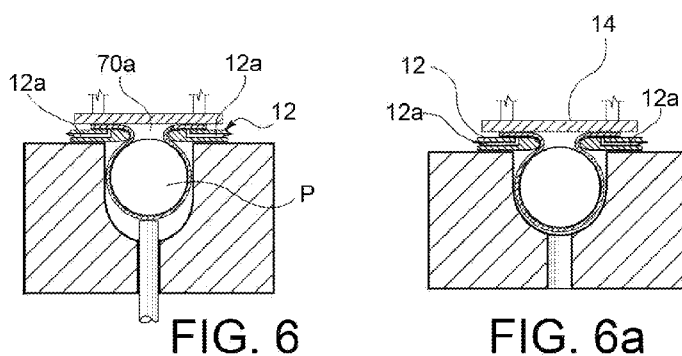




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(54) Title: A PROCESS FOR PACKAGING A PRODUCT IN A SEALED WRAPPER OF SHEET MATERIAL



(57) Abstract: Process and corresponding apparatus for wrapping a product (P) in a wrapper of sheet material, adhering to the surface of the product, the process comprising the steps of: providing a first (2) and a second sheet (4) of wrapping material, shaping said first sheet (2) according to a cup-shaped configuration comprising a bottom portion (2a) substantially complementary to a bottom portion of the surface of the product, a tubular portion (2b) which extends above the top of the product when inserted in said so-shaped sheet and defining a mouth adapted for the introduction of the product and an annular flange terminal portion (2c) surrounding said mouth, introducing the product (P) in said first shaped sheet (2), and connecting said second sheet (4) to said annular flange (2c) so as to form a closed wrapper around said product. Following the introduction of the product and prior to connection of said second sheet (4) with said annular flange, it includes the operation to make a bottleneck of said tubular portion (2b) of said first sheet (2) in its region (2d) immediately above the top of the product, exerting on said annular flange (2c) a pressure suitable to bind the edges of flange (2c) or to limit its radial movement, so as to cause the adhesion of said tubular wall (2b) to a substantial portion of the top surface of the product.



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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A process for packaging a product in a sealed wrapper of sheet material

The present invention relates to a process for wrapping a product, in particular a confectionery product such as a praline or a chocolate, having a generally convex form in a
5 wrapper of sheet material which can be sealed, tightly adhering to the surface of the product.

A process of the type to which the invention relates is described, for example, in EP 0 591 742 A1. In this case, the wrapper is obtained proceeding from two sheets, the first of which
10 is shaped like a dish so as to wrap most of the product; the other sheet is then laid on the rest of the product so as to assume a form complementary to that of the product itself.

After the two sheets have been welded peripherally to give the wrapper sealing characteristics and the edges which project beyond the welding zone have been cut, the
15 thus formed wrapper is subjected to a shaping step which causes the first sheet to cover practically the entire product, hiding the second sheet from view.

EP 1 046 579 A1 describes a process of the type indicated above, with the aim of obtaining a shaped wrapper which comprises, as an integral part of the wrapper itself, a formation
20 like a small cup ("fluted case"). In this case, following the achievement of an intermediate packaging formed by a first bowl-shaped sheet, with a containing wall including the product and a mouth surrounded by a radial flange, and by a second sheet arranged so as to overlap and possibly be connected sealingly to said radial flange, provision is made to shape the peripheral regions of said flange to obtain a wall which surrounds the containing
25 wall of the first shaped sheet at a radial distance, forming a small cup ("fluted case").

This step is carried out by shaping means which comprise a forming cavity, which can receive in its interior the intermediate packaging, and a male element which can penetrate into the forming cavity like a punch, so as to compress the peripheral regions of the first
30 and of the second sheet between the inner surface of the forming cavity and the outer surface of the male element.

In order to improve the adhesion of the wrapper to the surface of the product, WO2008/018008 A1 describes a process of the type in EP 1 046 579, in which the shaping of the small cup, integral with the packaging, is obtained by means of a mandrel with radially movable petals which are able to assume a radially retracted configuration in which the petals of the mandrel are able to penetrate into a forming cavity to improve the adhesion of the wrapper to the product and simultaneously shape a portion of the wrapper into the configuration like a small cup.

It is an object of the present invention to provide a process which further makes it possible to improve the adhesion of the wrapper to the outer surface of the product, thereby limiting the presence of air within the wrapper, which is made airtight by the adhesive or welding connection between the two sheets which constitute the wrapper itself.

