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MULTI-LAYER CONTAINER AND KIT OF PARTS

- (57)

According to the present invention, there is provided a multi-layer container comprising; an inner container configured to house material; and an outer container configured to house the inner container; wherein the outer container comprises a body portion connected
- to a removable portion; wherein the removable portion is configured to be removed from the body portion to provide access to the inner container. A kit of parts is also provided.

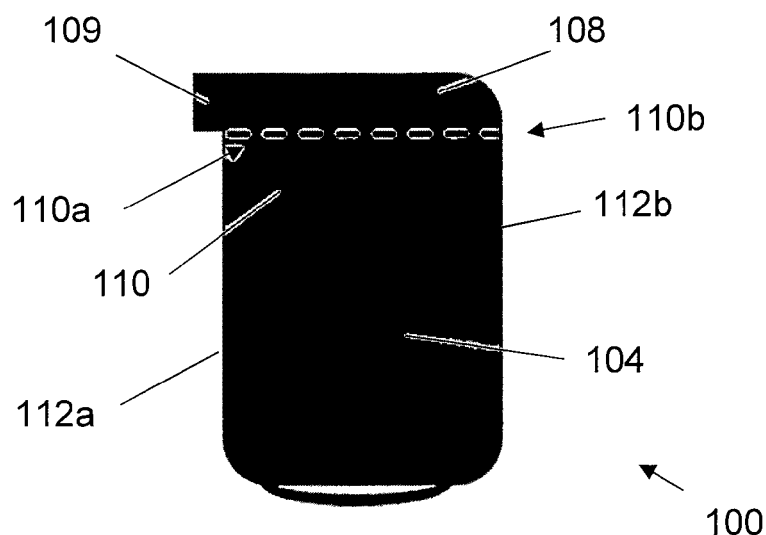


FIG. 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a multi-layer container. The present invention also relates to a kit of parts.

BACKGROUND TO THE INVENTION

[0002] Powdered construction material, such as cement or gypsum, and wet construction materials, such as pastes, are typically packaged in bags or sacks for ease of storage and transportation.

[0003] Conventional bags for powdered and wet construction materials often include multiple layers, these layers including a mix of paper and plastics materials. Where bags have these complex structures, recycling any of the bag material can be challenging, or even unfeasible as the layers of the bag are difficult to separate.

[0004] Additionally, it is often challenging to recycle conventional bags for powdered and wet construction materials due to the bag itself becoming contaminated with the construction material. Whilst residual construction material can hinder a wide range of recycling process, the presence of these contaminants is especially damaging in paper recycling processes. As such, where the bags comprise paper layers, they often become waste products disposed of as landfill.

[0005] Objects and aspects of the present invention seek to alleviate at least these problems with the prior art.

SUMMARY OF THE INVENTION

[0006] According to a first aspect of the present invention, there is provided a multi-layer container comprising; an inner container configured to house material; and an outer container configured to house the inner container; wherein the outer container comprises a body portion connected to a removable portion; wherein the removable portion is configured to be removed from the body portion to provide access to the inner container.

[0007] In this way, there is provided a multi-layer container where the inner container and the outer container may be separated for recycling. Additionally, in use, only the inner container will contact the material such that the material will not contaminate the outer container, ensuring it can be recycled with ease post use.

[0008] Preferably, the inner container is an inner bag and the outer container is an outer bag. In this way, a multi-layer bag is provided. In this way, the container is semi-flexible permitting ease of transportation and handling.

[0009] Preferably, the removable portion is connected to the body portion via a frangible connection. Preferably, the frangible connection comprises a line of perforations. Alternatively, the frangible connection comprises a single line of weakness. In this way, the user is able to easily

remove the removable portion from the body portion by manually breaking open the outer container along the weakened frangible connection. The frangible connection provides a weakened connection, permitting the user to easily break apart the removable portion from the body portion using their hands, while providing a connection strong enough for the outer container to remain sealed during transportation and storage i.e. prior to use.

