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(54) **Lid for open containers and closed container using said lid**

(57) The invention is a lid (1) for open containers (R), comprising a shaped body (2) made of a thin sheet of plastic material, provided with a peripheral groove (3) suited to be sealingly coupled with an edge (B) that delimits the mouth of the open container (R), and with a hollow area (4) created in its inner surface (1a), facing

towards the inside of said open container (R) and closed with a breakable film (5). In this way a chamber (6) is defined for containing a substance (S) to be added to the contents of said open container (R). On the inner surface (4a) of the hollow area (4) there is a projection (7) directed towards the breakable film (5) and suited to break it when pressure is exerted onto the lid.

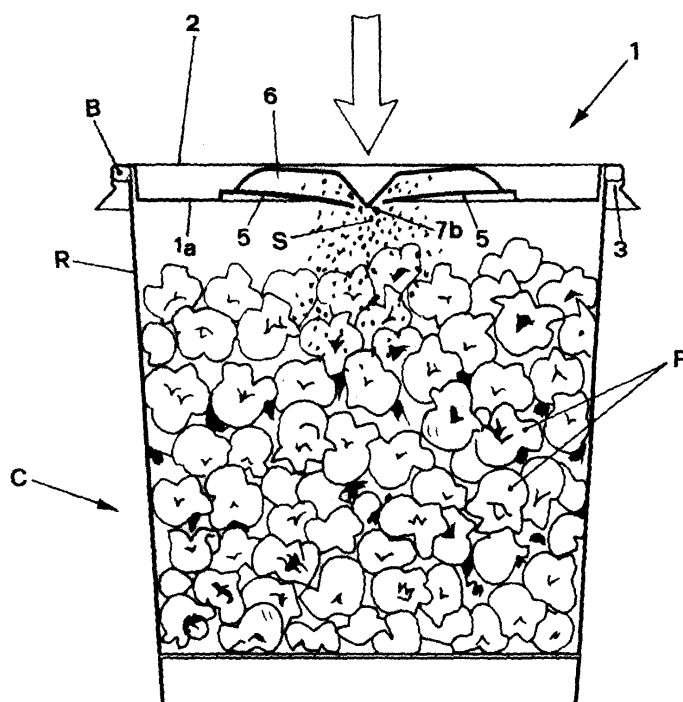


FIG. 7

Description

[0001] The invention concerns a lid particularly suited to be applied to open containers.

[0002] The invention also concerns a closed container particularly suitable for containing food products which comprises an open container using said lid.

[0003] The lid that is the subject of the invention is preferably of the type suited to be applied in a sealing manner to the perimetral edge of the mouth of cup-shaped open containers that are used for solid or liquid food products, in particular for containing popcorn distributed by token or coin-operated vending machines.

[0004] It is known that one of the methods for selling popcorn includes the use of apposite coin or token-operated vending machines that are installed in the places where popcorn is notably consumed, i.e. arcades, sports facilities, amusement parks and the like.

[0005] There are different types of popcorn vending machines that, though distinguished by different embodiments, all comprise a popping unit that transforms corn into popcorn, associated with a feed unit that introduces the ready popcorn inside an open container.

[0006] This generally has the shape of a cup and is collected by the consumer once filling has been completed.

[0007] If the consumer wants to eat the popcorn with salt or sugar instead of plain, he/she can use the sugar or salt dispenser provided in the vending machine, which, according to his/her choice, dispenses a suitable predefined quantity of salt or sugar into the open container.

[0008] In some cases, the consumer also collects a lid to be applied to the cup from a special container.

[0009] It is known that said vending machines pose some acknowledged drawbacks, especially concerning the quality and hygiene of the salt or sugar dispensing operation.

[0010] In particular, a first drawback lies in that sugar and, most of all, salt are highly hygroscopic substances that tend to absorb moisture from the air and therefore to become hard and lumpy inside the respective dispensers.

[0011] Since these vending machines are installed in places with wide temperature ranges and sometimes high humidity, this phenomenon takes place rather frequently.

[0012] Obviously, when salt or sugar becomes hard and lumpy, the dispensing operations become imprecise and the dispenser often gets clogged.

[0013] A further drawback is constituted by the fact that the contact of salt and sugar with the dispensers and containers in which they are kept inside the vending machine may affect their sterility.

