Dec. 9, 1969 H. D. BARTELS 3,482,738

AEROSOL CONTAINER AND VALVE THEREFOR

Filed March 15, 1966 2 Sheets-Sheet 1

FIG. 1

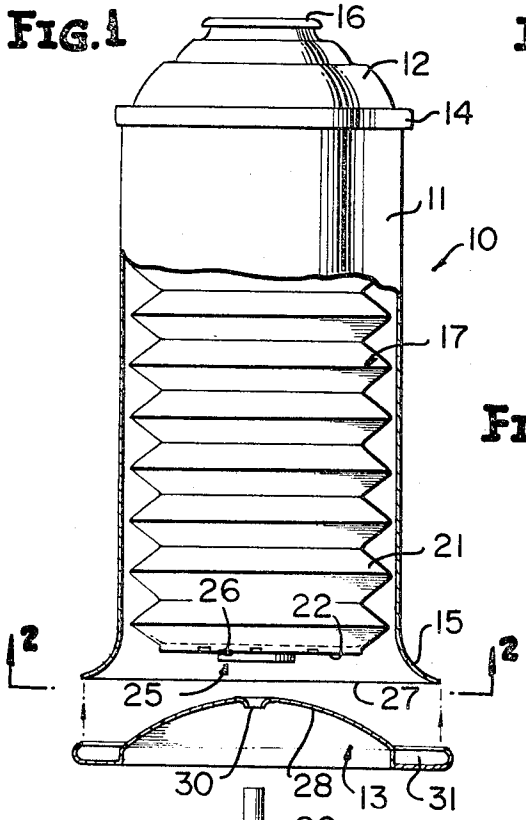


FIG. 2

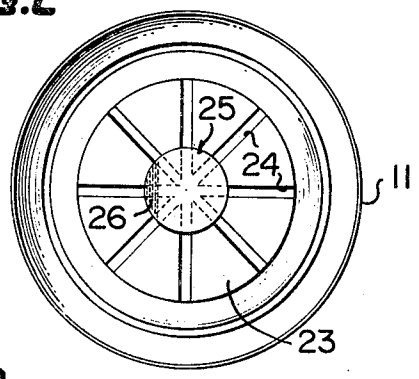


FIG. 3

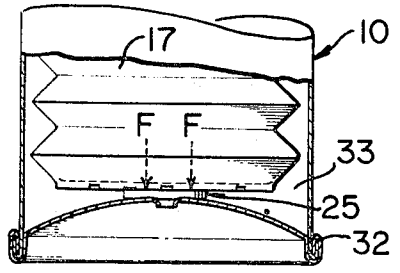


FIG. 5

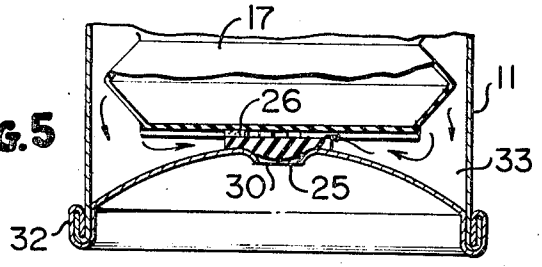


FIG. 4

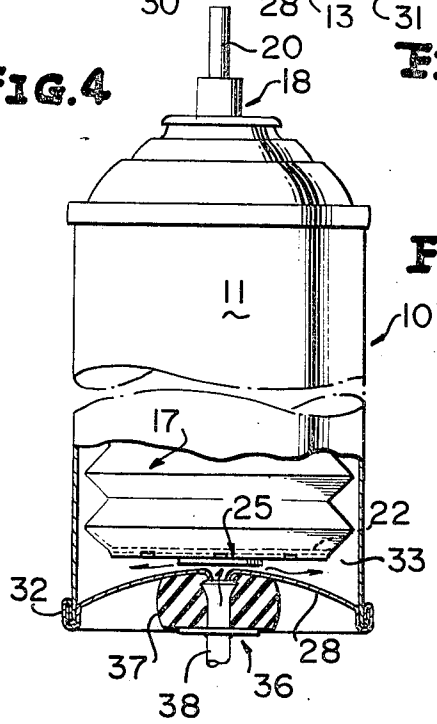
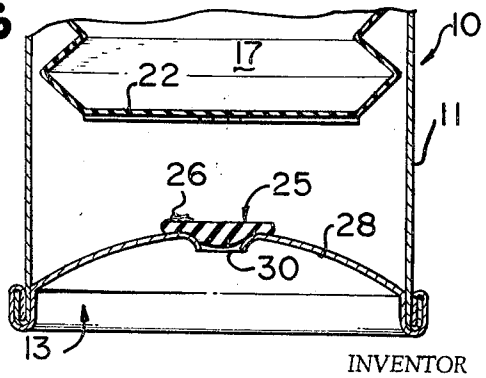