[0010] The line of perforations or single line of weakness may be manufactured by any appropriate means, for example by laser perforation, blade perforation or any suitable puncturing or scoring tool.

[0011] Preferably, the frangible connection has a first end located at a perimeter of the outer container. In this way, the user can pull on the removable portion or the body portion to form a tear in the perimeter of the outer container. Preferably, the frangible connection is substantially straight. Preferably, the frangible connection extends from a first side of the outer container to a second opposing side of the outer container. In this way, the removable portion can easily be removed entirely from the body portion of the outer container. Preferably, the frangible connection extends from a first side of the outer container to a second opposing side of the outer container along the shortest path between the two sides. In this way, a reduced number of, for example, perforations are required and less user force is required to remove the removable portion from the body portion.

[0012] Alternatively, the frangible connection extends across at least 25% of the width of the outer container. Preferably, the frangible connection extends across at least 75% of the width of the outer container. In some embodiments, it is beneficial for the frangible connection to extend across only part of the width of the outer container, such that the removable portion remains partially attached to the body portion. In this way, the removable portion does not become separated from the outer container and instead the outer container can be recycled or otherwise disposed of as a single piece. Additionally, the frangible connection may help the user to form an initial tear in the outer container, which can be manually enlarged by the user such that the tear continues beyond the end of the frangible connection.

[0013] Preferably, the frangible connection comprises at least one slit located at a perimeter of the container. When the user pulls the removable portion, a tear will start at the end of the slit, thereby allowing the user to easily remove the removable portion from the body portion of the outer container. Preferably, the frangible connection comprises at least one slit and a line of perforations. Preferably, the line of perforations extends from the at least one slit. In some embodiments, the line of perforations connects a pair of slits located at opposing points on the perimeter of the outer container. In this way, the user may easily remove the removable portion from the body portion from either side of the outer container.

[0014] In select embodiments, the at least one slit is provided without a line of perforations or other line of

weakness as the at least one slit provides an adequately weakened frangible connection for the user to tear the removable portion from the body portion. Such an arrangement is less suited to outer containers made from thicker or stronger materials which are harder to tear by hand and benefit from a line of perforations.

[0015] Preferably, the removable portion is connected to the body portion at a first end of the body portion. Preferably, the outer container comprises a handle. Preferably, the handle is located at a second end of the body portion. Preferably, the first end and second end of the outer container are opposing ends. The outer container may be any suitable shape but is preferably rectangular. In such embodiments, preferably, the first end and second end are the short ends of the rectangular outer container.

[0016] Preferably, the handle comprises the same material as the outer container. In this way, the outer container can be recycled or otherwise disposed of as a single piece, without a need to remove the handle prior to recycling. More preferably, the handle consists of the same material as the outer container.

[0017] Preferably, the inner container comprises an inner material receiving aperture, and the outer container comprises an outer material receiving aperture. In this way, the inner container can easily be filled with material. It is appreciated that the inner container may be configured to house any suitable material, but more preferably is configured to house powdered construction material and/or wet construction material. Examples of powdered construction materials include gypsum (stucco), carbonates or cement and examples of wet construction materials include carbonate-based jointing products often referred to as "wet ready mixes". Preferably, the inner material receiving aperture and the outer material receiving aperture at least partially overlap. In this way, the user can easily feed material through the outer material receiving aperture in the outer container and into the inner container via the inner material receiving aperture located in the inner container.

[0018] Preferably, an inner material tube extends from the inner material receiving aperture, the inner material tube extending through the outer material receiving aperture. Preferably, an outer material tube extends from the outer material receiving aperture, and the inner material tube and the outer material tube are generally coaxial. The inner material tube and outer material tube aid the filling of the inner container with material as a passage between the internal volume of the inner container and the external environment is provided. By providing a separate inner material tube and outer material tube, the material tubes can be incorporated or manufactured into the inner container and outer container, respectively, improving ease of manufacture.

[0019] Additionally, the inner material tube and outer material tube allow the inner container to be easily filled with material with a reduced risk of loose material contaminating the outer container by falling in the gap be-

tween the outer container and the inner container. Such contamination is not desired as it can impact the recyclability of the outer container and can cause loose material to spill out if the outer container is broken, such as during transit.

