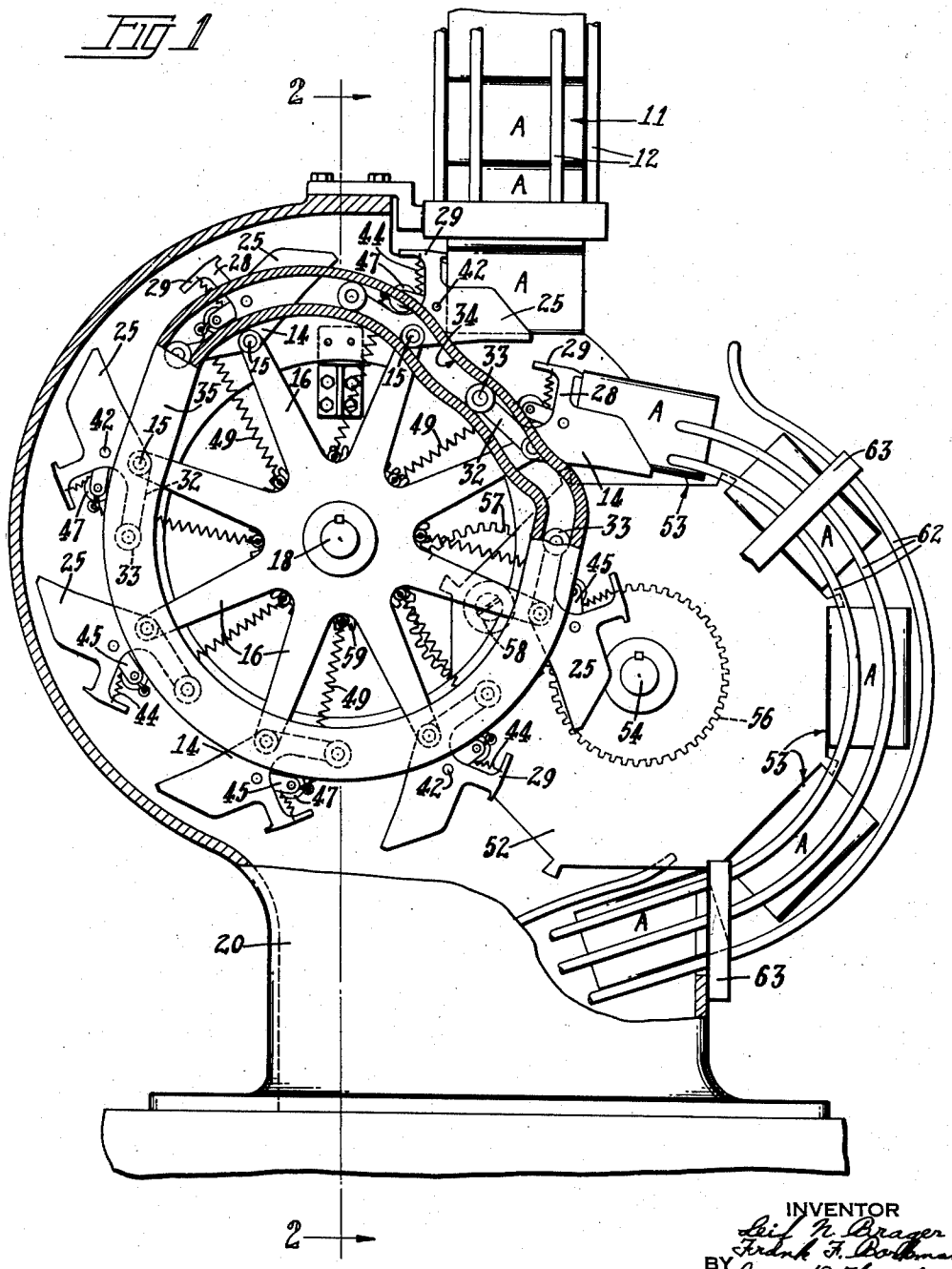
Sept. 9, 1952 L. N. BRAGER ET AL 2,609,946

