July 27, 1937. T. PETERSEN 2,088,010

CAPPING DEVICE

Filed Oct. 21, 1935 2 Sheets-Sheet 1

Fig. 1

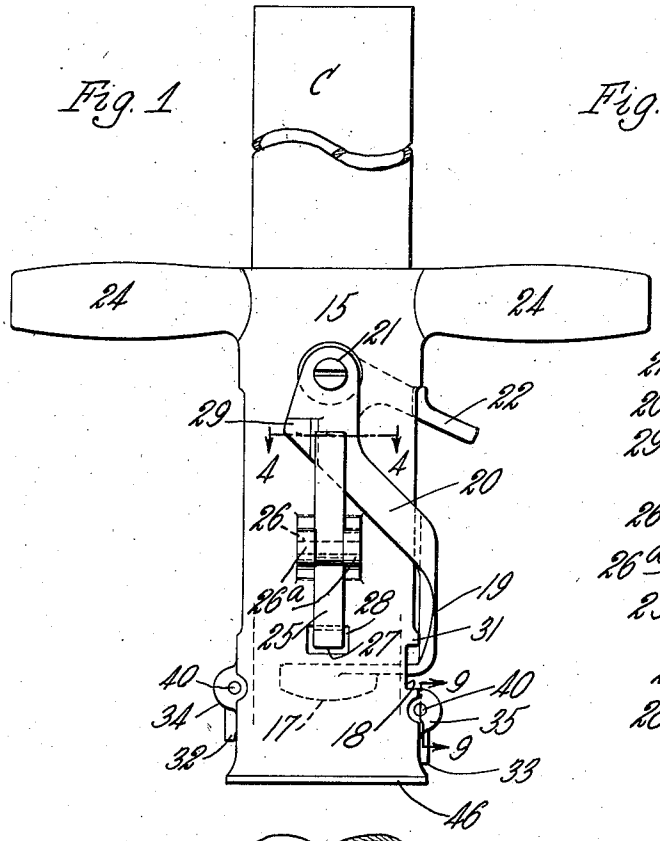
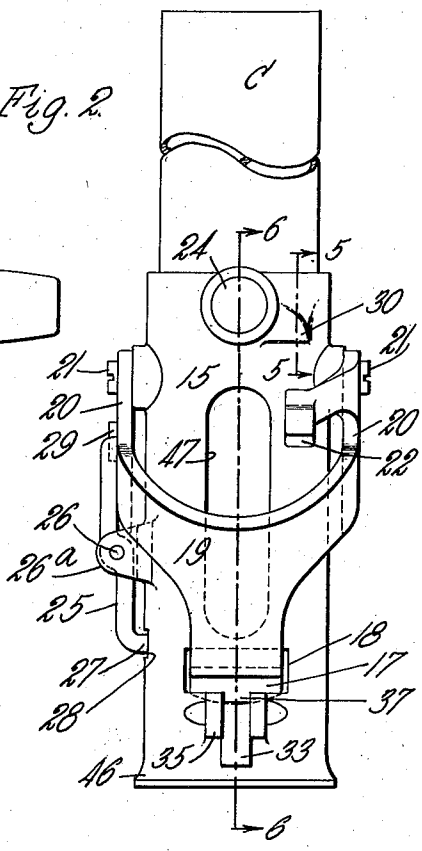


