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(54) **Method for packaging a product in a container with a protective atmosphere obtained from a barrier shrink film**

(57) Method comprising a stage in which products (1, 2) are supplied, during which a product (1) reaches a packaging position (P1) and another product (2) a pre-packaging position (P2), a stage in which a tube (5) of film that wraps the products (1, 2) is generated, a stage of gas-injection in the tube (5), a stage in which the tube

(5) is sealed and cut, a packaged product (1) remaining in a container and the other product (2) in the tube (5) closed at one end, and a stage in which the container is shrink-wrapped. The method also comprises a stage in which pressure is exerted on a product (1), a stage for sucking gas out from the tube (5), and a stage in which pressure is exerted on the other product (2).

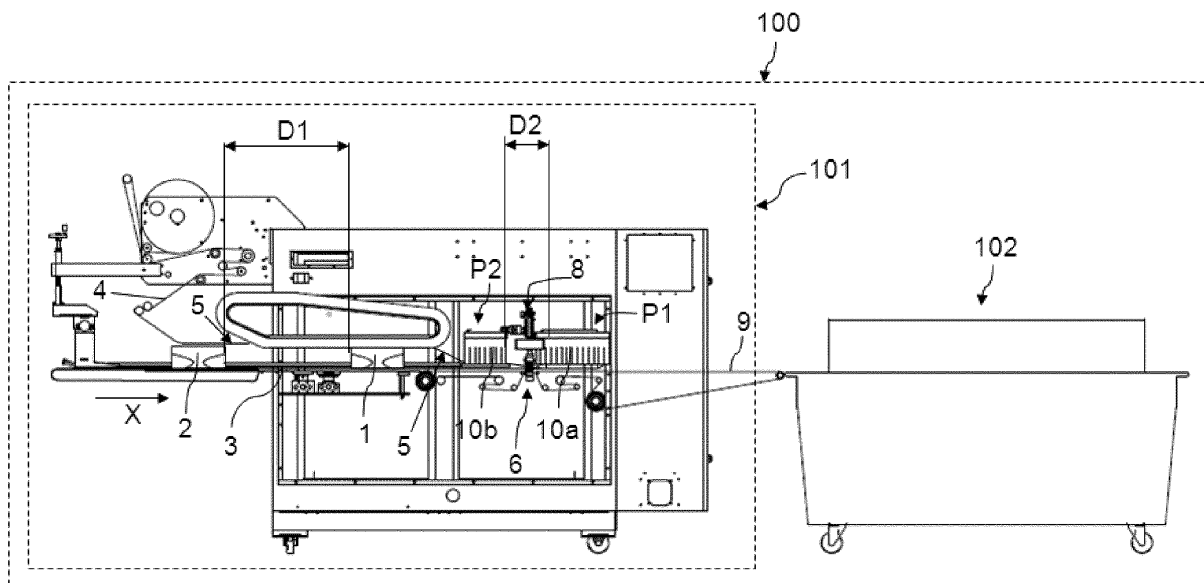


Fig. 1

Description

TECHNICAL FIELD

[0001] The invention relates to machines for packaging products and generating containers with a protective atmosphere, also known as flow-pack machines, and more specifically to methods for obtaining containers with a protective atmosphere in these types of machines from a shrink-wrap film.

PRIOR ART

[0002] In the industry of producing products for the food sector, packaged products must be disposed in conditions that guarantee that they are safe and in good condition when they are removed from their containers for their use and consumption. Furthermore, for the purposes of extending the useful life of said products, and therefore delaying their expiry as far as is possible, the containers that contain said products must provide conditions that enable the growth of bacteria and/or rust inside the container to be delayed, thereby preserving the packaged product for more time.

[0003] There are solutions on the market that offer these types of packaged products, some of which use the application in containers with a protective atmosphere, commonly known as Modified Atmosphere Packaging (MAP). Said containers comprise certain protective gases that are injected inside them, the protective gas used depending on the product to be packaged. These commonly used gases include CO₂ (carbon dioxide), O₂ (oxygen), N₂ (nitrogen) and Ar (argon), the properties of which allow the useful life of the packaged product to be extended.

