Aug. 29, 1967 C. C. OLSON 3,338,474

COLLAPSIBLE SPIRAL DISPENSING CONTAINER

Filed May 4, 1965 2 Sheets-Sheet 1

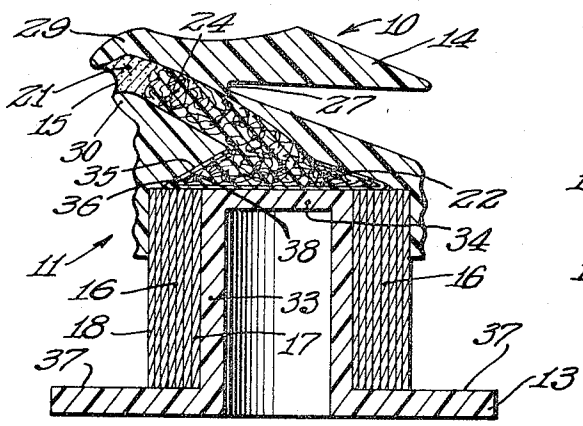


Fig. 3

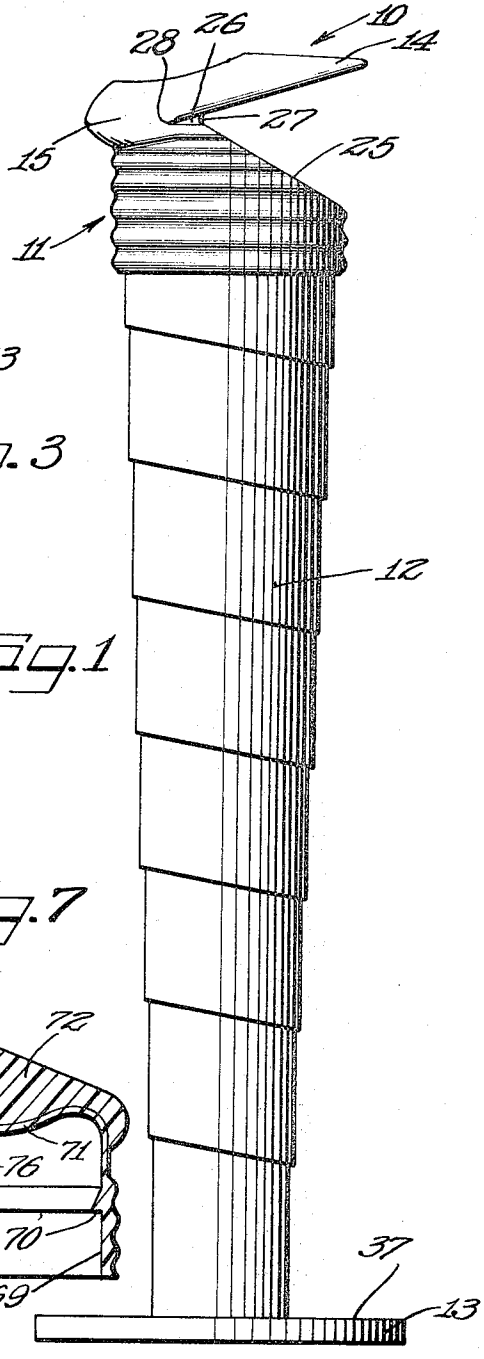


Fig. 1

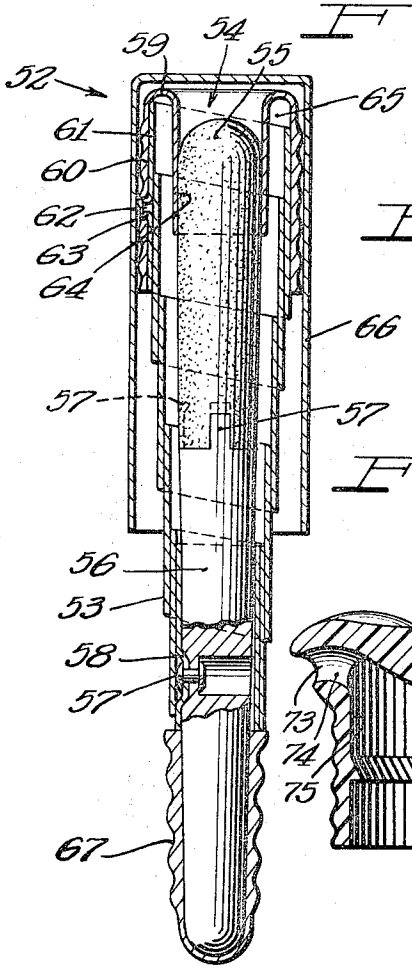


Fig. 7

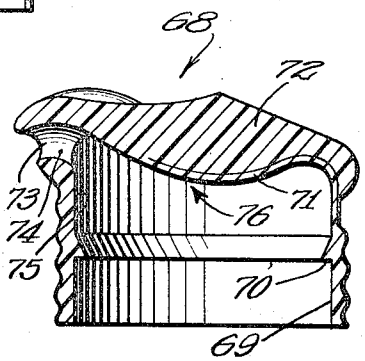


Fig. 6

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Fig. 4

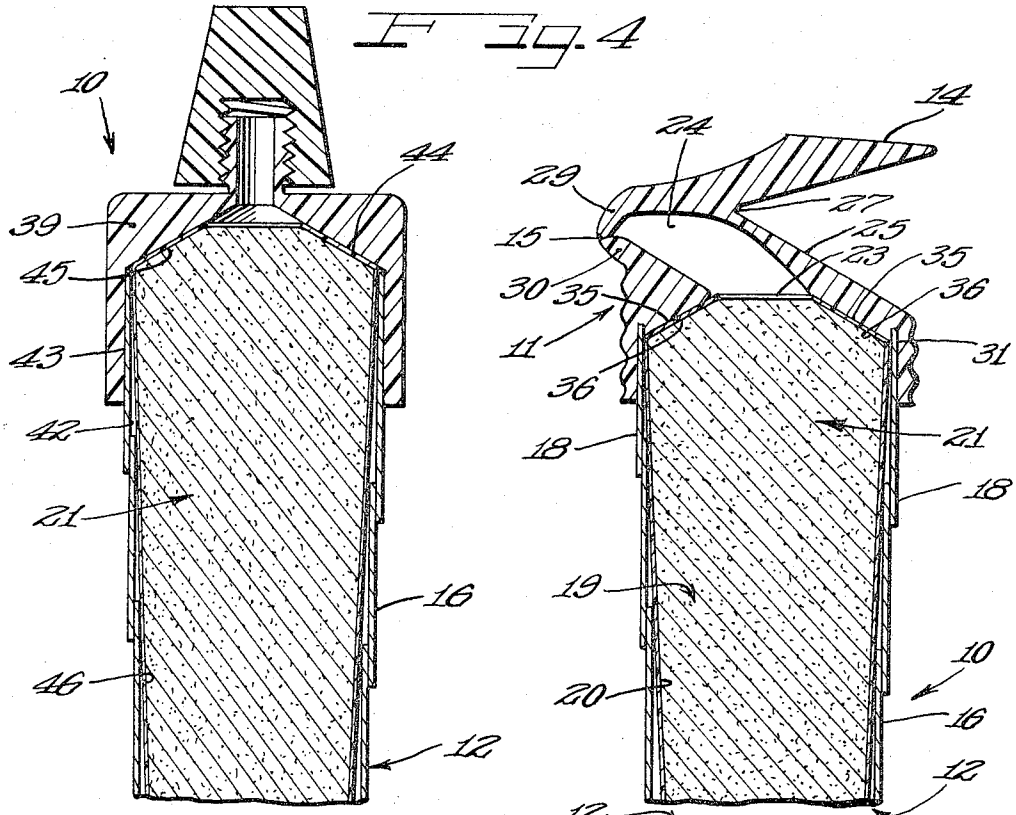


Fig. 2

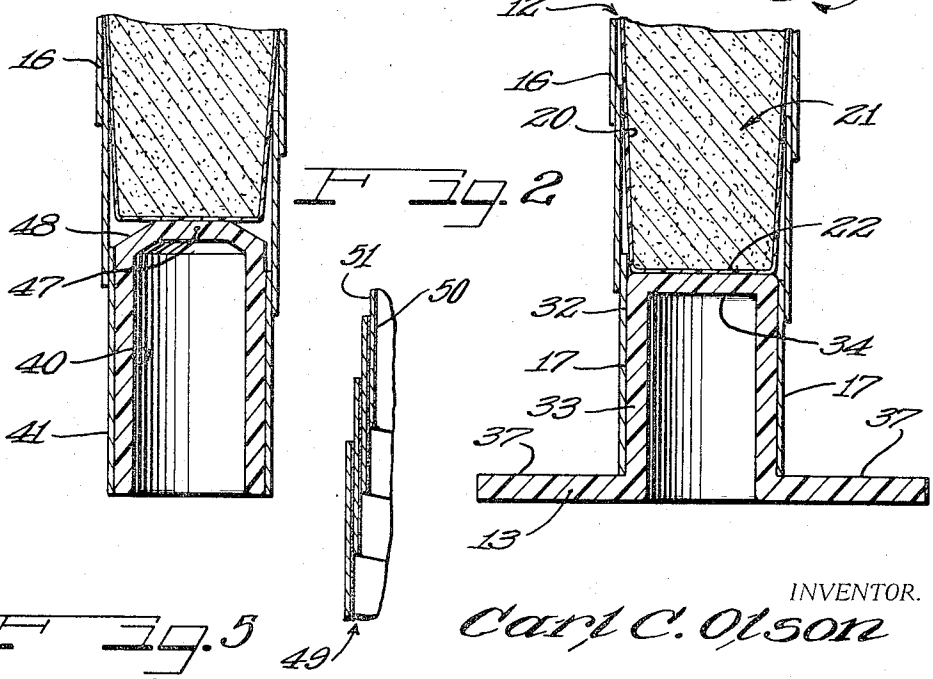


Fig. 5

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COLLAPSIBLE SPIRAL DISPENSING CONTAINER

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4 Claims. (Cl. 222—92)

This invention relates to dispensing containers and more particularly to a collapsible dispensing container with an overlapping spiral wall.

Many different types of containers have been utilized in the prior art which collapse in one manner or another to dispense material contained therein. Generally, these types of dispensing containers are formed of a hollow collapsible tube containing the dispensing material. As in the usual toothpaste dispensing container, the tube is made of a soft metal, primarily tin, so that when one end of the tube is sealed, squeezing of the soft metal tube will cause the tube wall to collapse to dispense the toothpaste from the container. In order to dispense substantially all of the toothpaste when using such a container, it is necessary of course to completely collapse the tube. However, since the tube is made of a soft metal, numerous creases or cavities capture and enclose some of the toothpaste and prevent dispensing from the container. Such a dispensing container is not only wasteful but also unsightly as the tube is squeezed or twisted to its various intermediate collapsed positions.

