

ERGONOMIC WIPER DISPENSING SYSTEM

FIELD OF THE INVENTION

The present invention pertains to wiper dispensing systems, and more particularly to an ergonomically-friendly, easily-transportable wiper dispensing system.

BACKGROUND OF THE INVENTION

One existing problem in this field is that very little innovation has been done in the way of wipe containers since the creation of the original, now-standard wipe container with a snap-top or screw-on lid closure, a dispensing opening, and a generally cylindrical shape. In the consumer market, some containers have been made easier to hold by reducing the overall size, providing a handle, and/or providing an overall hourglass shape to the container. However, in the professional market, even less progress has been made. This is due in part to the fact that products sold to professional customers must have a higher wipe count, and thus the container size will be larger. These large containers are cumbersome and difficult to grasp and hold while carrying from location to location and/or dispensing wipes.

Other problems that exist in relation to the dispensing of a wipe are at the start, and at the end, of a center-pull roll of wipes. At both the start and end, two or more wipes can converge or bunch together at the dispensing opening. In a traditional container, one of two things generally occur: (1) the user will have to remove the cap from the container and re-feed the wipe through the opening since it has become hopelessly jammed due to the bunching of the wipes, or (2) the opening is designed large enough to compensate for such multiple wipe bunching and will flex locally at the opening to allow the bunched wipes to pass through. The problem with the former is that it creates frustration on the part of the user at having to re-open the container and take the time to re-feed the wipes. Worse yet, the user can become so frustrated with the jam that the entire container is discarded. The problem with the latter is that, while allowing bunched wipes to pass through the opening, single sheet dispensing is clearly not optimized since the opening is oversized to accommodate the bunched wipes, and will thus let multiple wipes through under non-bunched conditions. Both of these situations are highly undesirable to the user, and particularly so if the user operates in a fast-paced environment.

One particular concern in this area involves professional workers in a hospital, medical, clinical, or similar fast-paced environment in which the work place is extremely intense, and any waste of time unacceptable. For example, nurses need, but do not currently have, easy-to-use containers that keep wipes moist and

ready-to-use. They, and others in similar situations, are extremely busy and do not have time for the complicated, cumbersome large, hard-to-use current wipe containers. The average hand size of female nurses does not easily accommodate handling current large wipe containers. More often than not, they, and others similarly situated, have to drop what they are doing in order to use both hands to dispense a wipe from the container.

Thus, the generally prevailing attitude toward current containers is that they are all basically the same with the same performance failings. Users expect the wipes to be difficult to thread and dispense. In short, they have become frustratingly resigned to using existing large cumbersome containers.

SUMMARY OF THE INVENTION

In one embodiment of the present invention there is provided an ergonomic wiper dispensing system including a canister adapted for containing a roll of wiper material having a plurality of perforation lines for dispensing individual wipers therefrom. The canister includes a containing portion adapted to contain the roll of wiper material, and an ergonomically designed dispensing portion attached to the containing portion. The dispensing portion includes an intermediate section having a width less than a width of the remaining dispensing portion.

BRIEF DESCRIPTION OF THE DRAWING

The above-mentioned and other features of the present invention and the manner of attaining them will become more apparent, and the invention itself will be better understood by reference to the following description of the invention, taken in conjunction with the accompanying drawing, wherein:

Figure 1 illustrates a perspective view of one embodiment of the present invention,

Figure 2 illustrates the embodiment of Figure 1 with the lid open,

Figure 3 illustrates the embodiment of Figure 1 with the lid open and a wiper being dispensed therefrom,

Figure 4 illustrates the embodiment of Figure 1 showing the hand of a user using a cylinder grip to hold the embodiment of Figure 1,

Figure 5 is similar to Figure 4 with the hand of a user using a ball grip,

Figure 6 is a top elevational view of the interior wall of the dispensing portion,

Figure 7 is a top elevational view of the interior wall of the dispensing portion of the embodiment of Figure 1, and

Figure 8 is a cross-sectional, elevational view of the embodiment in Figure 1 illustrating a wiper being dispensed therefrom.

DESCRIPTION OF A PREFERRED EMBODIMENT

In response to the problems and disadvantages of current wipe containers as described earlier, the present invention provides an ergonomic wiper dispensing system with the advantage of a unique ergonomically-shaped dispensing portion for the canister that allows the user to grasp the dispensing portion with only one hand in order to transport the container or to dispense a wiper with the other hand. This clearly obviates the necessity of using two hands that can retard work flow in a fast-paced, intense work environment.