[0004] These containers are obtained in machines known as flow-pack machines, in which a tube of shrink-wrap film is generated inside which the products to be packaged are transported, a protective gas is injected into the tube of film, the film is cut and sealed to form a container or bag with at least one product in its interior, and said container or bag is heated to shrink the film present in said container or bag. The injection of the gas causes the movement of at least part of the air disposed in the tube of film towards the exterior, the protective gas occupying its place inside said tube of film.

[0005] Document GB 2250499 A discloses a packaging machine with which containers with a protective atmosphere are obtained. The machine comprises means for injecting gas in a tube of film that comprises at least one product in its interior and which has been formed in the machine itself, a pressure plate to exert pressure on an area of the tube of film that comprises at least one product, exerting pressure on the product so that at least part of the gas or air present in said area is removed, and a clamp for cutting the film and generating a container or bag with the product in its interior. It also comprises a nozzle by means of which at least part of the gas is sucked

out continuously to aid its removal from said area of the tube of film.

[0006] The document WO 2008122680 A1 discloses a method for obtaining a container with a protective atmosphere. The method comprises a supply stage in which products to be packaged are supplied in a continuous manner on transport means, a wrapping stage in which a film is provided in order to wrap the products, a tube of film being generated inside which said products are present, an injection stage in which a gas is injected into the tube of film, a first cutting stage in which a first end of the tube of film is cut, a shrink-wrapping stage in which one end of the tube of film that wraps a product is heated, and a second cutting stage, subsequent to the shrink-wrapping stage, in which a second end of the tube of film is cut, thereby generating a shrink-wrapped container or bag with the product in its interior.

BRIEF DISCLOSURE OF THE INVENTION

[0007] It is an object of the invention to provide a method for obtaining a container with a protective atmosphere, as described in the claims.

[0008] The method for obtaining a container with a protective atmosphere of the invention comprises a supply stage in which products to be packaged are supplied in a continuous manner and during which a first product is disposed in a packaging position and a second product, adjacent to the first product, is disposed in a pre-packaging position, a wrapping stage in which a shrink-wrap film is provided in order to wrap the products while said products are supplied, a tube of film being generated inside which said products are present, an injection stage in which a gas is injected in a continuous manner in the tube of film, a cutting stage in which the tube of film is sealed and cut at an intermediate point between the first product and the second product when the first product and the second product are in the packaging position and in the pre-packaging position respectively, so that the first product is packaged inside a container or bag and the second product is disposed inside the tube of film closed at one end, and a shrink-wrapping stage in which the container or bag is heated with the product in its interior, the container adapting itself to the outline of the product that is in its interior due to the heating.

[0009] The method also comprises a pressing stage in which pressure is exerted on the first product when it is in the packaging position, so that at least part of the gas or air-gas mixture present in the area around the first product is removed, and a suction stage that begins after the pressing stage starts and in which at least part of the gas or air-gas mixture present around the first product and at least part of the gas or air-gas mixture present in the tube of film between the first product and the second product is sucked out.

[0010] The method also comprises an additional pressing stage that starts after the suction stage starts and in which pressure is exerted on the second product

when it is in the pre-packaging position, and a release stage in which pressure is taken off the first product and the second product, pressure being kept on the products from the start of the corresponding pressing stage to the release stage. As a result, when pressure is exerted on the second product the volume inside the tube of film is delimited or marked out between the first product and the second product, with the purpose of ensuring the removal of the gas until the suction stage ends.

[0011] The cutting stage is carried out after the additional pressing stage starts, and during it pressure is kept on both products. The release stage is carried out once the tube of film has been sealed and cut in the cutting stage.

