April 25, 1961 A. B. CAMPBELL 2,981,446

DISPENSING CAPS AND ASSEMBLIES CONTAINING SAME

Filed Jan. 5, 1959 2 Sheets-Sheet 1

Fig. 1.

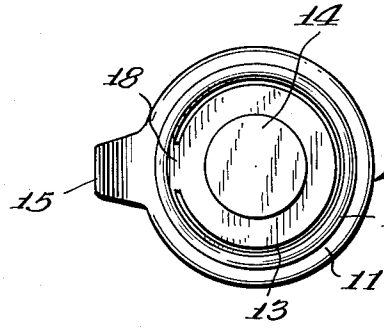


Fig. 5.

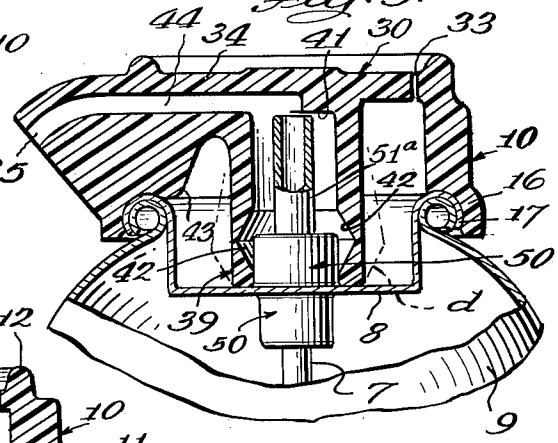


Fig. 2.

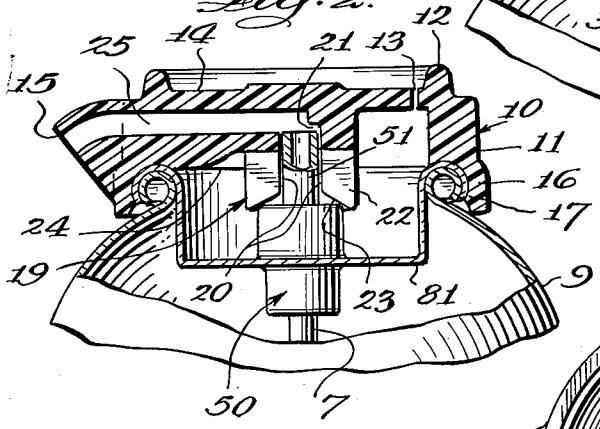


Fig. 4.

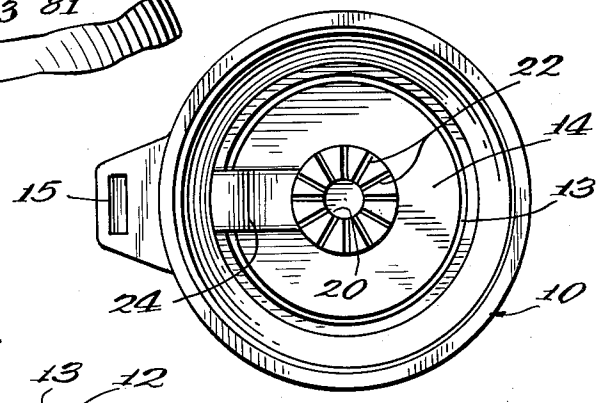
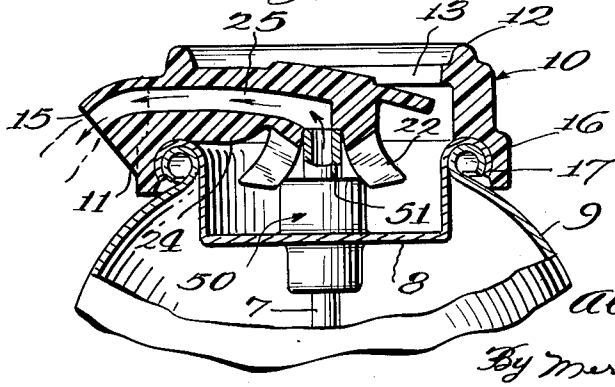


Fig. 3.



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DISPENSING CAPS AND ASSEMBLIES CONTAINING SAME

Filed Jan. 5, 1959 2 Sheets-Sheet 2

Fig. 6.

