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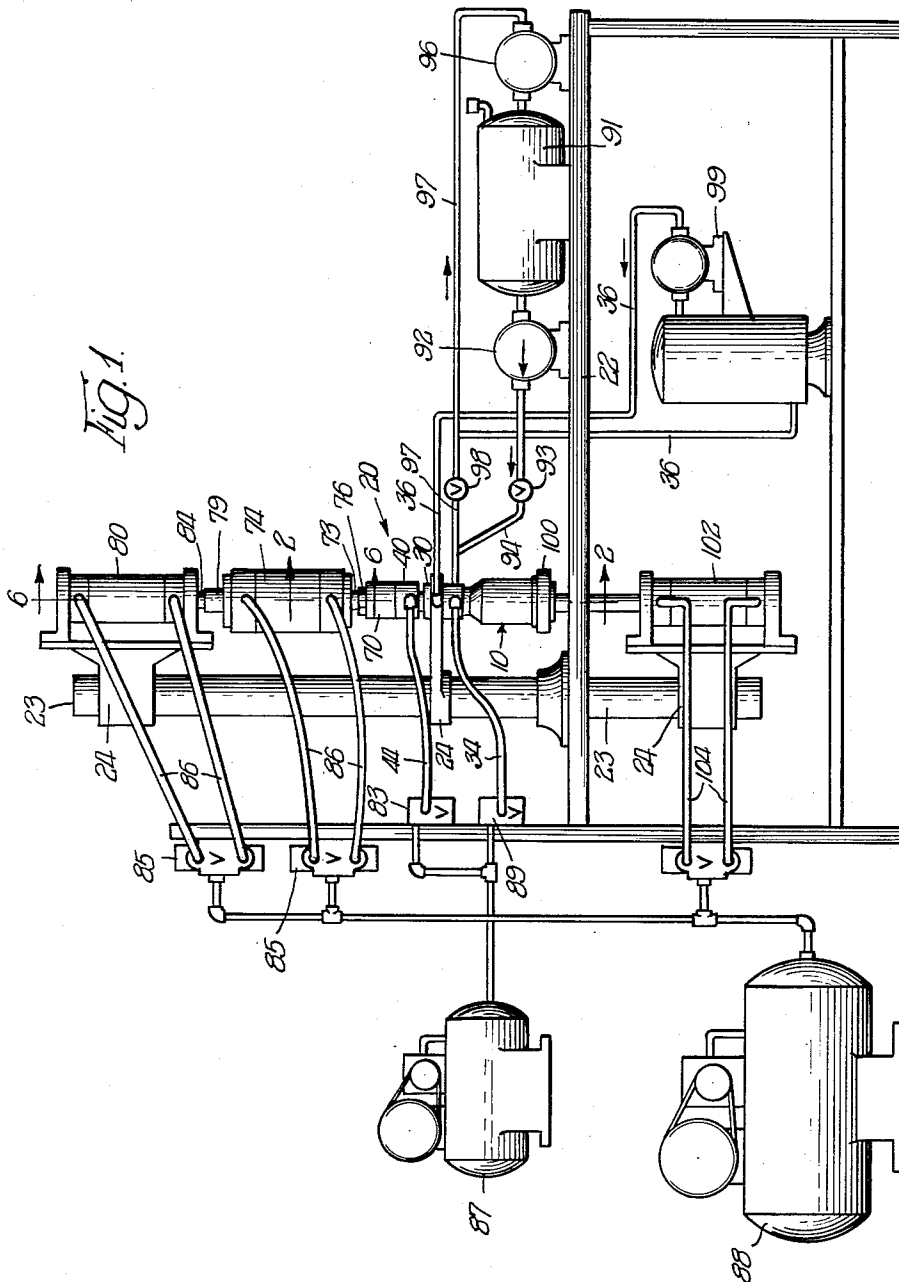
R. B. STANLEY ET AL

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FILLING AND SEALING RECEPTACLES