It is a particular object of the invention to provide a process which makes it possible to achieve the contact of the wrapper virtually over the entire surface of the product, even when the product has an outer surface with small bumps and protrusions which act as spacers between the outer general surface of the product and the wrapper.

These bumps and/or protrusions are typical, for example, in a praline having a generally convex form, to the surface of which pieces of chocolate or of dried fruit or coconut shavings, for example, are applied.

In view of these objects, the invention relates to a process and an apparatus having the features defined in the claims which follow and which form an integral part of the present description.

The invention will now be described, purely by way of non-limiting example, with reference to the accompanying drawings, in which:

Figures 1 to 7 show successive steps of an embodiment of the process according to the invention;

Figures 1a, 2a and 6a are realisation steps corresponding to those in Figures 1, 2 and 6 in an alternative embodiment of the process;

Figure 8 is a plan view of an iris tool used in the process;

Figures 9 and 10 are schematic plan views showing two configurations of the shutter means of the iris tool shown in Figure 8 and respectively shown in Figures 5 and 6 with the detail 12;

5 Figure 11 is a perspective view showing the final result of the packaging operation comprising the steps shown in Figures 1 to 7; and

Figures 12 and 13 are schematic views showing operational steps which follow the step shown in Figure 6 or 6a, in an embodiment of the process which leads to a product packaged in a sealed wrapper comprising a small cup or fluted case associated therewith.

10

The product which is to be packaged is constituted, in the exemplary embodiment shown, by a praline P with a spherical overall shape. In particular, this may be a praline which is constituted by a spherical wafer shell with a pasty and creamy filling, coated on the outside with chocolate or a similar coating, possibly with the application of granular food
15 substances, such as coconut shavings, hazelnut pieces and the like, which give the outer surface of the praline an irregular overall aspect.

The process according to the invention is particularly advantageous for obtaining adhesion of the wrapper to an irregular surface of the type indicated above; however, the invention is
20 also suitable for application to natural products having a different shape, but preferably having a generally convex shape, more preferably having a shape with one end or both ends shaped like a dome.

Still remaining within the confectionery sector, it is possible to refer to hollow or filled
25 chocolate eggs, chocolates or pralines having an approximately spherical shape or with a flat bottom wall.

According to the invention, a sealingly adherent wrapper is formed around the product P using two sheets of aluminium or of other laminar material, denoted by 2 and 4 (see Figure
30 7 for the latter).

The preferred material constituting the sheets 2 and 4 can be aluminium or polypropylene;

however, it is possible to use other plastic material which is suitable for contact with food or else paper or metallised paper; the sheets 2 and 4 can be present in a single layer or in a plurality of layers, for example composite materials or coextrudates such as aluminium/plastic material, paper/plastic material, paper/metallised plastic material. In particular, it is preferable for the two sheets 2 and 4 to be coated on their inner faces, which are intended to face the product P, by a welding lacquer or by a layer of thermowelding material, so as to allow the two sheets to be welded, as will be seen hereinbelow.

The two sheets can be of any desired shape but are preferably cut in advance into a circular shape.

The first step in the operation for packaging the product P consists in an operation for shaping, preferably by deep-drawing, the sheet 2 according to a cup-shaped general configuration (Figures 1 and 2). This operation is usually carried out by means of a tool comprising a mould 6 which, in its interior, defines a cavity 6a, into which a punch 8 having a shape which is substantially complementary to the cavity 6a can penetrate; in particular, the lower part of the cavity 6a of the mould has a shape which is exactly complementary to the shape of half of the product P which is intended to be wrapped by the sheet 2.

By means of the punch 8, the sheet 2 is thereby shaped according to a cup-shaped configuration comprising a bottom portion 2a complementary to said half or bottom portion of the product P, a tubular wall portion 2b defining a mouth adapted for the introduction of the product and an annular flange portion 2c surrounding the mouth; the tubular wall 2b has an axial extension (in height) such that it extends above the top of the product P when the latter is inserted in the shaped sheet; the tubular wall portion, which, as indicated above, extends between the plane of the annular flange 2c and the top of the product P, denoted by 2d in Figure 4, will be identified hereinbelow by the term neck portion.

In the next step (Figure 3), the product P is introduced in the sheet 2 shaped previously like a cup as indicated; in the illustration in Figure 3, the product is introduced in the shaped

sheet when the latter is housed in the forming cavity 6; it is of course intended that this option is not binding, it being possible to extract the shaped sheet from the mould and transfer it into another mould or into another cavity formation which is able to support the sheet 2 with a view to introducing the product P.

