

Jan. 12, 1965

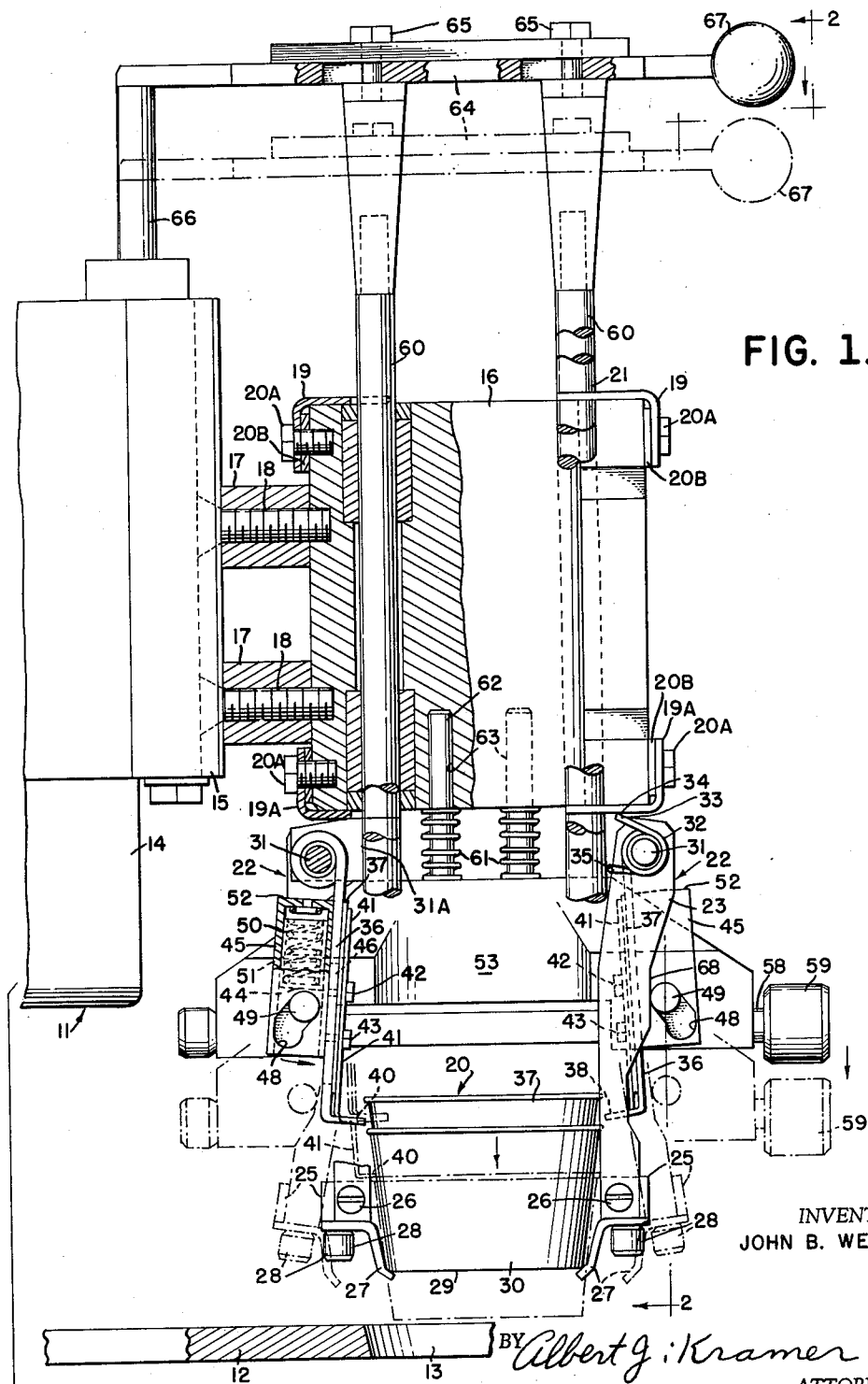
J. B. WEST

3,165,233

CONTAINER FEEDING MACHINE

Filed Sept. 25, 1963

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