[0020] Preferably, the outer container consists of recyclable material. More preferably, the outer container consists of paper material. It is understood that paper material consists of material made from the pulp of wood or other fibrous substances, such as cardboard or reinforced paper. Paper material may include hemp or other crops. Preferably, the outer container consists of paper material suitable for recycling. In some embodiments, the outer container consists of recyclable plastic. In this way, the outer container can be recycled after use.

[0021] In some embodiments, the inner container comprises a coating. In some embodiments, the coating is located on an outer surface of the inner container. In some embodiments, the outer container comprises a coating. In some embodiments, the coating is located on an outer surface of the outer container. Alternatively, the coating is located on an inner surface of the outer container. In select embodiments, both the inner container and outer container comprise a coating. In some embodiments, the inner container consists of plastic.

[0022] Preferably, the coating is a recyclable coating. In this way, the coating on the inner container and/or outer container does not inhibit the recyclability of the inner container and/or outer container.

[0023] Preferably, the coating is vapour-resistant. Namely, the coating provides a vapour barrier which limits vapour transmission. The coating may also provide a barrier against penetration of other gaseous material, such as carbon dioxide. In some embodiments, the coating is water-resistant. In some embodiments, the coating is waterproof. The coating reduces the water-vapour transmission rate of the inner and/or outer container, thereby increasing moisture and water resistance. In this way, material housed within the inner container is afforded protection from vapour and other gaseous material. The contents of the inner container are therefore better protected from external moisture. It is desirable to prevent moisture from prematurely reacting with the material housed in the inner container. Preferably, the coating comprises a polymer. Advantageously, an inner container and/or outer container coating takes away the requirement for a separate liner layer, such as a polyethylene (PE) liner. Preferably, the inner container is filled with a powdered construction material and/or a wet construction material. Both powdered construction material, such as gypsum, cement, calcined gypsum (stucco) and carbonates, and wet construction material, such as pastes, disturb the recycling process and is often not accepted by recycling collectors. In particular, when the container consists of paper, the powdered construction material and/or a wet construction material disturbs the paper making process and so is not accepted by recycling collectors or paper manufacturers. As such, the present in-

vention is particularly advantageous as a multi-layer container for powdered and/or wet construction material.

[0024] It is understood that the volume of the inner container, and therefore the size of the inner container and outer container, is dependent on the volume of material to be held. For example, the inner container may be configured to house 25kg of powdered construction material.

[0025] According to a second aspect of the invention there is provided a kit of parts for providing the multi-layer container of the first aspect of the invention.

DETAILED DESCRIPTION

[0026] Embodiments of the present invention will now be described by way of example only and with reference to the following figures:

Figure 1 depicts a front view of a multi-layer container of the first aspect of the present invention;

Figure 2 depicts a further front view of the multi-layer container of Figure 1, the removable portion removed from the body portion of the outer bag;

Figure 3 depicts a further front view of the multi-layer container of Figure 1, the inner bag part-removed from the outer bag;

Figure 4 depicts a further front view of the multi-layer container of Figure 1, the inner bag removed from the outer bag; and

Figure 5 depicts a second embodiment of the first aspect of the invention, wherein the frangible connection extends across only part of the width of the outer bag.

[0027] With reference to Figures 1 to 4, there is depicted a multi-layer container, wherein the multi-layer container is a multi-layer bag 100, comprising an inner bag 102 configured to house material (not pictured) and an outer bag 104 configured to house the inner bag 102. In this embodiment, the outer container is an outer bag 104 and the inner container is an inner bag 102. In this embodiment, the inner bag 102 is configured to be filled with a powdered construction material such that the multi-layer bag 100 is a powdered construction material bag. Alternatively or additionally, the inner bag 102 can be configured to be filled with a wet construction material such that the multi-layer bag 100 is a wet construction material bag or a wet and powdered construction material bag.