FEEDING MECHANISM WITH GRIPPING DEVICE

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Fig 1



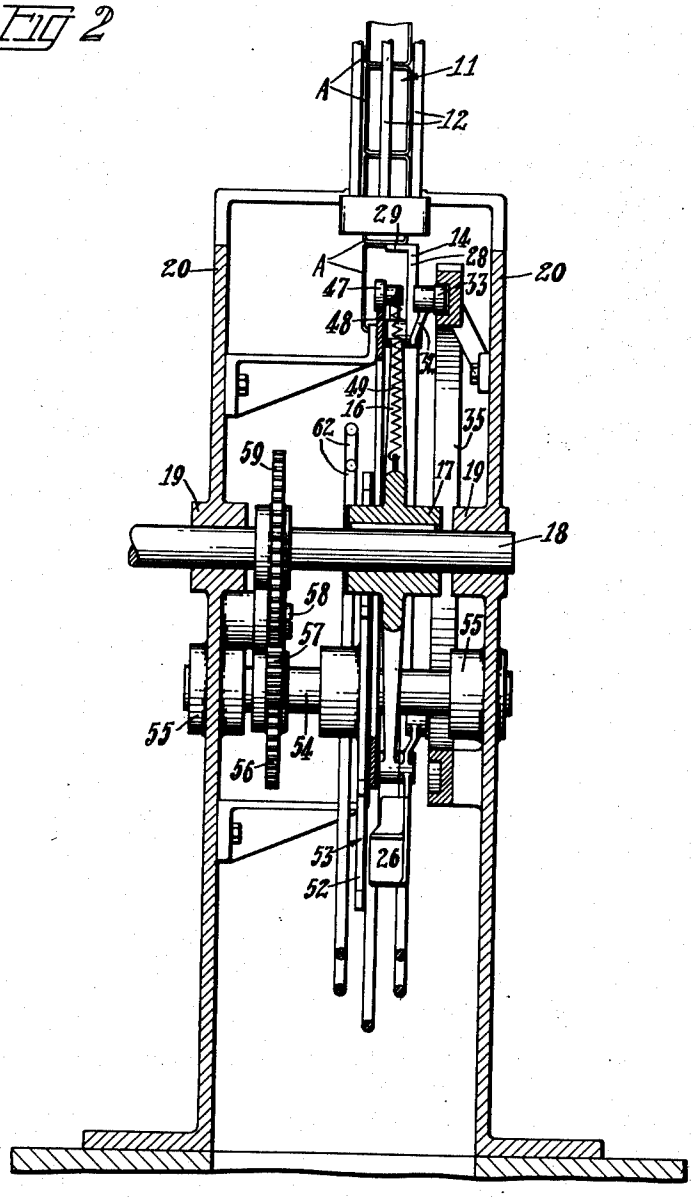
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FEEDING MECHANISM WITH GRIPPING DEVICE

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Fig 2



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FEEDING MECHANISM WITH GRIPPING DEVICE

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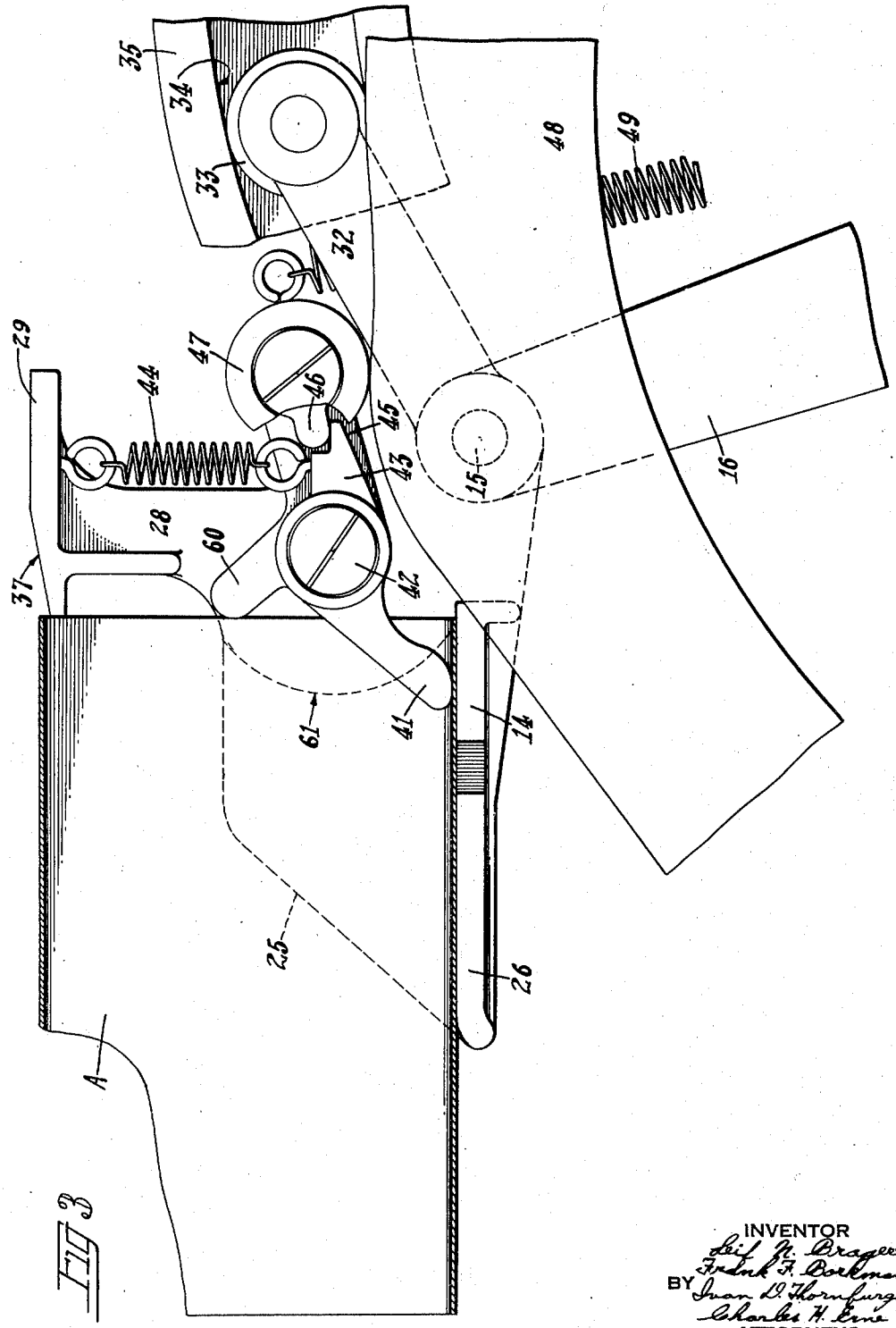