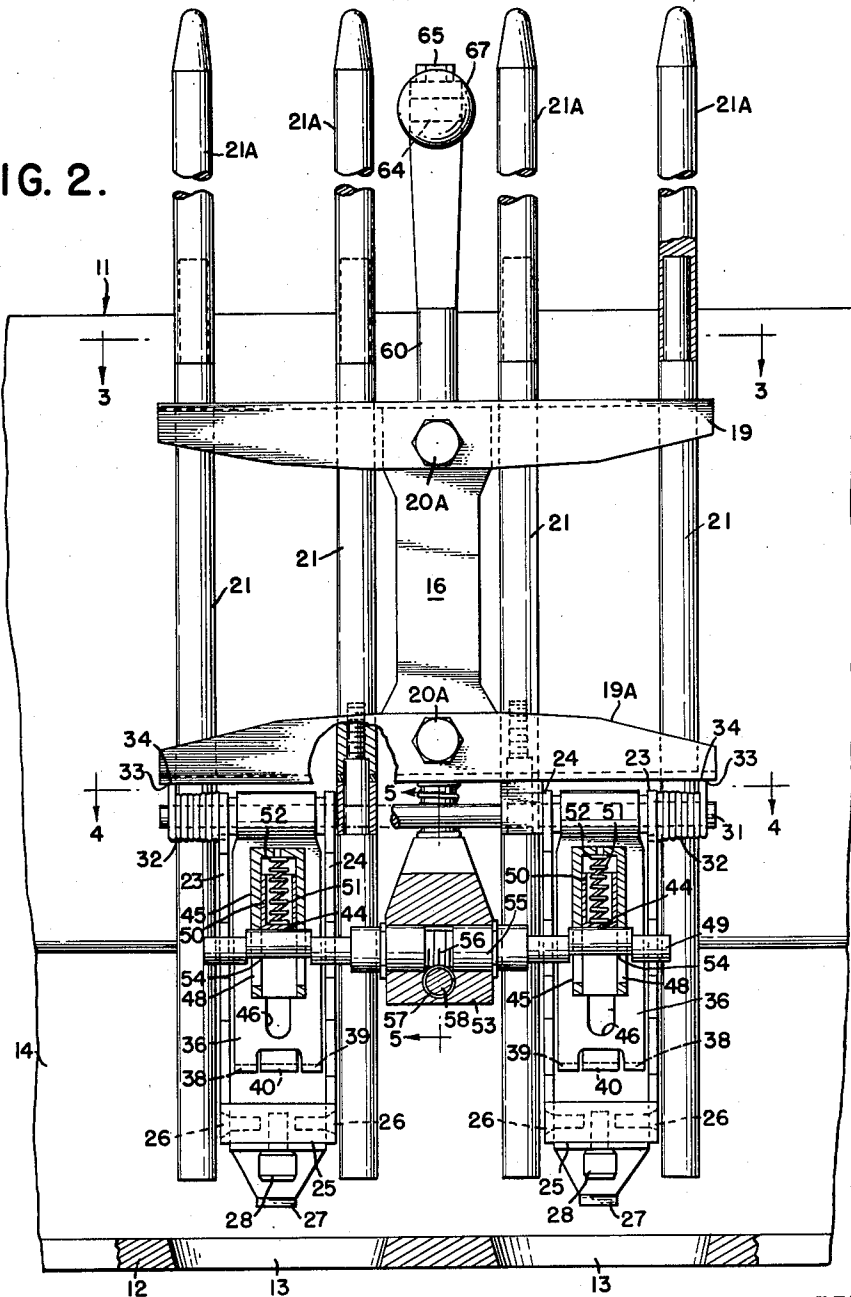
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FIG. 2.



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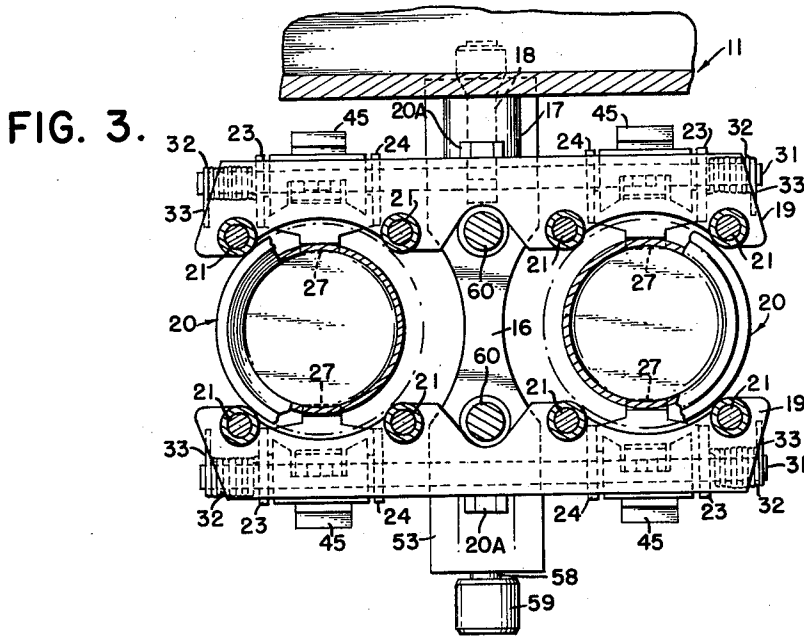