Fig. 2



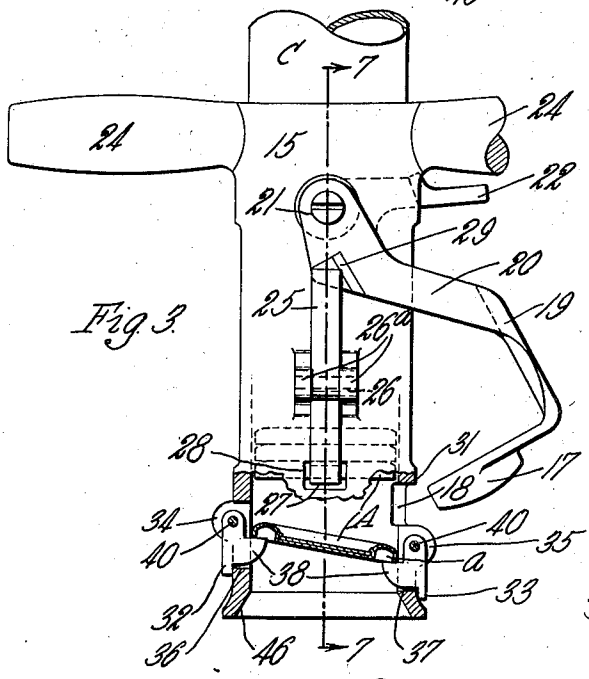


Fig. 3

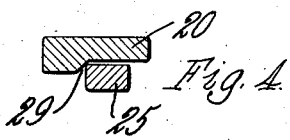


Fig. 4

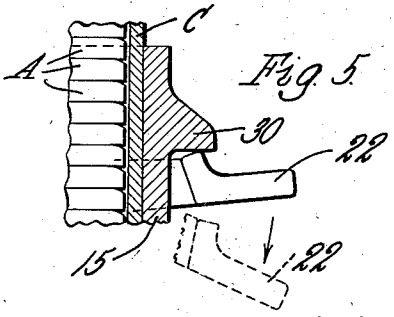


Fig. 5

INVENTOR

Thorvald Petersen

by Parker, Prochnow & Farmer.

ATTORNEYS.

July 27, 1937. T. PETERSEN 2,088,010

CAPPING DEVICE

Filed Oct. 21, 1935 2 Sheets-Sheet 2

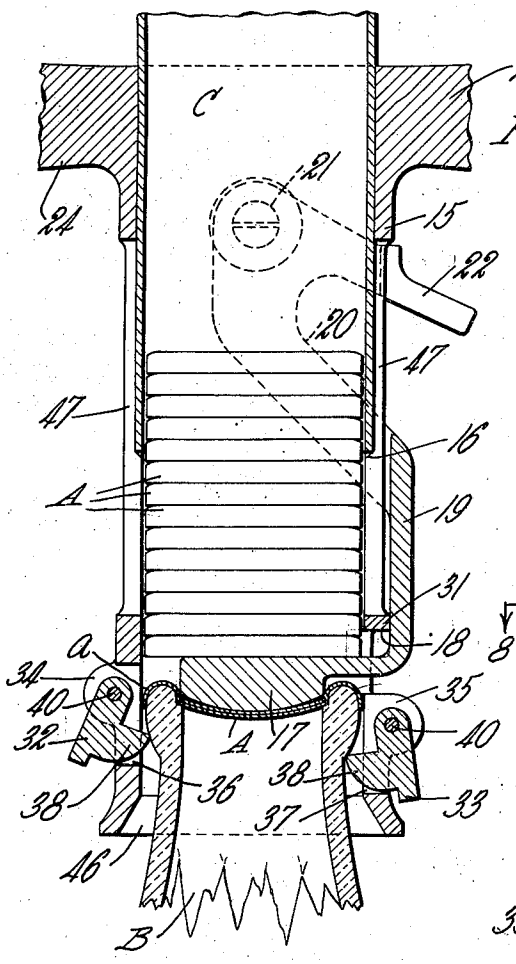


Fig. 6.

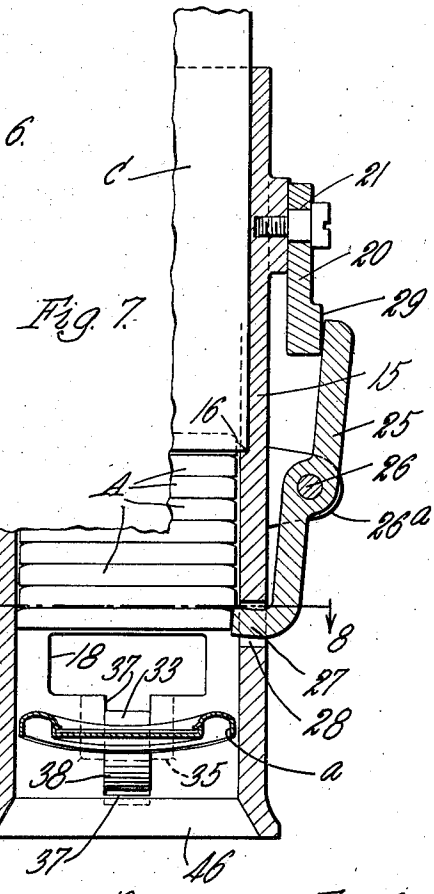


Fig. 7.