Filed March 28, 1955

4 Sheets-Sheet 1



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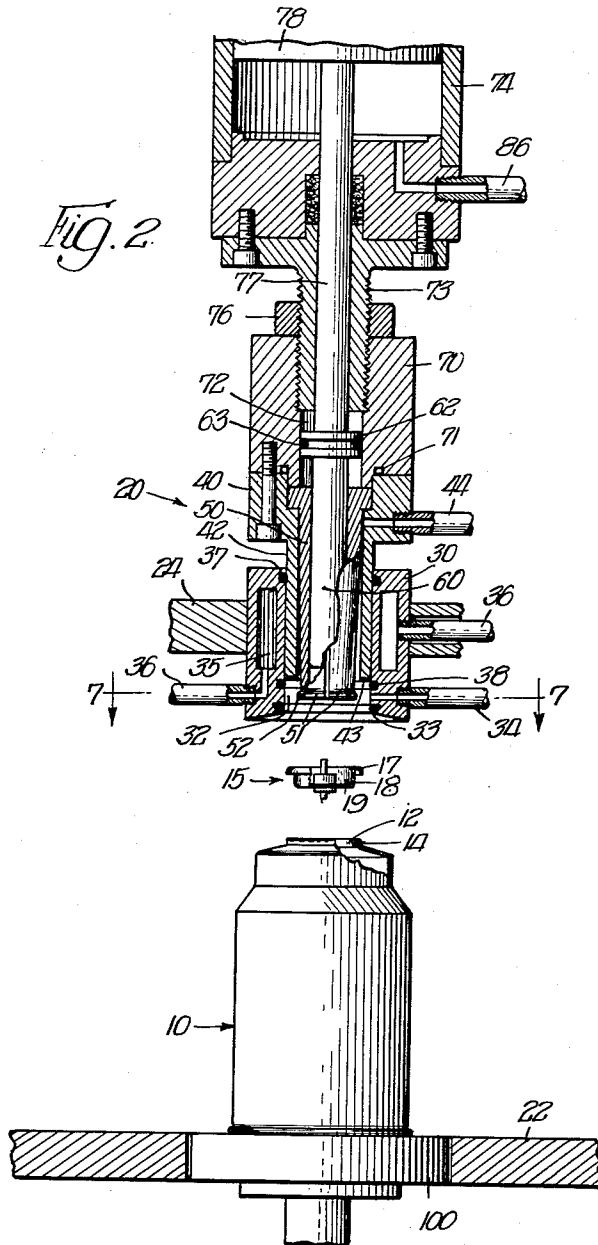
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4 Sheets-Sheet 2



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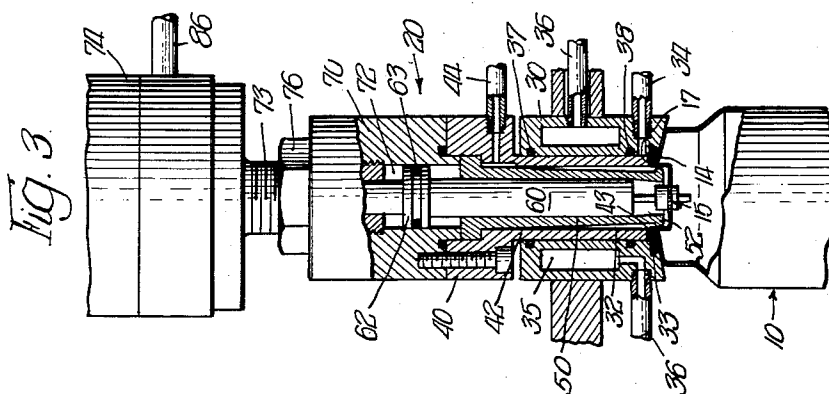
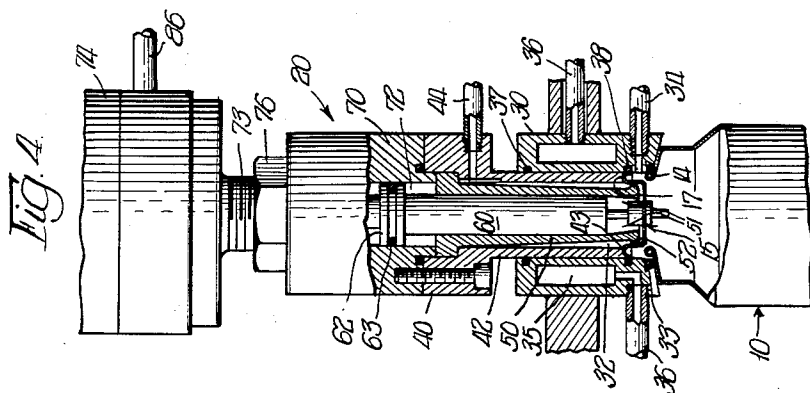
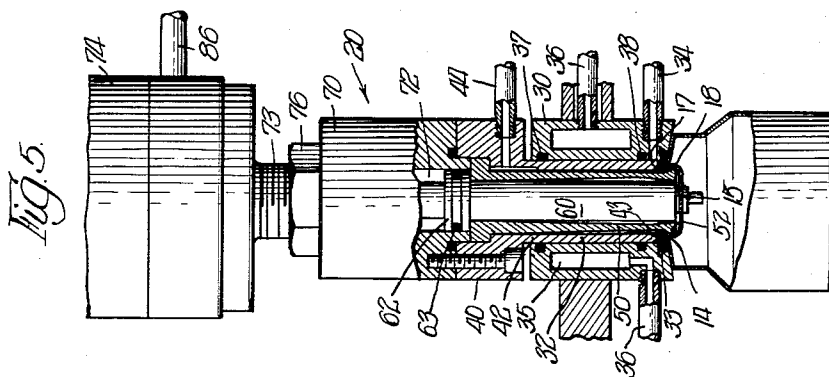
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FILLING AND SEALING RECEPTACLES

