Aug. 12, 1941. J. F. PRICE 2,252,201

MACHINE FOR AUTOMATICALLY APPLYING SLIP COVERS TO CONTAINERS

Filed June 22. 1939 5 Sheets-Sheet 1

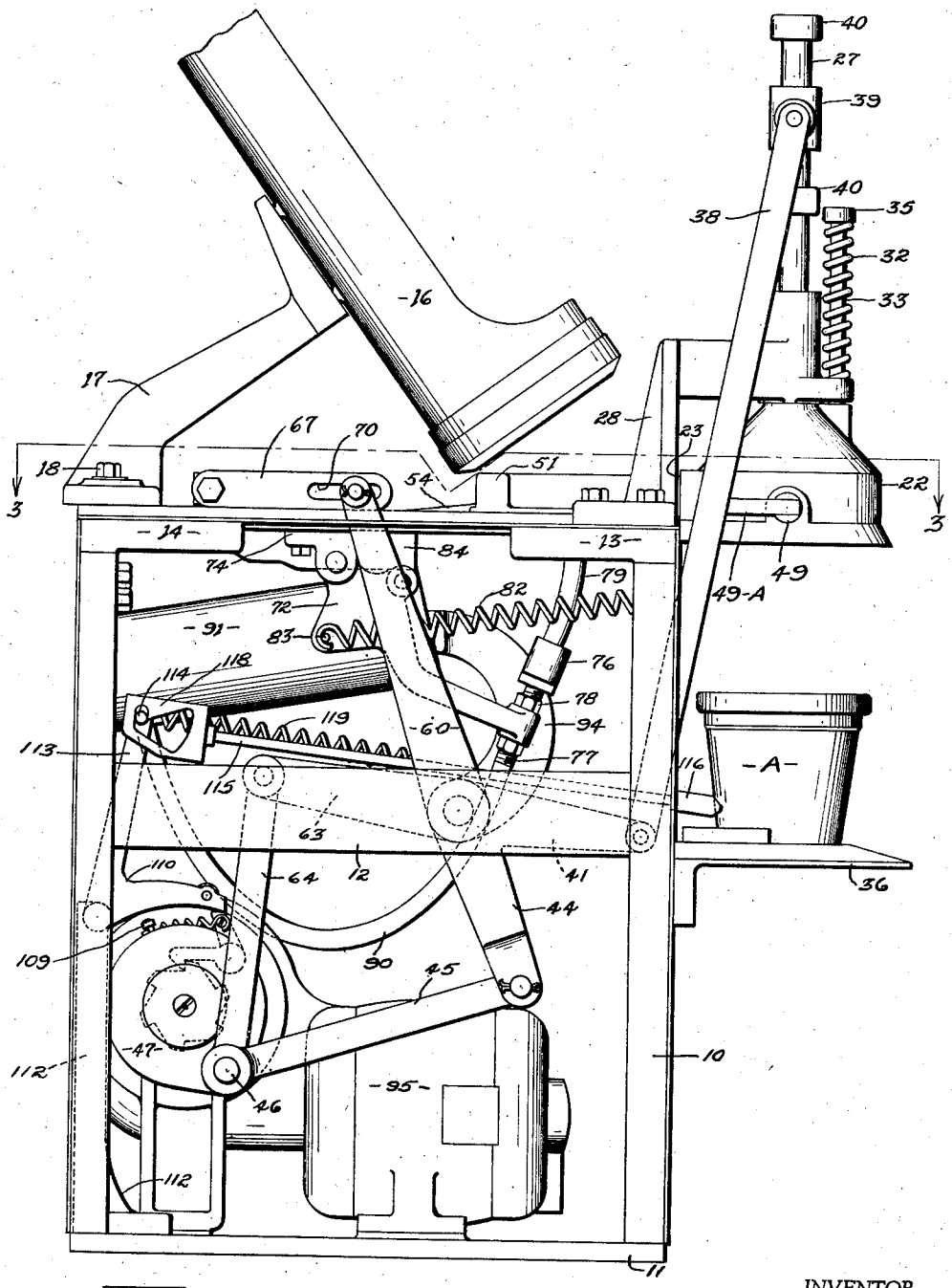

FIG. 1

INVENTOR.
JOHN F. PRICE

BY
Bodell & Thompson
ATTORNEYS