It is therefore an object of the present invention to provide a collapsible container for the dispensing of substantially all of the material contained therein.

It is also an object of this invention to provide a dispensing container which maintains its basic structural form during dispensing of the material contained therein.

It is another object of this invention to provide a dispensing container having a spirally wound overlapping wall which is collapsible.

It is a further object of this invention to provide a sealed dispensing container which simultaneously opens and collapses to dispense material from within the container.

It is a still further object of this invention to provide a dispensing container which has a deformable spout and a collapsing wall so that deforming the spout and simultaneously collapsing the wall dispenses material from within the container.

It is another object of this invention to provide a dispensing container with an inner collapsible container enclosing the dispensing material.

Other objects and advantages of this invention and a fuller understanding of the nature thereof may be had by refering to the claims and to the following detailed description taken in conjunction with the accompanying drawings.

FIGURE 1 is an elevational view of a preferred embodiment of a dispensing container according to the present invention.

FIGURE 2 is a sectional elevational view of the dispensing container of FIGURE 1 in the extended position.

FIGURE 3 is a sectional elevational view of the dispensing container of FIGURE 1 in a fully collapsed position.

FIGURE 4 is a sectional elevational view of another embodiment of a dispensing container formed according to the present invention.

FIGURE 5 is a fragmentary sectional view of an alternate wall construction.

FIGURE 6 is a third embodiment of a dispensing container according to the present invention.

FIGURE 7 is a sectional view of an alternative deforming spout.

In accordance with one of the aspects of this invention a dispensing container is formed of a single continuous strip of resilient material which is spiral wound or wrapped, thus forming a dispensing container with spiral overlapping wall sections. By sealing one end of this spiral wrap, and providing a spout at the other end, material within the container can be dispensed from the spout by moving one end closer to the other which collapses the spiral wrap. The end seal is shaped and precisely mounted in the container so that when the spiral wrap is completely collapsed, and the wall sections are entirely overlapping each other, practically all of the material formerly within the container will have been dispensed therefrom.

There can also be provided a normally closed deformable spout wherein deformation of the spout causes the contents to be dispensed by following the path of least resistance through the spout which simultaneously opens. In one form deforming the spout and simultaneously collapsing the spiral wall dispenses the contents. In another form, deforming the spout dispenses the contents with the subsequent collapsing of the wall admitting more of the contents to the spout. The container maintains itself in intermediate collapsed positions due to the slight frictional engagement between the overlapping wall sections.

