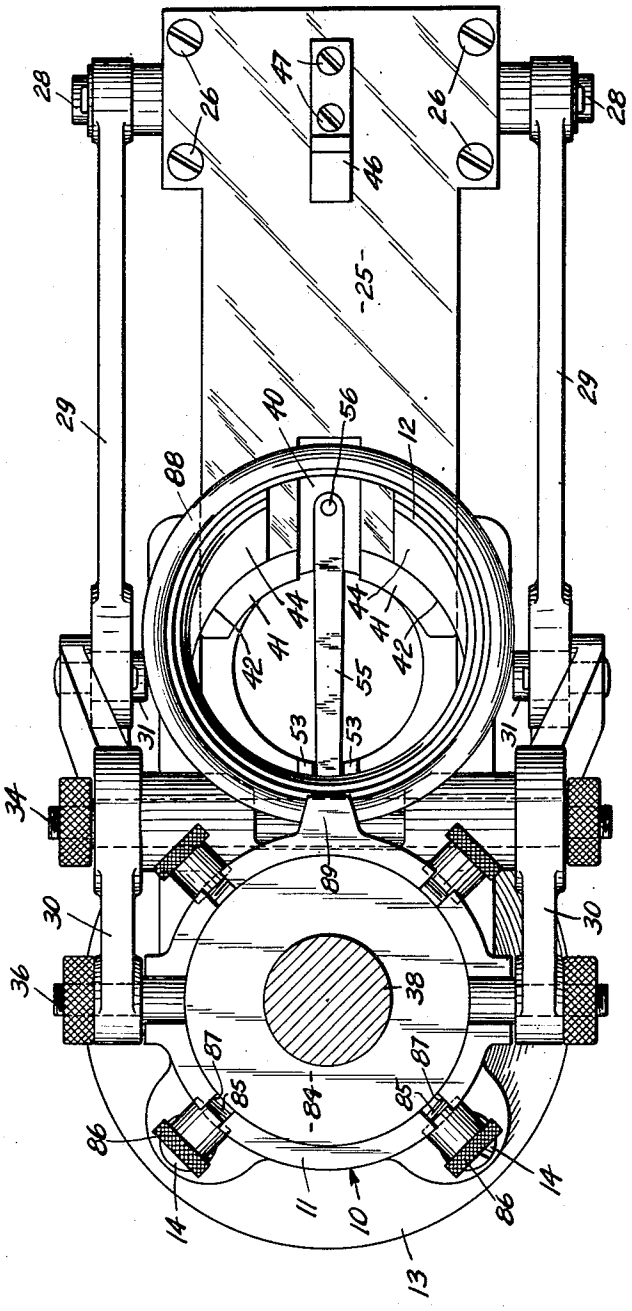
Jan. 4, 1938. L. D. PIERCE 2,104,671

CAPPING HEAD FOR APPLYING CLOSURES TO MILK BOTTLES AND THE LIKE

Filed Oct. 25, 1935 5 Sheets-Sheet 1

FIG. 1



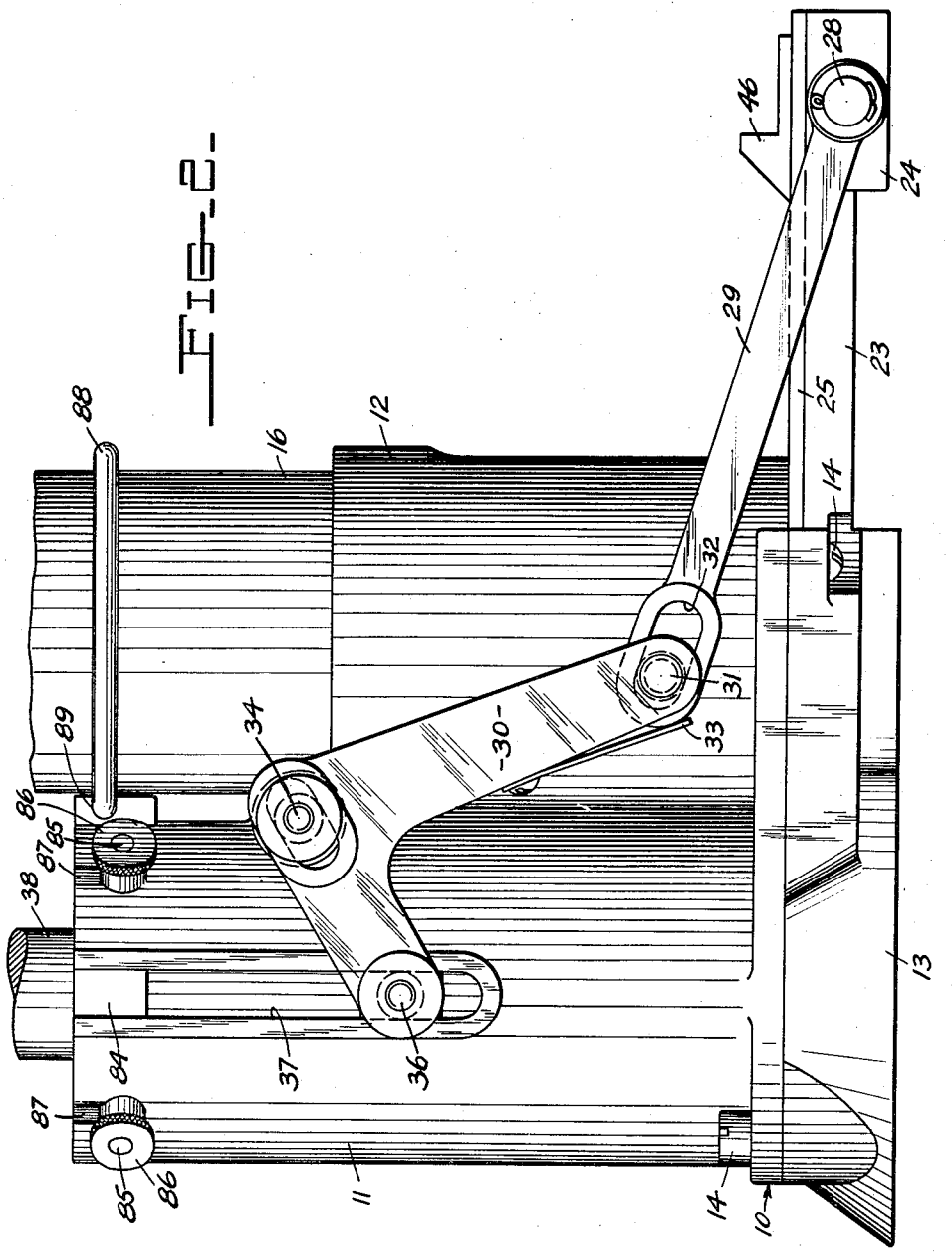
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CAPPING HEAD FOR APPLYING CLOSURES TO MILK BOTTLES AND THE LIKE