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4 Sheets-Sheet 3



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Fig. 7

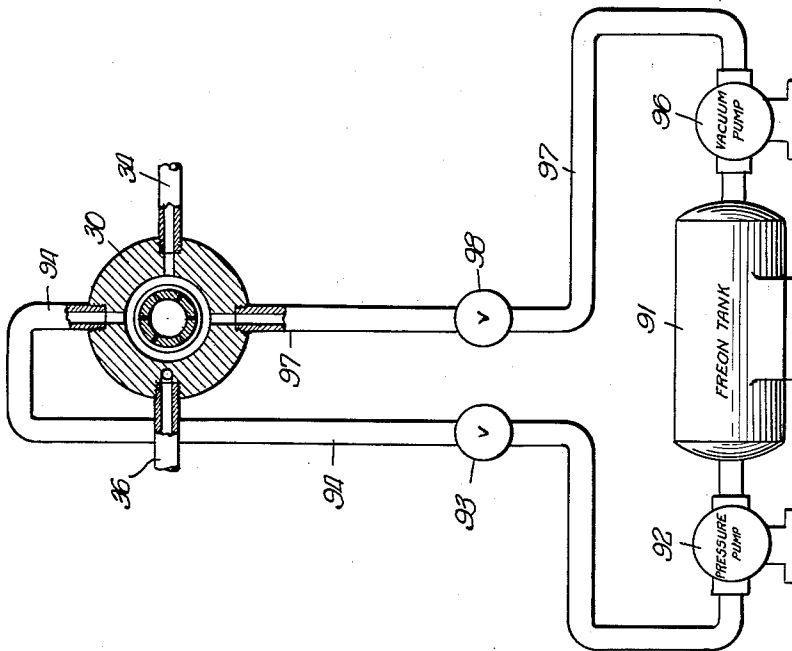
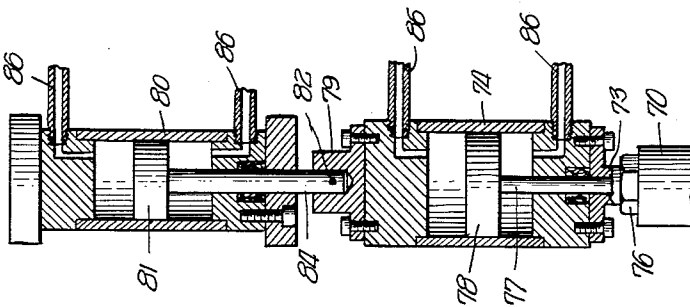


Fig. 6



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FILLING AND SEALING RECEPTACLES

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26 Claims. (Cl. 53—37)

This invention relates to a device for filling and sealing containers, and more particularly to a machine for charging aerosol cans with product and/or propellant.

In the past it has been customary to employ a vacuum type filling machine and also a device for crimping the caps to containers and receptacles. The previous machines, however, have employed separate, spaced stations for filling and for sealing.

In filling of aerosol cans with product and propellant, it is the usual practice to first fill the can with the proper quantity of the product. Then the can is charged with a gaseous propellant in liquid phase. The propellant may be kept in liquid form either by refrigeration or pressure, and either method is acceptable for the purposes of our invention. When the container is filled and the propellant is warmed to room temperature, or the pressure is removed, as the case may be, the gas escapes to the atmosphere and is wasted. Thus when an aerosol container is filled with a volatile liquid propellant, it is desirable to seal the cap to the container immediately after the container has been charged with the propellant, to prevent waste.

It is, therefore, an object of this invention to provide a device for sealing containers having a cap which extends partially into the mouth of the container.

It is another object of this invention to provide a filling and sealing mechanism in which the filling and sealing steps are performed at the same station.

It is a further object of this invention to provide a filling and sealing mechanism that operates in a single unit.

It is a still further object of this invention to provide a device that is rapid and effective in operation and which prevents the loss and waste of filling material.

Further objects and advantages of this invention will become evident as the description proceeds and from an examination of the accompanying drawing which illustrates one embodiment of the invention and in which similar numerals refer to similar parts throughout the several views.

In the drawings:

Figure 1 is a view in side elevation of a device embodying the invention.

Figure 2 is a sectional view taken substantially along line 2—2 of Figure 1, except that the container and cap are shown in exploded view.

