(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 096 047 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
02.09.2009 Bulletin 2009/36

(51) Int Cl.:
B65D 88/16 *(2006.01)*

(21) Application number: **09154004.7**

(22) Date of filing: **27.02.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

(30) Priority: **27.02.2008 US 31876 P**

(71) Applicant: **MGS Horticultural Inc.**
Leamington ON N8H 3W1 (CA)

(72) Inventor: **Stickles, Perry**
Leamington
Ontario
N8H 3W1 (CA)

(74) Representative: **Moore, Michael Richard**
Keltie
Fleet Place House
2 Fleet Place
GB-London EC4M 7ET (GB)

(54) Container for storing and dispensing bulk dry materials

(57) An improved container for storing and dispensing bulk dry materials is provided, in which conventional bottom located discharge tubes are replaced by a cuttable patch (22a) integral with the container and overlying an opening (22b) in the bottom (18) thereof. At the point of delivery of the container contents, the patch (22a) is cut or sliced open manually or mechanically to allow for the outflow of materials. The container may be a bulk sack or bag.

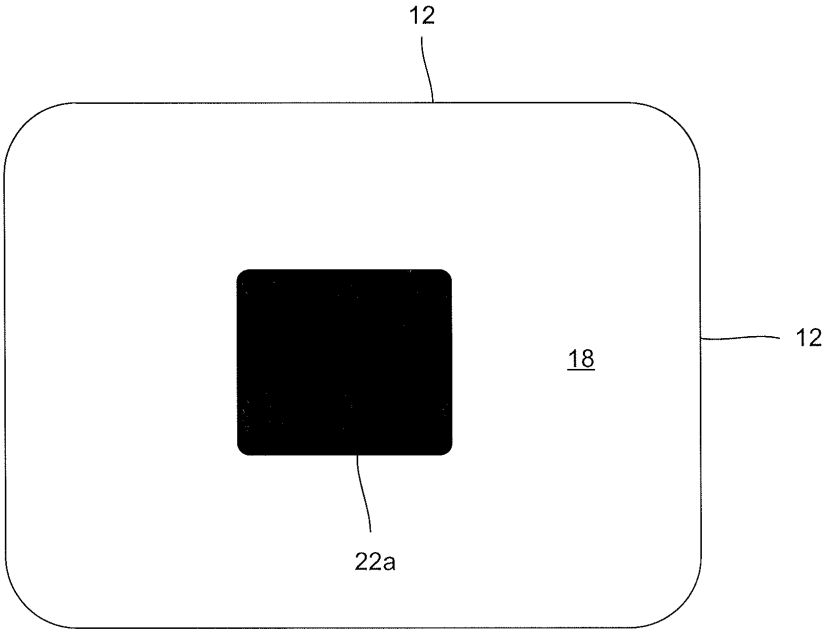

FIGURE 5

EP 2 096 047 A1

Description

FIELD OF THE INVENTION

[0001] This invention relates to improvements in containers, such as bags and sack, for the transportation and delivery of bulk quantities of powdered or granular material.

BACKGROUND OF THE INVENTION

[0002] Dry flowable materials such as fertilizer are often supplied in bulk sacks designed to hold pre-metered quantities of material based on consumer needs and handling equipment limitations. Bulk bags of this kind are generally constructed of a woven plastic material, cut and sewn into a generally rectangular box shape.

[0003] For filling and discharge, such bulk bags typically include an upper filling spout, through which materials are charged into the sack, and a bottom discharge closure arrangement through which the flowable material may be discharged at the point of use.

[0004] Known examples of bags having closable openings at the top and bottom are described in United States patents Nos. 3,961,655 (Nattrass et al); 4,364,424 (Nattrass); and 6,431,752 (Rogers et al).

[0005] In conventional bulk sacks, there is provided a bottom spout which is tied off prior to filling and a top or filling spout which is tied off after filling is complete. In use, emptying the sack of its materials requires the operator to lift the sack over its target, and either to cut or to untie the knot which has been keeping the emptying spout closed. Where, as is often the case, the sack includes an interior liner to provide airtight storage, the operator must also reach up inside the sack and cut that liner substantially to allow the material to flow out freely.

[0006] This conventional process is characterized by inconvenience and costs which the present invention is intended to eliminate. The complexity of sewing two spouts and tying mechanisms onto a conventional bulk bag adds to manufacturing costs, and the procedure of untying the emptying spout of the sack is time-consuming. Further, the dimensions of the spout impose a limit on the rate of flow of the product out of the bag which could be disadvantageous if this rate is not commensurate with the speed at which material can be processed as it exits the sack.