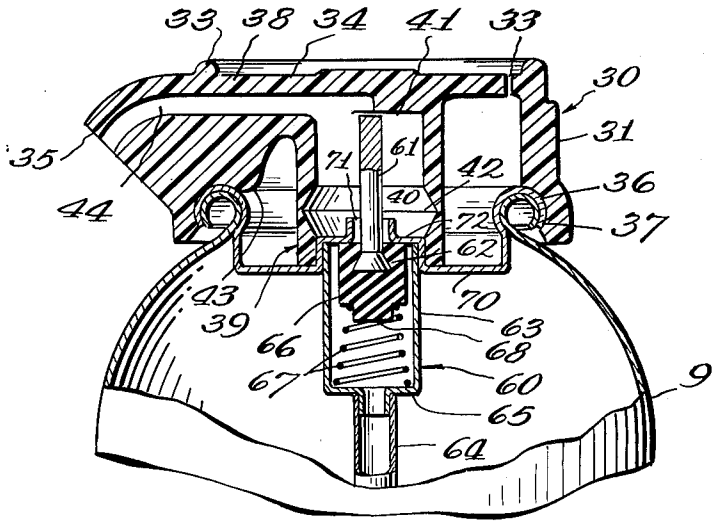
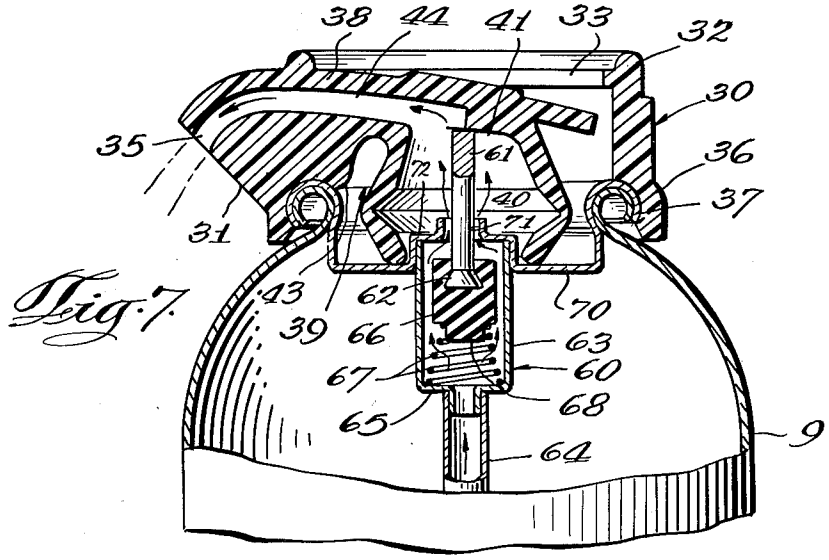


Fig. 7.



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2,981,446

DISPENSING CAPS AND ASSEMBLIES CONTAINING SAME

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6 Claims. (Cl. 222—394)

This invention relates to dispensing caps that are adapted to be used primarily with aerosol dispensers, and the combination of said dispensing caps with components of dispenser assemblies.

My cap is made of a single piece of flexible plastic. The cap comprises a skirt having a fluid outlet, a depressible tab or diaphragm spaced at the top of the skirt, and a rigid upstanding wall that extends above the diaphragm for preventing accidental depression of the diaphragm and valve stem and unintentional release of the contents of the container. This cap may be used in a dispenser assembly comprising a container having an upper opening for receiving and retaining a valve assembly, a valve assembly secured to the container having a vertically reciprocative valve stem, and the integral, flexible plastic cap.

The rigid upstanding wall extends above the depressible diaphragm and reciprocative valve stem, thereby preventing accidental depression of the diaphragm and dispensing valve stem. Therefore, (*a*) the diaphragm may be depressed independently of the upstanding wall, but only by selective pressure applied within the boundary of the upstanding wall, (*b*) the cap may be secured to the container without actuating the dispensing valve structure, and (*c*) dispenser assemblies may be stacked one upon another without causing unintentional depression of the diaphragm and valve stem.

There are essentially two general types of dispensing valve assemblies used today in aerosol type dispenser assemblies. In the first type of dispensing valve structure, the valve stem is a tubular member that may be depressed to unseat the valve. This depression causes the contents of the dispenser assembly to be discharged from the container proper through a tubular passage that extends along the longitudinal axis of said tubular stem. This type of valve structure is shown in Abplanalp's Patent 2,631,814 and is referred to in Abplanalp's Patent 2,753,214 and his Reissue Patent 24,555. In the second type of valve assembly the contents of the dispenser assembly are dispensed by the vertical displacement of a valve stem, which causes the contents of the container to be ejected from the container through an annulus that circumscribes the periphery of the stem. This second type of valve structure is shown in Campbell Patents 2,755,973 and 2,766,915.