Another advantage of the present invention is that it provides a novel dispensing port that remedies the problem of bunched wipers at the start and end of dispensing a role wipes associated with current wipe container products. Further, the dispensing port provides improved dispensing of single wipers.

Referring now to Figure 1-3, 8, an ergonomic wiper dispensing system of the present invention includes a canister 10 comprising a containing portion 12 and a dispensing portion 14 having top section 16, intermediate section 18, and lid 20. Containing portion 12 contains a roll of wiper material 22 (Figure 8) having a plurality of perforations 24 (Figure 8) extending between its longitudinal sides at predetermined distances for separation into individual wipers 26. Canister 10 is preferably made of synthetic resin and can be blow molded or vacuum formed to the dimensions desire. A desired synthetic is high density polyethylene or polypropylene. Wiper material 22 may be made of non-woven synthetic materials, such as polypropylene or polyethylene, or any desired mixture thereof, as well as fibrous materials, such as non-woven fabric, paper or gauze. If desired, the wiper material 22, and it follows each individual wiper 26 as well, can be saturated or impregnated with a liquid such as liquid cosmetics, cleaning solutions, disinfecting solutions, sporicidal solutions, or the like for a specific intended use.

Unique to the present invention is that dispensing portion 14 is generally hourglass-shaped with intermediate section 18 having a diameter less than a diameter of the remaining portion of dispensing portion 14. Parenthetically, it is to be noted that the term "diameter" with respect to dispensing portion 14 includes a diameter of a circular or cylindrical body, or the smallest measured dimension of a non- circular or non-cylindrical body, i.e., this smallest measured dimension could be a width. This is unique in two respects, one being that most current containers have an overall hourglass-like shape and, with respect to the present invention, intermediate section 18 is smaller in diameter to permit the user to use one hand to grasp and hold canister 10. This is particularly advantageous in those environments in which it is preferred, or even necessary, to use one hand, as

opposed to having to use both hands to grasp and use the container. Due to the hourglass-shape of dispensing portion 14, it forms at its top section 16 a shoulder 28 to which lid 20 is attached. Shoulder 28 serves, among other purposes, to support a user's hand (Figures 4 and 5) in grasping and holding canister 10 for use. Again, in a fast-paced, intense working environment, this is extremely helpful in dispensing wipers 26 therefrom.

Another unique aspect of the present invention is that canister 10 has a visual cue 30 on all, or just a portion, of dispensing portion 14. This informs the user, visually and immediately, where to grasp canister 10, thereby eliminating any hesitancy on the part of the user. Visual cue 30 can be any visually discerning color, design, mark, or the like. If a color is used, it should be more visually distinct than the color of containing portion 12. For example, if containing portion 12 is white, then dispensing portion 14 could be blue, thereby drawing the user's vision to the more distinct color. Visual cue 30 could also be a design such as, by way of example, a checkerboard design, cross-hatch design, artistic design, or the like. Again, the design is to draw the user's immediate attention to dispensing portion 14. Similarly, a mark can be used as visual cue 30 such as, for example, a company's logo, name of the work team, or the like in order to draw the user's attention to dispensing portion 12.

Yet another unique aspect of the present invention is a gripping device or means 32 on all, or a portion, of dispensing portion 14 to assist the user in maintaining a firm grasp or hold on canister 10. Gripping device 32 can be a texture applied to dispensing portion 14 such as, for example, a roughened surface, an embossed surface, or a tacky surface. The present invention contemplates other treatments that increase the user's grasp or hold on canister 10.

Thus, as described to this point, the present invention provides an easy and quick use of canister 10 in order to dispense individual wipers 26. To emphasize this with reference to Figures 4-5, a hand can grip in two ways: a ball grip (Figure 5) or a cylinder grip (Figure 4). A ball grip is the hand position in which the hand can encompass most of the object being gripped. An example of a ball grip is the gripping of a door knob. A cylinder grip is when a hand is positioned on an object causing the hand to curve around half of or less of the object being gripped. An example of a cylinder grip is the gripping of a can of soda or coffee cup. Generally, a female hand has a grip width range of about 3.0 inches to about 3.6 inches. Grip width is the width of the four fingers when held together, measured from the bottom of the little finger to the top of the index finger. A female hand has a grip length range of about 3.8 inches to about 4.8 inches. Grip length is measured from the tip of the middle finger to the top of the palm adjacent the wrist. A male hand generally has a grip width range of about 3.4 inches to about 4.1 inches, and a grip length range of about 3.8 inches to about 5.6 inches. Desirably,

intermediate section 18 of canister 10 of the present invention has a diameter equal to or less than about 4.8 inches.