Referring to FIGURE 1 there is illustrated a dispensing container **10** generally formed of a deformable spout **11**, a collapsing wall **12**, and a base **13**. An actuating arm **14** is provided on the spout **11** to deform the spout and simultaneously open a mouth **15**.

The details on the construction of the dispensing container **10** are clearly shown in the sectional views of FIGURES 2 and 3. FIGURE 2 shows the collapsing wall **12** being formed of a number of overlapping wall sections **16** which configuration is obtained by spirally wrapping or winding a continuous strip of resilient material such as manila paper, plastic, or metal in an overlapping arrangement from wrap **17** to wrap **18**.

The resulting collapsing wall **12** defines a generally cylindrical chamber **19** in which there is located a collapsing bag **20** containing a quantity of dispensing material **21**. The bag **20** has a closed end **22** which is situated near the end of the first wrap **17**, that is, closed end **22** is located a distance from the base **13** equal to the height of one of the wall sections **16**. The height of the wall sections **16** is of course determined by the width dimension of the strip of resilient material forming the wall **12**. An open end **23** of the bag **20** is located slightly above the last wrap **18**.

It will be noted that the spout **11** contains a passage **24** which connects the bag open end **23** with the spout mouth **15** to lead the material **21** in the bag **20** out of the mouth **15** when the actuating arm **14** is depressed. The actuating arm **14** is spaced from a sloping face **25** by a rib **26**, as shown in FIGURE 1. The rib **26** narrows from a junction **27** of the actuating arm **14** and the sloping face **25**, to a point **28** which is intermediate the position of the actuating arm **14** and the mouth **15**. Thus, depression of the actuating arm **14** toward the sloping face **25** causes a hinge effect at the rib **26** so that an upper lip **29** will move from a lower lip **30** of the mouth **15**. The position of the actuating arm **14**, the upper lip **29**, and the lower lip **30**, during depression of the actuating arm **14** is most clearly shown in FIGURE 3. The dispensing of the material **21** from the mouth **15** is achieved by depressing the arm **14** and simultaneously collapsing the wall **12** with a downward twisting motion. FIGURE 3 shows the dispensing container **10** in a fully collapsed position with the wall section **16** completely overlapping one another from wrap **17** to wrap **18**.

The spout **11** is connected to the last wrap **18** by means of a recess **31** into which the end of the last wrap **18** is

inserted and cemented. At the other end of the collapsing wall **12**, the first wrap **17** is cemented to the base **13** along an exterior surface **32** of an integral platform **33** of the base **13**. The platform **33** extends from one end of the base **13** to a floor **34** which is located immediately adjacent the bag closed end **22** near the end of the first wrap **17**.

The floor **34** thus seals off one end of the collapsing wall **12** and is located with respect to the closed end **22** so that upon total collapse of the dispensing container **10** practically all of the material **21** will be dispensed from the container.

Referring more particularly to FIGURE 3, the dispensing container **10** is shown in the fully collapsed position with the overlapping wall sections **16** overlapping each other as previously described. It may be noted that the floor **34** has driven the bag closed end **22** within the spout **11** and immediately adjacent the passage **24**. The view of FIGURE 3 is of course enlarged so that details of the inner construction of the dispensing container **10** may be accurately shown and described. It will thus be appreciated that a dispensing container **10** made of proportionately smaller dimensions than that shown in FIGURE 3 would of course trap only a very slight amount of material **21** within the passage **24** or the very small uncollapsed portion of the bag **11**. If desired, the floor **34** may be constructed in a somewhat dome form to match the sloping interior face **35** of the spout **11**. In such a case, the sloping dome of the floor **34** would abut the face **35** when the dispensing container **10** was in the position shown in FIGURE 3.

The bag open end **23** is formed by a sealing edge **36** of the bag **20** which is laid adjacent to and cemented to the sloping interior face **35** of the spout **11**. The bag **20** is made of polyethylene or any other type of material which may be formed into a thin film tube, and in the collapsed form takes up a very slight amount of space within the dispensing container **10**.