Aug. 12, 1941. J. F. PRICE 2,252,201

MACHINE FOR AUTOMATICALLY APPLYING SLIP COVERS TO CONTAINERS

Filed June 22, 1939 5 Sheets-Sheet 2

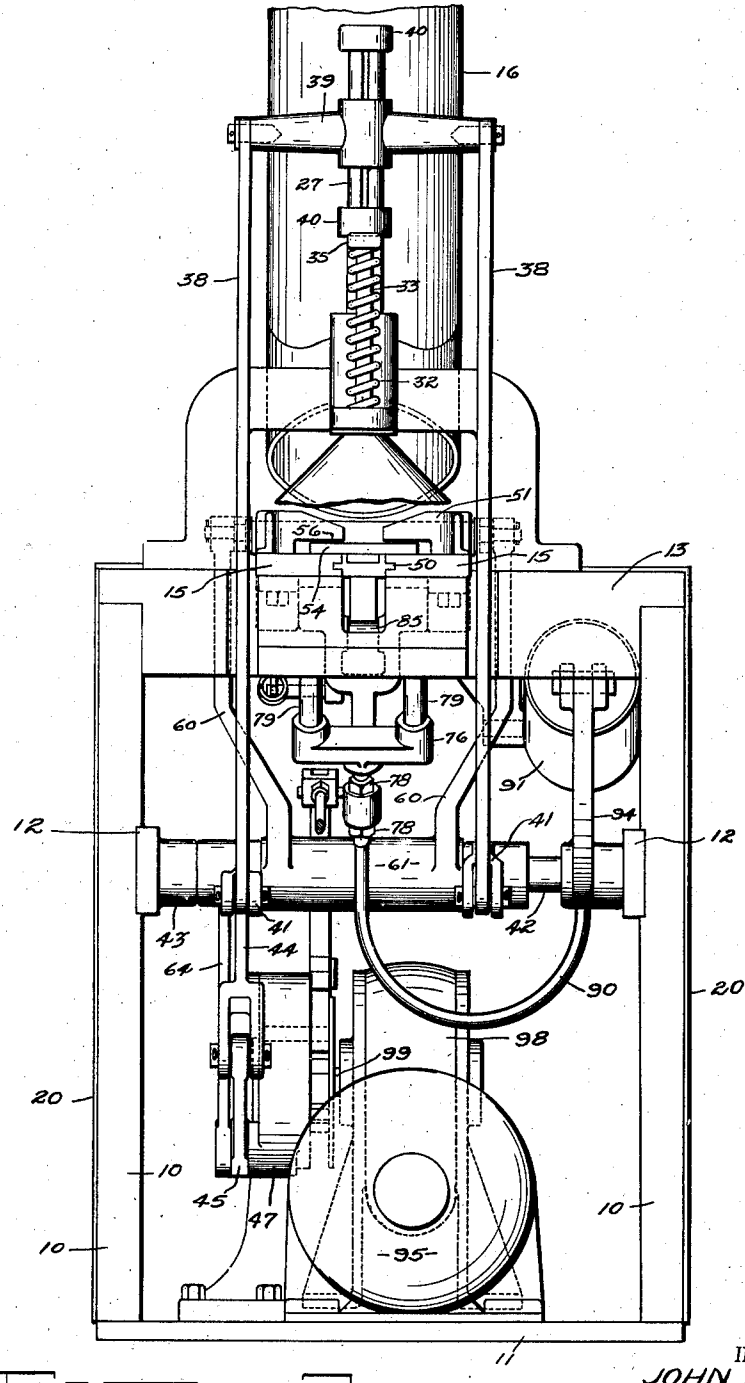

FIG. 2

INVENTOR.
JOHN F. PRICE

BY

Bodell & Thompson
ATTORNEYS.