Figure 3 is a fragmentary view partly in section of the filling and sealing unit showing the first step in the filling operation, in which the mandrel is lowered to lift the cap of the container.

Figure 4 is a fragmentary view partly in section of the filling and sealing unit showing the cap lifted from the mouth of the container and in position to evacuate the container and charge it with the filling material.

Figure 5 is a fragmentary view partly in section of the filling and sealing unit, showing the step of sealing the cap to the container.

Figure 6 is a sectional view taken substantially along

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line 6—6 of Figure 1, showing the connection between the double acting cylinders which operate the filling and closing unit.

Figure 7 is a view in section taken substantially along line 7—7 of Figure 2.

Referring now to Figure 2 of the drawings, a container 10 is illustrated therein, having an open mouth 12 bordered by a rolled rim 14. The valve cap 15 for the container, shown in exploded view, has a lip 17 shaped to partially encircle the rolled rim 14 of the container. A well 19 is formed in the cap and extends partially into the mouth of the container, with the sides 18 thereof adapted to be adjacent the mouth of the container and depending below the rolled rim 14.

As shown in Figures 1 and 2, the filling and sealing operations may be performed on a suitable table 22 provided with a vertical column 23 supporting the various parts of the device by brackets 24. Column 23 supports the filling and sealing unit 20 above table 22. Unit 20 performs the various operations on the container at one station, including evacuating the container, filling the container with filling material, and sealing the cap to the container.

Supported above the table 22 and held stationary by a bracket 24 is a bell 30, in the filling and sealing unit. The bell is provided with a lower surface for receiving the mouth and cap of container 10. An O-ring 33, located at the mouth of chamber 32 in bell 30, encircles the mouth 12 of the container 10 to form a hermetic seal between the bell and container when the container is forced thereagainst. After the container has been lifted against the mouth of bell 30 and the cap 15 of the container lifted in chamber 32, the air in the container 10 and chamber 32 is evacuated through tube 34 leading to a vacuum pump.

Bell 30 is provided with a heating jacket 35 in which is circulated hot water by tubes 36. The heating jacket prevents frosting of the bell caused by the introduction of the refrigerated propellant into the container through the bell.

A sealing ring 37 is mounted in the bell to maintain an airtight seal between chamber 32 and portion 42 of a mandrel which reciprocates in said bell chamber. Sealing ring 38 forms an air-tight seal between bell 30 and cap 15 when the latter is lifted in chamber 32 during the filling operation thereby preventing entry of outside air into the container or chamber 32 (Figure 4).

A mandrel 40 is mounted for reciprocating movement relative to bell 30, and has a hollow tubular portion 42 projecting into chamber 32 of bell 30. The bottom end of tubular portion 42 has an annular recess 43 shaped to a configuration complementary to the lip 17 of cap 15. The tubular portion 42 of the mandrel is adapted to engage the cap 15 with the concave face of the mandrel resting on the lip 17 (Figure 3). A vacuum then is produced in the hollow mandrel through tube 44 leading to a vacuum pump, so that the cap is held against the mandrel and lifted therewith from the container and into chamber 32 of bell 30 during the filling operation.

Mounted in the mandrel 40 for reciprocal motion therewith is an expansible collet 50 having one end projecting a short distance below the lower end of tubular portion 42 into chamber 32. The expansible collet is formed of split sections 51 having a tapered inner surface of gradually diminishing diameter at the lower end of the collet. Laterally projecting crimping lips 52, located at the lower end of the collet below mandrel 40, are designed to seal the cap 15 to the container by crimping the inside walls thereof outwardly when the collet is expanded by a plunger.

Extending into collet 50, and adapted to be moved relative thereto, is a plunger 60. Plunger 60 is mounted

to be inserted and removed in the collet independently of the motion of mandrel 40. In this manner the plunger may be inserted towards the lower end of the collet and upon engaging the tapered inside walls of the split sections 51, the collet is expanded outwardly to force the crimping lips 52 against the inside surface of the wall 18 of cap 15 to crimp the cap and seal it to container 10 (Figure 5). In order to prevent the entry of outside air into the mandrel 40 when a vacuum is created therein, a sealing ring 63 is mounted on boss 62 of plunger 60, so that an effective seal is formed between the plunger and head 70 which supports the mandrel 40.

A movable head 70 contains a hollow chamber 72 for the reciprocation of boss 62 of plunger 60 relative to the mandrel. The head 70 supports mandrel 40 and is connected to one end 73 of the double acting piston and cylinder 74. Head 70 is locked at the end 73 of cylinder 74 by lock nut 76.