[0007] One attempt which has been made to simplify and lower the cost of use of bulk sacks of this general kind has been to provide the sack with a filling hole only and no emptying tube. The sack is elevated over the target where the operator wishes the material to be delivered and the bottom of the sack is sliced open, using a sharp instrument. While such sacks are generally less expensive, the procedure of cutting the woven bag bottom often results in the breakage of fibers from the sack itself, which enter into the product as it is discharged. That is undesirable, particularly where the materials carried or their subsequent processing must be free of contaminants.

SUMMARY OF THE INVENTION

[0008] To address the aforementioned disadvantages, a sack or other container according to the present invention is manufactured with an integral patch over an opening in the bottom of the sack or container, in lieu of the bottom discharge spout. Suitably, the sack or container is a bulk bag / sack, such as that used for the storage and eventual dispensing of bulk dry materials. The patch is of a size, material and thickness chosen to be strong enough to hold back the weight of the contents during transport. When sliced open (e.g. manually), at the point of delivery of the sack contents, the patch allows for the outflow of materials. Advantageously, such bottom cutting patches can be made from materials which will not lead to contamination of the end product. The patch may be manufactured from a plastics material, such as those that can be readily cut / sliced open, particularly those that can be cut open manually, for example, using a sharp implement (such as a blade). A number of plastic materials, with or without internal webbing, have been found suitable.

[0009] The perimetrical configuration / shape (or internal circumference) of the opening formed when the patch is cut may be selectively formed so that a desired rate of discharge of materials inside the sack is achieved. Suitably, the patch is also configured having regard to the shape of opening so that when cut the desired discharge rate of material is achieved. Beneficially, corners (internal with respect to the opening and external with respect to the patch) are rounded to avoid sharp transitions between the sides. Thus, the sides of the patch or opening merge smoothly.

[0010] Using a bulk bag with integral cutting patch according to the present invention, less costly sacks can be manufactured and less time may be required by the operator to begin emptying the bag. Too, the patch size and/or opening size can be predetermined for regulation of the outflow of product at a desired mass flow rate.

[0011] The construction of a bulk sack according to the invention also permits use of a piercing / discharge structure containing a blade upon which the sack patch can be set to initiate and facilitate emptying of the bag.

[0012] In a large industrial application, the efficiencies afforded by using sacks or containers according to the invention are cumulative and can be substantial.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The invention will be better understood by reference to the accompanying drawings, wherein:

Figure 1 is a schematic drawing of a conventional dry material bulk sack;

Figure 2 is a schematic drawing of a conventional dry material bulk sack, showing the upper filling spout;

Figure 3 is a bottom plan view of the sack of Figure 1, showing the bottom emptying spout tied off for use during transportation;

Figure 4 is a bottom perspective view of the sack of Figure 1, showing the emptying spout open in the discharge position;

Figure 5 schematically represents the bottom of a second variant of bulk bag according to the invention, wherein the bottom patch is of a rectangular shape.

Figure 6 illustrates a variation in the bag of Figure 5, having a generally cruciform opening to provide a predetermined opening area;

Figure 6A is a schematic representation of a cruciform-shaped patch suitable for use with the bag of Figure 6.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

[0014] The bulk bag according to the present invention will appear in its upper portion and sides much like the conventional bag of Figure 1 having a top wall 10, generally rectangular sides 12 support/carrying loops 14 and a filling spout 16.

[0015] On its bottom wall 18, however, a bulk sack according to the present invention does not present an emptying spout 20 and associated collar structure 21, unlike the conventional sack illustrated in Figure 3 but, rather, a cuttable bottom patch 22a, covering an opening in the bottom of the sack (as depicted in Figure 5).

[0016] In the embodiment of the invention illustrated in Figure 5, the opening (not shown) and patch 22a are of a generally rectangular form. The four corners of the opening and of the overlapping section of patch are slightly rounded (or convexly curved), so that they merge smoothly into each other, rather than at sharp corners when resistance of the patch material might be lessened presenting a risk of unintended tearing. In some embodiments, the sides, rather than being straight up to the rounded corners, may also be slightly curved.

[0017] A preferred material for patch 22a is a cross-laminated high density polyethylene plastic which may be sliced open, as noted above, without the production of contaminating fibers or fragments.

