May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 1

Fig. 1.

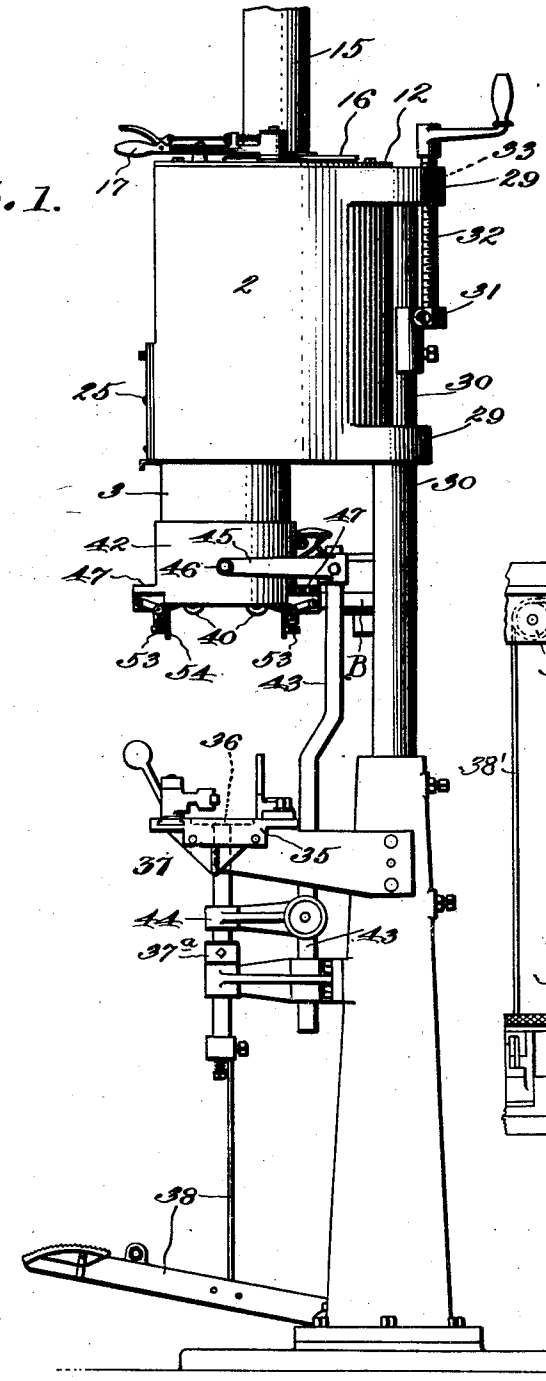


Fig. 14.

Inventors
W. L. Wright
L. D. Pierce

By

Hubert E. Locke Attorney

May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 2

Fig. 2.

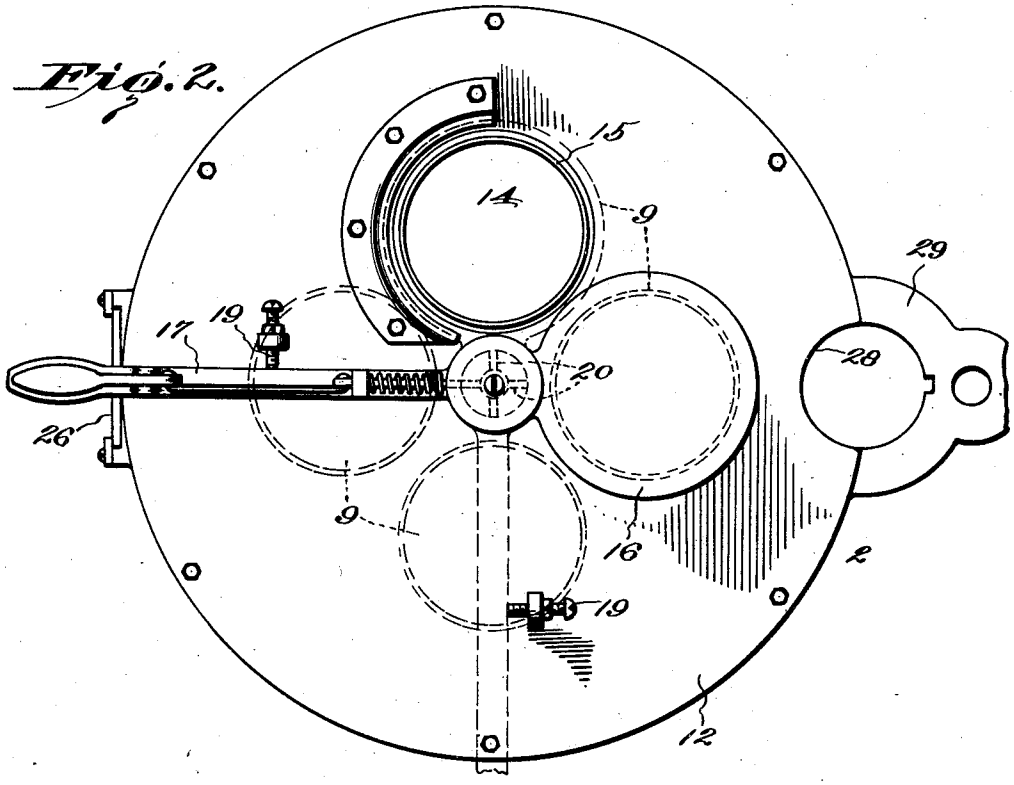
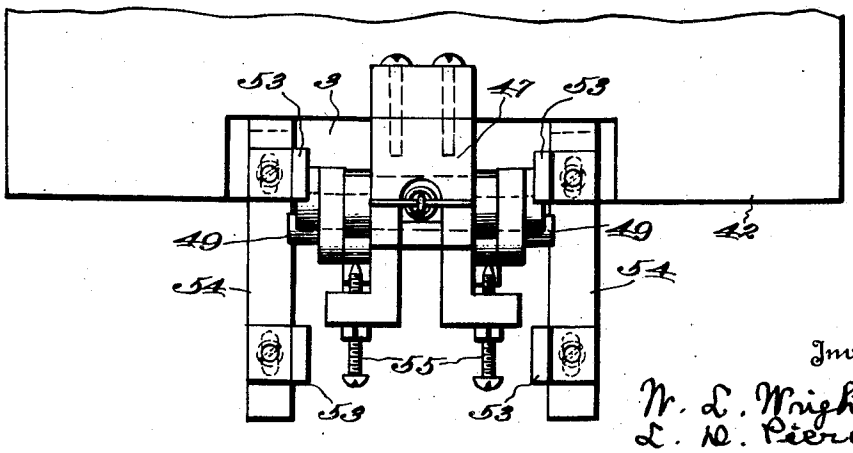


Fig. 3.



Inventors

W. L. Wright

L. M. Pierce

By

Hubert E. Beck Attorney

May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 3

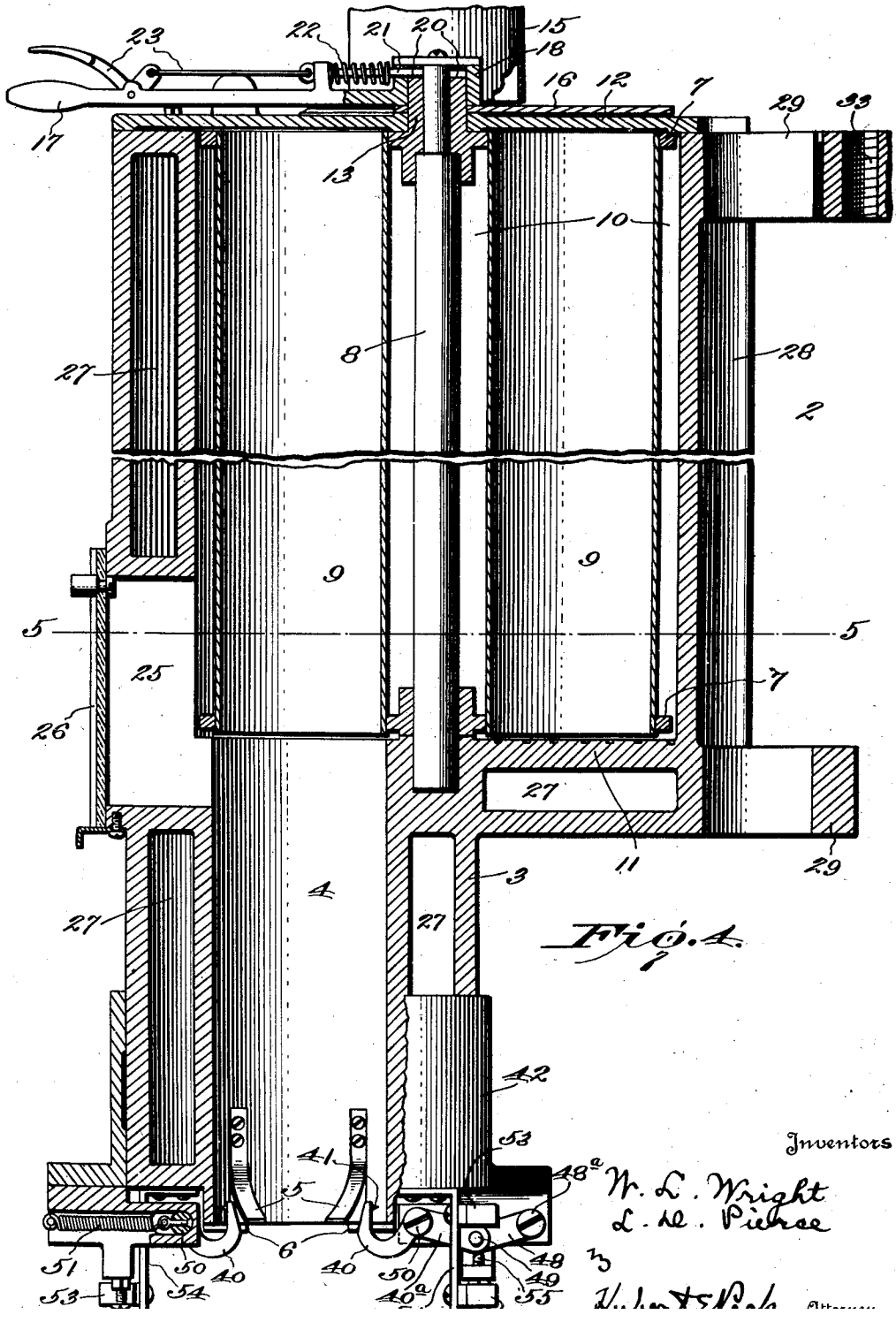


Fig. 4.

