(54) BAG WITH VARIABLE VOLUME

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(21) Appl. No.: 09/782,627

(22) Filed: Feb. 13, 2001

Related U.S. Application Data

(63) Continuation-in-part of application No. 29/106,466, filed on Jun. 15, 1999, now Pat. No. D437,481, which is a continuation-in-part of application No. 29/094,412, filed on Oct. 1, 1998, now abandoned.

Publication Classification

(51) Int. Cl. ................................. B65D 30/00
(52) U.S. Cl. ................................. 383/2

ABSTRACT

The invention relates to a bag that includes a shell having a predetermined maximum volume. A channel is connected to the shell. An elongated strip has a first portion and a second portion. The first portion is disposed within the channel, and the second portion is exposed from the channel. The strip is moveable with respect to the channel thereby causing the volume of the shell to vary from a maximum volume to a plurality of volumes less than the maximum value.
BAG WITH VARIABLE VOLUME

CROSS REFERENCE TO RELATED CASE


BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a bag whose size can change so that the bag has a variable volume. More specifically, the present invention relates to a bag that includes a system of cinching channels connected to the shell of the bag that permits the bag to vary its shape and volume in a substantially predetermined manner.

[0004] 2. Discussion of the Related Art

[0005] Referring to FIGS. 1-4, bags 100, 102 and 104 in accordance with the prior art are illustrated. Referring now to FIG. 1, bag 100 includes straps 106 on the outside side of the bag whose length is variable via a conventional D-ring 108, thereby permitting the depth of bag 100 to vary. In addition, it is known to include a cord 110 on the outside of the bag, whose overall length is adjustable via a cord lock 112. Thus, by varying the length of cord 110, the width of bag 100 can be varied.

[0006] FIG. 2 illustrates a bag 102, which has a conventional opening 112. Bag 102 is selectively opened and closed via a cord 114 and a cord lock 116. Cord 114 is threaded through a channel formed about the periphery of opening 112. The contents of the bag are placed through the opening 112 so that the contents are disposed below the selectively closable opening 112. By closing the opening via the cord/cord lock assembly 114,116, the contents are secured within bag 102. The volume of bag 102 does not essentially change while opening and closing the bag, and remains essentially constant when the bag is closed and in use.

[0007] Referring now to FIGS. 3 and 4, a bag 104 having a gusset 118 is illustrated. In the non-expanded or closed position, a zipper 120 is fastened together causing a gusset 118 to be disposed within bag 104. To expand bag 104, zipper 120 is opened, thereby permitting the bag 104 to move to the expanded position shown in FIG. 4. The length of bag 104 is increased essentially by the length of gusset 118.

[0008] A problem with all of these known bags is that they do not permit the size of the bag to be adjusted to the size of an object placed within the bag. All of these bags only permit an exterior sectional or partial adjustment of the size of the bag along one of the bag’s major dimensions (i.e., width, depth or height). But none of these prior art bags permit the size of the bag to be changed to snugly fit the contents of just about any object placed within the bag. Additionally, none of these bags permit the volume of the bag to be changed by an internal mechanism so that the mechanism will not entangle with exterior objects. Further, none of the prior art bags use the handle of the bag as a size adjustment mechanism. Nor do the prior art bags utilize the bag cinching handle to support the weight of the bag by fitting snugly around the bottom of the bag and its contents.

SUMMARY OF THE INVENTION

[0009] It is an object of the present invention to provide a bag whose size and, therefore, volume can be changed in a predetermined manner to snugly fit the contents of any object placed within the bag.

[0010] In accordance with a presently preferred exemplary embodiment of the present invention, this and other objects are achieved with a bag that includes a shell having a predetermined maximum volume. A channel is connected to the shell. An elongated strip has a first portion and a second portion. The first portion is disposed within the channel, and the second portion is exposed from the channel. The strip is moveable with respect to the channel thereby causing the volume of the shell to vary from a maximum volume to a plurality of volumes less than the maximum value, thereby permitting the size of the bag to be changed to snugly fit the contents of the object placed within the bag.

