

Sept. 23, 1958

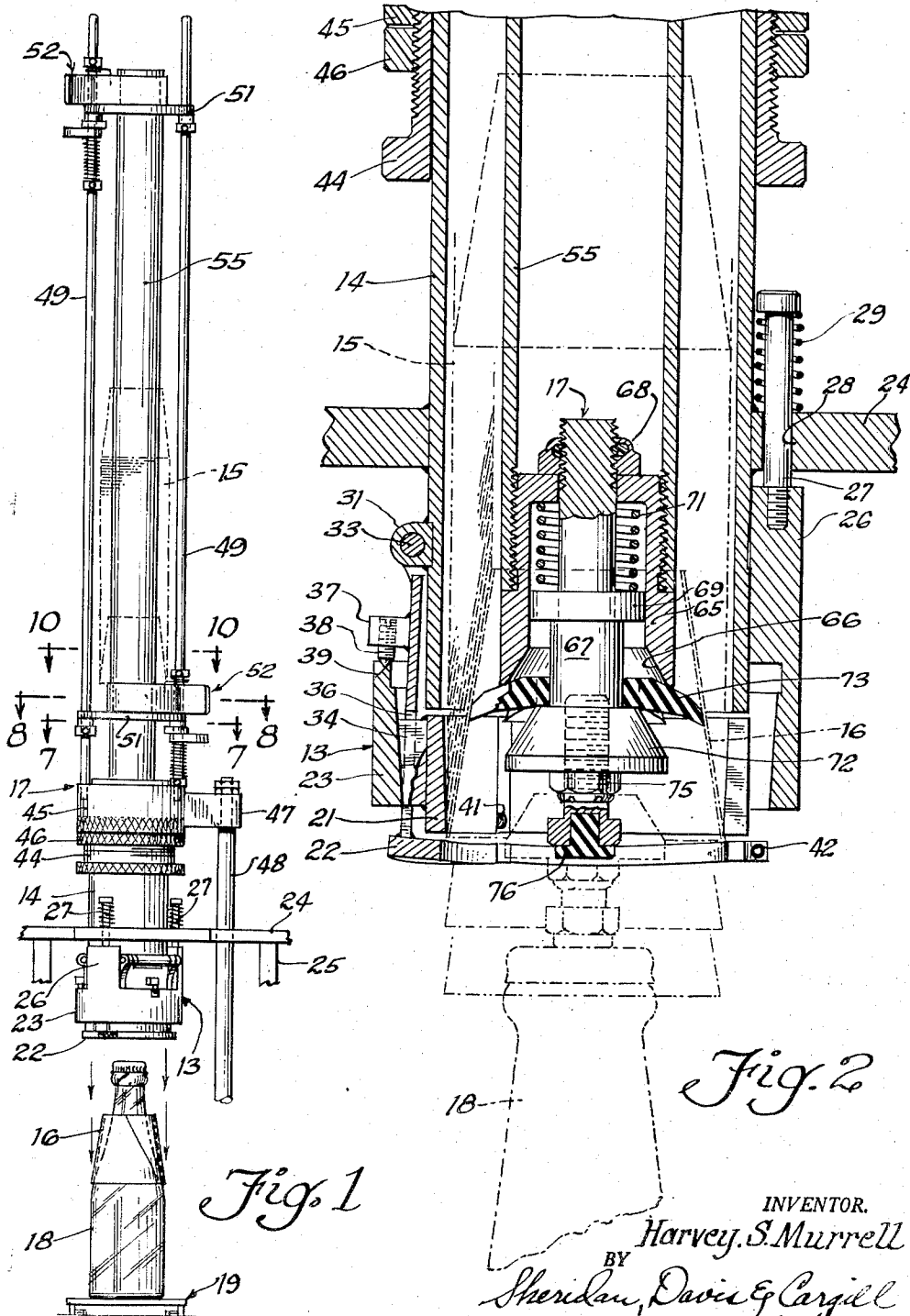
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2,852,899

COLLAR FEEDING MECHANISM

Filed March 16, 1954

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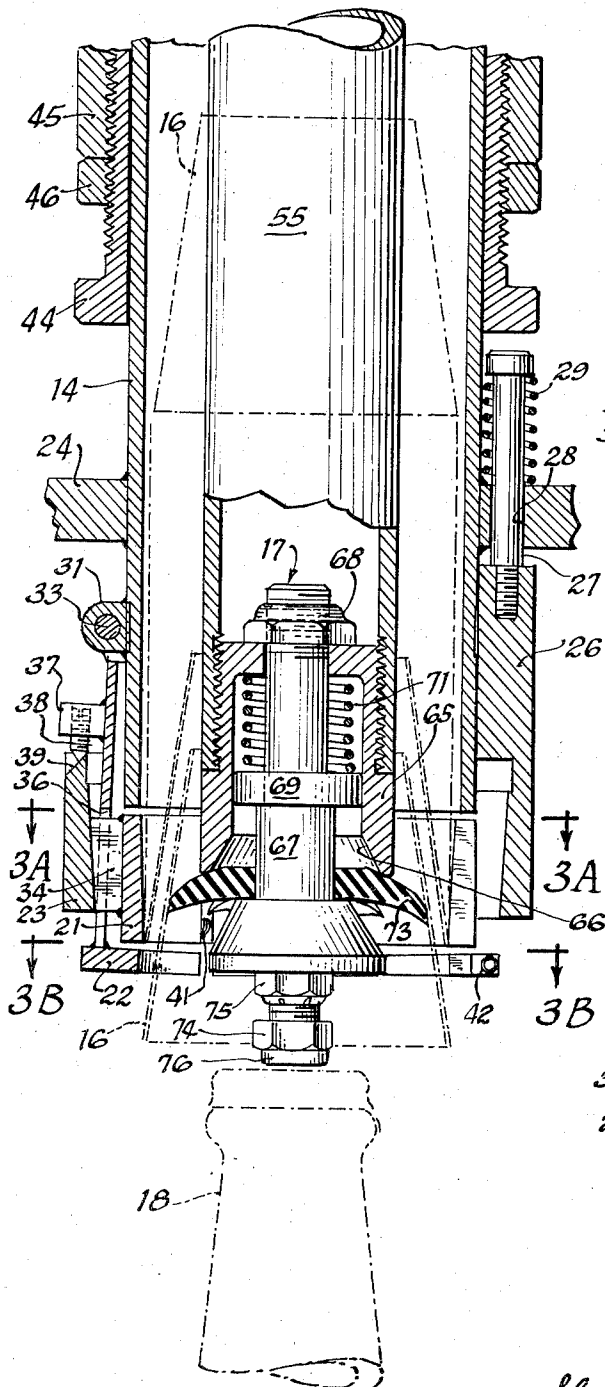


