Sept. 10, 1957 R. F. ANDERSON 2,805,532

COVER APPLYING APPARATUS

Filed March 19, 1956 2 Sheets-Sheet 1

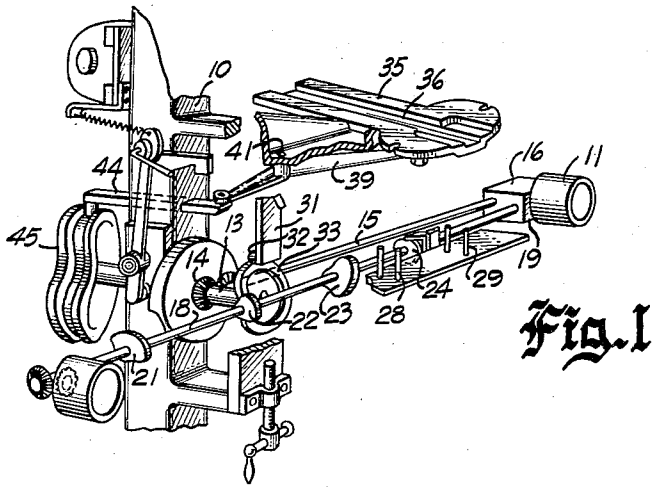
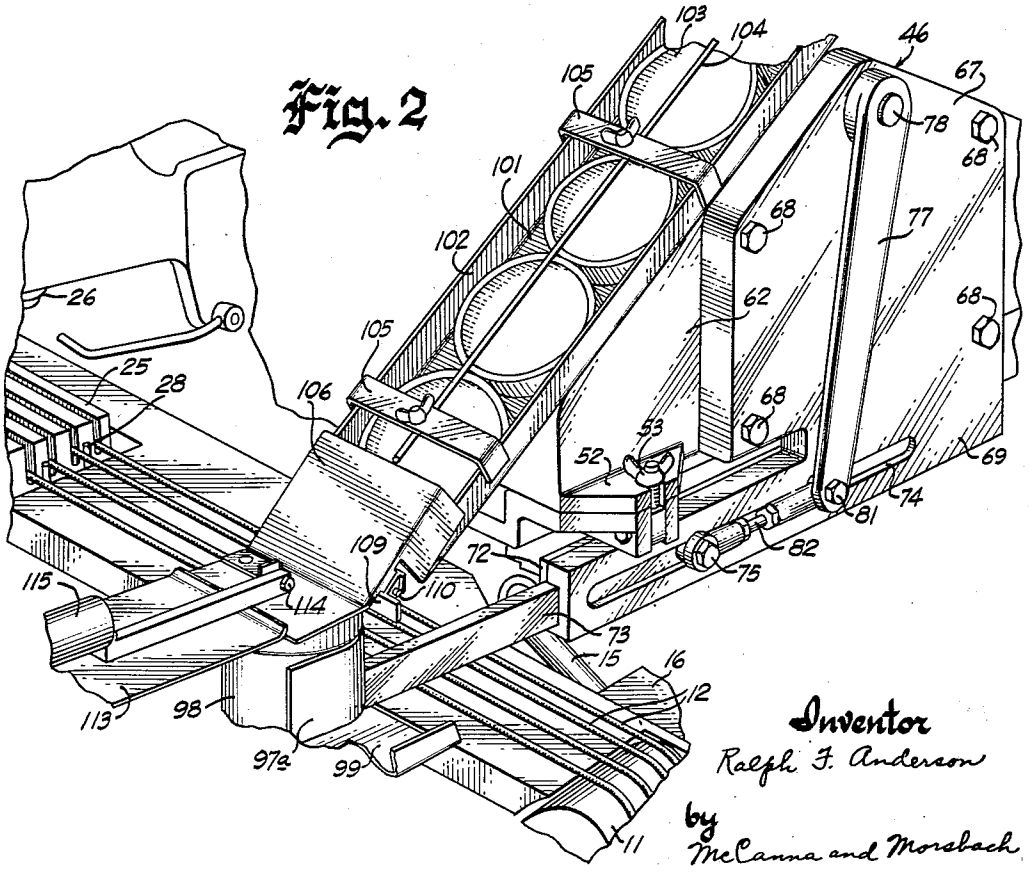