[0014] Another drawback, concerning especially salt, is constituted by the high corrosiveness of this substance on some parts of the vending machine, which cannot resist this aggressive effect and with which it comes accidentally into contact during operation of the vending

machine.

[0015] The effect of salt on these parts or materials becomes particularly aggressive when in the presence of humidity or, even worse, condensate, salt changes into brine.

[0016] A further drawback that in any case is a consequence of the drawbacks described above is constituted by the need to carry out frequent and accurate maintenance operations to keep the salt and sugar dispensers efficient over time, remove any encrustations and avoid corrosion.

[0017] Last but not least, another drawback lies in that the presence of the salt and sugar dispenser makes the vending machine more complex to construct and thus more expensive.

[0018] The present invention aims to overcome the drawbacks listed above.

[0019] It is a first object of the invention to improve the hygiene and quality of the salt or sugar mixed with the popcorn dispensed by vending machines.

[0020] It is another object of the invention to ensure that the quantity of salt or sugar mixed with the popcorn is always the predefined one, independently of the external conditions.

[0021] The objects described above have been achieved through the construction of a lid for open containers in accordance with the contents of the main claim, to which the reader should refer for the sake of brevity.

[0022] Other details of the invention are described in the dependent claims.

[0023] To advantage, the lid of the invention contains a precise quantity of salt or sugar, which is mixed with the popcorn when the consumer wishes, with rapid and simple manoeuvres.

[0024] Still advantageously, the lid of the invention ensures a higher level of hygiene of the operation for adding salt or sugar to the product contained in the cup.

[0025] The objects and advantages described above will be highlighted in greater detail in the description of a preferred embodiment of the invention that is supplied as an indicative, non-limiting example, with reference to the enclosed drawings, wherein:

- Figure 1 shows an axonometric view of a closed container comprising the lid that is the subject of the invention applied to an open container;
- Figure 2 shows an axonometric view of the lid that is the subject of the invention seen from the outside;
- Figure 3 shows an axonometric view of the lid of the invention seen from the inside;
- Figure 4 shows a plan view of the lid of the invention seen from the outside;
- Figure 5 shows a longitudinal cross section of the lid shown in Figure 4, carried out along plane V-V;
- Figure 6 shows a longitudinal cross section of the closed container shown in Figure 1;
- Figure 7 shows a longitudinal cross section of the closed container shown in Figure 1 during use.

[0026] The lid that is the subject of the invention is represented in Figure 1, where it is indicated as a whole by **1** and where it can be seen that it is applied to an open container indicated as a whole by **R** to define the closed container **C**.

[0027] The lid **1** of the invention is applied to preferably cup-shaped open containers **R** of popcorn **P** dispensed by vending machines of the known token or coin-operated type, not represented herein.

[0028] It is clear, however, that the lid of the invention may also be applied to other open containers having a different shape or nature to obtain closed containers for other food products.

[0029] The lid **1** of the invention comprises a shaped body **2** made of a thin sheet of flexible plastic material as shown also in Figures from 2 to 6, and is provided with a peripheral groove **3** suited to be sealingly coupled with the edge **B** that defines the mouth of the open container **R**.

[0030] According to the invention, on the inner surface **1a** of the lid **1** there is a hollow area **4** facing towards the inside of the open container **R** and closed by a breakable film **5** to define a chamber **6** for containing a substance **S** to be added to the contents **P** of the open container **R**, while on the inner surface **4a** of the hollow area **4** there is at least one projection **7** directed towards the breakable film **5**.

[0031] Preferably, but not necessarily, said substance to be added is salt or sugar.

[0032] More particularly, it can be observed that on the inner surface **4a** of the hollow area **4**, which has a substantially circular shape, there is a single projection **7** positioned at the centre of the hollow area **4** and directed towards the breakable film **5**.

[0033] In particular, the projection **7** has the shape of a truncated cone **7a** whose vertex **7b** is directed towards the breakable film **5** and is arranged in such a way as to graze it.

[0034] The hollow area **4** is peripherally delimited by an annular edge **8**, lowered with respect to the inner surface **1a** of the lid **1**, on which the perimetral edge **5a** of the breakable film **5** rests after interposition of adhesive means suited to maintain adherence between the film **5** and the annular edge **6**.