[0012] An excessive volume of gas inside the container or a container that is too large for the product to be packaged (excess amount of film) results in, when the container is shrink-wrapped and the film shrinks and adapts itself to the outline of the product, the container failing to adapt itself to the outline of the product correctly and remaining enlarged due to the excess gas and/or wrinkled due to the excess film, which results in a container that the consumer find unattractive. With the method of the invention a container is successfully prepared for its shrink-wrapping, the risk of there being an excessive volume of gas or an excess of film being prevented, a container with a product in its interior being obtained comprising a minimum and sufficient amount of film and a minimum and sufficient amount of gas or an air-gas mixture in its interior. As a result of this, when the container is shrink-wrapped it adapts to the shape or outline of the product and the risk of the gas or the air-gas mixture present in the container causing, during the course of the useful life of the product, the container to swell or a reduction in the volume of the container is reduced, which would result in said container becoming, at least in some parts, loose, flaccid or wrinkled, which would undermine the presentation of container to an end user.

[0013] These and other advantages and characteristics of the invention will be made evident in the light of the drawings and the detailed description thereof.

DESCRIPTION OF THE DRAWINGS

[0014]

Figure 1 shows a schematic view of an embodiment of a system when the method of the invention is implemented.

DETAILED DISCLOSURE OF THE INVENTION

[0015] Figure 1 shows an embodiment of a system 100 where the method for obtaining a container with a protective atmosphere of the invention is implemented, which comprises a flow-pack machine 101 and a shrink-wrapping oven 102.

[0016] The method comprises a supply stage in which

food products 1 and 2 to be packaged are supplied in a continuous manner in a direction of supply X, preferably disposed on transport means 3 such as a conveyor belt or poly-belts, and during which a first product 1 is disposed in a packaging position P1 and a second product 2 is disposed in a pre-packaging position P2, a wrapping stage in which a shrink-wrap film 4 is provided in a continuous manner in order to wrap the products 1 and 2 while they are supplied, a tube of film 5 being generated inside which said products are present 1 and 2, and an injection stage in which a gas is injected in a continuous manner throughout the tube of film 5 which replaces, at least in part, the air originally present in the tube of film 5 and also acts as a barrier preventing the intake of air from the outside of the tube of film 5. The gas is injected in order to extend the life of the packaged product, and its composition therefore depends on the product. The most common gases are CO₂, N₂, Ar₂ and O₂, separately, combined with air, or combined with each other, although any other gas or any other combination may also be used if the product to be packaged so requires. For the purpose of keeping the gas inside the tube of film 5 the film 4 used is of the barrier type, which does not have any pores and does not allow gas to escape

[0017] The method also comprises a support stage in which the tube of film 5 is supported on its path, acting on it for the purpose of reducing the perimeter of the tube of film 5 that is formed and thereby reduce the amount of film 4 that wraps each product 1 and 2. This also results in a smaller volume inside the tube of film 5 for housing gas. The tube of film 5 may be accompanied in different ways, such as by exerting pressure on the tube of film 5 to press it against the product 1 and 2 (against the top surface of the product 1 and 2 or against the top surface and the lateral surfaces of said product 1 and 2 for example), and/or stretching the film 4 around the product 1 and 2 by means of stretching means not shown in the Figures, preferably claws or equivalent members, during the generation of the tube of film 5, for example.

[0018] The method also comprises a cutting stage in which, by means of cutting means such as a clamp 6, the tube of film 5 is sealed and cut at an intermediate point or area 8 between the first product 1 and the second product 2 when the first product 1 and the second product 2 are in the packaging position P1 and in the pre-packaging position P2 respectively, so that the first product 1 is packaged inside a container or bag not shown in the Figures and the second product 2 is disposed inside the tube of film 5 closed at one end. The method also comprises a shrink-wrapping stage in which the container is heated with the product in its interior, said container being shrink-wrapped on the product.

[0019] As the products 1 and 2 are supplied in a continuous manner, when a first product 1 is packaged inside a container, said first product 1 is shrink-wrapped in the shrink-wrapping stage, while the second product 2 becomes the new first product 1 and carries on moving towards the packaging position P1, and a new product be-

comes the second product 2.

