BULK BAG WITH PERFORATED SECTIONS

Applicant: North American Salt Company, Overland Park, KS (US)

Inventors: Kevin Thimmesch, Overland Park, KS (US); Kurt Strater, Plattsburgh, NY (US)

Assignee: North American Salt Company, Overland Park, KS (US)

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ABSTRACT

A novel bag for holding, transporting, and pouring a bulk product is provided. In one embodiment, the bag comprises a curved, perforated section at one corner. The section can be removed by tearing along the perforation, thus forming a spout for pouring the product from the bag. In another embodiment, the bag further comprises a second perforated section extending the majority of the way (and preferably the entire way) horizontally across the bag. In this embodiment, the bag could alternatively, or additionally, be opened by tearing along the second set of perforations and separating the resulting two sections of the bag. The bag is typically formed of plastic, and can be used for salt, animal food, and other pourable products.
Fig. 3.
Fig. 5.
BULK BAG WITH PERFORATED SECTIONS

RELATED APPLICATIONS


BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention is broadly concerned with the field of bags for holding pourable products such as salt. More particularly, the inventive bags have a curved, perforated section at one corner and, in some embodiments a second perforated section that extends substantially, and preferably entirely, horizontally across the bag, for removal and pouring of the product from the bag.

[0004] 2. Description of the Prior Art

[0005] Bag are commonly used to hold and transport pourable products (i.e., products comprising numerous small pieces). Such products include salt cubes or pellets, animal food, flour, and sugar, to name a few. These pourable products are typically sold in large quantities (e.g., 30-50 lbs.) and in bulk sizes that are difficult for the average person to handle. Even more difficult than carrying these bags is pouring the product from the bulky bag. That is, the consumer must open the bag, attempt to pick up the very heavy bag, and carefully pour the product in a controlled manner. This often results in spilling of the product, which goes from not coming out at all to rapidly falling from the bag and outside of the target area. There is a need for a bag that can be more easily opened at the point of use, as well as more easily poured with minimal or no spillage.

SUMMARY OF THE INVENTION

[0006] In one embodiment, the invention provides a bag for holding a pourable product. The bag comprises front and back panels comprising first and second end portions presenting respective outermost edges, and first and second side portions presenting respective outermost edges. The front and back panels and the end and side portions cooperate to form a chamber for holding the pourable product, with the first end portion and the first side portion cooperating to form a first corner. The panels further comprise a seam extending between the first and second side portion outermost edges. The front and back panels comprise perforations at the first corner, and the perforations extend in a non-linear fashion from the outermost edge of the first end portion to the outermost edge of the first side portion. The perforations have a radius of curvature of from about 3 inches to about 4 inches when measured from a point that is about 0.25 inches to about 2 inches from the seam and about 0.1 inches to about 0.75 inches from the outermost edge of the first side portion.

[0007] In a further embodiment, the bag comprises front and back panels each comprising first and second end portions presenting respective outermost edges, and first and second side portions presenting respective outermost edges. The front and back panels and the end and side portions cooperate to form a chamber for holding the pourable product, with the first end portion and the first side portion cooperating to form a first corner. The panels further comprise perforations at the first corner, with the perforations extending in a non-linear fashion from the outermost edge of the first end portion to the outermost edge of the first side portion. Finally, the panels comprise a handle adjacent at least one of the first and second end portions and integrally formed with the bag.

[0008] In another embodiment, a method of using the above inventive bags is provided. The method comprises tearing the front and back panels at the perforations to form an opening, and causing the pourable product to exit the bag from the opening, preferably by tilting the bag.

[0009] In a further embodiment, the invention provides a bag for holding a pourable product. The bag comprises front and back panels comprising first and second end portions presenting respective outermost edges, and first and second side portions presenting respective outermost edges. The front and back panels and the end and side portions cooperate to form a chamber for holding the pourable product. The bag has a width “W,” defined as the shortest distance between the respective outermost edges of said first and second side portions, and the first end portion and the first side portion cooperate to form a first corner. The front and back panels comprise a first set of perforations at the first corner, and the first set of perforations extend in a non-linear fashion from the outermost edge of the first end portion, or from a seam or area near to said outermost edge of said first end portion, to the outermost edge of the first side portion. The front and back panels further comprise a second set of perforations extending from at least one of the respective outermost edges of the first and second side portions a distance of at least about 50% of “W,” towards the other of the respective outermost edges of the first and second side portions.