[0035] The substance to be added to the popcorn **P** that is put in the containing chamber **6** included between the breakable film **5** and the hollow area **4** will be sugar or salt, in a quantity suitable for the quantity of popcorn present in the open container.

[0036] Obviously, the containing chamber **6** will be filled with suitable automatic systems of the type available on the market.

[0037] As regards the peripheral groove **3**, it can be seen in particular in Figures 5, 6 and 7 that its cross section has a prismatic profile in which it is possible to identify at least one undercut area **9** in which the edge **B** of the open container **R** is snap-fitted.

[0038] In this way, when the lid is applied to the open

container by exerting pressure, the lid **1** and the edge **B** are snap-fitted so as to be tight, which ensures the mechanical stability of the lid **1** with respect to the open container **R** as well as insulation of the product **P** from the external environment.

[0039] It can be observed in particular in Figure 5 that the undercut area **9** is an annular area included between the annular bottom surface **3a** and the annular side surface **3b** that define the peripheral groove **3** and is delimited, on the side opposite the annular bottom surface **3a**, by a first annular edge **10** present at the end of the annular side surface **3b** and inclined towards the inside of the peripheral groove **3**.

[0040] It can be observed also that the first annular edge **10** belongs to a truncated-cone shaped annular surface **11** that peripherally delimits the lid **1** and in which it is possible to identify also a second annular edge **12** connected to the first annular edge **10**, diverging externally from the lid **1**.

[0041] In this way the truncated-cone shaped annular surface **11** serves as a grip to be used by the consumer when he/she intends to remove the lid **1** from the container **R**.

[0042] In practice, after introducing the token or the coin in the vending machine (not represented herein), the consumer takes the cup-shaped open container **R** with the popcorn as well as a lid **1** with the suitable quantity of salt or sugar contained in the chamber **6** included between the hollow area **4** and the breakable film **5**.

[0043] The consumer then applies the lid **1** onto the open container **R** that thus becomes a closed container **C** as shown in the axonometric view of Figure 1.

[0044] Therefore, exerting pressure on the outside surface **1b** of the lid **1**, he/she pushes the vertex **7b** of the projection **7** against the film **5** in such a way as to break it and cause the salt or sugar **S** to drop on the popcorn, as shown in Figure 7.

[0045] Then the consumer energetically shakes the closed container **C** thus mixing the salt or sugar with the product.

[0046] After mixing, the consumer removes the lid from the container and eats the product.

[0047] If he/she does not eat all the product, the remaining quantity can be preserved by closing the container with the lid, which insulates the product from the external environment.

[0048] On the basis of the above, it is clear that the lid that is the subject of the invention achieves all the set objects.

[0049] As far as hygiene and food consumption are concerned, it is clear that the dispensing of salt or sugar by the consumer from the lid directly into the container and thus onto the product ensures greater hygiene, since salt and sugar do not come into contact with any mechanical dispensing device and thus when they are added to the popcorn they are sterile as guaranteed by the supplier.

[0050] Furthermore, defining in advance the quantity

of salt or sugar in the containing chamber ensures that the dispensed quantity is constant.

[0051] Furthermore, since the salt or sugar is insulated from the external environment, it does not absorb moisture.

[0052] Finally, the use of the lid with a chamber for containing salt or sugar closed by a breakable film allows the structure of vending machines to be simplified - in fact they can be without dispensers -, reduces the need for maintenance and increases the operating reliability of the vending machines.

[0053] In the construction stage, the lid of the invention can be carried out even in shapes and sizes different from those represented and described.

[0054] Any modifications made to the lid must all be considered protected by the present patent, provided that they fall within the scope of the following claims.