FIG. 4.

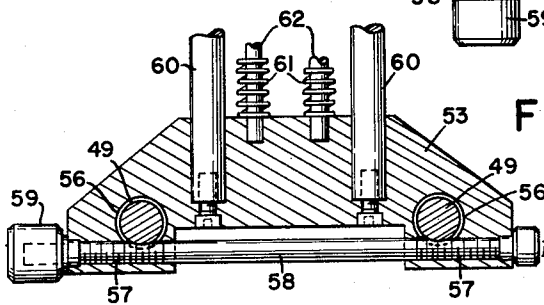
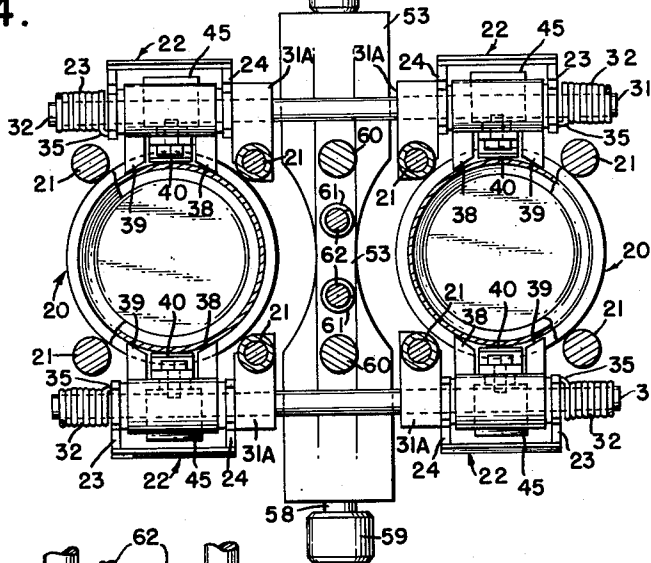


FIG. 5.

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FIG. 6.

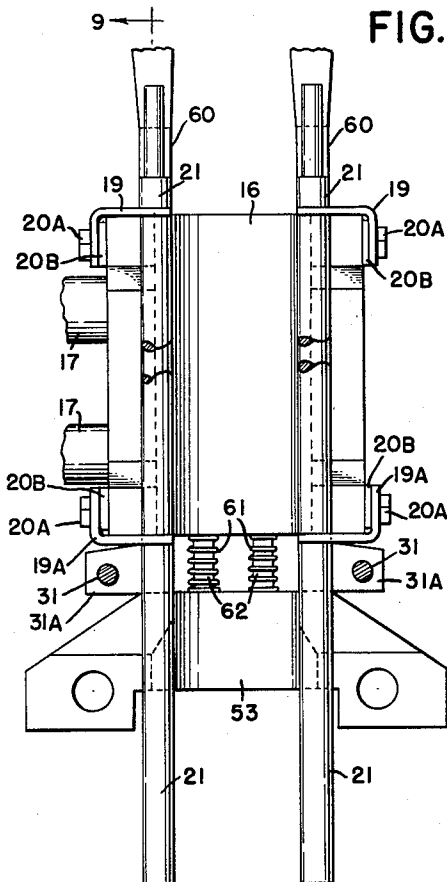


FIG. 7.