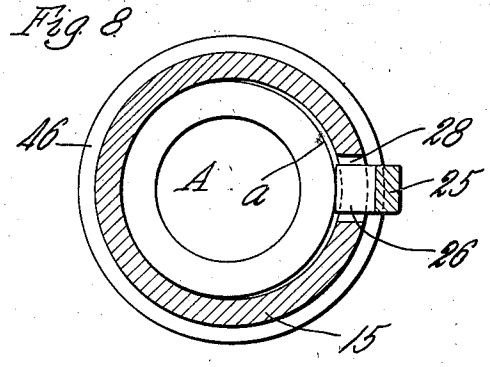


Fig. 8

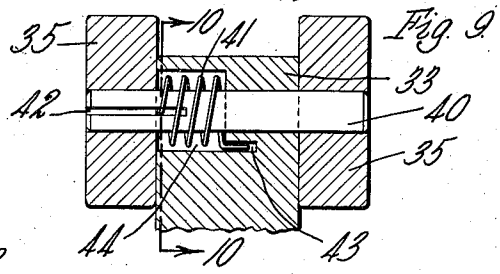


Fig. 9.

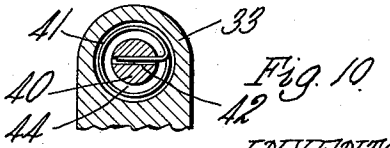


Fig. 10.

INVENTOR
Thorvald Petersen
By Parker, Prickard & Farmer.
ATTORNEYS.

Patented July 27, 1937 2,088,010

UNITED STATES PATENT OFFICE

2,088,010

CAPPING DEVICE

Thorvald Petersen, Erie, Pa., assignor to R. G. Wright & Company, Buffalo, N. Y.

Application October 21, 1935, Serial No. 45,871

20 Claims. (Cl. 226—92)

This invention relates to improvements in devices for placing caps or closures on containers such, for example, as milk bottles.

Bottle capping devices heretofore have commonly been constructed in such a manner that the capping device was supported on the edge of the container during the capping operation. Such capping devices, however, could not be used in connection with the placing on containers of caps of larger diameters than the upper end of the container which is to be capped. For example, caps for milk bottles have now come into general use which have an annular hood or projection which fits over the outer end of the bottle top as well as seating in the annular recess formed near the outer end of the neck of the bottle.

The objects of this invention are to provide a capping device for placing caps or closures on containers and which is capable of use in connection with caps or closures of either greater or less diameter than the upper end of the container and which is simple and inexpensive in construction and reliable in operation; also to provide a capping device with means of improved construction for feeding caps from a magazine one at a time into capping position; also to provide a capping device in which the magazine for the caps is substantially in alinement with the container which is being capped; also to provide a capping device in which a member which serves as a support for a stack of caps in the magazine also serves to force the cap into its operative position on a container; also to provide a capping device in which a member, serving both to support the stack of caps and to place a cap into operative position on a container, is movable laterally into and out of its operative position for permitting the lowest cap in the stack to drop into a position for placing on a container; also to provide in a device of this kind means of improved construction for supporting the caps in the stack while the cap support is moved out of its stack supporting position; also to provide means of improved construction for supporting caps in a capping position below the combined stack supporting and capping member; also to improve the construction of capping devices in other respects hereinafter specified.

In the accompanying drawings:

Fig. 1 is a front elevation of a capping device embodying this invention.

Fig. 2 is a side elevation thereof.

Fig. 3 is a front elevation thereof, partly in section, and showing parts of the device in different positions than in Fig. 1.

Fig. 4 is a fragmentary section thereof, on line 4—4, Fig. 1, on an enlarged scale.