FIG. 6



INVENTOR

HERBERT D. BARTELS

BY Mason, Porter, Diller & Brown

ATTORNEYS

Dec. 9, 1969 H. D. BARTELS 3,482,738

AEROSOL CONTAINER AND VALVE THEREFOR

Filed March 15, 1966 2 Sheets-Sheet 2

FIG. 7

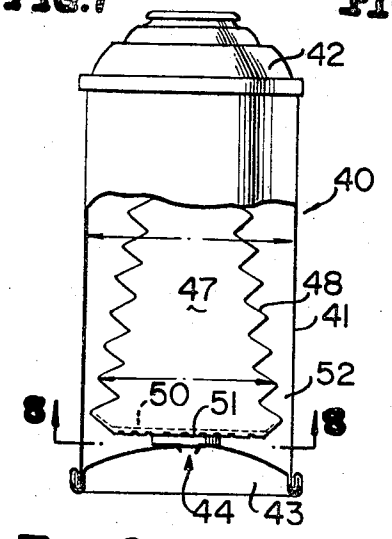


FIG. 9

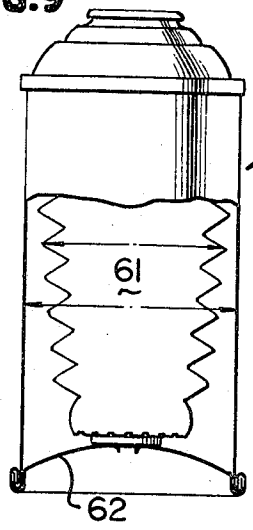


FIG. 10

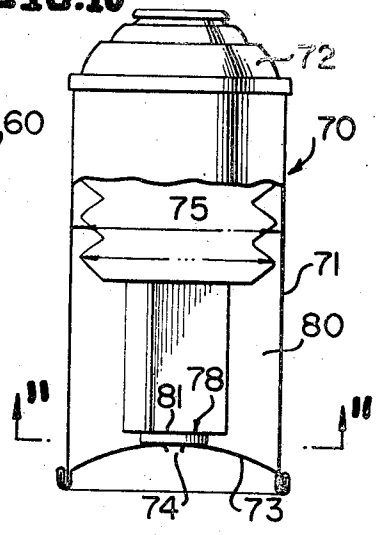


FIG. 8

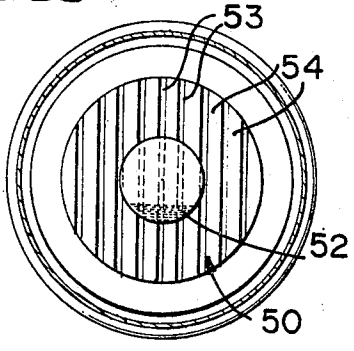


FIG. 11

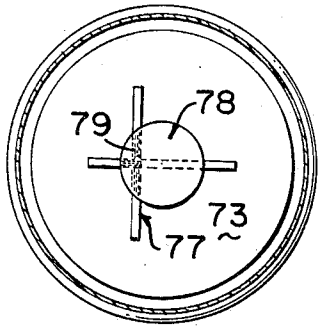


FIG. 12

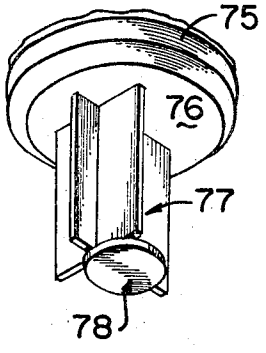


FIG. 13

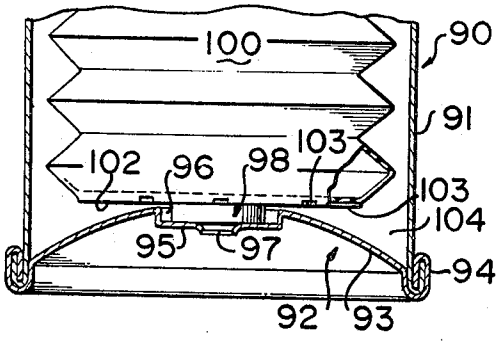
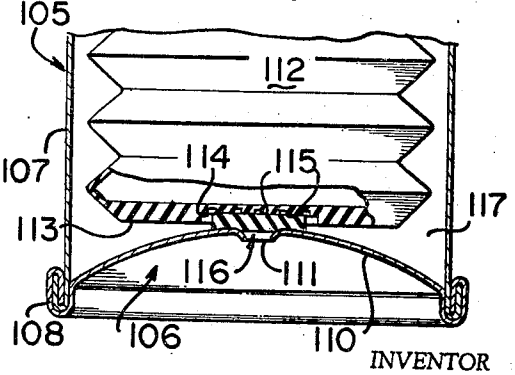


FIG. 14



INVENTOR

HERBERT D. BARTELS

BY Mason, Porter, Miller & Brown

ATTORNEYS

United States Patent Office 3,482,738
Patented Dec. 9, 1969

3,482,738

AEROSOL CONTAINER AND VALVE THEREFOR

Herbert D. Bartels, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York

Filed Mar. 15, 1966, Ser. No. 534,452
Int. Cl. B65d 35/28, 35/14; B67d 3/00
U.S. Cl. 222—95 13 Claims

ABSTRACT OF THE DISCLOSURE

This invention is directed to a novel dispensing container of the type including a propellant chamber and a product chamber, the product chamber being a bag-like structure having a closed end portion, means for dispensing a dispensable product from the product chamber to atmosphere, and aperture means for introducing a propellant into the propellant chamber. Closure or valve means close the aperture means and are maintained in the closed position thereof by the closed end portion of the bag-like structure prior to the performance of a dispensing operation.

A further object of this invention is to provide a novel dispensing container of the type immediately above-described wherein means are provided for securing the closure means to the closed end portion of the bag-like structure and means are further provided for releasing the securing means whereby the closure means is released from the bag-like structure and retained in position relative to the aperture means by the force of a propellant within the propellant chamber.

Still another object of this invention is to provide a novel dispensing container of the type heretofore described in which the releasing means is defined by passage means between the closure means and the closed end portion of the bag-like structure.

