July 30, 1929. W. J. PEELLE 1,722,763

MEANS FOR OPERATING ON JAR COVERS

Filed June 7, 1926 4 Sheets-Sheet 1

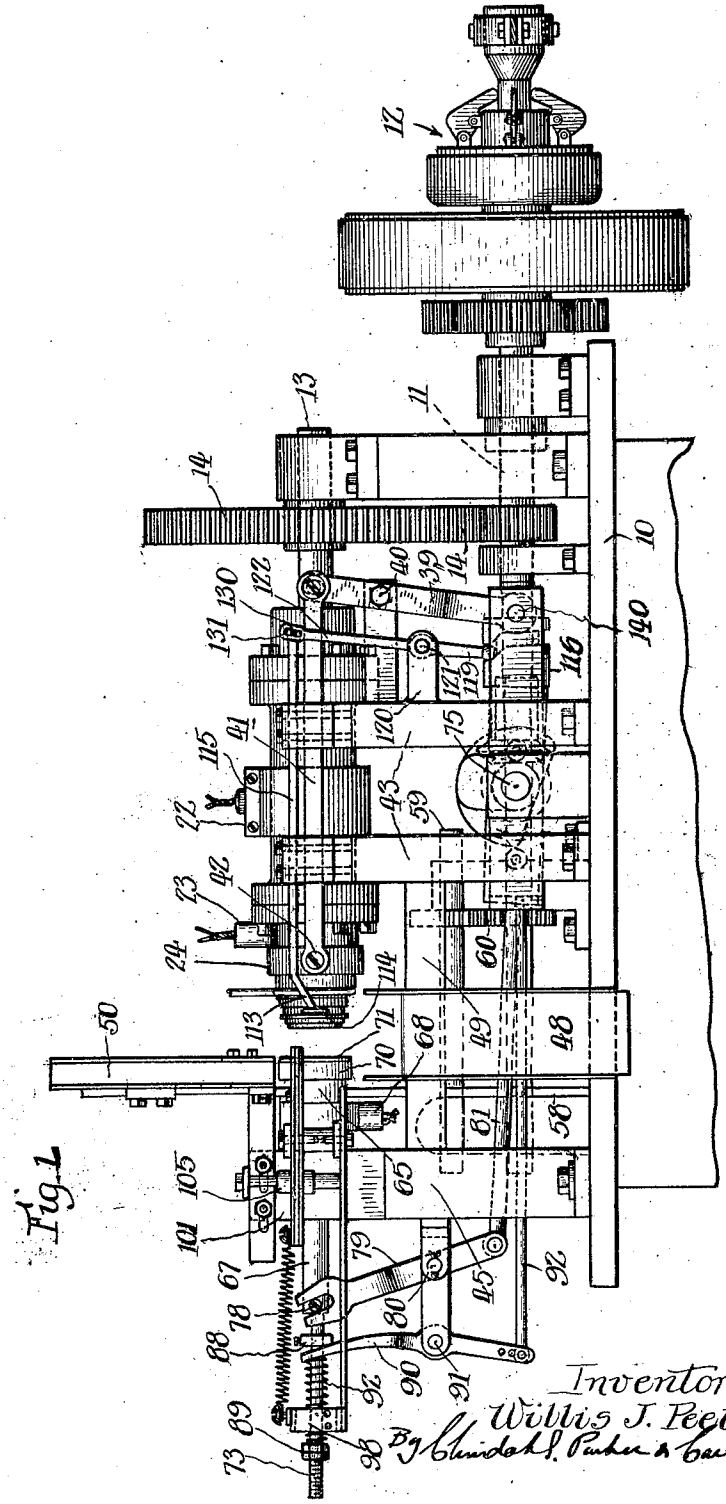


Fig. 1

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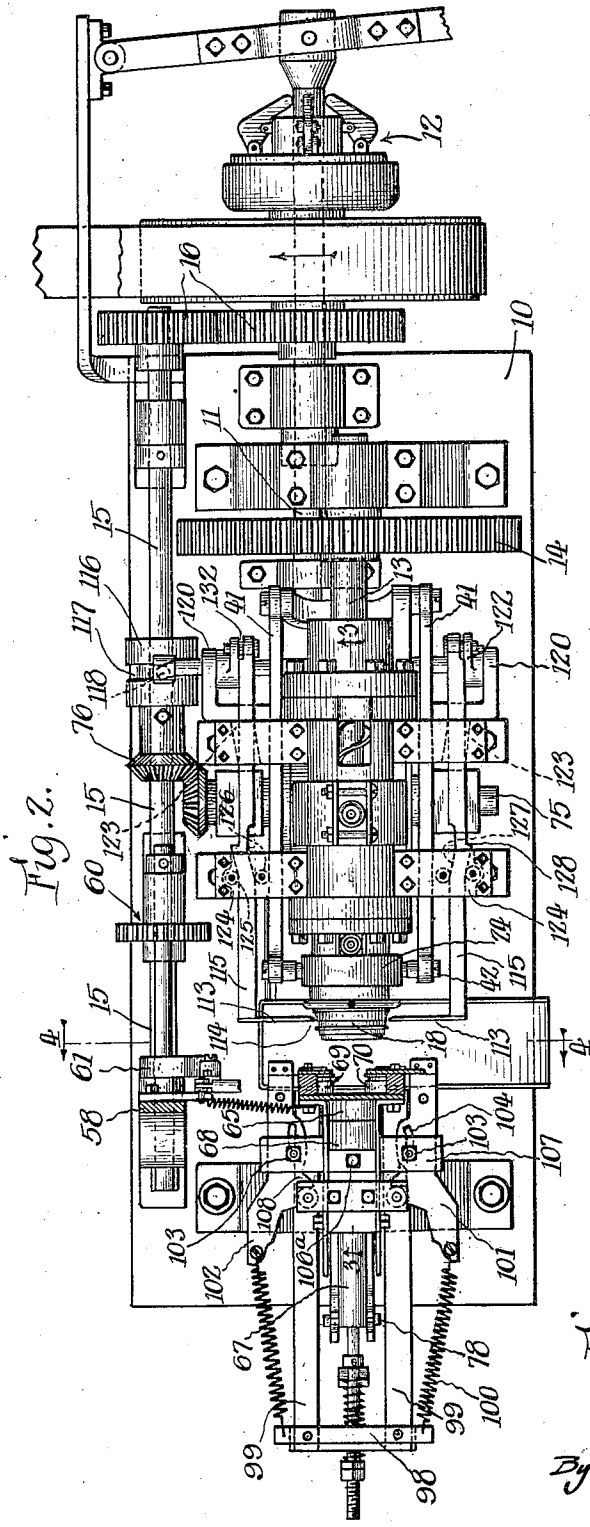