[0020] The method also comprises a pressing stage in which pressure is exerted on the first product 1 when it is in the packaging position P1, pressure preferably being exerted from above and from its two sides in order to reduce the amount of gas or air-gas mixture in the area around the first product 1, a suction stage that begins after the pressing stage starts and in which at least part of the gas or the air-gas mixture present around the first product 1 and at least part of the gas or the air-gas mixture present in the tube of film 5 between the first product 1 and the second product 2 is sucked out, and in which pressure is kept on the first product 1, an additional pressing stage that begins after the suction stage starts when the second product 2 reaches the pre-packaging position P2 and in which pressure is exerted on the second product 2, preferably from above and from its two sides, and a release stage in which pressure is no longer exerted on the first product 1 and the second product 2, pressure being kept on the products 1 and 2 from the start of its corresponding pressing stage to the release stage. As a result, during the suction stage the products 1 and 2 are prevented from moving from their packaging P1 and pre-packaging P2 positions respectively, and the volume of the tube of film 5 is also marked out in the intermediate area 8 between the two products 1 and 2. In the pressing stages sponges 10a and 10b or equivalent members are used respectively, for example, to exert pressure on the products 1 and 2 in each case, which adapt to the outline of the product 1 and 2 to be packaged, enabling the removal of more gas from the area around it as pressure is exerted on the cavities where said gas may remain housed inside the tube of film 5 and around the product 1 and 2. The sponges 10a and 10b comprise the required pressing shape which may be U shaped for example, when seen from below, and may be disposed facing each other if pressure is to be exerted on the products 1 and 2 from above and from its three sides, in order to mark out the volume of the tube of film 5 between two consecutive products 1 and 2.

[0021] The cutting stage is carried out after the additional pressing stage starts, and during it pressure is kept on both products 1 and 2. The release stage is carried out once the tube of film 5 has been sealed and cut in the cutting stage. The suction stage can begin before the cutting stage starts, although it can also be carried out during it and finish at the same time.

[0022] A container with a product 1 is thus prepared for its shrink-wrapping and which comprises a minimum and sufficient amount of film 5 and a minimum and sufficient amount of gas or air-gas mixture in its interior for the conservation of the product 1. As a result of this, when the container is shrink-wrapped it adapts to the shape of the product 1, and the risk of the gas or the air-gas mixture present in the container causing over time the container to swell or a reduction in the volume of the container is reduced, which would result in said container becoming, at least in some areas, loose or flaccid, which would un-

dermine the presentation of container to an end user. In addition, as the volume of the tube of film 5 is reduced, the consumption of film 4 is reduced which results in a reduced cost and a reduced environmental impact in obtaining a packaged product 1.

[0023] The products 1 and 2 are supplied distanced from each other by a preset initial distance D1, and the method comprises an approach stage in which, when the first product 1 reaches its packaging position P1, the distance between the first product 1 and an adjacent second product 2 is reduced to a certain packaging distance D2, the packaging distance D2 corresponding with the distance between the first product 1 and the second product 2 when both products 1 and 2 are in the packaging position P1 and in the pre-packaging position P2 respectively. The approach stage reduces the space between both products 1 and 2, thereby reducing the tension of the tube of film 5 in the intermediate area 8 between both products 1 and 2, which enables the suction of the gas or air-gas mixture in the intermediate area 8 during the suction stage, the risk of said tube of film 5 rupturing in the intermediate area 8 during the suction stage or during the cutting stage being prevented; and the sealing of the container in the cutting stage being optimised, preventing the risk of leaks.

[0024] The pressing stage begins when the first product 1 reaches its packaging position P1, the additional pressing stage begins when the second product 2 reaches its pre-packaging position P2, and the approach stage begins before the pressing stage, the approach stage ending when the release stage begins, both products 1 and 2 being in the packaging position P1 and in the pre-packaging position P2 respectively at that moment, and the distance between both products 1 and 2 corresponds with the packaging distance D2.