When the first type of valve assembly is used, caps of the type shown in either Patent 2,753,214 or Reissue Patent 24,555 may be used. The resilient plastic cap shown in Patent 2,753,214 is adapted to be secured to the container. This cap is provided with a resilient diaphragm or tab that overlies the tubular valve stem and has a chambered hub which forms a socket in which the upper end of the tubular valve stem is retained. A discharge passage leads from the cylindrical chamber in the hub to a spout. When the diaphragm is depressed by the operator, the valve is unseated, thereby enabling the contents of the container to be dispensed out the dispenser assembly through the stem, chamber, passage, and spout.

It has been reported that the diaphragm of the cap shown in Patent 2,753,214 has many objectionable characteristics. One such objection attributed to this cap was deemed inherent in the fact that the hub had to fit over the tubular valve stem of the container and experience showed that, when enough pressure was placed on the cap as a whole to force it over the lip of the can in mounting the cap on the can, the application of such pressure to force the hub into engagement with the valve stem would cause discharge of the contents of the can through the nozzle of the cap and in order to produce a marketable product. The discharged material had to be wiped off, which meant extra labor costs and was altogether undesirable because the interior of the spout could not be entirely cleaned of the product which lodged therein. This problem of accidental depression of the diaphragm when the cap was secured to the container was alleviated to at least some degree by the use of the cap shown in Reissue Patent 24,555.

The cap shown in Reissue Patent 24,555 is substantially similar to the cap shown in Patent 2,753,214. However, the circular diaphragm of the cap shown in Patent 2,753,214 is secured to the skirt portion along its entire circular periphery, whereas the circular diaphragm shown in Reissue Patent 24,555 is hingedly attached to the skirt at the top thereof for a short distance along its periphery. From the customer's standpoint, the cap shown in Reissue Patent 24,555 is much easier to install since it may be made with a substantially rigid peripheral wall or skirt which may be forced down over the lip of a container with enough pressure to quickly and firmly secure it in place while the diaphragm is pivoted along its flexible hinge in an upward direction without exerting depressible pressure on the valve stem. Pressure may then be applied to the diaphragm to seat the upper portion of the valve stem in the chambered hub at the center of the diaphragm. Thus, when the cap of the reissue patent is secured to the container, the hinged diaphragm is moved in an upward direction more readily and a further distance than the diaphragm of the cap shown in Patent 2,753,214. However, despite the advantages that may result from the use of a hinged diaphragm, there is still some chance of the stem being depressed when the cap is securely fitted to the container and the upper end of the tubular valve stem. My invention obviates this danger of unintended depression of the tubular valve stem.

When the second type of valve assembly is used, the dispensing cap may be readily secured to the container without contacting the top end of the valve stem. For example, the Campbell patents referred to above show a cap wherein the depressible diaphragm is positioned above the upper end of the valve stem and the stem and diaphragm are not secured to each other. Campbell's cap normally contacts the valve stem only when the diaphragm and stem are depressed, thereby causing the valve stem to be actuated to a dispensing position. However, when this type of valve assembly and valve stem are used, the ejected contents of the container fill the confines of the cavity that is formed between the cap and container. My present invention permits the depressible diaphragm of the type shown in the Campbell patents to be hinged along a part of its periphery in much the same manner as shown in Abplanalp Reissue Patent 24,555, thereby providing the diaphragm with freer depressible movement. At the same time, my invention permits the resulting hinged diaphragm to be normally free of the upper end of the valve stem.

My new dispensing caps and the combination of said caps with components of a dispenser assembly are illus-

trated in the accompanying diagrammatic drawings, wherein:

Figure 1 is a plan view of the cap structure shown in Figures 2 and 3;

Figure 2 is an enlarged partial sectional elevational view of a dispenser assembly comprising a dispensing cap, dispensing valve assembly of the type shown in Abplanalp Patent 2,631,814, and container;

Figure 3 is an enlarged partial sectional elevational view, similar to that shown in Figure 2, showing the hinged diaphragm of the cap and associated tubular valve stem in a depressed, dispensing position;

Figure 4 is an enlarged bottom view of the dispensing cap shown in Figures 1–3;

Figure 5 is an enlarged partial sectional elevational view showing a second cap in combination with the same valve assembly shown in Figures 2 and 3;

Figure 6 is an enlarged partial sectional elevational view showing the second cap embodiment and a second dispensing valve assembly of the type shown in Campbell Patent 2,755,973; and

Figure 7 is an enlarged partial sectional elevational view, similar to that of Figure 6, showing the second cap embodiment in a depressed position and the associated valve stem of the second valve assembly in a depressed, dispensing position.