Fig. 3

Fig. 3A

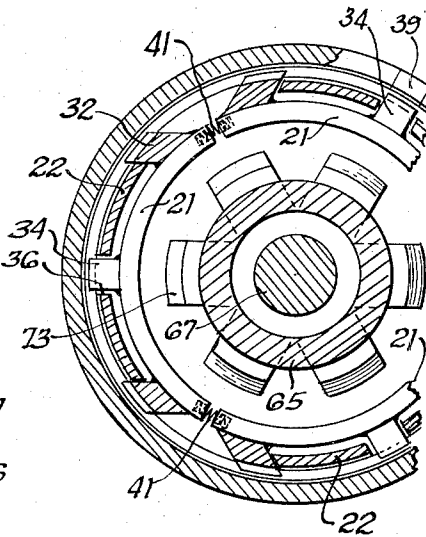
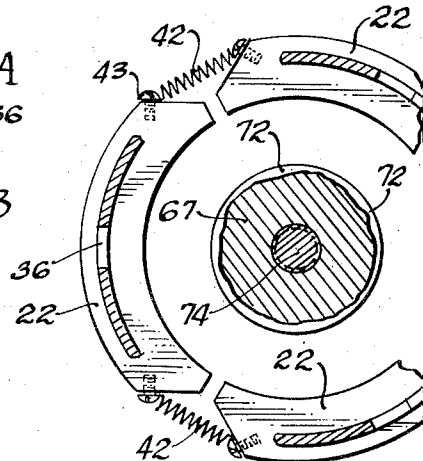


Fig. 3B



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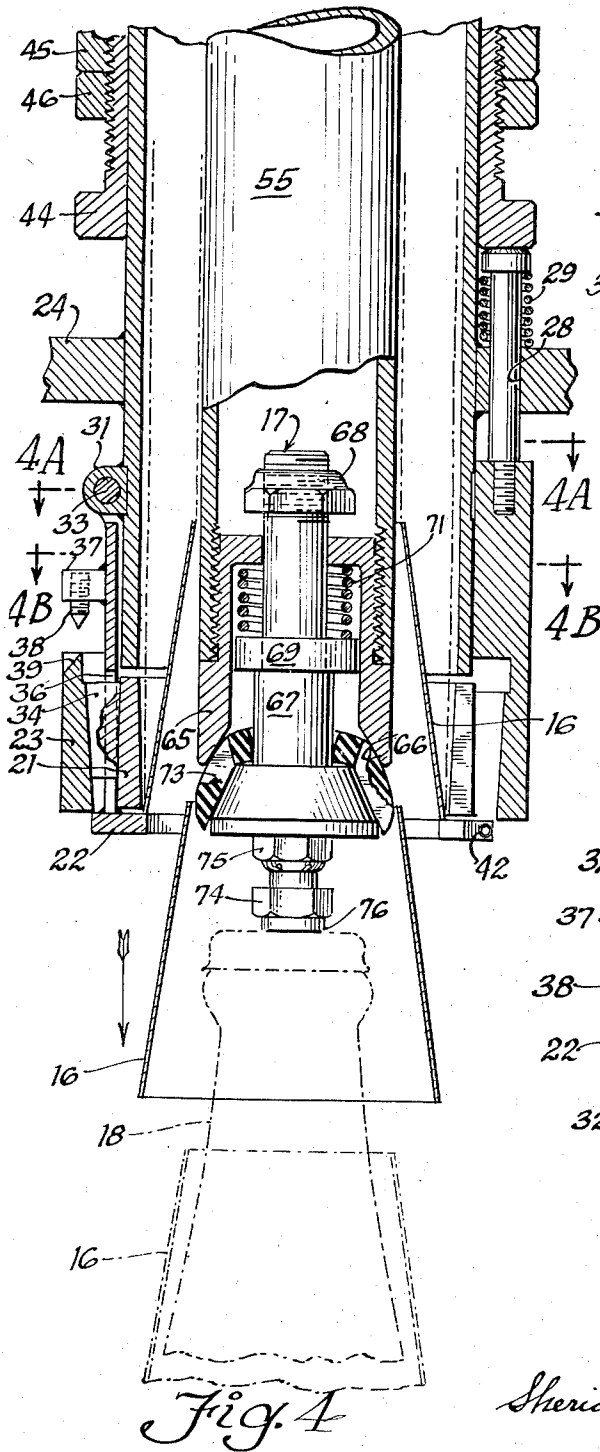


Fig. 4A

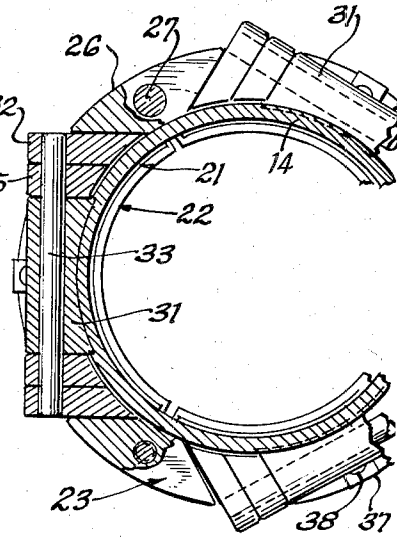
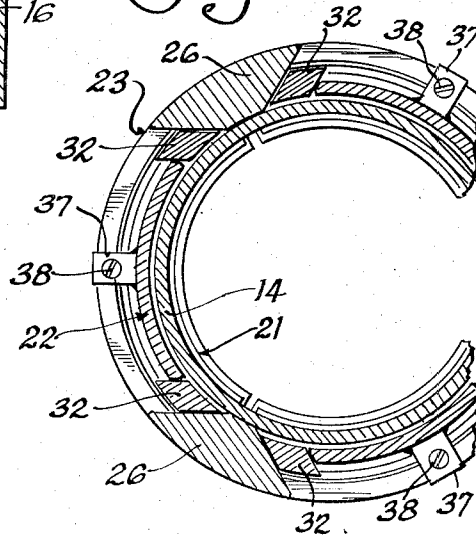