Another object of this invention is to provide a novel dispensing container of the type heretofore described in which the closure means is a relatively flat disc-like valve element, and propellant within the propellant chamber defines the sole means for maintaining a disc-like valve element in overlying relationship to the aperture means.

With the above, and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings:

In the drawings:

FIGURE 1 is an exploded view partly in fragmentary side elevation and partly in longitudinal section of a dispensing container, and illustrates a valve disc secured to a lower end portion of a collapsible product chamber and an associated aperture lower closure prior to the complete assembly of the dispensing container.

FIGURE 2 is a bottom end view taken generally along line **2**—**2** of FIGURE 1 and illustrates the valve disc and passages in an end wall of the collapsible product chamber.

FIGURE 3 is a fragmentary side elevational view of a lower end portion of the dispensing container of FIGURE 1 with parts broken away for clarity, and illustrates the valve disc sandwiched between the lower closure and a bottom wall of the product chambers.

FIGURE 4 is a side elevational view of a completely assembled dispensing container with parts broken away for clarity, and illustrates propellant being introduced into a propellant chamber by the unseating of the valve disc under the influence of the propellant.

FIGURE 5 is an enlarged fragmentary axial sectional view through the dispensing container of FIGURE 4, and illustrates propellant migrating to an area between the valve disc and the bottom wall of the product chamber.

FIGURE 6 is an enlarged fragmentary axial sectional view through the dispensnig container of FIGURE 4, and illustrates the separation of the valve disc from the bottom wall of the product chamber at sometime during a dispensing operation.

FIGURE 7 is a highly schematic side elevational view with parts broken away for clarity of another dispensing container constructed in accordance with this invention, and illustrates another valve disc sandwiched between a lower closure of the container and a collapsible truncated product chamber.

