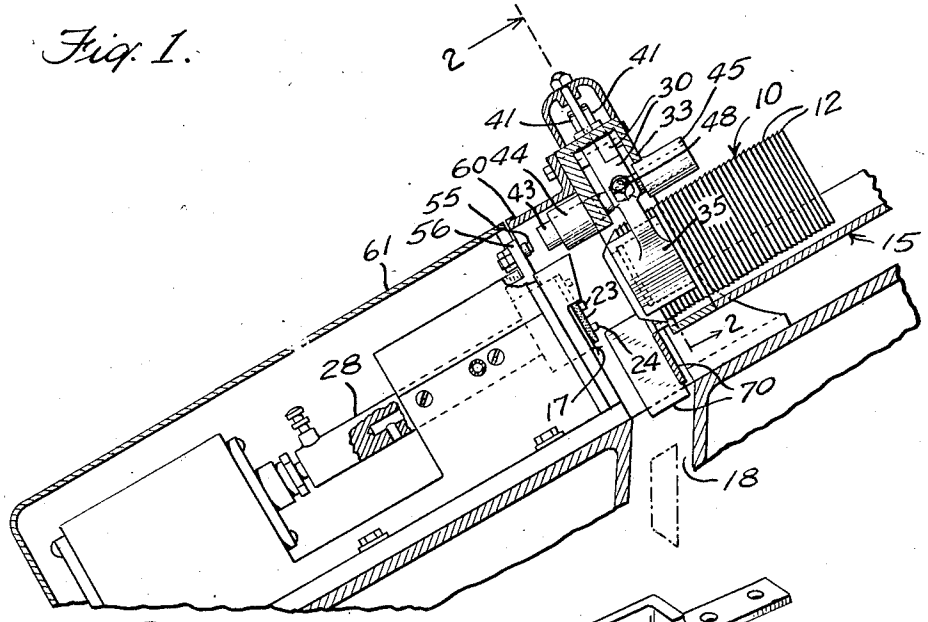
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CAP DELIVERY MEANS

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Fig. 1.



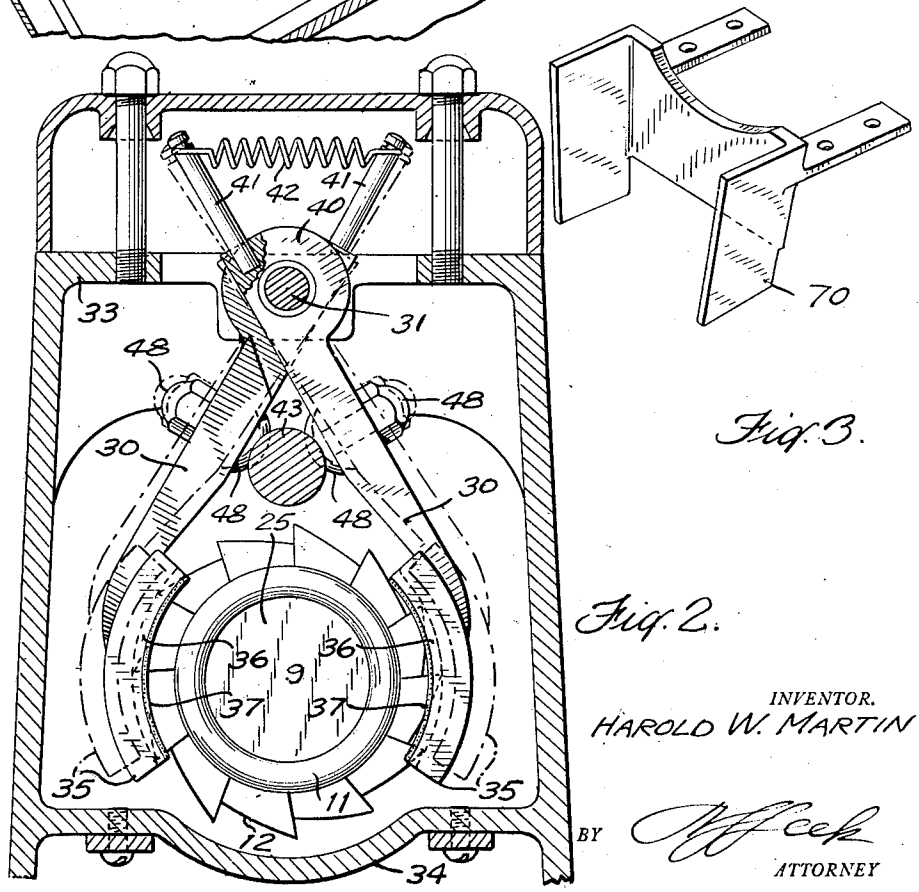


Fig. 3.