Fig. 5 is a fragmentary section thereof, on line 5—5, Fig. 2.

Fig. 6 is a sectional elevation thereof, also on an enlarged scale, on line 6—6, Fig. 2.

Fig. 7 is a fragmentary sectional elevation on line 7—7, Fig. 3.

Fig. 8 is a transverse sectional plan view on line 8—8, Fig. 7.

Fig. 9 is a fragmentary section on a still larger scale on line 9—9, Fig. 1.

Fig. 10 is a section thereof, on line 10—10, Fig. 9.

Briefly stated the capping device shown in the accompanying drawings as illustrating one embodiment of this invention, includes a housing having an upright substantially cylindrical passage therethrough for the caps, the upper portion of the cylindrical part of the housing forming a magazine or container for a stack of caps and the lower portion of the housing being formed to receive the upper part of a container while the cap is being placed thereon. The stack of caps is normally supported by the upper face of a cap supporting member and the lower face thereof serves as a plunger or pressure member for positioning the cap on a container. This supporting member is movable laterally out of a housing to permit the lowest cap of the stack to be dropped into capping position.

The invention is illustrated in the accompanying drawings as applied to the capping of milk bottles by means of caps A arranged to be placed over the entire upper end of a milk bottle B, each cap being provided with an annular peripheral skirt portion *a* which is adapted to overhang the upper edge of the milk bottle. It will be understood, however, that it is not intended to limit this invention to the capping of milk bottles, since obviously the capping device may operate on containers of any other kind, and furthermore, it will be readily seen from the accompanying description that this improved capping device may be equally well applied to the placing on milk bottles or other containers of caps or closure members which do not cover the entire upper end of the container, but which are of smaller diameter than that of the upper end of the container, which is the case with caps of the kind which merely seat in the annular shoulder in the upper end of the neck of the bottle.

15 represents the cylindrical part of the housing of the capping device, the upper end of which is adapted to receive a tubular carton or con-

tainer C for the caps A and the interior of the housing or body portion 15 is preferably provided with a shoulder 16 upon which the lower edge of a tubular carton C rests. This carton may be of the kind in which the caps are usually packed by the manufacturer thereof. The caps are discharged from the lower end of the carton C into the interior of the cylindrical body portion 15 where they are supported by the upper substantially flat face of a combined cap supporting and capping member 17. This member 17 is movable into and out of cap supporting position through an opening or aperture 18 in the housing and the movement of this member may be effected in any suitable or desired manner. In the construction illustrated, this member has an arm 19 which extends outwardly through the opening 18 and upwardly along the outside of the housing or body portion of the capping device and terminates in a bifurcated portion 20, the two arms of which extend along opposite sides of the housing or body portion and are pivoted thereon at 21, the pivotal support for this member being preferably vertically above the combined cap support and capping member so that downward pressure by this capping member toward a container will be resisted by the pivotal support above the cap support and capping member. The movement of this member 17 about its pivot 21 may be effected by any suitable or desired means, and in the particular construction illustrated, manually operable means are provided for this purpose, including an arm 22 extending laterally of the capping device into a position to be readily engaged by a finger of the operator. When the device is used as a hand operated capping device, the housing 15 is preferably also provided with one or more laterally extending handles 24 and the arm 22 preferably extends into a convenient position with relation to one of these handles so that the arm 22 may be operated by means of a finger of one of the hands grasping the adjacent handle 24. When it is desired to feed a cap into operative position for placing on the container, the arm 22 is raised, thus swinging the combined cap support and capping member into the position shown in Fig. 3 and permitting the lowest cap of the stack to drop into capping position. Upon release of the arm 22, the combined cap support and capping member will swing by gravity into its operative position under the stack of caps as clearly shown in Figs. 1 and 6. Any other means for moving the cap support and capping member into and out of stack supporting position may be used.