Aug. 12, 1941. J. F. PRICE 2,252,201

MACHINE FOR AUTOMATICALLY APPLYING SLIP COVERS TO CONTAINERS

Filed June 22, 1939 5 Sheets-Sheet 3

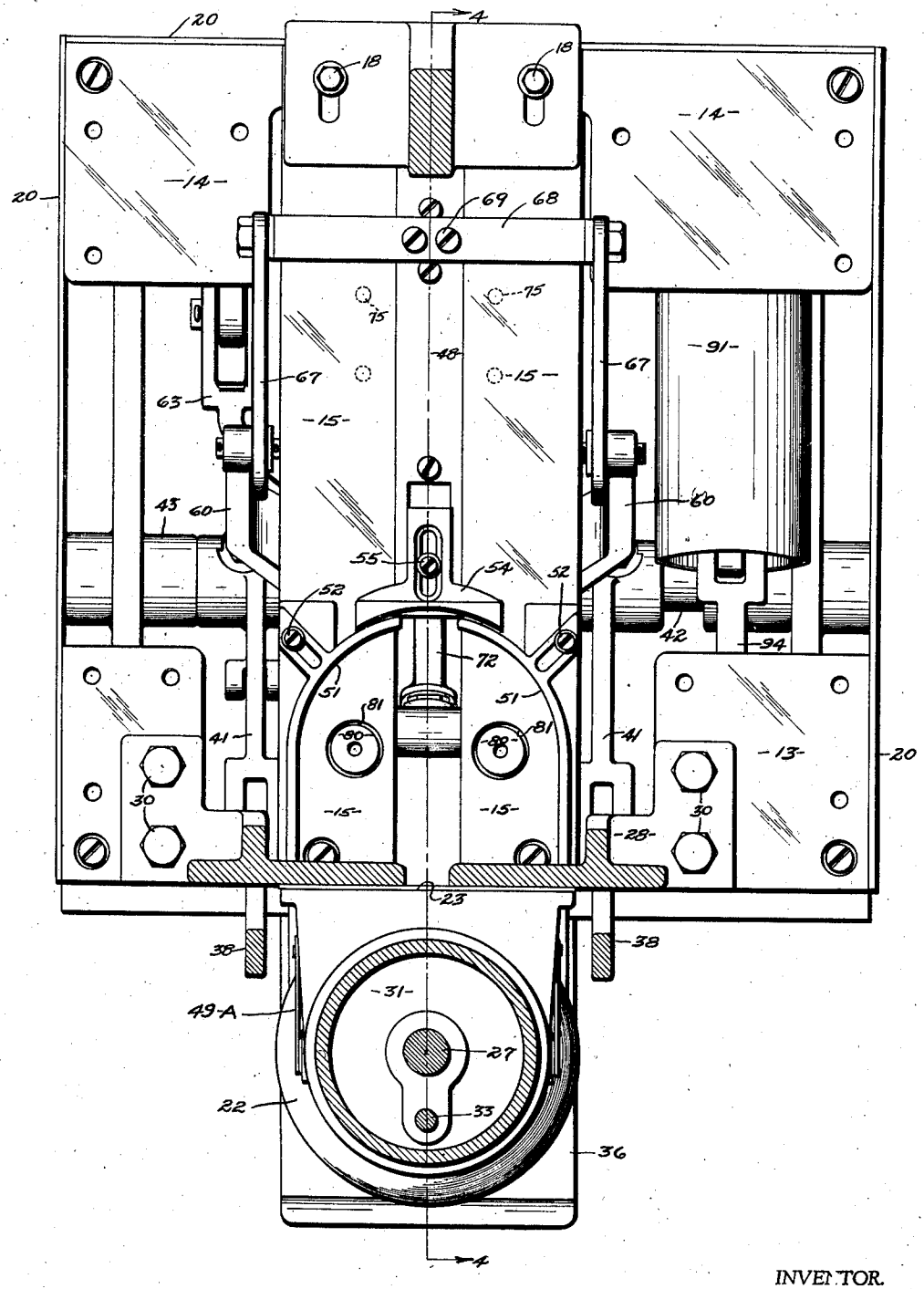

FIG. 3

INVENTOR.
JOHN F. PRICE

BY Bodell & Thompson
ATTORNEYS.

Aug. 12, 1941. J. F. PRICE 2,252,201

MACHINE FOR AUTOMATICALLY APPLYING SLIP COVERS TO CONTAINERS

Filed June 22, 1939 5 Sheets-Sheet 4

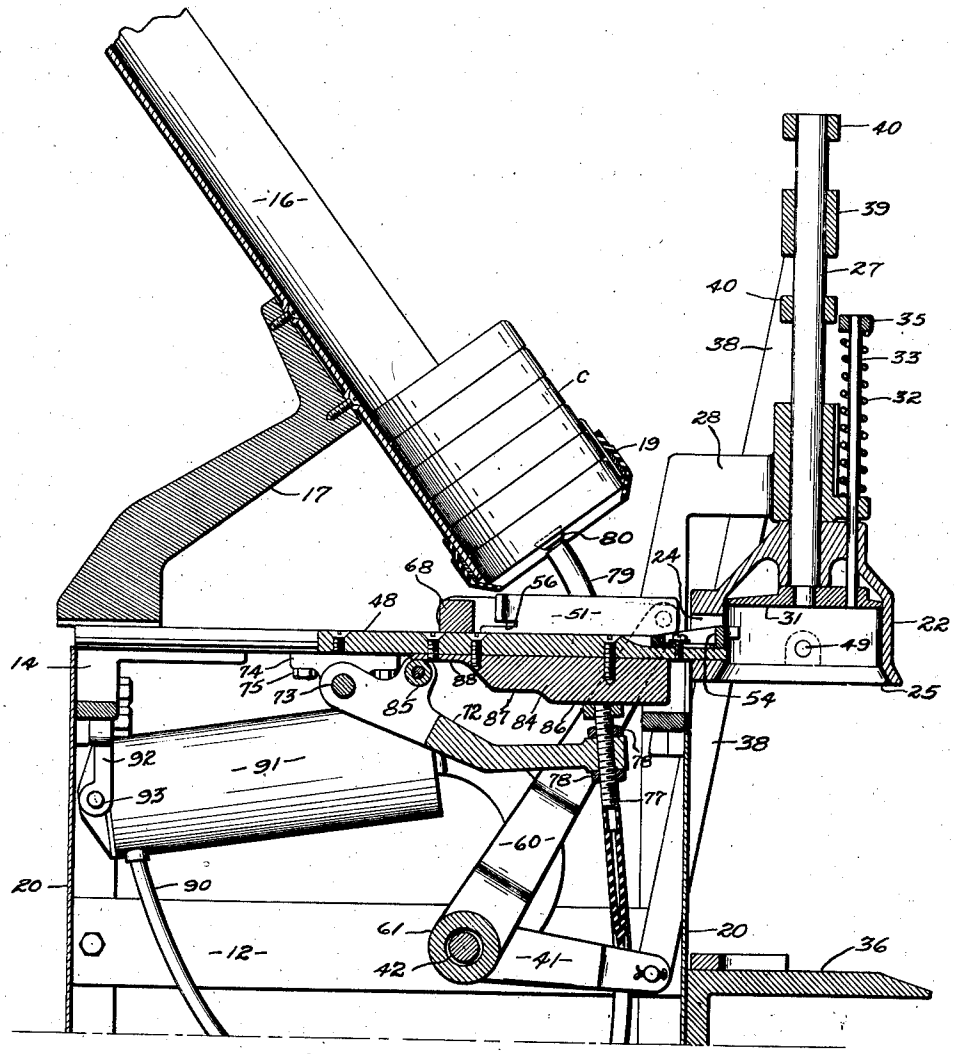

FIG. 4

INVENTOR.
JOHN F. PRICE

BY Bodell & Thompson
ATTORNEYS.