Fig. 2.

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Fig. 5.

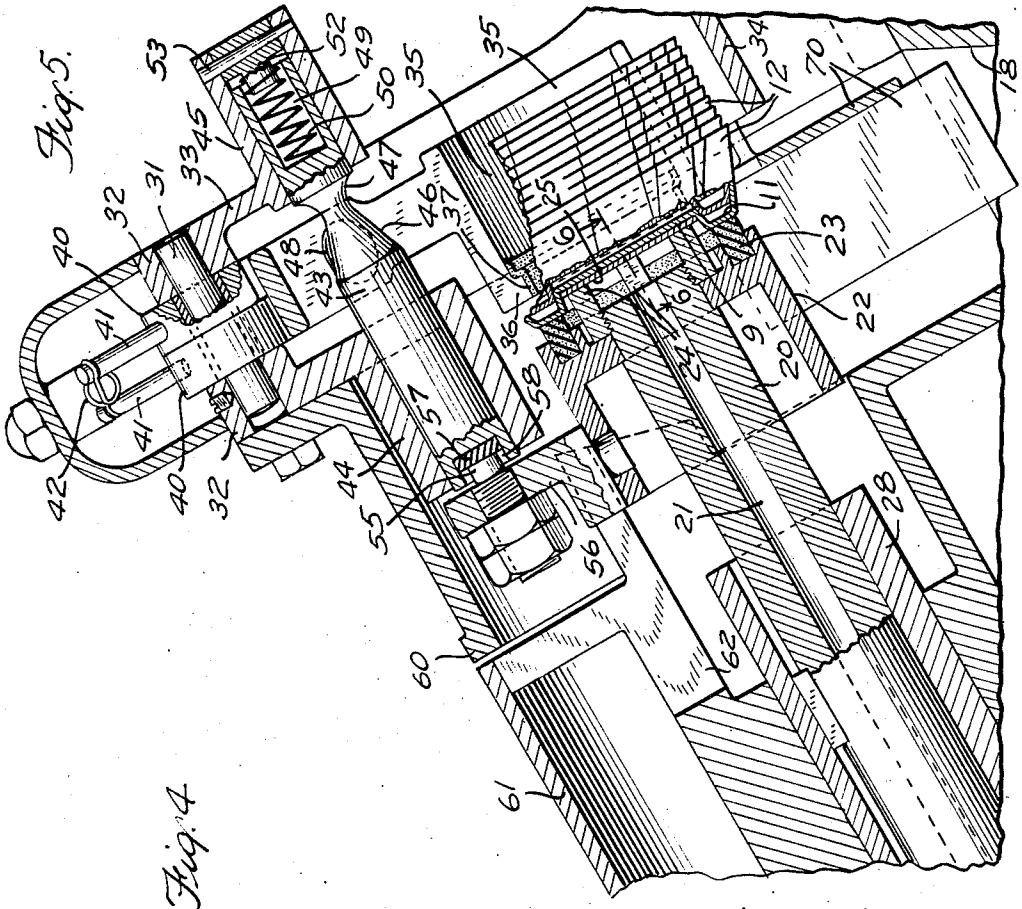


Fig. 4

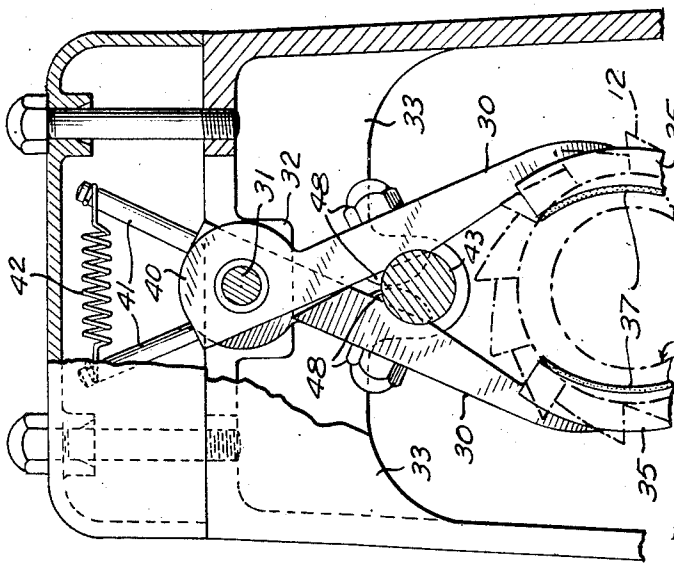
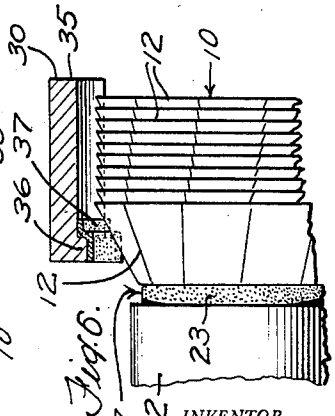


