April 1, 1952 R. E. BODENDOERFER ET AL 2,591,501

SANITARY MILK BOTTLE CAPPING HEAD

Filed March 7, 1949 3 Sheets-Sheet 1

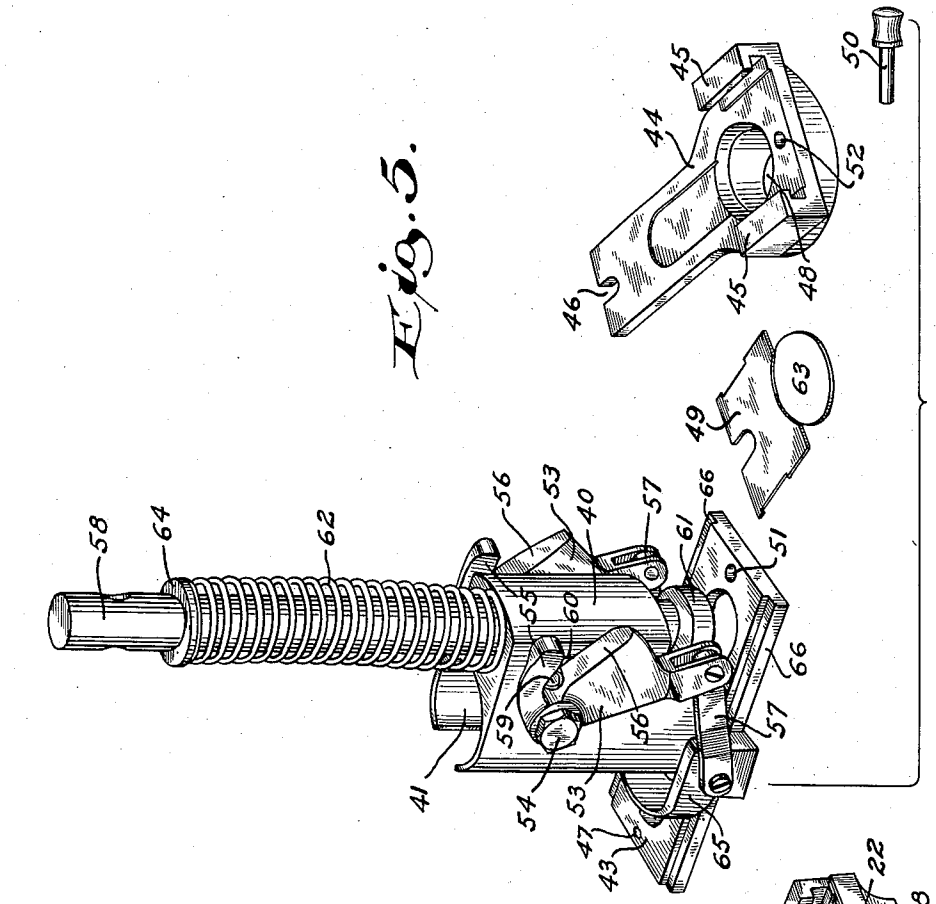


Fig. 5.