Fig. 4B



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Fig. 5

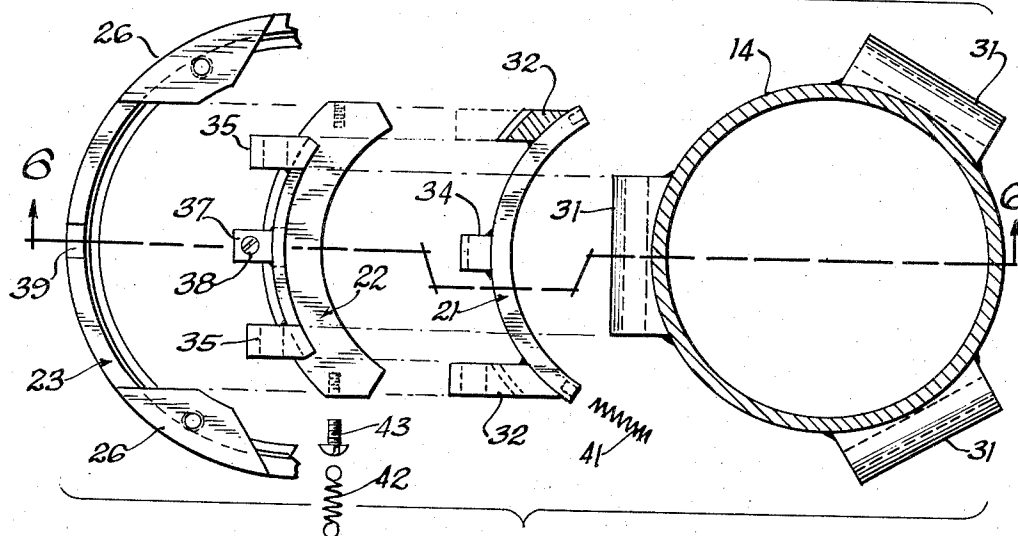
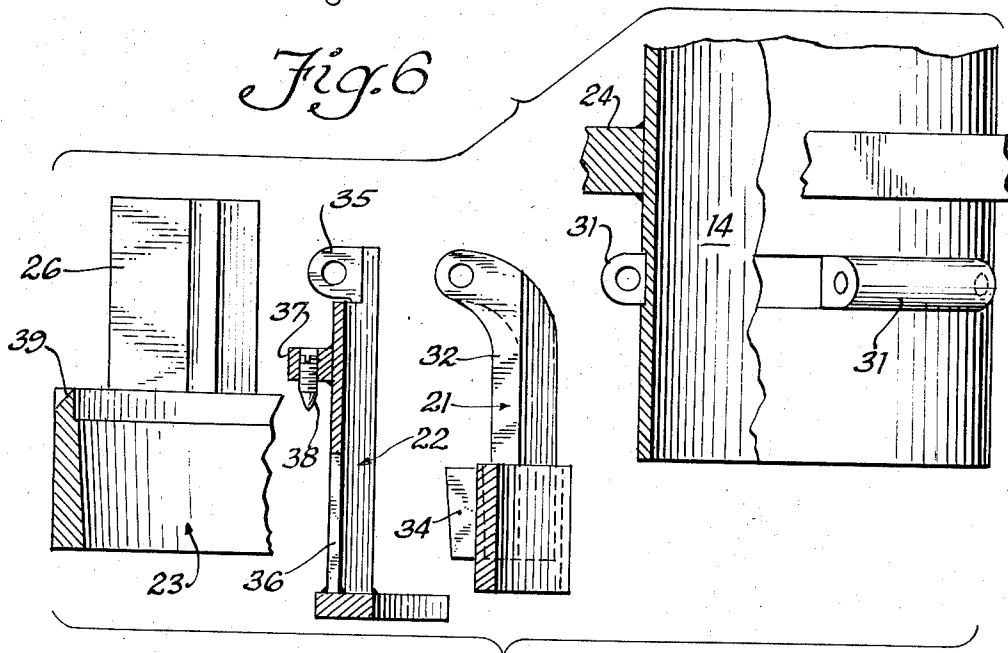


Fig. 6



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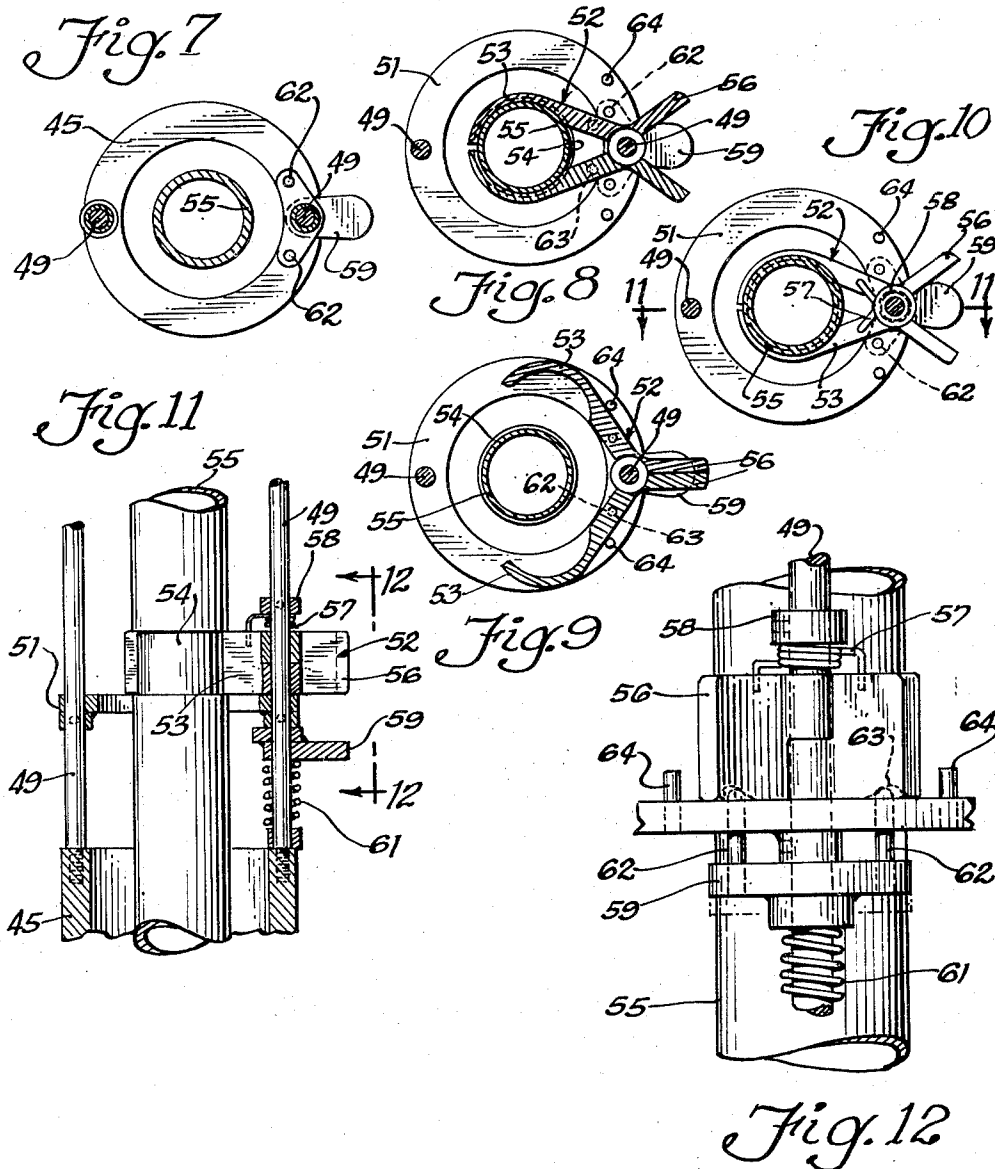
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5 Sheets-Sheet 5