5

According to a characterising aspect of the process according to the invention, following the introduction of the product P in the cup-shaped sheet 2, a bottleneck operation is carried out on the tubular wall portion 2b in its neck portion 2d, i.e. in the region immediately above the top of the product. This operation is carried out by binding the
10 annular flange 2c or rather limiting its ability to move radially (according to the arrows F2 in Figure 5); in this way, the tubular wall 2b is fitted tightly adhering to the surface of the product, both in its bottom region and in the upper cap region.

Figures 4, 5 and 6 show a way of carrying out this operation, this being carried out with the aid of an iris bottleneck tool 12, with the aid of a pressure member 14 and with the aid of
15 extraction means which are connected to vacuum and are associated with the iris tool 12.

According to an optional embodiment, shown in Figure 4, the shaped sheet, including the product, is lifted by means of a pusher member 10 which can slide in a through-hole
20 through the mould, so as to make the neck portion 2d emerge from the forming cavity 6a.

The bottleneck operation is performed by means of the iris tool 12, one embodiment of which is shown in Figure 8. This tool comprises shutter means, denoted as a whole by 16 (Figures 9 and 10), which are movable between a configuration in which they define an enlarged opening (Figure 9) and a configuration in which they define a narrow opening
25 (Figures 10 and 8). Said shutter means 16 comprise a plurality of petals 18, 20, 22, 24 (four petals in the example shown), the main faces of which are coplanar and which are associated with an annular plate 26. The plate 26 has a central opening whose profile is denoted by 28 (Figure 8) and a plurality of eyelets 30, 32, 34 and 36 in which a respective
30 slider 38, 40, 42 and 44 protruding from the surface of the petals which faces the plate 26 engages. The petals are thus capable of linear translation movement relative to the plate 26 in the direction of the arrows F3, F4, F5 and F6 (Figure 9). The petals have respective front

edge profiles 46, 48, 50 and 52 (i.e. the profiles facing the centre of the tool), which, in the enlarged configuration, define a central opening 54 having a dimension such that, when the iris tool is operated, to cause the bottleneck of the shaped sheet, in its neck portion, this opening surrounds the neck portion 2d.

5

The translation movement of the petals is controlled by means of an annular member 56, having a central opening whose profile is denoted by 66 (Figure 8) and which has a plurality of slits or radial eyelets 58, 60, 62 and 64 in which pins 68 protruding from the upper surface of the petals slidably engage. The rotation of the annular member 56 (by means of the lever F7) controls the translation movement of the petals from the enlarged configuration to the narrow configuration, shown in Figure 10, in which the front profiles of the petals define a narrow central opening 70 (Figure 10 and Figure 8).

The radial dimension of the opening 70 is such that the sheet 2, following movement of the iris tool into the narrow configuration, has a narrow opening, such that the sheet covers some of the surface of the upper cap of the product P. In one embodiment (Figures 4 to 6), for performing the bottleneck operation on the sheet 2 in its neck region 2d, the shaped sheet is lifted from the deep-drawing cavity by means of a pusher member 10 so as to make the neck region 2d emerge (Figure 4). Then, the iris tool 12, associated with the mould 6, is moved from its enlarged position (Figure 5) to its narrow configuration (Figure 6). At the same time as or before the movement of the iris tool from the enlarged configuration to the narrow configuration, a pressure member 14 is moved in the direction of the arrow F8, so as to bind the annular flange 2c between said pressure member and the upper surface of the iris tool. The pressure exerted by the pressure member 14 can be regulated so as to block the edges of flange 2c or to limit by friction its ability to slide in the radial direction (arrow F2).

Since the flange is blocked or the ability thereof to slide is limited, the bottleneck operation causes the tubular wall 2b of the sheet 2 to be tightly fitted in substantial adhesion with the outer surface of the product.

Optionally or as an alternative, the shutter means 16, in their area of contact with the flange

2c of the sheet 2, may have through-holes 12a connected to vacuum (Figures 5 and 6), which is activated in order to bring about attachment of the shutter means to the flange 2c, during the bottleneck operation, further improving the adhesion of the wall of the sheet 2 to the surface of the product and the resultant evacuation of the air, before the sheet 4 is
5 connected to the flange 2c.

The axial extension of the neck portion 2d is chosen so as to obtain an opening 70a (Figure 6) with a somewhat reduced dimension with respect to the original dimension of the mouth of the cup-shaped sheet.