[0011] In accordance with a further feature of the present invention, the channel/cinching mechanism is independent from the mechanism for opening and closing the bag.

[0012] In accordance with a further feature of the present invention, the channel/cinching mechanism is formed in multiple circumferences around the shell.

[0013] In accordance with still yet a further feature of the present invention, the channel/cinching mechanism is formed in the interior of the shell.

[0014] In accordance with another feature of the present invention, the handle is a part of the channel/cinching mechanism, and the handle extends around the bottom of the bag to snugly fit around and support the contents of the bag.

DESCRIPTION OF THE DRAWING FIGURES

[0015] These and other features, aspects, and advantages of the present invention will become better understood with reference to the following description, appended claims and accompanying drawings where:

[0016] FIG. 1 is a perspective view of a bag in accordance with the prior art;

[0017] FIG. 2 is a front plan view of a bag in accordance with the prior art;

[0018] FIGS. 3 and 4 are perspective views of a bag in accordance with the prior art;

[0019] FIGS. 5-7 are a front plan view of a bag in accordance with the present invention shown at different volumes;

[0020] FIGS. 8-10 show the bag of FIGS. 5-7 illustrated in various shapes and volumes;

[0021] FIGS. 11-13 are side views of a knapsack bag, shown at different volumes;

[0022] FIGS. 14-16 are front views of a messenger bag that uses the strap/channel gathering system of FIGS. 5-13;

[0023] FIGS. 17-19 are perspective views of a tote bag utilizing straps that have one mating portion of a snap connected to it and channels having the other mating portion of the snap connected to it;
FIG. 20 is a partial perspective view of a bag incorporating a cord and cord lock cinching mechanism;

FIG. 21 is a partial perspective view of a bag incorporating the cinching mechanism shown in FIGS. 17-19;

FIG. 22 is a perspective view of a bag;

FIG. 23 is a perspective view of a bag incorporating the cinching mechanism shown in FIGS. 17-19;

FIGS. 24-26 are perspective views of a bag in accordance with another embodiment of the present invention, shown at different volumes;

FIGS. 27-29 are perspective views of yet another embodiment of the present invention, shown at different volumes;

FIG. 30 is a bottom perspective view of another embodiment of a bag in accordance with the present invention;

FIG. 31 is a bottom perspective view of yet another embodiment of a bag in accordance with the present invention;

FIG. 32 is a bottom perspective view of still yet another embodiment of a bag in accordance with the present invention;

FIG. 33 is a perspective view of a portion of a piece of fabric having a cord channel through a conduit that is stitched to the surface of the fabric;

FIG. 34 is a perspective view of a portion of a piece of fabric that has been gathered;

FIG. 35 is a perspective view of a portion of a piece of fabric that has been gathered and tied in place;

FIG. 36 is a perspective view of a portion of a piece of fabric that has been gathered and locked in place;

FIG. 37 is a perspective view of a portion of a piece of fabric that includes a strap for gathering the fabric material;

FIG. 38 is a perspective view of a portion of a piece of fabric that uses a strap with snaps for gathering the fabric;

FIG. 39 is a perspective view of a portion of a piece of fabric that is gathered with a cord and locked in position with a cord lock;

FIG. 40 is a perspective view of the piece of fabric of FIG. 39 with the loop of cord lock being connected to a ring attached to another portion of the cord;

FIGS. 41 and 42 are perspective views of a piece of fabric with a handle connected to two eyelets;

FIG. 43 is a perspective view of a piece of fabric with a handle having its ends connected to one eyelet;

FIGS. 44-46 are perspective views of a bag in accordance with another embodiment of the present invention, shown at different volumes;

FIG. 47 is a perspective view of a piece of two-ply fabric incorporating a cord to gather material;

FIG. 48 is a perspective view of a piece of fabric incorporating two channels with one of the cords partly exposed;

FIG. 49 is a perspective view of a piece of padded fabric with both cords exposed;

FIG. 50 is a front plan view of a bag incorporating the cinching channel illustrated at FIG. 47;