Fig. 2.

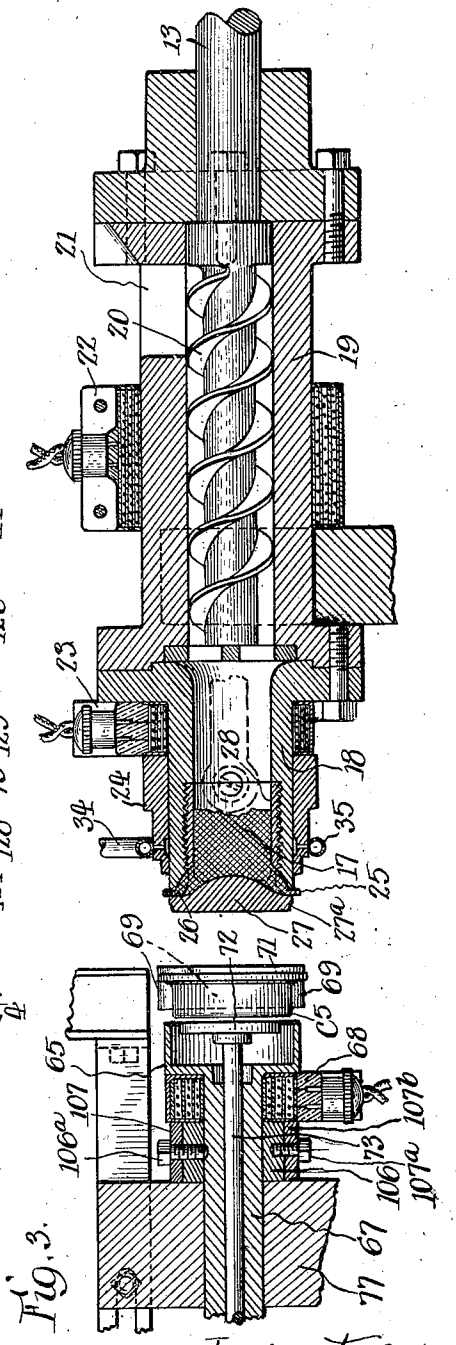


Fig. 3.

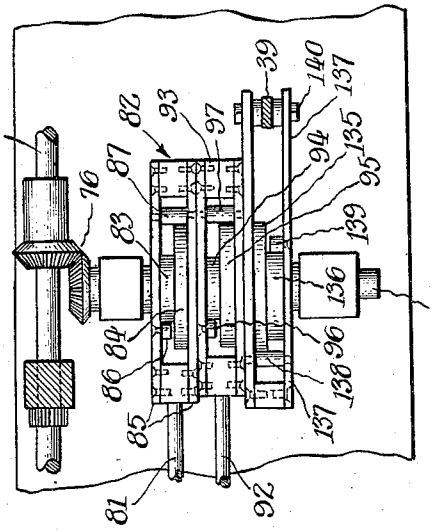
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Fig. 5.