The two embodiments of my dispensing cap structure shown in (*a*) Figures 1–4 and (*b*) Figures 5–7 are adapted to be used, interchangeably, with either a reciprocative, hollow, tubular valve stem, such as illustrated in Patent 2,631,814, or the solid, reciprocative valve stem, such as shown in accompanying Figures 6 and 7 (corresponds with Campbell Patent 2,755,973) or Campbell Patent 2,766,915.

The drawings show aerosol dispenser assemblies, each of which has (1) a container, (2) valve assembly, and (3) cap, which comprises: (1) a dispenser container having an upper opening for receiving a dispensing valve assembly; (2) a dispensing valve assembly fitted to the top opening of the container and retained thereat; said valve assembly having a substantially vertically extending fluid passage means with an upper outlet positioned above said container and a lower inlet communicating with the confines of said container; a vertically extending, vertically reciprocative valve stem having an upper portion extending above said container; and sealing means for selectively opening and sealably closing said fluid passage means; said sealing means, valve stem and passage means being operatively associated with each other so that (*a*) said sealing means normally closes said passage means and thereby prevents the egress of contents of said container through said passage outlet, and (*b*) movement of said stem from its normal position permits the egress of contents of said container through said passage outlet; and (3) an integral, flexible plastic cap comprising a substantially cylindrical skirt portion normally secured to said container and normally circumscribing said passage means and said upper portion of the reciprocative valve stem; the lower end of said skirt having retaining means for permitting the cap to be secured to a valve support or cup, which is in turn secured to the container and becomes a part thereof; said skirt portion having a fluid outlet through which the contents of the container are adapted to spout; when the cap is secured to the container, said fluid outlet therein extends at an angle to the axis of said stem; said cap having a substantially flat, flexible, circular, resiliently hinged diaphragm at the top of said skirt and overlying said upper portion of the valve stem which, when depressed, contacts said valve stem and depresses it from its normal position towards said container opening, thereby permitting the egress of contents of said container through said passage outlet; a substantially vertical, rigid upstanding wall extending from the skirt and projecting above said skirt and depressible diaphragm, thereby preventing accidental depression of said depressible diaphragm and said valve stem; said diaphragm being capable of being depressed independently of said upstanding wall but only by selective pressure applied within the boundary of the upstanding wall.

Referring first to the cap **10** shown in Figures 1–4, the cap **10** shown therein comprises a tubular skirt **11** that extends downwardly from the diaphragm opening **13** and diaphragm **14**. A rigid upstanding wall **12** extends from the skirt **11** above the diaphragm opening **13** and diaphragm **14**, and prevents accidental depression of the diaphragm. The lower portion of the skirt **11** is flared outwardly at **16** and is provided with an internal bead **17** so that the cap **10** may be sprung over and secured to the peripheral edge of the cup or support **8**. The cup **8** supports the valve dispensing assembly **50**, of the type shown in Abplanalp Patent 2,631,814, and is secured to and forms a part of the metal can or container **9**. The valve assembly **50** has a reciprocative tubular valve stem **51**. The resiliently hinged, circular diaphragm **14** is entirely free from attachment to the skirt **11** except for a relatively narrow peripheral resilient hinge connection **18** which is shown in Figure 1. Although the diaphragm **14** is otherwise unattached to the skirt **11** and opening **13**, its peripheral edge is positioned adjacent thereto. The hinge **18** permits the diaphragm **14** to be pivoted downwardly along its arcuate axis and to return to a raised position.