Any suitable means may be provided for supporting the caps in the magazine or stack with the exception of the lowest cap, so that only one cap will drop into capping position when the combined cap support and capping member is withdrawn out of the housing into the position shown in Fig. 3. For this purpose, I preferably employ means actuated and released by the movement of the cap support and capping member itself, and in the construction shown for this purpose, a cap holding lever 25 is provided which is pivoted at 26 on the exterior of the housing or body portion of the capping device upon a pair of lugs 26a which may be formed integral with the housing and which extend outwardly therefrom. One end of the lever has an inwardly extending projection or cap holding finger 27 extending through an aperture 28 formed in the side of the housing 15 opposite the next lowest cap of the stack, and the other end of the lever extends upwardly in contact with one part of the bifurcated arm 20. This arm is preferably provided with a cam portion 29, which is so positioned that when the cap supporting and capping member 17 is in its normal or operative position, the lever 25 hangs loosely on its pivot 26 out of engagement with the caps in the stack. Upon initial movement of the cap support 17 out of its operative position, the cam portion 29 will move laterally and force the upper end of the lever 25 outwardly and thus produce a corresponding inward movement of the lower end of this lever. The lower end 27 of the lever, consequently, engages the cap which is immediately above the lowest cap of the stack and presses the same in frictional engagement with the opposite portion of the cylindrical wall of the housing 15, as clearly shown in Fig. 7. This will cause the second lowest cap to be held against downward movement when the cap support 17 is removed from its cap supporting position, and this cap will, consequently, support the entire stack of caps until the cap support again moves into supporting position, whereupon the cam portion 29 of the bifurcated arm 20 moves out of engagement with the lever 25 and permits the same to release its pressure against the cap held by it, thus permitting the stack of caps to drop into position to be supported by the combined cap support and capping member 17. In the meantime, the lowest cap will have dropped, while the cap supporting member 17 was out of the housing 15, into a capping position below the member 17. It will be noted too that the lower arm of the lever 25 and the inwardly projecting end 27 thereof are offset toward the housing 15 with reference to the pivotal axis of the lever 25 in such a manner that when the cam 29 moves out of engagement with the upper end of the lever, the weight of the lower end of the lever will cause this lever to swing into a position in which the lower end 27 of the lever releases the cap with which it had been forced into engagement by the cam 29. Any other means for supporting the stack of caps while the cap supporting member is moved out of the housing may be employed.

The movement of the cap supporting and capping member 17 into and out of its operative position may be limited in any suitable or desired manner. For example, the outward swinging of this member may be limited by means of a stop lug 30 which may be formed integral with the housing 15 and arranged in the path of the movement of the arm 22, see Figs. 2 and 5, and a stop 31 may be provided on the housing 15 to engage the arm 19 to limit the movement of the combined cap supporting and capping member 17 into the housing 15.

Any suitable or desired means may be provided for holding a cap, after it is dropped from the stack of caps, into a position below the member 17 for placing upon a container, and in the construction shown for this purpose, a pair of movable cap holding members 32 and 33 are mounted on the housing 15. In the construction illustrated, these movable members are pivoted on lugs 34 and 35 formed integral with the housing 15 and extending outwardly therefrom and the housing is also provided with apertures 36 and 37 through which portions of the cap holding members 32 and 33 may enter into the housing and into the path of movement of the caps. Each of these cap holding members is for this

purpose provided with a cam-shaped lug or projection 38, the upper face of which is substantially flat or horizontal and the lower face of which is preferably curved or cam-shaped. The upper faces of the cap holding members are adapted to engage edge portions of the cap as the same drops into its capping position and to hold the cap in capping position until a container moves upwardly into the lower end of the housing 15. The upper edge of the container will engage the cam-shaped portions of the cap holding members and move them laterally out of their holding positions and the cap will, consequently, become positioned on the upper end of a container. Furthermore, relative movement of the capping device and container in a direction to cause the upper end of the container to move into the capping device will result in the cap being moved against the lower end of the combined cap supporting and capping member 17. The lower face of this member is so formed as to properly press a cap into its correct position on the upper end of the container. Upon relative movement of the capping device and container in opposite directions resulting in the movement of the upper end of the container out of the capping device, the cap holding members 32 and 33 will be swung laterally about their pivotal connections to permit the container with a cap thereon to move out of the capping device.