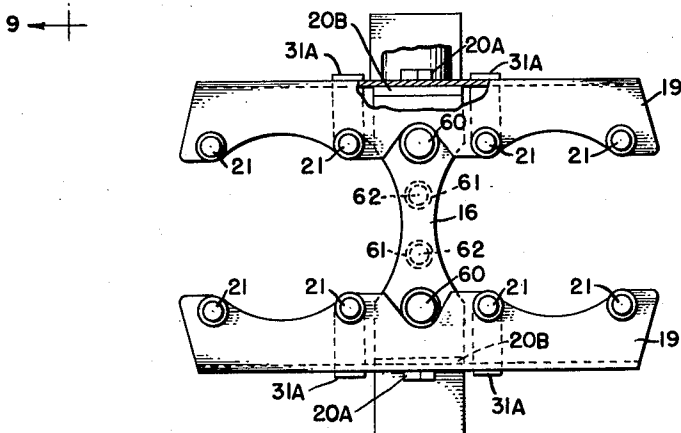
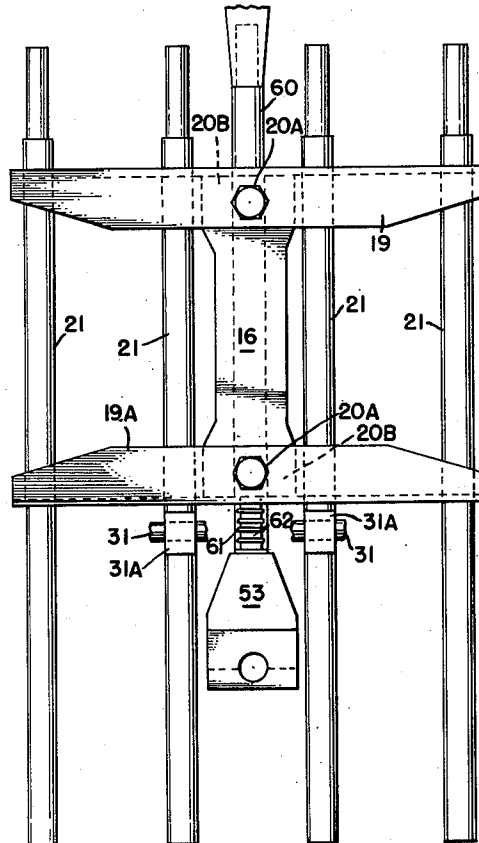


FIG. 8.

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FIG. 9.

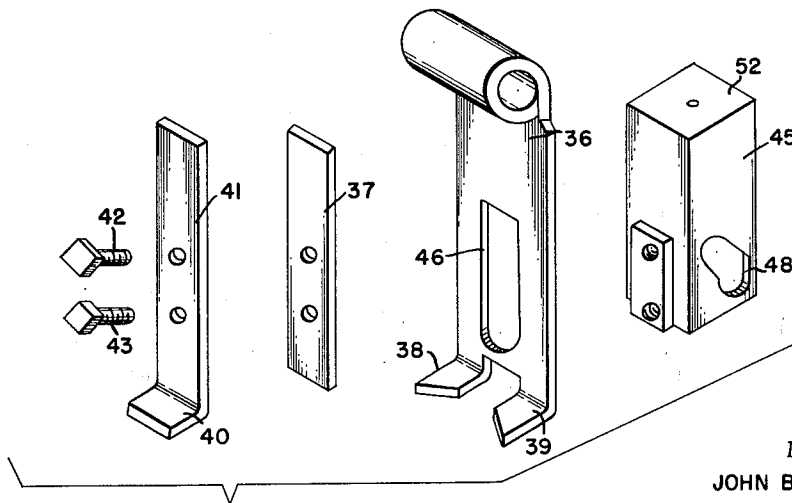
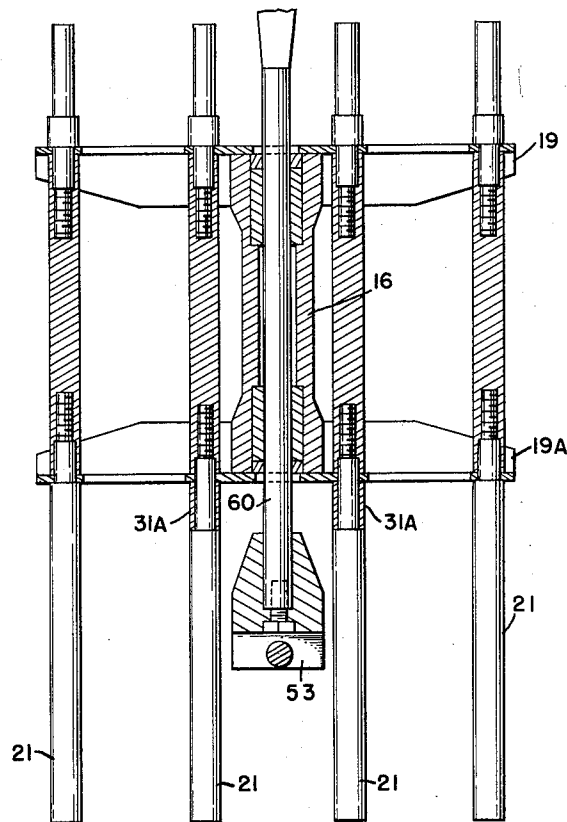