Fig. 6.



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2,788,155

CAP DELIVERY MEANS

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Application April 29, 1953, Serial No. 351,869

1 Claim. (Cl. 221—211)

This invention relates to the feeding of preformed hood caps from a stack and more particularly to a mouthpiece for a cap magazine.

An object of the invention is to provide a mouthpiece having novel and improved characteristics.

Another object is to provide a mouthpiece which cooperates with the picker to insure dependable feed of the caps from the magazine.

Another object is to provide a mouthpiece which is effective with caps of different sizes so that adjustment or replacement is unnecessary when changing from one cap size to another.

Another object is to provide a mouthpiece which accommodates itself automatically to minor variations in size in the individual caps in the stack.

Other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

The nature of the invention will be better understood from the following description, taken in connection with the accompanying drawings, in which a specific embodiment has been shown for purposes of illustration.

In the drawings:

Fig. 1 is a broken side elevation of the forward end of a cap magazine embodying the invention;

Fig. 2 is a section taken on the line 2—2 of Fig. 1, but on a larger scale, showing the gripping arms in partly open position;

Fig. 3 is a detail view of the guide plate for guiding the caps into the conveyor chute;

Fig. 4 is a section similar to Fig. 2 showing the arms in closed position to retain the caps in the magazine;

Fig. 5 is a vertical longitudinal section through the cap magazine and picker mechanism; and

Fig. 6 is a section taken on the line 6—6 of Fig. 5.

Referring to the drawings more in detail, the invention is shown as applied to a bottle capping machine of the type disclosed more in detail in Mackin et al., Patent No. 2,563,654, dated August 7, 1951, which includes a cap magazine 15 carrying a stack 10 of nested, preformed hood caps having a central diaphragm 9 to seat within the bore of a milk bottle, a pouring lip housing 11 to extend over the pouring lip of the bottle, and a pleated flaring skirt 12 carrying a thermoplastic adhesive for heat sealing around the neck of the bottle.

The stack 10 of caps is carried in magazine 15 which is inclined for feeding the caps by gravity and terminates in a mouthpiece which grips the leading caps and cooperates with a picker 17 for feeding the caps in succession to a chute 18 which conveys them through a heating zone to a capping station where they are applied to the mouths of advancing milk bottles. This machine is of standard construction as described in detail in said Patent No. 2,563,654 and only so much thereof is shown herein as is necessary to an understanding of this invention.

The leading caps are picked from the stack by a suction picker 17 comprising a plunger 20 having a bore 21 through which suction is applied, and a head 22 having a resilient ring 23 adapted to seat on the pouring lip

housing 11 to effect a seal and having fingers 24 to engage the disc 25 seated on the diaphragm 9 and thus prevent the disc from pulling out of the cap or otherwise distorting the cap. The plunger 20 is mounted to reciprocate in a housing 28 and suction is controlled in timed relationship to the operation of the plunger by a control mechanism not shown.

In accordance with the present invention, the mouthpiece comprises a pair of arms 30 which are pivoted about a common shaft 31 held in bosses 32 in a bracket 33 carried by the frame 34 of the cap magazine 15. Each arm 30 is formed at its lower end with a segmental clamp 35 having at its forward end an inner arcuate flange 36 which may be lined with a soft material 37, such as rubber. The segmental clamps are disposed to grip the opposite sides of the cap skirts 12 of the leading caps in the magazine 15 while the flanges 36 grip the smaller diameter portion of the leading cap near its pouring lip housing 11. The clamps 35 and flanges 36 thus form an adjustable mouthpiece for holding the caps in the magazine 15 until they are removed by the picker mechanism.