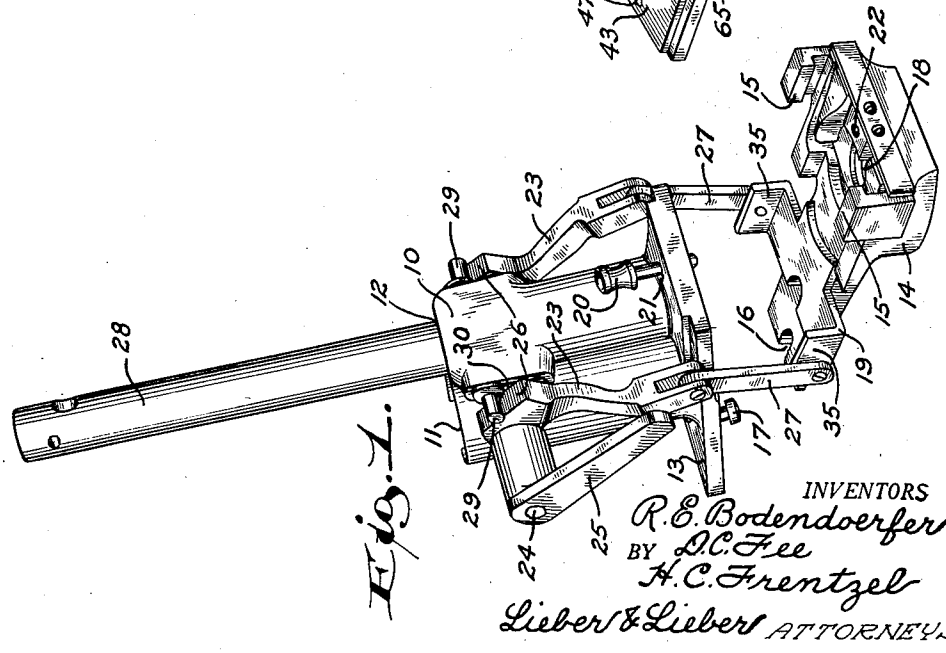


Fig. 1.

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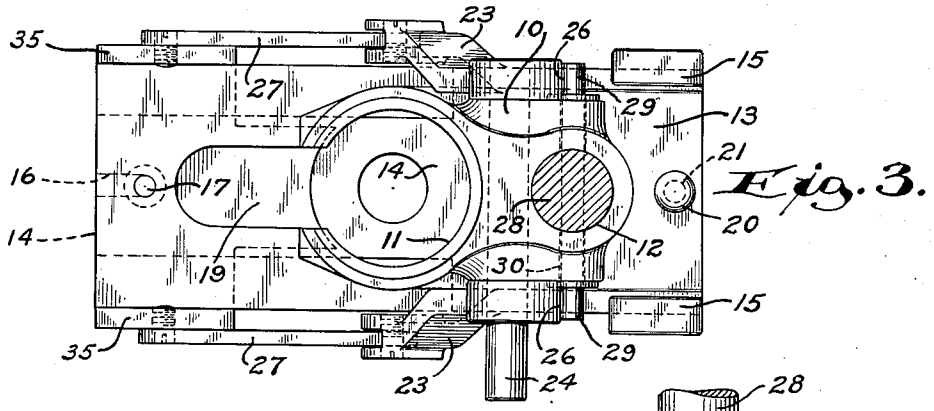


Fig. 3.

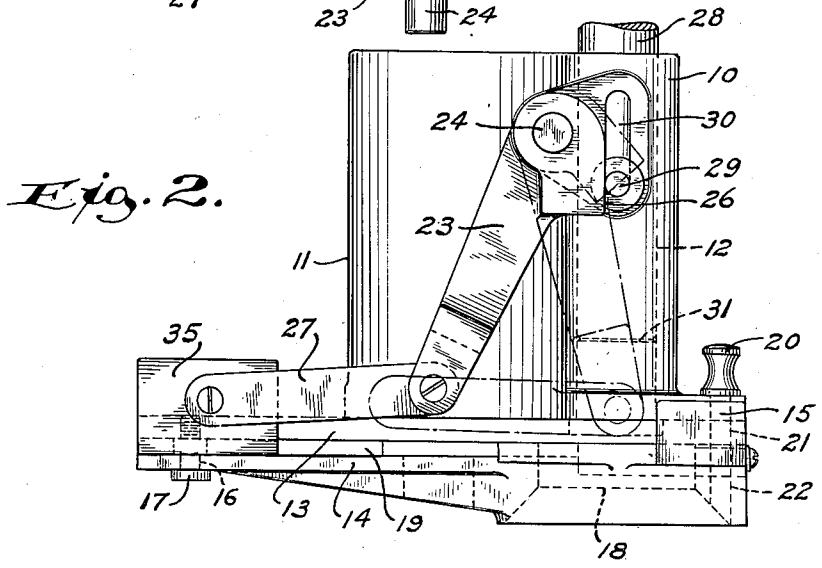


Fig. 2.