FIGURE 8 is an enlarged bottom end view taken generally along line **8**—**8** of FIGURE 7, and illustrates parallel passages formed in a bottom wall of the product chamber for permitting propellant to break an adhesive bond between the valve disc and the product chamber during a dispensing operation.

FIGURE 9 is a highly schematic side elevational view of another dispensing container with parts broken away for clarity, and illustrates a collapsible product chamber of a generally inverted configuration as compared to the product chamber of the dispenser shown in FIGURE 7.

FIGURE 10 is a highly schematic side elevational view with parts broken away for clarity of another dispensing container, and illustrates a generally T-shaped extension of a collapsible product chamber maintaining a valve disc in overlying sealed relationship to an apertured lower closure.

FIGURE 11 is an enlarged bottom view taken generally along line **11**—**11** of FIGURE 10, and more clearly illustrates the relationship between the extension and the valve disc.

FIGURE 12 is a bottom perspective view of the T-shaped extension and a portion of the product chamber, and more clearly illustrates the configuration of the extension and the valve disc secured thereto.

FIGURE 13 is a fragmentary sectional view with parts broken away for clarity of a lower end portion of a dispensing container and illustrates a recessed lower closure locating a valve disc in overlying relationship to an aperture.

FIGURE 14 is a fragmentary sectional view with parts broken away for clarity of another dispensing container, and illustrates a recess formed in a bottom wall of a product chamber for locating a valve disc in overlying relationship to an aperture.

A novel dispensing container constructed in accordance with this invention is best illustrated in FIGURES 1 and 4 of the drawings, and is generally designated by the reference numeral **10**. The dispensing container **10** includes a tubular, cylindrical, metallic body **11** closed at opposite ends by respective upper and lower closures **12, 13**. The closure **12** is illustrated being secured to the container **11** by a conventional double seam **14** while the lower closure **13** is illustrated in FIGURE 1 prior to being secured to a flange **15** of the container body **11**. The upper closure **12** is generally dome-shaped in configuration and includes a mouth **16** opening to the interior of a collapsible, beaded product chamber generally referred to by the numeral **17**. The product chamber **17** is crimped or otherwise conventionally secured adjacent the open mouth **16**. A dispensable product is thereafter introduced into the product chamber **17** through the mouth **16** after which a conventional manually operable dispensing mechanism, generally referred to by the reference numeral **18** (FIGURE 4) is secured to the upper closure **12**. The dispensing mechanism **18** is preferably valve actuated and, upon depressing a plunger **20** thereof, the product

(not shown) within the chamber **17** is dispensed in a conventional manner under the influence of a propellant (not shown) as will become more apparent hereafter.

The product chamber **17** is a bag-like structure which is preferably constructed from plastic or relatively ductile metallic material and includes a closed lower end portion **21** terminating in a thickened bottom wall **22**. A lower surface **23** (FIGURE 2) of the bottom wall **22** is provided with a plurality of intersecting slots **24** which define passage means for a purpose to become more fully apparent hereafter.

Closure means **25** in the form of a generally circular disc-like element or valve disc is secured to the surface **23** of the product chamber bottom wall **22** by adhesive **26**. The bond strength of the adhesive **26** is relatively weak but is sufficiently strong to maintain the disc-like element **25** secured to the bottom wall **22** in the manner illustrated in FIGURE 1 of the drawings prior to the attachment of the lower closure **13** to the container body **11**.

As is best illustrated in FIGURE 1 of the drawings, it should be particularly noted that the valve disc **25** and the bottom wall **22** of the product chamber **17** are positioned closely adjacent a lowermost terminal edge **27** of the container body **11** prior to the securement of the lower closure **13** to the flange **15**.

The lower closure **13** is preferably constructed from metallic material and includes a generally upwardly dome-shaped end panel **28** which is axially apertured at **30** and includes a peripheral edge portion **31**.

The closure **13** is secured to the container body **11** by moving the closure **13** axially upwardly from the position in FIGURE 1 of the drawings to a position at which the flange **15** is received in the conventionally contoured peripheral edge portion **31** of the closure **13**. During this upward movement of the closure **13**, the central portion of the end panel **28** engages the lower surface (unnumbered) of the valve disc **25** and urges the valve disc **25** and the closed lower end portion **21** of the product chamber **17** upwardly to the position illustrated in FIGURE 3 of the drawings. At this time conventional end seaming apparatus forms the portions **15, 31** into a conventional double seam **32** to unite the lower closure **13** to the body **11**. The valve disc **25** is now in intimate forceful overlying contact relative to the aperture **30** due to the force F of gravity (FIGURE 3) of the product within the product chamber **17**, the weight of the product chamber **17** itself, and the tendency of the product chamber **17** to rebound under the influence of inherent stresses toward the lower closure **13**. In this manner, a propellant chamber **33** is normally closed to atmosphere by the valve disc **25** prior to the introduction of propellant into the propellant chamber **33** as will become immediately apparent hereafter.