Filed Oct. 25, 1935 5 Sheets-Sheet 2

FIG. 2.



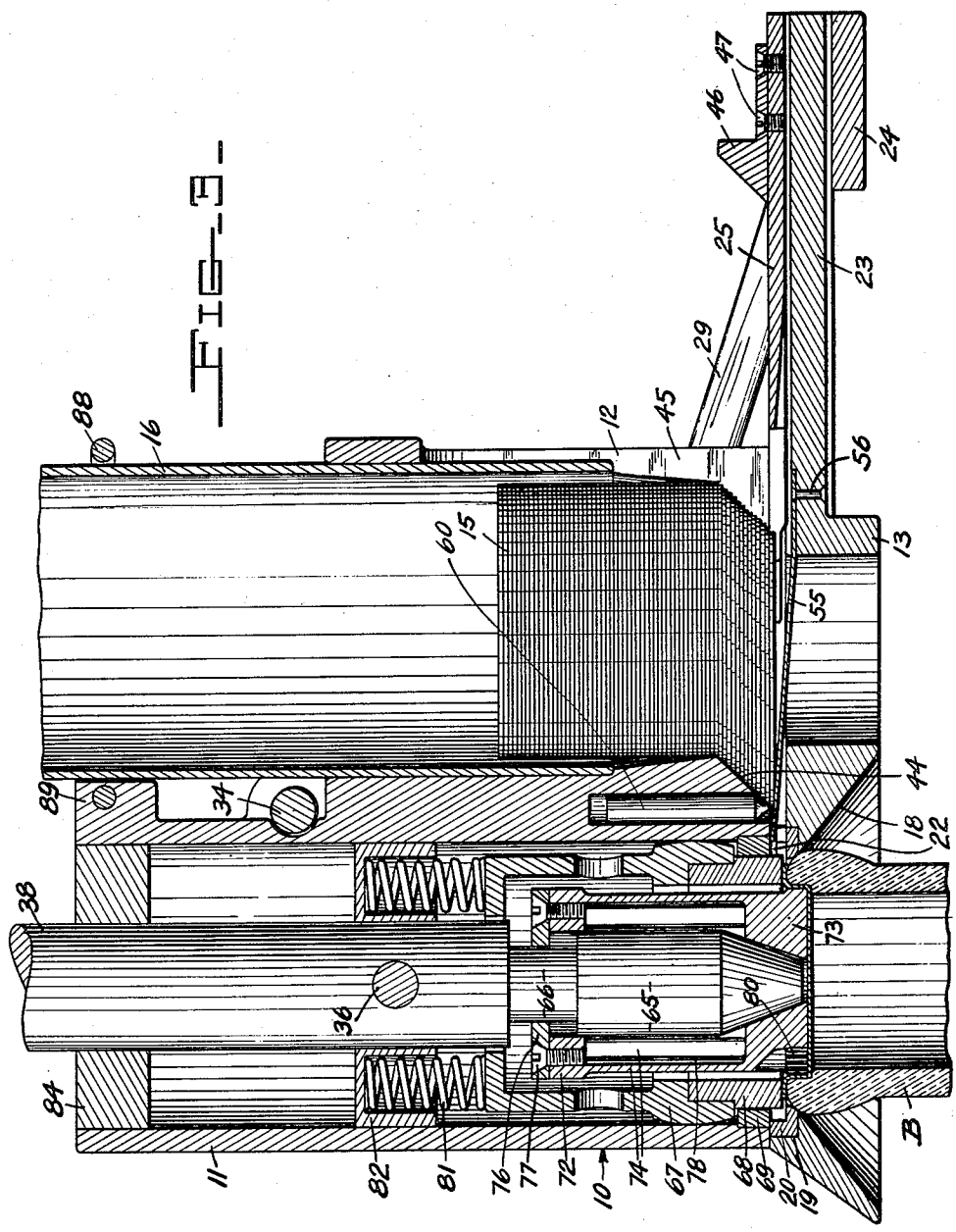
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CAPPING HEAD FOR APPLYING CLOSURES TO MILK BOTTLES AND THE LIKE