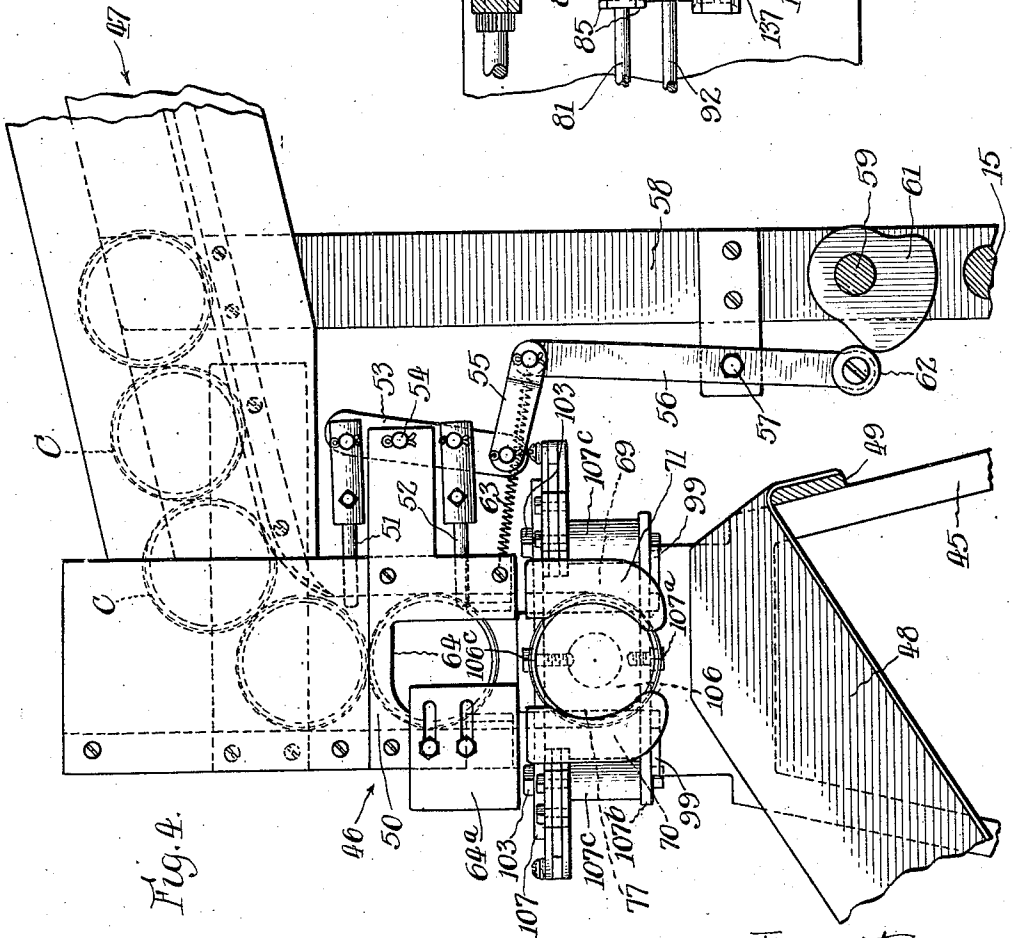


Fig. 4.

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Fig. 6.

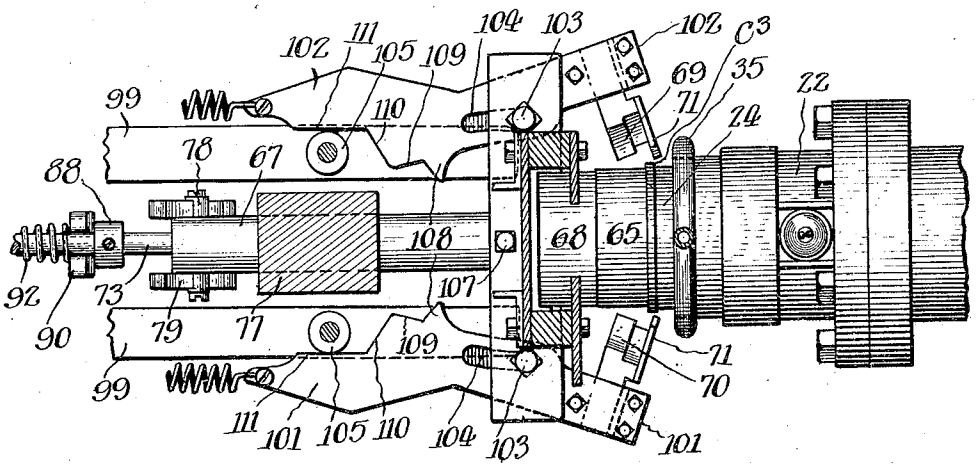


Fig. 7.

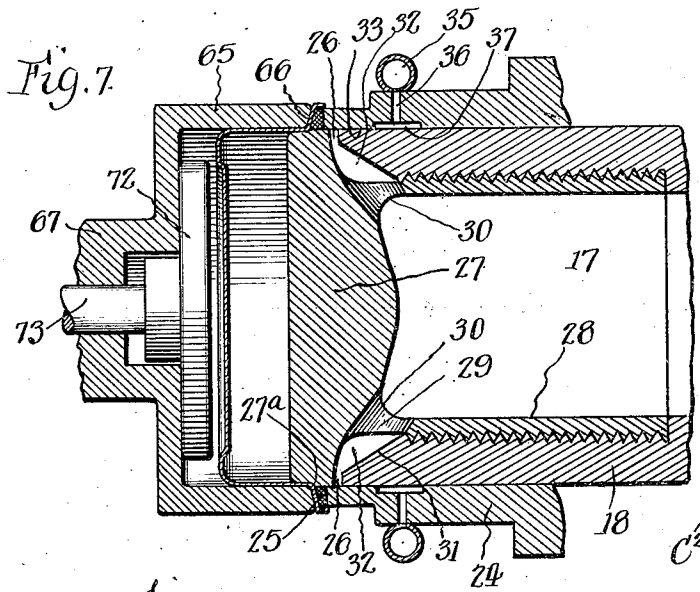


Fig. 9.

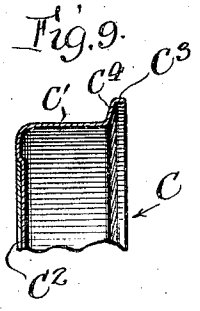


Fig. 10.

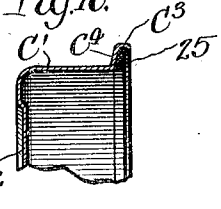
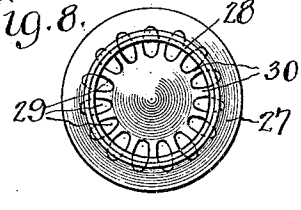


Fig. 8.



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Patented July 30, 1929. 1,722,763

UNITED STATES PATENT OFFICE.

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MEANS FOR OPERATING ON JAR COVERS.

Application filed June 7, 1926. Serial No. 114,224.

This invention relates to machines for operating on jar covers or caps and particularly to a machine which not only applies plastic rings or gaskets to caps already formed, but also to a machine which simultaneously forms the ring to be so applied to the cap.

The general object of the invention is to provide automatic feeding mechanism for the caps and means to present the caps singly to a gasket applying device.

Another object is to provide mechanism for timing the operations of the machine to render it wholly automatic.

Still another object is to provide means for effectually removing the finished caps from the gasket applying means of the machine.

A further object is to provide a machine of the character described which forms plastic gasket rings by extrusion, and further to provide a construction for the extruding dies which permits of an association therewith of a shearing sleeve.

A further object of the invention is to provide a die core for the extruder which is so constructed that it is rigidly positioned with respect to the remainder of the die, and further so constructed that it provides an annular extrusion slot capable of emitting a uniform annular ring of plastic material.