[0028] The outer bag 104 comprises a body portion 106 connected to a removable portion 108. As illustrated in Figures 2 and 3, the removable portion 108 is configured to be removed from the body portion 106 to provide access to the inner bag 102.

[0029] The removable portion 108 is connected to the body portion 106 via a frangible connection 110. The fran-

gible connection 110 comprises a straight line of perforations which extend from a first side 112a of the outer bag 104 to a second opposing side 112b of the outer bag 104. In this way, the frangible connection 110 has a first end 110a located at the perimeter of the first side 112a of the outer bag 104, and a second end 110a located at the perimeter of the second side 112a of the outer bag 104. The frangible connection 110 provides a weakened connection between the removable portion 108 and the body portion 106, permitting the user to easily tear open the outer bag 104. Further, the line of perforations provides a visual indication of the weakened tear-line along which the user can open the outer bag 104.

[0030] When the frangible connection 110 is unbroken, the inner bag 102 is sealed within the outer bag 104 and access to the inner bag 102 is inhibited. In this way, the contents of the inner bag 102 are provided with an additional protective layer provided by the outer bag 104. When the user breaks the frangible connection 110, access to the inner bag 102 is provided.

[0031] The removable portion 108 further comprises a tab 109 which extends outside of the perimeter of the body portion 106. The tab 109 is located adjacent the first end 110a of the frangible connection 110 which is located at the perimeter of the first side 112a of the outer bag 104. The tab 109 is parallel to the line of perforations to aid the user in tearing the bag along the frangible connection 110. The tab 109 assists user grip on the removable portion 108.

[0032] The removable portion 108 is connected to the body portion 106 at a first end of the body portion 106 and the outer bag 104 comprises a handle 114 located at an opposing second end of the body portion 104. In this embodiment, the outer bag 104 is substantially rectangular.

[0033] As illustrated in Figures 2 and 3, the user can remove the removable portion 108 from the body portion 106 by tearing the outer bag 104 along the line of perforations. The inner bag 102 can be pulled in direction A and/or the outer bag 104 can be pulled in direction B to remove the inner bag 102 from the outer bag 104. The inner bag 102 is easily removed from the outer bag 104 as the inner bag 102 is arranged with a clearance fit within the outer bag 104. The inner bag 102 is not fixed to the outer bag 104 such that removal of the inner bag 102 from the outer bag 104 is not inhibited.

[0034] The handle 114 aids removal of the inner bag 102 from the outer bag 104 by providing purchase for the users' hands to grip onto during removal. It is further appreciated that the user may remove the removable portion 108 and rotate the bag 100 such that the inner bag 102 is close to or touching the ground. The user may then grip the handle 114 and pull the outer bag 104 away from the inner bag 102 such that the inner bag 102 falls to the ground under gravity.

[0035] The user can then access the contents of the inner bag 102 by breaking open the inner bag 102 using any suitable means, such as using a blade.

[0036] The inner bag 102 comprises an inner material receiving aperture (not pictured), and the outer bag 104 comprises an outer material receiving aperture (not pictured). An inner material tube (not pictured) extends from the inner material receiving aperture, the inner material tube extending through the outer material receiving aperture. Further, an outer material tube (not pictured) extends from the outer material receiving aperture, and the inner material tube and the outer material tube are coaxial. The inner material tube and outer material tube thereby provide a passage into the inner bag 102 such that the inner bag 102 can be partially or wholly filled with material. In this way, material can be easily fed into the inner bag 102 by passing the material through the outer material receiving aperture in the outer bag 104 and the inner material receiving aperture located in the inner bag 102.

[0037] The inner bag 102 and outer bag 104 can be sealed by sealing the inner material receiving aperture and the outer material receiving aperture after the inner bag 102 is adequately filled.

[0038] The inner bag 102 comprises a water-resistant coating located on an outer surface 116 of the inner bag 102. The coating protects the contents of the inner bag 102 from moisture, such as moisture which enters the outer bag 104 from the external environment. The outer bag 104 further aids in preventing water and other contaminants from the external environment from reaching the contents of the inner 102. It is desirable to prevent moisture from prematurely reacting with or contaminating any material housed in the inner bag. In this embodiment, the inner bag consist of paper material and the coating comprises a polymer.