Referring now to Figures 1 and 6, the cylinder 74 is supported by another double acting cylinder 80. As shown in Figure 6, one end 79 of cylinder 74 is connected by a cross pin 82 to piston rod 84 of cylinder 80. By this arrangement the cylinder 74, head 70, and mandrel 40 may be reciprocated by the piston 81 in cylinder 80. On the other hand, the plunger 60, which expands the collet 50 in the crimping operation, is independently reciprocated by piston 78 in cylinder 74. Movements of the pistons in cylinders 74 and 80 are caused by compressed air supplied through tubes 86 connected to an air compressor 88 and regulated by valves 85.

A vacuum pump and tank 87 are connected through tube 44 to evacuate mandrel 40 to lift the cap prior to filling. The evacuation is controlled by valve 83. Tube 34 connects the vacuum tank 87 to bell 30 for evacuating the container prior to filling, as controlled by valve 89.

The propellant, such as Freon, which is to be charged in container 10, is supplied from a tank 91 by a pump 92 to tube 94, controlled by a valve 93.

A vacuum pump 96 is connected through tube 97 to bell 30 for reclaiming the excess Freon remaining in the bell. After the filling operation there is usually excess Freon in the bell, and during the sealing step when the head 70 is moved to the down position, the excess propellant is withdrawn from the bell through tube 97 controlled by valve 98.

Container 10 (Figures 1 and 2) is supported on a movable pedestal 100 which raises the container against the bell 30 and holds the container there-against during the filling and sealing operations. The pedestal 100 is raised and lowered by a double acting piston and cylinder 102, supplied with compressed air from air compressor 88 through tubes 104.

From the foregoing the operation of the device should be apparent. In filling aerosol containers the container 10 is first partially filled with the product and the cap 15 loosely placed on mouth 12. Container 10 is placed on pedestal 100 of the double acting air piston cylinder 102. The container, with the cap seated thereon, is then raised by pedestal 100 against the bell 30. A hermetic seal is formed around the mouth of the container by the sealing ring 33 positioned in the mouth of the bell. With the container in this position the mandrel 40 is lowered by the double acting air cylinder and piston 80 so that the crimping lips 52 of collet 50 enter well 19 of cap 15 and the concave face 43 of the mandrel rests on lip 17 of the cap (Figure 3). A vacuum is produced in the hollow mandrel through tube 44 so that the cap adheres to the mandrel. The vacuum is maintained in the mandrel through sealing ring 37 between the bell and mandrel, sealing ring 71 between the head and mandrel, and sealing ring 63 between the plunger and head (Figure 2).

The vacuum is maintained in the mandrel 40 as the head 70 and mandrel are lifted by air cylinder 10 into the position shown in Figure 4. The lip 17 of the cap

comes in contact with the sealing ring 38 located in chamber 32 of the bell 30 which, together with the sealing ring 33, effectively seal off the chamber 32 of the bell and the container 10 from the outside atmosphere. With the cap in raised position and adjacent sealing ring 38, the air in chamber 32 and container 10 is exhausted through tube 34 by vacuum pump 87. The container is then charged with the propellant, such as Freon, from tank 91 by pump 92 controlled by valve 93 (Figures 1 and 7) through tube 94.

While the container is being filled with the refrigerated propellant there is a tendency for the moisture in the atmosphere to condense on the bell 30, forming a frost. In order to prevent this, during the period in which the container is being filled with cold propellant, the heating jacket 35 is being circulated with hot water supplied by tubes 36 from the hot water circulating pump 99.

After the container is filled with the propellant, cylinder 74 and head 70 are lowered by cylinder 80 until the cap 15 is again seated on container 10. In this position, with the crimping lips 52 inside well 19 of the cap 15, the plunger 60 is forced downwardly by piston 78 of cylinder 74 into collet 50. The plunger 60 acting on the tapered inside walls of the split sections 51 expands the crimping lips 52 of the collet against the inside wall 18 of the cap causing the metal of the side wall of the cap to expand outwardly under the rolled rim 14 of the container and by this action effectively sealing and crimping the cap to the container (Figure 5).

While the head 70 is in the down position (Figure 5) the excess propellant remaining inside of the chamber 32 of the bell 30 is reclaimed through tube 97 (Figure 7) by the propellant evacuating pump 96 (Figure 1) which returns the propellant to tank 91. This action is controlled by valve 98.

Piston 78 of cylinder 74 now moves upwardly thereby retracting plunger 60 and the crimping lips 52 return to their position spaced from the walls 18 and are disengaged from the cap 15. The head 70 and cylinder 74 are then raised by piston and cylinder 80 to upward position and container 10 is lowered by pedestal 100.

In the drawing and specification, there have been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation. Changes in form and in the proportion of parts, as well as the substitution of equivalents are contemplated, as circumstances may suggest or render expedient, without departing from the spirit or scope of this invention as further defined in the following claims.