[0010] In yet a further embodiment, a method of using the above inventive bag is provided. The method comprises tearing the first corner at the first set of perforations to form a first opening, or at the second set of perforations to form a second opening, or at both the first and second sets of perforations to form first and second openings. The pourable product is then caused to exit the bag from the opening or the first and second openings, preferably by tilting the bag.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a front elevation view of one embodiment of a bag according to the invention;

[0012] FIG. 2 is a rear elevation view of the bag of FIG. 1;

[0013] FIG. 3 is a front elevation view illustrating the dimensions of the bag of FIG. 1;

[0014] FIG. 4 is a front elevation view of an alternative embodiment of the bag according to the invention;

[0015] FIG. 5 is a rear elevation view of the bag of FIG. 4; and

[0016] FIG. 6 is a front elevation view illustrating the dimensions of the bag of FIG. 4.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Bag with Curved Perforations Only

[0017] With reference to FIGS. 1-3, a bag 10 is illustrated. Bag 10 includes a front panel 12 and a back panel 14. As
shown, front and back panels 12, 14 are flat to demonstrate their respective shapes before being filled with product. Front panel 12 and back panel 14 share a first end portion 16 and a second end portion 18.

[0018] Front panel 12 and back panel 14 further share a first side portion 20 and a second side portion 22. First and second end portions 16, 18 and first and second side portions 20, 22 present respective outermost edges 24a-d, which define an outer boundary or periphery 26 of the bag 10. Outermost edges 24a and 24b oppose, and are substantially parallel to, one another, while outermost edges 24c and 24d oppose, and are substantially parallel to, one another. Furthermore, outermost edges 24c and 24d are substantially perpendicular to outermost edges 24a and 24b.

[0019] Each of the first and second end portions 16, 18 intersects with first and second side portions 20, 22 at corners 28a-d. Front and back panels 12, 14, first and second end portions 16, 18, and first and second side portions 20, 22 cooperate to form a chamber for holding a pourable product.

[0020] First end portion 16 comprises a first horizontal seam 30 spaced apart from outermost edge 24a, thus forming a flap 32 in first end portion 16. First horizontal seam 30 has a thickness of from about 1/16 inch to about 1/4 inch (more preferably about 1/8 inch) and is substantially parallel to outermost edge 24a. Flap 32 comprises a handle 34 formed therein. Handle 34 comprises a patch 36 that is heat-sealed to the flap 32. Patch 36 could be heat-sealed on either side of the flap 32 (i.e., on front panel 12 or on back panel 14), or on both sides if extra strength is required. Patch 36 can be any material typically used for bags carrying bulk products, including plastics such as linear low density polyethylene (LLDPE). A C-shaped grip 38 is formed through patch 36 and flap 32 to form an opening, through which a user may place his or her fingers during carrying, pouring, etc.

[0021] Outermost edge 24c of first end portion 16 is bisected by centerline 40 (see FIG. 3). In a preferred embodiment, handle 34 is positioned such that some portion of the grip 38 falls upon the centerline 40. Also, while it will be appreciated that the handle 34 is integrally formed with the bag 10 (and particularly with flap 32) as described above, one may also substitute an integrally formed handle with a separately formed handle that is then physically attached to the bag 10.

Also, flap 32 could include a small opening (not shown) in or around corner 28b to provide a place for the user to place his or her finger during pouring to assist with that process.

[0022] First end portion 16 also comprises a pouring spout 42, preferably at corner 28a. In the preferred embodiment, the spout 42 comprises perforations 44, which allow for easy opening of the spout 42 at the time of use.

[0023] As shown in the figures, perforations 44 are in the form of a curved (i.e., non-linear) pattern rather than a straight line as found in prior art bags. Perforations 44 intersect outermost edge 24a at point 45a and outermost edge 24c at point 45b approximately (+5°, preferably)+2° a 90° angle. The radius of curvature "R" (see FIG. 3) is preferably from about 3 inches to about 4 inches, and more preferably about 3.5 inches. Furthermore, the radius of curvature "R" is measured at a point that is set in from the corner of the bag, at distances D3 and D4. This non-linear pattern allows product to be more easily poured from open spout 42 as the opening is less prone to closing up on itself. Furthermore, the offset radius of curvature shifts the opening created by spout 42 downwardly towards the pourable product, making the product more flowable from the bag. Advantageously, this design results in an opening at spout 44 that has a cross-sectional area of from about 4 in², to about 31 in², preferably from about 9 in² to about 28 in², and more preferably from about 13 in² to about 19 in². This design yields a bag that can be emptied 15-20% more quickly than prior art bags.