In the accompanying drawings there is shown an exemplary embodiment of the invention which is capable of accomplishing the foregoing objects, and of attaining ancillary advantages.

In the drawings

Figure 1 is a front elevation of the machine.

Fig. 2 is a plan view of the machine.

Fig. 3 is an enlarged longitudinal section of part of the machine taken on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged view showing in elevation the cap supplying and feeding mechanism as viewed from the plane of line 4—4 of Fig. 3.

Fig. 5 is a detail view of a transverse cam shaft located centrally of the machine.

Fig. 6 is an enlarged plan view of the cap presenting mechanism showing the same in a position different from that shown in Fig. 2.

Fig. 7 is an enlarged view of the plastic ring extruding device showing in detail the structure of the die.

Fig. 8 is an end view of the die core viewed from the right hand side of Fig. 7.

Figs. 9 and 10 are fragmentary sectional views of the cap respectively showing the same without and with a plastic ring.

It is to be understood that the machine shown in the drawings and the following description thereof are not to be construed as limiting the invention to the precise disclosure. The machine itself and various parts thereof are susceptible to such various modifications and such various rearrangements and alternative constructions as fall within the scope of the appended claims.

Generally the machine comprises a cap presenting head and a plastic ring extruding mechanism together with suitable motion-controlling mechanisms for rendering the machine automatic.

The cap presenting head is fed with caps in a rapid succession as from a hopper, the feeding of each cap being timed in the operation of the machine. The ring extruding mechanism comprises a magazine for plastic material with means for feeding it therefrom in an annular ring and with shearing means for removing the ring. Cooperating parts are employed on the cap presenting head and the ring-extruder for placing the ring in the cap, and other means are employed for positively removing the finished cap from the machine.

The machine has a base 10 upon which is mounted a belt driven power shaft 11 controlled through a clutch 12. Two countershafts are driven by the main shaft 11, there being a shaft 13 for the ring extruder connected by reducing gears 14 to the shaft 11, and also a shaft 15 used in part for the cap presenting mechanism and driven at a higher speed through gears 16.

The ring extruding device (Fig. 7) is one which presents an annular slot or groove in a cylindrical surface. A two-part construction is employed for the device and the arrangement is such that a true cylindrical surface is formed by the two parts on either side of the slot to permit the use of a cylindrical shearing sleeve to remove the ring. A rubber composition is the preferred plastic material for extrusion to form rings and when using rubber a heated magazine 17 is

provided within a hollow cylinder 18. The cylinder 18 is associated endwise with a rubber feeding device comprising in the present instance a coaxial cylinder or sleeve 19 (Fig. 3) containing a feed screw 20 driven by the shaft 13. Sleeve 19 at the far end has an opening 21 therein through which rubber strips can be fed to fill the magazine. Annular electric heaters 22 and 23 are provided for heating the sleeve 19 and the magazine 17, respectively.

A shearing sleeve 24 (Figs. 3 and 7) slides over the magazine cylinder 18 to shear therefrom a ring of rubber 25 (Fig. 3) extruded through a slot 26 in the projecting end of the cylinder 18. This region of the cylinder is considered as a die and the end of the cylinder as a die core, the periphery of which most desirably is a cylindrical surface precisely coextensive with the cylinder 18. In order that this relation may obtain in such a way as to maintain the surfaces of the two die parts precisely coextensive cylindrically, and yet to provide the required annular slot 26 for uniformly extruding a rubber ring from a hollow magazine, the following construction is provided. A removable die core having a cylindrical head 27 and a threaded sleeve 28 is screwed into the end of the magazine sleeve 18. The threaded parts are arranged for being interthreaded to a limiting position so as to leave a predetermined width for the slot 26. The sleeve 28, near the head 27 but at some distance from the slot, is perforated annularly with a closely related series of holes 29 (Figs. 7 and 8) leaving supporting webs 30 which alone serve to carry the head 27 in rigid association with the magazine cylinder 18.

The end of the cylinder 18 is cut away inwardly as at 31 forming an annular chamber 32 radially within the slot 26. The holes 29 are large and the radial flow capacity of the holes and of the annular chamber is greater than the flow capacity of the slot 26 in order to permit amalgamation of the plastic material into an annular form after it has been divided by the webs 30 in passing through the holes. In Fig. 7 the shearing sleeve 24 is shown as having passed the slot and as having sheared a ring 25.

Since the inner surface of the sleeve 24 is exposed in part to the rubber remaining in the extrusion slot, a lubricant is provided to prevent sticking of the rubber to the sleeve. The lubricant is preferably a film of water which is emitted from the bearing space 33, the water being supplied from a pipe 34 to a tubular ring or collar 35 wherefrom it is discharged through ports 36 into an internal channel 37 on the inner side of the shearing sleeve. The shearing sleeve is moved longitudinally by a yoke or lever 39 (Fig. 1) pivoted at 40 and arranged to be actuated by cam means, as hereinafter set forth. Parallel links 41 connect the upper ends of the yoke or lever 39 with pins 42 provided on the shearing sleeve.

In the present instance the ring-extruder just described is fixed to the base 10 on supports 43 and the cap which is to receive the ring is moved to it by the cap-presenter. The parts are so arranged that the cap adheres to the ring-extruder, on withdrawal of the cap-presenting means and it is thereafter knocked or picked off by means later to be described.