Fig 3

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FEEDING MECHANISM WITH GRIPPING DEVICE

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Fig 4

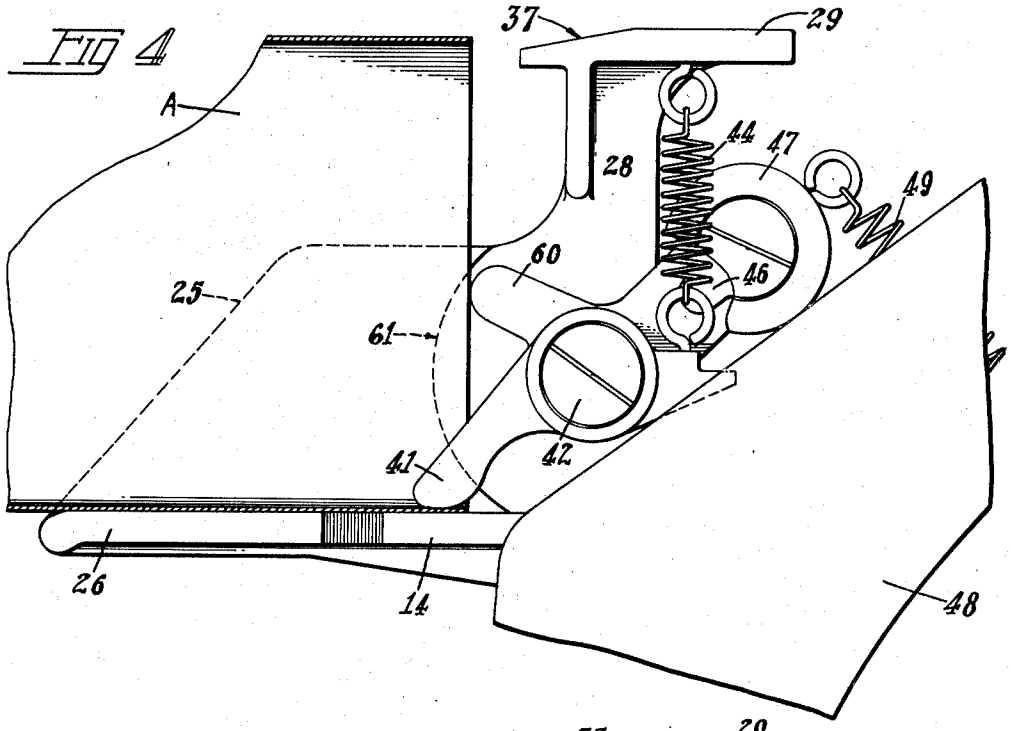
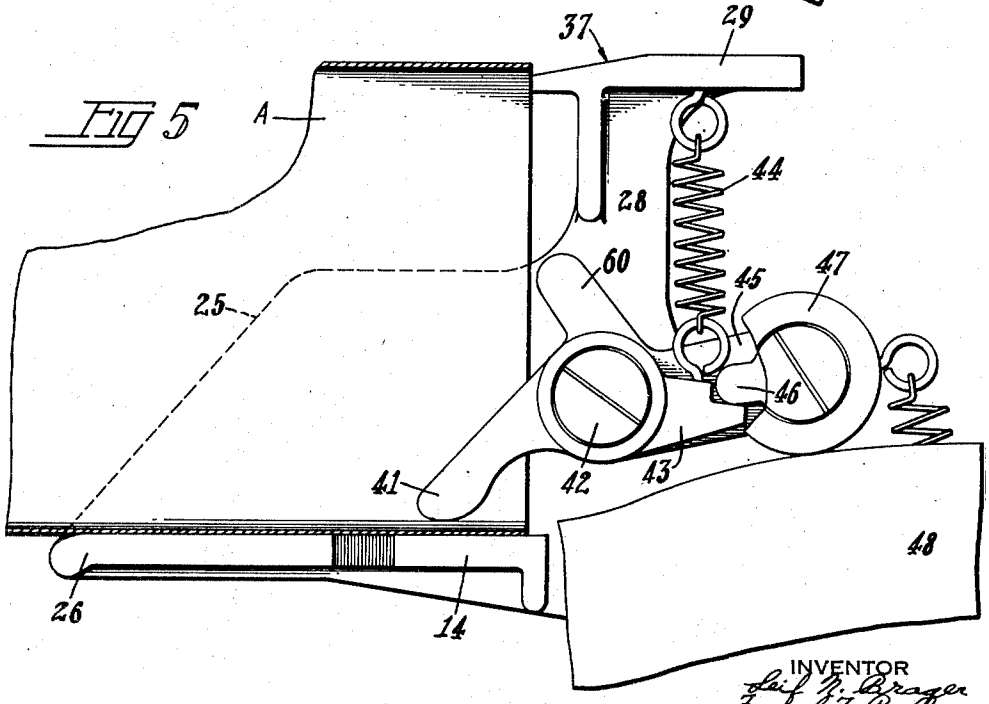