Suitable means may be employed for yieldingly urging the cap holding members 32 and 33 into their cap holding positions, and for this purpose, each of the cap holding members is preferably provided with a pivot pin 40 extending through alined apertures of the bearing lugs and the cap holding member and a coil spring 41 is preferably employed which may be arranged about the pivot or bearing pin 40, and which acts to yieldingly press the cap supporting member into its cap holding position. The spring will readily yield to permit its cap holding member to move outwardly with regard to the housing when engaged by a container. In the construction shown, one end of the pivot or bearing pin 40 is provided with a slot 42 into which one end of the coil spring 41 enters, and the other end may extend into a hole 43 in the cap holding member, the spring itself being located in a larger hole or recess 44 formed in the cap holding member. The pivot or bearing pin 40 may be frictionally held in the apertures of the bearing lugs 34 or 35, and if desired, the ends of the bearing pin or member 40 at opposite sides of the slot 43 may be spread apart to a slight extent so as to yieldingly support itself in fixed position in the aperture in the adjacent bearing lug. Consequently, by turning the pin 40 with a screw driver inserted into the slot 42, the tension of the spring 41 can be adjusted as may be desired. Any other means for resiliently urging the cap holding members into their operative or holding positions may be employed in place of those described.

It will be obvious that the cap holding members may be entirely omitted, if the container to be capped is so positioned relatively to the capping device that the cap will drop directly upon the end of the container.

In the use of the capping device, if the same is operated manually, after a stack of caps has been inserted into the housing 15, the cap supporting member 17 will retain the stack of caps in the interior of the housing 15. Before applying a cap to a container, the arm 22 is first swung upwardly, which causes the cap supporting member 17 to swing outwardly of the housing into the position shown in Fig. 3. This releases the lowest cap of the stack and causes the lever 25 to swing into engagement with the second lowest cap and hold the same together with all caps above it in fixed position in the interior of the housing 15. The lowest cap drops into capping position upon the cap holding members 32 and 33. Upon release of the arm 22, the combined cap supporting and capping member 17 swings back into its operative position in the interior of the capping device and upon pressing the capping device downwardly about the upper end of a container, the cap held by the holding members 32 and 33 will first be loosely placed upon the upper end of the container member and finally pressed into its operative position on the container by the member 17.

Since the capping member moves outwardly from underneath the stack of caps toward one side of the housing of the capping device, it will be obvious that the side of the cap opposite to the aperture 18 in the housing will first drop downwardly. In order to prevent this cap from moving into an excessively inclined position and from turning over, the cap holding member 32 is preferably located at a higher elevation than the other cap holding member 33.

The lower end of the housing of the capping device may be flared or provided with a bell mouth 46 to facilitate the proper positioning of the capping device on the container. The housing may also be provided with openings 47 in the sides thereof through which the lowest caps of the stack may be seen and through which any incorrect alinement of these caps with reference to the device may be remedied.

The capping device described is of simple and reliable construction including the minimum number of parts and the movable parts are all of simple construction and will not readily become damaged or inoperative. The capping device is very positive in its action and may be used on any type of cap or closure. By means of the arrangement shown in which the member 17 serves the double function of supporting a stack of caps and also as a capping member, a very much simplified construction results, since the feeding of caps vertically downwardly from the stack reduces the mechanism necessary to effect the feeding of the caps from the stack or magazine into capping position.

I claim as my invention:

1. In a container capping device, the combination of a magazine for a stack of caps, a member having its upper face formed to support said stack of caps and having its lower face formed to press a cap into its operative position on a container, said member being movable out of a position beneath said stack of caps to effect feeding of a cap into a capping position below said member, and means below said member for releasably holding a cap in position to be pressed on a container by said member.

2. A capping device according to claim 1, in which the combined stack supporting and capping member is pivotally mounted to swing into and out of its feeding position.

3. A capping device according to claim 1, including means for supporting all the caps of the stack except the lowest cap when said member is in its cap feeding position, said means being actuated by said member.