[0024] The perforation 44 also preferably includes a “starter split” 43 through first horizontal seam 30. Starter split 43 is an area of weakness that renders perforation 44 easier to tear. Unlike prior art bags, starter split 43 is actually integral within first horizontal seam 30 so that the seam 30 does not hinder tearing due to the inherent perforation weakness.

[0025] Finally, the bag 10 preferably has a side panel 46. Side panel 46 is essentially a lay-flat fold whose width is defined by a turn axis 48. Side panel 46 allows for expansion of the bag upon filling with the pourable product.

[0026] Referring to FIG. 3, several dimensions of the inventive bag 10 have been defined. The ranges for those dimensions are shown in Table 1.

<table>
<thead>
<tr>
<th>Dimension from FIG. 3</th>
<th>Broad Range (inches)</th>
<th>Preferred Range (inches)</th>
<th>Most Preferred Range (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>about 20 to about 25</td>
<td>about 24 to about 30</td>
<td>about 26 to about 28</td>
</tr>
<tr>
<td>W</td>
<td>about 10 to about 24</td>
<td>about 14 to about 20</td>
<td>about 15 to about 18</td>
</tr>
<tr>
<td>D1</td>
<td>about 5 to about 8</td>
<td>about 5.5 to about 7.5</td>
<td>about 5.8 to about 7</td>
</tr>
<tr>
<td>D2</td>
<td>about 4.5 to about 7</td>
<td>about 5 to about 6.5</td>
<td>about 5 to about 6</td>
</tr>
<tr>
<td>D3</td>
<td>about 2 to about 3.5</td>
<td>about 2.2 to about 3</td>
<td>about 2.4 to about 2.8</td>
</tr>
<tr>
<td>D4</td>
<td>about 2.5 to about 5</td>
<td>about 3 to about 5</td>
<td>about 3.2 to about 4.5</td>
</tr>
<tr>
<td>D5</td>
<td>about 2 to about 4</td>
<td>about 2.5 to about 4.5</td>
<td>about 2.9 to about 3.2</td>
</tr>
<tr>
<td>D6</td>
<td>about 0.25 to about 2</td>
<td>about 0.75 to about 1.25</td>
<td>about 1</td>
</tr>
<tr>
<td>D7</td>
<td>about 0.1 to about 0.75</td>
<td>about 0.2 to about 0.75</td>
<td>about 0.375</td>
</tr>
<tr>
<td>L1</td>
<td>about 17 to about 30</td>
<td>about 20 to about 28</td>
<td>about 22 to about 26</td>
</tr>
<tr>
<td>D1/D1<em>D2</em>D3</td>
<td>about 0.8 to about 1.7</td>
<td>about 1 to about 1.5</td>
<td>about 1.1 to about 1.3</td>
</tr>
<tr>
<td>W/D2<em>D3</em>D4</td>
<td>about 2 to about 5</td>
<td>about 3 to about 4.5</td>
<td>about 3.5 to about 4</td>
</tr>
<tr>
<td>W/D2**</td>
<td>about 1.5 to about 5</td>
<td>about 2 to about 4</td>
<td>about 2.5 to about 3</td>
</tr>
</tbody>
</table>

*Unitless

[0027] This embodiment of the inventive bag 10 can be manufactured by various methods, but the preferred method is described herein. First, a tube or sleeve of plastic is cut to the desired length (represented by “L” in FIG. 3). The plastic of which the inventive bag is formed can be any material typically used to form bags carrying bulk products. The plas-
tic should be flexible and stretchable so that the bag collapses as the bulk product is poured from the bag. Preferably, the plastic of which the bag is formed stretches from about 1 to about 2 times at yield, and more preferably about 1.5 times at yield. Furthermore, it is preferred that the bag be formed of a plastic that stretches at least about 4 times, preferably at least about 5 times, and more preferably from about 5 to about 7 times at its break point. Thus, the preferred plastic has an ASTM D882 percent elongation of from about 200% to about 800%, preferably from about 400% to about 700%, and most preferably from about 500% to about 650%. The thickness of the preferred plastic is from about 0.2 to about 14 mil, preferably from about 0.4 to about 10 mil, and more preferably from about 6 mil to about 8 mil. The most preferred material is LLDPE.