The cap presenter is mounted on a support 45 on which is superposed a cap feeding device 46 (Fig. 4) associated with a cap supplier in the form of an inclined runway or chute 47. A discharge runway 48 is likewise secured to the base on a lateral bar 49 between the two supports 43 and 45. The cap feeder is preferably a gravity operated device having a positively operated and time controlled escapement mechanism to release the caps singly. The supplied caps C roll from chute 47 into a vertical chute 50 into the side of which project two stop pins 51 and 52 pivoted to a bar 53 oscillating about a center 54 intermediate the two pins. A link 55 connects bar 53 to a cam controlled lever 56 pivoted at 57 on a support 58. Two shafts bear in support 58, one being the before mentioned shaft 15 and the other being a shaft 59 connected by gearing 60 (Figs. 1 and 2) to shaft 15. A cam 61 on shaft 59 operates on lever 56 through a roller 62 against a spring 63 which serves to draw lever 56 toward the chute. The free action of the spring tends to move the lower pin 52 into a position to retain the lowermost cap in the chute. Movement of the lever 56 by the cam so as to withdraw the lower pin 52 permits one cap to drop, the upper pin 51 entering the chute to retain the succeeding cap, which is then dropped onto the releasing pin 52 when pin 51 is withdrawn. The open face of chute 50 at the end is recessed as shown at 64 and a slidable plate 64^a covers a portion of the recess permitting ready access to the chute should a cap become lodged therein.

Beneath the chute there is a pocket-forming device to receive the released cap, to hold it, and then to carry it forwardly for receiving the ring which has been extruded and sheared as above described. In the present instance the type of cap operated upon by the machine is designated C (Figs. 9 and 10). It has a cylindrical body portion C^1, a dished back C^2 and a peripherally enlarged rim or edge C^3, and an angular flange C^4 presenting an annular ledge to receive the plastic ring 25.

The carrying means for moving the cap toward the ring-extruder is preferably a cup receiver 65 fitting neatly over the cap body C^1. It is provided with a bias edge 66 which is complementary to the cap ledge C^4 in

order to permit compressing together the sheared ring 25 and the cap ledge C^4 between the end of the shearing sleeve 24 and the cup rim 66. Cup 65 is mounted on a slidable stem 67 about which there is a ring heater 68 to keep the cup hot. The cup is capable of retraction away from a position directly under the chute, so that the cap may drop in front of it from the chute. The cap falls into a receiving member comprising hooked fingers 69 and 70 (Figs. 4 and 6), each shaped to conform with the outer periphery of the cap and having a front retaining flange 71. Within the cup 65 there is a plate 72 movable from the top to the bottom of the cup and carried on a shaft 73 slidable within the cup stem 67. The plate 72 is capable of motion forwardly in the cup so that it may lie flush with the rim 66 thereof (Fig. 3). When the cup is retracted prior to receiving a dropped cap the plate is flush with the cup rim 66 (Fig. 3). Thus the flanges 71, fingers 69 and 70, and plate 72 define a terminal extension space or pocket below the chute 50 which definitely positions the dropped cap so that it may be properly picked up and advanced. It will be noted (Fig. 3) that the fingers 69 and 70 are narrower than the width of the cap body C^4, so that the cup may be moved over the closed end of the cap while still held by the fingers.

A cap lying in this terminal space or pocket is picked up on motion of the cup toward the right (Fig. 3), the plate 72 remaining at first substantially stationary and then yielding. The cap end C^5 thus enters the cup for a sufficient depth to hold it firmly positioned in the cup, after which the fingers 69 and 70 may be withdrawn to the position shown in Fig. 6. Thereafter the cup is free to be moved wholly to enclose the cap as shown in Figs. 6 and 7, the plate 72 being moved or forced to the bottom of the cup.

The mechanism employed in the present instance to accomplish these manipulative movements includes a transverse cam shaft 75 (Figs. 1 and 5) located under the ring-extruder and driven by bevel gears 76 from the shaft 15. The gears 76 should have the same ratio as gears 60 so that shafts 75 and 59 operate at the same speed. The ratio illustrated is unity.

The cup-carrying stem 67 (Figs. 1, 2 and 6) slides in a block 77 and at its rear end has diametrical pins 78 engaged by a slotted bifurcated lever 79 which is pivoted at 80. The lever 79 is positively operated by a link 81 (Figs. 1 and 5) carrying a block 82 (Fig. 5) acted upon by cam means comprising rigid cam plates 83 and 84 on the cam shaft 75. The block 82 in the present instance comprises spaced plates 85 enclosing the two cams and carrying cam rollers 86 and 87.

The slidable rod or stem 73 (Fig. 1) of the cup facing plate 72 projects from the slide 67 and carries a set collar 88 and locked nut 89. A forked lever 90 with a fixed pivot 91 positively moves the rod to the right (Fig. 1) and impositively moves it to the left through a spring 92 between the forked lever and the nuts 89. The spring permits the cup to advance the plate 72 and stem 73 as the cup carries the cap to receive the ring. The spring also forces the plate 72 to move to the bottom of the cup upon the movement of the lever 90 out of engagement with the collar 88. When the cup is holding the cap upon the die, the plate 72 can be made positively to hold the cap on the die while the cup is being retracted. In this way the cap is positively removed from the cup. The lever 90 is operated by structure similar to that which operates lever 79, these parts including a link 92, cam block 93 with cams 94 and 95, and rollers 96 and 97.

The cap-receiving flanged fingers 69 are operated by mechanism which causes them to move outwardly after they are advanced, and after the cap enters the cup, thus releasing the cap for complete insertion into the cup and exposing the opening of the cap to the die core 27. At the left end of the machine (Figs. 1 and 2) there is a fixed member or cross bar 98 supported by longitudinal bars 99. To the fixed member are anchored springs 100 which tend to draw movable arms 101 and 102 inwardly of the machine and to the left by an angular pull. The movable arms 101 and 102 (Figs. 2 and 6) are herein built up of three layers of material and each at one end carries one of the cap-receiving fingers 69 and 70 between the two outer layers. The arms are pivoted intermediate the ends on carried bolts 103, which enter arcuate slots 104 in the arms. Rollers 105 are mounted on the longitudinal supporting bars 99 for acting on cam surfaces of the arms 101 and 102 to move the arms in the desired directions. The pivot bolts 103 are mounted to move with the cup. The construction herein provided for so moving the pivot bolts 103 with the cup comprises a block 106 (Fig. 3) carried on the cup stem 67.