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COLLAR FEEDING MECHANISM

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Application March 16, 1954, Serial No. 416,667

15 Claims. (Cl. 53—198)

This invention relates in general to collar feeding mechanism, and more particular to means for automatically serially feeding collars or bands of truncated conical shape from a nested vertical stack, with their larger ends lowermost, onto upstanding articles, such as filled bottles, as the latter are disposed thereunder or passed therebeneath in timed relationship, as by a suitable conveyor.

A principal object of the invention is to provide such collar feeding means which will accurately and reliably remove only the lowermost collar from a stack of the same at each operation, without requiring all adjacent collars in the nested stack to have their ends substantially uniformly spaced from each other.

Another important object is to provide such feeding means which removes the lowermost collar from the nested stack by frictional engagement with its inner surface by means of a plurality of resilient fingers spaced uniformly peripherally of the collar to prevent any possibility of misshaping or injuring the collar. When the collars are formed from paper, metal foil, or the like, as is usually the case, such engagement has the outstanding advantage of being at their strongest point and in the nature of an attempted uniform expansion, which is the one application of force thereto which they are structurally best able to resist.

A further important object of the invention is to cause release of a collar from the feeding means only in response to a portion of the latter being blocked, or having its feeding movement stopped, by engagement with a collar-receiving article, so that a collar will not be released until and unless the intended article is in proper position to receive it. In the illustrated embodiment of the invention, this object is attained by mounting the resilient feed fingers on a plunger which is slidably mounted on a vertically reciprocable member having a lower peripheral portion that engages and collapses the fingers to collar-releasing position when moved downwardly relative to the plunger, which occurs when downward movement of the plunger is blocked, during the final increment of feeding movement of the reciprocable member, by engagement against a properly positioned collar-receiving article.

Another object is the provision of such a reciprocable member which is dimensioned to extend vertically through the nested stack of collars to function additionally as a stack guide, together with novel clamping means for so mounting that member as not to interfere with relative movement between it and the surrounding stack and also to facilitate the addition of more collars to the stack without interrupting operation of the feeding means.

A further object of the invention is to provide novel stack supporting and lowering means, including fingers for normally clampingly engaging the peripheral portion of the lower part of the stack, and shelf members normally disposed in inoperative position outwardly of the

lower end of the stack, together with a cam member operable by the feeding means in timed relationship therewith to permit spring movement of the shelf members into operative or active position under the stack and of the clamping fingers to inoperative or inactive position to enable downward gravitational lowering of the stack after the lowermost collar has been removed therefrom by the feeding means. Conversely, return upward movement of the feeding means results in spring-urged movement of the cam member to cause the fingers to clampingly re-engage the stack and to return the shelf members to inoperative position.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

In the drawings:

Figure 1 is a front elevational view of a feeding mechanism embodying the features of the instant invention and showing a bottle disposed therebeneath on a suitable conveyor;

Fig. 2 is an enlarged vertical sectional view through the lower portion of the feeding mechanism of Fig. 1 showing the parts in their normal position of rest;

Fig. 3 is a vertical section similar to Fig. 2 showing the feeding means moved downwardly to an intermediate position just prior to engagement thereof with the upper end of a bottle, or the like, for receiving the lowermost collar being removed from the stack;

Figs. 3A and 3B are detail horizontal sections taken substantially, respectively, on lines 3A—3A and 3B—3B of Fig. 3;

Fig. 4 is a vertical section similar to Figs. 2 and 3 showing the feeding means in its lowermost position as a collar is being released therefrom;

Figs. 4A and 4B are detail horizontal sections taken substantially, respectively, on the lines 4A—4A and 4B—4B of Fig. 4;

Fig. 5 is an exploded plan view of a portion of the stack supporting and lowering means, including part of the cam sleeve and one of each of the shelf members and clamping members, and showing the main frame in horizontal section;

Fig. 6 is a detail vertical section taken substantially on the line 6—6 of Fig. 5;

Figs. 7 and 8 are horizontal sectional views taken substantially, respectively, on the lines 7—7 and 8—8 of Fig. 1 and showing the lower tube supporting clamping means in operative position;

Fig. 9 is a sectional view similar to Fig. 8 showing the clamping means in open or inoperative position;

Fig. 10 is a horizontal section taken substantially on the line 10—10 of Fig. 1;

Fig. 11 is a detail vertical section taken substantially on the line 11—11 of Fig. 10; and

Fig. 12 is an enlarged detail side elevation, as seen from the right of Fig. 11.

Referring more particularly to Fig. 1 of the drawings, the collar feeding mechanism illustrated therein comprises a stack supporting and lowering means, indicated generally by reference numeral 13, and including a main frame or housing member 14 which functions as an outer guide for a stack 15 consisting of a plurality of separate collars or bands 16 of truncated conical shape nested vertically with their larger diameters lowermost, as better seen in Fig. 2. Slidably mounted on the main frame 14 for vertical reciprocable movement relative thereto is a stack guiding and individual collar feeding means, indicated generally in Fig. 1 by reference numeral 17. This collar feeding mechanism is adapted to

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serially deliver individual collars 16 from the stack 15 onto upstanding articles, such as the filled bottle 18 shown in Fig. 1, as the latter are disposed thereunder or passed therebeneath in timed relationship, as by a suitable conveyor indicated generally at 19.