We claim:

1. A device for filling and sealing a container which has a mouth closed by a cap seated thereon, said cap having a concentric well extending partially within said container comprising bell means for seating on the container and forming a hermetic seal encircling the mouth, means for raising the cap from the container to open the mouth, means for evacuating said bell means and container while the cap is lifted, means for introducing material through said bell means into said container, an expansible collet having crimping lips extendable into the well of the cap, and reciprocable means mounted within the collet for expanding the collet to force said crimping lips outwardly against the inner surface of the well, causing the cap to expand outwardly under the mouth thereby sealing the cap to the container.

2. A device for filling and sealing a container which has a mouth closed by a cap loosely seated thereon, said cap having a concentric well extending partially within said container comprising bell means for seating on the container and forming a hermetic seal encircling the mouth, means for raising the cap from the container to open the mouth, means for evacuating said bell means and container while the cap is lifted, means for introducing ma-

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terial through said bell means into said container, a collet mounted in said bell means and having crimping lips for engaging the inside surface of the well in the cap, and means for expanding the collet to force said crimping lips outwardly against the inner surface of the well causing the cap to expand outwardly under the mouth thereby sealing the cap to the container.

3. A device for filling and sealing a container which has a mouth closed by a cap loosely seated thereon, said cap having a concentric well extending partially within said container comprising bell means for seating on the container and forming a hermetic seal encircling the mouth, a mandrel extending into said bell means adapted to be placed against the cap, said mandrel having a hollow channel, means for producing a vacuum in said hollow channel, means for raising said mandrel relative to said container while maintaining the vacuum in said hollow channel to cause the cap to be lifted from the container, means for evacuating said bell means and container, means for introducing material through said bell means into said container, an expandable collet mounted in said bell means and having crimping lips for engaging the inside surface of the well in the cap, and means for expanding the collet to force said crimping lips outwardly against the inner surface of the well causing the cap to expand outwardly under the mouth thereby sealing the cap to the container.

4. A device for filling and sealing a container which has a mouth closed by a cap loosely seated thereon and having a well partially extending within the container, comprising bell means for seating on the container and forming a hermetic seal encircling the mouth, a hollow mandrel extending into said bell means adapted to be placed against the cap, means for producing a vacuum in said hollow mandrel, means for raising said mandrel relative to said container while maintaining the vacuum in said mandrel whereby the cap is lifted from the container, means for evacuating said bell means and container, means for introducing material through said bell means into said container, means for lowering said cap into the mouth, an expandable collet mounted in said bell means and having crimping lips engageable with the well in the cap, and means for expanding the collet to force the crimping lips outwardly causing the cap to expand outwardly under the mouth thereby sealing the cap to the container.

5. A device for filling and sealing containers having a rim projecting upwardly around the periphery of the mouth thereof and a metal cap that seats on said rim, said cap having a concentric well formed therein extending partially into said container, comprising bell means for seating on the container and forming a seal encircling the mouth, means for raising the cap to open the mouth, means for introducing material through said bell means into said container, means for lowering said cap to seating position on said rim, a hollow expandable collet having crimping lips for engaging the inside surface of the well of the cap, and means for expanding said collet thereby forcing said crimping lips outwardly against the inside surface of the cap causing the metal cap to expand outwardly under the rim, thereby sealing the cap to the container.

6. A device for filling and sealing containers having a rim projecting upwardly around the periphery of the mouth and a cap that seats on said rim with a concentric well formed therein extending partially into said container, comprising bell means for seating on the container and forming a seal encircling the mouth, a hollow mandrel extending into the bell means adapted to engage the lip of the cap and effect a seal therewith, means for raising the mandrel and thereby the cap to open the mouth, means for introducing material through the bell means into the container, an expandable collet having a hollow tapered inside surface, said collet having crimping lips for engaging the inside surface in the well of the cap,

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and plunger means for expanding said collet and forcing said crimping lips outwardly against the inside surface of the cap causing the cap to be expanded outwardly under the rim, thereby sealing the cap to the container.

7. A device for filling and sealing a container having a rim projecting upwardly around the periphery of the mouth which is closed by a cap that seats loosely on said rim and has a concentric well extending partially into said container, said device comprising bell means for seating on the container and forming a hermetic seal encircling the mouth, means for raising the cap from the container to open the mouth, means for evacuating said bell means and container while the cap is lifted, means for introducing material through said bell means into said container, a hollow expandable collet, said collet having crimping lips for engaging the inside surface of the cap in the well, and means for expanding said collet to force said crimping lips outwardly against the inside surface of the cap causing the cap to expand outwardly under the rim, thereby sealing the cap to the container, said means for raising the cap, for evacuating, for introducing material, and for expanding said collet being operable while said hermetic seal is maintained.