The inner or lower side of the diaphragm **14** has an integral, collapsible tubular hub **19** with tubular chamber **20** having an upper offset portion which forms an annular shoulder **21**. The shoulder **21** and chamber **20** are shown positioned in spaced relation to the top and longitudinally extending sides of the dispensing valve stem **51** when the diaphragm **14** is in its normal position, such as shown in Figure 2. Thus, when the cap **10** is secured to the container **9**, the cap can in no way cause or effect the unintended depression of the tubular valve stem **51**. The lower tubular portion of the collapsible hub **19** has vertically extending slots **22** formed therein. The lower portion of the slotted hub **19** rests on the valve assembly **50** in the manner shown in Figure 2. As shown in Figure 2, the slots **22** extend from the bottom of the hub **19** to about two-thirds the height of the hub, but below the upper end of the tubular valve stem **51**. The lower slotted portion of the hub **19** has an upwardly and inwardly projecting taper **23**.

When the operator wishes to actuate the valve assembly **50**, the diaphragm **14** should be depressed from its position shown in Figure 2 to its pivoted position shown in Figure 3, during which the tapered portion **23** of the slotted hub **19** is moved downwardly and outwardly and the shoulder **21** is brought into engagement with the upper end of the stem **51**. This pivotal movement of the diaphragm **14** depresses the stem **51** and causes the valve to be actuated to a dispensing position.

A rib **24** extends radially from the hub **19** to the skirt **11** directly below the hinge **18** and upstanding wall **12**. The rib **24** is shown in Figures 2–4 to be integrally joined at its peripheral outer end to the skirt **11** and at its upper side to the diaphragm **14**. The rib **24** is provided with an internal tubular passage **25** which communicates with the spout **15** and the chamber **20** of the hub **19** and the top open end of the tubular stem **51**.

In operation, the contents of the container **9** shown in Figures 2 and 3 may be dispensed with the cap **10** by depressing the diaphragm **14** from its normal position shown in Figure 2 to its dispensing position shown in Figure 3. The depression of the diaphragm causes the annular shoulder **21** to contact the upper end of the tubular stem **51**, which, in turn, depresses the stem to its dispensing position. The slots **22** at the lower end of the hub **19** and the lower tapered surface **23** thereof facilitate the depression of the shoulder **21** of the collapsible hub **19**, as shown in Figure 3. Once the valve

assembly 50 has been actuated, the contents of the container 9 are ejected through the dip tube 7, through the tubular stem 51 into the tubular chamber 20 in the hub 19, into the passage 25 in the rib 24, and out of the cap through the spout 15. When the diaphragm 14 is depressed as shown in Figure 4, the upper portion of the chamber 20, adjacent the passage 25, sealably engages the stem 51, thereby preventing the flow-back of the ejected contents of the container 9 into the cavity defined by the cap 10 and cup 8. Once the fingers of the operator are removed from the depressed diaphragm 14, the stem 51 will be urged to its upper, normal position, and the diaphragm will flex back to a raised position. During this dispensing operation, the cap 10 contacts the stem 51 only when the diaphragm 14 is depressed.

The cap 30 shown in Figures 6 and 7, and shown in part in Figure 5, may be used in conjunction with either the valve assembly 50 as shown in Figure 5 or valve assembly 60 disclosed in Figures 6 and 7. Irrespective of the particular valve assembly with which the cap 30 is used, the depression of the resiliently hinged diaphragm 34 causes the hub 39 to collapse and the cylindrical valve stem to be depressed. Figure 5 shows the cap 30 supported directly on the cup 8, whereas Figures 6 and 7 show the cap 30 resting on the cup 70.

With respect to the assembly shown in Figure 5, the cap 30 operates the valve assembly 50 in the same manner described above with respect to the cap 10, except that the weakened hub 39 is supported by the cup 8 instead of the valve and its depression is facilitated by means of the groove 42 instead of slots and a tapered surface. Actuation of the valve assembly 50 causes the ejected material to pass through the dip tube 7, through the stem 51*a* into the tubular chamber 40 in the hub 39, into the passage 44 in the rib 43, and out of the cap 30 through the spout 35 that is shown in Figures 6 and 7. When the diaphragm 34 of the cap 30 shown in Figure 5 is depressed, the cap assumes the shape shown in Figure 7.

When the cap 30 is used in conjunction with the valve assembly 60 shown in Figures 6 and 7, the diaphragm and valve stem 61 are depressed in the same manner as described above with respect to the assembly shown in Figure 5. However, the valve assembly 60, which is of the type shown in Campbell Patent 2,755,973, operates in a somewhat different manner that that described above with respect to valve assembly 50.