Inventors

W. L. Wright

L. W. Pierce

By

Attorney

May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 4

Fig. 5.

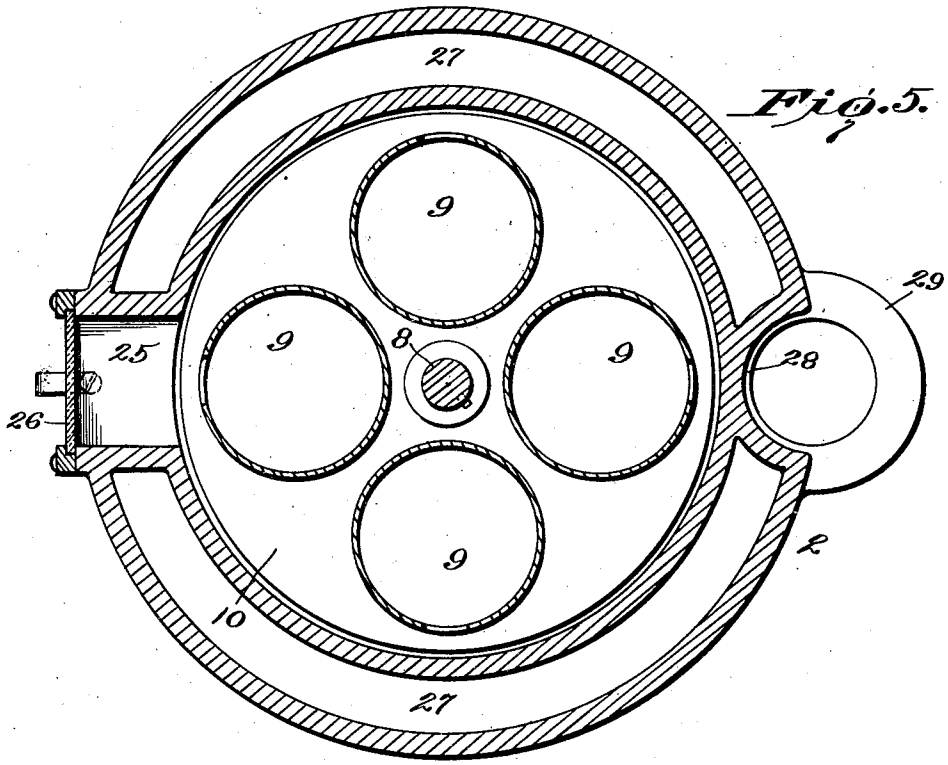
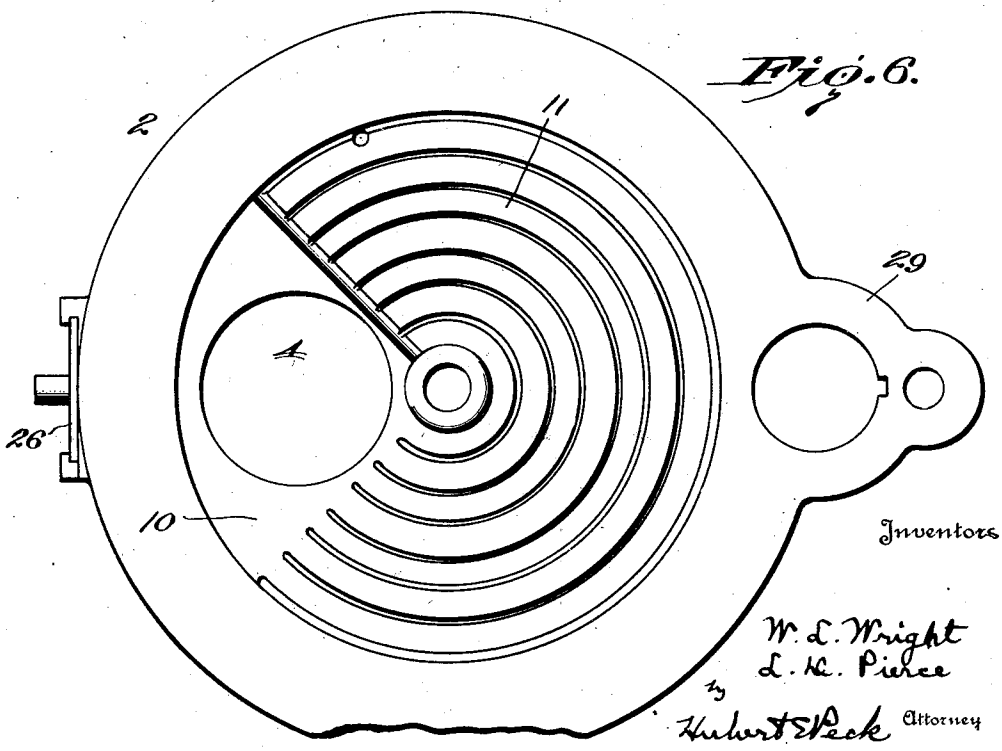


Fig. 6.



Inventors

W. L. Wright

L. M. Pierce

by Hubert S. Peck Attorney

May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 5

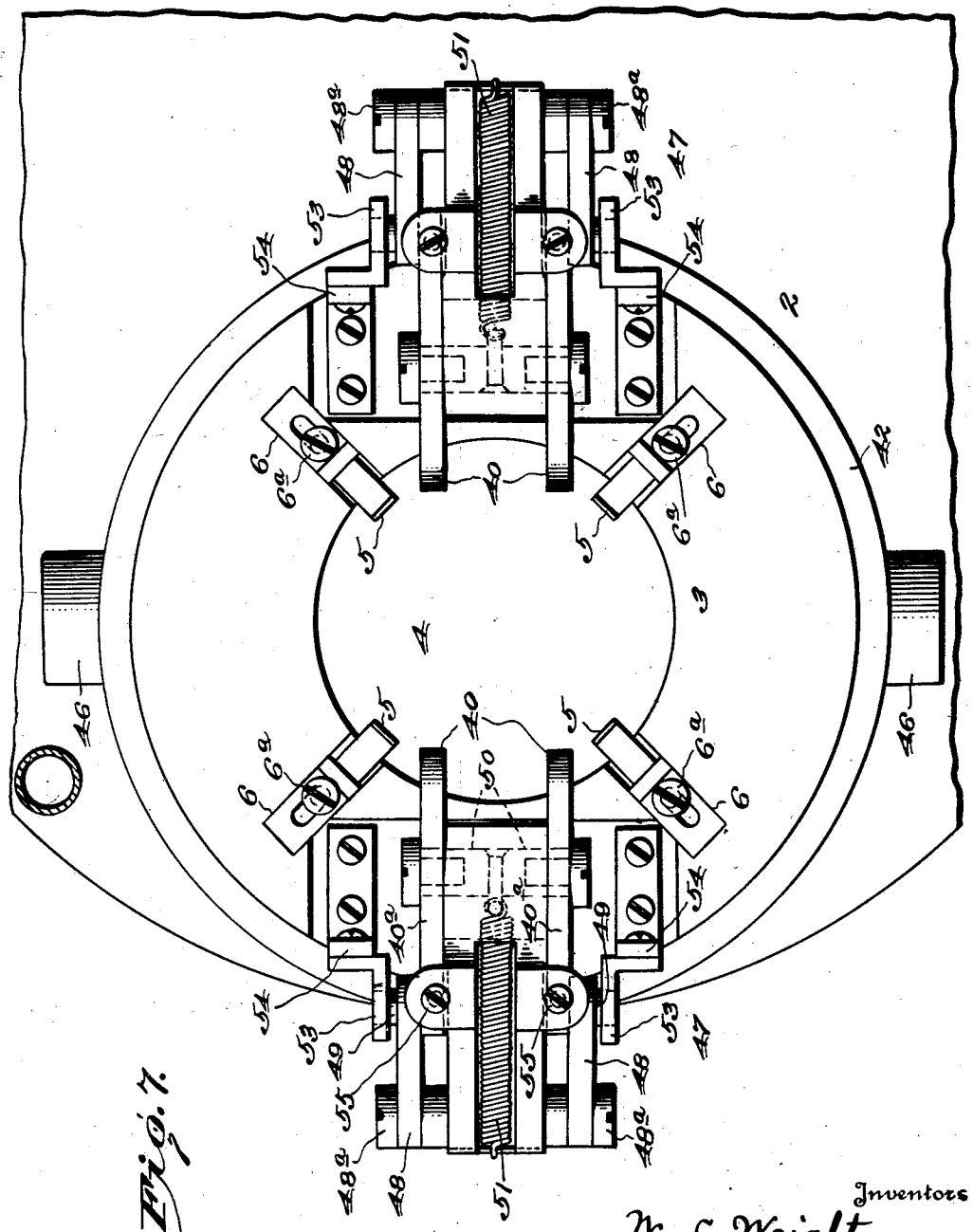


Fig. 7.