8. A device for filling and sealing a container having a rim projecting upwardly around the periphery of the mouth which is closed by a cap that seats loosely on said rim and has a concentric well extending partially into said container, said device comprising bell means for seating on the container and forming a hermetic seal encircling the mouth, a mandrel extending into said bell means adapted to be placed against the cap, said mandrel having a hollow channel, means for producing a vacuum in said hollow channel, means for raising said mandrel relative to said container while maintaining the vacuum in said channel to lift the cap from the container, means for evacuating said bell means and container, means for introducing material through said bell means into said container, a hollow expandable collet mounted in said mandrel, said collet having crimping lips projecting beyond said mandrel for engaging the inside surface of the cap in the well, and means for expanding said collet to force said crimping lips outwardly against the inside surface of the cap causing the cap to expand outwardly under the rim, thereby sealing the cap to the container.

9. A device for filling and sealing a container having a rim projecting upwardly around the periphery of the mouth which is closed by a cap that seats loosely on said rim and has a concentric well extending partially into said container, said device comprising bell means for seating on the container and forming a hermetic seal encircling the mouth, a hollow mandrel extending into said bell means adapted to be placed against the cap, means for producing a vacuum in said hollow mandrel, means for raising said mandrel relative to said container while maintaining the vacuum in said mandrel to lift the cap from the container, means for evacuating said bell means and container, means for introducing material through said bell means into said container, a hollow expandable collet mounted in said hollow mandrel, said collet having crimping lips projecting beyond said mandrel for engaging the inside surface of the cap in the well, a plunger mounted in said collet, and means for inserting said plunger into said collet to force said crimping lips outwardly against the inside surface of the cap causing the cap to expand outwardly under the rim, thereby sealing the cap to the container.

10. A machine of the character described comprising: a seat adapted to receive and support in upright position a container having a top opening with a closure loosely resting therein, an operating head positioned above the seat, means for producing relative movement between the seat and the head to bring about engagement between the head and the container, means on the head for producing a seal around the top opening of the container when the head is engaged with the latter, means on the head for lifting the closure free from the top opening

of the container, means for introducing a predetermined quantity of propellant through the head into the container while the closure is lifted, means for thereafter lowering the closure, and means on the head for thereafter crimping the closure to the container to form a hermetic seal therewith.

11. The herein described method of filling an aerosol container having a top opening and a separate closure provided with a dispensing valve mechanism, which comprises: introducing into the container a predetermined quantity of active ingredient, then placing the closure in cooperative relation with the top opening with the closure in unsealed condition and with the dispensing mechanism closed, bodily lifting the closure from the container, then introducing a predetermined quantity of a propellant into the container through the top opening thereof beneath the closure while the dispensing mechanism of the latter remains closed, and thereafter lowering the closure and permanently securing it to the container.

12. The herein described method of filling an aerosol container having a top opening and a separate closure provided with a dispensing valve mechanism, which comprises: introducing into the container a predetermined quantity of active ingredient, then placing the closure in cooperative relation with the top opening with the closure in unsealed condition and with the dispensing mechanism closed, bodily lifting the closure from the container, then introducing a predetermined quantity of a propellant into the container through the top opening thereof beneath the closure while the dispensing mechanism of the latter remains closed, producing relative pressure differences between the introduced propellant and the atmosphere in the container and maintaining a greater pressure on said introduced propellant than the pressure in said container during the introduction of the propellant, and thereafter lowering the closure and permanently securing it to the container.

13. The herein described method of filling an aerosol container having a top opening and a separate closure provided with a dispensing valve mechanism, which comprises: introducing into the container a predetermined quantity of active ingredient, then placing the closure in cooperative relation with the top opening with the closure in unsealed condition and with the dispensing mechanism closed, bodily lifting the closure from the container, evacuating the air from the container while the closure is lifted, then introducing a predetermined quantity of propellant into the container through the top opening thereof beneath the closure while the dispensing mechanism of the latter remains closed, and thereafter lowering the closure and permanently securing it to the container.

14. A device for filling and sealing a container having a top opening with a cap loosely resting therein, comprising bell means for seating on the container and forming a hermetic seal around the said opening, a hollow expandable mandrel reciprocable within said bell means and engageable with said cap, means for raising the cap from the container, means for evacuating the air from said bell means and container, means for introducing material into said container while the cap is lifted, means for maintaining a greater pressure on the introduced material than the pressure in said container during the introduction of the material, means for replacing the cap in said opening, and means carried by the mandrel for thereafter expanding the mandrel and thereby crimping the closure to the container to form a hermetic seal therewith, said means for raising the cap, for replacing the cap, and for expanding the mandrel being operable while said hermetic seal is maintained between said bell means and said container.