The block 106 is secured to the stem by a bolt 106^a on the upper side of the block, which bolt also secures a transverse strap 107 to the block. On the under side of the block a similar construction is employed, the bolt 107^a securing thereto a transverse strap 107^b. The lower strap 107^b slides on the rear supporting bars 99 (Fig. 4). Each of the straps 107 and 107^b extends laterally beyond the block 106, and at the ends the bolts 103 pass through them. Spacing blocks 107^c are provided on the bolt shanks to act as lower bearing surfaces for the movable arms 101 and 102, the upper strap 107 being the upper bearing surface.

Each pivot bolt 103 normally lies (Fig. 2) at the left end of the slot 104, the arms being held against rearward motion by limiting lugs 108 (Figs. 2 and 6) abutting the rollers

105. As the cup moves forward from the position shown in Fig. 2, the fingers 69 and 70 do not follow it but they move inwardly slightly to grasp and center the cap tightly for entry into the cup 65. The grasping of the cap is effected by the engagement of the bolts with the convex sides of the arcuate slots 104. When the fingers 69 and 70 move forwardly by engagement of the cup rim therewith, they draw arms 101 and 102 forwardly, and a cam edge 109 of each arm rides on its roller 105. The cam edge 109 at this time is parallel to the general direction of forward motion of the arm. The cam edge is then broken by a set back portion 110 so that the springs 100 pulling inwardly and backwardly on the arms, cause them to turn about their pivots until each roller 105 strikes another edge 111 (Fig. 6). The turning of the arms is sufficient to free the cap from the fingers 69 and 70 and also to cause the flanges 71 to clear the enlarged rim C^3 of the cap. The fingers are now free from the pushing influence of the cap and the springs 100 then draw the arms rearwardly to the limit of the slots 104 as shown in Fig. 6. The return of the pivot bolts 103 with the return of the cup 65 permits such return movement of the arms 101 and 102 under influence of the springs 100. The edge 110 is so arranged that on return motion (to left in Fig. 2) of each arm, it cams the fingers again into closed position (Fig. 2). The length of slots 104 is such that the cap, sticking to the die core 27, is cleared before the fingers begin to close.

In order to provide for removing the cap from the ring-extruder a timed mechanical means is employed which removes it after the cap-presenting means has been withdrawn. The device comprises knock-off fingers 113 having arcuate tips 114 which move inwardly toward the cylinder 18 after the withdrawal of the shearing sleeve 24, and which also move longitudinally of the cylinder to push the cap from the die. The fingers 113 are mounted on movable arms 115, the motions of which are cam controlled. The main cam controlling means for this mechanism is in the present instance a barrel cam 116 which has a continuous cam slot 117 therein. Because an even ratio is used between shafts 75, 59 and 15, the barrel cam 116 may be placed on shaft 15. A cam roller 118 on a lever or crank arm 119 rides in the cam slot for operating the knock-off fingers 113. The base of the machine has horizontal brackets 120 spaced apart in which is pivoted on axes 121 a yoke member 122 of which 119 is a lever arm. The ends of the yoke are pivoted loosely and universally to the arms 115, which are flat and which are controlled to move laterally as they move longitudinally.

Each arm 115 being flat is mounted in two guides 123 and 124 (Fig. 2) which provide special recesses to permit longitudinal and horizontal motion of the arms. The right hand guide 123 is in the form of an angular slot of greater width than the bar 115, the relation being such that the bar or arm 115 can move both longitudinally and angularly therein to move the fingers 114 inwardly toward the cylinder 18. The guide 124 comprises a recess defined laterally by two rollers 125 and 126 spaced apart the width of the arm. One side of the arm is recessed at 127 and the other side has a complementary cam lug 128 so that motion of the bar longitudinally between the rollers cams the bar to move laterally thereby to carry the fingers 114 at its one end inwardly at an angle corresponding to the angles of the cam lug 128. This motion of the arm 115 moves the other end which is connected to the yoke 122 outwardly. For this reason the pivot joint of said arm and said yoke comprises a pivot pin 130 fixed in the arm 115, a slot 131 in the yoke slightly wider than the pivot, and a clearance space 132 between the arm and yoke.

The shearing sleeve 24 and the fingers 114 move alternately with respect to each other in timed relation, the sleeve being substantially fully withdrawn before the fingers move inwardly.

The means serving to operate the shearing sleeve 24 is also cam controlled and is associated with the transverse cam shaft 75 (Fig. 5). The shaft 75 has in addition to the four cams above described two other cams 135 and 136, with which is associated a cam block 137 having rollers 138 and 139, these parts being similar to the structure which operates the cap-presenting mechanism. The lever 39 above described is pivoted to the cam block 137 at 140 (Figs. 1 and 5).

The operation of the various parts of the machine has been explained in the above description. However, the operation in general is as follows: A supply of caps is provided for the runway 47 from which they drop one by one through chute 50 into the terminal receiving space defined laterally by the hooked clamping fingers 69 and 70 and facially by the flanges 71 and the cup plate 72. A single cap so received below the chute 50 is firmly grasped by the fingers 69 and 70 and the cup behind the cap moves forwardly partly to enclose the cap. The cup moves the cap and also the fingers forwardly. Thereupon the fingers are withdrawn sidewise, and the cap within the cup advances further toward and onto the die center 27 of the rubber ring-extruder. As the cup presses the cap onto the die, the cup plate 72 is positively actuated to hold the cap on the die and it remains stationary as the cup is withdrawn, thus removing the cap from the cup. In the advancing movement, upon moving laterally away from the cap the fingers 69 and 70 are stationed so that upon withdrawal of the cup 65 from the cap, the return-