[0055] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. Lid (1) for open containers (R) comprising a shaped body (2) made of a thin sheet of flexible plastic material, provided with a peripheral groove (3) suited to be sealingly coupled with the edge (B) that delimits the mouth of said open container (R), **characterized in that** it comprises a hollow area (4) created in the inner surface (1a) of said lid (1), facing towards the inside of said open container (R) and closed by a breakable film (5) to define a chamber (6) for containing a substance (S) to be added to the contents of said open container (R), while on the inner surface (4a) of said hollow area (4) there is at least one projection (7) directed towards said breakable film (5).
2. Lid (1) for open containers (R) according to claim 1), **characterized in that** on said inner surface (4a) of said hollow area (4) there is a single projection (7) positioned at the centre of said hollow area (4) and directed towards said breakable film (5).
3. Lid (1) for open containers (R) according to claim 1) or 2), **characterized in that** said projection (7) has the shape of a truncated cone (7a) with the vertex (7b) arranged so as to graze said breakable film (5).
4. Lid (1) for open containers (R) according to claim 1) or 2), **characterized in that** said hollow area (4) is peripherally delimited by an annular edge (8), lowered with respect to the inner surface (1a) of said lid (1), on which the perimetral edge (5a) of said break-

able film (5) rests after interposition of adhesive means.

5. Lid (1) for open containers (R) according to claim 1), **characterized in that** the cross section of said peripheral groove (3) has a prismatic profile in which it is possible to identify at least one undercut area (9) in which said edge (B) of said open container (R) is snap-fitted.
6. Lid (1) for open containers (R) according to claim 5), **characterized in that** said undercut area (9) is included between the annular bottom surface (3a) and the annular side surface (3b) of said peripheral groove (3) and is delimited, on the side opposite said annular bottom surface (3a), by a first annular edge (10) present at the end of said annular side surface (3b) and inclined towards the inside of said peripheral groove (3).
7. Lid (1) for open containers (R) according to claim 6), **characterized in that** said first annular edge (10) belongs to a truncated-cone shaped annular surface (11) that peripherally delimits said lid (1) and in which it is possible to identify also a second annular edge (12) connected to said first annular edge (10) and diverging externally from said lid (1).
8. Closed container (C) comprising an open container (R) with a lid (1) carried out according to claim (1).