Filed Oct. 25, 1935 5 Sheets-Sheet 3

FIG. 1



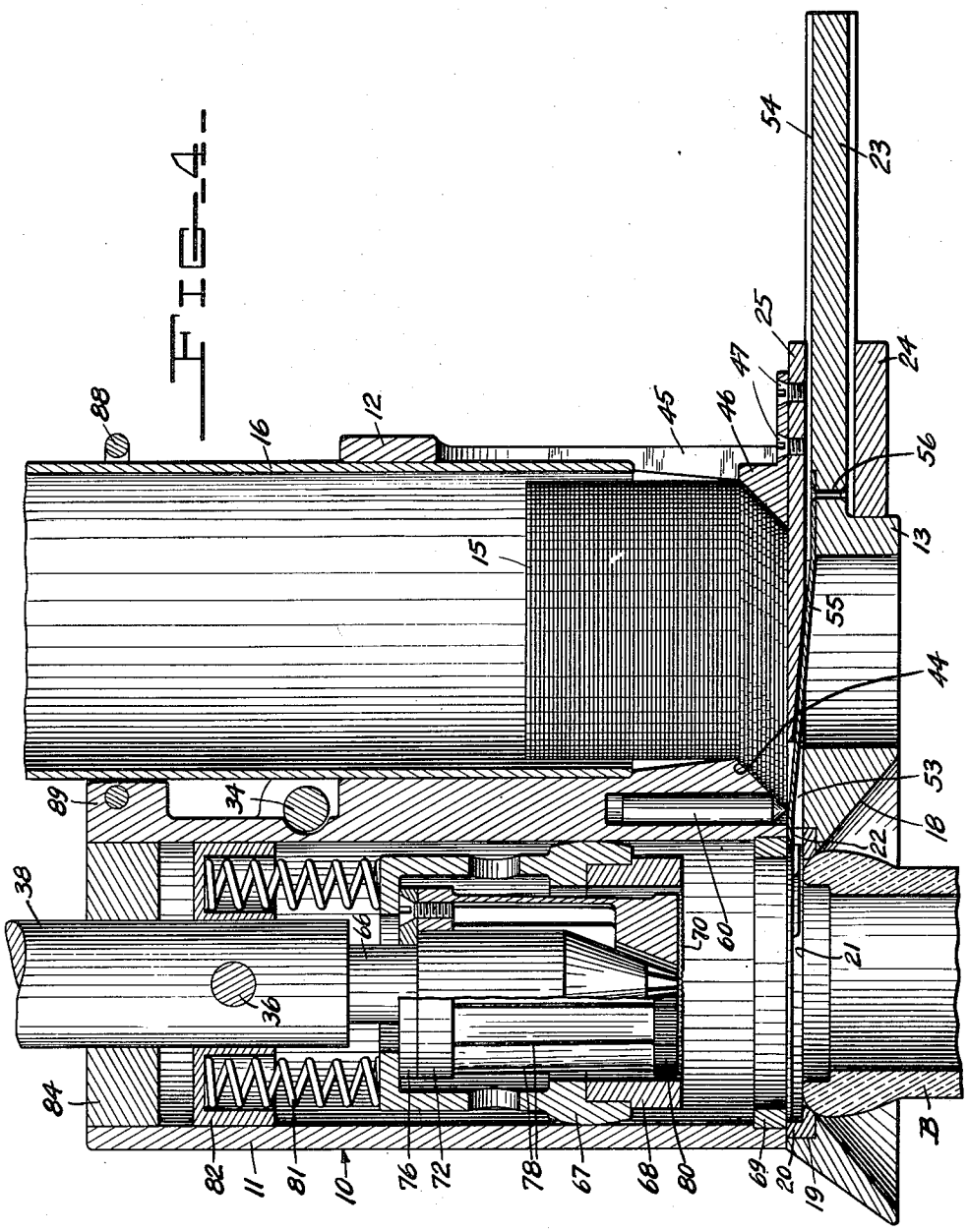
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CAPPING HEAD FOR APPLYING CLOSURES TO MILK BOTTLES AND THE LIKE

Filed Oct. 25, 1935 5 Sheets-Sheet 4

FIG. 4.



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CAPPING HEAD FOR APPLYING CLOSURES TO MILK BOTTLES AND THE LIKE

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Fig. 5.