[0025] The products 1 and 2 are supplied firstly on the transport means 3, which move at a constant speed, and in order to reach the packaging position P1 the first product 1 moves from the transport means 3 to additional transport means 9, which move at a speed substantially equal to the speed of the transport means 3 during this step. When the first product 1, which is on the additional transport means 9, reaches the packaging position P1, the speed of the additional transport means 9 is reduced so that the second product 2, which is on the transport means 3 and the speed of which remains constant, approaches the first product 1. The speed can be reduced or stopped, until the distance between both products 1 and 2 is equal to the packaging distance D2, said speed equalling the speed of the transport means 3 once more after the release stage. The cutting means, the additional transport means 9 and at least part of the transport means 3 form part of a unit that moves in the direction of supply X of the products 1 and 2, in one or another direction as required, with the result that in order for it to allow time to keep the products 1 and 2 pressed or under pressure and to seal and cut the tube of film 5 at high production speeds, said unit moves in the direction of supply of the

products 1 and 2 at a speed substantially equal to the speed of the transport means 3.

[0026] In a preferred embodiment the method also comprises a punctual injection stage, which begins before the first product 1 reaches the packaging position P1 and ends before the pressing stage starts, in which a gas is injected towards the intermediate area 8 between the first product 1 and the second product 2. Thanks to the punctual injection the flow of gas that is introduced in the gas-injection stage in a continuous manner can be reduced as the punctual injection completes the amount of gas needed to obtain the required state of conservation of the product 1, resulting in a reduction in the consumption of gas and, therefore, in a reduction in the cost of obtaining a container with at least one product 1 in its interior. In the punctual injection stage the gas is preferably injected at a higher pressure than in the injection stage, and comprises a duration of a preset time interval, there being injected in said time interval a flow of gas preferably greater than the flow of gas that is injected in the injection stage in the same time interval.

[0027] To ensure that the supply of products is continuous, a unit of the machine 100 formed by the transport means 3, the additional transport means 9, the cutting means and the sponges 10a and 10b moves in the direction of supply X, in one or another direction as required. When a first product 1 is disposed beneath the sponge 10a, the unit moves in the same direction of supply as the products 1 and 2 at a speed equal to the speed of supply of the products 1 and 2. When the release stage takes place the unit moves in the opposite direction to its original position.

Claims

1. Method for obtaining a container with a protective atmosphere, comprising
 - a supply stage in which products (1, 2) to be packaged are supplied in a continuous manner and during which a first product (1) is disposed in a packaging position (P1) and a second product (2), adjacent to the first product (1), is disposed in a pre-packaging position (P2),
 - a wrapping stage in which a shrink-wrap film (4) is provided in a continuous manner in order to wrap the products (1, 2) while said products (1, 2) are supplied, a tube of film (5) being generated inside which said products are present (1, 2),
 - an injection stage in which a gas is injected in a continuous manner along the tube of film (5),
 - a cutting stage in which the tube of film is sealed and cut (5) at an intermediate point between the first product (1) and the second product (2) when the first product (1) and the second product (2) are in the packaging position (P1) and in the pre-packaging position (P2) respectively, so that the first product (1) is packaged inside a container or bag and the second prod-

uct (2) is disposed inside the tube of film (5) closed at one end, and

a shrink-wrapping stage in which the container is shrink-wrapped with the product (1) in its interior,

characterised in that the method also comprises a pressing stage in which pressure is exerted on the first product (1) when it is in the packaging position (P1),

a suction stage that begins after the pressing stage starts and in which at least part of the gas or air-gas mixture present around the first product (1) and at least part of the gas or air-gas mixture present in the tube of film (5) between the first product (1) and the second product (2) is sucked out,

an additional pressing stage that begins after the suction stage starts and in which pressure is exerted on the second product (2) when it is in the pre-packaging position (P2), and

a release stage in which pressure is no longer exerted on the first product (1) and the second product (2), pressure being kept on the products (1, 2) from the start of its corresponding pressing stage to the release stage,

the cutting stage being carried out after the additional pressing stage starts and the release stage being carried out when the tube of film (5) has been sealed and cut in the cutting stage.