Aug. 12, 1941. J. F. PRICE 2,252,201

MACHINE FOR AUTOMATICALLY APPLYING SLIP COVERS TO CONTAINERS

Filed June 22, 1939 5 Sheets-Sheet 5

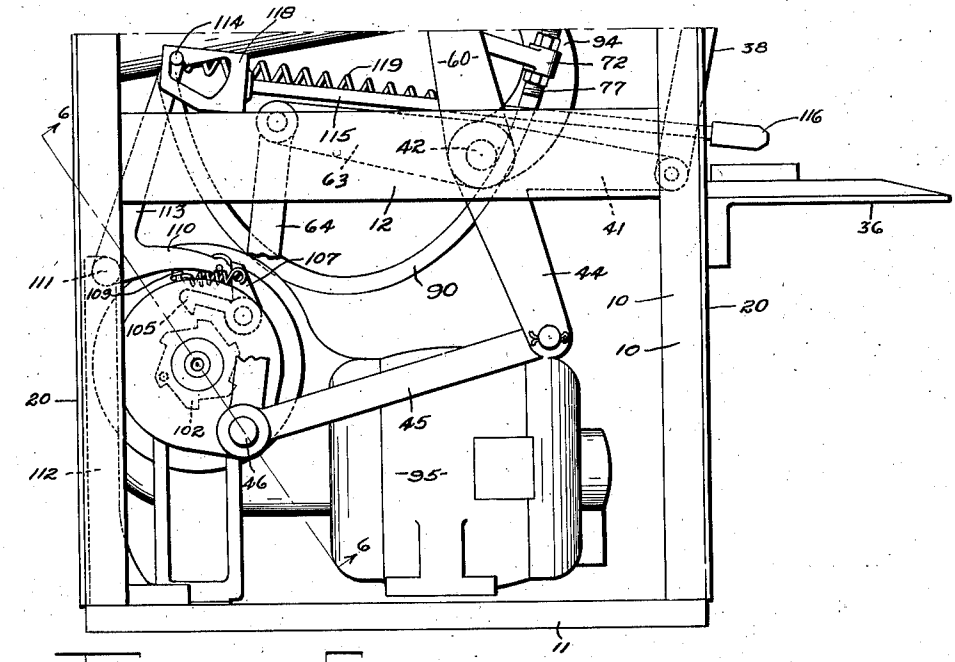

FIG. 5

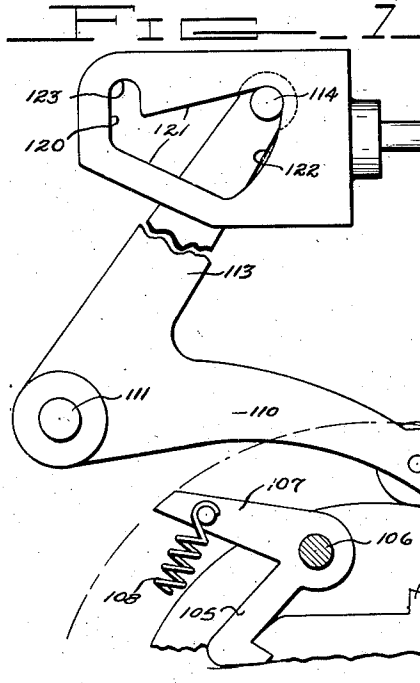

FIG. 7

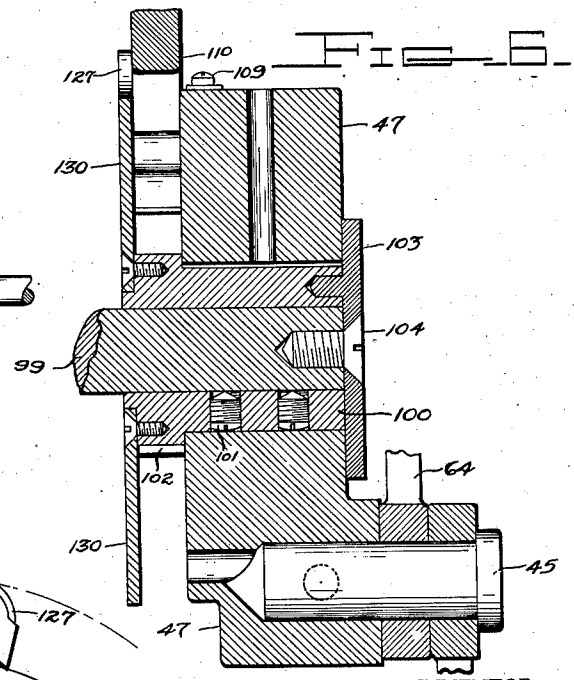

FIG. 6

INVENTOR.
JOHN F. PRICE.