Inventors
W. L. Wright
L. M. Pierce

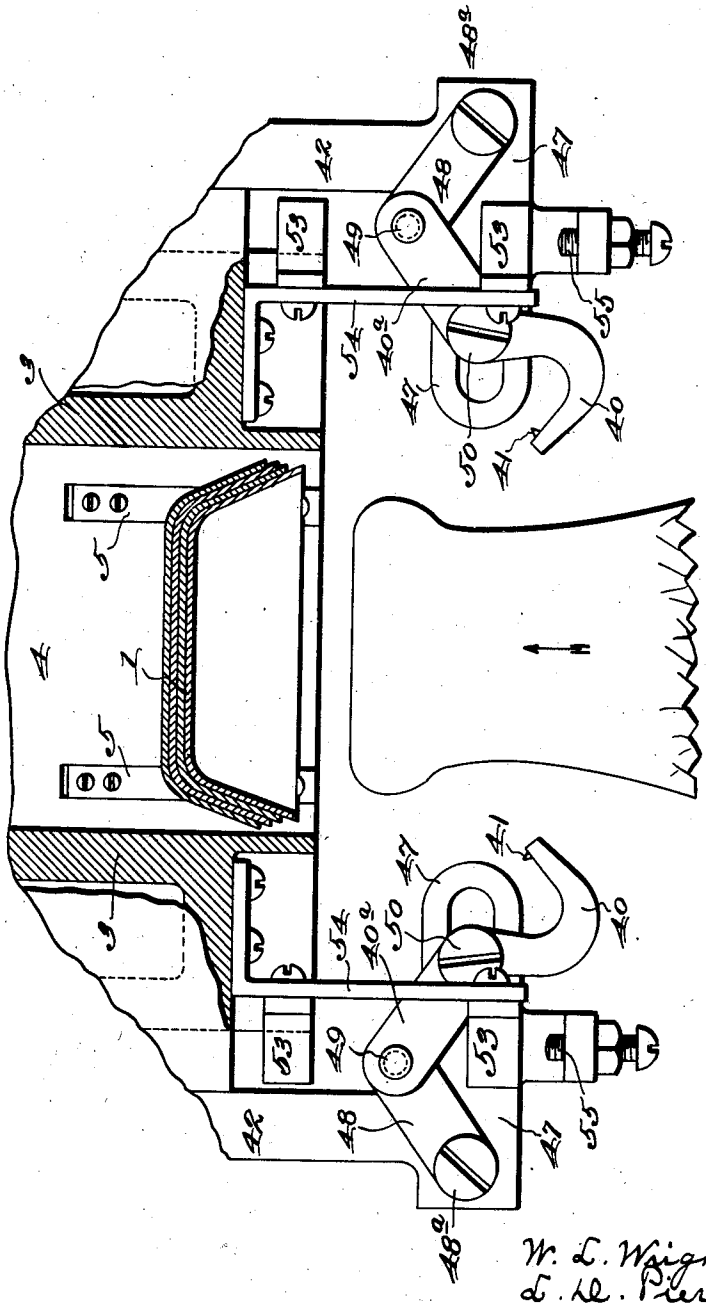
By
Hubert E. Peck Attorney

May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 6

Fig. 8.



Inventors
W. L. Wright
L. L. Pierce

By
Hubert E. Peck Attorney

May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 7

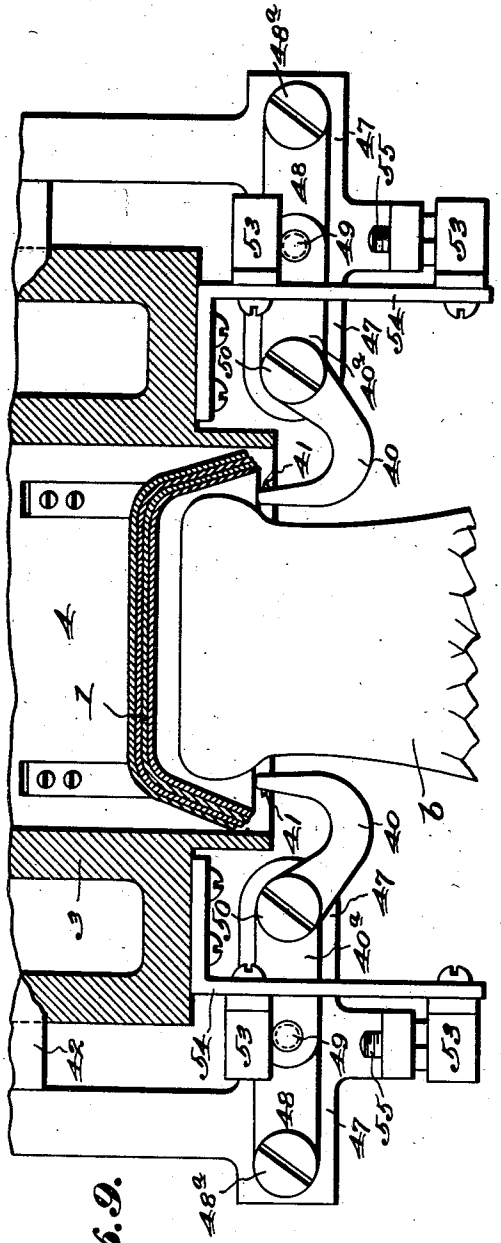


Fig. 9.

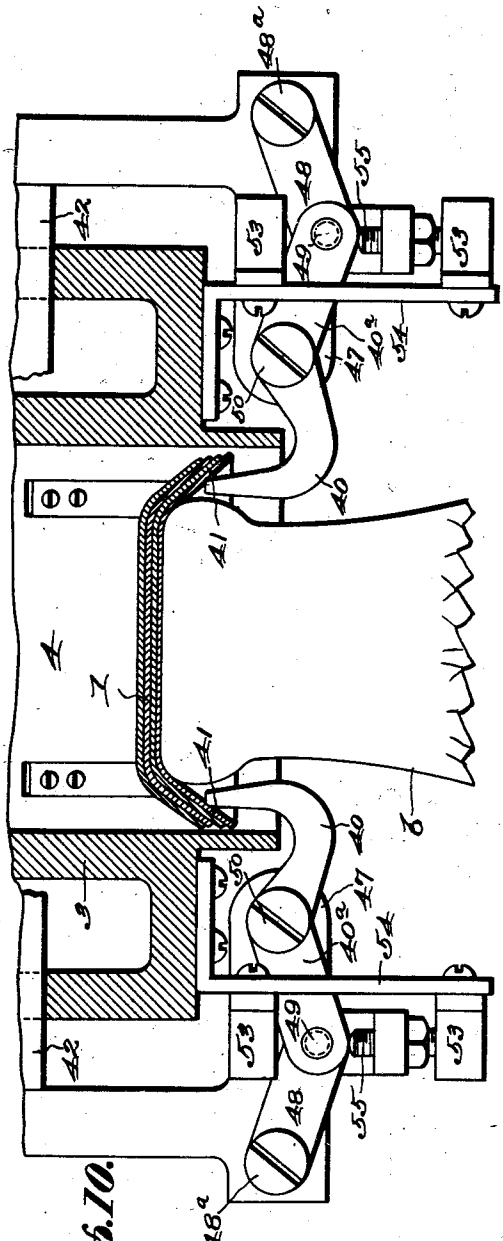


Fig. 10.

Inventors

W. L. Wright

L. W. Pierce

By

Hubert F. Peck Attorney

May 3, 1932. W. L. WRIGHT ET AL. 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 8

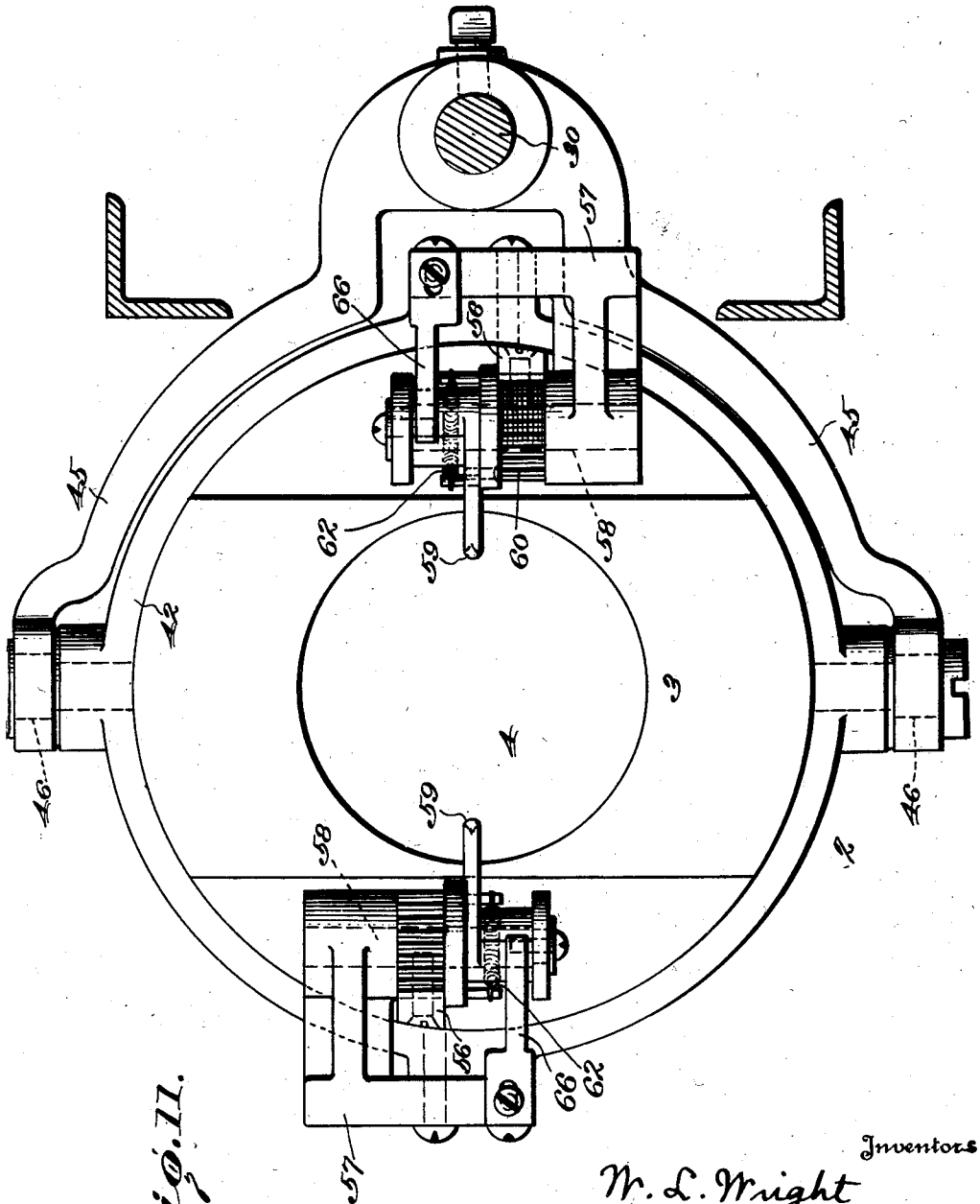


Fig. 11.

