March 21, 1933. J. L. PARDUE 1,901,982

CLOSURE FOR RECEPTACLES

Filed Sept. 26, 1931 2 Sheets-Sheet 1

Fig. 1.

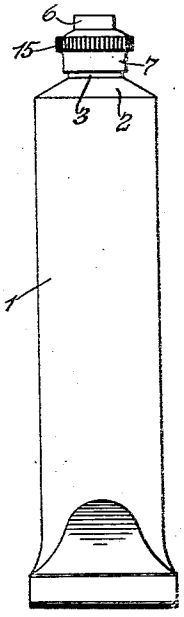


Fig. 2.

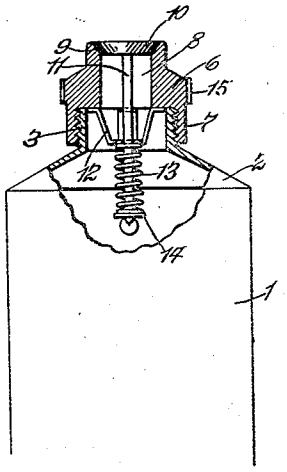


Fig. 3.

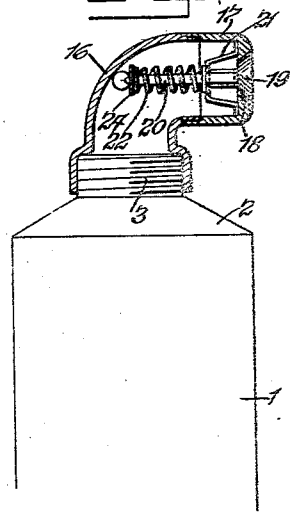


Fig. 4.

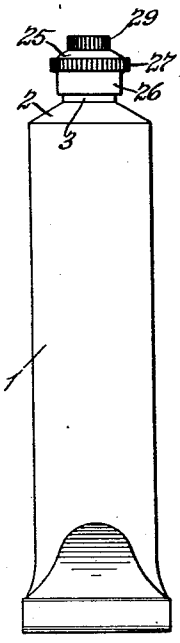


Fig. 5.

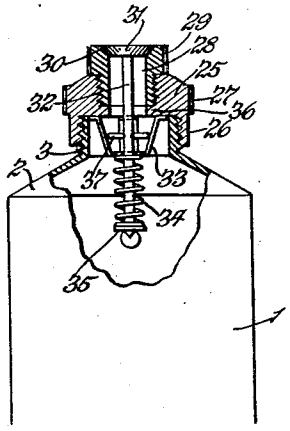


Fig. 7.

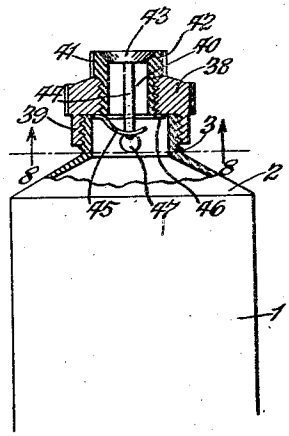


Fig. 6.

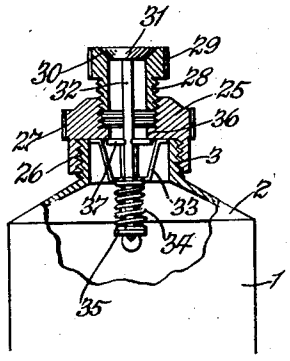
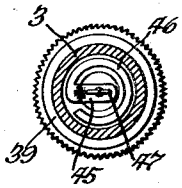


Fig. 8.



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CLOSURE FOR RECEPTACLES

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Fig. 8.

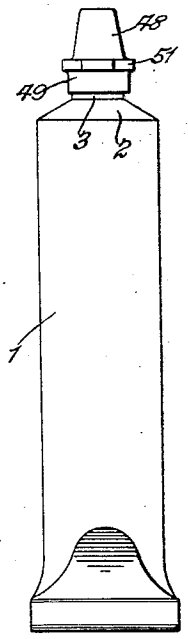


Fig. 10.

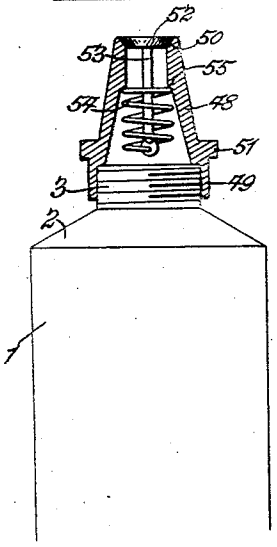


Fig. 11.