In addition to the main frame or outer stack guide 14, the stack supporting and lowering means 13 comprises a plurality of normally active clamping fingers 21, a similar number of normally inactive shelf members 22 constituting auxiliary stack supporting means, and a cam sleeve or ring 23 surrounding the members 21 and 22 and mounted for sliding vertical movement on the main frame or housing member 14. As shown in Fig. 1 and better illustrated in detail in Fig. 2, the main frame or housing member 14 is secured to, as by welding, or the like, and supportingly mounted by, a suitable plate 24 which is mounted by legs 25 (Fig. 1) a predetermined distance above the conveyor 19 determined by the height of the bottles 18 or other collar-receiving articles carried by the conveyor. It will be understood, of course, that such specific arrangement comprises only one of several possible methods of mounting the instant mechanism, and, as will be explained more fully hereinafter, the collar feeding mechanism of Fig. 1 may be employed either alone, as therein illustrated, or in combination or bank arrangement comprising a plurality of such feeding mechanisms mounted in adjacent relationship to facilitate simultaneous feeding of a plurality of collars to a like number of collar-receiving articles, such as an open-topped case of filled bottles.

Since the embodiment illustrated employs three clamping fingers 21 and three associated shelf members 22, the cam sleeve or ring 23 is formed with three upstanding portions 26 spaced equal distances from each other around its periphery. As best seen in Fig. 2, a bolt 27 is screwed into the upper end of each of these upstanding portions 26, extends slidably upward through a suitable aperture 28 in the frame plate 24, and is provided with a coil spring 29 interposed between that plate and its head. The springs 29 thus normally maintain the cam sleeve 23 in its raised position of Figs. 2 and 3. As best seen in Figs. 1, 2, 5 and 6, the main frame or housing member 14 is provided with three horizontally disposed hinge brackets 31 spaced equidistantly from each other and secured to the outer surface thereof in any suitable manner, as by welding. Each of these hinge brackets 31 is somewhat shorter in length than the distance between adjacent vertical walls of the upstanding portions 26 of the cam sleeve 23, and functions as a pivotal support for one of the clamping fingers 21 and one of the shelf members 22. As best seen in Figs. 5 and 6, the lower end of each clamping finger 21 comprises an arcuate portion having an inner radius substantially equal to that of the larger ends of the collars 16. Adjacent each end of this curved stack-clamping portion, the finger 21 is provided with an upstanding hinge arm 32 curving outwardly at its upper end and provided with a suitable aperture for receiving the outer end portion of a hinge pin 33 (Fig. 2) which is journaled by the associated bracket 31. The arms 32 are spaced from each other laterally so as to slidably engage adjacent vertical surfaces of the upstanding portions 26 of the cam sleeve 23. These portions 26 therefore will function to prevent displacement of the hinge pins 33. The lower arcuate portion of each clamping finger 21 is provided centrally thereof with a rearwardly extending cam lug 34, the outer sloping surface of which is slidably engaged by the inner sloping surface of the cam ring 23 in the manner best illustrated in Fig. 2.

Each shelf member 22, in addition to a substantially horizontal and arcuate shelf portion at its lower end for supporting engagement with the bottom of the stack 15, as shown in Fig. 4, has a pair of upstanding hinge arms 35 (Fig. 5) suitably apertured at their upper ends

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to pivotally engage the associated hinge pin 33. These arms 35 are so dimensioned and spaced from each other that each of their outer surfaces slidably engages the inner vertical surfaces of the arms 32 on the associated clamping finger 21, and each of their inner vertical surfaces slidably engages the outer ends of the associated hinge bracket 31. Interconnecting these hinge arms 35 is a vertical web having an aperture 36 (Fig. 6) for accommodating the cam lug 34 on the associated clamping finger 21. This web portion of each shelf member 22 is provided with an outwardly extending tapped lug 37 for mounting a vertically adjustable cam screw 38. Each cam screw 38 cooperates, in a manner to be explained more fully hereafter, with an associated sloping cam surface 39 formed on the upper edge of the main body of cam sleeve 23. As best seen in Figs. 3A and 5, adjacent ends of the clamping fingers 21 normally are urged away from each other by coil springs 41 having their ends housed within suitable horizontally extending apertures in the clamping fingers 21. Conversely, as best seen in Figs. 3B and 5, the lower ends of the shelf members 22 are urged inwardly toward each other by coil springs 42 secured at their ends by suitable screws 43 to the ends of adjacent shelf members 22.

Referring back to Fig. 1, the stack guiding and individual collar feeding means 17 includes an outwardly threaded sleeve or ring 44 slidably mounted upon the upper end of the main frame or housing member 14 upon which are threadedly mounted an auxiliary frame or collar member 45 and a locking ring 46. The purpose of this construction, the details of which are better illustrated in Fig. 2, is to facilitate adjustment of the lower surface of sleeve 44 relative to the upper ends of the bolts 27 and the auxiliary frame or collar member 45. This latter member 45 is provided with a suitable extension 47 secured in any suitable manner to the upper end of an actuating rod 48 which is vertically reciprocable in any desired manner in timed relationship to the movement of the conveyor 19, so that the final increment of downward movement thereof during each operation will be effected as a bottle 18, or other collar-receiving article, is moved by the conveyor into vertical alignment with the central axis of the feeding mechanism. It is during such final increment of downward movement of actuating rod 48 that sleeve 44 is carried thereby from its position of Fig. 3 to that shown in Fig. 4. Such movement of the parts and their return to their positions of Fig. 3 from those of Fig. 4 constitute the operating cycle of the stack supporting and lowering means 13.

Again referring to Fig. 1, the stack guiding and individual collar feeding means 17 also includes a pair of diametrically opposed vertical rods 49 extending upwardly from, and secured at their lower ends to, auxiliary frame or collar member 45. Secured to these rods 49 in any suitable manner are a pair of lower and upper rings 51, each of which supports a manually operable clamping means indicated generally by reference numeral 52. These upper and lower clamping means 52 are identical to each other and are best illustrated in Figs. 1 and 7 through 12. Each clamping means 52 includes a pair of complementary clamping arms 53, the inner ends of which provide arcuate portions engageable in an associated circumferential groove 54 in a central tube, rod, bar, or the like 55, which comprises a vertically movable guide extending through the center of the stack 15. The outer ends of the clamping arms 53 comprise finger pieces 56, which normally are disposed in spaced and angular relationship to each other as shown in Fig. 8 when the inner portions of the arms are engaged in their associated groove 54, and may be moved into contact with each other, as shown in Fig. 9, to disengage these inner portions of arms 53 from grooves 54 and dispose the arms outwardly of the inner diameter of their associated ring 51. For such movement of the clamping arms 53, the intermediate portions thereof are suitably apertured for