More specifically, the skirt 31 of the cap 30 extends downwardly from the diaphragm opening 33 and hinged diaphragm 34. An upstanding wall 32 extends from the skirt 31 above the diaphragm opening 33 and diaphragm 34, and prevents accidental depression of the diaphragm 34. The lower portion of the skirt 31 is flared outwardly at 36 and is provided with an internal bead 37 so that the cap can be sprung over and secured to the peripheral edge of either the circular cup 8 shown in Figure 5 or cup 70 of Figures 6 and 7. The hinged diaphragm 34 is entirely free from the attachment of the skirt 31 except for a narrowly peripheral resilient hinge connection 38 that is similar to the hinge 18 shown in Figure 1 with respect to the cap 10. Although the diaphragm 34 is otherwise unattached to the skirt 31 and diaphragm opening 33, its peripheral edge is positioned adjacent thereto. The resilient hinge 38 permits the diaphragm 34 to be pivoted along its arcuate axis and to return to a raised position.

The inner or lower side of the diaphragm 34 has an integral tubular hub 39 with a tubular chamber 40 having an upper offset portion which forms an annular shoulder 41. The shoulder 41 and chamber 40 are positioned in spaced relation to the top and longitudinally extending sides of the dispensing valve stem (stem 51 of Figure 5 and stem 61 in Figures 6 and 7) when the diaphragm 34 is in its normal position, such as shown in Figures 5 and 6. Thus, when the cap 30 is secured to the container 9, the cap can in no way cause or affect the unintended depression of the associated valve stem. The lower portion of the collapsible hub 39 has a triangular annular groove 42 therein. This groove 42 weakens the hub 39 and facilitates its radial extension when the hinged diaphragm is depressed as shown in Figure 7. The broken lines "*d*" in Figure 5 show the position of the outer wall of the hub 39 when it is depressed.

A rib 43 extends radially from the hub 39 of the skirt 31 below the hinge 38 and upstanding wall 32 in a manner somewhat similar to that shown in Figures 1 and 2 with respect to the cap 10. The rib 43 is shown in Figures 6 and 7 to be integrally joined at its peripheral outer end to the skirt 31 and at its upper side to the diaphragm 34. The rib 43 is provided with an internal tubular passage 44 which communicates with the spout 35 and the chamber 40 of the hub 39.

The dispensing valve assembly 60 shown in Figures 6 and 7 comprises a cylindrical bonnet member 63 having a bottom opening with a dip tube 64 secured thereto for receiving the contents of the container 9. The bonnet 63 is secured to the cup 70, which, in turn, is secured to the container 9 and becomes a part thereof. The bonnet 63 has a lower internal shoulder 65. A resilient cubical valve gate element 66 made of rubber is positioned within the bonnet member 63 and is adapted to move into and out of sealing relationship with the detent 72 of the cup 70 by compression with the cup 70 to seal the central opening 71 of the cup 70 against passage of contents out of the container 9. A coiled spring element 67 is positioned within the bonnet member 63 and is positioned adjacent the annular shoulder 65 thereof. The spring element 67 is adapted to resist compression until said gate element 66 has been at least partially compressed in a downward direction. The bottom surface of the gate 66 is provided with a neck-like or cylindrical protruding portion 68 that is received by the upper narrow portion of the spring 67. The valve stem 61 is inserted into the opening 62 in the gate element 66.

In operating the valve assembly 60, the first applied finger pressure against the depressible diaphragm 34 shown in Figure 6 causes the shoulder 41 to contact the upper end of the valve stem 61 and depress the stem a slight distance to a dispensing position. The displacement of stem 61, as shown in Figure 7, causes the resilient valve gate element 66 to be compressed slightly, the pressure exerted through the stem being insufficient to compress the coiled spring 67 until the gate element 66 has been at least partially compressed. The compression of valve gate element 66 and spring, in tandem, results in displacing the sealing surface a short distance from the detent or valve seat portion 72 of the cup 70. The pressure within the aerosol container forces the contents up through the dip tube 64, through the coiled spring 67 and passageway between element 66 and bonnet 63, out of the bonnet 63 through the central opening 71 of the cup 70, around the stem 61 into the chamber 40 of the hub 39, through the passage 44 in the rib 43 and ultimately out through the spout 35.

It can be readily seen from the above drawings, that my dispensing caps may be readily secured to the container without contacting the reciprocative valve stem until the depressible diaphragm is intentionally depressed by the operator to an actuating position. Further, it can be readily seen that my caps may be readily used with the types of reciprocative stem shown in Abplanalp Patent 2,631,814 as well as the valve shown in Campbell Patents 2,766,915 and 2,755,973. On the other hand, the caps shown in Abplanalp Patent 2,753,214 and Abplanalp Reissue Patent 24,555 may not be effectively used with the type of valve structure shown in said Campbell patents.