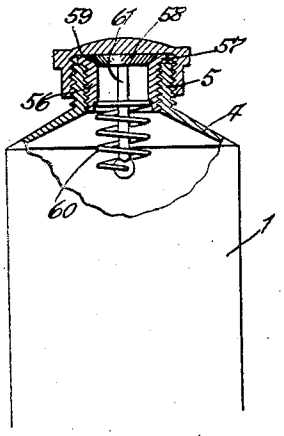


Fig. 14.

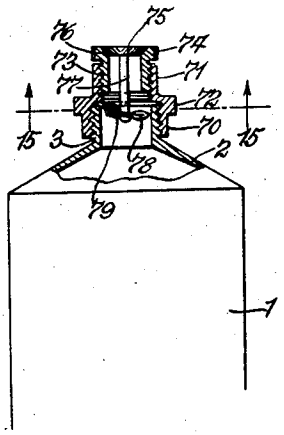


Fig. 12.

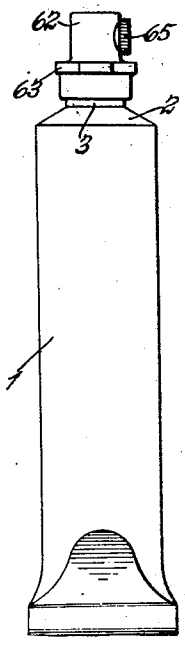


Fig. 13.

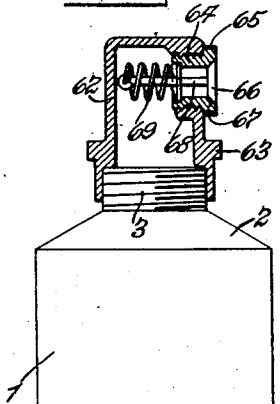


Fig. 15.

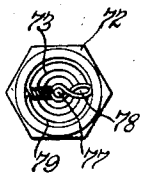
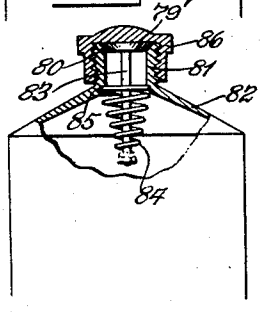


Fig. 16.



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UNITED STATES PATENT OFFICE

JOHN L. PARDUE, OF ST. LOUIS COUNTY, MISSOURI, ASSIGNOR OF ONE-THIRD TO THEODORE M. PARDUE AND ONE-THIRD TO WILLIAM A. PARDUE, BOTH OF ST. LOUIS COUNTY, MISSOURI

CLOSURE FOR RECEPTACLES

Application filed September 26, 1931. Serial No. 565,241.

This invention relates to closures for receptacles of the collapsible and compressible type, such as the familiar compressible and collapsible tubes that contain tooth paste, shaving cream, cold cream, vanishing cream, and other preparations of that general class.

An object of the invention is to provide an improved closure for containers and receptacles of the character mentioned and including a tubular body having means for detachable engagement with the discharge nozzle of the container or receptacle and provided with an outlet opening, in combination with a valve controlling said opening and movable under the pressure of the contents of the container or receptacle to open position to permit the contents to pass through said outlet opening in the form of a hollow tube.

Other objects of the invention are to provide an improved closure designed and adapted to be detachably secured to one end of a collapsible tube or receptacle constituting a container for merchandise of the general class mentioned and including a valve movable perpendicularly to and from a valve seat in order to close and to open a discharge opening; means contained within the device for moving the valve to closed position automatically when the pressure on the collapsible tube or receptacle is removed; to provide a cover or enclosure for protecting and shielding said valve in order to prevent loss or discharge of the contents of the tube or enclosure if the valve should be accidentally opened; and to provide an improved device of the type mentioned constructed and arranged to accomplish all of the useful advantages and purposes herein disclosed or made apparent from the following description, reference being made to the accompanying drawings, in which—

Fig. 1 is a side elevation of an embodiment of the invention applied to a collapsible tube or container of familiar type.

Fig. 2 is an enlarged sectional view of the closure showing the valve in closed position.

Fig. 3 is a sectional view showing a device for discharging the contents of the tube laterally instead of longitudinally.

Fig. 4 is a side elevation of an alternative form of valve support.

Fig. 5 is an enlarged sectional view of the valve support of Fig. 4, shown in position to permit the valve to open by the pressure of the contents of the tube or container.

Fig. 6 is a sectional view similar to Fig. 5, showing the valve support adjusted to prevent the valve from opening.