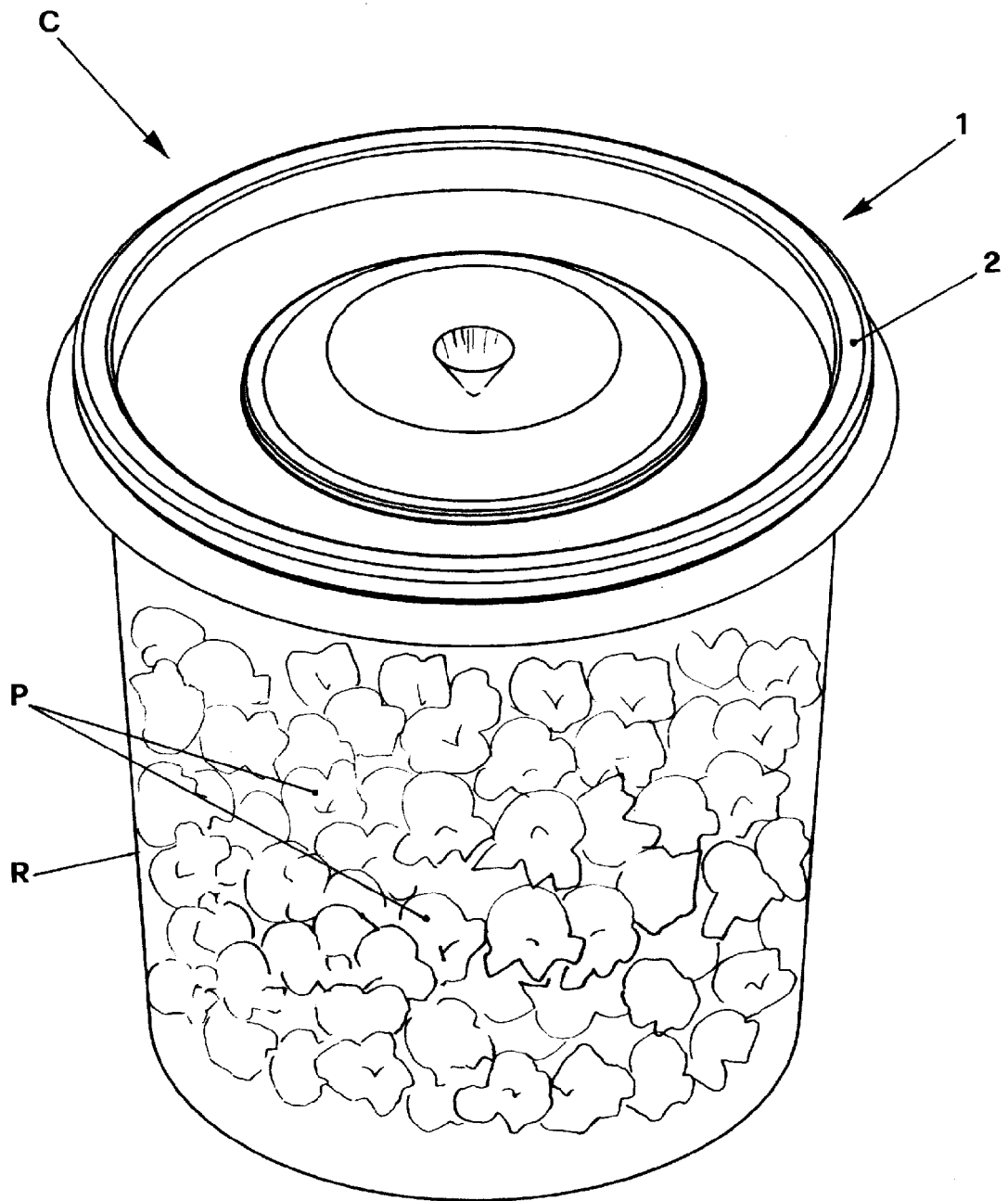


FIG.1

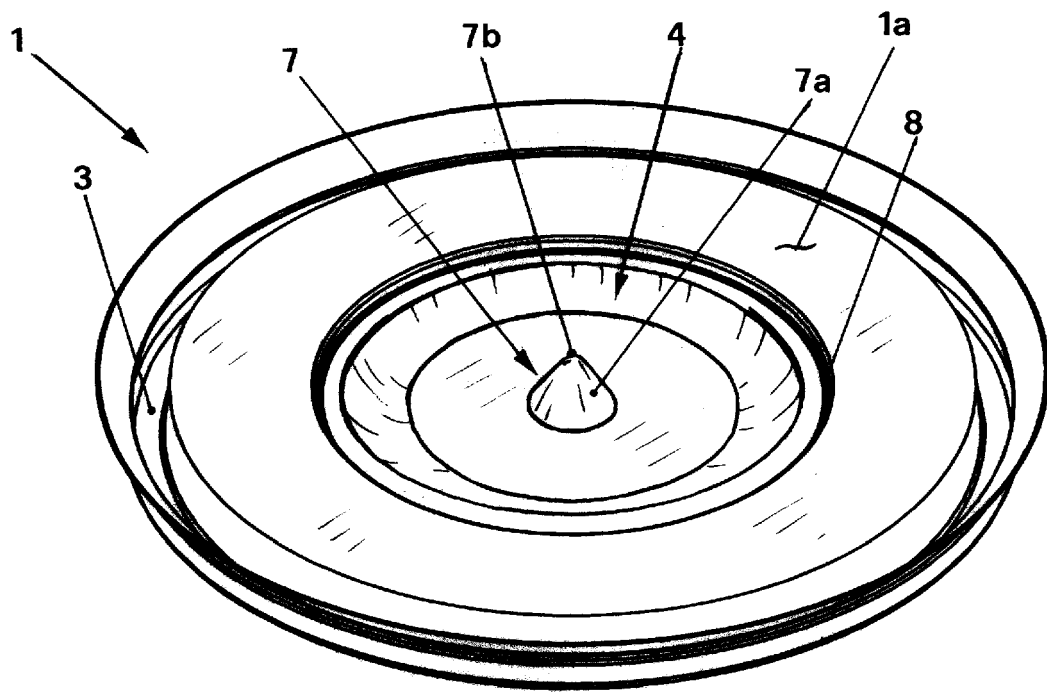