15. A device for filling and sealing a container having a top opening with a closure loosely resting therein, comprising bell means located above the opening, means for producing relative movement between said bell means and the container to bring about engagement between the

bell means and the container and form a hermetic seal around the said opening, a hollow mandrel reciprocable within said bell means and engageable with said closure, means for producing a vacuum in said hollow mandrel when engaged with the closure, means for separating the mandrel from the container while maintaining said vacuum whereby the closure is separated from the container, means for evacuating the air from said bell means and container, means for introducing material into said container while the closure is separated, means for replacing the closure in said opening, and means carried by the mandrel for thereafter crimping the closure to the container to form a hermetic seal therewith.

16. A machine of the character described comprising a seat adapted to receive and support in upright position a container having a top opening with a valved closure loosely resting therein, an operating head positioned above the seat, means for producing relative movement between the seat and the head to bring about engagement between the head and the container, means on the head for producing a seal around the top opening of the container when the head is engaged with the latter, means on the head for lifting the closure free from the top opening of the container, means for introducing a predetermined quantity of propellant through the head into the container while the closure is lifted, means for thereafter lowering the closure, and means on the head for thereafter crimping the closure to the container to form a hermetic seal therewith, said means for lifting the closure, for lowering the closure and for crimping said closure being operable while the top opening of the container remains sealed with respect to the head.

17. A machine according to claim 16, wherein the means for producing a seal between the head and the container is in the form of a gasket carried by the head and engageable with the container.

18. A machine according to claim 16, wherein the head embodies a cylinder having therein a piston provided with a gasket adapted to form a seal with the closure, and means for introducing compressed air below the piston to raise the latter for the purpose of lifting the closure from the top opening of the container.

19. Machine according to claim 16, wherein the means for crimping the closure to the container comprises a plurality of annularly arranged crimping jaws, and a plunger operable within said jaws to radially force them apart to perform the crimping operation.

20. A machine of the character described comprising a seat adapted to receive and support in upright position a container having a top opening with a closure loosely resting therein, an operating head positioned above the seat and provided with a gasket to bear against and form a seal with the container peripherally of said opening, means for producing relative movement between the seat and head to bring about engagement between the head and the container to effect said seal, a hollow piston located in the head and having an extension carrying a gasket to bear against and form a seal with the closure, means for imparting a vacuum to the interior of the piston and its extension to anchor the closure to the piston, means for introducing compressed air below the piston to elevate the same and lift the closure from the top opening of the container, valve controlled passages in the head through which a predetermined quantity of a propellant is introduced into the container through the top opening of the latter while the closure is lifted, means for thereafter venting the space above and below the piston to return the closure to a position within the top opening of the container, and means for thereafter expanding the closure within said opening of the container to form a pressure tight seal between them.

21. Machine according to claim 20, wherein the means for expanding the closure comprises a crimping member embodying a plurality of crimping jaws, and a plunger operable interiorly of the jaws to force them radially

outward to expand the closure into engagement with the container opening.

22. Machine according to claim 21, wherein the plunger is provided with means for pneumatically operating the same.

23. The herein described method of filling an aerosol container having a top opening and a separate closure provided with a dispensing valve mechanism, which comprises introducing into the container a predetermined quantity of active ingredient, then placing the closure loosely in cooperative relation with the top opening with the closure in unsealed condition and with the dispensing valve mechanism closed, bodily lifting the closure from the container, then introducing a predetermined quantity of a propellant into the container through the top opening thereof beneath the closure while the dispensing valve mechanism of the latter remains closed, and thereafter lowering the closure and permanently securing it to the container.

24. An aerosol charging and sealing machine comprising means for supporting a container having a top opening, a charging and sealing head provided therein with a chamber, means for imparting relative movement between such a container and the head to engage the former with the latter with the top opening of the container registering with the head chamber, means for injecting a predetermined measured quantity of propellant into the head chamber and through said chamber and top opening into the container while the head

and container are engaged with one another and the top opening of the container entirely open and unobstructed, and means for thereafter applying a valved closure cap to said top opening and permanently sealing said cap to the container while the head and container remain engaged with one another.

25. The method of charging and sealing an aerosol container having a top opening and a valved cap, which comprises positioning the valved cap loosely on the container in cooperative relation with the top opening of said container, thereafter bodily lifting the valved cap free of said container to completely free the top opening from obstruction thereby, thereafter placing a predetermined measured quantity of a propellant in the container through the thus unobstructed top opening thereof, and thereafter returning the valved cap into cooperative engagement with the container and sealing said valved cap thereto.

26. A method as in claim 25, wherein an active ingredient is placed in the container prior to sealing the valved cap thereto.

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