pivotal mounting on one of the vertical rods 49. The arms 53 are spring-urged into active position in engagement with their groove 54 by a grasshopper-type spring 57 having its body coiled around the associated rod 49 and its ends bent downwardly and engaging in suitable apertures, respectively, in the upper surfaces of the arms 53. This spring 57 is retained in such engagement by a suitable collar 58 secured to the associated rod 49. Slidably mounted on that rod 49 below the associated ring 51, is a finger plate 59 urged upwardly into engagement with the ring 51, or its attaching or mounting means, by a coil spring 61. This plate 59, or suitable lateral extensions thereof, carries a pair of upstanding studs 62 which extend through suitable apertures in the associated ring 51. These studs 62 are adapted to cooperate with suitable cam surfaces and apertures 63 formed in the lower edges of the clamping arms 53, whereby outward movement of the arms 53 from their position of Fig. 8 to that of Fig. 9 first depresses studs 62 and finger plate 59 against the action of coil spring 61, and then permits the latter to return the studs 62 upwardly into engagement with these apertures in the arms 53 to retain the latter in their inactive position of Fig. 9. Pins 64 may be provided on the upper surface of the rings 51 to limit such outward movement of the clamping arms 53, in conjunction with the finger pieces 56, and will assure proper positioning of arms 53 outwardly of the inner diameter of their ring 51. To return this clamping means to its active position of Fig. 8, it is necessary only to depress finger plate 59 to remove studs 62 from their apertures 63, whereupon spring 57 will swing the inner portions of arms 53 into their clamping position in engagement with their associated groove 54. Thus, so long as either of the clamping means 52 is engaged in its associated groove 54, as seen in Figs. 1, 8, 10 and 11, it will support and secure the tube 55 for vertical reciprocation with the sleeve 44 by the actuating rod 48 relative to the main frame or housing member 14.

In addition to the above-described members 45-64, the stack guiding and individual collar feeding means 17 includes the following mechanism for effecting the serial feeding of the lowermost collar 16 from the stack 15. Secured in any suitable manner to the lower end of the central stack guide or tube 55, as by the threaded engagement best illustrated in Fig. 2, is a cylindrical member 65 which terminates at its lower end in an inner annular cam surface 66. A flanged plunger 67 is slidably mounted in the cylindrical member 65 with an outwardly threaded upper end thereof extending through a suitable aperture in that member and having an adjustable lock nut 68 mounted thereon. Mounted on the reduced upper end portion of the plunger 67 and engaging against a suitable shoulder thereon, is a piston ring 69 between which, and the upper end of the cylindrical member 65, is interposed a coil spring 71 for normally maintaining the plunger in its outermost position of Fig. 2 relative to the members 65 and 55. The flanged lower end of the plunger 67 is formed to provide an outwardly flaring or sloping surface 72, and a resilient ring 73 of rubber, or any other suitable material, having a plurality of radially extending fingers formed integrally therewith is mounted upon the intermediate portion of the plunger 67 directly above this sloping surface 72. This resilient ring 73 is best illustrated in plan in Fig. 3A, its radial fingers being equally spaced from each other around its periphery. In its normal position of Figs. 2 and 3, the hub portion of this ring 73 is substantially horizontally disposed, and its radial fingers curve downwardly and are reduced in thickness toward their outer ends. Proper adjustment of the lock nut 68 may be made to insure the resilient ring 73 normally being maintained in this position of Figs. 2 and 3 with its upper surface engaging the lower end of the cylindrical member 65. Screwed into a suitable tapped bore in the lower end of the plunger 67 is a bolt or stud 74 having a lock nut 75 mounted thereon to enable vertical

adjustment thereof relative to the plunger and the resilient ring 73. The head portion or lower end of this stud 74 preferably is provided with a suitable resilient insert 76 as a shock absorbing means, since this stud 74 strikes against the collar-receiving articles during operation of the feeding mechanism.

Operation

With the instant mechanism disposed in its normal position of Figs. 1 and 2, an initial stack 15 of collars 16 may be placed therein in the following manner. The lower clamping means 52 is retained in its normal operative position of Fig. 8 to support the central guide 55, while the upper clamping member 52 is manually moved to its inactive position of Fig. 9 by squeezing together of the finger pieces 56. The nested collars 16 may then be dropped over the upper end of the central guide 55, and are free to fall downwardly through the space between this member 55 and the inner diameter of the upper ring 51, as will best be appreciated from the illustration of Fig. 9. After a stack 15 has thus been loaded into the mechanism, it will come to rest on the lower clamping means 52 in the broken line position shown in Fig. 1. The upper clamping means 52 is then released by depressing its finger plate 59 for return by its spring 57 into operative engagement with the central guide member 55. As soon as this upper clamping means 52 thus assumes its normal function of mounting the central guide 55 on the rods 49, the lower clamping means 52 is manually moved to its inactive position of Fig. 9 by squeezing together of its finger pieces 56, wherein it will be retained automatically by the upstanding studs 62 and spring 61. This release of the lower clamping means 52 permits the stack 15 to fall into its position of Fig. 2, in which the lower portion thereof is clampedly engaged peripherally by the fingers 21, and the feeding mechanism is then ready for operation. It will be appreciated that with this arrangement of the two clamping means 52, additional collars 16 may be introduced into the mechanism at any time to replenish the stack 15 without interrupting the operation of the mechanism. In other words, as soon as a sufficient number of collars 16 have been removed from the lower end of the stack to lower the latter below the lower clamping means 52, this lower clamping means may be re-engaged with the central guide or tube 55, the upper clamping means 52 released therefrom, and additional collars 16 placed in the feeding mechanism.

Each cycle of operation of the mechanism comprises a complete reciprocation of the individual collar feeding means 17 from its position of Fig. 2, through its position of Fig. 3 to its lowermost position of Fig. 4, and upward return to its normal position of Fig. 2. During such upward or return movement, the outer ends of the radial finger portions of the resilient ring 73 frictionally engage the inner surface of the lowermost collar 16 in the stack, so that subsequent downward movement of the feeding means removes that lowermost collar 16 and carries it downwardly through the intermediate position illustrated in Fig. 3. Such removal of the lowermost collar from the stack is accomplished without distortion of the collar, since the gripping of the latter by the resilient ring 73 is at the point of greatest resistance to deformation of the collar. While the lowermost collar 16 is thus being removed downwardly from the mechanism, the stack 15 will continue to be supported by the clamping fingers 21.