Fig 5



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FEEDING MECHANISM WITH GRIPPING DEVICE

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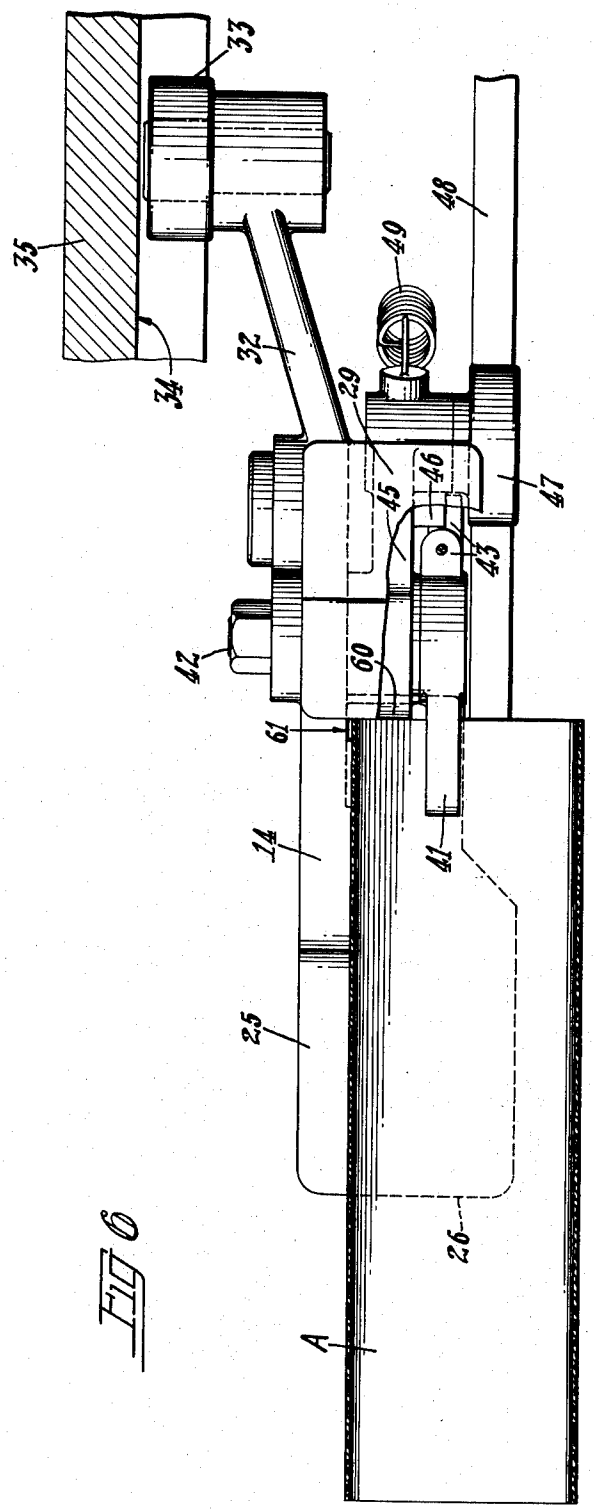


Fig 6

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2,609,946

UNITED STATES PATENT OFFICE

2,609,946

FEEDING MECHANISM WITH GRIPPING DEVICE

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Application May 14, 1947, Serial No. 747,954

12 Claims. (Cl. 214—8.5)

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The present invention relates to a rotatable feeding mechanism for articles such as container bodies and the like and has particular reference to devices for gripping and holding the bodies in a predetermined position while feeding them through a curved path of travel for further advancement.