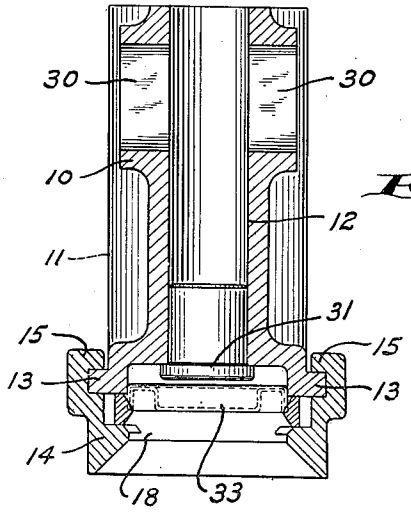


Fig. 4.

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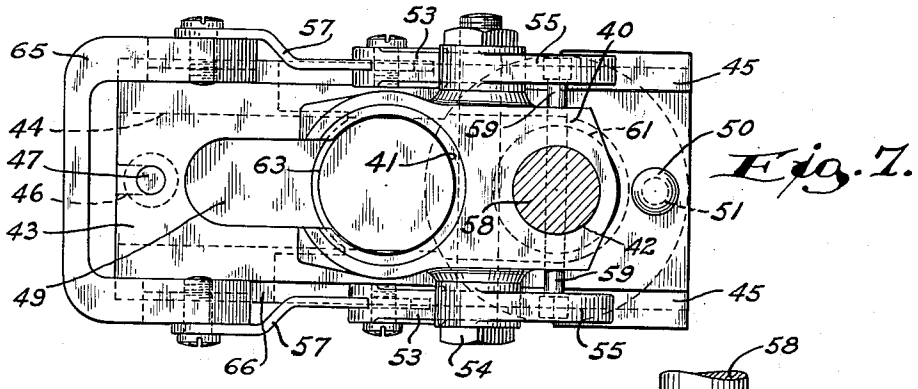


Fig. 7.

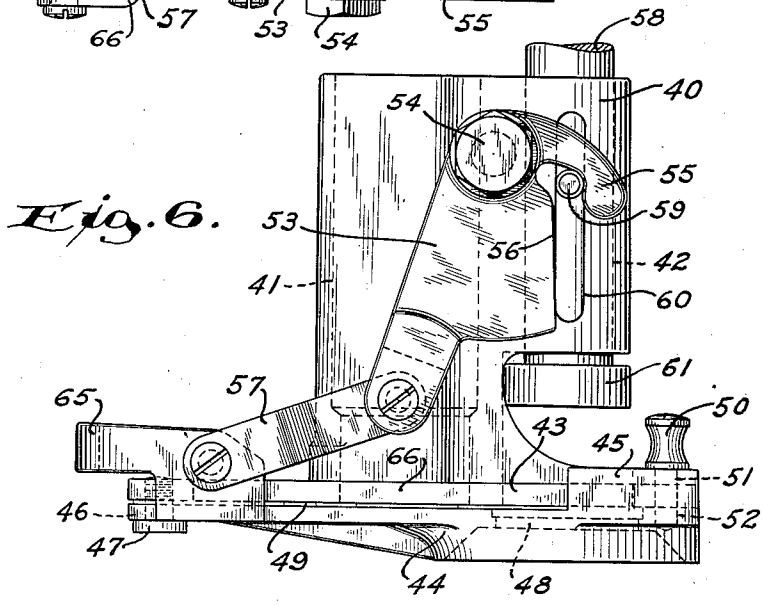


Fig. 6.

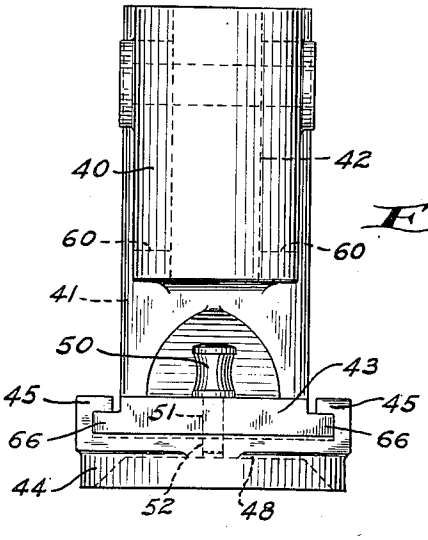


Fig. 8.