ing fingers readily clear the cap, which is at this time pressed onto the die core 27 by the plate 72. Prior to the cap being placed on the die core a ring 25 of plastic rubber is extruded from slot 26 and sheared off by the sleeve 24. The placing of the cap on the die center and the forward motion of the shearing sleeve are so timed that the end of the shearing sleeve and the rim of the cup position and clamp the extruded ring into the flange of the cap to which it adheres because of its hot plastic condition and because of the clamping pressure employed. The cam 135 on shaft 75 effects the withdrawal of the shearing sleeve 24 and immediately following this the barrel cam 116 on shaft 15 causes the knockoff fingers 114 to move angularly toward the cylinder 18 so as to engage behind the flange C^3 of the cap and thereby remove it positively from the die center, the cap therefore drops and rolls down the runway 48 away from the machine. During this operation the cup 65 is retracted past the end of the chute 50, and the fingers 69 and 70 are again closed and positioned beneath the chute 50. The plate 72 within the cup 65 is held forward in the cup positively by the lever 90 acting upon the collar 88. The terminal receiving space or pocket is thus again completed to receive the succeeding cap. With the second cap received in this space the cup again moves forward and the operation is repeated.

It will thus be seen that the present machine provides a series of automatically timed devices which cooperate together to feed caps. to form rubber rings or gaskets therefor and to insert the ring in the cap all in rapid succession.

I claim as my invention:

1. In a machine having a relatively movable cap presenting member and a gasket applying means arranged to press a plastic gasket into a jar cap, an automatically operable cap feeding mechanism supplying caps to said presenting member comprising, in combination, means located to receive a cap and adapted to hold it for forcible engagement by in front of the cap presenter, feeding means automatically operable to release caps singly into said receiving means, said receiving means and cap presenter being initially spaced apart in axial alinement and arranged for relative motion toward each other to permit the cap to be engaged by the cap presenter, and means adapted to disengage the cap receiving means whereby to expose the cap for presentation to the gasket applying means.

2. A machine for operating upon jar caps in order to place a ring gasket therein comprising, in combination, a mechanically controlled device operative to supply caps singly, gasket forming means adapted to extrude a ring gasket for presentation to a cap, other means adapted to forcibly engage a cap held within said supplying device, and automatic mechanism operable to cause said cap engaging means and said gasket forming means to approach each other for inserting the ring gasket in the cap.

3. A machine for inserting a ring gasket in jar caps comprising, in combination, means adapted to contain a supply of caps, an escapement mechanism operable to release the caps one at a time, a receiving device for a released cap, a cap presenting device arranged to engage and to position the cap and movable to carry the cap away from the receiving device, a plastic ring extrusion device including an annularly slotted cylinder providing a die and a shearing sleeve slidable over said die, means operable to move the cap presenter and shearing sleeve relatively axially toward each other for placing a sheared ring against a part of the cap for adherence to said cap, and operable further to compress said gasket and cap together between said cap presenter and said shearing sleeve, and means operable positively to remove the gasket retaining cap from said compressing members.

4. A machine for inserting a ring gasket in jar caps comprising, in combination, means adapted to contain a supply of caps, an escapement mechanism operable to release the caps one at a time, a receiving device for a released cap, a cap presenting device arranged to engage and to position the cap and movable to carry the cap away from the receiving device, a plastic ring extrusion device including an annularly slotted cylinder providing a die and a shearing sleeve slidable over said die, and means operable to move the cap presenter and shearing sleeve relatively axially toward each other for placing a sheared ring against a part of the cap for adherence to said cap, and operable further to compress said gasket and cap together between said cap presenter and said shearing sleeve.

5. In a machine of the character described, in combination, mechanically controlled means arranged to discharge a succession of caps, receiving means for a discharged cap comprising edgewise and axial supports for the cap, a cup constructed to receive the cap by partial enclosure thereof endwise, an axially movable support in and movable relatively to the cup, and means operable to move the cup to enclose the cap and to move the supports constituting the receiving means so as to expose the cap for inserting a gasket therein against said cup.

6. In a device of the character described, a cap feeding mechanism comprising, in combination, a pair of hooked flanged fingers arranged to receive and to hold a released cap, a cup positioned adjacent said fingers and arranged to move in upon said cap to engage and support the cap, means operable to move said cup and to carry said fingers with the cup, and mechanism associated with said fin-

gers operable to open them for releasing the cup to expose the same for placing a gasket therein.

7. In a machine of the character described, in combination, mechanically controlled means for discharging a succession of caps, receiving means for a discharged cap, supporting means for said cap other than said receiving means, said supporting means serving to hold the cap to present the open side thereof, said receiving means and said supporting means being relatively movable to effect a relative transfer of the cap from the receiving means to the supporting means, and other means relatively to move the receiving means and the supporting means to permit exposure of the opening of the cap for receiving a gasket therein.

8. In a device of the class described, means adapted to receive a cap discharged thereinto comprising, in combination, two retaining members which receive and hold the discharged cap and which are capable of a separating movement to release the cap, arms carrying said fingers, said arms being pivoted on similarly movable pivots passing through slots in said arms, spring means tending to move the arms longitudinally in one direction and to turn the arms about the pivots to open the fingers, and cam means arranged first to limit the longitudinal motion of the arms by said springs, second, to permit longitudinal advance of the arms and fingers against said spring for a predetermined distance, and, third, to permit opening of said fingers on motion past said predetermined distance, said slots permitting retraction of said arms by said spring means in the open position of the fingers, and said cam means closing said fingers on retraction of the arms.

9. In a device of the class described, means adapted to receive a cap discharged thereinto comprising, in combination, two retaining members which receive and hold a cap and which are capable of a separating movement to release the cap, arms carrying said fingers, said arms being pivoted on similarly movable pivots, spring means tending to move the arms longitudinally in one direction and to turn the arms above the pivots to open the fingers, and cam means arranged first, to limit the longitudinal motion of said arms by said spring means, second, to permit longitudinal advance of the arms and fingers against said spring for a predetermined distance, and, third, to permit opening of said fingers on motion past said predetermined distance.