An object of the invention is the provision in a feeding mechanism of devices wherein container bodies may be fed from a stack while holding the bodies under control for delivery in a predetermined position to other devices for advancing them along a path of travel in a continuous procession.

Another object is the provision of such devices wherein the bodies are fed from the stack and delivered in a predetermined spaced and timed order for delivering the bodies under control in a continuous procession.

Another object is the provision of such devices wherein the manner of gripping and holding the bodies and of releasing them upon delivery is especially adapted to high speed feeding and advancing of fragile lightweight bodies.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a side elevation of a feeding mechanism embodying the instant invention, with parts broken away and parts shown in section;

Fig. 2 is a vertical transverse sectional view taken substantially along the line 2—2 in Fig. 1, with parts broken away;

Figs. 3, 4 and 5 are enlarged fragmentary views of details of the mechanism as viewed from the left in Fig. 2, the views showing the same parts in different positions, and

Fig. 6 is a top plan view of the details shown in Fig. 3.

As a preferred embodiment of the instant invention the drawings illustrate a mechanism for feeding lightweight container bodies A (Fig. 1) individually from the bottom of a stack of such bodies for advancement in spaced and timed relation in a continuous procession. The bodies shown in the drawings, by way of example, are rectangular shaped, fibre bodies of the type used for frozen foods and other products and have both ends open.

The bodies A to be fed from the stack are disposed in a horizontal or sidewise position one on

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top of the other in a vertical magazine 11 (Figs. 1 and 2) defined by vertically disposed guide rails 12 leading from a source of supply of the bodies. The bodies are fed from the stack in timed order and in rapid succession by a plurality of spaced carrier elements or carriers 14 (see also Fig. 3) which are mounted on pivot pins 15 carried in the outer ends of arms 16 of a continuously rotating carrier wheel or disc 17 located adjacent the lower end of the magazine 11 in longitudinal alignment with the bodies in the magazine (see also Fig. 6).

The carrier wheel 17 is disposed in a vertical position on a drive shaft 18 (Figs. 1 and 2) which is journaled in bearings 19 formed in a frame 20 which may be the main frame of a more elaborate machine in which the feeding mechanism is used. The shaft 18 may be driven in any suitable manner. Hence as the carrier wheel rotates, it propels the carriers 14 through a circular path of travel adjacent the lower end of the stack of bodies A in the magazine 11. Thus each carrier 14 in succession and in timed order, individually passes adjacent the lower end of the magazine.

Each of the carriers 14 is formed with an L-shaped support for a body A, the support comprising a vertically disposed side wall section 25 (Figs. 3 and 6) and an angularly disposed bottom or ledge 26 which extends inwardly from the side wall section at right angles thereto. This L-shaped support is disposed on the forward or leading side of the carrier pivot pins 15. Adjacent the pivot pin, the side wall section 25 is formed with an extension 28 which carries an inwardly projecting flat web or retaining pad 29. On the opposite or following side of the pivot pin 15 each carrier 14 is formed with a rearwardly and outwardly extending cam arm 32. The outer end of the arm carries a cam roller 33 which operates in a cam track 34 of a stationary ring cam 35 secured to the frame 20.

Hence when a carrier 14 on the rotating carrier wheel 17 approaches the lower end of the magazine 11 as an incident in its movement through its circular path of travel it approaches an open end of the lowermost body in the magazine and its side wall section 25 moves along the body into a position adjacent and engaging against the outer vertical side wall of the body. The inner surface of the side wall section 25 adjacent its leading edge is slightly beveled to facilitate passage of this wall section into position adacent the wall of the body.

During this approach of a carrier 14 toward

the body, the cam track 34 tilts the carrier into such a position that its support ledge 26 moves into position under the body along a horizontal plane parallel with the horizontal underside of the body as best shown in Figs. 4, 5 and 6. The carrier thus moves endwise into position under the body for receiving and for removing it from the magazine.

As this parallel or horizontal movement of the body continues with the rotation of the carrier wheel 17, the leading edge of the retaining pad 29 engages against the adjacent end edges of the body and pushes the body horizontally and outwardly with the carrier. As soon as the body starts to move with the carrier it is clamped in position against the carrier as best shown in Fig. 3, and is then pushed out from under the stack of bodies in the magazine 11.