Inventors

W. L. Wright

L. W. Pierce

By

Hubert Peck Attorney

May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 9

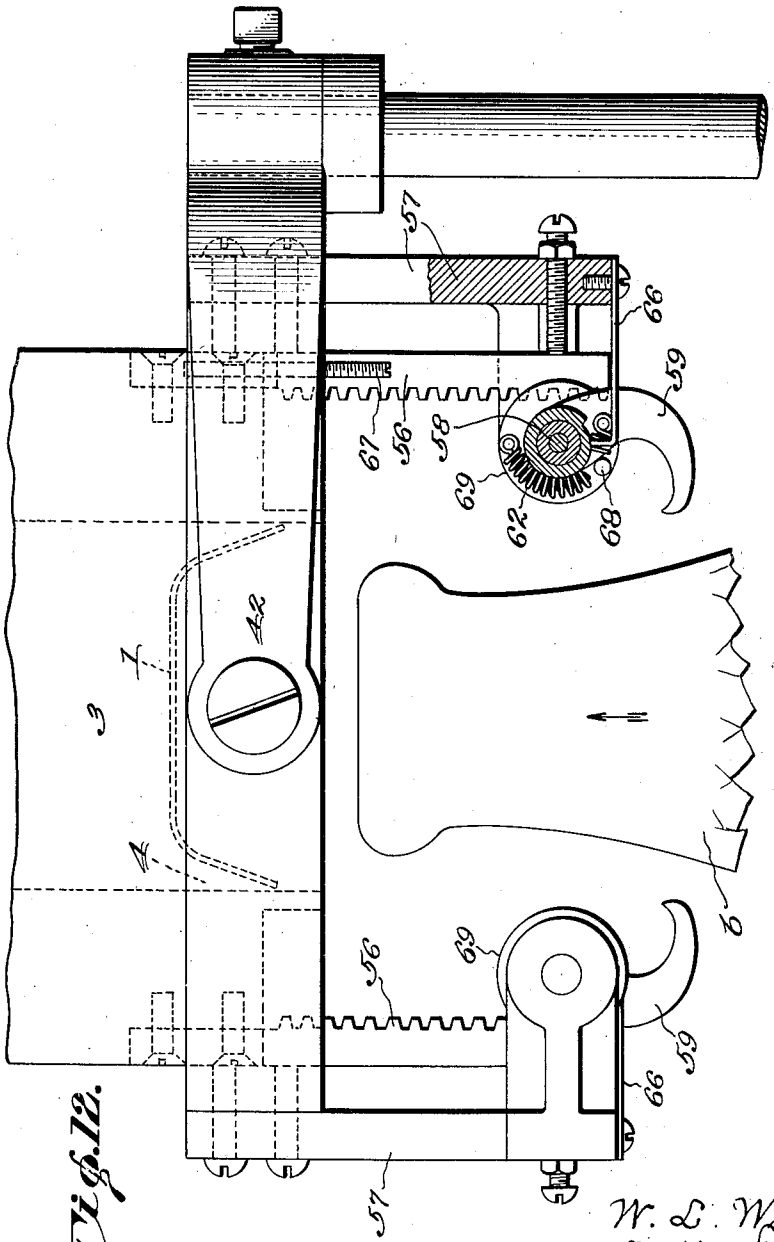


Fig. 12.

Inventors
W. L. Wright
L. L. Pierce

By

Hubert E. Peck Attorney

May 3, 1932. W. L. WRIGHT ET AL 1,857,074

HOOD CAPPING CONTAINER

Filed Sept. 25, 1925 10 Sheets-Sheet 10

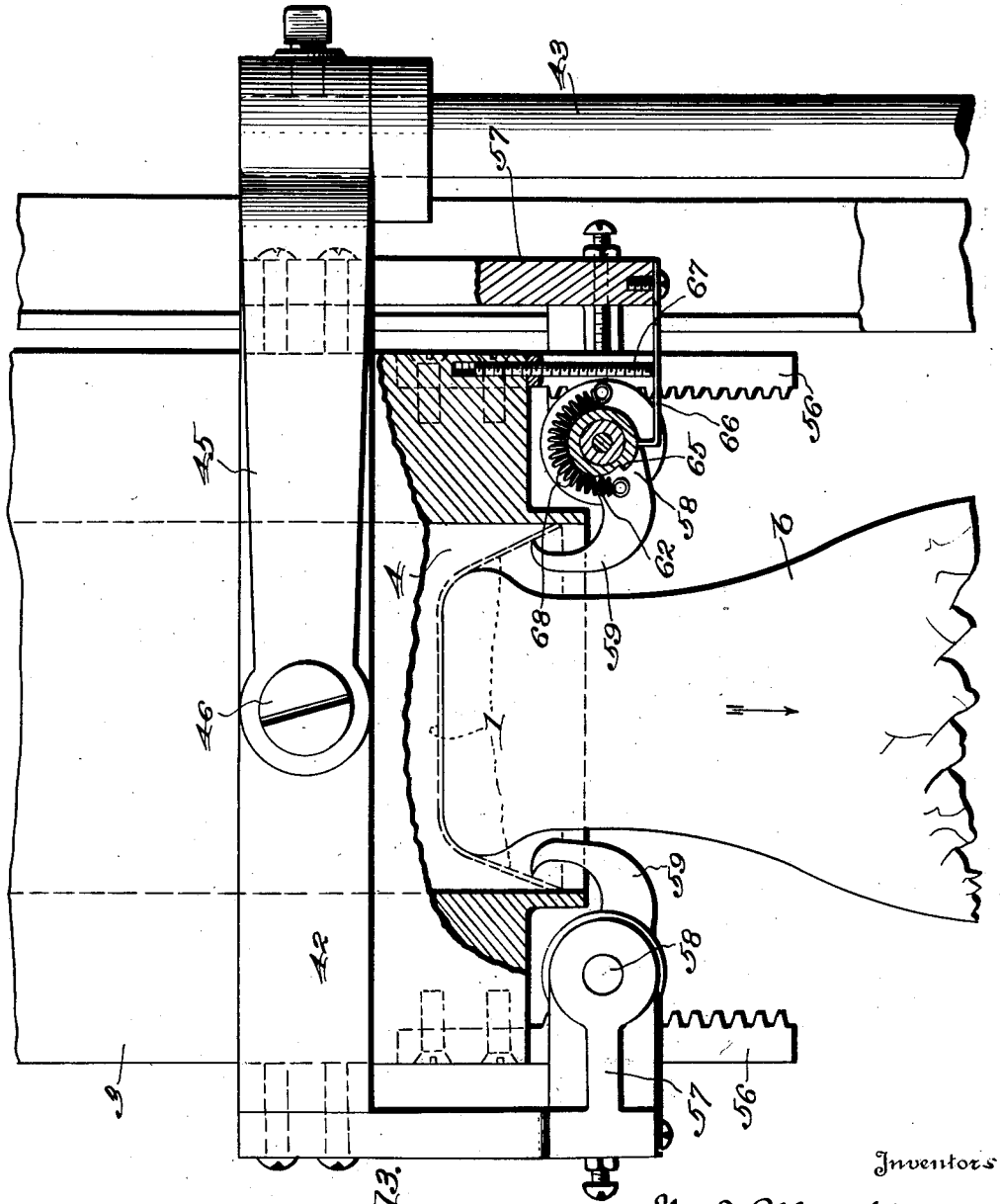


Fig. 13.

Inventors

W. L. Wright

L. D. Pierce

By Hubert & Pickett Attorney

Patented May 3, 1932 1,857,074

UNITED STATES PATENT OFFICE

WILBUR L. WRIGHT AND LEE D. PIERCE, OF FULTON, NEW YORK, ASSIGNORS TO OSWEGO FALLS CORPORATION, OF FULTON, NEW YORK, A CORPORATION OF NEW YORK

HOOD CAPPING CONTAINER

Application filed September 25, 1925. Serial No. 58,613.

This invention relates to treating plastic hood caps to render them temporarily moldable and applying such caps to containers; and the objects and nature of the invention will be readily understood by those skilled in the art in the light of the following explanations of the steps followed, and of the accompanying drawings that illustrate what we now believe to be the preferred mechanical expression or embodiment of our invention from among other forms, constructions and arrangements within the spirit and scope of our invention.

It is an object of this invention to provide for heating and sterilizing paper or other flexible material hood caps, at least the annular securing portions of which embody a binder substance or composition rendering said securing portions stiff and hard at climatic temperatures and soft and moldable when more or less highly heated and to assemble and maintain a supply of temporarily moldable plastic caps, and to apply such caps when in the moldable condition to container mouths for contraction of the moldable skirt securing portions under the container rims and securing by the setting or hardening of such portions in such contracted condition.

With this and other objects in view, the invention consists in certain novel steps, and features, and in combinations or arrangements, as more fully and particularly set forth and specified hereinafter.

Referring to the accompanying drawings, forming part hereof:

Fig 1 is an end elevation of hood cap softening, applying and securing apparatus of our invention, the hood cap heater and applicator being shown in side elevation.

Fig. 2 is a detail top plan of the hood cap heater, dotted lines showing certain hidden features and also indicating the limit of anti-clockwise movement of the reel operating lever.

Fig. 3 is a detail front elevation of a portion of the means at the lower end of the heater for gripping the hood cap and holding the same on the container mouth during the withdrawal of the container from the heater.

Fig. 4 is a detail vertical longitudinal section of the hood cap heater and cap gripping devices.

Fig. 5 is a detail cross section on the line 5—5, Fig. 4.

Fig. 6 is a detail top plan of the heater with the reel and heater top plate removed.

Fig. 7 is a detail bottom plan of the heater nozzle or mouth and the cap gripping devices.

Fig. 8 is a detail view showing the lower portion of the heater nozzle in vertical section, and several of the nested moldable hood caps therein in vertical section, the cap gripping devices being shown in elevation in their normal inoperative positions, the head or mouth portion of a bottle being shown, in elevation, on its upward movement to enter the bottom cap in the nozzle.

Fig. 9 is a detail view similar to Fig. 8 with the exception that the bottle is shown in position on its upward movement about to enter the lower cap, and the cap gripping devices are shown in the positions on their upward movements where they are about to swing up and out to grip the lower cap after the bottle mouth or head has seated itself within such cap.

Fig. 10 is a detail view similar to Figs. 8 and 9, with the exception that the bottle head is shown seated in the bottom hood cap and about to start on its withdrawal movement with said cap and the gripping devices are shown in position gripping and holding the cap to move down with the bottle.