[0018] In the embodiment of the invention illustrated in Figure 6, opening 22b is of a generally cruciate (cross) shape. The cruciate-shaped opening 22b may be covered by a patch of any suitable shape: for example, the cruciate-shaped patch 22a depicted in Figure 6A. In this embodiment, the area of the planar opening from the inside to the outside of the bag is much smaller than for a rectangular opening (and patch), thereby exposing less patch material to the pressure of the bag contents. Although the cruciate-shaped patch of Figure 6A is generally depicted with relatively long, thin branches / arms, it will be appreciated that any suitable cruciform dimensions could be used. For example, the arms of the cruciform may be relatively short and wide, or may be long and wide: the important point being that the patch is suitable for covering the opening in the sack and that the join between the patch material and sack has sufficient strength to seal the sack until it is deliberately opened. The internal and external corners of the patch 22a are advantageously curved to eliminate sharp transitions at the corners of the arms. In use, to empty a sack having a cruciate-shaped opening (such a that of Figure 6), sealed with a cruciate-shaped patch, such as patch 22a of Figure 6A, the patch can be sliced along the intersecting axis (e.g. along line c-c shown in Figure 6A) of the cruciform. In this way, the part-flaps 23a, 23b, 23c and 24d of the sack 22b, formed by cutting, open downwardly and allow the material to flow out centrally and smoothly from the sack 22b.

[0019] For a particular product / application, the size and shape of cuttable patch can be selected to regulate the outflow of material to a desired degree. The sack may be suitable for food for human or animal consumption, or may be used with non-edible material. The width of overlap between the patch and the perimeter of the opening is typically not essential, and can likewise be selected according to requirements, such as the required strength of the interaction. The patch can be integrated with / attached to the sack or container using any suitable means, the important requirement being that the strength of interaction is sufficient to avoid the patch being loosened or removed from the sack or container in normal handling or by the weight of the material contained therein. Thus, the patch may be annealed (e.g. glued, melted or otherwise fused with), or stitched to the sack or container. The patch and opening can be any suitable shape or size, for example, rectangular, circular, cruciate, and may be the same or different. A cruciate patch (particularly in combination with a cruciate-shaped opening) can be advantageous in that less material is required for the patch and less material is exposed to the weight / pressure of the bag contents. In some embodiments, the patch may be provided with markings to indicate where and/or the extent to which the patch should be opened. It will be appreciated that the container, such as a bulk bag or sack, may have any suitable dimensions and the size is determined by the intended use and/or the typical material contents for transportation and delivery. Generally, the size is that which is typical for the handling of materials that are stored, transported and emptied in the manner described herein. Thus, the container, sack or bag may have a capacity of over 100 kgs of material, for example, 100 to 1500 kgs.

[0020] A method for manufacturing a container for use

in the storage and eventual dispensing of bulk dry materials, such as a bulk sack / bag, comprising a bottom opening and a patch as described herein is also provided. A method for opening a container, sack or bag for use in the storage and eventual dispensing of bulk dry materials having a bottom opening and a patch as described herein, comprising opening the patch, e.g. by cutting through the patch with a sharp implement or blade, is also provided.

[0021] The specific embodiments illustrated in the drawings should not be construed as limitations on the scope of the invention but, rather, only as exemplifying preferred variations of the invention which is defined in the attached claims.

Claims

1. A sack or other container for use in the storage and eventual dispensing of bulk dry materials, wherein the sack or container is of the kind which is filled at the top and emptied from the bottom thereof, **characterised in that** the sack or container comprises a bottom opening having a peripheral configuration selected to permit desired outflow of said bulk dry materials, and further comprises a cuttable patch overlying said opening and integral with the bottom of said sack or container.

2. The sack or container of Claim 1, wherein said patch is fabricated of a cross-laminated high density polyethylene plastic.

3. The sack or container of Claim 1 or Claim 2, wherein said opening is of a generally rectangular perimetrical configuration with convexly curved, smoothly merging sides.

4. The sack or container of Claim 1 or Claim 2, wherein said opening is of a generally cruciform shape.

5. The sack or container of any preceding claim, wherein said patch is of a generally rectangular shape having rounded corners.