During this pushing action against the end of the body, the retaining pad 29 moves under the body next above in the stack (see Fig. 1), sliding along the underside wall of this body and thus holding the stack in place until the next following carrier 14 on the carrier wheel comes into place under the stack to receive and support the next body therein. The top surface of the retaining pad 29 adjacent its leading or pushing edge is formed with a tapered wall section 37 (Fig. 3) to facilitate movement of the pad into place under the stack.

Clamping of the body in the carrier before removal from the magazine is brought about by a clamping or gripper finger 41 (Figs. 3 and 6) mounted on a pivot stud 42 disposed under the retaining pad 29 and secured in the side wall section 25 of each of the carriers 14. Beyond the pivot stud 42 the clamping finger 41 is formed with a spring arm 43 which may be formed integrally therewith. This arm is secured to one end of a tension spring 44. The other end of the spring is secured to the underside of the retaining pad 29. The spring thus draws the spring arm 43 upwardly, as viewed in Fig. 3 and thus holds the finger 41 in a position tightly clamped against the support ledge 26 of the carrier 14. This is the normal position of the clamping finger.

However, just prior to a carrier 14 coming into position to receive a body A from the magazine 11 as described above, the clamping or gripper finger 41 is momentarily lifted clear of the ledge 26 of the carrier as best shown in Fig. 5, to permit the positioning of the body between the finger and the ledge of the carrier. This lifting of the finger is effected by a lifter arm 45 which is disposed adjacent the finger, between the finger and the side wall section 25 of the carrier and is mounted on the pivot stud 42. Adjacent its outer end, the lifter arm is formed with a lateral projection 46 which overhangs the spring arm 43 and normally engages against the spring arm.

This outer end of the lifter arm carries a cam roller 47 (Figs. 2, 3 and 6) which operates against a stationary annular edge cam 48 (see also Fig. 2) bolted to the main frame 20. The roller is kept in contact with the cam, as the carrier travels around its curved path of travel, by a tension spring 49 one end of which is secured to the outer end of the lifter arm 45. The opposite end of the spring is secured to the carrier wheel 17.

The cam 48 permits the spring 49 to draw the lifter arm 45 downwardly at the proper moment in the cycle of travel of the carrier and

thus through its overhanging projection 46, temporarily rock the finger 41 into an open position to receive the body A. As soon as the body has been picked up by a carrier 14 the cam 48 acts to raise the pivoted lifter arm 45 and thereby release the clamping finger 41 to return to its normal position under the tension of its spring 44 for clamping the received body tightly in position.

With a body A clamped tightly in position in a carrier 14, the carrier continues along its circular path of travel with the rotating carrier wheel 17 and is brought into position adjacent a rotating turret 52 (Figs. 1 and 2) having a plurality of square cut pockets 53 formed in its outer periphery for the reception of and advancement of the fed bodies A. During this travel of the carrier 14 it is maintained in a predetermined position under control of the stationary cam 35.

The turret 52 is disposed in a vertical plane adjacent the carrier wheel 17 and is mounted on a cross shaft 54 journaled in bearings 55 formed in the main frame 20. The turret 52 is rotated continuously in time with the carrier wheel 17 by a driven gear 56 which is mounted on the turret cross shaft 54. This gear meshes with an idler gear 57 which is mounted on a stud 58 threadedly secured in the main frame 20. The idler gear meshes with a driving gear 59 which is mounted on and driven by the main driving shaft 18.

As a carrier 14 with its body A approaches the turret 52, the stationary cam 35 tilts the carrier forward at a slight downwardly inclined angle for delivering the body into a pocket 53 of the turret. Simultaneously with this action the stationary annular edge cam 48 rocks the lifter arm 45 upwardly and thus forces a pusher lug 60 integral therewith (Figs. 4 and 6), outwardly against the edge of body A and hence frictionally forces the body out from under the clamping finger 41 while the latter is in spring tensioned clamping position, and into the adjacent pocket 53 of the turret. The pusher lug 60 operates in a recess 61 formed in the inner face of the carrier side wall section 25. The turret 52 thereupon carries the body along a curved path of travel partially around it. A plurality of guide rails 62 disposed adjacent the outer periphery of the turret retain the body in place in its turret pocket. These guide rails are secured to brackets 63 bolted to the main frame 20. The turret 52 and the guide rails 62 guide the bodies A to any suitable place of deposit or for further treatment.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. In a feeding mechanism for articles such as container bodies and the like, the combination of a magazine for holding a stack of tubular container bodies, a carrier support rotatably mounted on a horizontal axis beneath said magazine, a carrier pivotally mounted on said support for engaging and removing a container body from the bottom of said magazine, gripper means pivotally mounted on said carrier having means for moving the same into engagement with the

interior wall surface of a supported body on said carrier for clamping the body in place thereon, means for rotating said carrier support in a substantially vertical plane, means adjacent the path of travel of said carrier with said support for tilting the moving carrier on its pivotal mounting and relative to said support into a predetermined position for delivery of the clamped body therefrom, movable means adjacent the path of travel of said carrier for receiving the body therefrom and for advancing said body along a continuing path of travel, and means actuated by the rotation of said carrier support for transferring said container body from said carrier to said movable means.