Fig. 1

Fig. 2



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Fig. 3

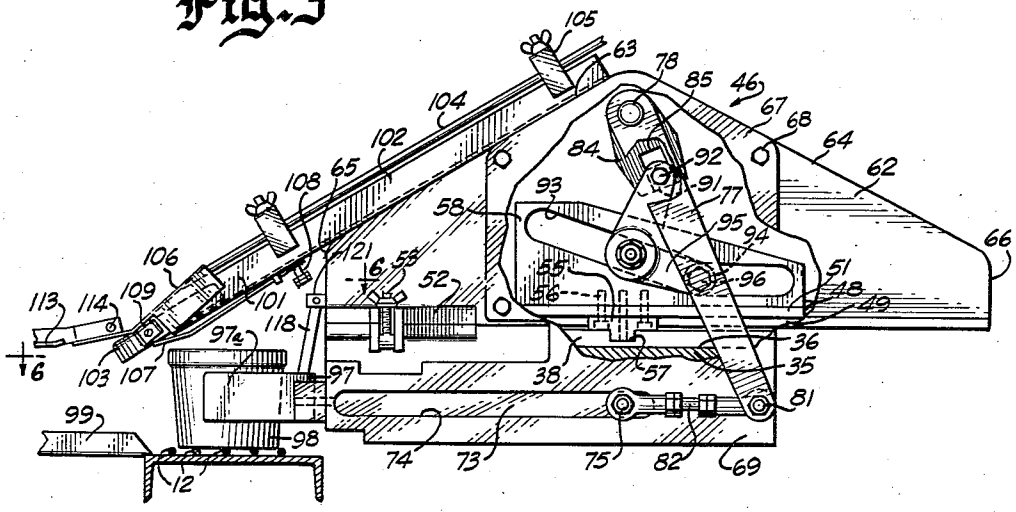


Fig. 4

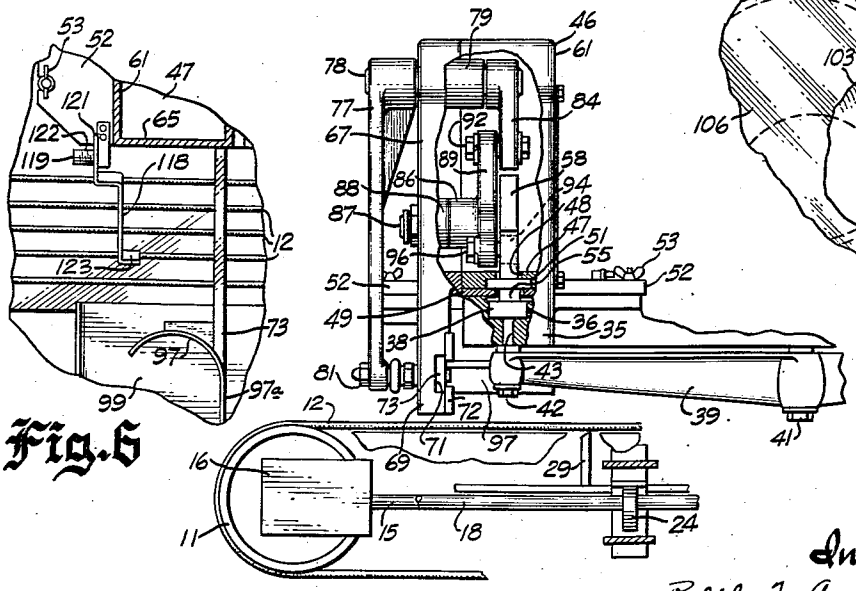


Fig. 5

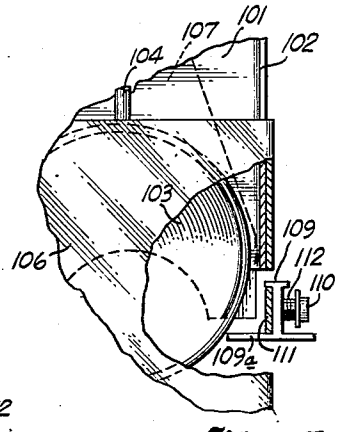


Fig. 6

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2,805,532

COVER APPLYING APPARATUS

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Application March 19, 1956, Serial No. 572,466

12 Claims. (Cl. 53—314)

This invention relates to a capping apparatus and more particularly to an apparatus for applying skirted covers to a container.