FIG. 51 is a front plan view of a bag utilizing the cinching channel illustrated in FIG. 48;

FIG. 52 is a front plan view of a bag utilizing the channel cinching mechanism shown in FIG. 49;

FIG. 53 is a perspective view of an asymmetric table lamp;

FIG. 54 is a perspective view of the bag of FIG. 52 containing the table lamp of FIG. 53, with the bag gathered to provide a snug fit about the table lamp;

FIG. 55 is a top plan view of a bag having a multi-channel cinch mechanism so that various contents can be isolated; and

FIG. 56 is a top plan view of the bag of FIG. 55 with contents cinched and isolated from one another.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EXEMPLARY EMBODIMENTS

Referring now to FIGS. 5-7, a bag 10 in accordance with the present invention is illustrated. Bag 10 includes a shell 12 having a predetermined maximum volume as illustrated in FIG. 5. A channel 14 is sewn into the outside of shell 12. An elongated strap 16 has a first portion 18 and a second portion 20. The first portion 18 is disposed within channel 14, and is therefore hidden from view in the Figures. Second portion 20 is exposed from channel 14. Part of the exposed portion 20 forms a handle for bag 10. The size of bag 10 can be changed by moving strap 16 with respect to channel 14, thereby causing the volume of bag 10 to vary from a maximum volume (see FIG. 5) to volumes less than the maximum volume (see FIGS. 6 and 7) to accommodate for the size of the contents placed within the bag.

For example, referring now to FIGS. 8-10, bag 10 is illustrated in various shapes and volumes depending upon the contents within the bag and the user's handling preferences and/or requirements. Bag 10 utilizes the handle strap 16 as a part of the channel/cinching mechanism. The handle strap 16 extends around the bottom of the bag to snugly fit around and support the contents of the bag. The strap 16, therefore, supports the predominant weight of the bag (including its contents) and transfers these forces directly to the handle or shoulder strap 16. Therefore, the stresses applied to the bottom portion of the shell 12 are greatly reduced as compared to a conventional bag. Thus, the cinching mechanism can be incorporated into a handle or shoulder strap that wraps around the contents of the bag by gathering the bottom of the bag to fit snugly around it's contents thus traversing the weight of the bag to the cinching handle or shoulder strap. This feature decreases stress to the shell fabric and also allows less rolling of contents inside the bag.
Other types of bags in accordance with the present invention may incorporate a similar type of strap/channel gathering system as shown in FIGS. 5-10. For example, referring now to FIGS. 11-13, a knapsack 20 is illustrated. Knapsack 20 has a shell 22 and a pair of channels 24 sewn into the outside of shell 22. A strap 26 has a portion extending through channel 24. As with bag 10, strap 26 is moveable with respect to channel 24 causing the volume of the shell to vary from the maximum volume (see FIG. 11) to any number of a plurality of volumes which are less than the maximum volume (see, e.g., FIGS. 12 and 13).

Referring now to FIGS. 14-16, a messenger bag 30 is illustrated using the same strap/channel gathering system of FIGS. 5-13.

Referring now to FIGS. 17-19, a tote bag 40 using two different types of channeling techniques is illustrated. Bag 40 includes a shell 42 and a plurality of channels 44. Four straps 46 (one of which is hidden from view, and therefore not shown) are placed within the channels 44. As illustrated in FIGS. 17-19, each strap 46 has one mating portion of a snap connected to it. These snaps are preferably low-profile snaps so that each snap can easily travel through channel 44. However, those skilled in the art will readily recognize that the snaps could be of conventional size and the channel would have to be sized accordingly so that the snap can travel therethrough. Other mating portions of the snap are connected to channel 44 at predetermined spaced apart locations so that the strap can be secured in place with respect to the channel in any of a number of positions as illustrated in FIGS. 17-19. These low-profile snaps are sold under the trade name FASGRIP®, which are commercially available from Fasnaps of Elk hart, Ind.