The caps 10 and 30 may be made of resilient plastic

material such as polyethylene, or other suitable polymer or copolymer. The collapsible hubs **19** and **39** of caps **10** and **30**, respectively, may be weakened by means other than disclosed above, and may normally rest on the valve, such as shown in Figures 2 and 3, or may be supported by the cup or container as illustrated in Figures 6 and 7. Although I prefer that chambers **20** and **40** and shoulders **21** and **41** of caps **10** and **30** normally do not contact the valve stem, these caps may be modified so that their chambers contact the stem along its outer longitudinally extending surface; however, it is important that the shoulders **21** and **41** do not contact the valve stem until the diaphragm is depressed and actuation of the valve assembly is desired.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

I claim:

1. An integral, flexible plastic dispensing cap for aerosol dispenser assemblies comprising: a substantially cylindrical skirt portion with a bottom portion engageable with a dispenser container; said skirt having a dispensing opening; a depressible diaphragm extending across an upper interior portion of said skirt and resiliently hinged thereto along a part only of the internal periphery of said skirt; a collapsible, resilient chambered hub projecting downwardly from the lower side of said diaphragm, said hub being collapsible upon selective depression of the diaphragm; said hub having a continuous chamber with an opening at the bottom of said hub; the lower portion of the hub contacting during operation of the cap a separate supporting surface of the dispenser that tends to restrain downward movement of the hub during depression of the diaphragm and collapsing of the hub; said hub having inwardly directed valve actuating means that is normally free of direct actuating contact with an underlying reciprocative valve stem of a valve assembly; means positioned below the diaphragm between said skirt and hub having a continuous passage communicating with said dispensing opening and said chamber in the hub; said depressible diaphragm being capable of being hingedly depressed by the application of pressure thereupon; said selective depression of the diaphragm effecting the depression of said collapsible hub and depression of the valve actuating means to a position that then depresses the underlying reciprocative valve stem, thereby causing the unseating of valve means for the discharge of contents of the container through said dispensing opening of the cap.

2. An integral, flexible plastic dispensing cap for aerosol dispenser assemblies comprising: a substantially cylindrical skirt portion with a bottom portion engageable with a dispenser container; said skirt having a dispensing opening; a depressible diaphragm extending across an upper interior portion of said skirt and resiliently hinged thereto along a part only of the internal periphery of said skirt; an upstanding protective wall extending above the diaphragm, said wall preventing accidental depression of the diaphragm against an underlying reciprocative valve stem of a dispensing valve assembly; a collapsible, resilient chambered hub projecting downwardly from the lower side of said diaphragm, said hub being collapsible upon selective depression of the diaphragm; said hub having a downwardly extending continuous chamber with an opening at the bottom; said hub having an offset valve actuating shoulder that is normally free of direct actuating contact with the underlying reciprocative valve stem; the lower portion of the hub contacting during operation of the cap a separate supporting surface of the dispenser that tends to restrain downward movement of the hub during depression of the diaphragm and collapsing of the hub; means positioned below the diaphragm between said skirt and hub having a continuous passage communicating with said dispensing opening and said chamber in the hub; said depressible diaphragm being capable of being hingedly depressed only by selective pressure applied within the boundary of said upstanding wall; said selective depression of the diaphragm effecting the depression of said collapsible hub and depression of the offset shoulder into actuating contact with the underlying reciprocative valve stem, thereby causing the unseating of valve means for the discharge of contents of the container through said dispensing opening of the cap.