FIG. 3

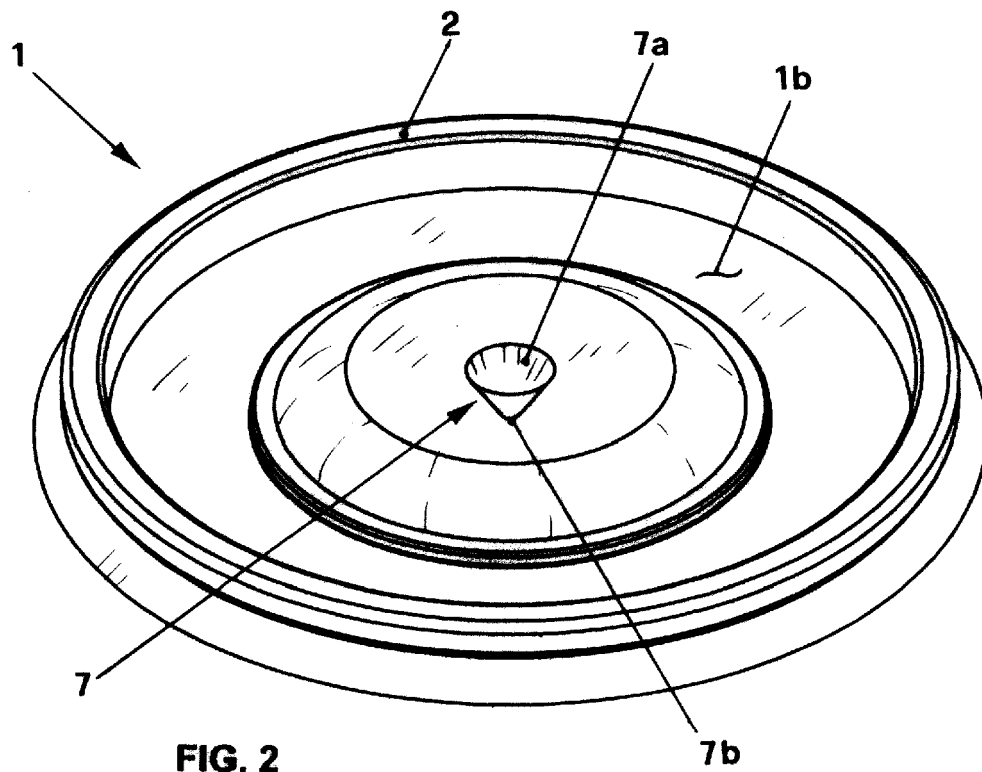