FIG. 10.

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3,165,233

CONTAINER FEEDING MACHINE

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3 Claims. (Cl. 221—221)

This invention relates to feeding machines and it is more particularly concerned with machines for feeding containers of various kinds from a stack of nested containers, such as paper and plastic cups and tubs, ice cream cones, etc.

An object of the invention is the provision of a feeding machine of the type mentioned which supports a stack of nested containers and discharges them one by one on cyclic actuation of an operating member.

Another object of the invention is the provision of such a machine which is adapted for use in conjunction with filling machines that dispenses materials of various kinds, such as food, into the containers.

A further object is the provision of means for cyclicly supporting and releasing a stack of nested containers at the bottom thereof in combination with cyclic means cooperating therewith to alternately grip and release the penultimate container of the stack, thereby permitting the lowermost container to fall away and be separated from the stack.

A still further object of the invention is the provision of means for cyclicly supporting and releasing a stack of nested containers at the bottom thereof in combination with cyclic means coaxing therewith to alternately grip and release the penultimate container of the stack and for exerting a positive force downwardly against the lowermost container when the penultimate container is gripped so as to insure separation of the lowermost container from the rest of the stack.

A still further object is the provision of a container feeding machine which is long wearing and adapted for prolonged periods of continuous use as a manufacturing facility.

These and still further objects, features and advantages of the invention will appear more fully from the description which follows hereinafter in conjunction with the accompanying drawing.

In the drawing:

FIG. 1 is a front elevational view, partly broken away, of an embodiment of the invention especially adapted for flat bottom paper cups or "tub," attached to a filling machine, the latter being shown fragmentarily.

FIG. 2 is a vertical sectional view along the line 2—2 of FIG. 1.

FIG. 3 is a plan sectional view along the line 3—3 of FIG. 2.

FIG. 4 is a plan sectional view along the line 4—4 of FIG. 2.

FIG. 5 is a vertical sectional view of a fragmentary portion along the line 5—5 of FIG. 2.

FIG. 6 is an elevational view of the frame skeleton parts of the embodiment, with some parts broken away.

FIG. 7 is another elevational view of the frame skeleton parts of the embodiment as seen from the right side of FIG. 6.

FIG. 8 is a top plan view of the skeleton frame parts, partly broken away.

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FIG. 9 is a vertical sectional view along the line 9—9 of FIG. 6.

FIG. 10 is an exploded view in perspective of certain parts of the embodiment.

Referring to the drawing with more particularity, the embodiment is illustrated in reference to a container filling machine 11 having a rotatably mounted horizontal loading wheel 12 which is provided with apertures 13 for receiving the containers to be filled. The filling machine alone, however, forms no part of the present invention.

A stationary wall 14 of the filling machine adjacent the wheel 12 is provided with a mounting bracket 15 opposite the space between a consecutive pair of the apertures 13 when the loading wheel is in its stationary or resting phases between intermittent rotational movements. The location of the bracket is in advance of the filling station (not shown) of the filling machine or of the initial filling station if there are more than one, such as where a plurality of materials are to be loaded into each container successively.

Spacers 17 are provided between a beam 16 comprising part of the frame of the embodiment and the bracket 15 about mounting screws 18.

The device, when so mounted, extends outwardly from the wall 14 over the loading wheel 12 and comprises a pair of spaced upper transverse ribs 19, 19 and a pair of corresponding lower transverse ribs 19A, 19A which correspond to and normally straddle the apertures 13 of the loading wheel when the wheel is in the resting phase of its cycle of operation. The spaces between the ribs comprise passageways through which the containers pass from a pair of nested stacks of the containers 20. The ribs are connected to the beam 16 by bolts 20A.