Referring now to FIGS. 20 and 21, different methods for cinching a bag are illustrated. FIG. 21 illustrates a cinching mechanism similar to that shown on the side of bag 40 illustrated in FIGS. 17-19. Alternatively, as illustrated in FIG. 20, a cord 41 and cord lock mechanism 43 may be used to cinch the length of the side of bag 40.

For ease of illustration in the drawings, all channels have been shown on the exterior of the bag. However, one skilled in the art will readily recognize that the channels can also be sewn on the inside of the bag so that the cord loops or strap loops are disposed in the interior of the bag. It is currently preferred to place the channels on the inside of the bags so that the bags will have a less messy appearance and the straps or cord loops will not likely entangle with exterior objects. The channels themselves can be formed by stitching a row between the lining and the face of the bag, thereby creating a channel for the cinching material (e.g., cord or webbing). See, for example, the two-ply fabric bag of FIG. 47. Alternatively, the loops can be exposed on one side of the single-ply fabric through the use of a slit or an eyelet placed between the stitched channels on the same side of a single-ply fabric.

Referring now to FIGS. 22 and 23, a bag 50, similar to the bag shown in FIG. 17-19 is illustrated in FIG. 22, and bag 40 of FIGS. 17-19 is illustrated in FIG. 23. Bag 50 does not include any snaps in the handle strap for the variable positions of the bag. Thus, bag 50 is shown in approximately the same volume as bag 40, but bag 40 provides a “neater” appearance because the snaps provide for equidistance spacing along the length of the shell of the bag. Of course, either bag may be used, depending upon the preference of the user.

Referring now to FIGS. 24-26, bag 60 is illustrated having a shell 62 with channels 64 sewn therein. A strap 66 is placed within each channel 64. As in the embodiment illustrated in FIGS. 17-19, strap 66 has one mating portion 68 of a low-profile snap attached to it. Similarly, the other mating portion of the snap is sewn into the channel at a plurality of predetermined locations within each channel so that bag 60 can be locked in a variety of different specific lengths, each corresponding to a different volume. However, unlike the embodiment illustrated in FIGS. 17-19, straps 66 do not form a handle for bag 60. In accordance with this embodiment, a separate handle 69 is provided for bag 60. Thus, handle 69 remains the same length regardless of the volume of bag 60.

Referring now to FIGS. 27-29, another bag 70 in accordance with the present invention is illustrated. Bag 70 includes a handle 79 whose length does not vary regardless of the size of bag 70. A separate cinching strap 78 is placed within channel 74 so that the size of bag 60 can be varied.

Referring now to FIGS. 30-32, another bag 80, 80′, respectively, in accordance with the present invention is illustrated. Strap 86, 86′, 86″, in each of these embodiments, is secured at the base of the shell to minimize the twisting of the strap along the bottom of the bag.

FIG. 30 illustrates strap 86 being stitched at the side of the bag by a box stitch 81. FIG. 31 illustrates strap 86′ and channel 84′ terminating at a base panel 83′ that is stitched in place. Bag 80′ of FIG. 32 includes straps 86″ being securely locked in place at the base of the bag within its respective channel by having strap 86″ being locked in place at the base via the snaps. Thus, straps 86″ do not move with respect to their channels respective 84″ at the base of bag 80″.

Referring now to FIGS. 33-36, the cinching of a cord 91 channeled through a conduit that is stitched to the surface of the bag fabric 93 is illustrated. A portion of the fabric 93 in the uncinched state is illustrated in FIG. 33. By pulling on cord 91, fabric material 93 begins to cinch, as illustrated in FIG. 34. Once the desired amount of material has been cinched or gathered, the cord can be locked in place, for example, by creating a knot in the cord, as illustrated in FIG. 35, or through the use of a cord lock 95 as illustrated in FIG. 36.