[0028] A heat seal is then applied at first end portion 16 in order to form horizontal seam 30. A film (typically having a 10-mil thickness) is heat-sealed to flap 32 to form patch 36. C-shaped grip 38 is then cut (e.g., die-cut) through the patch 36 and flap 32, thus forming handle 34, which serves as the primary carrying handle. The perforations 44 can be added at this time according to conventional methods in order to form pouring spout 42.

[0029] The manufactured bag can then be stored until needed, or immediately filled and sealed. Either way, after the bag 10 is filled to the desired level, a final heat seal is applied at second end portion 18 to create second horizontal seam 35, making the filled bag 10 ready for distribution. It will be appreciated that the inventive bag 10 can be used to transport and store numerous types of pourable products, including cubes, pellets, tablets, powders, compacted pieces, and/or granules of those selected from the group consisting of: salt (e.g., water softening, pool treatment, deicing, etc.); animal food (e.g., bird seed, grain, dog or cat food); bulk flour or sugar; cement; seed (e.g., grass seed) and other lawn and garden products; fertilizers; ice; sand; rice; spices; soil (including soil mixtures); pesticides (e.g., fire ant treatments); industrial chemicals; mortar; plaster; marble dust; stones (including pebbles and gravel); and constructions products. Such products will typically cause the bags to weigh from about 20 lbs to about 100 lbs., and more typically from about 40 lbs. to about 60 lbs.

[0030] In use and before pouring, a user would tear corner 28a at perforations 44 in order to remove (or at least partially remove) corner 28a at spout 42. This forms an opening at spout 42, rendering spout 42 ready for pouring. This controlled pouring allows for fairly exact dispensing of the product, while preventing spillage and waste of the product.

Bag with Curved and Full Perforations

[0031] FIGS. 4-6 show an alternative embodiment of the invention. In this embodiment, a bag 10a is illustrated, with like numbering being used to show like parts from FIGS. 1-3. Bag 10a includes a front panel 12 and a back panel 14. As shown, front and back panels 12, 14 are flat to demonstrate their respective shapes before being filled with product. Front panel 12 and back panel 14 share a first end portion 16 and a second end portion 18.

[0032] Front panel 12 and back panel 14 further share a first side portion 20 and a second side portion 22. First and second end portions 16, 18 and first and second side portions 20, 22 present respective outermost edges 24a-d, which define an outer boundary or periphery 26 of the bag 10a. Outermost edges 24a and 24b oppose, and are substantially parallel to, one another, while outermost edges 24c and 24d oppose, and are substantially parallel to, one another. Furthermore, outermost edges 24c and 24d are substantially perpendicular to outermost edges 24a and 24b.

[0033] Each of the first and second end portions 16, 18 intersects with first and second side portions 20, 22 at corners 28a-d. Front and back panels 12, 14, first and second end portions 16, 18, and first and second side portions 20, 22 cooperate to form a chamber for holding a pourable product.

[0034] First end portion 16 comprises a first horizontal seam 30 spaced apart from outermost edge 24a, thus forming a flap 32 in first end portion 16. First horizontal seam 30 has a thickness of from about 1/8 in to about 1/4 in (and more preferably about 1/5 in) and is substantially parallel to outermost edge 24a. Flap 32 comprises a handle 34 formed therein. Handle 34 comprises a patch 36 that is heat-sealed to the flap 32. Patch 36 could be heat-sealed to either side of the flap 32 (i.e., on front panel 12 or on back panel 14), or on both sides if extra strength is required. Patch 36 can be any material typically used for bags carrying bulk products, including plastics such as linear low density polyethylene (LLDPE). A C-shaped grip 38 is formed through patch 36 and flap 32 to form an opening, through which a user may place his or her fingers during pouring, carrying, etc.

[0035] Outmost edge 24a of first end portion 16 is bisected by centerline 40 (see FIG. 4). In a preferred embodiment, handle 34 is positioned such that some portion of the grip 38 falls upon the centerline 40. Also, while it will be appreciated that the handle 34 is integrally formed with the bag 10a (and particularly with flap 32) as described above, one may also substitute an integrally formed handle with a separately formed handle that is then physically attached to the bag 10a. Also, flap 32 could include a small opening (not shown) in or around corner 28b to provide a place for the user to place his or her finger during pouring to assist with that process.

[0036] First end portion 16 also comprises a pouring spout 42, preferably at corner 28a. In the preferred embodiment, the spout 42 comprises a first set of perforations 44, which allow for easy opening of the spout 42 at the time of use.