The containers illustrated comprise conventional stiff paper cups or tubs and they are supported in the form of nested stacks which can extend above the beam 16 and be laterally retained by means of a group of vertical guide rods 21 with extension sections 21A set about the spaces between the ribs. The guide rods 21 are provided in threadedly engageable sections and they are mounted on the ribs 19 and 19A as shown in FIGS. 6—9. The spaces between the ribs may be reduced for smaller size containers by inserting shims 20B between the ribs and the beam 16.

The stacks of containers are each intermittently supported by a pair of swinging arms 22, 22 on diametrically opposite sides of the stack.

The arms 22 each comprise a pair of matching side members 23 and 24 which are secured at the bottom to a cross bar 25 by means of screws 26.

To the bottom of the cross bar 25, there is secured an inwardly extending finger 27 by means of a bolt 28 for engaging the bottom side 29 of the lowermost container 30 of the stack when the arms 22 are in their closest position to each other. The arms are pivoted at their upper ends to the pintles 31, 31 carried by brackets 31A on the inner pair of rods 21, 21 between a shoulder 31B of the lower section of each rod and the bottom side of the adjacent rib 19A. The ribs 19A are biased outwardly by means of tensioned coil springs 32 mounted on the pintles having in each case one of their ends 33 secured to a stationary point 34 of a rib 19A, and their other ends 35 secured to the respective arms to urge the

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arms to rotate on their pintles to the outward positions shown by the broken lines in FIG. 1.

The stacks above the lowermost receptacles are each alternately supported by a second pair of vertical arms 36, 36 which are hingedly mounted on the same pintles 31 between the side members 23 and 24. The lower ends of these arms each have horizontal portions which are bifurcated to provide a pair of spaced fingers 38 and 39. The fingers are adapted in their innermost positions to contact opposite walls of the penultimate cone 37 of the stack.

Between each pair of fingers 38 and 39 there is disposed a horizontal flange 40 of a vertical bar 41. The bars 41 are adapted to reciprocate vertically when the fingers are engaging the walls of the penultimate container of the stack. By means of this reciprocating motion, the flanges 40 move downwardly and contact the rim of the lowermost container 30 of the stack and urge it to disengage from the stack, if it has not already been disengaged under the force of gravity alone, thereby insuring a positive feeding action of a container on each cycle of operation. To effect this reciprocating motion, the vertical bars 41 are disposed on the inner sides of their respective arms 36 and are attached by bolts 42 and 43 to camming blocks 45 through a vertical slot 46 of each arm 36 and an offsetting shim 37 is interposed between it and the bar 41.

The camming blocks 45 are each provided with a camming slot 48 through which a camming rod 49 extends transversely.

The camming blocks 45 are hollow and they are each provided on the interior with a retainer cup 50 the lower end 44 of which bears against the top of the corresponding camming rod 49 under the action of a coil spring 51 on the interior of the cup, the upper end of the spring bearing against upper wall 52 of the block 45. By these means the blocks 45 are each constantly urged upward relative to its respective camming rod 49. Thus, as the rods move downwardly in the camming slots 48 the blocks are maintained in their uppermost positions under the force of the springs 51 until the rods reach the bottom of the camming slots whereupon they force the blocks downward and carry with them the bars 41. In moving downward, the rods 49 in the camming slots force the arms 46 inwardly due to the slope of the inner edges of the slots 48.

The camming rods 49 are rotatably mounted on a vertical carrier block 53 and the portions 54 thereof in contact with the camming blocks 45 are eccentric relative to the axis of rotation on the block 53. The middle sections 55 of the rods 49 have threaded portions 56 which engage the threads 57 of a transverse lead screw 59 rotatably mounted in the block 53. The lead screw 58 is provided with a finger knob 59. By turning the knob, the portions 54 can be adjusted to different positions of eccentricity relative to the camming blocks in their vertical reciprocation and, hence to vary the camming action for difference size containers within limits. The carrier block 53 is secured to the bottom of guide rods 60 slidably mounted in the beam 16 and is urged to a downward position relative to the beam by means of coil springs 61 between the bottom of the beam and the top of the block 53. The springs 61 are mounted on pins 62 that are secured to the block 53 and which project upward into sliding engagement with sockets 63 of the beam 16. The pins so mounted and slidably engaged with the sockets also serve to limit the relative movement of the block toward the beam.