2. In a feeding mechanism for articles such as tubular container bodies and the like, the combination of a carrier support rotatably mounted on a horizontal axis, a carrier pivotally mounted on said support for receiving and holding a container body, gripper means pivotally mounted on said carrier and insertable into said body for holding the body in place on said carrier, means for rotating said carrier support in a substantially vertical plane for inserting said gripper means into an end of said tubular container body, cam controlled means adjacent the path of travel of said carrier support for tilting the moving carrier on its pivotal mounting and relative to said support into a predetermined position for delivery of the body from said carrier, movable means adjacent the path of travel of said carrier for receiving the body therefrom and for advancing said body along a continuing path of travel, actuating means movably mounted on said carrier and operable in time with the reception of a body to be held on said carrier and the delivery of the body from said carrier for opening and closing said gripper means, and pusher means movably mounted on said carrier and actuated by the rotation of said carrier support for transferring said container from the carrier to said movable means.

3. In a feeding mechanism for articles such as tubular container bodies and the like, the combination of a magazine for retaining a stack of bodies, a movably mounted carrier rotatable on a horizontal axis beneath said magazine for receiving and supporting a container body, gripper means movably mounted on said carrier and insertable into an end of said body for clamping the body in place on the carrier, means for bodily rotating said carrier in a substantially vertical plane and for inserting said gripper means into an end of said tubular container body, means adjacent the path of travel of said carrier for moving the carrier into a different position for delivery of the body therefrom, rotatable means adjacent the path of travel of said carrier for receiving the body therefrom and for advancing said body along a continuing path of travel, and movable means on said carrier actuated by the carrier rotating means for transferring said container body from said carrier to said rotatable means.

4. In a feeding mechanism for articles such as tubular container bodies and the like, the combination of a magazine for retaining a stack of bodies, a pivotally mounted carrier rotatable on a horizontal axis in a vertical plane beneath said magazine for removing the lowermost container body therefrom and for supporting the removed body, a member formed on said carrier and engageable under the body next above the removed body for temporarily holding said stack of bodies

in place, gripper means mounted on said carrier and insertable into an end of the removed body for holding it in place on said carrier, means for bodily rotating said carrier on said horizontal axis and for inserting said gripper means into an end of said tubular container body, means adjacent the path of travel of said carrier for tilting the moving carrier on its pivotal mounting into position for delivery of the body therefrom, movable means adjacent the path of travel of said carrier for receiving the body from the carrier and for advancing it along a continuing path of travel, and pusher means carried by and actuated by the rotation of said carrier for transferring said container body from the tilted carrier to said movable means.

5. In a feeding mechanism for articles such as tubular container bodies and the like, the combination of a plurality of carriers each pivotally mounted on a common rotary support and bodily rotatable in a vertical plane for receiving and supporting container bodies, gripper means pivotally mounted on said carriers and respectively insertable into the open ends of said bodies for holding the received bodies in place on said carriers respectively, means for rotating said carrier support and for inserting said gripper means into an end of said tubular container body, means adjacent the path of travel of said carriers for tilting the moving carriers individually on their pivotal mountings relative to said support into a predetermined position for delivery of the bodies therefrom, movable means disposed adjacent the path of travel of said carriers for receiving the bodies individually therefrom and for advancing said bodies in a continuous procession along a continuing path of travel, and pusher members on said carriers actuated by the rotation thereof for successively transferring said container bodies from the tilted carriers to said movable means.

6. In a feeding mechanism for articles such as tubular container bodies and the like, the combination of a support rotatable in a vertical plane on a horizontal axis, a carrier pivotally mounted on said support for receiving and holding a container body, a gripper finger pivotally mounted on said carrier and insertable into said held tubular body for clamping the body in place on the carrier, means for rotating said carrier support and for inserting said gripper finger into an end of said tubular container body, means adjacent the path of travel of said carrier for tilting the latter on its pivotal mounting into a predetermined position for delivery of the body therefrom, movable means adjacent the path of travel of said carrier for receiving the body from the carrier and for advancing it along a continuing path of travel, and pusher means carried by said carrier and actuated by the rotation of said support for transferring said container body from the tilted carried to said movable means.