2. Method according to claim 1, wherein the products (1,2) are supplied distanced from each other by a preset initial distance (D1), the method comprising an approach stage in which, when the first product (1) reaches its packaging position (P1), the distance between the first product (1) and an adjacent second product (2) is reduced to a certain packaging distance (D2), the packaging distance (D2) corresponding with the distance between the first product (1) and the second product (2) when both products (1, 2) are in the packaging position (P1) and in the pre-packaging position (P2) respectively.
3. Method according to claim 2, wherein the pressing stage begins when the first product (1) reaches its packaging position (P1), the additional pressing stage begins when the second product (2) reaches its pre-packaging position (P2), and the approach stage begins before the pressing stage and ends when the release stage starts.
4. Method according to claim 3, wherein the products (1, 2) are supplied on transport means (3), which move at a constant speed, and in order to reach the packaging position (P1) the first product (1) moves from the transport means (3) to additional transport means (9), which move at a speed substantially equal to the speed of the transport means (3),

the speed of the additional transport means (9) being reduced when the first product (1) reaches the packaging position (P1), and the speed of said additional transport means (9) equalling the speed of the transport means (3) after the release stage. 5

5. Method according to claim 4, wherein the speed of the additional transport means (9) is reduced until it stops. 10
6. Method according to any of the preceding claims, comprising a punctual injection stage in which a gas is injected towards an intermediate area (8) between the first product (1) and the second product (2). 15
7. Method according to claim 6, wherein the punctual injection stage takes place before the first product (1) reaches the packaging position (P1) and ends before the pressing stage starts. 20
8. Method according to claims 6 or 7, wherein in the punctual injection stage the gas is injected at a higher pressure than in the injection stage. 25
9. Method according to any of claims 6 to 8, wherein the punctual injection stage comprises a duration of a preset time interval, there being injected in said time interval a flow of gas greater than the flow of gas that is injected in the injection stage in the same time interval. 30
10. Method according to any of the preceding claims, wherein in the release stage pressure is taken off the second product (2) first and after that pressure is then taken off the first product (1). 35
11. Method according to any of the preceding claims, wherein the suction stage ends before the cutting stage is carried out. 40
12. Method according to any of claims 1 to 10, wherein the suction stage ends during the cutting stage, before the release stage starts. 45
13. Method according to any of the preceding claims, comprising a support stage in which the tube of film (5) is accompanied on its path, the perimeter of said tube of film (5) being so reduced. 50