Fig. 11 is a bottom plan view of the cap heater nozzle provided with a modified construction of cap gripping devices.

Fig. 12 sectional elevation of the heater nozzle and gripping devices of Fig. 11, a bottle mouth being shown in elevation moving up to enter the bottom cap in the nozzle, the gripping devices being shown in their normal inoperative positions.

Fig. 13 is a view similar to Fig. 12 but showing the bottle head in the lower cap in the nozzle and the gripping devices in operative cap gripping positions; the bottle, cap

and gripping devices about to descend from the heater nozzle.

Fig. 14 is a detail front elevation of a portion of the apparatus shown in end elevation by Fig. 1.

This invention is designed to operate or handle paper or other fibrous material more or less flexible hood caps, such as 1, the annular depending flaring skirts of which are self-securing by contraction or molding and then setting hard or stiff under the exterior rims of the container mouths that are exteriorly covered by the caps applied thereto. These caps are thus rendered self-securing by the presence of a binder on or in (or both) the cap skirts, at least the securing portions of such skirts, that has the quality of rendering the portion of the skirt that embodies the binder hard or stiff at climatic temperatures, and soft or moldable when more or less highly heated, say, to the temperature of or approaching the melting point of the binder which usually runs between two and three hundred degrees Fahrenheit more or less.

Each cap, is preheated so that its skirt is soft and moldable, and is applied to the container to be capped thereby while in this moldable condition. The hot moldable skirt of the cap, properly positioned on the container mouth, is then molded to the container neck or radially and annularly compressed to fit under the exterior rim of the container mouth and thus held until the skirts set to rigid stiff form and secured position and condition.

According to our present invention, we provide a magazine or holder for one or more rows of the hood caps that embody a binder, whether or not such caps are pre-nested in units or individually or otherwise arranged in rows or stacks in the magazine or cap supply, and we also provide means whereby the caps in this magazine are subjected to the required high temperature for the necessary length of time to render the securing portions of the cap skirts soft and moldable, and also cap separating and applying means whereby the hot caps are individually discharged or removed from the magazine and placed on the containers in position and condition to be secured as hereinbefore described.

In the particular example illustrated, we show a hood cap heating and dispensing vessel or container 2, that provides a vertical depending cap magazine and discharge or dispensing nozzle 3, forming an internal vertically elongated usually cylindrical feed bore or receptacle 4 for a column or unit of nested hood caps 1. The inner surface of this bore is usually smooth to permit free downward movement of the caps by gravity, and its internal diameter is such with respect to the maximum diameter of the caps as to guide the same in their vertical movement. This magazine or feed bore is open at its lower end for successive downward vertical removal of the bottom end caps of the gradually descending column of caps in the bore. The column of caps is upheld in the bore by any suitable means although for this purpose we happen to show several vertical spaced light flexible spring fingers 5, having their depending lower ends free and inclined inwardly and downwardly into the bore at the lower end thereof so that the lower edge of the bottom cap of the column of caps will engage the free ends of the springs and normally uphold the column, until sufficient downward force is exerted on the lower cap to force the springs radially outward to permit passage of such cap past the springs which will return to normal position and engage the next cap above to prevent continued downward passage of the remaining caps from the bore. These detent or supporting fingers 5 are usually arranged in vertical slots extending radially through the magazine wall and are carried by angle or L-shape brackets 6, adjustable radially of the bore, through the medium of slots in the horizontal ends of the brackets fitting the bottom end face of the magazine, and securing or clamping screws 6*a*, extending through said slots into the bottom edge of the magazine. In the particular form shown, the upper portion of the cap heating container is enlarged above the depending nozzle to provide an internal closed vertical heating chamber 10 of enlarged diameter for the reception of a vertical horizontally rotatable reel 7, rotatable on fixed vertical axis 8, eccentrically arranged with respect to the longitudinal axis of bore 4. This reel 7, provides a plurality of similar vertically elongated cap unit bores, passages or tubes 9 open at their upper and lower ends. The reel is constructed and arranged to be rotated step by step and to bring the lower ends of these tubes 9 successively into registration with the upper end of the bore 4, so that the charges of caps in said tubes can be successively discharged or dropped into bore 4, to maintain a supply of caps therein.

Each tube 9, is of sufficient length to receive a unit or column of nested hood caps, arranged with their skirts depending (say, about one hundred hood caps to a unit, more or less) and the magazine bore 4 is also of sufficient length to receive such unit of caps. The internal diameter of the tubes 9, is approximately the same as the internal diameter of bore 4, so that the cap units of nested caps can freely slide down therein by gravity. The cap heater and magazine 2 is vertically elongated, and the so-called depending nozzle 3 usually forms the lower portion or approximate half thereof, and the portion enclosing radially enlarged chamber 10, forms the upper approximate half of said heater and magazine 2. The internal heating chamber

10 is closed at the bottom by a flat floor 11, designed to support the columns of caps in the tubes 9 of the reel 7. The upper end of the magazine bore 4 opens through this floor 11, so that when a tube 9 of the reel 7 registers with magazine bore 4, the caps in said tube 9 will drop by gravity into bore 4 onto the uppermost cap of those remaining in said bore or onto the fingers 5, if said bore contains no caps. The caps in the tubes 9 of the reel 7, that are not in registration with bore 4, are upheld by floor 11 and the bottom caps in said tubes slide on said floor as the reel advances toward the bore 4.

In the example shown, the reel consists of top and bottom disk-like heads carrying the uniformly spaced vertical tubes 9 that open through the heads; the heads being formed with central vertical hubs that receive and rotate on the axis 8, fixed in and rising from floor 11. The closed heating chamber 10, wherein the reel is located, is usually closed at the top by a normally fixed cover plate 12, having a central opening in which the top hub 13 of the reel 7 is rotatable and through which it projects upwardly. Various means can be employed to advance the reel step by step to carry the tubes 9 thereof in succession in an endless path to a filling station where each tube receives a unit of cold caps, and then through the heating chamber, and then to the discharge station, namely into registration with bore 4, and then back to the filling station.

In the particular example illustrated, the reel is rotated to advance the tubes 9 clockwise, and we happen to show the reel provided with four tubes 9, and hence locate the tube filling station one step behind the tube discharge station so that the filled tubes will remain in the heating chamber for a maximum length of time to insure that the caps are softened and moldable before being dropped into bore 4 at the discharge station. The filling station can be formed by a vertical port 14, through the top plate 12, of sufficient size to permit free downward passage of a unit of caps into a tube 9, registering with and located under said port, said port being arranged so that the tubes 9 pass in succession into registration therewith.

A tube 15 can be erected on the top plate 12, alined with the cap supply port, and this tube can contain one or more units of nested caps to feed or drop by gravity through port 14 and into the reel tube 9 registering with said port. The caps in supply tube 15 are normally upheld therein by a horizontal cover plate 16, that normally covers the port 14, and forms the bottom floor of the tube 15. This cover plate 16 is horizontal and arranged on the upper face of the top plate 12, and is laterally movable to and from operative position over the port 14 and within the tube 15, to permit a unit of nested caps to drop into a tube 9 for heating. In the particular example illustrated, this cover plate 16 is carried by and forms the projecting free end of an exposed accessible horizontally swingable lever 17, having a hub 18 mounted and rotatable on the projecting upper end of the top hub 13 of the reel 7. This lever is located above the cap heating container and projects forwardly and is swingable laterally and is arranged to cooperate with certain features to advance the reel 7 forwardly step by step to carry the tubes 9 forwardly at each step the distance from the discharge station to the loading station. The lateral swing of the lever 17 is limited by adjustable stops 19 to attain the desired more or less accurate registration of the tubes 9 with the cap port 14 and the magazine bore 4.

Suitable means are provided to operatively lock the hand lever 17 to and release the same from the reel 7 for advancing the reel a step and for the free return swing of the lever. As a mere example of suitable means for this purpose, we show the reel hub 13 formed with radial sockets 20, and the lever hub provided with a radially slidable retractive pin 21, adapted to enter any one of said sockets to operatively connect the lever and reel. A spring 22 can be provided to project the pin and a hand clip and pull connection 23 to withdraw the pin.

The normal position of the lever is at its limit of swing toward the right, i. e. anticlockwise, with its plate 16 covering the cap port 14 and forming the floor of tube 15 and suporting a unit of cold caps in said tube. When the lever is in this position, all of the tubes 9 of the reel (with the possible exception of the tube 9 at the discharge station) should be filled with caps undergoing heat treatment for softening to moldable condition. When the tube 9 at discharge station has discharged its caps into the magazine bore 4, the reel should be advanced a step. The operator thereupon swings lever 17 a full stroke from right to left (the pin 21 being engaged in a socket 20) thereby rotatively moving the reel 7, to carry the empty tube 9 from discharge station to filling station and advancing the three tubes 9, of heated caps, a step forward and bringing the first tube of the three to the discharge station where its heated moldable caps drop into the magazine duct 4. The operative swing of the lever toward the left carries the plate 16 to the right from operative position, and the unit of cold caps drops from tube 15 into the empty tube 9 of the reel. The pin 21 is then withdrawn by clip 23, and the hand lever is immediately swung to the right to normal position to carry the plate 16 back to normal position to support and uphold the next unit of cold caps in tube 15 and to close port 14 against escape of heat from the heating chamber 10 within the cap heating container.

Means are provided whereby the operator is informed when the magazine bore 4 needs a fresh supply of moldable caps. As means for this purpose, we show a peep or inspection window 25 through the front wall of the cap heating container into the upper portion of bore 4 and the lower portion of heating chamber 10. This window is closed against substantial loss of heat by transparent panel 26. The outer side of the lower portion of the wall of each tube 9, is longitudinally slotted, so that the operator through the window can observe the presence or absence of caps in the tube 9 at discharge station, and hence determine when the supply of tubes in bore 4, needs replenishing.

Any suitable source of heat can be utilized to maintain the desired cap softening temperature within the cap heating container, and such container can be of any suitable formation and variously equipped as may be required by the particular heating medium or heat source employed. As steam is commonly employed for various purposes in the treatment of milk and in milk bottling establishments, we have in the example illustrated, provided a metal cap heating container constructed to receive steam as the heating medium to maintain a cap heating temperature, say of about 220° F. For this purpose, we show steam spaces or jackets 27 around the nozzle 3 and below and around the heating chamber 10. If so desired, the chamber 10 and the nozzle 3 can be formed by a cast metal shell that includes the steam spaces or jacket, and that is covered at the top by the separately formed top head or plate 12, which permits the insertion and removal of the reel 7.