As described above, the ergonomic wiper dispensing system of the present invention provides a dispensing portion 14 having a unique and distinct shape with smooth undulations that are visually differentiating and distinctive to the user. Close attention has been paid to the innovative shape of dispensing portion 14 with respect to hand placement on the smooth undulations in conjunction with visual cue 30 and gripping device 32 to increase overall user interaction. The overall ergonomics, transportability, utility and ease-of-use of the present invention remedy the problems presented by current wipe containers, as described earlier.

Turning now to Figures 6-8, dispensing port 34 of the present invention is disposed in interior wall 36 of dispensing portion 14 and includes a generally circular opening 38 with 3 channels 40 (Figure 6) forming 3 flexible flaps 46 in interior wall 36. In another aspect of the present invention, dispensing port 34 includes 4 channels 40 (Figure 7) forming 4 flexible flaps 46 in interior wall 36. For ease of description, the remaining description of dispensing port 34 will be made with reference to 4 channels 40, with the understanding that 3 channels 40 can likewise be used. As illustrated in Figure 7, channels 40 are in communication with opening 38 and extend radially outwardly therefrom. Dispensing port 34 further includes a pair of slots 42 in communication with opening 38 extending outwardly therefrom and beyond channels 40. Slots 42 are narrower in width than channels 40 and each slot 42 terminates in an aperture 44. Desirably, each aperture 44 is generally T-shaped, as illustrated in Figure 7. Together, slots 42 and apertures 44 form a pair of flexible panels 48 in interior wall 36.

Following are preferred dimensions of dispensing port 34: (1) opening 38 has a diameter of about 0.365 inches; (2) each channel 40 has a width of about 0.070 inches and a length as measured from the center of opening 38 of about 0.286 inches; (3) each slot 42 has a width of about 0.005 inches and a length as measured from the center of opening 38 of about 0.135 inches; (4) the width of each of the 2 segments of each aperture 44 that form the T-shape is about 0.70 inches; (5) the length of the horizontal (as viewed in Figure 7) segment of each aperture 44 is about 0.337 inches; and (6) the length of the vertical (as viewed in Figure 7) segment of each aperture 44 is about 0.793 inches.

Turning now to Figure 8, there is illustrated a wiper 26 being dispensed with perforation 24 just beginning to be torn or detached as it passes through opening 38, with flaps 46 flexing upwardly from a relaxed, generally flat or planar state. A counterbore 50 is formed at opening 38 resulting in each flexible flap 46 having a tapering surface 52 that tapers inwardly toward the center of opening 38. Tapering surfaces 52 provide the desired flexibility to flaps 46 to allow them to flex upwardly

upon dispensing a wiper 26, and to pinch or hold the following wiper 26 to prevent it from falling back through opening 38 into containing portion 12. Flaps 46 are designed to exert a force sufficient to tear a perforation 24. In this case, the detachment peak load for each perforation 24 is in the range of about 1100 grams force to about 1461 grams force. Naturally, the present invention contemplates other force ranges depending upon the nature of the perforations for other types of wiper material.

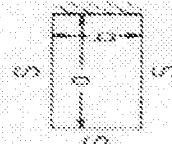
In dispensing a wiper 26, the generally circular opening 38 is optimal for maintaining equal force on the wiper 26 as it exits allowing for tearing and detachment of a perforation 24. With only a generally circular opening 26, a following wiper 26, behind the wiper 26 immediately being dispensed, can fall back through opening 38 into containing portion 12. The present invention remedies this with the incorporation of channels 40 that flex upwardly during dispensing. After a wiper 26 detaches at a perforation 24, flaps 46 flex to their original flat or planar state to “pinch” or hold the following wiper 26, thus preventing it from falling back into containing portion 12.