Referring to FIGURE 4 of the drawings, a conventional propellant is introduced into the propellant chamber **33** of the dispensing container **10** by accurately seating the lower closure **13** upon a filling head **36** which includes a sealing gasket **37** and a conduit **38** in fluid communication with the propellant source. A suitable valve (not shown) in the conduit **38** is opened and the propellant is introduced into the chamber **33** through the aperture **30** and a gap formed upon the upward movement of the valve disc **25** and the bottom wall **22** of the product chamber **17** under the influence of the propellant as is graphically indicated by the unnumbered headed arrows in FIGURE 4 of the drawings. After a predetermined quantity of propellant has been introduced into the propellant chamber **33**, the valve (not shown) in the conduit **38** is closed.

Referring now to FIGURE 5 of the drawings, the propellant within the propellant chamber **33** migrates through the passages **24** between the valve disc **25** and the bottom wall **22** of the product chamber **17**, as is illustrated by the unnumbered headed arrows in FIGURE 5. The propellant thereby acts with equal pressure axially upwardly against the wall **22** and axially downwardly against an upper surface (unnumbered) of the valve disc **25**. During a dispensing operation, the propellant progressively collapses the product chamber **17** during which time the bottom wall **22** thereof compressively moves upwardly from the position illustrated in FIGURE 5 to a position adjacent the upper closure **12** (FIGURE 1). During the initial movement of the bottom wall **22** upwardly from the position shown in FIGURE 5, the adhesive **26** securing the valve disc **25** to the bottom wall **22** is ruptured or torn permitting the product chamber **17** to freely collapse and the propellant within the propellant chamber **33** to, in and of itself, maintain the valve disc **25** in sealing relationship to the aperture **30** during the life of the dispensing container **10**.

It should be particularly noted that prior to the introduction of the propellant into the propellant chamber **33** a light compressive seal is effected between the valve disc **25** and the aperture **30** (FIGURE 3) while upon subsequent charging and dispensing of the container **10** this seal is effected and maintained solely under the influence of the force of the propellant within the propellant chamber **33** in the absence of auxiliary means of any type. This construction permits the dispensing container **10** to be manufactured at extremely low cost since the valve disc **25** and the adhesive **26** represent but a minor portion of the total manufacturing cost. Also, in a preferred form of the invention, the product chamber **17** is blow-molded by conventional apparatus which includes as a part thereof a pair of complementary split molds having lower cavities which define mirror images of the passages or grooves **24**. The passages **24** are thereby formed during the blow-molding of the product chamber **17** and subsequent machining operations are unnecessary although it is considered within the scope of this invention to form the bottom wall **22** without the passages or grooves **24** and subsequently machine-form the same in the bottom surface **23**.

Another dispensing container constructed in accordance with this invention is illustrated in FIGURES 7 and 8 of the drawings, and is generally designated by the reference numeral **40**. The dispensing container **40** is identical to the dispensing container **10** and, while not illustrated, includes a dispensing mechanism coresponding to the mechanism **18** of the container **10**.

The dispensing container **40** includes a container body **41** closed at axially opposite end portions by upper and lower closures **42, 43**, respectively. The lower closure **43** is provided with a central aperture **44**, corresponding to the aperture **30** of the closure **13**. A product chamber **47** in the form of a collapsible bag-like structure is housed in the container body **41** and secured to an upper end portion thereof in the manner heretofore described with reference to the dispensing container **10**. As compared to the product chamber **17**, the product chamber **47** includes a beaded body **48** of a generally frusto-conical configuration having a wider lower end portion closed by a bottom wall **50**. A valve disc **51** is secured by adhesive **52** (FIGURE 8) to the exterior surface (unnumbered) of the bottom wall **50**, and is in light compressing engagement with the portion of the lower closure **43** defining the aperture **44**. In the position of the components illustrated in FIGURE 7, propellant has not been introduced into a propellant chamber **52** and the sealing contact between the valve disc **51** and the aperture **44** is effected solely under the influence of gravity and the tendency of the collapsible product chamber **47** to rebound to its original longer length, as was heretofore noted with respect to the dispensing container **10**.