6. The sack or container of Claim 4, wherein said patch is of a cruciform shape.

PRIOR ART

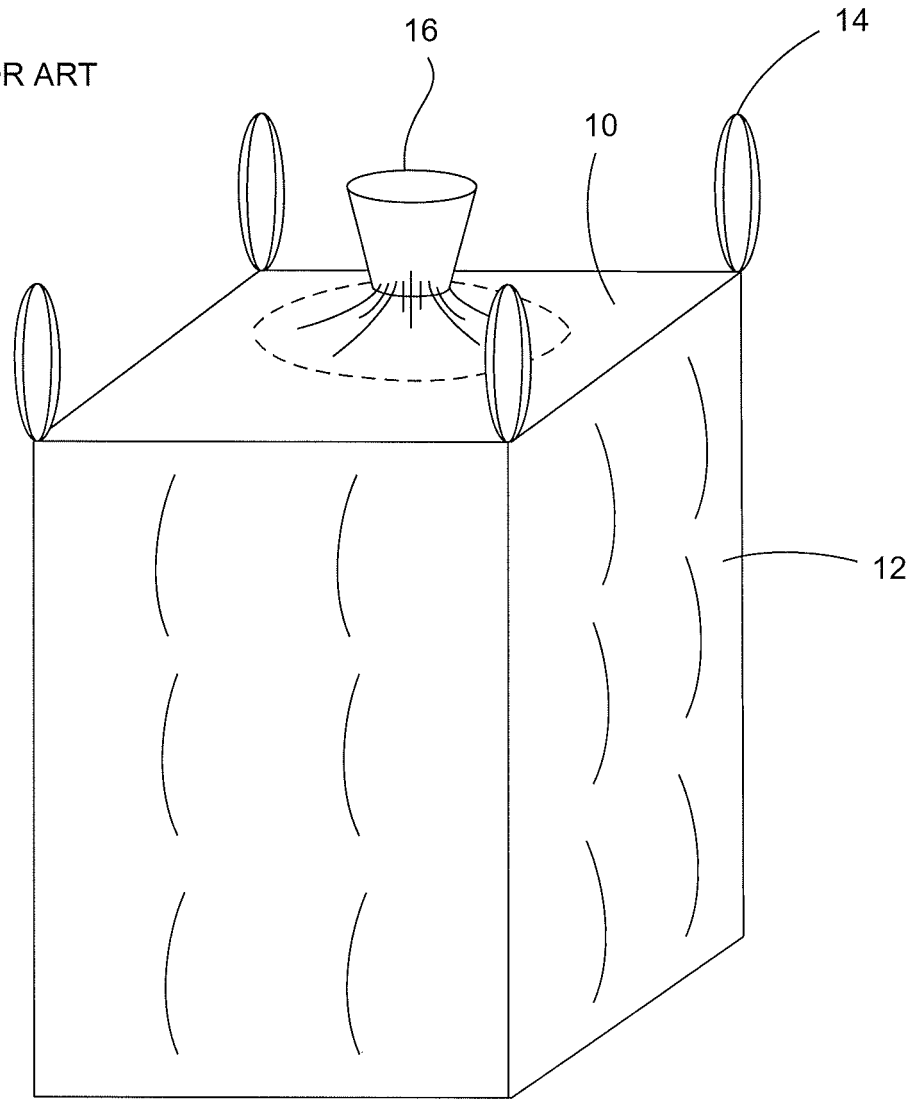

FIGURE 1

PRIOR ART

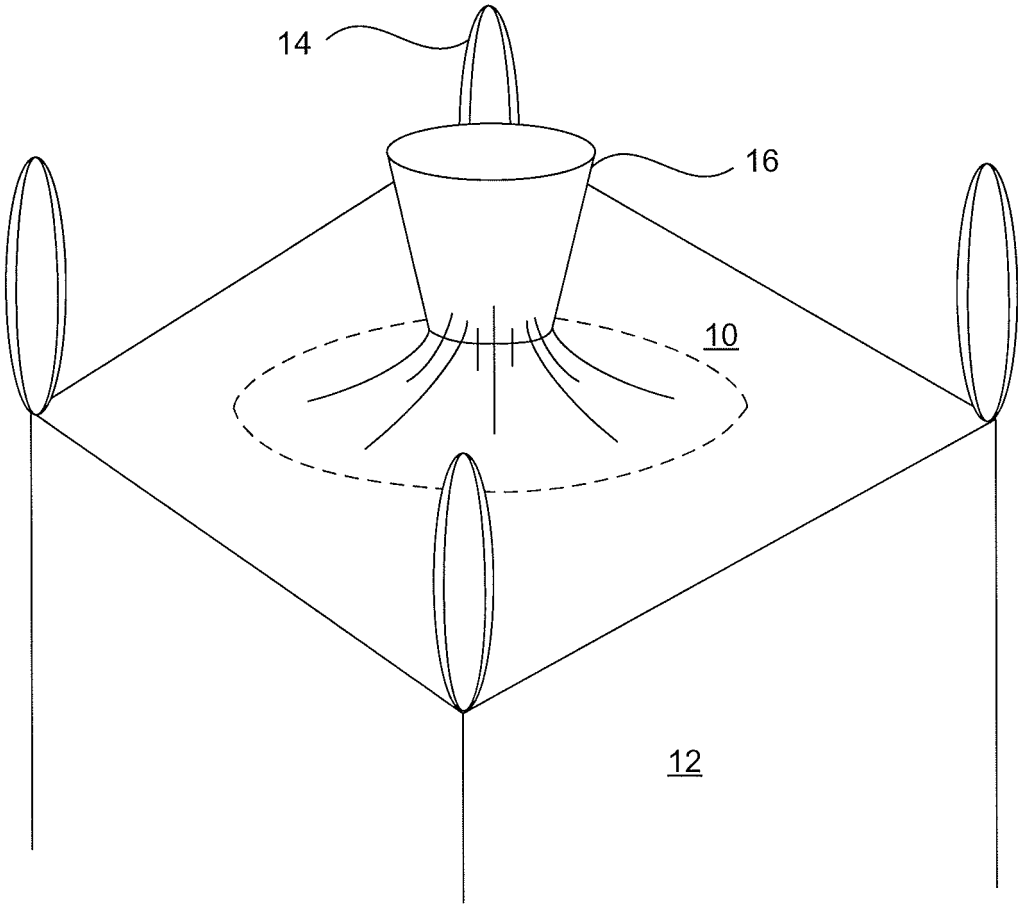

FIGURE 2

PRIOR ART

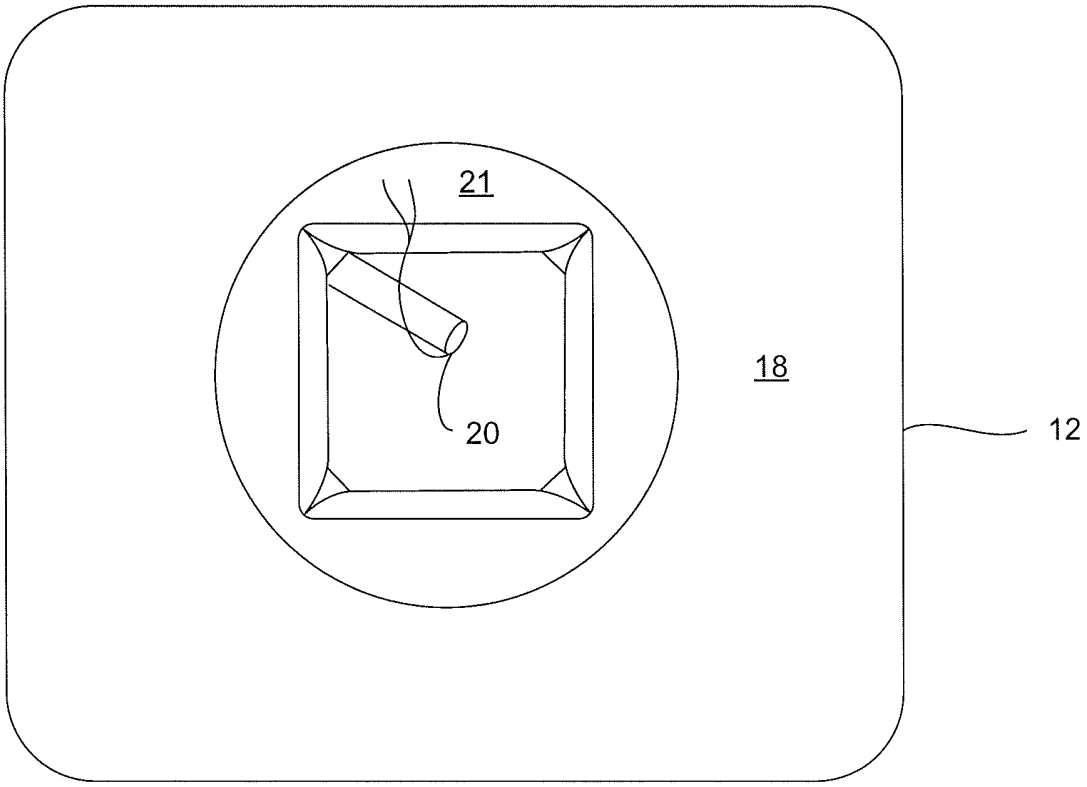

FIGURE 3

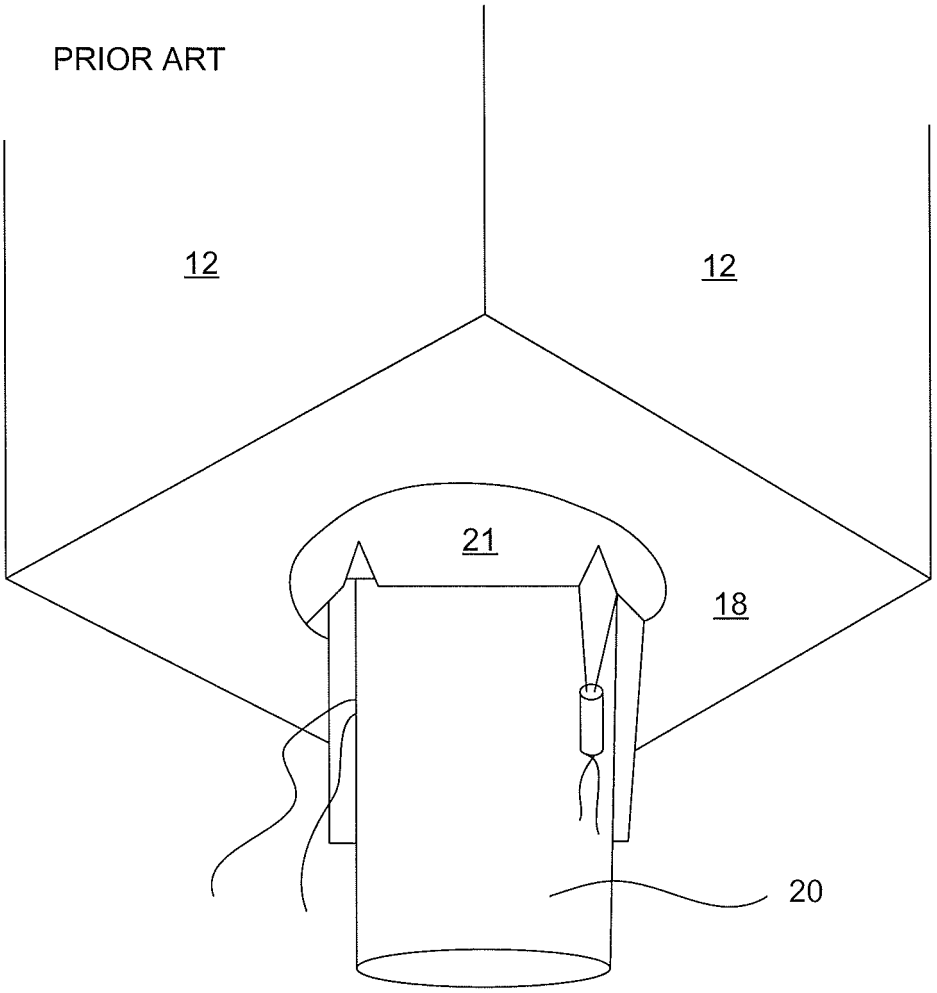

FIGURE 4