Referring now to FIGS. 37 and 38, the cinching of material 93 is illustrated with the use of strap or webbing 97. As shown in FIG. 37, a pair of D-rings 99 are used to act as a stopper because the D-rings are larger than the channel opening 94. To cinch material 93, excess strap or webbing 97 is pulled between the two D-rings 99, thereby gathering material 93. The D-rings thereafter prevent the excess strap 97 from traversing back through the D-ring. As illustrated in FIG. 38, low profile snaps of alternating mating halves are placed on straps 97. Thus, to gather or cinch material 93, strap 97 is pulled through the exposed portion of the channel and then once the desired amount of material has been gathered, at least two (and preferably more) mating portions of the snaps on strap 97 are connected together to maintain the desired gathered amount of material 93.
Referring now to FIGS. 39 and 40, the tying down of cord 91 is illustrated. As illustrated in FIG. 39, the desired amount of material 93 is gathered by pulling cord 91 through cord lock 95. Once the desired amount of cord has been pulled through cord lock 95, the end of the loop of cord 91 can then be connected via a hook through a ring or eyelet 101 that can be attached to another portion of the cord 91 or to any other portion of the bag as may be available.

Referring now to FIGS. 41-43, the use of a ring/eyelet hardware 101 for attaching a carrying strap 103 to any one of the bags in accordance with the present invention is illustrated. The ends of strap 103 can be attached to one ring (see FIG. 43) or to a pair of rings at different spaced apart distances depending on the use and desired length of the carrying strap (see FIGS. 41 and 42).

Referring now to FIGS. 44-46, a cartesion channel system for gathering bag 110 into different shapes is illustrated. Bag 110 is illustrated in FIGS. 45 and 46 fitting snugly about two different contents. Bag 110 includes a shell 112 and a plurality of channels 114. A cord 116 is placed within each of the channels 114. A cord lock is placed at the location where each of the cords is exposed so that the cord can be secure at the desired fabric gathered position. Additionally, handle straps similar to those illustrated in FIGS. 41-43, can be incorporated into bag 110 as illustrated in FIG. 46. These custom shaped bags permit the user to carry the weight of the bag and its contents along the cinched cords, thereby providing a more secure grip. Additionally, the user is permitted to shape the bag snugly around the contents to allow for better handling and less roll of the contents within the bag. The user is also better able to determine the proper orientation of the contents of the bag, which is especially important for contents that should only be handled in a “right side up” manner.

Referring now to FIGS. 47-49, a cinching channel 94 is illustrated. Cinching channel 94 is created by sewing two plies of fabric 93 with two turned back stitch openings to expose the threaded cord 91, as illustrated in FIG. 47.

FIG. 48 shows two channels 94 criss-crossing with one cord 91 partly exposed.

FIG. 49 illustrates two channels 94 criss-crossing with both cords 91 partly exposed. The cinching channels 94 shown in FIG. 49 provides a user with more cinching options than the cinching channels 94 illustrated in FIG. 48 because both cords 91 are exposed in the FIG. 49 embodiment. In other words, the gathering can be formed on two axes, that are shown perpendicular to each other, but are not limited to this exact angular relationship. The channels can intersect at any desired angle. Additionally, FIG. 49 illustrates the use of a padded fabric 93 that can be used to increase the protection for the contents of the bag, especially should they be fragile. The cords 91 can be pulled at their exposed locations from the channels to cinch or compress the padded fabric snugly around the fragile contents.

Referring now to FIGS. 50-52, cinching channels are placed on an angle with respect to the longitudinal axis of the bag and with respect to the opening to bag 130, 130, 130. Referring now to FIG. 50, the cinching channel illustrated in FIG. 47 is utilized with bag 130. Bag 130, illustrated in FIG. 51, utilizes the cinching channel illustrated in FIG. 48. Bag 130, illustrated in FIG. 52, utilizes the channel cinching mechanism shown in FIG. 49. In addition, the cinching mechanism illustrated in FIG. 52 continues around the front, back and sides of the bag, whereas the embodiments shown in FIGS. 50 and 51 terminate at the side channels of the bag. Because there are so many cinching locations in the bag illustrated in FIGS. 50, 52, there are virtually an infinite number of custom cinching channel configurations that can be formed from any one of the bags 130, 130, 130.

An example of a custom fit provided by bag 130° is illustrated in FIG. 54. The asymmetric table lamp 140 shown in FIG. 53 has been placed within bag 130°, and bag 130° has cinched to provide a snug fit about lamp 140 as illustrated in FIG. 54.