[0037] As shown in the figures, perforations 44 are in the form of a curved (i.e., non-linear) pattern rather than a straight line as found in prior art bags. Perforations 44 intersect first horizontal seam at point 45a and outermost edge 24c at point 45b approximately (±5°, preferably ±2°) a 90° angle. The radius of curvature “R” (see FIG. 6) is preferably from about 3 inches to about 4 inches, and more preferably from 3.5 inches. Furthermore, the radius of curvature “R” is measured at a point that is set in from the corner of the bag, at distances D’ and D”.

[0038] As was true with bag 10, perforation 44 of bag 10a also preferably includes a “starter slit” 43 through first horizontal seam 30. Starter slit 43 is an area of weakness that renders perforation 44 easier to tear. Unlike prior art bags,
starter slit 43 is actually present within first horizontal seam 30 so that the seam 30 does not hinder tearing due to inherent perforation weakness.

The bag 10a further comprises a second set of perforations 52 in front and back panels 12, 14. Perforations 52 provide an area where the front and back panels 12, 14 can be separated, creating an alternative, or additional, opening for pouring of product from the bag 10a. Ideally, perforations 52 form a pattern that is linear in nature, and substantially parallel to outermost edges 24a, 24b, and substantially perpendicular to outermost edges 24c, 24d. The figures depict perforations 52 extending from outermost edge 24c to outermost edge 24d; however, in some embodiments, the perforations 52 do not extend entirely across the width “W” of the front and back panels 12, 14. However, it is preferred that the perforations 52 extend at least about 50% of “W,” preferably at least about 75% of “W,” and more preferably about 100% of “W.” Furthermore, although the figures show the perforations 52 at a distance “D” from outermost edge 24b, it will be appreciated that the perforations 52 can be positioned anywhere along the length “L” of the front and back panels 12, 14, provided perforations 52 are at least about 0.5 inches, and preferably at least about 1 inch, from first horizontal seam 30 and outermost edge 24b. The second set of perforations 52 provide a “total dump” option to the user, when a spout 42 is not needed or desired.

The bag 10a also preferably has a side panel 54. Side panel 54 is essentially a lay-flat fold whose width is defined by a turn axis 56. Side panel 54 allows for expansion of the bag upon filling with the pourable product.

Referring to FIG. 6, several dimensions of the inventive bag 10a have been defined. The ranges for those dimensions are shown in Table 2.

<table>
<thead>
<tr>
<th>Dimension from FIG. 3</th>
<th>Preferred Range (inches)</th>
<th>Most Preferred Range (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>about 20 to about 35</td>
<td>about 24 to about 30</td>
</tr>
<tr>
<td>W</td>
<td>about 10 to about 24</td>
<td>about 14 to about 20</td>
</tr>
<tr>
<td>D</td>
<td>about 5 to about 8</td>
<td>about 5.5 to about 7.5</td>
</tr>
<tr>
<td>D1</td>
<td>about 4.5 to about 7</td>
<td>about 5 to about 6.5</td>
</tr>
<tr>
<td>D2</td>
<td>about 2 to about 3.5</td>
<td>about 2.2 to about 3</td>
</tr>
<tr>
<td>D3</td>
<td>about 2.5 to about 5.5</td>
<td>about 3 to about 5</td>
</tr>
<tr>
<td>D4</td>
<td>about 2 to about 4</td>
<td>about 2.5 to about 4.5</td>
</tr>
<tr>
<td>D5</td>
<td>about 0.25 to about 2</td>
<td>about 0.75 to about 1.25</td>
</tr>
<tr>
<td>D6</td>
<td>about 0.1 to about 0.75</td>
<td>about 0.2 to about 0.5</td>
</tr>
<tr>
<td>D7</td>
<td>about 0.5 to about 10</td>
<td>about 2 to about 8</td>
</tr>
<tr>
<td>L1</td>
<td>about 17 to about 30</td>
<td>about 20 to about 28</td>
</tr>
<tr>
<td>D1/D2</td>
<td>about 0.8 to about 1.7</td>
<td>about 1 to about 1.5</td>
</tr>
<tr>
<td>L1/D1</td>
<td>about 2 to about 5</td>
<td>about 3 to about 4.5</td>
</tr>
<tr>
<td>W/D1</td>
<td>about 1.5 to about 5</td>
<td>about 2.5 to about 3</td>
</tr>
</tbody>
</table>