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SANITARY MILK BOTTLE CAPPING HEAD

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Application March 7, 1949, Serial No. 79,982

4 Claims. (Cl. 226—92)

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The present invention relates in general to improvements in closing machines for sealing receptacles such as commodity laden bottles in rapid succession, and relates more specifically to improvements in the construction and operation of automatic milk bottle cappers or the like.

The primary object of our invention is to provide various improvements in the construction of milk bottle capping heads whereby such devices may be rapidly dismantled for effective cleaning, and just as rapidly reassembled for normal operation.

It has heretofore been common commercial practice in the dairy industry, to utilize so-called capping heads for the purpose of applying both flat disks and cup-shaped closures in rapid succession to milk laden bottles. Because of the fatty nature of the product and in order to maintain the sealing apparatus in sanitary condition, it is necessary to frequently dismantle and clean the cap feeding and applying mechanism, and to reassemble the same for normal operation after cleaning has been effected. In all known prior capping head assemblages, it has been necessary in order to effect such dismantling and assembly of the parts, to manipulate retaining screws and nuts which not only produced filth collecting pockets and corners difficult to clean, but also required considerable time and caused objectionable delay in capping operations. The prior capping heads were therefore hard to maintain in sanitary condition without introducing excessive loss of operating time, besides being relatively complicated in structure.

It is therefore an important object of the present invention to provide a simplified cap feeding slide structure for milk bottle closure mechanisms, which may be very quickly and most conveniently dismantled and assembled by merely manipulating a single retainer pin or smooth element.

Another object of our invention is to provide improved instrumentalities for quickly assembling and disassembling milk bottle sealing mechanisms adapted to apply either disk or cup type closures to the receptacles.

A further object of the invention is to provide an improved milk bottle capper which is simple, compact and durable in construction, and which may be most conveniently cleaned and maintained in sanitary and efficient operating condition.

Still another object of this invention is to provide an improved capping head for milk filled bottles or the like, which may be manufactured

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and sold at moderate cost for cooperation with various types of automatic fillers.

These and other objects and advantages of our invention will be apparent from the following detailed description.

A clear conception of the features constituting the present improvement and of the construction and operation of two types of capping heads embodying the invention, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts.

Fig. 1 is a perspective view of a partially dismantled milk bottle capping head of the type adapted to apply coverall cup shaped closure caps to the successive bottles;

Fig. 2 is an enlarged side elevation of the same capping head with the slide actuating lever omitted and showing the unit assembled for normal use;

Fig. 3 is a similarly enlarged top view of the assembled capping head of Fig. 2;

Fig. 4 is a likewise enlarged vertical section through the cap applying zone of the coverall capping head of Figs. 2 and 3, with most of the actuating mechanism omitted but showing a cap in position preparatory to application thereof to a bottle;

Fig. 5 is an exploded perspective view of a dismantled milk bottle capping head of the type adapted to apply flat closure disks to the successive bottles;

Fig. 6 is an enlarged side elevation of the capping mechanism shown in Fig. 5, showing the same assembled;

Fig. 7 is a similarly enlarged top view of the assemblage shown in Fig. 6; and

Fig. 8 is a likewise enlarged front view of the main frame, bottom plate, and connecting pin of the capping head disclosed in Figs. 6 and 7.

While the invention has been shown and described herein as having been applied to only two specific types of milk bottle capping heads, it is not our intention to unnecessarily restrict the applicability of the improved features by virtue of these limited embodiments; and it is also contemplated that specific descriptive terms employed herein be given the broadest possible interpretation consistent with the disclosure.