4. In a capping device, the combination of a

housing having an upright cylindrical passage therethrough, the upper portion of said passage forming a magazine for a stack of caps and the lower portion of said passage being adapted to receive the upper end of a container to be capped, a combined cap supporting and capping member arranged to move into and out of said passage and supporting the stack of caps in said magazine when in said passage, means for supporting all but the lowest cap of said stack when said member moves out of said passage to feed the lowest cap into capping position, and means for holding said cap in the lower portion in said passage until applied to a container, said member, when in cap supporting position also serving to press a cap into operative position on a container.

5. In a capping device, the combination of a housing having an upright cylindrical passage therethrough, the upper portion of said passage forming a magazine for a stack of caps and the lower portion of said passage being adapted to receive the upper end of a container to be capped, a combined cap supporting and capping member arranged to move into and out of said passage and supporting the stack of caps in said magazine when in said passage, to permit the lowest cap of said stack to drop into a capping position below said member, and means for holding all but the lowest cap of said stack in fixed position while said member is out of said passage, said member having the lower face thereof formed to press a cap on a container when said container moves inwardly in said passage and when said member is in stack supporting position.

6. In a capping device having a magazine for a stack of caps, a member which supports said stack, and which is mounted to move out of its supporting position under said stack to permit the lowest cap of the stack to drop into a position below said member, means actuated by the movement of said member to hold other caps of said stack in fixed position during movement of said member, the lower face of said member being formed to press a cap positioned below the same on a container.

7. In a container capping device, the combination of a magazine for a stack of caps, a cap supporting member arranged at the bottom of said stack and movable into a position out of supporting relation to said stack, means for holding the second cap from the bottom of said stack against downward movement when said member is withdrawn from its supporting position to cause the lowest cap of said stack to move into a position below said member, means below said member for yieldingly holding said lowest cap, said means being movable out of their holding positions by a container, and means for guiding the upper end of a container into correct relation to said capping device to receive said cap and to have said cap forced into seating position on said container by engagement with said member.

8. In a container capping device, the combination with a magazine for a stack of caps, a member for pressing caps into closing position on a container, means cooperating with said member for feeding caps one at a time from said stack to a position below said member, and cap holding members movably arranged below said pressing member and having upper faces adapted to hold a cap and lower cam faces adapted to be engaged by a container for moving said holding members out of holding positions to deposit the cap held thereby on said container while said container and pressing member are moving toward each other for pressing the cap on said container.

9. In a container capping device, the combination of a magazine for a stack of caps, a member for pressing caps into closing position on the container, means cooperating with said member for feeding caps one at a time from said stack to a position below said member, and cap holding members pivotally mounted below said pressing member and having upper faces arranged to hold a cap, and lower cam faces adapted to be engaged by a container during movement of said container and pressing member toward each other, said container causing said holding members to swing out of the path of movement of the container and to deposit a cap held thereby on said container.

10. A container capping device provided with means for feeding caps from a magazine into a position to be placed on the container, said feeding means including a member movably arranged at the bottom of a stack of caps and movable outwardly from under said stack, a holding member adapted to engage the second lowest cap of the stack when said movable member moves out of its holding position under said stack, so that the lowest cap of said stack is released, and means actuated by the movement of said movable member for moving said holding member into its operative position.

11. A container capping device provided with means for feeding caps from a magazine into a position to be placed on the container, said feeding means including a member movably arranged at the bottom of a stack of caps and movable outwardly from under said stack, a lever having one end thereof adapted to swing into a position to grip the second lowest cap of the stack when said movable member moves out of its position under said stack, and a cam on said movable member which engages said lever to move the same into its holding position when said movable member moves out of its position under said stack, to cause the lowest cap of the stack to be dropped into capping position.

12. In a container capping device, the combination of a substantially cylindrical housing having an upright passage extending therethrough, the upper portion of which forms a magazine for caps and the lower portion of which receives the upper portions of containers to be capped, a member which supports the caps in said magazine and which serves to press a cap on a container, said member being pivoted on said housing and movable into and out of said passage to permit the lowest cap in the magazine to drop into a position below said member, a cap holding lever pivoted on said housing and having a part adapted to enter into said passage to engage the second lowest cap of said stack and hold the same against downward movement in said passage, and a cam on said pivoted member adapted to engage said lever during movement of said member out of said passage to move said lever into its cap holding position, said cap being pressed into its closing position on a container when the upper end of said container is pressed toward said member.