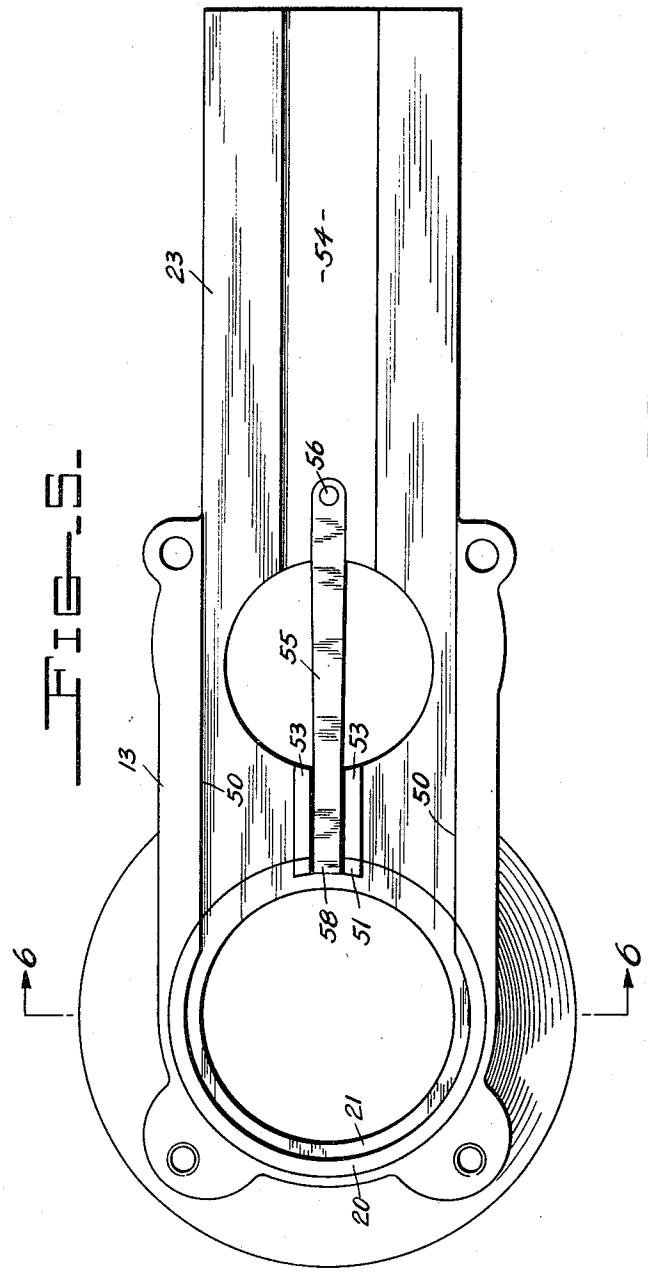


Fig. 7.

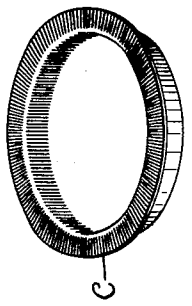
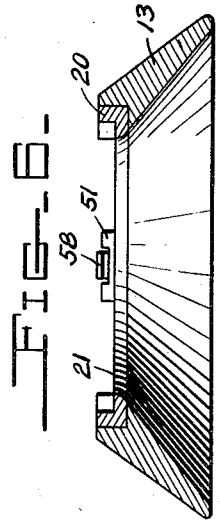


Fig. 6.



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Patented Jan. 4, 1938 2,104,671

UNITED STATES PATENT OFFICE

2,104,671

CAPPING HEAD FOR APPLYING CLOSURES TO MILK BOTTLES AND THE LIKE

Lee D. Pierce, Fulton, N. Y., assignor to Oswego Falls Corporation, Fulton, N. Y., a corporation of New York

Application October 25, 1935, Serial No. 46,762

9 Claims. (Cl. 226—86)

This invention relates to what is commonly known as capping heads. A capping head is that portion of a capping machine that applies the cap to the bottle.

The invention relates particularly to the application of closures to milk bottles.

Milk bottles are generally closed by means of a cardboard disk which is inserted in the mouth of the bottle, after the same has been filled, the disk being automatically inserted by the capping head of the machine. Various designs of capping heads have been used, the design varying according to the particular style of disk or plug cap being employed.

While the plug cap effectively closes the mouth of the bottle, it possesses the disadvantage of not covering the top edge of the bottle and keeping it in a sanitary condition.

Various types of caps have been developed for use as a closure for the bottle and at the same time provide a covering for the upper edge of the bottle. However, these paper caps, in all instances that I am aware of, are pre-formed, or finally shaped, at the time of manufacture. This results in a comparatively thick bottle cap which must be of sufficient height to extend upwardly from the shoulder, or cap seat, in the mouth of the bottle over the top of the bead, or pouring lip, of the bottle. Such caps occupy, in the shipping tubes and capper head magazines, four or five times the space of the common plug cap. Also, because of the great thickness or total height of the cap, the caps are somewhat difficult to feed into the capping head, and are also more liable to become disarranged in the magazine. Due to the comparatively large variation in sizes and shapes of bottles, the pre-formed caps often do not fit the mouth or bead of the bottle, with the result that they are easily displaced from the bottle during ordinary handling of the bottle.

An object of the present invention is to simultaneously form and apply a cap which acts as a closure for the bottle, and also covers the top edge of the bottle.

A further object of the invention is a capper head which will economically and efficiently form such a cap from a flat paper disk.

A further object of the invention is a capper head which, during the formation and application of the cap to the bottle, forms the peripheral margin of the cap with a plurality of radially extending ribs, or corrugations, which effectively stiffen the peripheral margin of the cap and tends to maintain the cap in tight contact with the bottle mouth.

A further object of the invention is a capper head provided with means for radially expanding that portion of the cap contiguous to the bore in the mouth of the bottle against the same, whereby the cap is accurately shaped to each individual bottle, regardless of variations in size and shape of the bottles.

A further object of the invention is a capper head employing means for transferring successively the comparatively thin flat disks from the magazine to the throat of the capper in such manner that the disks do not become disarranged, and are transferred to a position concentric with the mouth of the bottle.

A further object of the invention is a capper head of such novel construction that while possessing the above features may be readily completely disassembled, whereby all the operating parts may be easily cleaned.

A further object of the invention is the novel method of applying closures to milk bottles and the like, as disclosed herein.

The invention, insofar as it concerns the machine, 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 top plan view of the capper head.

Figure 2 is a side elevation view of the capper head.

Figure 3 is a longitudinal sectional view showing the parts in operative position when the closure is applied to the bottle.

Figure 4 is a view, similar to Figure 3, showing a disk overlying the top of the bottle and the operative parts in position previous to the capping operation.

Figure 5 is a top plan view of the base of the capper head with the body portion removed.

Figure 6 is a view taken on line 6—6, Figure 5.

Figure 7 is a perspective view of the cap after it is formed from the disk.

The method herein described of applying closures to milk bottles and the like, consists in placing a flat paper disk on the mouth of the bottle with the peripheral margin of the disk overlying the top edge of the bottle, pressing the peripheral margin of the disk against the top edge of the bottle, pressing the central portion of the disk into the bore of the mouth of the bottle and simultaneously during such pressing action forming a plurality of radially extending

corrugations in the peripheral flange of the disk.