As soon as the lower end of the stud 74, or its resilient insert 76, during such downward movement abuts against a collar-receiving article, such as a filled bottle 18, further downward movement of the plunger 67 is blocked. The actuating means 48 continues to move the central tube 55 downwardly through the connections previously described, however, which results in movement of the cylindrical member 65 and its annular cam surface 66 relative to the plunger 67 and resilient ring 73 from the position of Fig. 3 to that shown in Fig. 4. This relative

movement causes downward bending and peripheral constriction of the radial fingers of the resilient ring 73 until they are disposed in their positions of Fig. 4 between the then substantially parallel cam surfaces 66 and 72, which releases the collar 16 being carried downwardly by resilient ring 73 to permit the same to fall onto the collar-receiving article or bottle 18 which has been responsible for such release by its blocking of the downward movement of plunger 67. The initial portion of the immediately subsequent upward movement of the central guide member 55 is not accompanied by similar movement of the plunger 67 until the upper end of the cylindrical member 65 re-engages the lock nut 68, or the collar-receiving article or bottle 18 has been removed from engagement with the stud 74. It will thus be seen that the instant feeding mechanism is readily adapted to serially feed the collars 16 either to a stationary article or one that is moved therepast in timed relationship to the reciprocations of the actuating member 43. In any case, the fed collar 16 will have dropped below the lower end of the flanged plunger 67 before subsequent relative movement between the latter and the cylindrical member 65 by spring 71 permits return of the resilient ring 73 to its normal expanded or substantially horizontal position.

Downward movement of sleeve 44 to its lowermost position of Fig. 4 during such cyclic operation of the feeding means 17 actuates the stack supporting and lowering means 13 by depressing rods 27 against the action of springs 29 to lower cam sleeve 23. The several clamping fingers 21 and shelf members 22 are thereby released for movement by their associated springs 41 and 42. In other words, the clamping fingers 21 normally are disposed with their lower ends in the inner active positions of Figs. 2 and 3, wherein they support the stack 15. The several shelf members 22, on the other hand, normally are in their inactive or inoperative positions of Figs. 2 and 3 wherein the shelf portions at their lower ends are disposed outwardly of the stack-clamping inner surfaces of the fingers 21. Such downward movement of cam sleeve 23 thus permits spring-urged movement of the shelf members 22 inwardly to their operative positions of Fig. 4, followed by outward spring-urged movement of the clamping fingers 21 to their inoperative or inactive positions of this figure. The stack 15 is thereby released by the clamping means and permitted to fall or be gravitationally lowered the distance of the vertical overlap previously existing between the lowermost and penultimate collars 16 in the stack, the latter and now lowermost collar coming to rest upon the shelf portions of members 22. Immediate return of these parts from such positions of Fig. 4 to their normal positions of Figs. 2 and 3, is accomplished by springs 29 to raise the cam sleeve 23 in response to lifting of the sleeve 44. This upward return of cam sleeve 23 to its normal position first causes the inner cam surface of the sleeve to act against the outer cam surface of the lugs 34 to return the clamping fingers 21 into clamping engagement with the stack against the action of springs 41. Immediately thereafter, the sloping cam surfaces 39 contact and actuate the cam screws 38 to swing shelf members 22 outwardly to inoperative position against the action of their springs 42.

The upward return of sleeve 44 by actuating means 43 also carries tube 55 and cylindrical member 65 from their positions of Fig. 4 to those of Fig. 3 to effect return to normal expanded condition of the resilient ring 73, and complete return of these parts to their normal positions of Fig. 2 frictionally engages the ends of the radial fingers of resilient ring 73 with the now lowermost collar 16 in the stack. The next cycle of operations of the feeding mechanism thus will effect similar feeding of that lowermost collar from the stack and incremental lowering of the latter.

In the event of no collar-receiving article being properly disposed below the feeding mechanism in the downward movement of the parts from their positions of Fig.

3, continued downward movement of stud 74 will not be blocked, and no relative movement between plunger 67 and cylindrical member 65 will result, so that the resilient feed ring 73 will remain extended. The collar 16 being carried by ring 73 thus will not be released therefrom and will be returned upwardly through its position of Fig. 3 into the lower end of the stack 15. Since the latter will have been lowered in the meantime from its former position of Fig. 2 to that of Fig. 4, this collar 16 cannot be returned to the position of the lowermost collar in stack in Fig. 2, but will be stopped somewhat short of that position by the stack 15. However, because of the resilient construction of the feed ring 73, all that will happen will be that its radial fingers will be slightly depressed at their outer ends from their position of Fig. 2, and the immediately following cycle of operations will result only in the downward feeding of that same undelivered collar 16. During such subsequent re-lowering of the previously undelivered collar 16, the shelf members 22 will be swung inwardly to their position of Fig. 4, as above described, but since the lower end of the stack 15 will then be in contact with their horizontal shelf portions, the usual lowering of the stack will not take place in that cycle. Consequently, if a collar-receiving article is then in proper position below the feeding mechanism to block movement of stud 74, the formerly undelivered collar 16 will be released and dropped thereon in the usual manner. Thus it will be seen that the instant feeding mechanism will release and deliver a collar from the stack only when a collar-receiving article is in proper position to receive it, and failure to release and drop the lowermost collar because of the absence of a collar-receiving article, although repeated indefinitely, will have no deleterious effect, either upon the undelivered collar or any other in the stack.

As will also be appreciated from the preceding description, dimensioning of the parts to maintain the exact spacing between the upper surfaces of the horizontal shelf portions of the members 22 and the lower ends of clamping fingers 21 shown in Fig. 4 is not necessary, and the overlap between adjacent collars in the stack need not be exactly uniform, since the clamping fingers 21 will always effectively support the stack, as shown in Fig. 3, whenever the shelf members 22 are in their outer inoperative position, and the feed ring 73 always will remove the lowermost collar from its retention by the clamping fingers, if the previously removed collar has been delivered. And the proper gripping by fingers 21 is assured by suitable adjustment of the cam screws 38, since their position determines the normal relative positions of the cam ring 23 and the clamping fingers 21, as shown in Fig. 2. In other words, upward adjustment of screws 38 will permit springs 29 to raise cam ring 23 a corresponding distance, which will wedge cam lugs 34 inwardly a corresponding amount to decrease the effective radius of the clamping fingers or increase the pressure exerted thereby peripherally on the lower end portion of the stack. Such adjustments also may be made to compensate for wear of the cooperating cam surfaces of ring 23 and lugs 34 and the cam surfaces 39. Suitable adjustments similarly are readily available of the normal position and effective gripping action of feed ring 73 by means of lock nut 68, and of the releasing action or collapsing of ring 73 and effective length of stud 74 by means of lock nut 75.

As illustrated in Fig. 1, the present invention has been described only specifically with relation to its use in connection with a conveyor adapted to move upstanding filled bottles serially thereunder, so that the feeding mechanism will deliver a collar 16 to each of the bottles. In addition, it is contemplated that a plurality of feeding units similar to that shown in Fig. 1 may be mounted in bank to be simultaneously operated by a suitable activating member similar to rod 48 to each deliver a collar 16, or the like, to one of a plurality of

collar-receiving articles disposed therebeneath. In other words, such a multiple or bank arrangement of feeding mechanisms may thus be arranged to facilitate placement of collars or the like on the bottles contained in an open-topped case in a single operation. Since such multiple arrangement, broadly speaking, comprises only duplication of the mechanism hereinbefore described, such arrangement has not been illustrated.