**Unless otherwise specified.

As was true with the first embodiment (bag 10), the inventive bag 10a can be manufactured by various methods, but the preferred method is described herein. First, a tube or sleeve of plastic is cut to the desired length (represented by “L” in FIG. 6). The plastic of which the inventive bag is formed can be any material typically used to form bags carrying bulk products. The plastic should be flexible and stretchable so that the bag collapses as the bulk product is poured from the bag. Preferably, the plastic of which the bag is formed stretches from about 1 to about 2 times at yield, and more preferably about 1.5 times at yield. Furthermore, it is preferred that the bag be formed of a plastic that stretches at least about 4 times, preferably at least about 5 times, and more preferably from about 5 to about 7 times at its break point. Thus, the preferred plastic has an ASTM D882 percent elongation of from about 200% to about 300%, preferably from about 400% to about 700%, and more preferably from about 500% to about 650%. The thickness of the preferred plastic is from about 2 mil to about 14 mil, preferably from about 4 mil to about 10 mil, and more preferably from about 6 mil to about 8 mil. The most preferred material is LLDPE.

A heat seal is then applied at first end portion 16 in order to form horizontal seam 30. A film (typically having a 10-mil thickness) is heat-sealed to flap 32 to form patch 36. C-shaped grip 38 is then cut (e.g., die-cut) through the patch 36 and flap 32, thus forming handle 34, which serves as the primary carrying handle. The perforations 44 and 52 can be added at this time according to conventional methods.

The manufactured bag can then be stored until needed, or immediately filled and sealed. Either way, after the bag 10a is filled to the desired level, a final heat seal is applied at second end portion 18 to create second horizontal seam 58, making the filled bag 10a ready for distribution. It will be appreciated that the inventive bag 10a can be used to transport and store numerous types of pourable products, including cubes, pellets, tablets, powders, compacted pieces, and/or granules of those selected from the group consisting of: salt (e.g., water softening, pool treatment, deicing, etc.); animal food (e.g., bird seed, grain, dog or cat food); bulk flour or sugar; cement; seed (e.g., grass seed) and other lawn and garden products; fertilizers; ice; sand; rice; spices; soil (including soil mixtures); pesticides (e.g., fire ant treatments); industrial chemicals; mortar; plaster; marble dust; stones (including pebbles and gravel); and constructions products. Such products will typically cause the bags to weigh from about 20 lbs. to about 100 lbs., and more typically from about 40 lbs. to about 60 lbs.

It will be appreciated that the present invention provides the user for more than one option for removing the product from the bag. In use and before pouring, one option allows a user to tear corner 28a at perforations 44 in order to remove (or at least partially remove) corner 28a at spout 42. This forms an opening at spout 42, rendering spout 42 ready.
for pouring. This controlled pouring allows for fairly exact dispensing of the product, while preventing spillage and waste of the product.

[0046] Another option allows a user to tear the front and back panels 12, 14 at perforations 52 in order to separate (or at least partially separate) strip 60 from the remainder 62 of bag 10a. It will be appreciated that this allows for easy pouring of the product from the bag 10a. This controlled pouring allows for fairly exact dispensing of the product, while preventing spillage and waste of the product. This type of opening is particularly advantageous in situations where the bag is being poured into a large opening. The user can just lay the bag on top of the large opening and use both hands to tear perforations 52 and separate strip 60 from remainder 62, thus avoiding the need to hold and tilt a heavy bag during product removal.

[0047] As yet a further option, the user could tear both the perforations 44 and the perforations 52 to form two openings, and use both openings to remove the product from the bag. It will be appreciated that these options allow the end user to select the best option for his/her particular use, environment, strength, etc.

[0048] Regardless of whether the inventive bag is provided as bag 10 or bag 10a, it should include a number of features and properties that give it advantages over the prior art. For example, perforations 44 and 52 should tear easily at the time of use, but at the same time should be sufficiently strong that they do not tear before desired, thus allowing spilling of the product.

[0049] Additionally, the inventive bags 10, 10a must be sturdy enough to be not damaged upon dropping. More specifically, the bags 10, 10a should pass a six-sided drop test.

We claim:

1. A bag for holding a pourable product, said bag comprising front and back panels each comprising:
   first and second end portions presenting respective outermost edges;
   first and second side portions presenting respective outermost edges, said front and back panels and said end and side portions cooperating to form a chamber for holding the pourable product, said first end portion and said first side portion cooperating to form a first corner;
   a seam extending between the first and second side portion outermost edges; and
   perforations at said first corner, said perforations extending in a non-linear fashion from the outermost edge of said first end portion, to the outermost edge of said first side portion, said perforations having a radius of curvature of from about 3 inches to about 4 inches when measured from a point that is about 0.25 inches to about 2 inches from said seam and about 0.1 inches to about 0.75 inches from the outermost edge of said first side portion.