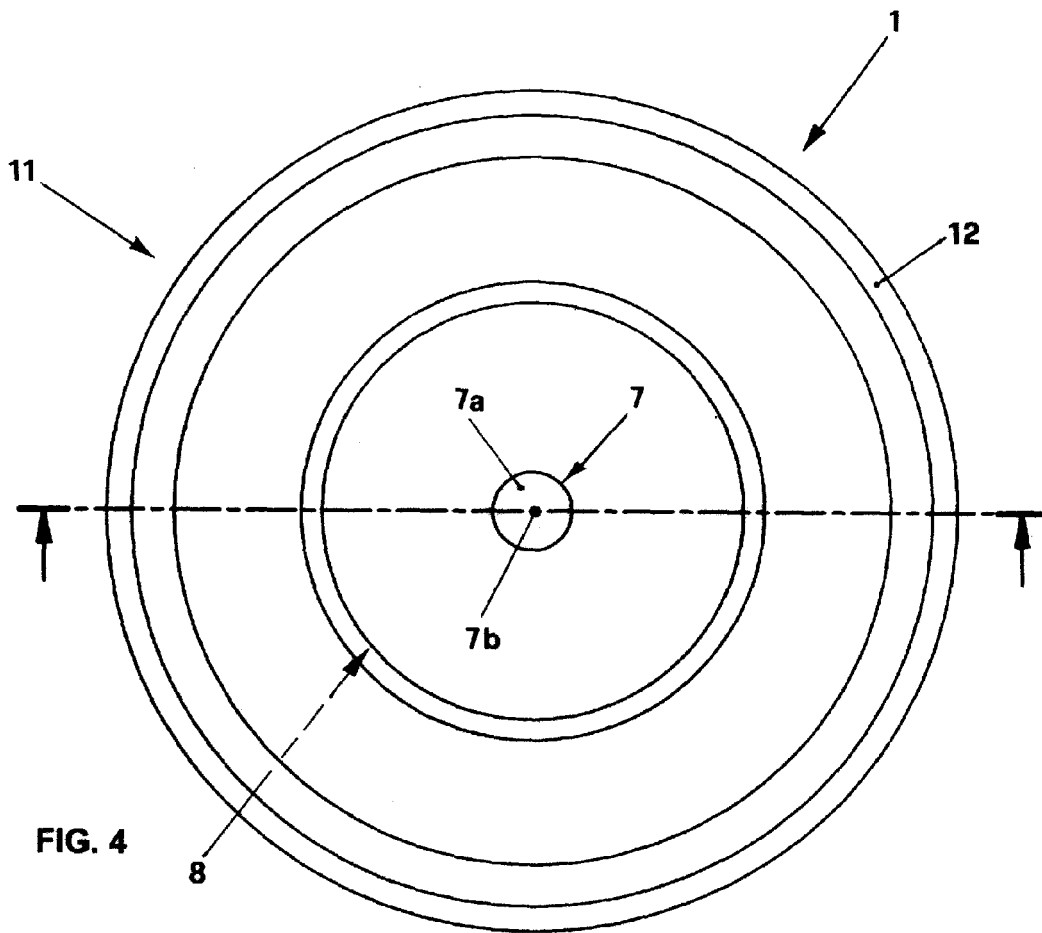
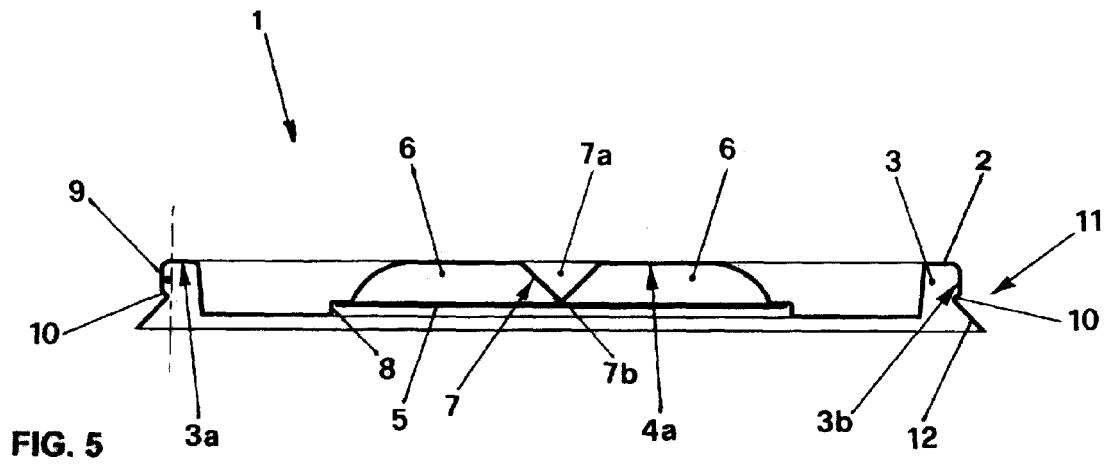