[0039] The outer bag 104 consists of recyclable paper material. It is understood that paper material consists of material made from the pulp of wood or other fibrous substances, such as cardboard or reinforced paper. Preferably, the outer bag consists of paper material suitable for recycling. In this way, the outer bag can be recycled after use. The handle 114 comprises the same material as the outer bag 104 such that the outer bag 104 and handle 114 can be recycled as a single piece. Further, the removable portion comprises the same material as the outer bag 104 such that the removable portion can also be recycled.

[0040] After the inner bag 102 is removed from the outer bag 104, as illustrated in Figure 4, the inner bag 102, which is contaminated with the construction powder material, can be disposed of. The outer bag 102 is not contaminated by construction powder material and so the entire outer bag 104, including the body portion 106, handle 114 and removable portion 108, can be recycled. In this way, more of the multi-layer bag 100 can be recycled after use than conventional bags, such that a reduced amount of waste is produced.

[0041] With reference to Figure 5, a second embodiment of a multi-layer bag 200 is illustrated. The bag 200 of Figure 5 is substantially identical to the bag 100 of

Figures 1 to 4 but with the following differences. The frangible connection 210 extends across about 75% the width of the outer bag. The frangible connection 210 again extends from the perimeter of a first side 212a of the outer bag 204 such that the tab 209 is located adjacent the frangible connection 210. In this way, the tab 209 aids the user in tearing the outer bag 205 along the frangible connection 210. It is beneficial for the frangible connection to extend across only part of the width of the outer bag, such that the removable portion remains partially attached to the body portion. In this way, the removable portion does not become separated from the outer bag and instead the outer bag can be recycled or otherwise disposed of as a single piece.

[0042] Further embodiments within the scope of the present invention may be envisaged that have not been described above, for example, the multi-layer container may be any suitable shape and/or volume for the desired application.

Claims

1. A multi-layer container comprising;
 - an inner container configured to house material; and
 - an outer container configured to house the inner container;
 - wherein the outer container comprises a body portion connected to a removable portion;
 - wherein the removable portion is configured to be removed from the body portion to provide access to the inner container.
2. The multi-layer container of claim 1, wherein the removable portion is connected to the body portion via a frangible connection.
3. The multi-layer container of claim 2, wherein the frangible connection comprises a line of perforations.
4. The multi-layer container of any one preceding claim, wherein the removable portion is connected to the body portion at a first end of the body portion.
5. The multi-layer container of any one preceding claim, wherein the outer container comprises a handle.
6. The multi-layer container of claim 5, wherein the handle is located at a second end of the body portion.
7. The multi-layer container of any one preceding claim, wherein the inner container comprises an inner material receiving aperture, and the outer container comprises an outer material receiving aperture.
8. The multi-layer container of claim 7, wherein the in-

ner material receiving aperture and the outer material receiving aperture at least partially overlap.

9. The multi-layer container of claim 7 or claim 8, wherein an inner material tube extends from the inner material receiving aperture, the inner material tube extending through the outer material receiving aperture. 5
10. The multi-layer container of claim 9, wherein an outer material tube extends from the outer material receiving aperture, and the inner material tube and the outer material tube are generally coaxial. 10
11. The multi-layer container of any one preceding claim, wherein the outer container consists of paper material. 15
12. The multi-layer container of any one preceding claim, wherein the inner container comprises a coating. 20
13. The multi-layer container of claim 12, wherein the coating is vapour-resistant.
14. The multi-layer container of any one preceding claim, wherein the inner container is filled with a powdered construction material and/or a wet construction material. 25
15. A kit of parts for providing the multi-layer container of any one preceding claim. 30