The capping apparatus of the present invention, although generally adapted for use in applying skirted covers to paper containers, is particularly designed for use with a container filling machine of the type disclosed in the patent to S. F. Anderson, 2,029,299. In general, the container filling machine of that patent includes a conveyer for advancing a container from a loading station past a filling station to the capping station. The capping apparatus of that patent includes a capping bell overlying the conveyer to support a cover thereat and an operating mechanism arranged to feed a cover to the capping bell in timed relation to the advance of the containers on the conveyer. In that construction, the cover in the capping bell is applied to a container in response to raising the container off from the conveyer and into engagement with the cover in the bell.

An important object of this invention is to provide an improved capping apparatus arranged for attachment to a container filling machine of the type disclosed in the aforementioned patent and to be operated by the operating mechanism thereof in timed relation to the advance of the containers to the capping station, to move each container crosswise of the conveyer onto a loading platform and to simultaneously apply a skirted cover to the container.

Another object of this invention is to provide a capping attachment for use on a container filling machine of the type disclosed in the aforementioned patent, which attachment does not necessitate any modification in the construction of the operating mechanism for the capper and which may be rapidly installed and removed to permit interchanging of the capping apparatus of the present invention with different cap applying devices.

A more particular object of this invention is to provide a capping attachment adapted for mounting and dismounting from a dispensing mechanism as a unit and including a reciprocable pusher arm for moving the container crosswise of a conveyer and a cover feeding chute overlying the pusher arm and arranged to support a cover at the lower end thereof to apply the cover to the container as it is moved by the pusher arm off the conveyer and onto a loading platform.

A further object of this invention is to provide an attachment in accordance with the foregoing object and having provision for stopping the containers as they are advanced by the conveyer to locate the containers on the conveyer in proper relation wtih respect to the pusher arm and cover supporting mechanism on the lower end of the chute.

A still further object of this invention is to provide a capping attachment having provision for stopping the advance of containers on the conveyer to the capping attachment when the pusher arm is extended.

Yet another object of this invention is to provide a capping apparatus in which the operating mechanism is

substantially completely enclosed whereby to prevent contamination of the material in the container and facilitate cleaning of the capping apparatus.

These, together with various ancillary objects and advantages of this invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description when taken in connection with the accompanying drawings wherein:

Figure 1 is a fragmentary skeleton view of a filling machine with which the capping apparatus of the present invention is adapted to be used;

Fig. 2 is a fragmentary perspective view of a filling mechanism having the capping apparatus applied thereto;

Fig. 3 is a side elevational view of the capping apparatus shown applied to the dispensing mechanism with parts broken away and shown in section to illustrate details of construction;

Fig. 4 is a rear elevational view of the capping apparatus shown applied to the dispensing mechanism, with parts broken away and shown in section to illustrate details of construction;

Fig. 5 is a fragmentary top view of the lower end of the cover chute with parts broken away and shown in section to illustrate details of construction; and

Fig. 6 is a fragmentary sectional view, taken on the plane 6—6 of Fig. 3.

The capping apparatus of the present invention is adapted for use with a container filling machine of the type wherein the containers are carried by a conveyer from a loading station past a dispensing mechanism to a capping station to have a cap applied thereto. One such dispensing machine is illustrated in skeleton in Fig. 1 of the accompanying drawings and is of the type disclosed in the aforementioned patent to S. F. Anderson, 2,029,299, to which reference is made for a more complete description, it being understood that the capping apparatus may be used with various other filling machines of this general type and may, within the purview of the present invention, be used independent of the filling machine. As shown in Fig. 1, the filling machine includes a frame 10 having spaced sheaves 11 mounted thereon, which sheaves are adapted to support a conveyer 12 herein shown in the form of a plurality of endless belts. A motor (not shown) is operatively connected to the main drive shaft 13 and the conveyer sheaves 11 are driven from the main drive shaft through bevel gears 14, power take off shaft 15 and a gear assembly 16. A cam shaft 18 is drivingly connected to the power take off shaft 15, through the gear assembly 16 and is driven thereby in timed relation with the main drive shaft 13. The gearing between the cam shaft 18 and the main drive shaft 13 is arranged to drive the cam shaft through one revolution during each revolution of the main drive shaft.