As earlier described with reference to some current products, at the start and end of the dispensing of role 22 of wiper material, there can be the tendency for two or more wipers 26 to bunch or clump together at opening 38. The present invention compensates for this bunching by including slots 42 and T-shaped apertures 44. Under normal dispensing conditions, optimal dispensing of single wipers 26 is maintained by opening 38 and flaps 46. Slots 42 are sufficiently narrow in width so as not to add significant increased flex to the flaps 46, and to prevent wiper 26 from entering slots 42. In the case of a jam or bulge created by bunched wipers 26 at the start or end of the dispensing, panels 48 formed by slots 42 and T-shaped apertures 44, flex upwardly to allow passage of the bunched wipers therethrough. Thereafter, panels 48 return to their generally flat or planar state to allow further optimized dispensing of subsequent individual wipers 26.

It is important to emphasize, and thus appreciate, the design of dispensing port 34 in optimizing the dispensing of single wipers 26 from role 22 of wiper material. The added features of channels 40, slots 42, and apertures 44 uniquely and timely provide increased flexibility to opening 38. The functionality of these features is as follows: as the wiper cross-section changes from a uniform stream to an increased massing or bunching of wipers, the force or pressure on opening 38 increases. This increasing force or pressure is transferred to panels 48 so that they flex upwardly to allow the bunched wipers to pass through dispensing port 34. Thereafter, the force or pressure is reduced and panels 48 return to their normal flat or planar state, and flaps 46 pinch the following wiper 26.

To determine the degree of improvement in flexibility provided by the present invention over traditional designs, one can employ flat plate numerical analysis. Consider the following for the present invention:

Case no., shape, and supports	Case no., loading	Formulae and tabulated specific values								
1. Rectangular plate, three edges simply supported, one short edge (y) fixed	Uniform over entire plate	Max $\sigma = \frac{f_0 b^2}{r^2}$	and	max $\epsilon = \frac{-\alpha_f b^4}{E r^3}$						
		α_f	1	1.5	2.0	2.5	3.0	3.5	4.0	
		β	0.50	0.67	0.73	0.74	0.75	0.75	0.73	
		α	0.030	0.071	0.101	0.122	0.132	0.137	0.139	
(Values from charts of Ref. 8, p. 80)										



The dispensing plane can be treated as a flat plate; three sides of the plate are all simply supported (end condition prevents transverse displacement, but permits rotation and longitudinal displacement) and denoted with the letter "S". The back side of the plane parallel to the opening side is fixed (end condition which prevents rotation and transverse displacement, but permits longitudinal displacement) and is denoted with cross-hatching. Assuming a uniform pressure distribution on the plate, the maximum deflection is defined as follows:

$$\max y = -\alpha q b^4 / Et^3$$

Where: $\alpha = 0.030$ (for $a/b = 1$)

q = Pressure

$b = 1.60$ in (from fig 1)

E = Modules of elasticity (50,000psi for Polypropylene)

t = plate thickness (.060 in from fig 1)

Substitution into the equation yields $\max y = .0186q$ with the maximum deflection occurring at the side parallel to the fixed edge.

For the traditional design, consider the below:

8. Rectangular plate, all edges fixed	9a. Uniform over entire plate	10. At center of long edge:		11. At corner of long edge:		$\frac{w_0 g^2}{p^2}$	$\frac{w_0 g^2}{p^2}$
		$\frac{w_0 g^2}{p}$	$\frac{w_0 g^2}{p}$	and	and		
	a/b	1.0	1.2	1.4	1.6	1.8	2.0
	β_1	0.0378	0.1844	0.4456	0.4659	0.4872	0.4974
	β_2	0.1286	0.1794	0.2344	0.2366	0.2436	0.2472
	α	0.0138	0.0188	0.0236	0.0251	0.0267	0.0277

Refs. 7 and 23 and Refs. 21, 6a, and 6, 3.

In this case, all the sides of the dispensing plane are considered fixed with the opening centered about the plate. Again assuming a uniform pressure distribution, the maximum deflection is as follows:

$$\max y = -\alpha q b^4 / Et^3$$

Where: $\alpha = 0.013$ (for $a/b = 1$)

q = Pressure

$b = 1.60$ in (from fig 1)

E = Modules of elasticity (50,000psi for Polypropylene)

t = plate thickness (.060 in from fig 1)

Substitution into the equation yields $\max y = .0084q$ with the maximum deflection occurring at the center of the plate (at the orifice).