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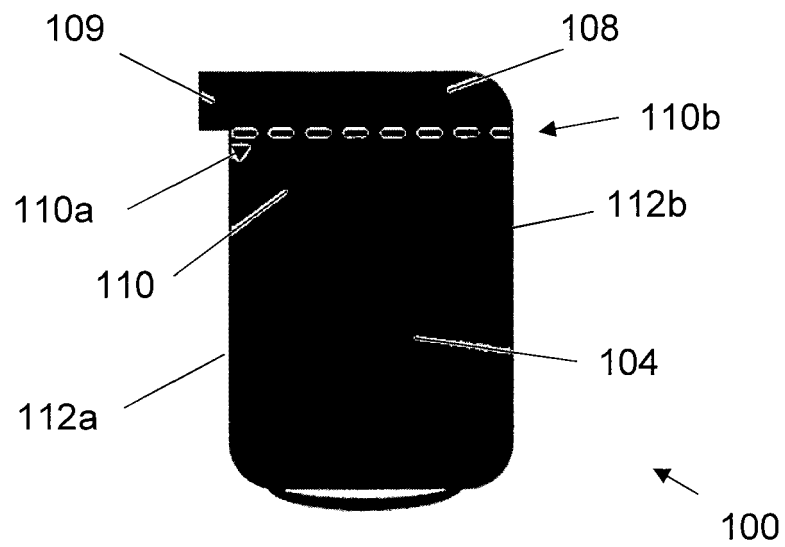