A plurality of cams 21—24 are mounted on the cam shaft for operating the several elevating tables and stop mechanisms in timed relation. In particular, cam 23 is arranged to operate an elevating table 25 (see Fig. 2) located below the dispensing mechanism 26 and cams 22 and 24 are arranged to operate the stop members 28 and 29 located at longitudinally spaced points along the conveyer. The dispensing mechanism 26 is operated in timed relation with the elevating and lowering of the table 25 therebelow by means of an operating member 31 (see Fig. 1) which is arranged in a manner more fully described in the aforementioned patent to dispense a quantity of material each time the member 31 is reciprocated. As shown in Fig. 1, the dispenser operating member 31 has a follower 32 thereon and engageable with a cam 33 on the main cam shaft 13 to be reciprocated thereby in timed relation with the operation of the elevating table 25. The cams 22 and 24 are arranged to elevate the stop members 28 and 29 prior

to the raising of the elevating table 25 to respectively stop a container below the dispensing mechanism 26 and to stop the preceding container in advance of the capping station. Cam members 22 and 24 operate to lower the stops 28 and 29 after the elevating table is lowered, to permit the containers to be advanced on the conveyer, and to again raise the stops to stop the succeeding containers thereat.

A capping bracket 35 is mounted at one side of the dispensing mechanism and overlies the conveyer, which capping bracket has a stepped groove 36 formed therein. A slide 38 (see Figs. 3 and 4) is slidably disposed in the stepped groove 36. The slide is reciprocated in timed relation to the operation of the dispensing mechanism by means of a lever 39 which is pivotally mounted on a pin 41 intermedate its ends. One end of the lever 39 is connected by a pin 42 carried by the slide 38, which pin extends through a slot 43 in the capping bracket. The other end of the lever 39 is operatively connected by means of a slide 44 (see Fig. 1) to a cam 45 on the main cam shaft 13. The cam 45 is arranged to retract the slide 38 in the capping bracket in a direction away from the conveyer, when the elevating table 25 below the dispensing mechanism is raised, and to extend the slide 38 when the table 25 is lowered to return the container back onto the conveyer. As also disclosed in the aforementioned patent, the dispensing mechanism 26 is operated when the table 25 therebelow is raised, to dispense a quantity of material into the container carried by the raised platform 25.

The capping attachment of the present invention, designated generally by the numeral 46, is arranged to be detachably mounted on the capping bracket 35 for operation by the slide 38 in timed relation with the advance of the containers on the conveyer. The capping apparatus includes a housing having a base 47. A stepped slot 48 is formed in the base and extends longitudinally thereof and plates 49 are secured to the underside of the base at opposite sides of the stepped slot 48 to form guideways for the reception of a shuttle 51. The base 47 is adapted to rest upon the top of the capping bracket 35 and is formed with laterally extending flanges 52. Wing bolts 53 are pivotally mounted on the capping bracket 35 and are arranged for engagement with the flanges 52 to detachably clamp the housing 46 to the capping bracket.

The shuttle 51 is operatively connected to the slide 38 by a key 55 (Fig. 1) which is affixed to the shuttle by fasteners 56 and extends into a keyway 57 in the slide. A vertically disposed cam plate 58 is affixed to the shuttle and extends upwardly therefrom through the slot 48.

The housing 46 includes upstanding sidewalls 61 and 62 and a top wall having a downwardly and forwardly sloping portion 63 and a downwardly and rearwardly sloping portion 64. Forward and rear walls 65 and 66 are provided to thereby form an enclosure for the capping mechanism. One of the side walls 62 has an enlarged opening therein and a cover plate 67 is affixed to the side wall 62 as by fasteners 68. The cover plate 67 has a depending apron 69 formed thereon which extends below the base 47 of the housing. A channel 71 (Fig. 4) is formed at the inner side of the apron 69 and guide plates 72 are affixed to the apron to define a guideway for the pusher arm 73. A slot 74 is formed in the apron and extends longitudinally of the guideway thereon and a pin 75 is affixed to the pusher arm and extends through the slot.