The particular machine here shown for carrying out this method consists generally of a body provided with a passage to receive the upper end of the bottle, a magazine arranged to receive a plurality of disks in stack formation, a reciprocating slide member operable to successively transfer the disks from the magazine to said passage with the peripheral margin of the disk overlying the top edge of the bottle, an annular member arranged concentrically with said passage and being slidable in the body toward and from the bottle, a plunger slidably mounted in the body and arranged within said annular member and being operable to press the central portion of the disk into the mouth of the bottle, and means for moving said annular member against the disk to press the same against the top edge of the bottle, and means for moving the plunger toward and from the bottle.

The capper head, herein described, further includes means operable for effecting radial expansion of the lower end of the plunger to press that portion of the cap, contiguous to the vertical bore in the mouth of the bottle, against said bore.

10 designates generally the body which, as here shown, consists of cylindrical portions 11, 12, arranged in vertical spaced apart relationship upon the base 13 to which the body is detachably secured by screws 14. The rear cylindrical portion 12 constitutes a magazine for receiving and holding a plurality of flat paper disks 15 in stack formation. The upper end of the magazine is provided with a straight cylindrical bore to slidably receive the tube 16 which is usually of cardboard or paper board in which the disks 15 are shipped to the dairy.

The forward cylindrical portion 11 is formed with a straight cylindrical bore in which is mounted the mechanism for forming a disk 15 into a cap and simultaneously applying the same to the bottle. The forward portion of the base, beneath the cylindrical portion 11, is provided with a circular bottle receiving passage, the lower portion 18 of the passage being conical to act, more or less, as a centering device for the bottle as the capper head descends upon the same, as will be well understood by those familiar with devices of this kind.

The upper portion of the passage, Figures 3, 4, is here shown as counterbored, as at 19, to receive an annular member 20 having a radially inwardly extending flange 21. The inner surface of the flange 21 is formed preferably on the same angle and arranged in axial alinement with the conical bore 18, and is of such diameter that when resting on the bead of the bottle B, Figures 3, 4, the upper surface of the flange 21 will be located in substantially the same plane as the top of the bottle.

The bottom of the body intermediate the cylindrical portions 11, 12, and the contiguous portion of the base are relieved to provide a slot or horizontal throat 22 through which the disks 15 are successively transferred from the magazine to the annular member 20 with the peripheral margin of the disk overlying the top of the bottle.

The base 13 has a rearwardly extending portion 23 on which block 24 is slidably mounted. The block 24 being U shaped in cross section with the legs of the U extending upwardly straddling the rear portion 23 of the base. A plate 25 is attached to the upper ends of the legs of the block 24 by screws 26. The forward end of the plate 25 extends into the bottom of the magazine, and as the block 24 and plate 25 are reciprocated, the lowermost cap 15 of the stack in the magazine is transferred through the throat 22 into the annular member 20. The block 24 is provided with laterally extending trunnions 28 to which the rear ends of the links 29 are pivotally connected, Figures 1 and 2. The forward ends of the links 29 are pivotally connected to the lower arm of angle lever 30, as at 31. This pivotal connection includes a lost motion arrangement in that the forward ends of the links 29 are provided with an elongated slot 32, and the contiguous arm of the lever 30 is provided with a spring 33 which normally maintains the links 29, block 24, plate 25, in the rearmost position. The levers 30 are pivoted at their angle to a rod 34 extending through the body intermediate the cylindrical portions 11, 12, the levers 30 being also provided with an elongated slot at this point. The upper arm of the lever 30 is pivotally connected to a rod 36 extending through slots 37 arranged in opposite sides of the cylindrical portion 11 and also through the shaft 38.

The pin 36, in addition to acting as a pivotal connection between the levers 30 and the shaft 38, also prevents relative rotary movement between the capping head and the shaft 38. It will be well understood by those familiar with these devices that the shaft 38 is suitably secured to a reciprocating power driven member of the capping machine, not shown, whereby upon vertical movement of the shaft, vertical movement is imparted to the capper head as a whole, and when the head coacts with the top of the bottle B, further downward movement of the shaft 38 effects application of the cap to the bottle. Thereafter, the upward movement of the shaft 38 first effects forward movement of the slide 25 through the links 29, levers 30, in the well known manner to transfer another cap into position to be applied to the bottle.

The transfer mechanism here shown is, generally speaking, similar to that heretofore extensively employed. The forward end of the slide member 25 however, is of particular construction to effect proper transfer of the thin paper disks 15, and the slide 25 also carries a member cooperable during each reciprocation of the slide to arrange the caps in the bottom of the magazine in a predetermined relationship, as will be hereinafter described.

The forward end of the slide 25 is bifurcated, or formed with a central slot 40, and the ends 41 are arcuate and of reduced thickness forming an arcuate shoulder 42, the curvature of which is complemental to the diameter of the disks 15. The lower portion 44 of the bore in the disk magazine extends at substantially an angle of 45 degrees to the axis of the magazine, the bore sloping upwardly and rearwardly from the passage 22, Figures 3, 4, and the rear side of the magazine 12 is provided with an opening 45 which may extend from the base 13 upwardly an appreciable distance, as indicated in Figures 3, 4, and the lower end of the tube 16 may be provided with a slot, not shown, arranged in alinement with the opening 45, whereby the disks 15 may be inspected by the operator during operation of the capper head, whereby the operator is informed when it is necessary to insert a new tube of disks.