It will also be appreciated that it may be desirable to employ more than the two vertical rods 49 herein illustrated for mounting the clamping means 52. And the clamping means for mounting the central tube 55 for reciprocation with the auxiliary frame member or reciprocable means 44-46 obviously may take any desired form other than that illustrated, so long as it is capable of performing the necessary function of preventing relative movement between this reciprocable means 44-46 and the reciprocable member 55. For example, the clamping means 52, and particularly the lower one thereof, may take the form of a pair of pins slidable into and out of engagement with the lower circumferential groove 54. Such arrangement, together with means operable manually from a point adjacent the upper clamping means 52 for actuating such lower clamping means, will be particularly useful when a plurality of the instant collar feeding mechanisms are mounted in bank, as above described, since it will facilitate operation of the lower clamping means while adding collars to the stack. This arrangement will further facilitate interlocking of the upper and lower clamping means so that both of them cannot be disposed in their inoperative positions at the same time. The possibility of an operator mistakenly releasing both upper and lower clamping means at the same time will thus be eliminated, which will prevent inadvertent dropping of the central tube 55 and its feeding mechanism downwardly through the main frame 14 and stack supporting and lowering means 13.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A device of the class described, comprising stack supporting and lowering means, including a plurality of fingers normally clampingly engaging the lower peripheral portion of a plurality of truncated conical collars nested in vertical stack with their largest ends downward, and normally inoperative shelf means movable to operative position under the collars to support said stack; stack guiding and individual collar feeding means, including reciprocable means extending through the central portion of said stack for removing the lowermost collar therefrom; and operating means for actuating said reciprocable means, fingers and shelf means in sequence to effect removal of the lowermost collar, movement of said shelf means to operative position, and movement of said fingers to an inoperative position to allow said stack to fall onto said shelf means.

2. In a device according to claim 1, spring means tensioned by said operating means to effect subsequent return of said fingers into clamping engagement with said stack and movement of said shelf means to inoperative position.

3. A device according to claim 2, wherein said reciprocable means includes a collar-engaging device and a plunger member for mounting the same and movable relative to said operating means to effect disengagement of a collar from said collar-engaging device.

4. A device according to claim 3, wherein said operating means is operable in timed relationship to a conveyor for moving filled bottles beneath the device to

block downward movement of said plunger member to effect said disengagement of a collar from said collar-engaging device to permit the released collar to fall over the plunger-blocking bottle.

5. A collar feeding mechanism for serially removing the lowermost collars from a vertical stack thereof and dropping the same onto collar-receiving articles, comprising a reciprocable member, a spring-urged member mounted on said reciprocable member for movement therewith and relative thereto, a collar-engaging device mounted on said spring-urged member for removing the lowermost collar from said stack during movement of said spring-urged member with said reciprocable member, and means for releasing said lowermost collar from said collar-engaging device and allowing it to be dropped onto a collar-receiving article in response to relative movement between said reciprocable member and said spring-urged member effected by movement-preventing blocking of said spring-urged member by the collar-receiving article.

6. In a collar feeding mechanism according to claim 5, a conveyor for moving collar-receiving articles past said reciprocable member to block movement of said spring-urged member, and operating means for actuating said reciprocable member in timed relationship to said conveyor, whereby failure of the conveyor to present a collar-receiving article in blocking relationship to said spring-urged member will prevent disengagement of the collar carried by said collar-engaging device and will effect return by the latter of such collar to the stack.

7. In a collar feeding mechanism for serially removing the lowermost of a plurality of truncated conical collars nested in stack with their largest ends downward, stack supporting and lowering means, comprising a plurality of fingers normally clampingly engaging the lower peripheral portion of said stack, normally inoperative shelf means movable to operative position below said stack, and operating means for serially moving said shelf means to operative position and disengaging said fingers from said stack to permit the latter to be lowered by gravity onto said shelf means.

8. In a collar feeding mechanism according to claim 7, stack guiding and individual collar removing means, comprising a reciprocable member extending axially through said stack, and feed means mounted on the lower portion of said reciprocable member for frictionally engaging the inner surface of the lowermost collar in the stack.

9. A collar feeding mechanism according to claim 8, wherein said feed means comprises a resilient ring with radial fingers mounted for contracting movement relative to said reciprocable member to release a said collar therefrom.

10. In a collar feeding mechanism according to claim 9, means for mounting said stack guiding and individual collar removing means on said operating means for movement therewith and operable to enable the addition of collars to the upper end of said stack without interrupting operation of the feeding mechanism.

11. A collar feeding mechanism according to claim 10, wherein said means for mounting said stack guiding and individual collar removing means comprises mounting members secured to said operating means exteriorly of the stack, and clamping means mounted on said mounting members for selective movement relative thereto between an active position for engaging said reciprocable member and an inactive position exteriorly disposed relative to the stack.

12. A collar feeding mechanism for serially removing the lowermost collars from a vertical stack thereof, comprising stack supporting and lowering means, frame means for supporting said first means, reciprocable means for operating said first means slidably mounted upon said frame means, stack guiding and individual collar feeding means including a reciprocable member extending axially through said stack, supporting members secured to said

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reciprocable means exteriorly of said stack, and clamping means mounted on said supporting members and manually movable between an operative inner position for clampingly engaging said reciprocable member and an inoperative outer position disposed exteriorly of said stack.

13. A collar feeding mechanism according to claim 12, wherein said clamping means comprises upper and lower clamping members spaced vertically from each other and individually operable so that at least one of them will clampingly engage said reciprocable member to prevent movement of the latter relative to said reciprocable means.

14. In a device of the class described, frame means, reciprocable means slidably mounted on said frame means, vertically extending supporting members mounted at their lower ends on said reciprocable means, a vertically reciprocable member disposed between said supporting members, and clamping means mounted upon said supporting members for normally clampingly engaging said reciprocable member, comprising a pair of pivotally mounted clamping arms having their inner ends formed

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to engage said reciprocable member and their outer ends defining finger pieces normally spaced outwardly from each other, spring means engaging said arms to normally urge their inner ends toward each other, and cam means operable in response to manual movement of said finger pieces toward each other to automatically retain said arms in an inoperative position against the action of said spring means.

15. A device according to claim 14, wherein said cam means comprises spring-urged members cooperating with said arms, and a manually operable plate mounting said spring-urged members and operable to move the same to inoperative position to enable said spring means to return said arms into clamping engagement with said reciprocable member.

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