Provision is made for operatively connecting the pusher arm 73 to the shuttle 51 to reciprocate the latter in timed relation with the advance of the containers on the conveyer 12. In particular, the pusher arm is arranged to be retracted as the stops 28 and 29 are lowered to permit the containers to advance on the conveyer and the pusher arm is extended when the stops are raised to interrupt the advance of the succeeding containers. In the aforementioned patent to Anderson, the slide 38 is reciprocated to its extended position as the containers are advanced along the conveyer and is retracted when the stop members are raised. The operating mechanism for connecting the pusher arm to the shuttle is therefore arranged to reciprocate the pusher arm simultaneously and oppositely to the direction of reciprocation of the shuttle 51 and slide 38. For this purpose, a lever 77 is pivotally mounted at its upper end on a stub shaft 78 journaled in a boss 79 formed on the cover plate 67. The lower end of the lever 77 is connected by a pin 81 and link 82 to the pin 75 affixed to the pusher arm. An arm 84 is non-rotatably attached to the end of the stub shaft 78 remote from the lever 77 and is formed with an elongated slot 85 (Fig. 3). A bell crank 86 is pivotally mounted on a pin 87 supported in a boss 88 on the cover plate 67 and has one arm 89 thereof operatively connected to the arm 84 to oscillate the latter in response to oscillation of the bell crank. In the construction illustrated, the arm 89 of the bell crank has a guide block 91 affixed thereto by a pin 92 and slidably received in the slot 85 formed in the arm 84.

The cam plate 58, as best shown in Fig. 3, is formed with a cam groove 93 which extends forwardly and upwardly. A follower 94 (see Fig. 4) is disposed in the cam groove 93 and affixed to the other arm 95 of the bell crank by a pin 96. Thus, as the shuttle 51 is moved rearwardly with the slide 38, the bell crank is caused to move in a counterclockwise direction as viewed in Fig. 3 and thereby moves the arm 84 and the lever 77 in a clockwise direction. This, in turn, causes the pusher arm 73 to be moved to its extended position. Conversely, when the shuttle is moved forwardly, the pusher arm 73 is retracted.

A U-shaped cup-engaging finger 97 is affixed to the forward end of the pusher arm 73 and is arranged to engage a container 98 on the conveyer and move the latter with the pusher arm crosswise of the conveyer and onto a loading platform 99 located at the side of the conveyer opposite the capping apparatus. The finger 97 is formed with a container stop portion 97*a* which extends crosswise of the conveyer, when the pusher arm is in its retracted position as shown in Fig. 3, to engage the containers 98 as they are advanced by the conveyer, to stop the containers in proper relation to the pusher arm and to the cover applying mechanism to be described more fully hereinafter.

The capping apparatus 46 is arranged to apply skirted covers to the containers as they are moved off the conveyer and onto the loading platform 99 and for this purpose a chute 101 is affixed to the downwardly and forwardly inclined portion 63 of the top wall of the housing. The chute includes upstanding sides 102 to guide the covers 103 therealong and a guide bar 104 is affixed by brackets 105 to the chute 101 to retain the covers therein. A cover guide shoe in the form of an angulated plate 106 is affixed to the chute 101 adjacent the lower end thereof and slants downwardly relative to the bottom of the chute. A finger 107 (Figs. 3 and 5) is affixed to the underside of the chute and yieldably urged against the lowermost cover 103 therein, as by a spring 108, to support the cover in the lower end of the chute. Stops 109 are mounted on pins 110 carried by the depending tabs 111 formed on the cover guide shoe 106. The stops have portions 109*a* thereon arranged to extend inwardly of the chute to engage the periphery of the lowermost cover and retain the lowermost cover in the chute. The stops, as best shown in Fig. 5, are yieldably urged inwardly of the chute by springs 112. Conveniently, the stops may be formed of a pair of L-shaped strips disposed in back-to-back relation and having portions 109*a* of different lengths. With this arrangement, the stops may be removed from the pins 110 and reversed to accommodate covers of different diameters.