Fig. 7 is a sectional view showing a different type of spring for closing the valve.

Fig. 8 is a cross-sectional view on the line 8—8 of Fig. 7.

Fig. 9 is a side elevation of a form of the invention varied from that shown in Figs. 1 and 2.

Fig. 10 is a sectional view of the device shown in Fig. 9.

Fig. 11 is a sectional view illustrating a type of the invention provided with a retainer positively holding the valve closed.

Fig. 12 is a side elevation of an embodiment of the invention for discharging the contents of the tube or container laterally instead of longitudinally.

Fig. 13 is a sectional view of the device shown in Fig. 12.

Fig. 14 is a sectional view showing another form of the invention adjustable to prevent opening of the valve.

Fig. 15 is a sectional view on the line 15—15 of Fig. 14.

Fig. 16 shows a variation of the invention including a cap for preventing the valve from opening.

The tube container 1 is the same in all of the views of the drawings, and is composed of known flexible non-resilient material forming a compressible and collapsible container from which the contents are to be ejected by pressure applied to the tube or container at a distance from the discharge end.

In all of the views of the drawings other than Fig. 11, the end 2 of the tube is formed with an exteriorly threaded nozzle 3 onto which all forms of the invention may be detachably screwed other than the form shown in Fig. 11. In Fig. 11, the end 4 of the tube

1 is formed with an exteriorly and interiorly threaded nozzle 5.

The invention shown in Figs. 1 and 2 comprises a body 6 of substantially stiff and inflexible material having at one end an interiorly threaded cylindrical extension 7 designed and adapted to be screwed onto and from the nozzle 3. The body 6 has therethrough a longitudinal passage 8 through which the contents of the collapsible container tube 1 may be ejected. A valve seat 9 is formed around the passage 8 at the outer end of the body 6 and is opened and closed by a valve 10 located at the outer end of said body 6 and movable into and out of contact with the valve seat 9. A valve stem 11 has its outer end attached to the valve 10. The valve stem 11 extends through the passage 8 and through a guiding spider 12 that is attached to the inner end of the body 6 within the tubular extension 7. A spring 13 is mounted around the inner portion of the stem 11 and has its outer end abutting against the spider 12 and its inner end bearing against a washer 14 secured on the inner end of the stem 11, so that the energy of said spring is utilized to actuate the valve 12 to closed position against the seat 9 and to hold said valve yieldingly in said closed position. The body 6 is provided with a peripheral ribbed or knurled portion 15 that may be conveniently and effectively engaged between the thumb and one of the fingers in order to operate the body 6 to screw the same onto and from the threaded nozzle 3.

When it is desired to discharge any of the contents of the tube container 1, sufficient pressure is applied to said container to cause the contents to press against the inner side of the valve 10 and force said valve away from the seat 9. The contents may then pass through the outlet opening around the valve 10 in tubular form. When pressure is removed from the tubular container 1, the spring 13 will close the valve and will yieldingly hold said valve in closed position.

The device shown in Fig. 3 comprises an angular tube 16 having one end screwed onto the nozzle 3. A cylindrical body 17 is screwed on the outer end of the angular tube 16 and is formed at its outer end with an opening surrounded by a valve seat 18. A valve 19 is arranged to engage the valve seat 18 to close the opening. A valve stem 20 has its outer end attached to the valve 19 and its inner portion extending through a guiding spider 21 secured to the inner side of the body 17. A spring 22 surrounds the valve stem 20 and has its outer end engaging the spider 21 and its inner end engaging an abutment 24 secured on the inner end of the stem 20. This spring 22 is effective to close the valve 19 after each opening operation thereof and to hold said valve yieldingly in closed position.

The mode of use and operation of this valve 19 will be readily understood from the description of the construction and arrangement thereof and from the description of the mode of operation of the valve shown in Figs. 1 and 2.

The device illustrated in Figs. 4, 5 and 6 comprises a body 25 having on one end an internally threaded cylindrical extension 26 designed and adapted to be screwed onto and from the threaded nozzle 3. The body 25 is formed with a circumferential knurled portion or series of ribs 27 for manual engagement in attaching and detaching the device.

A tubular member 28 is exteriorly threaded at its inner end so that said member may be screwed into and out of a threaded hole in the body 25. A circumferential knurled portion or series of ribs 29 constitute an abutment to engage against the end of the body 25 to limit inward movement of the member 28.