It is realized of course that the base **13** must be made wide enough so that a downward twist on the spout **11** will collapse the wall **12** and can be accomplished with a one hand operation, without any tendency for the dispensing container **10** to move beyond the perimeter of the base **13**. The base **13** can be formed of plastic or other types of material which would have sufficient strength to react against the material **21** at the closed end **22** to drive the material **21** out of the mouth **15** as the dispensing container **10** is collapsed. During collapsing there may be a tendency for the wall sections **16** to move beyond the first wraps **17** and the base **13**, and to prevent this from occurring there is formed a ledge **37** as an integral part of the base **13**. This ledge **37** stops the wall sections **16** and stacks them in overlapping layers as shown in FIGURE 3. If desired, the base **13** may be formed with a sloping ramp which slopes from the platform **33** to the ledge **37** and matches the taper of the sloping face **35**, so that some of the wall sections **16** will, in their completely collapsed position, occupy the space **38** in the bag **20** to drive out from the mouth **15** any of the material **21** which may have been trapped therein.

An alternate embodiment of the dispensing container **10** is shown in FIGURE 4. This dispensing container **10** also has a collapsing wall **12** formed of spiral overlapping wall sections **16**, a spout **39**, and a base **40**. The first wrap **41** is similarly cemented to the base **40**, and the last wrap **42** is cemented to an interior surface **43** of the spout **39**. The spout **39** also has a sloping face **44** to which is cemented the sealing edge **45** of the collapsing bag **46**.

In this embodiment the base **40** is formed with a dome **47** having a sloping face **48** which matches the sloping face **44** of the spout **39** to fully dispense the material **21** within the bag **46** when the dispensing container of FIGURE 4 is completely collapsed.

The embodiments which have been previously described all contain an inner collapsible bag to contain the material for septic packaging. When septic conditions and viscosity of contents permit, the inner collapsible bag **20** may be discarded. In many applications, a collapsible type of dispenser may be used to dispense liquid or less viscous fluids. The wall construction for such an arrangement is shown in FIGURE 5. Overlapping spiral wound wall sections **49** are formed of a continuous strip **50** of resilient material similar to the wall sections **16** of the embodiment shown in FIGURE 2. Cemented to the strip **50** is a strip of sealing material **51** such as rubber, so that the sealing material **51** forms a seal between the overlapped strips **50**. In such a configuration, the natural resiliency of the continuous strip **50** tends to compress the sealing material **51** against the adjacent overlapping strip **50** so as to form a seal between the wall sections **49**.

FIGURE 6 illustrates another embodiment of the collapsible wall container and shows the use of the container for dispensing solid types of material. FIGURE 6 shows a dispensing container **52** having a collapsing wall **53** formed of resilient material in an overlapping spiral configuration similar to the arrangement of the embodiments shown in FIGURES 1–4. Within the dispensing container **52**, and at the dispensing end **54**, there is located a solid material **55**, such as lipstick, which is to be dispensed. A sealing and supporting member **56** is attached by means of a number of prongs **57** to the solid material **55**.

In the cutaway view of a portion of the sealing and supporting member **56**, there is shown a rivet **57** which connects the first wrap **58** to the member **56**. This arrangement is necessary to provide a pivoting connection between the last wrap **58** and the member **56** to prevent the wraps forming the wall **53** from disengaging with each other. If this occurred it would cause unsightly bulges in the collapsing wall **53**, and also allow unwanted matter from entering the dispensing container **52**. Thus, when the dispensing container **52** is collapsed, the connection made by the rivet **57** allows the last wrap **58** to pivot at the connecting points with the sealing and supporting member **56** and therefore allows the collapsing wall **53** to maintain its true taper form in the new position.

At the dispensing end **54**, an end piece **59** has an exterior gripping surface **60** which engages the last wrap **61**. Pivotal engagement is accomplished by forcing a hole **62** through the last wrap **61** and the surface **60** to form a spreading lip **63** from the material of the last wrap **61** which engages the end piece **59** at the gripping surface **60**. The end piece **59** is also provided with a guiding surface **64** and a pocket **65**. As the sealing and supporting member **56** is radially twisted in a direction to ease circumferential engagement of the collapsing wall **53**, and moved towards the dispensing end **54**, the solid dispensing material **55** exits from the dispensing container **52** guided by the surface **64**, and the collapsing wall **53** collects and stacks within the pocket **65**. A cap **66** may be placed over the end piece **59** to cover the dispensing end **54**. This cap **66** must of course be first removed before the dispensing of material **55** can occur.

A corrugated sleeve **67** is cemented or otherwise fastened to one end of the member **56** to provide a positive grip in moving the sealing member **56** toward the dispensing end **54** or in moving the end piece **59** towards the sleeve **67**. The collapsing wall **53** is made of resilient material, such as spring steel to provide a very resilient and yet firm collapsing wall for the dispensing container **52**. However, other types of material could also be used which exhibit the firm resiliency required such as brass, aluminum, or combinations of such metals.