3. An integral, flexible plastic dispensing cap for aerosol dispenser assemblies comprising: a substantially cylindrical skirt portion with a bottom portion engageable with a dispenser container; said skirt having a dispensing opening; a depressible diaphragm extending across an upper interior portion of said skirt and resiliently hinged thereto along a part only of the internal periphery of said skirt; an upstanding protective wall extending above the diaphragm, said wall preventing accidental depression of the diaphragm against an underlying reciprocative valve stem of a dispensing valve assembly; a collapsible, resilient chambered hub projecting downwardly from the lower side of said diaphragm, said hub being collapsible upon selective depression of the diaphragm; said hub having a downwardly extending continuous chamber with an opening at the bottom of said hub; the lower portion of the hub contacting during operation of the cap a separate supporting surface of the dispenser that tends to restrain downward movement of the hub during depression of the diaphragm and collapsing of the hub; said hub having upwardly extending slots and an upwardly and inwardly extending taper extending from bottom thereof; said hub having inwardly directed valve actuating means that is normally free of direct actuating contact with the underlying reciprocative valve stem; means positioned below the diaphragm between said skirt and hub having a continuous passage communicating with said dispensing opening and said chamber in the hub; said depressible diaphragm being capable of being hingedly depressed only by selective pressure applied within the boundary of said upstanding wall; said selective depression of the diaphragm effecting the depression of said collapsible hub and depression of the valve actuating means to a position that then depresses the underlying reciprocative valve stem, thereby causing the unseating of valve means for the discharge of contents of the container through said dispensing opening of the cap.

4. An integral, flexible plastic dispensing cap for aerosol dispenser assemblies comprising: a substantially cylindrical skirt portion with a bottom portion engageable with a dispenser container; said skirt having a dispensing opening; a depressible diaphragm extending across an upper interior portion of said skirt and resiliently hinged thereto along a part only of the internal periphery of said skirt; an upstanding protective wall extending above the diaphragm, said wall preventing accidental depression of the diaphragm against an underlying reciprocative valve stem of a dispensing valve assembly; a collapsible, resilient chambered hub projecting downwardly from the lower side of said diaphragm, said hub being collapsible upon selective depression of the diaphragm; said hub having a downwardly extending continuous chamber with an opening at the bottom of said hub; the lower portion of the hub contacting during operation of the cap a separate supporting surface of the dispenser that tends to restrain downward movement of the hub during depression of the diaphragm and collapsing of the hub; said hub having a weakened wall; said hub having inwardly directed valve actuating means that is normally free of direct actuating contact with the underlying reciprocative valve stem; means positioned below the diaphragm between said skirt and hub having a continuous passage communicating with said dispensing opening and said chamber in the hub; said depressible diaphragm being capable of being hingedly depressed only by selective pressure applied within the

boundary of said upstanding wall; said selective depression of the diaphragm effecting the depression of said collapsible hub and depression of the valve actuating means to a position that then depresses the underlying reciprocative valve stem, thereby causing the unseating of valve means for the discharge of contents of the container through said dispensing opening of the cap.

5. A dispenser assembly having a container, valve assembly and cap, which comprises: a dispenser container having an upper opening for receiving a dispensing valve assembly; a dispensing valve assembly fitted to the top opening of the container and retained thereat; said valve assembly having a substantially vertically extending fluid passage means with an upper outlet positioned above said container and a lower inlet communicating with the confines of said container; a vertically extending, vertically reciprocative valve stem having an upper portion extending above said container; and sealing means for selectively opening and sealably closing said fluid passage means; said sealing means, valve stem and passage means being operatively associated with each other so that said sealing means normally closes said passage means and thereby prevents the egress of contents of said container through said passage outlet, and movement of said stem from its normal position permits the egress of contents of said container through said passage outlet; and an integral, flexible plastic dispensing cap comprising a substantially cylindrical skirt portion with a bottom portion engageable with the dispenser container; said skirt having a dispensing opening; a depressible diaphragm extending across an upper interior portion of said skirt and resiliently hinged thereto along a part only of the internal periphery of said skirt; a collapsible, resilient chambered

hub projecting downwardly from the lower side of said diaphragm, said hub being collapsible upon selective depression of the diaphragm; said hub having a continuous chamber with an opening at the bottom of said hub; the lower portion of the hub contacting during operation of the cap a separate supporting surface of the dispenser that tends to restrain downward movement of the hub during depression of the diaphragm and collapsing of the hub; said hub having inwardly directed valve actuating means that is normally free of direct actuating contact with the underlying reciprocative valve stem; means positioned below the diaphragm between said skirt and hub having a continuous passage communicating with said dispensing opening and said chamber in the hub; said depressible diaphragm being capable of being hingedly depressed by the application of pressure thereupon; said selective depression of the diaphragm effecting the depression of said collapsible hub and depression of the valve actuating means to a position that then depresses the underlying reciprocative valve stem, thereby causing the unseating of said sealing means for the discharge of contents of the container through said dispensing opening of the cap.

6. The dispenser assembly of claim 5 wherein the cap has an upstanding wall extending above the diaphragm, thereby preventing accidental depression of the diaphragm against the underlying valve stem.

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