The outer end of the member 28 is formed with a valve seat 30 around the opening through said member. A valve 31 is movable to and from the valve seat 30 to close and to open the passage through the member 28. A valve stem 32 has its outer end attached to the valve 31 and its inner portion extending through a guiding spider 33 attached to the inner end of the body 25. A spring 34 is mounted on the stem 32 and has its outer end engaging the spider 33 and its inner end engaging a washer 35 secured to the inner end of the stem 32. This spring 34 acts to close the valve 31 after each opening operation thereof and to hold said valve yieldingly in closed adjustment.

The inner end of the body 25 is formed with an internal flange 36 designed and adapted to be engaged by a pin 37 secured in a hole through the stem 32. This pin 37, by engagement against the flange 36, limits extent of outward movement of the valve 31. To prevent the valve 31 from opening, the member 28 is unscrewed a distance to bring the pin 37 into engagement with the flange 36 and thus prevent further movement of the valve 31.

It will be understood that the valve 31 will open under pressure of the contents of the tube 1 in the manner described above in reference to Figs. 1 and 2.

The device shown in Figs. 7 and 8 comprises a body 38 having at one end an interiorly threaded cylindrical extension 39 designed and adapted to be screwed onto and from the nozzle 3. A tubular member 40 has its inner end exteriorly threaded and is screwed into a threaded hole in the body 38, a circumferential knurled portion or series of ribs 41 contacting with the outer end of the body 38. The outer end of the body 38 is formed with a valve seat 42. A valve 43 is designed and arranged to seat against the

seat 42 and has attached thereto an inwardly extending stem 44. The inner end of the stem 44 extends through a hole in a leaf spring 45 projecting inwardly from a ring 46 attached to the inner end of the body 38. This spring 45 engages an abutment 47 on the inner end of the stem 44 and is effective to move the valve 43 to closed position after each opening of said valve and to hold said valve yieldingly against the seat 42. The valve 43 will yield to the pressure of the contents of the tube 1 and will open to permit discharge of said contents in the manner that is now understood from the preceding description.

The construction shown in Figs. 9 and 10 comprises a tapered body 48 having an internally threaded portion 49 at one end and a valve seat 50 at the opposite end. The internally threaded portion 49 is designed and adapted to be screwed onto and from the nozzle 3. The body 48 is formed with a circumferential polygonal portion 51 for manual engagement in attaching and detaching the device.

A valve 52 is designed and arranged to seat against the valve seat 50 to close the opening through the body 48. A valve stem 53 has its outer end attached to the valve 52. A spring 54 surrounds the inner end of the stem 53 and has one end bearing against a shoulder 55 within the body 48 and the opposite end engaging the inner end of the stem 53. This spring is effective to close the valve 52 after the same has been opened, and to hold the same closed, but will yield to the pressure of the contents of the tube 1 when pressure is applied to said tube.

The mode of operation of this valve will be understood from the description of the preceding views of the drawings.

The arrangement shown in Fig. 11 comprises an externally threaded sleeve 56 screwed into the nozzle 5 and having on its outer end an abutting flange 57 engaging the outer end of said nozzle 5. A valve 58 seats against a valve seat 59 at the outer end of the sleeve 56 and constitutes a closure for the passage through said sleeve. A spring 60 has one end engaging the sleeve 56 and the opposite end engaging the inner end of a valve stem 61. The outer end of the valve stem 61 is attached to the valve 58, so that the spring 60 is effective to hold said valve 58 yieldingly against the seat 59. The operation of this valve 58 will be understood from the preceding description.

The construction shown in Figs. 12 and 13 comprises a body 62 detachably screwed onto the nozzle 3 and having a circumferential polygonal portion 63 for engagement to operate said body. The outer end of the body 62 has a lateral opening into which an externally threaded sleeve 64 is screwed. The sleeve 64 has on its outer end a circumferential flange 65 that abuts against the body 62. A valve 66 cooperates with a valve seat 67 at the outer end of the sleeve 64 to close the opening through said sleeve. A stem 68 has its outer end attached to the valve 66 and its inner end attached to the inner end of a spring 69. The opposite end of the spring 69 abuts against the sleeve 64. Said spring is effective to hold the valve 66 yieldingly against the valve seat 67. The operation of this valve 66 in opening and closing the opening controlled thereby will be understood from the preceding description.

The device shown in Figs. 14 and 15 comprises a cylindrical member including an internally threaded inner portion 70 screwed onto the nozzle 3 and an internally threaded outer portion 71. This member is formed with a polygonal circumferential portion 72 for engagement in attaching and detaching the device. A sleeve 73 is screwed into the threaded portion 71 and has at its outer end a circumferential flange 74 for engagement in screwing and unscrewing the sleeve 73. A valve 75 engages a valve seat 76 at the outer end of the sleeve 73 to open and close the passage through said sleeve. A stem 77 has its outer end attached to said valve and its inner end attached to a twisted spring 78 projecting from a ring 79 clamped between the nozzle 3 and the member 70—71. The sleeve 73 may be screwed outwardly to an extent to place the twisted spring portion 78 under considerable tension sufficient to hold the valve 75 seated against the seat 76 so that the valve will not accidentally open.