Referring now to FIGURE 7 there is illustrated an alternate deformable spout **68** which may be utilized instead of the spout **11** shown in FIGURES 1–3, it being understood that the last wrap of a collapsing wall is cemented or otherwise secured to a sealing surface **69** beneath a ridge **70**.

The spout **68** is formed with a thin deformable wall **71**, an arm **72** to exert pressure on the wall **71** so as to deform the wall in the manner shown, and a mouth **73**.

A passage **74** links the mouth **73** to an inside wall **75** of the spout **68**. In the dispensing position of FIGURE 7, the arm **72** has been depressed to deform the thin wall **71**, permitting the hydraulic law of equal force distributed throughout the viscous contents and against the walls **75** to search out the mouth **73** via the passage **74** which offers the path of least resistance. After dispensing all the contents from the spout space **76** contained in the deformed portion, the deformable wall **71** will assume its previously undeformed position.

The collapsible wall, such as the wall **12**, is then collapsed an amount to permit another portion of material to fill the spout space **76** and the spout **68** is ready to again dispense the contents upon deforming the wall **71**. It may be noted that an air seal is maintained by the contents filling the passage **74**; and by virtue of the partial vacuum created when the wall **71** returns to its original shape, the effort required to collapse the container wall is somewhat eased.

Although the drawings and specification present a detailed disclosure of preferred embodiments of the present invention, it is to be understood that the invention is not limited to the specific form disclosed, but covers all modifications, changes, and alternative construction falling within the scope of the principles taught by the invention.

I claim as my invention:

1. A collapsible dispensing container for dispensing material contained therein comprising:

(a) a substantially cylindrical spiral wall having a continuous wrap forming overlapping wall sections and defining a material chamber, said wrap presenting an increase in diameter when collapsed;

(b) a resilient sealing strip attached to said continuous strip to seal said overlapping wall sections, the resilience of said sealing strip being sufficient to compensate for said increase;

(c) a dispensing spout attached to one end of said cylindrical wall and communicating with said material chamber; and

(d) means for sealing the other end of said cylindrical wall to thereby dispense a desired amount of material from said spout as said wall is collapsed by moving said wall sections in greater overlapping relation to each other.

2. A collapsible dispensing container for dispensing material contained therein comprising:

(a) a substantially cylindrical spiral wall having a continuous wrap forming overlapping wall sections and defining a material chamber;

(b) means for sealing one end of said spiral wall;

(c) an end piece having integral exterior and interior portions, said interior portion adapted to guide the material within said chamber at the other end of said spiral wall; and

(d) means interconnecting the other end of said spiral wall to the exterior portion of said end piece to provide a pivoting connection therebetween as the two ends of said spiral wrap are moved to an abutting relation, said exterior and interior portions of said end piece forming a pocket for receiving the collapsed portion of said spiral wall.

3. A collapsible dispensing container for dispensing material contained therein comprising:

(a) a substantially cylindrical spiral wall having a continuous resilient metal wrap forming overlapping wall sections and defining a material chamber;

(b) an end piece having integral exterior and interior portions, said interior portion having a smooth surface to guide the material within said chamber, and said exterior and interior portions defining a pocket therebetween;

(c) first pivot means interconnecting the last metal wrap at one end of said spiral wall to the exterior portion of said end piece to provide a pivoting connection therebetween;

(d) a cap operatively associated with the exterior portion of said end piece to enclose said material chamber;

(e) a member within said cylindrical spiral wall and having an end secured to said material; and

(f) second pivot means interconnecting the last metal wrap at the other end of said spiral wall to said member to provide a pivoting connection therebetween as the spiral wall is collapsed within said pocket to dispense the material from the uncapped end piece.

4. A collapsible dispensing container for dispensing material contained therein comprising:

(a) a substantially cylindrical spiral wall having a continuous resilient metal wrap forming overlapping wall sections and defining a material chamber;

(b) an end piece having integral exterior and interior portions, said interior portion having a smooth surface to guide the material within said chamber, and said exterior and interior portions defining a pocket therebetween;

(c) first pivot means interconnecting the last metal wrap at one end of said spiral wall to the exterior portion of said end piece to provide a pivoting connection therebetween;

(d) a member within said cylindrical spiral wall and having an end secured to said material; and

(e) second pivot means interconnecting the last metal wrap at the other end of said spiral wall to said member to provide a pivoting connection therebetween as the spiral wall is collapsed within said pocket to dispense the material from the uncapped end piece.

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