Referring now to FIGS. 55 and 56, a bag 140 having a pair of channels 144 and a pair of straps 146 is illustrated. The cinching channels 144 can be, for example, customized (not necessarily in a regular pattern) so that specific contents can be isolated within various channel sections 151, 153, 155, 157 of the bag. In this embodiment, channels 144 are formed by stitching the front panel to the back panel of the bag, thereby dividing bag 140 into four separate quadrants. Each quadrant is accessible by a zipper opening about the circular periphery of the bag. A separate slide 147 is provided to access each quadrant. Thus, multiple specific contents can be placed within bag 140 and each item can be isolated in their respective gathered areas 151, 153, 155, 157 that are bounded by channels (see FIG. 56).

Having described the presently preferred exemplary embodiment of a bag with variable volume in accordance with the present invention, it is believed that other modifications, variations and changes will be suggested to those skilled in the art in view of the teachings set forth herein.

It is, therefore, to be understood that all such modifications, variations, and changes are believed to fall within the scope of the present invention as defined by the appended claims.

What is claimed is:
1. A bag of variable volume comprising:
   a. a shell having a predetermined maximum volume;
   b. a channel being connected to said shell;
   c. an elongated strip having a first portion and a second portion, said first portion being disposed within said channel, said second portion being exposed from said channel;
   d. wherein said strip is moveable with respect to said channel causing a portion of said first portion to be exposed from said channel and the volume of said shell to vary from said maximum volume to a plurality of volumes less than said maximum volume.
2. The bag according to claim 1, wherein said elongated strip is a strap which forms a handle for said shell.
3. The bag according to claim 1, wherein said channel is formed on the exterior of said shell.
4. The bag according to claim 1, wherein said channel is formed on the interior of said shell.
5. The bag according to claim 1, wherein said shell is formed of two plies of material, wherein said channel is
formed by sewing said two plies together to thereby form said channel to receive said strip.

6. The bag according to claim 1, wherein said strip is a cord that is selectively locked in position by a cord lock.

7. The bag according to claim 1, wherein said strip is a strap that is selectively locked in position by a snap.

8. The bag according to claim 7, wherein said snap includes one mating half mounted on said strap and another mating half mounted in said channel.

9. The bag according to claim 7, wherein said snap has alternating mating halves mounted thereon.

10. The bag according to claim 1, further comprising a handle being attached to said shell.

11. The bag according to claim 10, wherein said handle has a length that remains essentially constant regardless of said volume of said shell.

12. The bag according to claim 1, wherein said shell has an opening, said strip is secured to said shell at a location remote from said opening.

13. The bag according to claim 1, further comprising at least a second channel connected to said shell, and a second elongated strip of material having a first portion and a second portion, said first portion of said second strip being disposed within said second channel, and said second portion of said second strip being exposed from said second channel, wherein and said second strip is moveable with respect to said second channel causing the volume of said shell to vary from said maximum volume to a plurality of volumes less than said maximum volume.

14. The bag of claim 13, wherein said first and second strips are approximately disposed at a right angle with respect to each other.

15. The bag of claim 14, wherein said first and second strips are approximately disposed at an acute angle with respect to an opening in said shell.

16. The bag of claim 15, wherein said acute angle is approximately 45°.

17. The bag of claim 13, wherein said first strip is approximately disposed at approximately a 90° angle with respect to an opening in said shell.

18. The bag of claim 1, wherein said channel is formed by sewing a strip of fabric to said shell to thereby form said channel to receive said strip.

19. The bag of claim 1, wherein said bag has a selectively openable and closable opening, said strip being moveable independent of said selectively openable and closable opening.

20. The bag of claim 1, wherein said channel is formed in a plurality of circumferences around said shell.

21. The bag of claim 2, wherein said strap extends around a bottom portion of said shell to support said shell and gathers a bottom portion of said shell to snugly fit around contents of said bag, thereby the weight of said contents is transferred substantially directly to said strap.

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