BY

Bodell & Thompson
ATTORNEYS.

Patented Aug. 12, 1941

2,252,201

UNITED STATES PATENT OFFICE

2,252,201

MACHINE FOR AUTOMATICALLY APPLYING SLIP COVERS TO CONTAINERS

John F. Price, Fulton, N. Y., assignor to Oswego Falls Corporation, Fulton, N. Y., a corporation of New York

Application June 22, 1939, Serial No. 280,667

7 Claims. (Cl. 226—80)

This invention relates to a machine for applying slip covers to containers. More particularly, the slip covers consist of a discoidal portion arranged in the filling opening of the container, and a depending cylindrical flange encircling the top of the container. The containers are of cylindrical formation, and the covers and containers are generally formed of fibrous material, such as paperboard.

Containers of the type referred to are used extensively in retail establishments for the packaging of food. For example, many are used in ice-cream parlors for the packaging of ice-cream for home consumption. Heretofore, the slip covers have been applied to the filled containers by hand. The handling of the slip covers by the clerk is objectionable, and the general object of this invention is a machine in which the slip covers may be arranged in stack formation, the machine being operable to automatically apply a slip cover to a container when the container is placed on the container support of the machine.

The invention has as a further object a machine of the type referred to embodying a particularly simple and efficient mechanism for successively transferring the covers from the stack formation and applying them to the containers, the mechanism being automatically operated by power rendering the machine particularly useful for applying covers to a comparatively large number of filled containers within a minimum time.

The invention has as a further object a machine for automatically applying slip covers to containers embodying a construction whereby substantially the entire outer surface of the machine is smooth and free from projections, and may be readily and conveniently cleaned to maintain the machine in a sanitary condition, and which includes mechanism which is operable through one cycle to apply a cover to a container when the latter is placed on the container support of the machine.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a side elevational view of a machine embodying my invention.

Figure 2 is a front elevational view of the machine shown in Figure 1.

Figure 3 is a top plan view of the machine taken on substantially line 3—3, Figure 1.

Figure 4 is a vertical sectional view of the upper portion of the machine taken on line 4—4, Figure 3.

Figure 5 is a side elevational view of the lower portion of the machine illustrating the driving mechanism in normal or disengaged position.

Figure 6 is sectional view of the driving mechanism taken on line 6—6, Figure 5.

Figure 7 is a fragmentary elevational view of the control latch and driving mechanism illustrating the relative position of the parts during operation of the machine.

The machine herein shown, as a preferred embodiment of my invention, includes a frame consisting of four vertically extending corner posts 10 mounted upon a base plate 11, intermediate cross members 12, and front and back top cross members 13, 14. The top portion of the framework is completed by a pair of plates 15 extending in spaced apart relationship from the front and back cross pieces 13, 14. The covers C are arranged in stack formation in a chute 16 carried by a supporting bracket 17 secured to the rear cross piece 14 by screws 18. The chute 16 is arranged in angular relationship to the top of the machine, with the lower end of the chute terminating adjacent the front or forward side of the machine. The covers are yieldingly retained in the chute 16 by a rubber band 19 encircling the lower end of the chute with the lower end of the band contracting to engage the lowermost cover of the stack. The sides and ends of the frame are enclosed by plates 20, the plate being omitted from the left side of the machine in Figure 1, and from the front end of the machine in Figure 2, in order to more clearly show the mechanism of the machine.

The covers C are applied to the containers by a head 22. The head 22 is of general cylindrical formation having a flat side 23 arranged adjacent the front of the machine and provided with a rectangular shaped aperture 24 to permit the covers to be fed from plates 15 into the head. The lower end of the head is provided with a conical bore 25. The head 22 is slidably mounted upon the lower end of a stem 27 which is slidably arranged in a bracket 28 secured to the top of the machine, as by screws 30. A presser pad 31 is secured to the lower end of the stem 27 and is normally maintained against the under side of the top of the head by a helical compression spring 32 encircling a rod 33 which extends through an aperture in the bracket 28,

and is secured at its lower end to the pad 31, and is provided at its upper end with a head 35. The spring 32 acts between the bracket 28 and the head 35 to urge the pad 31 against the top of the head 22 and to urge the head upwardly.

The head 22 is reciprocated vertically toward and from a container support 36 mounted upon the front of the machine. This motion is accomplished by a pair of links 38 pivotally secured at their upper ends to a transversely extending arm 39 provided centrally with a bore to slidably receive the upper end of the stem 27. The movement of the arm 39, relative to the stem 27, is confined by collars 40 secured to the stem. The lower ends of the links 38 are pivotally connected to the ends of arms 41 secured to a shaft 42 journalled in bearings 43 carried by the cross members 12. One of the arms 41, to the left Figure 1, constitutes one leg of a bell crank, the opposite leg 44 being pivotally connected to a link 45 which in turn is pivotally connected to a crank pin 46 carried by the driving disk 47. It will be apparent that upon rotation of the disk 47, the head 22 is moved toward and from the container support 36.