Referring particularly to Figs. 1 to 4 inclusive, the overall capper shown therein comprises in general a vertically movable main casing or frame 10 having an upright stacked cap receptacle 11 and a vertical suspension rod bore 12 therein, and being provided with an integral hori-

zontal base 13 at the lower open ends of the receptacle and bore; a bottom plate 14 having integral opposite hook flanges 15 cooperable with the opposite sides of the base 13, and also having an open rear slot 16 cooperable with a depending headed projection 17 permanently secured to the rear of the base 13, and a bottle head receiving opening 18 disposed in vertical alinement with the bore 12; a cap transfer slide 19 normally slidably confined between the frame base 13 and the bottom plate 14 by the flanges 15 and projection 17 and slot 16, and by an assembly pin 20 coacting with alineable holes 21, 22 formed in the front portions of the base 13 and plate 14 respectively; opposite oscillatory side arms 23 swingable upon a pivot shaft 24 mounted in and piercing the frame 10 and having a rock lever 25 secured to an outer end thereof, each of the arms 23 being provided with a wedge surface 26 and having its swinging extremity connected to the adjacent side of the slide 19 by a link 27; a fixed frame suspension rod 28 slidably coacting with the frame bore 12 and having opposite side pins 29 extending through upright slots 30 in the frame 10 for cooperation with the wedge surfaces 26; and a cap applying plug 31 pressed within the lower end of the bore 12 and being cooperable with the successive bottle caps 33 to apply the same to the milk filled successive bottle heads when elevated through the opening 18.

The frame 10 and base 13 are preferably formed as a single block of corrosion-proof metal, devoid of unnecessary pockets and sharp corners, and the cap receptacle 11 is slotted at the rear and is adapted to hold a considerable supply of the so-called overall bottle caps 33 stacked upon each other with the peripheral cap flanges directed downwardly. The bottom plate 14 and the cap transfer slide 19 as well as other parts of the mechanism, are also preferably formed of corrosion resistant material, and when the frame and bottom plate have been properly assembled as in Figs. 2, 3 and 4, the rear slot 16 engages the projection 17 and the flanges 15 engage the base 13 while the vertically removable smooth retaining pin 20 coacts with the alined holes 21, 22 to hold the frame 10 and plate 14 in spaced relation so as to permit free reciprocation of the slide 19 therebetween. However, upon upward withdrawal of the pin 20, the bottom plate 14 and slide 19 may be pulled forwardly to release the plate 14 from the frame base 13 and to cause the plate and slide to drop away from the frame 10 for convenient cleaning, as depicted in Fig. 1. Reassembly of the mechanism after such dismantling has been effected may be just as quickly accomplished, thus making it possible to effect cleaning with minimum loss of time.

The front edge of the slide 19 is curved to conform with the periphery of the caps 33, and the thickness of this edge is also approximately equal to the cap height; so that each forward movement of the slide 19 as shown in dot-and-dash lines in Fig. 2 and produced by the lever 25 through the arms 23 and links 27 will feed a fresh cap 33 over the opening 18 from the lower end of the supply stack. However, each rearward movement of the slide 19 caused by the pins 29 coacting with the wedge surfaces 26 of the arms 23 will return the slide 19 to cap receiving position, as illustrated in solid lines in Fig. 2. The entire capping unit is vertically slidably suspended from the lower end of the stationary suspension rod 28 which snugly engages the front frame bore 12 above the fixed plug 31,

and the successive liquid filled bottles are adapted to be elevated so as to cause the caps 33 to be applied to the heads thereof by the plug 31 and to thereafter lift the frame 10 bodily in order to cause the fixed pins 29 to swing the arms 23 rearwardly, while the lever 25 is automatically operable in a well known manner to swing the arms 23 forwardly whenever the frame 10 descends along its suspension rod 28. The swinging ends of the arms 23 are pivotally attached to corresponding ends of the links 27 and the opposite corresponding ends of these links are likewise secured to integral flanges 35 at the opposite sides of the slide 19, and the portion of the bottom plate 14 beneath the opening 18 is preferably tapered as in Fig. 4 in order to properly guide the bottle heads.