10 The operation to lift the shaped sheet, shown in Figure 4, is to be considered purely optional and illustrative. As indicated in Figures 1a, 2a and 6a, it is indeed possible to carry out the deep-drawing of the sheet 2 in a mould 6 with an associated iris tool 12, such that the flange 2c is formed above the iris tool (Figure 2a).

15 The compression operation exerted on the annular flange 2c advantageously also flattens the annular surface of the flange, which, following the operation to deep-draw the sheet 2, generally has creases or small pleats, normally with a radial course.

20 This provides a substantially flat annular flange 2c, to which the sheet 4 is connected (Figure 7) by means of thermowelding or possibly by bonding with the aid of adhesive material.

25 This provides a packaged product P1, which has the configuration shown in Figure 11 and is characterised by the presence of a narrow neck region 2d surrounded by a flange and formed by the adhesion of the annular flange 2c and of the sheet 4. In an optional subsequent operation, said flange can be shaped further, according to the direction of the arrows F9, so as to bring it into contact with the wall portion of the sheet 2 which surrounds the region of the narrow neck.

30 The process according to the invention can also be adopted for obtaining a product packaged in a sealed wrapper which comprises a small cup, or better a small cup with

pleated walls ("fluted case"), following the optional operational steps shown in Figures 12 and 13, sequential to the operational step shown in Figure 6 or 6a.

In this embodiment, instead of using a second, flat sheet 4, use is made of a second sheet 4 which has been pre-emptively shaped (for example by deep-drawing) like a small cup, denoted by 5 (Figure 12), with a base wall 5a and a flared and preferably pleated side wall 5b.

Analogously to the operation described above with reference to Figure 6, the small cup or fluted case 5 is positioned, for example by means of a suction tool U, with its base wall 5a resting on the flange 2c of the first sheet (Figure 12), with the concavity of the small cup facing in the direction opposite with respect to the flange 2c, or, in the example illustrated, upwards. The base wall 5a and the flange 2c are then connected by bonding or preferably by thermowelding or ultrasonic welding. If the connection is made by means of thermowelding or ultrasonic welding, the small cup 5, on its outer surface, or at least on the surface of the base wall 5a facing the flange 2c, has a coating formed by a film of thermoweldable material, for example a welding lacquer or a polyethylene composite.

Once the welding operation has been carried out, with the use of a welding plate, the side wall 5b is folded by 180° according to the arrows F10 by means of an appropriate tool U1, so as to bring said wall into a position in which it surrounds the wrapped product, at a slight distance therefrom (Figure 13). Of course, this embodiment involves a final operation to turn the product by 180° such that the base wall 5b of the small cup acts as a bearing surface for the packaging.

The process according to the invention therefore achieves the object of obtaining a substantially sealed wrapper which insulates the product from contact with air and which adheres precisely to the outer surface of the product.

It goes without saying that the process according to the invention can be automated and applied in an industrial field providing for the simultaneous packaging of a plurality of products.

Clearly, without departing from the principle of the invention, the embodiments and in particular the constructional details may be greatly varied with respect to that described and illustrated purely by way of non-limiting example, without departing from the scope of the claims which follow.

CLAIMS

1. A process for wrapping a product (P) in a wrapper of sheet material, adhering to the surface of the product, comprising the steps of:

- 5 - providing a first (2) and a second sheet (4) of wrapping material,
- shaping said first sheet (2) according to a cup-shaped configuration comprising a bottom portion (2a) substantially complementary to a bottom portion of the surface of the product, a tubular portion (2b) which extends above the top of the product when inserted in said so-shaped sheet and defining a mouth adapted for the introduction of the product and
10 an annular flange terminal portion (2c) surrounding said mouth,
- introducing the product (P) in said first shaped sheet (2), and
- connecting said second sheet (4) to said annular flange (2c) so as to form a closed wrapper around said product, characterised in that, following the introduction of the product and prior to connection of said second sheet (4) with said annular flange, it
15 includes the operation to make a bottleneck of said tubular portion (2b) of said first sheet (2) in its region (2d) immediately above the top of the product, exerting on said annular flange (2c) a pressure suitable to bind the edges of flange (2c) or to limit its radial movement, so as to cause the adhesion of said tubular wall (2b) to a substantial portion of the top surface of the product.

20

2. A process according to claim 1, characterised in that said bottleneck operation is performed by means of an iris tool (12) comprising shutter means (16), movable between an enlarged configuration defining an opening (54) whose profile is adapted to surround said tubular portion (2b) and a narrow configuration in which said shutter means jointly
25 define an opening (70) whose profile has a small radial dimension.