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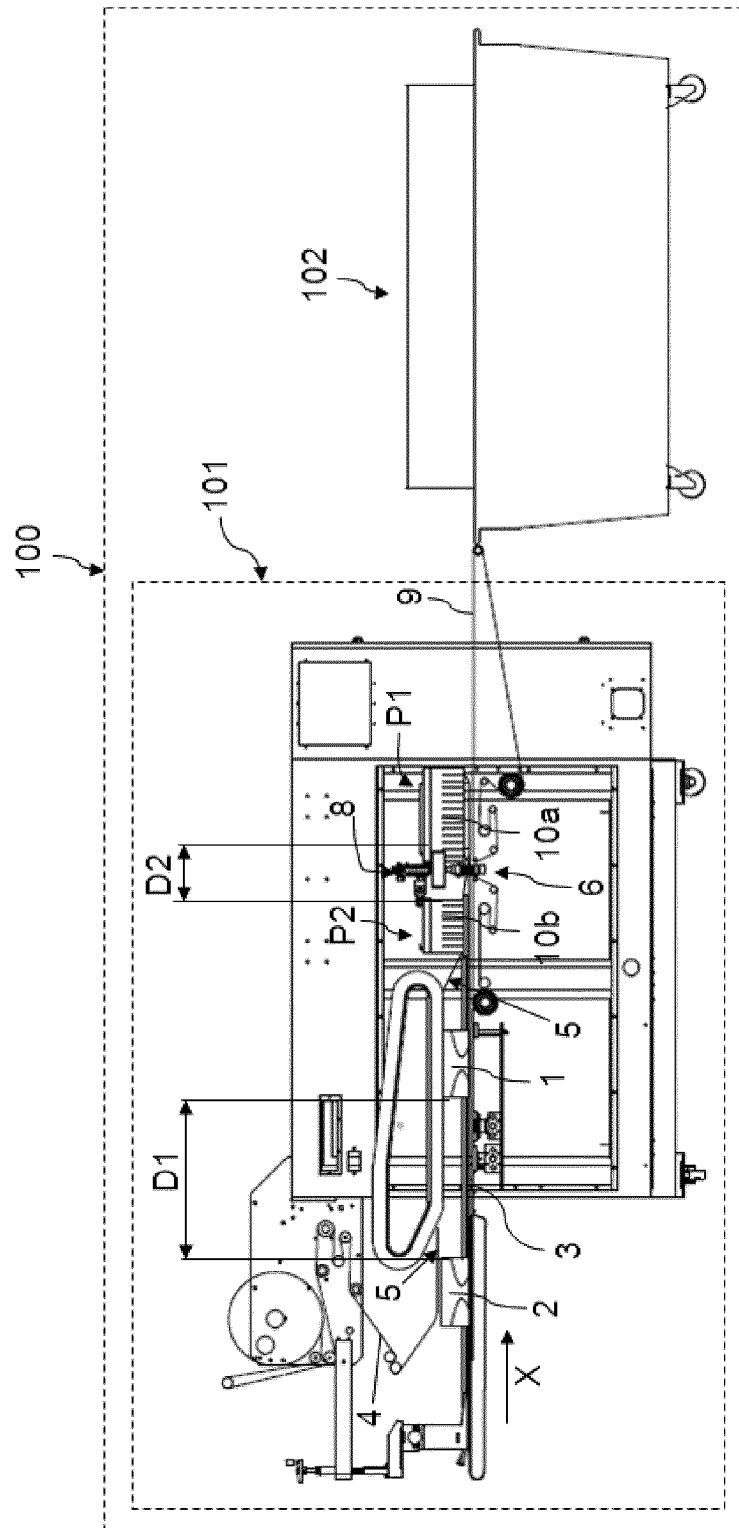


Fig. 1



EUROPEAN SEARCH REPORT

Application Number
EP 11 38 2385

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 03/051715 A1 (AWAX PROGETTAZIONE [IT]; RIMONDI RENATO [IT]) 26 June 2003 (2003-06-26) * page 9, line 5 - line 20 * * page 5, lines 1-5 * * figures 12,13 * -----	1-13	INV. B65B31/06 B65B9/073 B65B51/30
A	US 3 735 551 A (PRATT R) 29 May 1973 (1973-05-29) * column 2, line 63 - column 4, line 34; figure 2 * -----	1-13	
A	WO 2008/122680 A1 (ULMA PACKAGING TECHNOLOGICAL C [ES]; ARAMBURU ECHEZARRETA AITOR [ES];) 16 October 2008 (2008-10-16) * page 16 - page 17; figures 4,7 * -----	1-13	
A	US 2010/242410 A1 (BEER PHILIP ROLAND [US]) 30 September 2010 (2010-09-30) * claim 10; figure 12 * -----	1-13	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65B
4	Place of search Munich	Date of completion of the search 19 April 2012	Examiner Yazici, Baris
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	

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

EP 11 38 2385

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19-04-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03051715 A1	26-06-2003	AT 310672 T	15-12-2005
		AU 2002366279 A1	30-06-2003
		CA 2467745 A1	26-06-2003
		CA 2690882 A1	26-06-2003
		CN 1606519 A	13-04-2005
		DE 60207607 D1	29-12-2005
		DE 60207607 T2	10-08-2006
		EP 1456083 A1	15-09-2004
		ES 2253584 T3	01-06-2006
		JP 2005511437 A	28-04-2005
		US 2004250515 A1	16-12-2004
		US 2006112665 A1	01-06-2006
		WO 03051715 A1	26-06-2003

US 3735551 A	29-05-1973	NONE	

WO 2008122680 A1	16-10-2008	NONE	

US 2010242410 A1	30-09-2010	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2250499 A [0005]
- WO 2008122680 A1 [0006]