FIG. 1

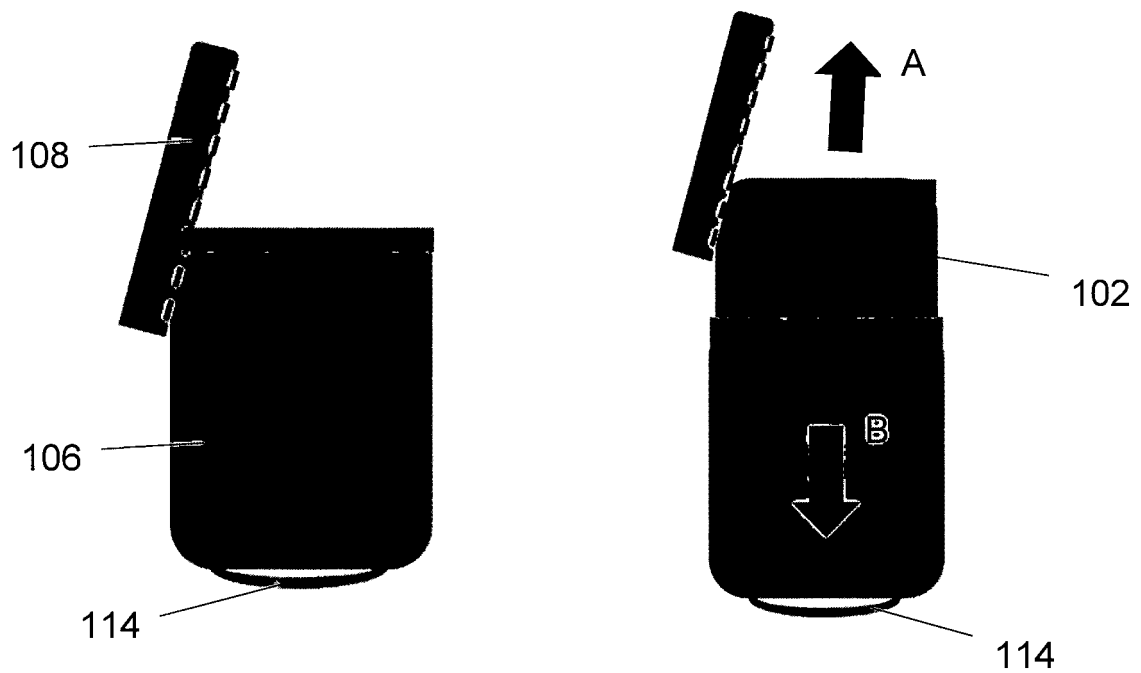


FIG. 2

FIG. 3



FIG. 4

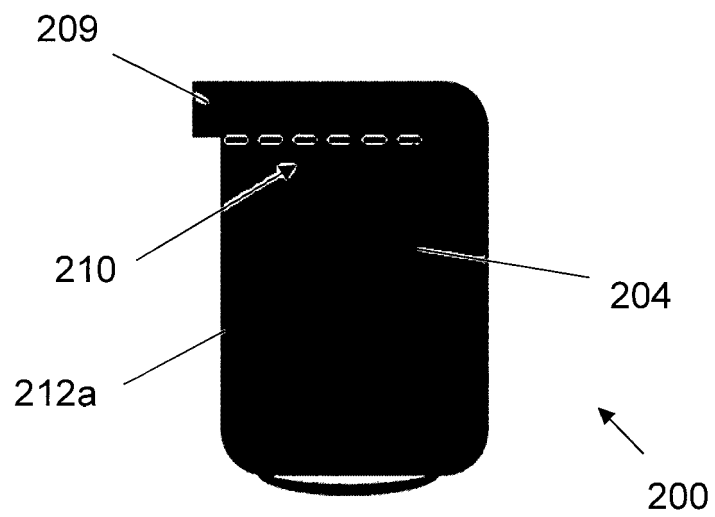


FIG. 5



EUROPEAN SEARCH REPORT

Application Number

EP 23 31 5194

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EPO FORM 1503 03.82 (P04C01)

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	WO 98/35886 A1 (CRYOVAC INC) 20 August 1998 (1998-08-20) * pages 1-28 * * figures 1-17 * -----	1-15	INV. B65D30/24 B65D33/06 B65D75/58 B65D75/38 B65D75/56
X	DE 33 44 877 A1 (ICOMA PACKTECHNIK GMBH [DE]) 13 June 1985 (1985-06-13) * pages 2-5 * * figures 1-7 * -----	1-15	
X	EP 3 792 192 A1 (MONDI AG [AT]) 17 March 2021 (2021-03-17) * paragraphs [0001] - [0098] * * figures 1-5d * -----	1-15	
X	JP 2011 046383 A (SIKO CORP) 10 March 2011 (2011-03-10) * paragraphs [0001] - [0026] * * figures 1-9 * -----	1-15	
A	US 2013/126370 A1 (DILIBERTO DAVID [US] ET AL) 23 May 2013 (2013-05-23) * figure 42 * -----	1-15	TECHNICAL FIELDS SEARCHED (IPC) B65D
A	US 2022/242639 A1 (MEYER ANDREW [US] ET AL) 4 August 2022 (2022-08-04) * figure 1 * -----	1-15	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 5 October 2023	Examiner Duc, Emmanuel
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			

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

EP 23 31 5194

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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.

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Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 9835886	A1	20-08-1998	AR	012292 A1		18-10-2000
			AT	E295315 T1		15-05-2005
			AU	737466 B2		23-08-2001
			BR	9807386 A		14-03-2000
			CA	2280760 A1		20-08-1998
			DE	69830159 T2		02-02-2006
			EP	0975529 A1		02-02-2000
			JP	3741445 B2		01-02-2006
			JP	2001511747 A		14-08-2001
			PL	335057 A1		27-03-2000
			US	6312742 B1		06-11-2001
			UY	24891 A1		10-08-1998
			WO	9835886 A1		20-08-1998

DE 3344877	A1	13-06-1985	NONE			

EP 3792192	A1	17-03-2021	DE 102019124821	A1		18-03-2021
			EP 3792192	A1		17-03-2021

JP 2011046383	A	10-03-2011	JP 5189572	B2		24-04-2013
			JP 2011046383	A		10-03-2011

US 2013126370	A1	23-05-2013	US 2013126370	A1		23-05-2013
			US 2016023834	A1		28-01-2016

US 2022242639	A1	04-08-2022	AU 2022212202	A1		17-08-2023
			CA 3209777	A1		04-08-2022
			US 11548709	B1		10-01-2023
			US 2022242639	A1		04-08-2022
			WO 2022165298	A1		04-08-2022