A block 46 is secured to the upper face of the slide 25 by screws 47. The forward surface of the block 46, toward the magazine, extends at an angle equal to the angle of the bore 44, and

the block 46 is so positioned relatively to the plate 25 that the forward side of the block coacts with the rear sides of the bottommost disks in the magazine, whereby during each reciprocation of the plate 25, the bottom disks in the magazine are moved, or shifted, against the forward portion of the angular bore 44, whereby the caps are alined therewith. With this construction, the lowermost disks in the stack are arranged axially of the capping head in overlapping relationship, whereby the ends 41 of the slide 25 may separate the lowermost disk in the stack more easily. When the plate 25 is in the rearmost position, Figures 1, 2, the shoulders 42 on the forward ends of the plate 25 are flush, or in alinement with the rear wall of the angular bore 44, whereby the rear edge portion of the lowermost disk in the stack is permitted to rest upon the ends 41 of the plate. The shoulders 42 are slightly less in height than the thickness of the disk 15, whereby upon forward movement of the plate 25, the lowermost disk is carried and pushed through the throat 22 into the annular ring 20 where the disk overlies the top of the bottle resting upon the ledge or flange 21.

The vertical portion of the annular member 20 is cut away on the side contiguous to the passage 22 in alinement with the sides 50 of the passage 22, or that portion thereof formed in the base 13, with the exception of a small portion 51 located in the medial line of the base, and which portion 51 is formed with a slot 52 in its upper side. The base 13 is likewise provided in its upper side adjacent the annular member 20 with a pair of spaced apart ribs 53 which are arranged upon each side of the slot 52. The purpose of the portion 51 is to prevent the disks 15 from becoming displaced out of the annular member 20.

The center of the rearwardly extending portion 23 of the base 13 is relieved, as at 54. A flat spring 55 extends diametrically under the cap magazine, and is secured at its rear end in the relief portion 54 of the base, as at 56. The forward end 58 of the spring 55 tends to move upwardly against the bottom of the intermediate portion of the body 10, and extends between the ribs 53 and through the slot 52 and portion 51 of annular member 20. The slot 40 is formed in the plate 25 to permit the ends 41 of the plate to straddle the spring 55 when the plate 25 is moved to forward position, see Figure 4. The purpose of the spring 55 is to prevent the plate 25 from retracting the disk before the ends 41 of the plate are withdrawn from beneath the rear edge of the disk, and the disk permitted to drop on the ledge 21.

In operation, as the disk 15 is moved toward the annular member 20, the free end 58 of the spring 55 is depressed between the ribs 53 and into the slot 52 permitting the disk to pass over the spring. As soon as the rear edge of the disk clears the free end of the spring, the spring is permitted to rise slightly in contact with the bottom of the body, because of the slot 40 and the foward end of the plate 25. As the plate 25 then moves rearwardly, the end 58 of the spring 55 contacts the rear edge of the disk and prevents it from being retracted from the annular member 20. As soon as the ends 41 of the plate 25 clear the disk, the disk is permitted to drop upon the flange 21 and is prevented from rearward movement by the projection 51.

By the novel method and apparatus herein employed, the cap can be formed of thin paper disks which, on account of their thinness and atmospheric conditions, often have a tendency to curl up or become otherwise disarranged, presenting difficulties in effectively separating the lowermost cap of the stack and transferring it to the annular member 20. This difficulty is principally overcome by the arrangement of the angular bore 44, and the arranging block 46, together with the particular construction of the forward end of the slide plate 25. However, to more effectively effect separation from the lowermost disk, the body 10, intermediate the magazine and the cylindrical portion 11, may be provided with an aperture extending upwardly from the base in which is slidably mounted a pin 60, the lower end of which is formed conical on an angle complemental to the angle of the bore 44. The aperture and pin is so arranged relatively to the bore that the conical end of the pin 60 extends in alinement with the bore 44. As the lowermost cap is moved forwardly, by operation of the plate 25, the pin 60 is moved upwardly so that the forward edge of the disk passes under the lower end of the pin which, however, is still in contact with the forward edge of the disk immediately above and prevents any tendency of the upper disk following along with the lowermost disk. The pin 60 is mounted in the aperture of the body so as to have a free vertically sliding movement.

That portion of the capping head which forms and applies the cap to the bottle will now be described. The lower portion of the shaft 38 is provided with a head 65 which, as here shown, is slightly smaller in diameter than the main portion of the shaft, and the lower end of the head 65 is formed conical. That portion of the shaft 66 contiguous to the head 65 is of reduced diameter. A cup shaped member 67 is slidably mounted in the cylindrical portion 11, and as here shown is constructed with a ring 68 inserted in the lower end thereof, and being of such external diameter as to slidably fit a ring 69 inserted in the bottom end of the body. The exposed end of the ring 68 is serrated or formed with a plurality of radially extending ribs 70, Figure 4. The cup shaped member 67 may be of one-piece construction. However, it is preferable that the annular member or ring 68 be formed of steel and hardened. The bottom of the cup shaped member 67 is provided with an aperture to slidably receive the shaft 38.

A ram or plunger is carried by the lower end of the shaft 38 and has relative axial movement thereto. The plunger comprises an upper portion 72 provided with an aperture to slidably receive the head 65 of the shaft 38, and a lower thickened portion 73 provided with a conical bore complemental to the conical end of the head 65. The upper and lower portions 72, 73, are connected by a comparatively thin cylindrical wall 74. A disk 76 is secured to the top of the upper portion, as by screws 77, and is provided with an aperture to slidably fit the reduced portion 66 of the shaft 38, whereby the plunger has a possible sliding movement relative to the shaft for a distance equal to the length of the reduced portion 66. The lower thickened end portion 73 and the side wall 74 are provided with a plurality of axially extending slots 78, Figures 3, 4. Or, in other words, the plunger 75 is somewhat of the construction of the ordinary spring collet used in machine tools and the like, and is preferably formed of steel and hardened. The intermediate wall 74 and the upper peripheral sur-

face of the lower end portions 73 are of slightly reduced diameter, while the lower peripheral portion of the end 73 is provided with a plurality of axially extending ribs 80 and is of such diameter as to slidably fit the ring 68. The cup shaped member 67 is urged downwardly toward the end of the shaft 38 by helical compression springs 81 inserted between the top of said member and a disk 82 which is secured to the shaft 38 by the pin 36, previously referred to.