FIG. 2



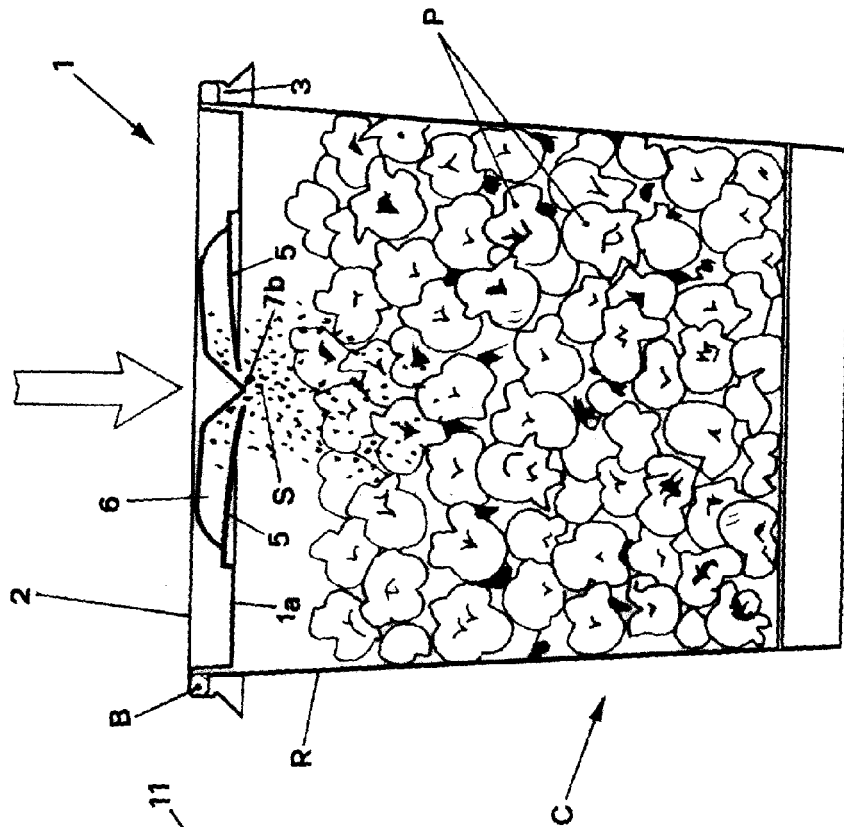


FIG. 7

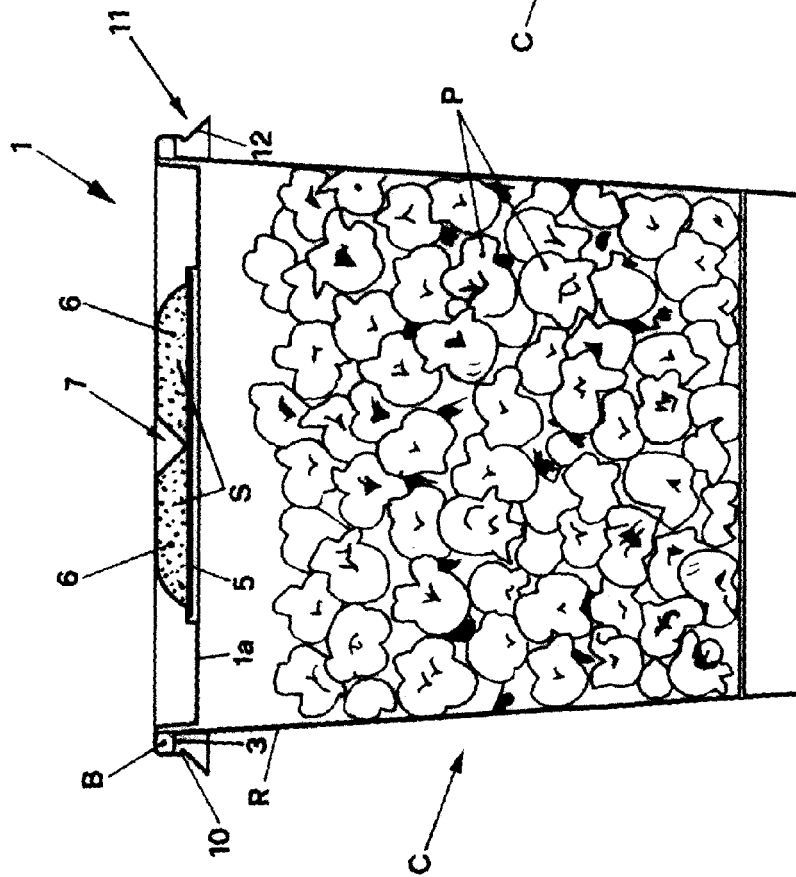


FIG. 6



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 11 2280

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	US 6 976 578 B1 (KENIHAN ANTONY AUSTIN [US]) 20 December 2005 (2005-12-20) * abstract; figures 6-8 *	1-3,5-8	INV. B65D51/28 B65D25/08
Y	-----	4	
X	US 5 979 647 A (HAN KI SU [US]) 9 November 1999 (1999-11-09) * column 5, line 31 - column 6, line 8; figures 3,5 *	1-3,5-8	
Y	----- WO 2004/113184 A (TETRA LAVAL HOLDINGS & FINANCE [CH]; KLOPFENSTEIN ANDRE [CH]; MIEGE SY) 29 December 2004 (2004-12-29) * page 7, lines 3-11; figure 1B/C * -----	4	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
Place of search		Date of completion of the search	Examiner
The Hague		18 September 2007	Dederichs, August
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EPO FORM 1503 03/82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 11 2280

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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18-09-2007

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