing air under pressure into the conduit by way of a path at least in part extending across the vertical guideway.

3. In apparatus of the character described, a vertical guideway for directing container parts to a preselected station, said guideway having an open upper receiving end and an open lower

end, means for bringing the container parts one at a time to a point adjacent to said receiving end, means for directing a stream of air under pressure against the container parts to propel them into said receiving end, and means whereby the accumulation of a predetermined number of the container parts in said guideway interrupts the flow of air under pressure to the directing means.

4. In apparatus of the character described, a vertical guideway for directing parts to a preselected station, said guideway having an open upper receiving end and an open lower end, means for bringing the cover parts one at a time to a point adjacent to said receiving end, means for directing a stream of air under pressure against the cover parts to propel them into said receiving end, and means whereby the accumulation of a predetermined number of the cover parts in said guideway interrupts the flow of air under pressure to the directing means, said means for interrupting the flow of air including an air conduit having an inlet opening into the guideway through one side wall thereof and an air port directly across the guideway from and in register with said conduit.

5. In combination, a vertical guideway having open upper and lower ends and through which work-pieces are adapted to move by gravity to said lower end, means for bringing work-pieces in succession to said open upper end, an air nozzle arranged to direct the work-pieces into the upper end of said guideway, and means whereby the accumulation of a predetermined number of pieces in said guideway momentarily terminates operation of the nozzle.

6. In combination, a vertical guideway having open upper and lower ends and through which work-pieces are adapted to move by gravity to said lower end, means for bringing work-pieces in succession to said open upper end, an air nozzle arranged to direct the work-pieces into the upper end of said guideway, and means whereby the accumulation of a predetermined number of pieces in said guideway momentarily terminates operation of the nozzle, said last named means including an air conduit in part formed by the guideway for conducting air under pressure to the nozzle.

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