As the cap heating container is usually mounted or supported in an elevated position so that the bottles to be capped can be located below and alined with the nozzle and elevated into the lower end thereof to receive a cap, we preferably form said container with exterior supporting means. For instance, we show the rear of the container formed with an exterior longitudinal groove 28 and rearwardly projecting horizontal loops 29, to receive a fixed vertical rear supporting post 30, on which the container is vertically adjustable. Suitable means are provided for vertically adjusting the container and holding the same at the desired elevation. For instance, we show a step block 31 secured to and projecting laterally from the post 30, and a vertical adjusting screw 32 at its lower end seated in said block and at its upper end having a handle. The upper loop 29 of the cap container is formed with a vertical tapped bore 33 through which the screw passes and that forms a nut on the screw that is moved vertically by rotation of the screw. By rotation of the screw the cap treating and dispensing container can be bodily elevated and depressed to the desired vertical position and thus held. The container slides vertically on the post and is preferably normally confined thereto against horizontal swing or oscillation thereon. In the operation of the apparatus, the bottle or other container *b*, to be exteriorly capped by a cap from the heating and dispensing container 2, is located below and longitudinally alined with the longitudinal axis of the nozzle 3, and on relative vertical movement between the container 2 and the bottle, the bottle mouth and the bottom cap in said nozzle are brought together.

Whether the bottle is inserted by hand or otherwise into the lower end of the bore 4 of the nozzle, or the container is moved down to the bottle, the relative movement is preferably such that the bottle mouth enters the bottom downwardly flaring softened hood cap upheld by the fingers 5 and the cap is centered on the bottle top with its flat top engaging the top edge of the bottle mouth. The bottle and nozzle must then be vertically separated to clear the bottle from the nozzle, and the cap must remain properly seated on the bottle mouth and hence be separated from the caps remaining in the nozzle and from the fingers 5.

As an example of means that can be employed for bringing together the bottle and nozzle to cause deposit of a soft moldable cap on the bottle, we show the cap heating and dispensing container supported in elevated normally fixed position with the elevated nozzle overhanging a horizontal longitudinally elongated bottle support, such as a table 35 on which the bases of the bottles rest and along which a row or one or more bottles can slide or otherwise advance so that the bottles can pass forward under the nozzle and come successively into longitudinal alinement with the nozzle 3. Below the nozzle and in alinement therewith, is provided a vertically movable bottle holder or rest 36, that is normally depressed to form a part of said table along which the bottles can slide. This holder or rest 36 is provided with any suitable means to elevate and control the descent thereof. For instance, the elevator 36 can be provided with a vertical depending slide or elevating rod 37, operatively connected with depressible foot treadle 38, by cable pull connection 38′ at its lower end secured to and extending upwardly from the treadle, and laterally over idler pulleys 38*a*, and downwardly to the lower portion of depending slide 37, to which said cable is secured, whereby the holder can be elevated and thus held by depression of the treadle. The structure and arrangement is preferably such that the bottle support and its slide will drop to normal depressed position on release of the treadle. By this arrangement, when a bottle to be capped is located on the support 36, the operator depresses the treadle, and

the support is thereby elevated carrying the bottle up and projecting the bottle mouth into the bottom cap in the nozzle, as hereinbefore explained.

To insure the descent of such cap with the bottle and properly positioned on the mouth thereof, when the treadle is released, various means can be provided. For instance, we show means for taking hold of the skirt of the cap in the bore 4 and on the mouth of the elevated bottle, to forcibly hold the cap to the bottle mouth and strip the cap from the fingers 5 and the cap nested therewith and immediately above, as the bottle moves down from the nozzle 3, on release of the treadle. We show for this purpose, a cap holding or gripping device normally arranged in inoperative retracted position, and designed to become operative whenever a bottle has entered the magazine bore and the bottom cap therein, i. e. when the bottle is in cap receiving position, to grip the flaring skirt of the cap on the bottle, by pricking the same and to then move down with the bottle while holding the cap to downward movement with the bottle. For instance, we show a pair of opposite fingers 40, at their free ends having sharp points 41 adapted to strike and take hold of the cap skirt and hold the same to downward movement with the bottle. Various means can be provided for operating and controlling these fingers, although in what we now believe to be the preferred form, the fingers are controlled and operated by a vertically movable slide 42 and toggles and stop devices. The slide 42 is in the form of an exterior sleeve slidable longitudinally on the nozzle 3 and normally located at its limit of downward movement with the fingers 40 in retracted or inoperative position. This sleeve 42 is limited in its downward movement on the nozzle 3 by a suitable stop, and its vertical operative movements are controlled, in the example illustrated, by the vertical movements of the stem or slide rod 37 of the bottle elevating support through the medium of a stop 37*a*, normally fixed to but vertically adjustable on rod 37, arranged to engage and lift an arm 44 normally fixed to and projecting laterally from a vertical slide rod 43 at its upper end coupled to sleeve 42, as by a fork 45 and pivot pins or trunnions 46. The range of vertical movement of the stem 37 of the bottle elevating support is usually longer than that of the sleeve 42 which sleeve rises and lowers with the bottle support while that support is moving through the upper portion of its up and down strokes.

Diametrically — opposite radially — arranged duplicated brackets or housings 47, traverse the lower edge portions of the nozzle 3, and of the slidable sleeve 42. and are fixed to move vertically with the sleeve. In the example shown, the brackets carry a pair of toggles, respectively, each embodying a cap grasping or holding finger 40. Each toggle consists of an outer link or lever member 48, at its outer end mounted on relatively fixed transverse axis 48*a* and an inner link or lever 40*a*, the inwardly projecting inner end or extension of which forms one of the fingers 40. The outer end of lever 40*a* is pivotally joined to the inner end of link 48, by transverse pivot pin 49. The lever 40*a*, intermediate its ends is fulcrumed to rock on transverse pin 50, and this pin 50 is slidable in the bracket radially of the sleeve 42 and the nozzle 3, i. e. horizontally toward and from the nozzle bore 4. A coiled spring 51, constantly exerts its tension on pin 50 to hold the same to its limit of outward movement and to return the same to such limit and hence to hold the toggle in broken position with the pin 49 out of alinement with the pins 48*a*, 50.

The inner end of each toggle lever curves downwardly, inwardly and upwardly, in the particular example shown, to form the finger 40 of U shape or hook form, or to extend down and inwardly past the lower end of the nozzle and to provide an upstanding free end to project up in the nozzle and within the depending skirt of the cap on the bottle mouth, said upstanding end having the outwardly directed prick or pin point 41, which on outward swing of the finger will prick or grasp the cap skirt from the inside thereof. When several of such fingers, projecting upwardly beside the bottle neck or mouth and within the skirt of the cap on the bottle mouth, are swung outwardly to bring their points into forceful gripping engagement with the cap skirt, the cap will be held thereby to move down with the bottle if the fingers are also moved down to correspond with the downward withdrawing movement of the bottle, which in the example shown is accomplished by the movement of the sleeve 42 carrying the fingers and coupled to move with the bottle elevating support. The center or knuckle pivot pins 49 of the finger controlling toggles project laterally from the toggles and these projecting pin ends move vertically (as sleeve 42 slides up and down) between upper and lower normally fixed stops 53 carried by fixed brackets 54 secured to and depending from the nozzle 3. An upper and a lower stop 53 is provided for each toggle and its projecting joint or knuckle pin 49, and provision is made for independent vertical adjustment of each stop 53 on its bracket 54. The arrangement of these stops is such that when the bottle elevating support is in its normal lowered position and the sleeve 42 is consequently in its normal lowered position, the pins 49 will rest down on the lower stops 53, and the toggles will be thereby straightened or broken upwardly and the gripping fingers 40 will consequently be in withdrawn positions swung down and back out of the way of the bottle

and a distance below the lower or discharge end of the bore 4, of nozzle 3. When the bottle elevating support is raised to carry the bottle mouth into the flaring skirt cap held in readiness in the lower portion of the nozzle bore 4, the sleeve 42 is moved upwardly carrying with it the several toggles, the gripping fingers of which are swung down and back to withdrawn positions. The pins 49 of said toggles move up from the lower stops 53, and the fingers arranged beside the bottle neck or mouth move up into the space between the flaring skirt of the cap and the bottle mouth and in the spaces between the cap upholding fingers 5. When the fingers have reached the proper positions within the cap and the bottle mouth has entered and approximately seated itself within the cap, the toggle projecting pins 49 are arrested in their upward movement by engagement with the upper stops 53, and the toggles are thereby caused to break joints downwardly with a sudden forceful snap under the tension of the springs 51, hence forcefully throwing the gripping fingers upwardly and their free ends outwardly within the cap skirt so that the grasping or pricking points thereof strike outwardly against the inner surface of the cap skirt and take hold thereof. The bottle and consequently the sleeve 42, are then allowed to descend, the downwardly buckled or broken toggles moving down with the sleeve and bottle with their gripping fingers maintaining their hold on the cap skirt and pulling the cap down with the bottle, stripping the cap from the cap above remaining in the bore 4, and pulling the cap free from the cap restraining or upholding fingers 5. The gripping fingers thus maintain their hold on the cap that is seated on the descending bottle mouth, until the descending cap is entirely detached from and free of the caps left in bore 4 and the nozzle 3, and fingers 5, and thereupon, the projecting toggle pins 49 are stopped in their downward movement by engagement with the lower stops, which on continued downward movement of sleeve 42, break the toggles upwardly causing withdrawal of the gripping fingers from the cap on the bottle by downward and outward swing of said fingers to positions clear of the cap and bottle and out of the path followed by the bottle in moving along the table for reception of means to contract and clamp the moldable flaring skirt of the cap to secured position under the exterior rim of the bottle.

Vertically adjustable stop screws 55 are, preferably, provided, to accurately limit and set the downward breaking movement of the toggle and the consequent outward radial throw of the pricking points of the gripping fingers when taking hold of the cap skirts. Various other means can be provided to operate the gripping fingers to cause them to take hold of and release the caps.