Each arm 30 is mounted on a hub 40 which is journalled on the shaft 31 and carries an upwardly extending pin 41. A tension spring 42 extends between the pins 41 to cause the clamps 35 to exert the required grip on the cap skirts.

In order to release the clamps to permit the withdrawal of the leading cap by the picker and also to center the clamps, a plunger 43 is provided which is mounted to slide in sleeves 44 and 45 carried by the bracket 33 and having tapered surfaces 46 and 47 positioned to be engaged by studs 48 on the arms 30. The rearward end of the plunger 43 is formed with a chamber 49 in which a spring 50 is seated. The spring 50 is held by a head 52 and pin 53 in the sleeve 45 and is adapted to urge the plunger 43 forwardly so as to keep the rear tapered surface 47 in contact with the studs 48 so as to center the clamps without exerting sufficient pressure to open the clamps or release the grip thereof on the cap skirts.

In order to release the grip of the clamps for the withdrawal of a cap, a pin 55 is provided which is carried in an arm 56 attached to the suction head 22 and reciprocating with the plunger 20. The pin 55 strikes a soft washer 57 held in a recess 58 in the forward end of the plunger 43 and is adusted to advance the plunger so that the tapered surface 46, acting as a cam against the studs 48, opens the clamps to release the grip on the caps, as seen in Figs. 3 and 5.

The arm 56 is covered by a shield 60 attached to the bracket 33 and by a shield 61 attached to the housing 28 having a slot 62 in which the arm 56 reciprocates.

A guide plate 70 (Fig. 3) is attached to the magazine 15 adjacent the feed chute 18 to guide the caps thereto as they drop from the picker and ensure that the caps reach the chute in proper position to feed therealong to the capping station.

In the operation of this device, the clamps 35 normally grip and hold the leading caps centered with respect to the picker head. When the head advances into engagement with the leading cap, the pin 55 engages and advances the plunger 43 to spread the arms 30 and release the grip of the clamps 35 on the cap skirts. The leading cap is at this time supported by the suction head of the picker and the weight of the stack against the picker head ensures a firm grip thereby.

When the picker head begins to retract and pull the leading cap through the clamps 35, the plunger 43 is retracted with the suction head and is withdrawn from the studs 48 to allow the clamps 35 again to engage and grip the cap skirts. Since the leading cap is being with-

drawn with the picker head, the clamps 35 close in back of the leading cap and hold the remainder of the stack as before. The spring 50 then exerts sufficient pressure to bring the tapered surface 47 into contact with the studs 48 and center the clamps 35.

Since the clamps 35 are spring pressed into gripping position, it is evident that they accommodate themselves automatically to different sizes of caps and also cooperate with the picker to feed caps which have minor variations in size in a single stack.

I claim:

A machine for feeding nested preformed hood caps having a central bottle closure portion and flaring pleated skirts, which comprises a magazine to contain a stack of said nested caps, picker means adapted to advance and retract to withdraw successively the leading caps from said magazine, a mouthpiece at the leading end of said magazine comprising a pair of clamp members mounted to engage and grip opposite sides of the leading cap in said magazine to hold the same in position to be withdrawn by said picker means, a pair of pivoted arms mounting said clamp members for oscillating closing and opening movement toward and away from each other for gripping and releasing said cap, means pivotally mounting said arms for oscillation about a common axis, spring means yieldingly biasing said arms toward each other, said arms having a pair of opposed cam followers, a reciprocal plunger disposed between said cam followers, said plunger having a pair of opposed oppositely flaring cam surfaces with a connecting surface therebetween, one of said cam surfaces being adapted to engage said cam followers when said plunger is advanced to thereby open said arms and said clamp members for releasing the leading cap in said stack, and the other of said cam

surfaces being adapted to engage said cam followers when said plunger is returned to thereby center said clamp members with respect to said stack, said connecting surface being of such size as to provide a clearance between said cam followers to thereby permit said clamp members to engage and clamp caps in said stack, a member carried by said picker means and adapted to engage and advance said plunger to cause one of said cam surfaces to actuate said cam followers to separate said arms for causing said clamp members to release said leading cap, and other spring means for returning said plunger independently of the movement of said picker means to first withdraw said one of said cam surfaces from said cam followers to permit said clamp members to be closed by said spring means to thereby grip said caps and to then move the other of said cam surfaces into engagement with said cam followers to center said arms and clamp members with respect to said stack, said other spring means being so constructed and arranged as to exert less force than said spring means whereby said other spring means cannot effect the opening of said clamp members against the closing bias of said spring means.

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