3. A process according to claims 1 or 2, characterised in that the iris tool (12) comprises a plurality of petals with main coplanar faces (18, 20, 22, 24) capable of straight translation movement and linearly slidably mounted in a respective groove (30, 32, 34, 36) of a
30 support plate (26) and actuator means (56), associated with said shutter means (16) adapted to cause the translation of said petals simultaneously from the enlarged configuration to the narrow configuration.

4. A process according to any one of claims 1 to 3, characterised in that the bottleneck operation is performed by exerting a compression of said annular flange (2c) between a pressure member (14) and the surface of said iris tool facing said pressure member.

5. A process according to any one of the preceding claims, characterised in that following the connection of the second sheet (4) to said annular flange (2c) said flange is folded into contact with the wall (2b) of the wrapper.

6. A process according to any one of claims 1 to 4, characterised in that said second sheet (4) is a sheet pre-emptively shaped like a small cup (5), comprising a base wall (5a) and a flared, preferably pleated, side wall (5b).

7. A process according to claim 6, characterised in that said second sheet (4), shaped like a small cup (5), has a heat melting coating on its outer surface.

15

8. A process according to claims 6 or 7, characterised in that said second sheet shaped like a small cup (5) is positioned with said base wall resting on the annular flange (2c) and with the concavity facing in the direction opposite with respect to said flange (2c), the base wall (5b) of said small cup (5) is connected by welding or bonding to said flange (2c), and then said side wall (5b) is overturned into a position surrounding the product wrapped by said first sheet.

20

9. A process according to any one of claims 1 to 8, characterised in that said first (2) and second (4) sheet are sheets of aluminium, paper or plastic material optionally coated on the side facing toward the product (P) with a heat melting lacquer.

25

10. A process according to any one of claims 1 to 8, characterised in that said first (2) and second (4) sheet are selected from aluminium/plastic material and paper/plastic material composites optionally coated with a heat melting blade.

30

11. A confectionery product packaged in a sealed wrapper adherent to the surface of the product obtained by the process according to any one of claims 1 to 10.

12. A confectionery product according to claim 11, obtainable by a process according to any one of claims 6 to 8, wherein said second sheet (4) is shaped like a small cup (5), having a base wall (5a) and a flared, preferably pleated, side wall (5b), and wherein said base wall has on its face facing said flange (2c) a heat melting coating and is connected to said flange (2c) by welding.

13. A packaging apparatus to wrap a product (P) in a wrapper of sheet material, adhering to the surface of the product formed from a first (2) and a second (4) sheet of wrapping material, comprising:

- forming means (6, 8) for shaping said first sheet (2) in a cup-shaped configuration comprising a bottom portion (2a) substantially complementary to a bottom portion of the surface of the product, a tubular portion (2b) which extends above the top of the product when it is inserted in said so-shaped sheet and defining a mouth adapted for the introduction of the product and an annular flange terminal portion (2c) surrounding said mouth;

- means for introducing the product in said first shaped sheet; and

- means for connecting said second sheet (4) to said annular flange,

characterised in that it includes an iris tool (12) configured to make a bottleneck of said tubular portion (2b) of said first sheet (2) in its region (2d) immediately above the top of the product and a pressure member (14) cooperating with said iris tool (12) to exert on said annular flange (2c) a pressure suitable to bind the edges of the flange or to limit its radial movement in the course of the bottleneck operation, so as to cause the adhesion of said tubular wall (2b) to a substantial portion of the top surface of the product.

14. An apparatus according to claim 13, characterised in that said iris tool (12) comprises shutter means (16) movable between an enlarged configuration defining an opening (54), whose profile is adapted to surround said tubular portion (2b) and a narrow configuration in which said shutter means jointly define an opening (70) whose profile has a small radial dimension.

15. An apparatus according to claim 14, characterised in that said shutter means (16) comprise a plurality of petals with main coplanar faces (18, 20, 22, 24) capable of straight

translation movement and linearly slidably mounted in a respective groove (30, 32, 34, 36) of a support plate (26) and actuator means (56) associated with said shutter means (16) adapted to cause the translation of said petals simultaneously from the enlarged configuration to the narrow configuration.

5

16. An apparatus according to any one of claims 13 to 15, characterised in that said pressure member (14) is arranged to cooperate with said iris tool (12) to constrain or limit the sliding of the edges of said annular flange (2c) during the operation of said iris tool (12) making the bottleneck of said tubular portion (2b) of said first sheet (2).