As is apparent from Fig. 3, the lowermost edge of the cover **103** is disposed in the path of movement of the container **98**, as it is moved by the pusher arm off the conveyer and onto the loading platform **99**. The upper portion of the container thus engages the depending flange on the cover and withdraws the latter from the chute. As the cover moves below the cover guide shoe **106**, the cover is pressed onto the top of the container. A presser plate **113** is hingedly connected by a pin **114** to the cover guide shoe **106** and extends therefrom. A weight or other yieldable means **115** is provided for yieldably urging the presser plate **113** downwardly whereby to firmly press the covers onto the tops of the containers.

In order to assure interruption of the advance of the containers on the conveyer to the capping station, when the pusher arm is extended, there is provided a stop arm **118**. The stop arm **118** is swingably mounted by a pin **119** and bracket **121** on the capping attachment for movement in a plane disposed crosswise of the conveyer **12** and in advance of the path of movement of the cup engaging finger **97** on the pusher arm, as the latter is extended and retracted. The stop arm **118** is yieldably urged by a torsion spring **122** to an extended position, as shown in Fig. 6, to stop the containers on the conveyer. A stop (not shown) is provided for limiting outward swinging movement of the stop arm **118**. A laterally extending finger **123** is provided on the stop arm **118** and arranged for engagement with the cup engaging finger **97**, as the latter is retracted. In this manner, the stop arm **118** is automatically retracted to the position shown in Fig. 3, to permit the advance of containers to the capping station when the pusher arm **73** is retracted.

From the foregoing, it is thought that the operation of the device will be readily understood. In general, the conveyer **12** together with stops **28** and **29** are operative to intermittently advance a container from a loading station (not shown) to the dispensing station below the dispensing mechanism **26**; to advance the preceding container from the dispensing station to an intermediate station; and to advance the second preceding container from an intermediate station to the capping station. The cams **22** and **24** then operate the stops **28** and **29** to raise the latter and stop the containers on the continuously moving conveyer **12**, at the dispensing station and at the intermediate station in advance of the capping sta tion.

While the stops **28** and **29** are in their lowered position, cam **45** operates the lever **39** to extend the slide **38**. The pusher arm **73** is therefore retracted to the position shown in Fig. 3 with the container stop portion **97***a* of the container engaging finger **97** extending into the path of movement of the containers **98** on the conveyer. As the pusher arm **73** is retracted, the container engaging finger **97** strikes the stop arm **118** and moves the latter out of the path of movement of the containers on the conveyer. Cams **22** and **24** then operate to raise the stops **28** and **29** to stop a container at the dispensing station and at the intermediate station in advance of the capping station and cam **23** is thereafter operative, while the stops are raised, to elevate the container at the dispensing station. Cam **33** on the main drive shaft **13** operates the dispensing mechanism **26** to dispense a quantity of material into the container on the elevating table, while the latter is raised. Substantially simultaneously with the elevating of the stops **28** and **29** and the raising of the table **25** below the dispensing mechanism, the cam **45** operates the lever **39** to retract the slide **38**. Retraction of the slide, as previously described, causes the bell crank to move in a counterclockwise direction as viewed in Fig. 3 whereby to oscillate the lever **77** in a clockwise direction and extend the pusher arm **73**. As the pusher arm is extended, the container which is stopped on the conveyer by the container stop portion **97***a* is moved with the pusher arm crosswise of the conveyer **12** and onto the loading platform **99**. Movement of the container engaging finger **97** to its extended position permits the stop arm **118** to swing outwardly under the bias of spring **122** to assure that a succeeding container will not be advanced by the conveyer to the capping station, until the container engaging finger is returned to its retracted position.

As the container is moved off the conveyer, the top of the container engages the depending lip on the lowermost cover **103** in the chute and removes the cover from the chute. The cover is pressed onto the top of the container by the cover guide shoe **106** and by the presser plate **113**. When the stops **28** and **29** are lowered, after the filling of the container at the dispensing station, the cam **45** operates the lever **39** to extend the slide **38** and simultaneously retract the pusher arm **73** whereby the portion **97***a* of the container engaging finger is returned to the position shown in Fig. 3 before the next succeeding container advances to the capping station.

I claim:

1. In an apparatus for applying covers to a container, the combination of an elongated conveyor for advancing containers to a capping station, a capping mechanism at said capping station including a platform at one side of said conveyer, a pusher arm mounted at the other side of said conveyer for reciprocation crosswise of the conveyer to move a container from said conveyer onto said platform, means overlying said conveyer and platform and operative in response to movement of a container off said conveyer and onto said platform for applying a cap to said container, and means for reciprocating said pusher arm to move a container off the conveyer and onto said platform to apply a cap thereto.