The guide rods 60 extend upwardly above the beam 16 and are secured to a crossbar 64 by bolts 65. One end 67 of the bar 64 is adapted to abut a powered reciprocating shaft 66 of the filling machine. The other end of the bar 64 extends outwardly and it is provided with a knob 67 for inwardly manipulating it such as may be necessary in engagement and disengagement of the opposite end with the shaft 66.

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In operation, as the bar 64 is reciprocated vertically by the powered shaft 66 it carrier with it the block 53 which supports the camming rods 49. In the uppermost position of the block 53 the camming rods are at the upper ends of the camming slots 48. In this position of the block, the camming rods are also in contact with offset shoulders 68 of the arms 22, thereby forcing the arms to their innermost positions against the action of the springs 32. In this position, too, the vertical bars 36 are in their outermost positions by reason of the position of camming rods 49 in the upper end of the camming slots 48. With the arms 22 in this innermost position, the fingers 27 cooperatively engage the lowermost container of the stack and thus support the entire stack, while the fingers 38 and 39 are free of contact with any container of the stack.

As the bar 64 moves downwardly, it carries with it the block 53 and camming rods 49. The downward movement of these camming rods in the slots 48 forces the camming blocks 45 inwardly, carrying with them the vertical arms 36 and the fingers 38 and 39. The camming rods, in moving from their uppermost positions to their lowermost positions, first reach intermediate positions at the bottom of the camming slots 48 and the fingers 38 and 39 engage the sides of the penultimate container of the stack. As the camming rods continue to move downwardly they bear against the camming blocks at the bottom of the slots 48 and thereby force the blocks downwardly. As these camming blocks move downwardly they carry with them the stripping fingers 40 which are attached to the camming blocks and cause them to engage the upper rim edge of the lowermost container of the stack. This engagement causes the container to become disengaged from the stack, if it has not already become disengaged under the force of gravity. In their lowermost positions, the camming rods ride off the shoulders 68, thereby permitting the arms 22 to spread apart under the action of the springs 32 and clear a path for the disengaged container to fall through to the loading wheel 12.

On the upward movement of the camming rods, the shoulders 68 are re-engaged to bring the arms 22 to their innermost positions and the fingers 38 and 39 are retracted thereby permitting the stack to fall incremently and be supported again by engagement of the lowermost container with the fingers 27 whereupon the cycle of operation is repeated.

In the case of containers having different diameters, the movement of the fingers 38 and 39 can be adjusted within the limits of eccentricity of the rod portions 54 by simply turning the knob 59.

Having thus described my invention, I claim:

1. A container feeding device comprising a stationary member having a vertical aperture for the disposition and passage of a nested stack of the containers there-through; a first pair of arms hinged to the member on opposite sides of the aperture; jaws carried by said arms for engaging the bottom container of a nested stack of containers extending through the aperture; a second pair of arms hinged to the member on opposite sides of the stack having jaws for engaging the sides of the penultimate container of the stack projecting above the bottom container; first resiliently yieldable means urging the said first pair of arms outwardly to positions clear of the containers; second resiliently yieldable means urging the said second pair of arms inwardly; means for moving said first arms inwardly to cause the jaws thereof to engage the bottom container of the stack against the action of said first resiliently yieldable means while holding the second pair of arms clear of the stack against the action of the said second resiliently yieldable means and for releasing the said first pair of arms under the action of the first resiliently yieldable means to cause the jaws thereof to engage the said penultimate container with the said second pair of arms and disengage the said first pair of arms from the stack; stripping means slidably attached to the said

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second pair of arms for exerting a downward force against the bottom container of the stack when the said first pair of arms are in the released position and the penultimate container is supported by said second pair of arms; said moving means comprising rods movable in paths adjacent to said arms, and blocks slidably attached to the said second arms, said blocks having slots in which said rods are disposed, said blocks having camming surfaces for engaging said rods, said rods being rotatably mounted along their longitudinal axes and having eccentric portions in camming contact with the blocks to vary the limits of motion of the arms in order to adapt the device to different sizes of containers.

2. A container feeding device as defined by claim 1 and means for rotating the rods relative to the blocks.
3. A container feeding device as defined in claim 1 in

which the rods are rotatably mounted in a reciprocating carrier block each rod having counter-threaded portions, and a transverse shaft having threaded portions engaging the counter-threaded portions of the rods, respectively.

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