The bottom wall **50** of the product chamber **47** is provided with a plurality of generally identical parallel passages **53** opening outwardly through a lower surface **54** of the wall **50**. The passages or grooves **53** are formed in the bottom wall **50** in the manner heretofore described

with respect to the passages **24**, and the function of the passages **53** is to permit the propellant to act against the upper side (unnumbered) of the valve disc **51** to break the adhesive bond between the valve disc and the bottom wall upon the performance of a dispensing operation in the manner heretofore described particularly with reference to FIGURES 5 and 6 of the drawings.

Another novel dispensing container constructed in accordance with this invention is illustrated in FIGURE 9 of the drawings and is generally referred to by the reference numeral **60**. The dispensing container **60** is identical to the dispensing container **40** of FIGURES 7 and 8 but with one exception. The generally frusto-conical configuration of a product chamber **61** of the dispensing container **60** is inverted relative to the position of the product chamber **47**, i.e., the wider end portion of the collapsible product chamber **61** is disposed above and remote from a lower closure **62**.

Another novel dispensing container constructed in accordance with this invention is illustarted in FIGURES 10 through 12 of the drawings, and is generally designated by the reference numeral **70**. The dispensing container **70** includes a dispensing mechanism (not shown) corresponding to the dispensing mechanism **18** of the container **10**. A container body **71** of the dispensing container **70** includes an upper generally dome-shaped closure **72** and a lower closure **73** provided with an axial aperture at **74**.

A collapsible product chamber **75** in the form of a beaded bag-like structure is secured at an upper end portion thereof (not shown) to the closure **72**. A lower end portion (unnumbered) of the product chamber **75** is closed by a bottom wall **76** (FIGURE 12) from which depends an integral extension **77** which is generally T-shaped in transverse section, as is best illustrated in FIGURE 11 of the drawings. The extension **77** is preferably integrally formed with the product chamber **75** during a blow-molding operation, but it is within the scope of this invention to form the elements **75**, **77** separately and adhesively or otherwise unite the extension **77** to the bottom wall **76** of the separately formed product chamber.

A valve disc **78** is temporarily adhesively secured to a lower face (unnumbered) of the extension **77** by adhesive **79**. Due to the T-shaped or X-shaped configuration of the extension **77**, propellant within a propellant chamber **80** of the dispenser **70** is free to act upon an upper surface **81** of the valve disc **78** as opposed to, for example, the provision of the passage means or grooves **24** of the dispensing container **10**. That is, once a propellant has been introduced into the propellant chamber **80** and the dispensing operation takes place, the upward collapsing movement of the product chamber **75** draws the extension **76** upwardly while the valve disc **78** is maintained in the position illustrated in FIGURE 10 by the propellant acting against the upper surface **81** thereof. The bond between the valve disc **78** and the extension **77** is subsequently broken and the valve disc **78** is thereafter retained in position sealing the aperture **74** solely under the influence of propellant within the chamber **80** acting against the upper surface **81** of the valve disc **78**.

In each of the dispensing containers **10**, **40**, **60** and **70** heretofore described, the respective valve discs are each adhesively bonded to bottom walls of the respective collapsible product chambers **17**, **47**, **61** and **75**. However, in accordance with another feature of this invention, it is unnecessary to positively secure a valve disc to an associated product chamber, as will be readily apparent from FIGURE 13 of the drawings in which is illustrated a lower end portion of a dispensing container **90** which is substantially identical to the dispensing container **10**. The dispensing container **90** includes a container body **91** having an upper end portion and a dispensing mechanism (both not shown) corresponding to the upper end portion of the container **10** of FIGURE 4. A bottom end of the container body **91** is closed by a generally dome-shaped lower closure **92** having an end panel **93** secured by a double seam **94** to the container body. A central portion **95** of the end panel **93** is recessed to define a generally cylindrical upwardly opening chamber **96**. The central portion **95** of the end panel **93** is apertured at **97**.