2. In an apparatus for applying covers to a container, the combination of an elongated conveyer for advancing containers to a capping station, a capping mechanism at said capping station including a platform at one side of said conveyer, a pusher arm mounted at the other side of said conveyer for reciprocation crosswise of the conveyer to move a container from said conveyer onto said platform, a container engaging finger on said pusher arm having a portion thereof extending into the path of movement of the container on the conveyer to stop a container at said capping station, means overlying said conveyer and platform and operative in response to movement of a container off said conveyer and onto said platform for applying a cap to said container, and means for reciprocating said pusher arm to move a container off the conveyer and onto said platform and thereby apply a cap to the container.

3. In an apparatus for applying covers to a container, the combination of an elongated conveyer for advancing containers to a capping station, a capping mechanism at said capping station including a platform at one side of said conveyer, a pusher arm mounted at the other side of said conveyer for reciprocation crosswise of the conveyer to move a container from said conveyer onto said platform, a container engaging finger on said pusher arm having a portion thereof extending into the path of movement of the container on the conveyer to stop a container at said capping station, means overlying said conveyer and platform and operative in response to movement of a container off said conveyer and onto said platform for applying a cap to said container, means for reciprocating said pusher arm to move a container off the conveyer and onto said platform and thereby apply a cap to the container, and means for stopping the containers on the conveyer in advance of the capping station when said pusher arm is extended.

4. In an apparatus for applying covers to a container, the combination of an elongated conveyer for advancing containers to a capping station, a capping mechanism at said capping station including a platform at one side of said conveyer, a pusher arm mounted at the other side of said conveyer for reciprocation crosswise of the conveyer to move a container from said conveyer onto said

platform, a container engaging finger on said pusher arm having a portion thereof extending into the path of movement of the container on the conveyer to stop a container at said capping station, means overlying said conveyer and platform and operative in response to movement of a container off said conveyer and onto said platform for applying a cap to said container, means for reciprocating said pusher arm to move a container off the conveyer and onto said platform and thereby apply a cap to the container, a stop arm mounted on said capping attachment for movement into and out of an extended position overlying the conveyer to stop the containers on the conveyer in advance of the capping station, and means for moving said stop arm into said extended position whenever said pusher arm is extended to thereby stop the succeeding containers on the conveyer.

5. In an apparatus for applying covers to a container, the combination of an elongated conveyer for advancing containers to a capping station, a platform mounted at one side of said conveyer at the capping station, a capping attachment mounted at the other side of said conveyer at the capping station and including a housing, a slide mounted for reciprocation on said housing in a direction transverse to said conveyer, a pusher arm mounted for reciprocation on said housing in a direction crosswise of said conveyer, said pusher arm having a container engaging finger on the end thereof engageable with a container on said conveyer to move the latter crosswise of the conveyer onto said platform as the arm is extended, means operatively connecting said pusher arm to said slide to reciprocate the arm in response to reciprocation of said slide, a cover chute attached to said housing and extending over said conveyer, means on said chute for releasably supporting a cover in the path of movement of the top of a container as it is moved by said arm onto said platform, and means for operating said container advancing means and said slide in timed relation.

6. In an apparatus for applying covers to a container, the combination of an elongated conveyer for advancing containers to a capping station, a platform located at said capping station and extending to one side thereof, a capping bracket located at the other side of said conveyer, a shuttle reciprocably mounted in said bracket for movement in a direction transverse to said conveyer and in a plane disposed above the level of the containers on said conveyer, means for reciprocating said shuttle in timed relation to the advance of containers on said conveyer to extend the shuttle as a container is advanced to the capping station and to retract the shuttle when the advance of the container on the conveyer is stopped, a capping attachment comprising a housing adapted to be mounted on said capping bracket, a pusher arm mounted on said housing for reciprocation in a direction crosswise of said conveyer, said pusher arm being disposed below said housing and having a container engaging finger on the end thereof adapted to engage a container on said conveyer and move the container off said conveyer onto said platform as the arm is extended, means on said housing engageable with said shuttle when said attachment is mounted on said bracket for reciprocating said arm simultaneously and oppositely to the reciprocation of said shuttle, a cover chute attached to said housing and extending downwardly and forwardly therefrom, and means on the lower end of said chute for supporting a cover in the path of the top of the container as it is moved by the pusher arm off the conveyer onto said platform to apply a cover to the container.