Referring especially to Figs. 5 to 8 inclusive, the disk type capper shown therein comprises in general a vertically movable main casing or housing 40 having an upright stacked closure disk receptacle 41 and a vertical suspension rod bore 42 therein, and being provided with an integral horizontal base 43 at the lower open ends of the receptacle and bore; a bottom plate 44 having integral opposite hook flanges 45 cooperable with the opposite sides of the base 43, and also having an open rear slot 46 cooperable with a depending headed projection 47 fixedly secured to the rear of the base 43, and a bottle head receiving opening 48 located in vertical alinement with the bore 42; a disk cap transfer slide 49 normally slidably confined in the space between the frame base 43 and the bottom plate 44 by the flanges 45 and slot 46 and projection 47, and by an assembly pin 50 coacting with alineable holes 51, 52 formed in the base 43 and plate 44 respectively; opposite oscillatory side arms 53 swingable upon a pivot bolt 54 carried by and piercing the frame 40, each of these arms 53 having a hook projection 55 and a cooperating wedge surface 56, and also having its swinging lower extremity connected to an actuating yoke 65 for the slide 49 by a link 57; a fixed frame suspension rod 58 slidably coacting with the frame bore 42 and having opposite side roller pins 59 slidable within slots 60 formed in the frame 40, these pins being cooperable with the arm projections 55 and with the wedge surfaces 56; a cap applying head 61 formed integral with the lower end of the frame suspension rod 58 for forcing the disk caps 63 into the openings of the successive milk filled bottles; and a helical compression spring 62 embracing the rod 58 above the frame 40 and reacting against a washer 64 secured to the rod.

The frame 40 and base 43 of the disk capper are also preferably formed as a single block of corrosion resistant metal, devoid of unnecessary pockets and corners, and the disk receptacle 41 is slotted at the rear and is adapted to hold a substantial supply of flat disc caps 63 stacked upon each other. The bottom plate 44 and the disk cap transfer slide 49 as well as other parts of the assemblage, are likewise preferably formed of corrosion resistant material, and when the frame and bottom plate have been properly assembled as in Figs. 6, 7 and 8, the rear slot 46 engages the projection 47 and the flanges 45 engage side rails 66 on the base 43 while the vertically removable smooth retainer pin 50 coacts with the alined holes 51, 52 to retain frame 40 and plate 44 in spaced relation so as to permit free reciprocation of the slide 49 therebetween. However, when the pin 50 is

lifted out of the opening 52, the bottom plate 44 may be pulled forward to release the plate 44 and the slide 49 from the base 43 and yoke 65, as depicted in Fig. 5. The slide actuating yoke 65 coacts loosely with the opposite sides of the slide 49 and engages the rails 66 with which the hook flanges 45 also coact; and when the capping unit has been thus dismantled, reassembly of the mechanism may be just as easily and quickly effected after the parts have been cleaned, with minimum waste of time.

The front edge of the slide 49 is curved to conform with the peripheral curvature of the flat disk caps 63 as illustrated in Fig. 5, and the thickness of the slide 49 is approximately equal to the thickness of each disk cap 63 so that each forward motion of the slide by the expanding helical spring 62 and by the projections 55 coacting with the roller pins 59, whenever a bottle has been capped and is withdrawn from the opening 48, will transfer a fresh cap 63 from the supply stack to the capping zone. However, each rearward motion of the slide 49 caused by the roller pins 59 coacting with the wedge surfaces 56 of the arms 53, when the frame 40 is lifted by an ascending liquid filled bottle, will be accompanied by a compression of the spring 62 and a descent of the cap supply stack. Since the entire capping unit is suspended from and is slidable vertically along the stationary rod 58 which snugly engages the front frame bore 42, the successive bottles will be capped by the head 61 which forces the caps 63 into the bottle openings when the bottles are raised into capping position. During such alternate lowering and raising of the frame 40 and associated parts, by the successive liquid filled bottles, the slide actuating yoke 65 will be reciprocated along the side rails 66 of the bottom plate 44 by the oscillating arms 53, and the portion of the plate 44 beneath the opening 48 is preferably tapered as shown in Fig. 8 in order to properly guide and center the bottle necks relative to the plunger head 61.