A valve disc **98** is seated in the chamber **96** of the lower closure **92** in overlying relationship to the aperture **97**. The recessed portion **95** of the end panel **93** thereby serves to accurately locate the valve disc **98** and maintain the same in overlying sealing relationship to the aperture **97**. A collapsible product chamber **100** having a bottom wall **102** and passage means **103** is secured to the container body **91** in a manner heretofore described. The product chamber **100** is identical to the product chamber **17** and, in the position illustrated in FIGURE 13, the bottom wall **102** is in lightly contacting abutment with an upper surface (unnumbered) of the valve disc **98**. The relationship of the components of the dispenser **90** are illustrated in FIGURE 13 prior to the introduction of suitable pressurized propellant into a propellant chamber **104** in the manner heretofore described.

The dispensing container **90** is assembled substantially in the manner heretofore described relative to the dispensing container **10**. However, rather than adhesively bonding the valve disc **98** to the bottom wall **102** of the product chamber **100** prior to inserting the lower closure **92** into the container body and forming the double seam **94**, the valve disc **98** is merely placed in the chamber **96** before the end panel **93** of the closure **92** is inserted into the lower end portion (unnumbered) of the container body **91** causing the valve disc **98** to be clampingly confined between the bottom wall **102** of the chamber **100** and the recessed portion **95** during the formation of the double seam **94**.

After the chamber **100** has been filled with a product and closed in a conventional manner, upon the introduction of a propellant into the propellant chamber **104** the valve disc **98** is temporarily unseated in the manner illustrated in FIGURE 4 of the drawings although it is to be noted that the valve disc **98** is at no time completely removed from the chamber **96**.

After the chamber **104** is filled to a desired capacity the passages **103** provide an access for the propellant between exposed surfaces of the bottom wall **102** and the upper surface (unnumbered) of the valve disc **98**. The greater internal pressure of the propellant, as compared to the pressure of atmosphere acting upon the underside of the valve disc **98** through the aperture **97** forces the valve disc **98** into highly compressive sealing engagement with the panel portion **95**, and upon upward collapsing movement of the product chamber **100** during a dispensing operation, the valve disc **98** is maintained in this position solely under the influence of the propellant pressure.

Referring now to FIGURE 14 of the drawings, a dispensing container **105** is shown having a lower closure **106** secured to a body **107** of the container **105** by means of a double seam **108**. A generally dome-shaped end panel **110** of the closure **106** is apertured at **111**.

A collapsible product chamber **112** in the form of a beaded bag-like structure is positioned in the body **107** and secured thereto in the manner heretofore described with respect to the dispensing container **10**. The product chamber **112** includes a lower end portion (unnumbered) closed by a relatively thick bottom wall **113** having a central downwardly opening recess **114**. The recess **114** is preferably, though not necessarily, circular in configuration and a surface (unnumbered) thereof opposing the end panel **110** is provided with a plurality of passages or grooves **115**. Closure means in the form of a valve disc **116** which corresponds to the valve discs heretofore described is partially received in the chamber **114** and sandwiched between the chamber and the end panel **110** in overlying relationship to the aperture **111**. As in the case of the valve disc **98**, the valve disc **116** is not

adhesively bonded or otherwise fixedly secured to the bottom wall **113** of the product chamber **112**.

The dispensing container **105** is filled with a dispensable product and propellant is charged into a propellant chamber **117** thereof in a manner substantially identical to that heretofore described. However, during the insertion of the end panel **110** into the container body **107** prior to the formation of the seam **101** care must be taken to prevent the valve disc **116** from inadvertently or accidentally slipping from a position overlying and axially aligned with the aperture **111**. During this assembly of the closure and the container body, the valve disc **116** is maintained in position upon the end panel **110** only by frictional forces. However, once the valve disc **116** is at least partially received within the chamber **114** slight relative movement between the valve disc **116**, the bottom wall **113** and the end panel **110** is permissible and inadvertent dislocation of the valve disc **116** is thereafter prevented by the annular wall (unnumbered) of the chamber **114**.