7. In a feeding mechanism for articles such as tubular container bodies and the like, the combination of a support rotatable on a horizontal axis in a vertical plane, a carrier pivotally mounted on said support for receiving and holding a container body, a gripper finger pivotally mounted on said carrier and insertable into said held body for clamping the body in place on the carrier, pressure means acting on said gripper finger for maintaining said finger in gripping position, means for rotating said carrier support and for inserting said gripper finger into an end of said tubular container body, means adjacent

the path of travel of said carrier for tilting the moving carrier on its pivotal mounting into a predetermined position relative to said support for delivery of the body therefrom, movable means adjacent the path of travel of said carrier for receiving the body from the carrier and for advancing it along a continuing path of travel, means for transferring the clamped container body from the tilted carrier to said movable means, and means movably mounted adjacent said gripper finger and operable in time with the reception of a body in said carrier for engaging said finger to tilt the same out of clamping position into position for insertion into a said container body.

8. In a feeding mechanism for articles such as tubular container bodies and the like, the combination of a carrier support rotatable upon a horizontal axis, a carrier pivotally mounted on said support for receiving and holding a container body, a gripper finger pivotally mounted on said carrier and insertable into said body for clamping a received body in place on said carrier, spring means for maintaining said finger in gripping position, an actuating lever disposed adjacent said gripper finger, means for rotating said carrier support in a substantially vertical plane and for inserting said gripper finger into an end of said tubular container body, means adjacent the path of travel of said carrier for tilting the moving carrier on its pivotal mounting into a predetermined position relative to said support for delivery of the body from said carrier, movable means adjacent the path of travel of said carrier for receiving the body therefrom and for advancing the body along a continuing path of travel, means for transferring the clamped container body from the tilted carrier to said movable means, and cam means operable against said actuating lever in time with the reception of a body in said carrier for successively moving said gripper finger on its pivotal mounting to open and container body clamping positions.

9. In a feeding mechanism for articles such as container bodies and the like, the combination of a carrier having a bottom wall section and a side wall section constituting a quarter mold for receiving and supporting a container body on its side, said bottom wall section of said carrier covering less than the full width of the body supported thereon, a gripper finger mounted on said carrier and engageable within said body adjacent the side wall section of said carrier for holding the body tightly against the bottom wall section of the carrier, movable means for propelling said carrier along a predetermined path of travel, means adjacent the path of travel of said carrier for shifting the moving carrier into a predetermined position for delivery of the body therefrom, movable means adjacent the path of travel of the bottom wall section of said carrier for receiving the body from the carrier and for advancing it along a continuing path of travel, and means for transferring said body from the shifted carrier to said movable means.

10. In a feeding mechanism for articles such as container bodies and the like, the combination of a rotatable disc, a plurality of carriers pivotally mounted on said disc at spaced intervals adjacent its outer periphery for receiving and supporting individual container bodies and for

carrying them along a curved path of travel with said disc, gripper means mounted on each of said carriers for holding the received bodies in place thereon, stationary cam means disposed adjacent said disc and engageable by said carriers for rocking the carriers individually at a predetermined place in their curved path of travel for shifting the bodies carried thereon into a predetermined position for delivery from the carriers, a turret having spaced pockets therein and rotating in time with said disc there-adjacent for receiving the bodies in its pockets from said carriers and for advancing them along a continuing path of travel, means for successively transferring the bodies from said carriers to said turret pockets, and guide rails disposed adjacent said turret for retaining the received bodies in place in the turret pockets.

11. In a feeding mechanism for articles such as tubular container bodies and the like, the combination of a carrier support rotatable upon a horizontal axis, a carrier pivotally mounted on said support for receiving and holding a container body, gripper means pivotally mounted on said carrier and insertable into a said body for clamping a received body in place on said carrier, means for rotating said carrier support in a substantially vertical plane and for inserting said gripper means into an end of said tubular container body, means adjacent the path of travel of said carrier for tilting the moving carrier on its pivotal mounting relative to said support into another predetermined position for delivery of the body therefrom, means for engaging and discharging a body from its clamped engagement with said gripper means on said carrier, and movable means adjacent the path of travel of said carrier for receiving the body discharged therefrom and for advancing said body along a continuing path of travel.

12. In a feeding mechanism for articles such as container bodies and the like, the combination of a carrier for receiving and supporting a container body, a gripper finger mounted on said carrier and insertable into said body for holding a received body in place thereon, movable means for propelling said carrier along a predetermined path of travel, means adjacent the path of travel of said carrier for shifting the moving carrier into a predetermined position for delivery of the body therefrom, a pusher lug operable in time with the travel of the body and engageable with the body for delivering it from said carrier, and movable means adjacent the path of travel of said carrier for receiving the body from the carrier and for advancing it along a continuing path of travel.

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