Both types of cappers illustrated function to automatically apply the caps 33, 63 to the successive liquid filled bottles whenever the latter are elevated to raise the frames 10, 40 upon their fixed suspension rods 28, 58 respectively; and to feed fresh caps 33, 63 into the capping zone when the frames 10, 40 drop by gravity. Both of these capping assemblages may be quickly dismantled for inspection and thorough cleaning as in Figs. 1 and 5 by merely withdrawing a single retainer pin 20, 50 and by thereafter sliding the bottom plate 14, 44 forwardly to release the same; and both cappers may also be just as quickly reassembled for normal operation by merely restoring the bottom plates 14, 44 to the positions shown in Figs. 2 and 6, and by merely dropping the retainer pin 20, 50 into the alined receiving holes of the frame and bottom plate, thus obviously making provision for rapid and convenient dismantling and reassembling of the mechanisms. The normal operation of the two types of units, is well known to those familiar with the milk bottle capping art, and the mode of suspending the stationary rods 28, 58 is also well known.

From the foregoing detailed description it should be apparent that our present invention in fact provides improvements in the construction of milk bottle capping heads or units, whereby such devices may be rapidly dismantled for effective cleansing, and just as rapidly reassembled for normal operation. Such operations may be conveniently effected by merely manipulating a single smooth retainer pin 20, 50 and by sliding the bottom plate 14, 44 along the frame base 13, 43, and the invention is conveniently applicable to either a disk capper or to an overall capper. The several improved capping units shown are obviously simple, compact and durable in construction while being devoid of inaccessible and unnecessary filth accumulating pockets and corners. The devices may also be manufactured and sold at moderate cost, for cooperation with various types of bottle filling machines, and both types of cappers shown herein have proven highly satisfactory and successful in actual commercial operation.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of operation of the two specific types of cappers shown and described herein, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

We claim:

1. A milk bottle capper comprising, a vertically movable suspended frame having an integral protruding base provided with integral opposite side rails and also having a receptacle for delivering closure caps through the base, a feed slide movable along the lower surface of said base to transfer the successive caps from said receptacle to a laterally disposed capping zone, a bottom plate having integral hook flanges coacting with said rails to support said slide and also having an opening between said flanges and communicating with said capping zone, and a freely vertically removable pin coacting with said base and plate to normally prevent relative shifting thereof, said bottom plate flanges being freely laterally removable from said base rails only when said pin has been removed.

2. A milk bottle capper comprising, a vertically movable suspended frame having an integral protruding base provided with integral opposite side rails and a rear depending projection and also having a receptacle for delivering closure caps through the base, a feed slide movable along the lower surface of said base to transfer the successive caps from said receptacle to a laterally disposed capping zone, a bottom plate having integral hook flanges coacting with said rails and a slot coacting with said projection to support said slide and also having an opening between said flanges communicating with said capping zone, and a freely vertically removable pin having a head resting upon said base and a shank coacting with said base and plate to normally prevent relative shifting thereof, said bottom plate flanges and slot being freely laterally removable from said base rails and projection only when said pin has been removed.

3. A milk bottle capper comprising, a frame suspended for vertical movement along an upright axis and having a base provided with integral opposite side rails and also having a receptacle disposed laterally of said axis for delivering closure caps in succession through the base, a feed slide movable along the lower surface of said base to transfer successive caps from said receptacle to a capping zone at said axis, a bottom plate supporting said slide and having integral hook flanges cooperable with said rails and an opening between said flanges communicating with said zone from beneath, and a freely removable pin resting upon the base and having a shank coacting with said base and plate

to normally prevent relative shifting thereof, said bottom plate flanges being freely removable from said base rails only after said pin has been removed.

4. A milk bottle capper comprising, a frame suspended for vertical movement along an upright axis and having a base provided with integral side rails and a depending headed projection and also having a receptacle disposed laterally of said axis for delivering closure caps in succession through the base, a feed slide movable along the lower surface of said base to transfer successive caps from said receptacle to a capping zone at said axis, a bottom plate supporting said slide and having integral hook flanges cooperable with said rails and a slot cooperable with said projection and also having an opening between said flanges communicating with said zone from beneath, and a freely removable pin resting upon said base and having a shank coacting with said base and plate to normally prevent relative shifting thereof, said bottom plate flanges and slot being freely removable from said base rails and projecting only after said pin has been removed.

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