The covers C are successively transferred from the chute 16 onto the plates 15 in juxtaposition to the opening 24 in the head. The covers are then moved into the head by a cover feed member in the nature of a slide or shuttle 48. The covers are yieldingly held in the head by buttons 49 slidably mounted in opposite sides of the head and pressed inwardly as by springs 49a. The slide 48 is arranged between the confronting edges of the plates 15 and is formed with ribs 50 on each side edge, the ribs 50 being arranged to slide in complemental grooves formed in the confronting edges of the plates 15.

A pair of arcuate cover guide and centering members 51 are adjustably secured to the plates 15, as by screws 52, and serve to position the cover in alinement with the opening 24 when the cover is transferred from the stack formation. The slide 48 is provided with a cover pusher 54 adjustably secured to the slide, as by screw 55. The forward end of the pusher member 54 is of arcuate formation to conform to the flange of the slip cover, and the rearwardly extending ends of the guide rails 51 are slotted, as at 56, to permit the pusher member 54 to pass thereunder when the slide is actuated toward the head 22, as illustrated in Figure 4.

The slide 48 is actuated toward and from the head by a pair of links 60 formed with an integral connecting hub 61 rotatably mounted upon the shaft 42 and arranged between the arms 41. The hub 61 is also provided with a rearwardly extending arm 63, to the end of which is pivotally connected a link 64 pivotally secured at its opposite end to the crank pin 46. The upper end of each of the links 60 is pivotally secured to connecting links 67 which, in turn, are pivotally secured to opposite ends of a cross arm 68 secured to the slide 48, as by screws 69. The connection between the links 60 and 67 is such as to provide lost motion between these links, and this is accomplished by the elongated slots 70 in the forward end of links 67. Accordingly, as the disk 47 is rotated, slide 48 is reciprocated in timed relation to the vertical movement of the head 22.

The covers are transferred from the stack formation to the plates 15 within the guide rails 51 by a vacuum transfer member operated in timed relation to the movement of the slide 48. The cover transfer mechanism consists of a lever 72 mounted at one end upon a shaft 73 journalled in bearings 74 secured to the under side of plates 15, as by screws 75. The lever 72 extends forwardly toward the front of the machine. A transversely extending yoke member 76 is mounted upon the forward end of the lever 72 and consists of a centrally arranged depending stem 77 extending through an aperture in the end of the lever 72, and is adjustably secured to the lever by jam nuts 78.

The stem 77 is hollow and connects with a transversely arranged passage in the yoke 76, which connects at each end with an arcuate shaped tube 79. The upper end of each tube 79 is provided with a conical suction cup 80, and the plates 15 are provided with apertures 81 to permit the cups 80 to pass therethrough upon oscillation of the lever 72 about its axis 73.

The lever 72 is urged in a counter-clockwise direction, Figures 1 and 4, about its pivot by tension spring 82 secured to lever 72, as at 83, and at its opposite end to the frame of the machine. The lever 72 is moved in a clockwise direction against the action of the spring 82 by a cam block 84 secured to the under side of slide 48. When the slide 48 is in rearward position, as shown in Figure 1, the roller 85, carried by lever 72, engages the lowermost surface 86 of the cam block 84 and the suction cups 80 are then positioned beneath the surface of plates 15.

As the slide 48 is moved forwardly, the roller 85 passes into engagement with the intermediate cam surface 87, and when the slide 48 has advanced sufficiently to transfer the cover into the head 22, the roller 85 moves into engagement with the cam surface 88, at which time the suction cups 80 are moved into engagement with the lowermost cap of the stack formation. The covers are supported in the chute 16 by the yielding band 19 encircling the lower tubular portion of the chute 16, as previously described.

Upon return movement of the slide 48, the cap is transferred to the plates 15 by roller 85 engaging the intermediate surface 87. When the forward end of the cam surface 87 engages the roller 85, the cap is positioned upon the plates 15 and at this time the pusher member 54 has moved rearwardly between the tubes 79 and with the arcuate portion of the pusher member located just forwardly of said tubes. Thereafter, upon further rearward movement of the slide 48 the lower cam surface 86 engages the roller 85 effecting movement of the vacuum cups out of engagement with the under side of the slip cover and positions them below the surface of the plates 15. At this time, the flange of the slip cover is positioned upon the plates 15 with the pusher member 54 arranged within the flange. As the slide 48 moves rearwardly to the completion of its rearward stroke, the flange of the slip cover rides up the inclined surface of the pusher member until the arcuate portion of the member passes beneath the rear ends of the arcuate guides 51 whereupon the flange of the slip cover drops onto the plates 15. Upon subsequent forward movement of the slide 48, the cover is fed into the head 22.