The construction shown in Fig. 16 comprises a valve 79′ designed and arranged to seat against a valve seat 80 at the outer end of the nozzle 81 which is formed integral with the container end wall 82. A valve stem 83 has its outer end attached to the valve 79′ and its inner end engaged by a spring 84, the outer end of which spring bears against a spring seat 85 in the nozzle 81. A cap 86 is provided to screw onto the nozzle 81 so as to cover the valve 79′ and to prevent discharge of the contents of the container by preventing the valve from opening. The cap 86 may be removed and detached when it is desired to eject any of the contents of the container, and then reattached to the nozzle 81 when the device is no longer in use.

This invention may be varied in other particulars than as specifically disclosed herein. I do not restrict myself in unessential respects, but what I claim and desire to secure by Letters Patent is:—

1. A collapsible and compressible container having a threaded discharge nozzle at one end, a tubular body screwed on said nozzle and having a valve seat at its outer end, a guide beyond and attached to the inner end of said body and leaving the opening in said tubular body unobstructed thereby, a valve

movable to and from position against said valve seat, a stem attached to said valve and extending inwardly through and beyond said tubular body and through said guide, and a spring connected with the inner end of said stem inwardly beyond and cooperating with said guide to hold said valve yieldingly in closed position against said seat and to move said valve to closed position after said valve has been opened.

2. A collapsible container having a discharge nozzle at one end, a body screwed on said nozzle and having a passage therethrough, a sleeve screwed into the outer end of said body and having a passage therethrough and having a valve seat at the outer end of said passage, a valve movable to and from closed position against said valve seat, a stem attached to said valve and extending inwardly through said body, a guide for said stem attached to said body, and a spring mounted on said stem and cooperating with said guide to hold said valve closed.

3. A collapsible container having a discharge outlet at one end, a sleeve supported by said container and having a discharge passage opening into said outlet, a guide rigidly mounted in said container beyond said sleeve, a valve for opening and closing said passage, a stem projecting from said valve through said guide, a spring yieldingly holding said valve closed and arranged to yield to the pressure of the contents of the container against said valve to permit said valve to open, and means for supporting said sleeve in position to prevent said valve from opening while said guide remains in a single position.

4. A collapsible container having a discharge outlet at one end, a sleeve having a discharge passage therethrough opening into said outlet, a guide rigidly mounted in said container beyond said sleeve, a valve for opening and closing said passage through said sleeve, a stem projecting from said valve through said guide, a spring holding said valve closed and arranged to yield to the pressure of the contents of said container against said valve to permit said valve to open, and means for supporting said sleeve in a longitudinally adjusted position relative to said guide to hold said spring under tension and prevent said valve from opening.

5. A collapsible container having a discharge nozzle at one end, a body seated against the end of said nozzle and having a threaded opening therethrough, a tubular extension from said body screwed on said nozzle, a tubular member screwed in said threaded opening in said body and having a valve seat at its outer end, a valve movable to and from position against said seat, a guide rigid with the inner end of said body in said nozzle inwardly beyond said valve seat, a stem projecting from said valve through said tubular member and through said guide, and a spring mounted on the inner end of said stem and engaging said guide for holding said valve against said seat.

6. A collapsible container having a discharge nozzle at one end, a body screwed on said nozzle and having a passage therethrough opening into said nozzle, a valve for opening and closing said passage, a guide rigid with the inner end of said body beyond said passage and leaving said passage unobstructed thereby, a stem projecting from said valve through said passage and through said guide, and a spring mounted on the inner end of said stem beyond said guide and cooperating with said guide to hold said valve yieldingly in closed position.

7. A collapsible container having a discharge nozzle at one end, a body screwed on said nozzle and having a passage therethrough opening into said nozzle, a valve for opening and closing said passage, a guide rigid with the inner end of said body beyond said passage and leaving said passage unobstructed thereby, a stem projecting from said valve through said passage and through said guide, a spring mounted on the inner end of said stem beyond said guide and cooperating with said guide to hold said valve yieldingly in closed position, means for moving said valve to a longitudinally adjusted position relative to said guide, and means for preventing said valve from opening in its longitudinally adjusted position.

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