Comparison of dispensing port 34 of the present invention with traditional designs with respect to $\max y$ indicates that the dispensing port 34 will flex or deflect 55% more for the same given pressure than traditional designs, thus validating its claim at being more flexible a design.

Set forth below is one example of improving the dispensing of wipers 26 as provided by the present invention. In this example, perforations 24 (Figure 8) have a detachment peak load range between about 1100 grams force to about 1461 grams force. A detachment peak force is measured by calculating the force applied at right angles to the perforation line in order to tear that specific type of perforation. Thus, by measuring the detachment peak force range for a specific perforation of a specific wiper, the size of opening 38 and channels 40 can be determined to provide an optimum dispensing of wipers.

In the Table 1 below, the opening has a diameter of 0.365 inches, channels 40 have a width of 0.070 inches and a length measured from the center opening of 0.286 inches, and the detachment peak force range for the wipers is about 1100 grams force to about 1461 grams force. For each of the five specimens, there is a recorded folded width and peak load or force, and then presented is a mean, standard deviation, and minimum and maximum peak loads or forces. With this

diameter of opening 38 and this peak force range for perforations 24, a wiper 26 will be dispensed and detached and channels 40 will pinch the following wiper 26.

TABLE 1

Specimen #	Specimen Width (mm)	Peak Load (gf)
1	105	1248.138
2	105	1324.998
3	103	1099.339
4	103	1326.834
5	103	1461.128
Mean	103.8	1292.087
StdDev	1.1	132.239
Minimum	103	1099.339
Maximum	105	1461.128

TABLES 2 and 3 below indicate the type and number of defects that occurred when dispensing wipers from an opening having a diameter of 0.365 inches at a 45 degree angle to the centerline of the roll (TABLE 2) and with a straight up, vertical pull, i.e., parallel to the centerline of the roll) (TABLE 3).

TABLE 2			TABLE 3		
<u>Angle of Pull</u>	<u>Defect type</u>	<u>Total</u>	<u>Angle of Pull</u>	<u>Defect type</u>	<u>Total</u>
45 degree	Bunching	11	Straight	Bunching	5
	Tab	2		Tab	1
	Excessive Tail			Excessive Tail	
	Lost Wiper			Lost Wiper	
	Hole			Hole	
	Perf Tear			Perf Tear	
	Roping			Roping	3
	Short Tail	7		Short Tail	1
	Tear	3		Tear	
	Sum of Defects	23		Sum of Defects	10
	Sum of Wipers	305		Sum of Wipers	299
	% Defective	7.50%		% Defective	3.30%

The defects mean the following: (1) "Bunching" means more than one wiper being pulled through opening 38; (2) "Tab" means a chad, i.e., a small torn portion; (3) "Excessive Tail" means too much of the following wiper exposed beyond opening 38; (4) "Lost Wiper" means there is no following wiper; (5) "Hole" means a hole in the wiper; (6) "Perf Tear" means a tear from the perforation into the wiper; (7) "Roping" means a stream of two or more attached wipers; (8) "Short Tail" means less than one-quarter inch of the following wiper being pulled through opening 38; and (9) "Tear" means a tear in the wiper. As you can see, with a 45 degree dispensing angle, the percent of defects was 7.50%, and for a straight pull was 3.30%.

In comparison to TABLE 1, the data in TABLE 4 is for a detachment peak force range of about 3430 grams force to about 4015 grams force, and with opening 38 having the same diameter of 0.365 inches. The data of TABLES 4, 5, and 6 show the necessity of designing opening 38 and channels 40 with consideration to the detachment peak forces, and if this is not done, then a far greater number of defects occur.

TABLE 4

Specimen #	Specimen Width (mm)	Peak Load (gf)
1	104	3517.965
2	102	3752.853
3	104	3430.067
4	102	3458.924
5	103	4015.844
Mean	103	3635.131
StdDev	1	247.805
Minimum	102	3430.067
Maximum	104	4015.844

TABLE 5			TABLE 6		
Angle of Pull	Defect type	Total	Angle of Pull	Defect type	Total
45 degree	Bunching	2	Straight	Bunching	4
	Tab	1		Tab	2
	Excessive Tail			Excessive Tail	
	Lost Wiper			Lost Wiper	
	Hole			Hole	
	Perf Tear			Perf Tear	
	Roping	81		Roping	108
	Short Tail	8		Short Tail	7
	Tear			Tear	
	Sum of Defects	92		Sum of Defects	121
	Sum of Wipers	360		Sum of Wipers	359
	% Defective	25.50%		% Defective	33.70%

As you can see, with a 45 degree dispensing angle, the percent of defects was 25.50%, and for a straight pull was 33.70%.