In operation, the shaft 38 and entire capping head descends until the base 13 rests upon the top head of the bottle B, at which time a disk has been transferred from the magazine to the annular member 20, as shown in Figure 4. Further downward movement of the shaft 38 causes the cup shaped member 67, or the ring 68 thereof, to press upon the peripheral margin of the disk, with the disk interposed between the ring 68 and the top edge of the bottle. Upon further downward movement of the shaft 38, the springs 81 are compressed and the plunger or ram moved downwardly relatively to the ring 68. This movement is accomplished by contact of the conical end of the head portion 65 of the shaft with the conical bore of the lower end portion 73 of the plunger. This movement of the plunger presses the central portion of the disk into the mouth of the bottle. That is, the disk is drawn into an inverted cup shaped closure with the upper end of the bottle acting as the drawing die, and the plunger as the punch. This movement continues until the central portion of the cap seats against the shoulder in the mouth of the bottle. The downward movement of the plunger is thus arrested, and further downward movement of the shaft 38 causes the lower end portion 73 of the plunger to expand radially outwardly. This movement is effected by the relative movement between the end portion or portions 73 and the conical end of the shaft 38. Preferably, the ribs 80 on the periphery of the lower end portion 73 of the plunger are complemental to the radially extending ribs or serrations 70 formed on the lower end of the ring 68.

With the motions above referred to, the disk is drawn into a cap C, as shown in Figure 7, and inserted into the mouth of the bottle. The shaft 38 is then moved upwardly first permitting the end portion 73 to spring radially inwardly and then, as the head 65 contacts the disk 76 the plunger is moved upwardly out of the mouth of the bottle and into the ring member 68.

As the shaft 38 moves upwardly, the disk 76 contacts the bottom of the cup shaped member 67 and moves the latter upwardly.

As the shaft 38 continues to move upwardly, the disk 82 contacts a disk 84 which is detachably secured in the upper end of the tubular member 11. As here shown, the disk 84 which, as shown in Figures 1, 3, and 4, is provided with an aperture to slidably receive the shaft 38, is provided with a plurality of radially extending studs 85, the outer ends of which are threaded to receive the nuts 86. The upper end of the tubular member 11 is provided with lengthwise extending slots 87 to receive the studs 85. When the nuts 86 are tightened, the disk 84 is secured in the upper end of the tubular member 11 as shown.

During this upward movement, the angle levers 30 are operated about their pivots effecting sliding actuation to the plate 25 to effect transfer of another disk from the magazine to the annular member 20, as previously described. A ring 88 is secured to the rear of the housing 11 at 89, and functions as a guide and support for the disk tube 16.

It will be observed that the action of the cap forming and applying mechanism is such as to evenly draw the disk into a cap with the excess material, caused by the drawing operation, evenly distributed throughout the circumference of the cap, and with the cap accurately formed to fit each individual bottle. The function of the serrations 70 on the lower end of the annular member 68 is to form a plurality of radially extending corrugations in the peripheral margin of the disk which accommodate the excess material as the central portion of the disk is drawn downwardly over the bead and into the mouth of the bottle. The function of the axial extending serrations 80 on the lower periphery of the plunger or ram is to maintain the ribs formed in the peripheral margin of the disk or cap, so that these ridges or corrugations extend from the peripheral edge of the cap down to the shoulder in the mouth of the bottle, and are uniformly and evenly spaced. It will be understood that these corrugations materially stiffen the flange portion of the cap and tend to maintain the cap in sealing contact with the vertical bore in the mouth of the bottle, and to maintain the periphery of the cap in contact with the top edge or bead of the bottle, with the result that the cap can be formed of comparatively light paper stock and still be sufficiently rigid after it is formed and applied to the bottle to prevent it from being unintentionally displaced during handling of the filled bottle. Also, regardless of the variations in the internal diameter of the mouths of the bottles, the cap is formed to the mouth of the bottle and pressed radially outwardly against the bore in the mouth of the bottle, with the result that an effective seal is secured and the cap tightly held in place.

As will be well understood by those familiar with the practical operation of dairy machinery, it is highly desirable that such machines be so constructed that the machine may be readily and conveniently disassembled so that any milk, or cream, that may have accumulated on the machine may be removed before it becomes sour, or rancid. Attention is particularly called to the construction herein described which may be completely disassembled with a minimum expenditure of time, and easily cleaned and reassembled. To completely disassemble the machine, it is only necessary to loosen the nuts 86, whereupon the body and base of the capping head may be readily dropped from the shaft 38 and the cap forming and applying elements which may be then conveniently rinsed off with a hose, or otherwise cleaned, and the body again secured to the disk 84.

What I claim is:

1. A machine for applying closures to bottles, comprising a magazine for containing a plurality of flat paper disks in stack formation, a body provided with a bottle throat, a reciprocating member operable to slide the lowermost cap in the stack from the magazine into said throat, a hold down member slidably mounted in the body toward and from said throat and arranged when in lowermost position to press the periphery of the cap against the top edge of the bottle, a ram mounted concentrically within said hold down member and operable to press the center portion of the disk into the mouth of the bottle, the disk engaging end of said ram being operable to expand and contract radially, means for actuating said ram, and means operable subsequent

to said pressing movement of the hold down member for radially expanding the lower end of said ram to expand the vertical portion of the disk into engagement with the bore of the bottle.