While each of the dispensing containers **90**, **105** have been described as being devoid of adhesive or similar bonding means between the respective bottom walls of the product chambers and the valve discs thereof, it is to be understood that an adhesive of low bond strength may be employed to fixedly secure the valve discs to the respective product chamber bottom walls. Also, while the dispensing containers **10**, **40**, **60** and **70** have been described as including adhesive or similar securing means to secure the valve discs to the respective product chamber bottom walls, the adhesive may, in accordance with this invention, be eliminated. For example, in the case of the dispensing container **10**, the valve disc **25** may be merely seated in overlying relationship to the aperture **30** of the lower closure **13** prior to the assembly of the closure **13** and the body **11**. Once the end panel **28** is inserted into the container body, the valve disc **25** is clampingly retained in position between the bottom wall **22** and the portion of the end panel **28** contacting the valve disc **25**. As propellant is introduced into the propellant chamber **33** the valve disc **25** is maintained in its position by the force of the propellant acting against the undersurface (unnumbered) of the valve disc **25**. During this charging operation, relatively little movement of the valve disc **25** will occur and upon the subsequent cutting-off of the propellant, the propellant within the chamber **33** acting against the product chamber **17** will immediately force the valve disc **25** into intimate forceful contact with the end panel **28**, in the manner illustrated in FIGURE 5 of the drawings. Thus, in each of the embodiments of the invention adhesive may or may not be employed between the bottom walls of the product chambers and associated valve discs.

From the foregoing, it will be seen that novel and advantageous provisions have been made for carrying out the desired end. However, attention is again directed to the fact that additional variations may be made in this invention without departing from the spirit and scope thereof as defined in the appended claims.

I claim:

1. A dispensing container comprising a body including product chamber means for receiving a dispensable product and propellant chamber means for receiving a pressurized propellant, aperture means for introducing a propellant into said propellant chamber means, and closure means normally closing said aperture means and being maintained in said closed position by said product chamber means directly contacting said closure means prior to the performance of a dispensing operation.

2. The dispensing container as defined in claim **1** wherein means are provided for accurately locating said closure means in said closed position.

3. The dispensing container as defined in claim **1** wherein means are provided for securing said closure means to said product chamber means.

4. The dispensing container as defined in claim **1** wherein means are provided for securing said closure means to said product chamber means prior to the performance of a dispensing operation, and means are provided for releasing said securing means whereby said closure means is released from said product chamber means.

5. The dispensing container as defined in claim **1** wherein said body includes lower closure means, said aperture means is formed in said lower closure means, said product chamber means is a bag-like structure, and a closed end portion of said bag-like structure normally contacts and maintains said closure means in overlying relationship to said aperture means.

6. The dispensing container as defined in claim **4** wherein said releasing means is defined by passage means between said closure means and said product chamber means.

7. The dispensing container as defined in claim **5** wherein means are provided for accurately locating said closure means in said closed position.

8. The dispensing container as defined in claim **5** wherein said closure means is a disc-like element having a surface portion in contact with a surface portion of said bag-like structure closed end portion, and means are provided for assuring discontact between said surface portions upon the movement of said bag-like structure during a dispensing operation.

9. The dispensing container as defined in claim **8** wherein said assuring means is defined by a multi-planar surface configuration of at least one of said surface portions whereby pressurized propellant acting against the surface portion of said element coupled with the movement of said bag-like structure effects discontact between said surface portions during a dispensing operation.

10. The dispensing container as defined in claim **8** wherein means are provided for temporarily connecting said disc-like element to said closed end portion and said assuring means is further effective to disconnect said connecting means during a dispensing operation.

11. The dispensing container as defined in claim **2** wherein said body includes lower closure means, said aperture means is formed in said lower closure means, and said locating means is a recess in said lower closure means in which said aperture closure means is normally seated.

12. The dispensing container as defined in claim **3** wherein said securing means is an adhesive for temporarily securing said closure means to said product chamber means.

13. The dispensing container as defined in claim **5** wherein said closed end portion of said bag-like structure includes a bottom wall, and said bottom wall further includes an integral axial extension which contacts and maintains said closure means in overlying relationship to said aperture means.

References Cited

UNITED STATES PATENTS

Re. 24,918	1/1961	Mills	222—386.5
2,937,791	5/1960	Micallef	222—95
3,112,846	12/1963	Hein	222—402.16
3,365,105	1/1968	Krizka	222—95 X

FOREIGN PATENTS

1,316,596	12/1962	France.

ROBERT B. REEVES, Primary Examiner

F. R. HANDREN, Assistant Examiner

U.S. Cl. X.R.

222—107, 482