This is another unique aspect of the present invention in that it provides for greatly reducing the per cent of defects in dispensing wipers. Further, some current products require the wipers to be pulled in a direction in alignment, or parallel, with the product's centerline, and this is not always the case in the usual reach-and-dispense motion of a user. The present invention overcomes this problem in that the wipers can be pulled through the dispensing port at various angles to the canister's centerline. In other words, a wiper can be pulled directly out of the canister in alignment or parallel with its centerline, or at an angle thereto, thereby increasing the utilization of the canister.

While this invention has been described as having a preferred embodiment, it will be understood that it is capable of further modifications. It is therefore intended to cover any variations, equivalents, uses, or adaptations of the invention following the general principles thereof, and including such departures from the present invention as come or may come within known or customary practice in the art to which this invention pertains and fall within the limits of the appended claims.

CLAIMS

What is claimed is:

1. An ergonomically designed canister adapted for containing a roll of wiper material having a plurality of perforation lines for dispensing individual wipers therefrom, comprising:
a containing portion,
an ergonomically designed dispensing portion attached to the containing portion,
and
an intermediate section of the ergonomically designed dispensing portion having a diameter less than a diameter of the remaining dispensing portion.
2. The canister of claim 1 further comprising a visual cue on the dispensing portion.
3. The canister of claim 2 wherein the visual cue is a color different from a color of the containing portion.
4. The canister of claim 2 wherein the visual cue is a design.
5. The canister of claim 1 further comprising a gripping means on the dispensing portion for providing additional grip thereto.
6. The canister of claim 5 wherein the gripping means is a texture.
7. The canister of claim 5 wherein the gripping means is an embossed surface.
8. The canister of claim 5 wherein the gripping means is a tacky surface.

9. The canister of claim 5 wherein the gripping means includes a shoulder on a top area of the dispensing portion, and extending outwardly from the remaining dispensing portion.

10. The canister of claim 1 wherein the intermediate section has a diameter equal to or less than about 4.8 inches.

11. The canister of claim 1 wherein the dispensing portion has an interior wall with a port adapted for dispensing the individual wipers, the port including an opening and a plurality of channels in communication with the opening and extending outwardly therefrom, and a respective plurality of flexible flaps formed in the interior wall by the plurality of channels.

12. The canister of claim 11 wherein the interior wall further includes at least two slots in communication with the opening and extending outwardly therefrom and beyond the plurality of channels, each slot having a width narrower than a width of each channel and terminating in respective shaped apertures, and two flexible panels formed in the interior wall by the two slots.

13. The canister of claim 11 wherein the plurality of channels is four channels, and the respective plurality of flexible flaps is four flexible flaps.

14. The canister of claim 12 wherein the opening is generally circular and each aperture is generally T-shaped.

15. A canister adapted to dispense individual wipers from a roll of wiper material, comprising:
a containing portion adapted for containing the roll of wiper material,
a dispensing portion attached to the containing portion, and having an interior wall with a port adapted for dispensing the wipers,
a visual cue on the dispensing portion adapted for directing the user where to grasp the dispensing portion,

a gripping means on the dispensing portion for providing additional grip thereto,

the interior wall including an opening and a plurality of channels in communication with the opening and extending outwardly therefrom, and
a respective plurality of flexible flaps formed in the interior wall by the plurality of channels.

16. The canister of claim 15 wherein the interior wall further includes at least two slots in communication with the opening and extending outwardly therefrom and beyond the plurality of channels, each slot having a width narrower than a width of each channel and terminating in respective apertures, and
two flexible panels formed in the interior wall by the two slots.

17. The canister of claim 15 wherein the visual cue is one of a color and a design.

18. The canister of claim 15 wherein the gripping means is one of a texture, an embossed surface, and a tacky surface.

19. The canister of claim 15 wherein the dispensing portion includes an intermediate section having a diameter less than a diameter of the remaining dispensing portion.

20. The canister of claim 19 wherein the intermediate section has a diameter equal to or less than about 4.8 inches.