2. A machine for applying closures to milk bottles and the like comprising a body provided with a passage for receiving the top of the bottle, a magazine arranged to receive a plurality of flat paper disks in stack formation, a reciprocating slide member operable to transfer the disks successively from said magazine to the bottle receiving passage, and an annular member slidably mounted in the body and arranged in axial alinement with said passage and being operable to press the periphery of the disk in said passage against the top edge of the bottle, a plunger arranged concentrically within said annular member and having axial movement relative thereto and being operable to press the central portion of said disk into the mouth of the bottle, the disk engaging end of said plunger being operable to expand and contract radially, means for actuating said annular member and plunger toward and from the bottle, and means operable subsequently to the pressing movement of said annular member for effecting radial expansion of said plunger to expand the vertical portion of the disk into engagement with the bore of the bottle.

3. A machine for applying closures to milk bottles and the like comprising a body formed with a passage to receive the upper end of the bottle, a magazine arranged to receive a plurality of paper disks in stack formation, a reciprocating slide member operable to transfer said disks successively from the magazine into said passage with the peripheral margin of the disk overlying the top edge of the bottle, means for pressing said marginal portion of the disk against the top edge of the bottle and during such pressing action to force the central portion of the disk into the mouth of the bottle and subsequently expand that portion of the disk contiguous the central portion into contact with the mouth of the bottle.

4. A machine for applying closures to milk bottles and the like comprising a body, a magazine carried by the body, said magazine being provided with a bore to receive a plurality of disks in stack formation, the lower portion of said bore extending at an oblique angle into the body, a reciprocating member operable to successively transfer said disks from said angular bore, said member being provided with means operable to arrange the lower portion of said stack of disks in alinement with said angular portion of the bore during each reciprocation of said member, and means carried by the body and being operable to apply said disk in transferred position to the bottle.

5. A machine for applying closures to milk bottles and the like comprising a body formed with a passage to receive the upper end of the bottle, a suitable magazine arranged to receive a plurality of flat disks in stack formation, a reciprocating slide member operable to transfer successively the disks from the magazine to said passage with the peripheral margin of the disk overlying the top of the bottle, an annular member slidably mounted in the body toward and from the bottle, and arranged to press the peripheral margin of the disk against the top edge of the bottle, a shaft slidably mounted in the body toward and from the bottle, a plunger carried by the lower end of the shaft and operable when the shaft is moved toward the bottle to press the central portion of the disk into the mouth of the bottle, the disk engaging end of said plunger being operable to expand and contract radially, means for resiliently pressing said annular member against the upper marginal portion of said disk, said shaft having means cooperable with the plunger for radially expanding the lower portion of the plunger, when the same is moved into the mouth of the bottle.

6. A machine for applying closures to bottles comprising a magazine for containing a plurality of flat paper disks in stack formation, a body provided with a bottle throat, a reciprocating member operable to slide the lowermost cap in the stack from the magazine into said throat, an annular member slidably mounted in the body toward and from the bottle and arranged, when in lowermost position, to press the periphery of the disk against the top edge of the bottle, a ram mounted concentrically within said annular member and movable axially thereof to press the center portion of the disk into the mouth of the bottle, the disk engaging end of said ram being operable to expand and contract radially, means for actuating said ram, and means for radially expanding the lower end of said ram to expand the vertical portion of the disk into engagement with the bore of the bottle mouth, the lower edge of said annular member being formed with a plurality of radially extending ribs, and the cap engaging periphery of said ram being provided with a plurality of axially extending ribs.

7. A machine for applying closures to bottles comprising a body, closure applying mechanism carried by the body, a magazine carried by the body and being provided with a bore for receiving a plurality of flat disks arranged in stack formation with the lower portion of said bore extending at an oblique angle relative to the upper portion of said bore, a transfer member slidably mounted in the body and being movable transversely across the lower end of said magazine to transfer the lowermost disk in said stack formation into juxtaposition with said closure applying mechanism, a spring member secured at one end to the body and extending transversely across the lower end of said magazine, the free end of said spring terminating adjacent said cap applying mechanism and being operable to hold said disk in such transferred position during return movement of the transfer member.

8. A machine for applying closures to bottles comprising a body, closure applying mechanism carried by the body, a magazine carried by the body and being formed with a bore to receive a plurality of flat disks arranged in stack formation, the lower portion of said bore extending at an oblique angle relative to the upper portion, a disk transfer member slidably mounted in the body and movable across the lower end of said magazine toward the closure applying mechanism and operable during such movement to transfer the lowermost disk in said stack formation in juxtaposition to the closure applying mechanism, a plunger slidably mounted in the body between said magazine and said closure applying mechanism and being movable at right angles to said transfer member, said plunger having a lower end surface coextensive with said angular portion of the magazine bore, and being arranged to engage a plurality of the lowermost disks in said stack formation, and being movable upwardly during movement of said transfer member toward the closure applying mechanism to per-

mit transfer of the lowermost disk and prevent transverse movement of the disks immediately above said lowermost disk.

9. A machine for applying closures to milk bottles and the like comprising a body, cap applying mechanism carried by the body, a magazine carried by the body, said magazine being provided with a bore to receive a plurality of disks in stack formation, the lower portion of said bore extending at an oblique angle into the body toward said cap applying mechanism, a plunger slidably mounted in the body between said cap applying mechanism and said magazine, and the lower end of said plunger extending at an angle complemental with the angle of the lower portion of said magazine bore and being operable to engage the lowermost disk of said stack formation, a transfer member slidably mounted in said body and movable transversely across the bottom of said magazine to successively transfer said disks from said angular bore to the cap applying mechanism, said transfer member being provided with means operable during each reciprocation of said member to arrange the lower portion of said stack of disks in engagement with the lower end of said plunger.

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