A flexible tube or hose 90 is connected at one end to the stem 77, and at the opposite end to a vacuum pump cylinder 91. The cylinder 91 is pivotally mounted at its rearward end to a bracket 92, as at 93. A piston is slidably mounted in the cylinder 91 and is actuated by an arcuate arm 94 secured on shaft 42 to the right Figure 2. The arrangement is such that the arm 94 moves the

piston inwardly during forward movement of the slide 48. The piston is moved outwardly, creating a vacuum in the rear end of the cylinder 91, during the return movement of the slide, whereby a suction is established at the cups 80 just prior to their engagement with the lowermost cover of the stack formation, and this vacuum or suction is maintained until the cover is deposited on the plates 15.

The disk 47 is rotated continuously by a motor 95 mounted on the base plate 11. The disk 47 is connected to the motor 95 by a clutch arrangement operable, when a container is placed in capping position on the support 36, to effect one complete revolution of the disk 47.

The motor 95 is connected to a gear reduction 98 having a driven shaft 99. A sleeve 100 is secured to the shaft 99 as by set screws 101. The inner end of the sleeve 100 is formed with a plurality of ratchet teeth 102, and the crank disk 47 is rotatably mounted upon the outer portion of the sleeve 100 and is held from axial movement between the ratchet teeth 102 and a washer 103 secured on the end of the shaft 99 by screw 104. The shaft 99 and sleeve 100 rotate continuously.

The crank disk 47 is operatively connected to the shaft 99, or sleeve 100, by a pawl or latch 105 which is pivotally mounted at 106 on the inner side of the disk 47, and is formed with an arm 107 extending outwardly beyond the periphery of the disk and at substantially right angles to the latch portion of the pawl. The pawl is urged in a counter-clockwise direction, Figure 5, by spring 108, one end of which is secured to the arm 107, and the opposite end to a pin 109 arranged in the periphery of the disk 47. That is, the pawl is urged into engagement with the ratchet teeth 102 by the spring 108. The pawl 105 is normally held out of engagement with the ratchet 102 by arm 110 of an angle lever pivoted at 111 to a bracket 112 mounted on the base plate 11. The other arm 113 of the angle lever extends upwardly and is provided at its end with a transversely extending pin 114. When the angle lever is moved in a counter-clockwise direction about the pivot 111, Figures 1 and 5, the end of the arm 110 is moved upwardly out of engagement with the arm 107 of the pawl, and the pawl is then urged into engagement with the ratchet 102 by spring 108, and the rotary movement of the ratchet is thus imparted to the disk 47.

The angle lever 110, 113 is actuated to release the pawl 105 when a container A is placed in cover receiving position on the support 36. This actuation is effected by a rod 115 extending from the front to the rear of the machine and being provided at its forward end with a container engaging member 116. The rear end of the rod is provided with a yoke member 118 having sides extending on each side of the arm 113, and the sides being provided with an aperture to receive the transversely extending pin 114. The rod 115 is urged forwardly by spring 119 extending from the yoke member 118 to the forward part of the frame of the machine. The aperture in the side walls of the yoke 118 is in the form of a substantially vertically extending slot 120 connecting with an enlarged forwardly extending slot having diverging top and bottom walls 121. The forward wall 122 of the aperture is of arcuate formation.

When the machine is at rest, as shown in Figure 1, the pin 114 is arranged in the recess 123 at the top of the rear slot 122. The arrangement of the rock arm 110, 113, and the formation of the aperture in the yoke 118 is such that when the rod 115 is moved rearwardly by engagement with a container, the rock arm is caused to move in a counter-clockwise direction effecting release of the pawl 105 and at substantially the same instant the pin 114 moves out of the recess 123 into the enlarged portion of the aperture in the yoke. During movement of the pin 114 into the enlarged portion of the aperture in the yoke, spring 108 has urged the pawl into engagement with one of the teeth of the ratchet, the disk 47 has rotated counter-clockwise, Figures 1 and 5, and the end of arm 107 has passed by the forward end of the arm 110. As the pin 114 enters the enlarged portion of the aperture in the yoke 118, the stop lever is permitted to move in a clockwise direction about the pin 111 until a roller 127, carried on the end of arm 110, engages the periphery of a disk 130 secured to the inner end of the sleeve 100. When disk 47, and the pawl secured thereto, have completed one revolution the end of arm 107 engages the end of arm 110, and the pawl 105 is urged out of engagement with the ratchet 102, the arm 110 acting to disconnect the disk 47 from the sleeve 100, and also acting as a positive stop for the disk 47, whereby the operating parts of the machine are stopped at this point regardless of whether the container to which the cover has been applied is removed from the support 36. In other words, the rod 115 may be maintained in shifted position by the presence of a container on the container support 36, but the operating mechanism of the machine can only operate through one cycle.

It will be apparent that the motion transmitting means connecting the motor with the operating mechanism of the machine is particularly advantageous inasmuch as the operator is not required to remove the covered container at any particular instant.