2. The bag of claim 1, said bag further comprising a handle adjacent at least one of said first and second end portions.

3. The bag of claim 2, wherein said handle is at said first end portion.

4. The bag of claim 2, wherein said handle is integrally formed with said bag.

5. The bag of claim 1, wherein said chamber includes therein a quantity of pourable product, said product being selected from the group consisting of salt, animal food, flour, sugar, cement, seed, fertilizer, ice, sand, rice, spices, soil, pesticides, industrial chemicals, mortar, plaster, marble dust, and stones.

6. A method of dispensing a pourable product from a bag, the method comprising:
   providing a bag comprising:
   front and back panels each comprising:
   first and second end portions presenting respective outermost edges;
   first and second side portions presenting respective outermost edges, said front and back panels and said end and side portions cooperating to form a chamber for holding the pourable product, said first end portion and said first side portion cooperating to form a first corner;
   a seam extending between the first and second side portion outermost edges; and
   perforations at said first corner, said perforations extending in a non-linear fashion from the outermost edge of said first end portion, to the outermost edge of said first side portion, said perforations having a radius of curvature of from about 3 inches to about 4 inches when measured from a point that is about 0.25 inches to about 2 inches from said seam and about 0.1 inches to about 0.75 inches from the outermost edge of said first side portion;
   and
   a quantity of the pourable product in said chamber;
   tearing said first corner at said perforations to form an opening; and
   causing said pourable product to exit the bag through the opening.

7. The method of claim 6, wherein said tearing comprises removing said first corner.

8. The method of claim 6, said bag further comprising a handle adjacent at least one of said first and second end portions.

9. The method of claim 8, wherein said handle is at said first end portion.

10. The method of claim 8, wherein said handle is integrally formed with said bag.

11. The method of claim 6, wherein said pourable product is selected from the group consisting of salt, animal food, flour, sugar, cement, seed, fertilizer, ice, sand, rice, spices, soil, pesticides, industrial chemicals, mortar, plaster, marble dust, and stones.

12. The method of claim 8, further comprising gripping said handle while causing said product to exit said bag.

13. The method of claim 6, wherein said causing comprises tilting said bag.

14. A bag for holding a pourable product, said bag comprising front and back panels each comprising:
   first and second end portions presenting respective outermost edges;
   first and second side portions presenting respective outermost edges, said front and back panels and said end and side portions cooperating to form a chamber for holding the pourable product, said first end portion and said first side portion cooperating to form a first corner;
   perforations at said first corner, said perforations extending in a non-linear fashion from the outermost edge of said first end portion to the outermost edge of said first side portion;
   and
   a handle adjacent at least one of said first and second end portions and integrally formed with said bag.

15. The bag of claim 14, wherein said handle is at said first end portion.
16. The bag of claim 14, wherein said chamber includes therein a quantity of pourable product, said product being selected from the group consisting of salt, animal food, flour, sugar, cement, seed, fertilizer, ice, sand, rice, spices, soil, pesticides, industrial chemicals, mortar, plaster, marble dust, and stones.

17. A method of dispensing a pourable product from a bag, the method comprising:
   providing a bag comprising:
   front and back panels each comprising:
      first and second end portions presenting respective outermost edges;
      first and second side portions presenting respective outermost edges, said front and back panels and said end and side portions cooperating to form a chamber for holding the pourable product, said first end portion and said first side portion cooperating to form a first corner, and
      perforations at said first corner, said perforations extending in a non-linear fashion from the outermost edge of said first end portion to the outermost edge of said first side portion;
   a handle adjacent at least one of said first and second end portions and integrally formed with said bag; and
   a quantity of the pourable product in said chamber;
   tearing said first corner at said perforations to form an opening; and
   causing said pourable product to exit the bag through the opening.

18. The method of claim 17, wherein said tearing comprises removing said first corner.

19. The method of claim 17, wherein said handle is at said first end portion.

20. The method of claim 17, wherein said pourable product is selected from the group consisting of salt, animal food, flour, sugar, cement, seed, fertilizer, ice, sand, rice, spices, soil, pesticides, industrial chemicals, mortar, plaster, marble dust, and stones.