13. In a container capping device, the combination of a substantially cylindrical housing having an upright passage extending therethrough, the upper portion of which forms a magazine for caps and the lower portion of which receives the upper portions of containers to be capped, a member which supports the caps in said maga-

zine and which serves to press a cap on a container, said member being pivoted on said housing and movable into and out of said passage to permit the lowest cap in the magazine to drop into a position below said member, a cap holding lever pivoted on said housing and having a part adapted to enter into said passage to engage the second lowest cap of said stack and hold the same against downward movement in said passage, a cam on said pivoted member adapted to engage said lever during movement of said member out of said passage to move said lever into its cap holding position, and means for yieldingly holding said cap in a position below said member for deposit upon the upper end of a container when the same is moved upwardly in said passage, said cap being pressed upon said container by said member upon further movement of the upper end of said container into said passage.

14. In a container capping device, the combination of a substantially cylindrical housing having an upright passage extending therethrough, the upper portion of which forms a magazine for caps and the lower portion of which receives the upper portions of containers to be capped, a member which supports the caps in said magazine and which serves to press a cap on a container, said member including a part movable into and out of said passage to support caps in said magazine and having an outwardly extending part pivoted on said housing, said housing having a handle for moving the capping device toward and from a container for capping the same, an arm on said pivoted member extending into proximity with said handle whereby said pivoted member may be moved into and out of said passage to permit the lowest cap in the magazine to drop into a position below said member, means for supporting the caps in said magazine with the exception of the lowest cap when said member is moved out of said upright passage, said lowest cap being pressed into closing position on a container by moving said capping device into engagement with the upper end of the container.

15. In a container capping device, the combination of a magazine for a stack of caps, a movable support for the stack of caps in said magazine and upon which the bottom cap of the stack rests, said support being movable out of engagement with said bottom cap, means for engaging the cap next to the bottom cap when said support moves out of its stack supporting position, and means below said support for receiving the bottom cap when said support is moved out of its supporting position, said support, when in its stack supporting position also engaging a cap supported below the same for pressing such cap into closing position on a container.

16. In a container capping device, the combination of a magazine for a stack of caps, a movable support for the stack of caps in said magazine and upon which the bottom cap of the stack rests, said support being movable out of engagement with said bottom cap, means for engaging the cap next to the bottom cap when said support moves out of its stack supporting position, and bottom cap receiving means movable out of cap holding position by a container for positioning a cap on a container, said support, when in its stack supporting position, also serving to engage a cap below the same for pressing the same into closed position on a container.

17. In a container capping device, the combination of a housing having a substantially upright tubular passage, the upper portion of which forms a magazine for a stack of caps, a member movable into and out of said passage and supporting the stack of caps with the upper face thereof and having the lower face adapted to press a cap into operative position to a container, means for retaining all but the lowest of the caps of the stack in said magazine when said member is moved out of said passage, and means extending into said passage below said member for releasably holding the cap, the lower end of said passage being formed to permit the upper end of the container to enter into the same to move said cap holding means out of cap holding position for positioning the cap on said container and for pressing the cap into engagement with the container by means of said movable stack supporting member.

18. In a container capping device having a magazine for a stack of caps, a member which supports said stack and which is mounted to move out of its supporting position under said stack to permit the lowest cap of the stack to drop into a position below said member, means for holding the other caps of said stack in fixed position during movement of said member, the lower face of said member being formed to press a cap positioned below the same on a container.

19. In a capping device having a magazine for a stack of caps, a member having an upper face which supports said stack and movable out of stack supporting position, to permit the lowest cap of the stack to drop below said member, means for holding the other caps of said stack against movement while said member is out of its stack supporting position, the lower face of said member serving to engage the upper face of said cap to press the same on a container.

20. In a container capping device, the combination of a magazine for a stack of caps, a combined stack supporting and cap positioning member movable out of stack supporting position to permit a cap from the stack to move into a position below said member, and means for releasably supporting a cap below said member and movable out of cap holding position by engagement with a container.

THORVALD PETERSEN.