10. In a device of the character described, in combination, a plastic ring extrusion die, means to place a cap upon the die for applying a plastic ring to the cap, said means being capable of withdrawing from the die to leave the cap positioned on the die, and other means to remove the cap from the die.

11. In a device of the character described, in combination, a plastic ring extrusion die, means to place a cap upon said die for applying a plastic ring thereto, said means being capable of withdrawing from the die to leave the cap positioned on the die, and mechanically operated means to push the cap off the die.

12. In a device of the class described, a knock-off device for removing a cap from a die comprising means movable longitudinally of the die and also movable simultaneously longitudinally and radially of the die to engage the rim of a cap for removing the cap from the die.

13. In a device of the character described, in combination, a die adapted to have a cap placed on the end thereof for receiving a plastic ring extruded from said die, a knock-off device including an arm alongside the die, means to move said arm longitudinally of the die, means to move said arm laterally toward and away from the die, and a knock-off tip on said arm, said two means cooperating to cause said tip to lodge behind a cap remaining on the die and positively to remove the cap from the die.

14. An automatic machine for applying rings to jar caps comprising, in combination, a plastic ring applying device, a cap holding device positioned in front of said ring applying device, means to move said parts relatively to each other to apply a ring to a cap, and means to feed caps to said cap-holding device in timed relation to its operation by said first means.

15. An automatic machine for applying rings to jar caps comprising, in combination, a plastic ring forming die, a cap holding device positioned in front of said die, means to move said parts relatively to each other to apply a ring to a cap, means to feed said caps to said cap holding device in timed relation to its operation by said first means, and means to remove said cap from said relatively movable parts after application of the plastic ring.

16. A machine for applying gaskets to jar caps comprising, in combination, a die adapted to extrude a ring of plastic adhesive material, means for positioning a cap in axial alinement with and opening toward the die, a member axially alined with said die but positioned on the opposite side of the cap, means operable to effect relative axial movement between said member and said die to apply the gasket to the cap, said die having associated therewith a shear operating in such relative movement to sever the gasket, and means for removing the cap together with its gasket from the die.

17. A machine for applying gaskets to jar caps comprising, in combination, a die adapted to extrude a ring of plastic adhesive material, means for positioning a cap in axial alinement with and opening toward the die,

a member axially alined with said die but positioned on the opposite side of the cap, and means operable to effect relative axial movement between said member and said die to apply the gasket to the cap, said die having associated therewith a shear operating in such relative movement to sever the gasket.

18. A machine for applying gaskets of raw rubber or the like to a metallic jar cap comprising, in combination, a gasket-extruding die, a member axially alined with and reciprocable toward and from said die, means for positioning a cap between said member and said die when in separated relation, and means for reciprocating the member to carry said cap into operative relation to the die whereby to effect the application of a gasket to the cap and thereupon to withdraw from holding relation with the cap.

19. A machine for applying gaskets of raw rubber or the like to a metallic jar cap comprising, in combination, a gasket-extruding die, a member axially alined with and reciprocable toward and from said die, means for positioning a cap between said member and said die when in separated relation, means for reciprocating the member to carry said cap into operative relation to the die whereby to effect the application of a gasket to the cap and thereupon to withdraw from holding relation with the cap, and means for positively removing the cap with its gasket from said die.

20. An apparatus of the character described having, in combination, means for forming plastic gaskets for jar covers and the like, means adapted to successively supply covers singly, a pocket-forming means to receive a released cover, a second means movable in a direction axially of the cover to present it to the gasket-forming means, said second means being adapted to grip and position said cover while held by said pocket-forming means, and means to disengage said pocket-forming means from the cap at a predetermined point in such axial movement of said second means.

21. A machine for applying gaskets to jar caps comprising, in combination, a die adapted to extrude a ring of plastic adhesive material, means for supporting a cap in axial alinement with and opening toward the die, said means comprising a pair of pocket-forming members movable radially of the cap, a member axially alined with said die but positioned on the opposite side of the cap supported by said members, means operable to effect relative axial movement between said member and said die to apply the gasket to the cap, and means operable in such movement of said member to effect radial movement of the pocket-forming members to clear said axially movable member.

22. A machine for applying gaskets to jar caps comprising, in combination, a die adapted to extrude a ring of plastic adhesive material, an annular member disposed axially of the die and reciprocable toward and from the die, means operable to position a cap between said die and said annular member when the latter is spaced from the die, means for reciprocating the annular member to carry the cap into operative association with the die and then to withdraw from the die, and means for holding the cap in the withdrawing movement of said annular member so as to disengage the cap from said member.

23. In a machine of the character described, the combination of a gasket-forming means, means forming a pocket adapted to receive and support a cap to be presented to said gasket-forming means, a member positioned axially of said cap, said pocket-forming means having two parts movable radially relative to the cap, and means for reciprocating said member relative to said gasket-forming means to present the cap to the gasket-forming means and to withdraw the member therefrom, said pocket-forming parts being operable in such movement to release the cap for movement by said member.

24. A machine for applying rings to jar caps comprising, in combination, a plastic ring forming die, means to position a cap upon the die with a portion projecting radially from the die, means operable to apply a plastic ring to the cap, and automatic means operable upon the application of the ring to force said cap from said die, said means including a device movable axially of said die into engagement with said projecting portion of the cap.

25. A machine for applying rings to jar caps comprising, in combination, a plastic ring forming die, means to position a cap upon the die, means operable to apply a plastic ring to the cap, and means operable in timed relation with the ring-applying means including a device movable radially of said die into engagement with the periphery of said cap to remove said cap from said die.

In testimony whereof, I have hereunto affixed my signature.

WILLIS J. PEELLE.