What I claim is:

1. A machine for applying slip covers to containers comprising a frame, a container support, a cover applying head movable from normal position toward and from said container support, means for supporting a plurality of covers in stack formation, a cover feed member slidably mounted in the frame below said stack formation and operable to feed a cover to said head when the latter is in normal position, a cover transfer member movably mounted in the frame and normally positioned below said cover feed member and being operable during forward movement of said cover feed toward said head to move upwardly and engage the lowermost cover in said stack formation, and operable during return movement of said cover feed to transfer to said lowermost cover into juxtaposition to said cover feed member, and motion transmitting means operable to effect movement of said head and said cover feed member in timed relation.

2. A machine for applying slip covers to containers comprising a frame, a container support, a cover applying head movable from normal position toward and from said container support, means for supporting a plurality of covers in stack formation, a cover feed member slidably mounted in the frame below said stack formation and operable to feed a cover to said head when the latter is in normal position, a cover transfer member movably mounted in the frame and normally positioned below said cover feed member, a cam secured to the under side of said cover feed member and being cooperable with said cover transfer member during a reciproca-

tion of said cover feed to move said transfer member upwardly, engage the lowermost cover in said stack formation, and transfer the same in juxtaposition to said cover feed member, and motion transmitting means operable to effect movement of said head and said cover feed member in timed relation.

3. A machine for applying slip covers to containers comprising a suitable frame, a container support, a cover applying head movable vertically from normal position toward and from said container support, means for supporting a plurality of covers in stack formation, a cover feed member reciprocally mounted in the frame below said stack formation and movable toward and from said head when in normal position to feed the covers therein, a lever pivotally mounted in the frame below said cover feed member, a vacuum cup carried by said lever and being normally positioned below said cover feed member, motion transmitting means connecting said lever and said cover feed member and operable during a reciprocation of said feed member to actuate said lever and move said vacuum cup into engagement with the lowermost cover of the stack formation and transfer the same into juxtaposition to said cover feed member, and motion transmitting means operable to effect movement of said head and said cover feed member in timed relation.

4. A machine for applying slip covers to containers comprising a frame, a container support, a cover applying head slidably mounted in the frame and movable from normal position toward and from said container support, means for supporting a plurality of covers in stack formation, a cover feed member slidably mounted in the frame and operable upon movement toward said head to feed a cover into the head, a lever pivotally mounted below said cover feed member, a suction cup carried by said lever and being normally positioned below said cover feed member, a cam block secured to the under side of said cover feed member and being cooperable with said lever to move the same about its pivot and to move said suction cup into engagement with the lowermost cover in said stack formation during movement of said cover feed member toward said head, and to effect movement of said lever to transfer said lowermost cover in juxtaposition to said cover feed member upon return movement of the same, motion transmitting means connecting said cover feed member and said head and being operable to actuate the same in timed relation.

5. A machine for applying slip covers to containers comprising a frame, a container support, means carried by the frame for supporting a plurality of covers in stack formation, a cover support, a cover transfer member movably mounted in the frame and operable when actuated to transfer the lowermost cover of said stack formation to said cover support, a cover applying head mounted in the frame and movable vertically toward and from said container support, said head being normally positioned to receive a cover fed from said cover support, and a cover feed member operable to feed the cover from the cover support to the head, a motor mounted in the frame, motion transmitting means operable through a cycle to effect movement of the cover feed member toward the head and to subsequently move the head toward the container support to apply the cover to a container positioned thereon, means operable to actuate said cover transfer member during return movement of said cover feed member, and clutch means operable upon placement of a container on said container support to connect said motion transmitting means to the motor during one cycle of said means.

6. A machine for applying slip covers to containers comprising a frame, a container support, means carried by the frame for supporting a plurality of covers in stack formation, a cover support, a cover transfer member movably mounted in the frame and operable when actuated to transfer the lowermost cover of said stack formation to said cover support, a cover applying head mounted in the frame and movable vertically toward and from said container support, said head being normally positioned to receive a cover fed from said cover support, and a cover feed member operable to feed the cover from the cover support to the head, a motor mounted in the frame, motion transmitting means operable through a cycle to effect movement of the cover feed member toward the head and to subsequently move the head toward the container support to apply the cover to a container positioned thereon, means operable to actuate said cover transfer member during return movement of said cover feed member, and clutch means operable upon placement of a container on said container support to connect said motion transmitting means to the motor and to automatically disconnect said motion transmitting means from the motor when said means has completed a single cycle.

7. A machine for applying slip covers to containers comprising a frame, a container support, a head slidably mounted in the frame and movable vertically toward and from said support, a cover feed member slidably mounted in the frame toward and from said head and being operable to feed a cover to said head, means for supporting a plurality of covers in stack formation, an annular member carried by said stack supporting means and operable to yieldingly maintain said stack in spaced relation above said cover feed member, a cover transfer member movably mounted in the frame and being operable upon a reciprocation of said cover feed member to transfer a cover from said stack formation to said feed member, and means operable to effect movement of said cover feed member and head in timed relation.

JOHN F. PRICE.

CERTIFICATE OF CORRECTION.

Patent No. 2,252,201. August 12, 1941.

JOHN F. PRICE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 57, claim 1, strike out the word "to" first occurrence; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of October, A. D. 1941.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.