For instance, a rack and pinion actuating means can be utilized instead of the toggle device. In this arrangement, stationary racks 56, depend from the nozzle 3, and the brackets 57, fixed to and carried by the sliding sleeve 42 and depending therefrom, carry transverse horizontal shafts or spindles 58, on which are mounted pinions 60 in mesh with the racks 56.

The cap gripping or picker fingers 59 are approximately U or hook shaped with sharp pointed free ends to function as described in connection with fingers 40. Each finger 59 is swingable on its spindle 58 as an axis, and in this instance is formed with a transverse hub rotatable freely on its spindle 58 except as controlled by the pinion 60 on such spindle. Each toothed finger 59 is provided with a coiled retractive spring 62 acting thereon to swing the finger upwardly, inwardly and outwardly to cap gripping position, and stops and trip devices are provided whereby the fingers after gripping the cap will remain in such gripping position on the downward movements of the bottle, cap and sleeve 42, until the cap is clear of the nozzle 3 and the caps therein, whereupon the rotation of the pinions by engagement with the fixed racks will cause downward and outward swing of the fingers to positions free of and removed from the cap on the lowered bottle. The coiled contractile spring 62 of a gripping finger actuating device, is secured at its inner end to said finger and at its outer end is secured to the adjacent end of the geared pinion 60, and the pinion is provided at one end with a projecting finger-depressing pin 68. The hub of the finger is formed with a shouldered depression or tooth 65, to receive the locking end of spring dog or detent 66.

The arrangement is such that when the sleeve 42 and the gripping fingers are at their limits of downward movements, the pinion pins 68 will rest on the top edges of fingers 59, and will hold said fingers in inoperative outwardly and downwardly swung positions against the tension of springs 62 (Fig. 12). When a bottle on its upward stroke to enter a cap in the nozzle 3, reaches a certain point in its movement, the sleeve 42, begins to ascend, the pinions 60 rotating clockwise as they ascend the racks 56, and thereby lift the pins 68, permitting the gripping fingers under the tension of their springs 62, to swing npwardly, until the spring dogs 66, click into the notches 65. The dogs 66, will thus hold the fingers in position to enter the flaring flange of the cap as the bottle head seats itself in the cap. These dogs thus hold the fingers as the pinions move a slight distance clockwise and increase the tension of the springs that are tending to swing the fingers upwardly and outwardly. When the

bottle mouth is about seated in the cap and just before the parts reach their limits of upward movement, the ascending spring dogs 66, strike the stops 67, and are thereby arrested in their upward movement, and hence spring down from the notches 65, as the sleeve 42 continues upwardly. The fingers 59 are thus released to spring up and outwardly under the tension of springs 62, and grasp the cap (see Fig. 13). When the sleeve and bottle start down on the bottle and cap withdrawing stroke, the fingers will pull the cap down on and with the bottle. As the fingers descend, the pinions will be rotated anti-clockwise (by the racks 56) free of the fingers until the pins 68 of the pinions strike and depress the fingers, swinging the fingers downwardly and outwardly free of the cap and out of the way of the bottle to the positions shown by Fig. 12.

Each bottle, after the mouth thereof has been covered by a hood cap having a hot flaring moldable skirt, as received from the cap softening and dispensing container, is handled or conveyed in any suitable manner or by any suitable means, to hood cap skirt contracting and molding means or mechanism for contracting and molding the hot soft cap skirt to the bottle neck under the exterior rim of the bottle and for thus holding the skirt until it sets and hardens to tight contracted securing condition on the bottle neck and rim, whereupon the securely exteriorly capped bottle is ready for packing, shipment or delivery. Each bottle might be taken by hand from the cap receiving station, and radially and annularly contracting means might be exteriorly applied to the hot moldable skirt of the hood cap on the bottle, by hand or otherwise, to contract the skirt and hold the same until set to stiff permanent secured position, whereupon such means might be removed. Various molding and contracting means might be employed for this purpose, and we have not herein illustrated such means in detail, as our instant invention involves means for rendering the hood cap skirts moldable and dispensing such caps while their skirts are moldable onto container mouths.

The foregoing description sets forth a method of hood capping bottles, of peculiar advantage, and that is distinguished from the prior art known to us, by the fact that we first provide previously completed or formed binder-carrying sheet paper-material hood caps having annular flaring skirts that are set and hard by reason of the binder carried thereby, and then assemble a supply or a stack of these hard cool skirted paper caps in a heating chamber wherein the temperature is sufficiently high to fuse the binder or otherwise render at least the paper skirts or the securing portions thereof soft or moldable, so that the skirted moldable caps can be separated and dispensed one by one from the supply of hot caps and assembled with and covering container heads with their still moldable depending flanges in position to be pressed to and held until set in position holding the hood caps on the container heads. By first heating up a stack or multiplicity of the paper caps, a supply of caps can thus be maintained ahead in the heating chamber in moldable condition, during capping runs, so that moldable caps can be delivered therefrom as required for quick rapid capping operations which is desirable because of the quick setting characteristics of the binding materials usually employed, and also because of the usually rapid delivery of bottles from the filling machinery for hood capping according to our method. It is a comparatively slow process to separately handle and heat each cap until moldable, one by one and thus deliver to the bottles, and the capping process is further slowed up where it is necessary to use each bottle head as a form or mandrel on which to mold a hood cap from a flat disk.

It is evident that various changes, variations, departures, and modifications might be resorted to, and mechanisms might be added, and features or structures might be omitted, without departing from the spirit and scope of our invention as defined by the claims, and hence we do not wish to limit the invention to the exact disclosures hereof.

What we claim is:—

1. Means for successively dispensing flaring skirted hood caps onto container mouths, embodying a heating chamber of a capacity to receive stacks of nested binder carrying paper material hood caps and providing a discharge station, means to advance several of said stacks within the chamber toward said discharge station, provision being made for heating the caps in said chamber to maintain the same in moldable condition, and cap skirt gripping means at said discharge station.

2. Means for softening hood cap skirts carrying a cap securing plastic binder, embodying a hood cap heating container having a discharge station to receive the mouth of a bottle to be capped and a vertical hood cap guiding and heating passage leading to said station, said container of a capacity to receive successive stacks of binder carrying paper hood caps and to feed the same to said discharge with the caps in upright position having their skirts depending, provision being made to maintain a cap binder softening temperature in said passage.

3. Means for rendering binder carrying paper hood caps moldable and for delivering such moldable caps onto bottle mouths for ultimate molding thereon, embodying a hood cap heating container providing a feed magazine for a stack of nested binder carry-

ing paper hood caps leading to a discharge station, said container having means at said station to maintain a hot hood cap with its moldable skirt depending in position to receive a bottle mouth, and means to hold the cap on the bottle to withdraw from the station with the bottle and positioned on the bottle mouth.

4. In combination, bottle elevating and withdrawing means, an elevated hood cap heating and dispensing container having a vertical mouth to receive the bottle mouth, said container providing a feed magazine for a stack of binder carrying paper hood caps to feed them successively to said mouth and provided with means to receive and uphold a heated softened cap at said mouth to fit on a bottle mouth moved upward therein, and movable hood cap gripping means operatively connected with said elevating means to grip the cap at said mouth and entered by the elevating bottle and to withdraw said cap from the mouth and on the bottle mouth and with the bottle.

5. A hood cap heating and dispensing container having a hood cap discharge mouth and a magazine bore leading up from said mouth to guide and feed down a stack of hood caps, said container having means to support the caps in said bore for successive withdrawal of the bottom caps at said mouth and means in said container to receive a plurality of stacks of caps for heat treatment and for delivering said stacks in succession into said bore, provision being made to maintain hood cap binder softening temperatures within the cap receiving portions of said container.

6. In the method of hood capping containers, those steps which comprise providing an assembly of previously-formed individually-complete sheet paper material hood caps having flaring annular skirts carrying binder material that renders said skirts hard at atmospheric temperatures and soft for molding when hot; rendering the skirts of said assembly of caps moldable by application of heat and thus maintaining a supply of caps in a moldable condition; dispensing caps separately from said assembly while hot and moldable onto the heads of containers with the moldable cap skirts depending around said heads, for pressing and holding thereon until set in secured position.

7. In the method of hood capping containers those steps which comprise heating a stack of nested previously-formed sheet paper material hood caps having flaring annular skirts carrying binder material to render said skirts moldable by heat and hard when set at atmospheric temperatures, and maintaining said stack heated to provide a supply of temporarily moldable caps; then successively applying the skirted caps while still hot and moldable to container heads; and then pressing the depending hot moldable skirts and thus maintaining the same until cooled to hard securing form on the container heads.

8. The method of capping containers, which comprises the steps of providing a stack of a multiplicity of paper material closure disks carrying a binder rendering the disks moldable when heated to approximately fuse the binder and quickly setting at atmospheric temperatures to stiff condition; heating the stack to render the disks moldable and maintaining the disks hot to provide a supply of temporarily moldable disks; and then successively removing the moldable disks from said supply of hot disks and dispensing the same quickly onto container heads for pressing and holding the same thereto until set.

9. In the method of capping containers, those steps which comprise, maintaining a multiplicity of binder-carrying paper material hood caps under binder softening temperature to provide a supply of hood caps in moldable condition and advancing the same toward a dispensing station; successively removing caps in temporary moldable condition at said station from said advancing supply and dispensing the same to containers for molding and holding thereon until set to securing condition; and preheating a multiplicity of binder carrying hood caps and replenishing said supply therewith and subjecting said preheated caps to said softening temperature.

10. A hood cap heating and dispensing container having a discharge mouth and provided with means for maintaining hood cap binder softening temperatures within the container, a reel in said container having a series of passages to carry charges of hood caps subjected to said softening temperatures for heating and successive delivery for feeding to said mouth, means for advancing said reel step by step, a hood cap supply with which said passages are successively brought in cooperative relation to receive charges of caps, and means for closing and opening said supply.

11. In combination, a feed magazine for a multiplicity of paper material closure disks carrying binder and arranged in stack form, said magazine having a closure disk discharge mouth and arranged to feed the disks thereto for successive removal therefrom; means to support the stack of disks in said magazine; means for separating disks in moldable condition from said supply and dispensing the same through said mouth for molding and setting on containers; means for advancing stacks of said disks for delivery to said magazine; means being provided for preheating said advancing stacks of disks for delivery to said magazine, and to heat the disk in the magazine to maintain therein a supply of disks in a temporarily moldable condition.