7. In an apparatus for applying covers to a container, the combination of a mounting base, a slide mounted for reciprocation on said base, a pusher arm mounted on said base for reciprocation in a direction parallel to the direction of reciprocation of said slide, a lever pivotally mounted on said base and operatively connected to said arm to reciprocate the latter in response to pivotal movement of said lever, means including a cam operatively connected to said slide for oscillating said lever as said slide is reciprocated, a cover chute attached to said mounting base and extending downwardly and forwardly therefrom, means on the forward end of said arm for engaging a container to move the latter with said arm as the arm is extended, and means on said chute for supporting a cover in the path of movement of the top of the container as it is moved by said arm to apply a cover to said container.

8. The combination of claim 7 wherein said lever oscillating means includes a bell crank pivotally mounted on said base, a follower on one leg of said bell crank engageable with said cam, and means operatively connecting the other leg of said bell crank to said lever to oscillate the latter in response to reciprocation of said slide.

9. In a capping attachment for applying hooded covers to containers, the combination of a housing including a base, upstanding side walls on said base, and a top wall having a downwardly and forwardly inclined portion, a chute attached to said inclined portion of the top wall and extending forwardly of said housing, means at the lower end of said chute for supporting a hooded cover thereat, a pusher arm mounted on said housing for reciprocation longitudinally thereof, means on said arm for engaging a container as the arm is extended to move the container therewith below the lower end of said chute to apply a cover thereto, and means in said housing for reciprocating said pusher arm.

10. In a capping attachment for applying hooded covers to containers, the combination of a housing including a base, upstanding sidewalls on said base, and a top wall having a downwardly and forwardly inclined portion, a chute for conveying covers affixed to said inclined portion of said top wall and extending forwardly of said housing, means at the lower end of said chute for releasably supporting a hooded cover thereat, a guideway carried by said housing and extending longitudinally thereof below said base adjacent one side thereof, and a pusher arm mounted in said guideway and having a container engaging finger thereon adapted to engage a container when the arm is extended to move the container below the lower end of said chute and apply a cover thereto.

11. A capping attachment comprising a housing including a base, upstanding side walls on said base, a top wall extending between said side walls, one of said side walls having an enlarged opening therein, a panel secured to said one side wall and overlying said opening, a slide reciprocably mounted on said base, a cam plate secured to said slide and extending upwardly therefrom into said housing, a pusher arm reciprocably mounted on said panel adapted to engage a container as the arm is extended to move the container therewith, a lever pivotally mounted at one end thereof on said panel, means operatively connecting the other end of said lever to said arm to reciprocate the latter in response to oscillation of said lever, a bell crank mounted on said panel, means carried by said panel for operatively connecting said bell crank to said lever, a follower on said bell crank adapted for engagement with said cam plate to oscillate said lever in response to reciprocation of said cam plate, and means for applying covers to the containers as they are moved by the arm.

12. A capping attachment comprising a housing including a base, upstanding side walls on said base, a top wall extending between said side walls, one of said side walls having an enlarged opening therein, a panel secured to said one side wall and overlying said opening, a slide reciprocably mounted on said base, a cam plate secured to said slide and extending upwardly therefrom into said housing, a pusher arm reciprocably mounted on said panel adapted to engage a container as the arm is extended to move the container therewith, a lever pivotally mounted

at one end thereof on said panel, means operatively connecting the other end of said lever to said arm to reciprocate the latter in response to oscillation of said lever, a bell crank mounted on said panel, means carried by said panel for operatively connecting said bell crank to said lever, a follower on said bell crank adapted for engagement with said cam plate to oscillate said lever in response to reciprocation of said cam plate, a cover chute attached

to said housing and extending downwardly and forwardly therefrom, and means on the lower end of said chute for releasably supporting a hooded cover in the path of the tops of the containers as they are moved by said pusher arm to apply covers to the containers.

No references cited.