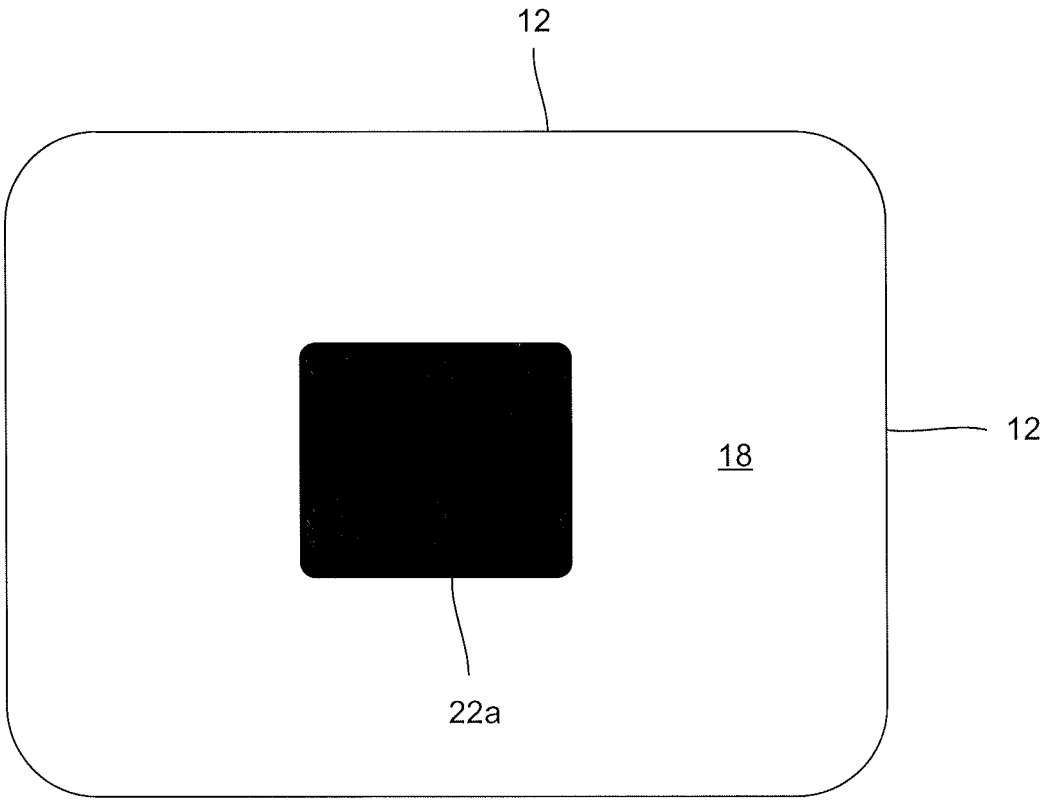

FIGURE 5

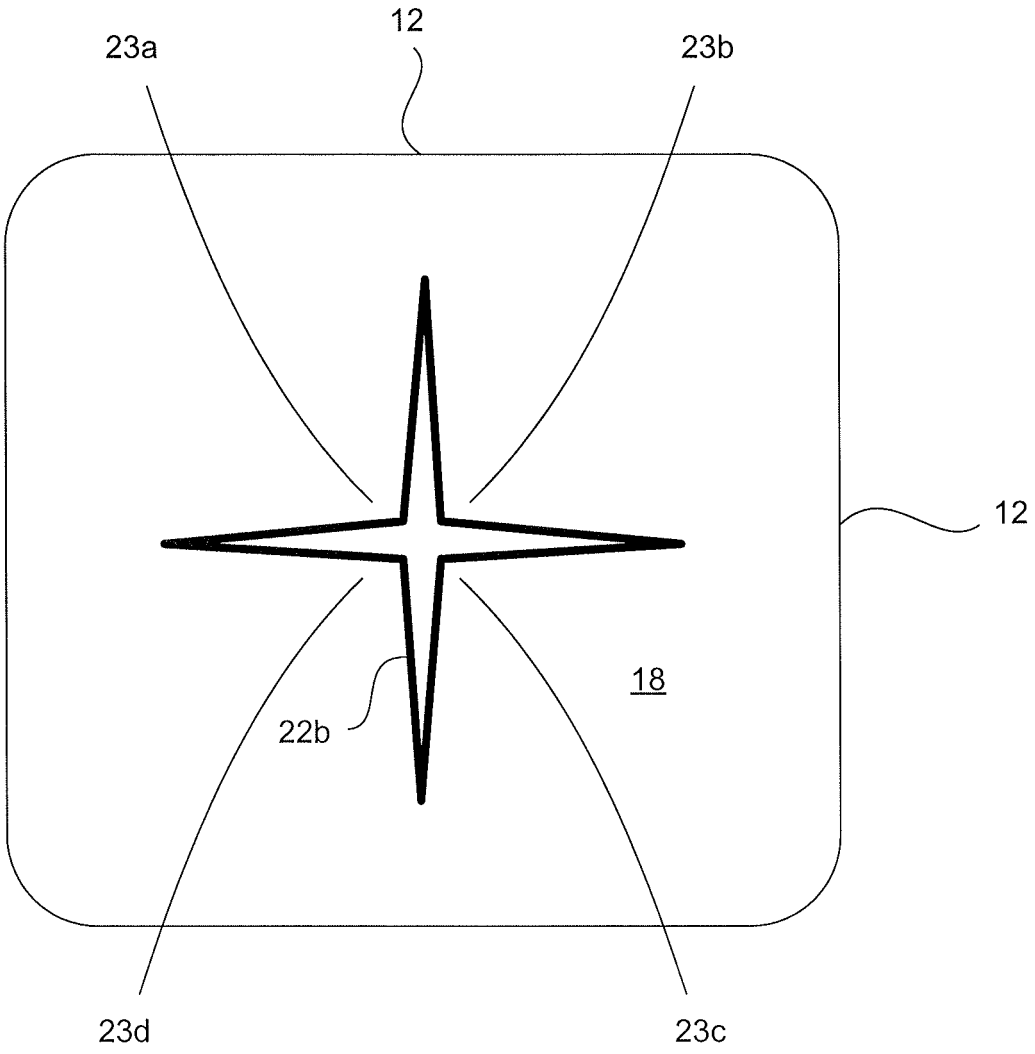

FIGURE 6

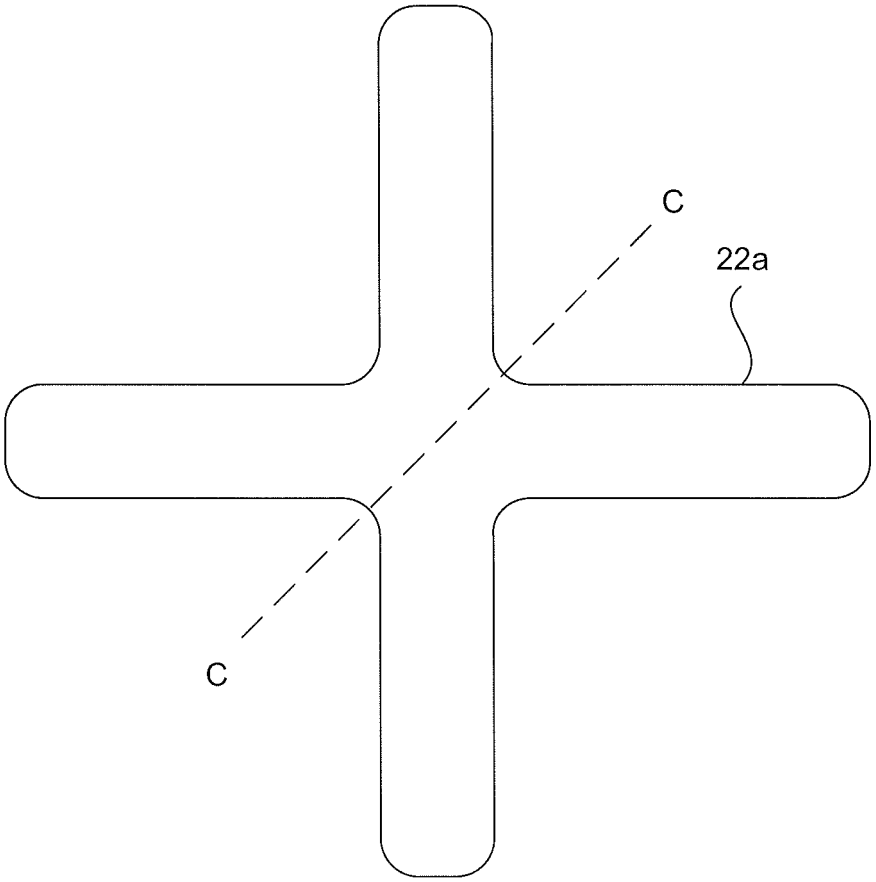

FIGURE 6a

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 15 4004

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 1 431 582 A (NATTRASS FRANK; NATTRASS P J) 7 April 1976 (1976-04-07) * page 2, column 1, lines 6-38 * * figures 1,2 * -----	1-6	INV. B65D88/16
X	EP 0 367 501 A (HOLMESWORTH INT LTD [GB]) 9 May 1990 (1990-05-09) * column 2, lines 25-31,52-55 * * figures 1,2 * -----	1	
X	GB 1 197 082 A (ASHTON CONTAINERS) 1 July 1970 (1970-07-01) * page 1, column 2, line 56 - page 2, column 1, line 42 * * figures 1-4 * -----	1	
A	JP 08 276944 A (KOIZUMI JUTE MILLS) 22 October 1996 (1996-10-22) * abstract; figures 1,2,5 * -----	1,4,6	
			TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 June 2009	Piolat, Olivier

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 15 4004

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-06-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1431582 A	07-04-1976	HK 17778 A	07-04-1978
		MY 8378 A	31-12-1978
EP 0367501 A	09-05-1990	NONE	
GB 1197082 A	01-07-1970	NONE	
JP 8276944 A	22-10-1996	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 3961655 A, Nattrass **[0004]**
- US 4364424 A, Nattrass **[0004]**
- US 6431752 B, Rogers **[0004]**