12. Container closure applying apparatus, comprising means to successively feed paper material binder-carrying closure disks to a discharge mouth and to uphold a stack of such disks with the bottom disk of the stack at such mouth, heating means being provided to heat and maintain a supply of such disks in a temporarily soft moldable condition for successive presentation at said mouth in a moldable condition; and disk transfer mechanism for separating moldable disks from the stack and dispensing the same from said mouth in condition for container closing purposes.

13. Container closure applying apparatus, comprising a holder for a multiplicity of paper material closure disks having binder carrying annular flaring skirts; heating means to raise said disks to a skirt softening temperature for molding and thus maintain a supply of such disks in a moldable condition; and dispensing mechanism for quick successive delivery of hot moldable disks from said supply of disks direct to containers in condition for molding and setting thereon.

14. Mechanism for applying paper material binder carrying hood cap disks while temporarily in a moldable condition to container heads for pressing and holding thereon until set to secured condition; comprising a disk holder embodying a vertical feed magazine for a stack of binder-carrying paper material hood cap disks, having a top supply opening for entrance of stacks of such disks and a bottom discharge elevated above a support for containers to be closed by such disks; heating means for heating a supply of disks in said magazine to render them moldable and for maintaining the disks at said discharge in moldable condition; means for upholding the disks in the magazine with the bottom moldable disk at said discharge; means for moving the container support to bring the container head against the moldable disk at said discharge and vertically movable means for dispensing moldable disks from said discharge with the container heads.

15. In container hood capping apparatus, in combination, an elevated feed magazine for a stack of nested paper material hood caps having a bottom discharge mouth and means to uphold the caps in the magazine with the bottom cap in container head receiving position; a container support arranged to support the container to be capped with its head opposite and alined with said mouth; means to bring together the container and said mouth with the container head within said bottom cap and to then separate the container and magazine; and vertically movable means for dispensing the bottom cap on the container head from said mouth and for holding the same on said head as the head and magazine separate.

16. In combination, in an apparatus for hood capping containers; an upright feed magazine for a stack of nested paper material flaring skirt hood caps, said magazine having and feeding the caps down to a discharge mouth, means to uphold the bottom cap at said mouth; a vertically movable container support arranged to support a container with its head below and approximately alined with said mouth to receive a hood cap direct therefrom; and a vertically movable cap transfer device for successively pulling the caps from the stack and carrying the same one at a time down from said mouth with the cap finally centered on the container head with its skirt depending in position for securing.

17. In combination, a feed magazine having an open end, said magazine formed to feed a stack of paper material hood caps toward said end and there maintain the end cap in position to receive the head of a container to be capped thereby, means to carry the container to be capped toward and from the magazine to enter its head into the end cap and to withdraw the container with the cap on its head; and reciprocatory cap dispensing mechanism having fingers to grasp said end cap by its flexible skirt and strip the cap from the magazine and hold the cap on the container head as it withdraws from the magazine.

18. In apparatus for hood capping containers, in combination, means for maintaining a supply of paper material binder carrying hood capping disks in a moldable condition for quick individual separation and dispensing on container heads for molding and setting thereon, embodying a feed magazine for a stack of a multiplicity of such disks, means for heating the disks of such stack to approximately fuse the binder and render the disks moldable and for maintaining the disks in such condition for dispensing moldable disks from such supply; and movable means for successively separating and removing the moldable disks from the magazine, said means embodying resiliently actuated moldable disk grasping means.

19. A hood cap heating and dispensing container providing a discharge mouth and embodying means to maintain heat within said container to render the hood caps therein moldable; means to hold a moldable hood cap at said mouth with its skirt depending to receive the head of the bottle to be capped; said container providing an internal heated magazine adapted to receive a stack of binder-carrying flaring skirt paper material hood caps and feed them to said mouth, in combination with movable means to withdraw the moldable hood cap on the bottle head longitudinally from the supply of moldable caps in the magazine as the bottle is withdrawn.

20. Apparatus for applying hood caps to container heads, comprising a magazine having a discharge mouth, said magazine adapted to receive a stack of a multiplicity of paper material flaring skirt nested hood caps and feed the same to said mouth, means being provided to uphold the caps with the bottom cap at said mouth, means to support the container to be capped approximately alined with said mouth; and relatively movable mechanism for dispensing each hood cap from said mouth and leaving the same in capping position for securing on the head of the bottle on said support, said mechanism embodying cap gripping fingers operative to grasp a cap at said mouth by opposite portions of the cap skirt above its free edge and strip the cap from the mouth and then release the cap on a bottle head, means carrying said fingers to and from said mouth and cap releasing position, and devices for moving the fingers to grasp the cap at said mouth and to release the cap on said container head and hold the fingers in cap grasping position while being carried to said cap releasing position.

21. Apparatus for dispensing hood cap disks in a hot temporarily soft moldable condition and applying the same for molding and setting on bottle heads; embodying a vertical feed magazine, for a multiplicity of such hood cap disks, having a bottom discharge, whereby said disks in the magazine advance by gravity to said discharge as disks are successively removed therefrom; means being provided to render the disks in said magazine soft and moldable by heat to maintain a supply of such disks in a soft moldable condition for rapid successive removal at said discharge in a temporarily moldable condition; means for presenting successive bottles vertically alined with said magazine having their heads below and centered against the bottom disks to receive successive temporarily moldable disks from said discharge; and mechanism for forcibly dispensing the soft disks one at a time directly down from said discharge centered on and for removal with the bottle heads for contraction and setting thereon.

22. Apparatus for hood capping bottles, embodying a vertically movable support for the bottle to be hood capped; a supporting frame; a container carried by and normally held at a fixed elevation by said frame with respect to said support; means whereby said container can be set at various elevations with respect to said frame and support; said container embodying a discharge for hood cap disks in a temporarily soft moldable condition for application to the heads of successive bottles presented by said support, said container also providing a passageway for a plurality of hood cap disks advancing in succession to said discharge, and means for rendering said plurality of advancing disks soft and moldable for maintaining in said passageway a plurality of temporarily soft moldable disks for quick successive removal from said discharge; and soft hood cap disk dispensing means for successively delivering such disks from said discharge.

23. Apparatus for hood capping bottles, embodying a support for the bottle to be hood capped; a container; said container embodying a discharge for hood cap disks in a temporarily soft moldable condition for application to the heads of successive bottles presented by said support, said container also providing a passageway for a plurality of hood cap disks advancing in succession to said discharge, and means for rendering said plurality of advancing disks soft and moldable for maintaining in said passageway a plurality of temporarily soft moldable disks for quick successive removal from said discharge; and soft hood cap disk dispensing means for successively delivering such disks from said discharge.

24. Apparatus for hood capping bottles, embodying a bottle support; a container arranged above said support and providing a hood cap disk discharge above said support and a passageway leading to said discharge for a plurality of advancing hood cap disks characterized by the capacity of becoming temporarily soft and moldable when heated and of cooling to a hard set condition; said container providing means for maintaining said plurality of disks in said passageway in a soft moldable condition and for successively presenting soft moldable disks at said discharge for centering and delivering on successive bottle heads for molding and setting thereon; a vertically reciprocatory carrier, relatively movable fingers bodily carried vertically by said carrier toward and from said mouth for successively removing moldable disks therefrom, and associated means for causing said relative movement of said fingers to take hold of and release said disks.

25. In apparatus for dispensing skirted hood caps while in a flexible condition from a container to the heads of successive bottles, supporting means to carry a flexible skirted hood cap with its annular skirt depending to receive the head of the bottle to be capped, and movable means provided with fingers to enter the cap skirt at the exterior of the bottle head in the cap and hold the cap to the bottle head during the separation of the bottle and said supporting means, actuating and controlling mechanism being provided for said movable means and fingers to cause the same to grasp and release said caps, said supporting means and the bottles being relatively movable to cause the bottle head to enter and separate from said supporting means.

26. In apparatus for dispensing flexible skirted hood caps for application to bottle

heads to be hood capped thereby, means for supporting flexible skirted hood caps at a discharge and for successively supplying such caps to said discharge; a bottle support movable to carry the bottle head into hood capping relation within the cap supported at said discharge and on the return stroke from said support with the cap on the bottle head, and movable cap grasping and releasing means to hold said cap to said head on said return stroke.

27. In the method of hood capping containers, those steps which comprise providing a multiplicity of previously formed annularly skirted paper hood caps, at least the skirts of said caps carrying binder rendering such skirts stiff by cooling and soft and moldable when heated to approximately binder fusing temperatures; successively advancing a plurality of said caps toward a discharge station while subjecting the same to the heat necessary to render their skirts soft and moldable and thus maintaining a supply of such caps in a moldable condition; and at said discharge station successively removing caps with their skirts in moldable condition while preserving the annular skirted form thereof for molding and cooling on container heads.

28. In the art of hood capping containers by molding on the heads thereof hood cap disks while in a temporarily moldable state and capable of setting thereon in the final molded secured form; those steps which include providing a multiplicity of such hood cap disks in a procession and submitting such procession to conditions whereby such disks are reduced to and maintained in said temporarily moldable state and thereby providing a supply of such moldable disks for quick successive delivery for hood capping; advancing such supply of moldable disks to present successive moldable disks for delivery; bringing together successive moldable disks from said supply and the heads of successive containers; and successively molding such disks to securing form on the container heads.

29. In the art of hood capping containers; those steps which include maintaining a multiplicity of hood cap disks in a temporarily moldable condition by heat to provide a constant supply of such disks; causing such disks to advance in procession; bringing together the heads of successive containers and successive moldable disks from said supply for securing on the successive heads; and molding the still moldable hood cap disks on the container heads.

30. Apparatus for rendering plastic hood cap disks temporarily moldable and hood capping bottles therewith; including means for maintaining a multiplicity of plastic hood cap disks; means for rendering such multiplicity of disks temporarily moldable to provide a supply of such disks maintained in a moldable condition; and mechanism for separately dispensing temporarily moldable disks from said supply to bottle heads for contraction to securing form thereon and holding until set in secured condition.

Signed at Fulton, Oswego County, New York, this 5th day of September, 1925.

WILBUR L. WRIGHT.
LEE D. PIERCE.