21. The method of claim 17, further comprising gripping said handle while causing said product to exit said bag.

22. The method of claim 17, wherein said causing comprises tilting said bag.

23. A bag for holding a pourable product, said bag comprising front and back panels each comprising:
   first and second end portions presenting respective outermost edges;
   first and second side portions presenting respective outermost edges, said front and back panels and said end and side portions cooperating to form a chamber for holding the pourable product, there being a width “W,“ defined as the shortest distance between the respective outermost edges of said first and second side portions, said first end portion and said first side portion cooperating to form a first corner;
   a first set of perforations at said first corner, said first set of perforations extending in a non-linear fashion from the outermost edge of said first end portion, or from a seam or area near to said outermost edge of said first end portion, to the outermost edge of said first side portion; and
   a second set of perforations extending from one of said respective outermost edges of said first and second side portions a distance of at least about 50% of “W” towards the other of said respective outermost edges of said first and second side portions.

24. The bag of claim 23, said second set of perforations extending a distance of at least about 75% of “W“.

25. The bag of claim 23, said second set of perforations extending a distance of about 100% of “W“.

26. The bag of claim 23, said second set of perforations forming a linear pattern that is substantially parallel to at least one of said respective outermost edges of said first and second side portions.

27. The bag of claim 23, said bag further comprising a handle adjacent at least one of said first and second end portions.

28. The bag of claim 27, wherein said handle is at said first end portion.

29. The bag of claim 27, wherein said handle is integrally formed with said bag.

30. The bag of claim 23, wherein said chamber includes therein a quantity of pourable product, said product being selected from the group consisting of salt, animal food, flour, sugar, cement, seed, fertilizer, ice, sand, rice, spices, soil, pesticides, industrial chemicals, mortar, plaster, marble dust, and stones.

31. The bag of claim 23, said front and back panels further comprising a seam extending between the first and second side portion outermost edges, and said first set of perforations having a radius of curvature of from about 3 inches to about 4 inches when measured from a point that is about 0.25 inches to about 2 inches from said seam and about 0.1 inches to about 0.75 inches from the outermost edge of said first side portion.

32. A method of dispensing a pourable product from a bag, the method comprising:
   providing a bag comprising:
   front and back panels each comprising:
      first and second end portions presenting respective outermost edges;
      first and second side portions presenting respective outermost edges, said front and back panels and said end and side portions cooperating to form a chamber for holding the pourable product, there being a width “W,“ defined as the shortest distance between the respective outermost edges of said first and second side portions, said first end portion and said first side portion cooperating to form a first corner;
      a first set of perforations at said first corner, said first set of perforations extending in a non-linear fashion from the outermost edge of said first end portion, or from a seam or area near to said outermost edge of said first end portion, to the outermost edge of said first side portion; and
      a second set of perforations extending from one of said respective outermost edges of said first and second side portions a distance of at least about 50% of “W“ towards the other of said respective outermost edges of said first and second side portions; and
   a quantity of the pourable product in said chamber;
   tearing said first corner at said first set of perforations to form a first opening, at said second set of perforations to form a second opening, or at both said first and second sets of perforations to form first and second openings; and
causing said pourable product to exit the bag through the opening, or through the first and second openings.

33. The method of claim 32, wherein said tearing comprises removing said first corner.

34. The method of claim 32, said second set of perforations extending a distance of at least about 75% of “W”.

35. The method of claim 32, said second set of perforations extending a distance of about 100% of “W”.

36. The method of claim 32, said second set of perforations forming a linear pattern that is substantially parallel to at least one of said respective outermost edges of said first and second end portions.

37. The method of claim 32, wherein said bag comprises a first half at said first end portion and a second half at said second end portion, said first set of perforations being at said first end portion and said second set of perforations being on said second half.

38. The method of claim 32, said bag further comprising a handle adjacent at least one of said first and second end portions.

39. The method of claim 38, wherein said handle is at said first end portion.

40. The method of claim 38, wherein said handle is integrally formed with said bag.

41. The method of claim 32, wherein said pourable product is selected from the group consisting of salt, animal food, flour, sugar, cement, seed, fertilizer, ice, sand, rice, spices, soil, pesticides, industrial chemicals, mortar, plaster, marble dust, and stones.

42. The method of claim 38, further comprising gripping said handle while causing said product to exit said bag.

43. The method of claim 32, wherein said causing comprises tilting said bag.

44. The method of claim 32, said front and back panels further comprising a seam extending between the first and second side portion outermost edges, and said first set of perforations having a radius of curvature of from about 3 inches to about 4 inches when measured from a point that is about 0.25 inches to about 2 inches from said seam and about 0.1 inches to about 0.75 inches from the outermost edge of said first side portion.

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