10

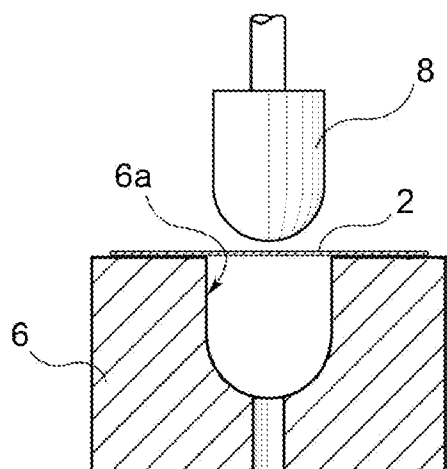


FIG. 1

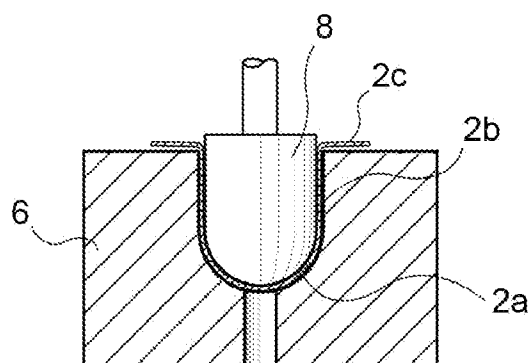


FIG. 2

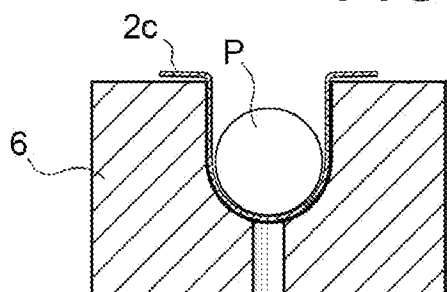


FIG. 3

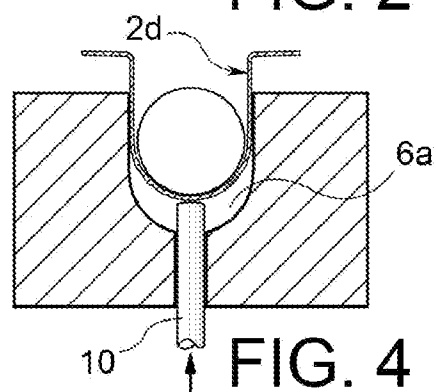


FIG. 4

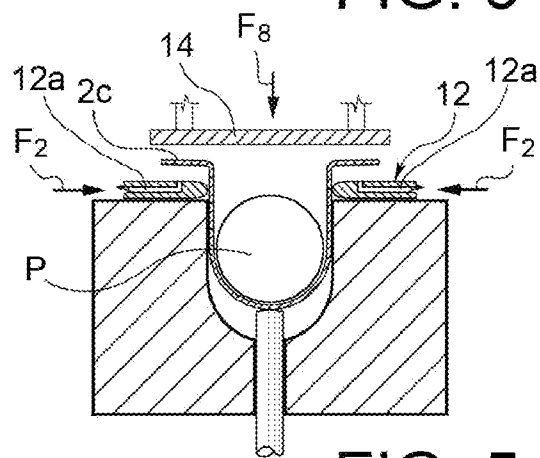


FIG. 5

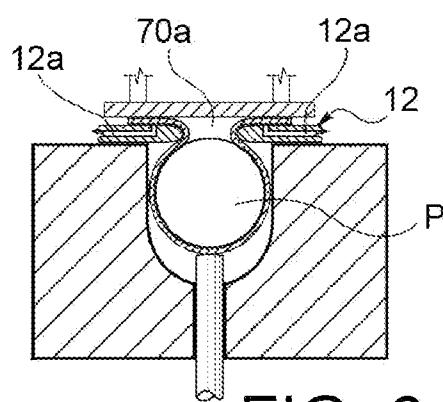


FIG. 6

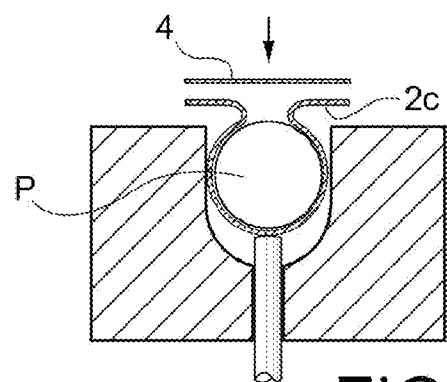


FIG. 7

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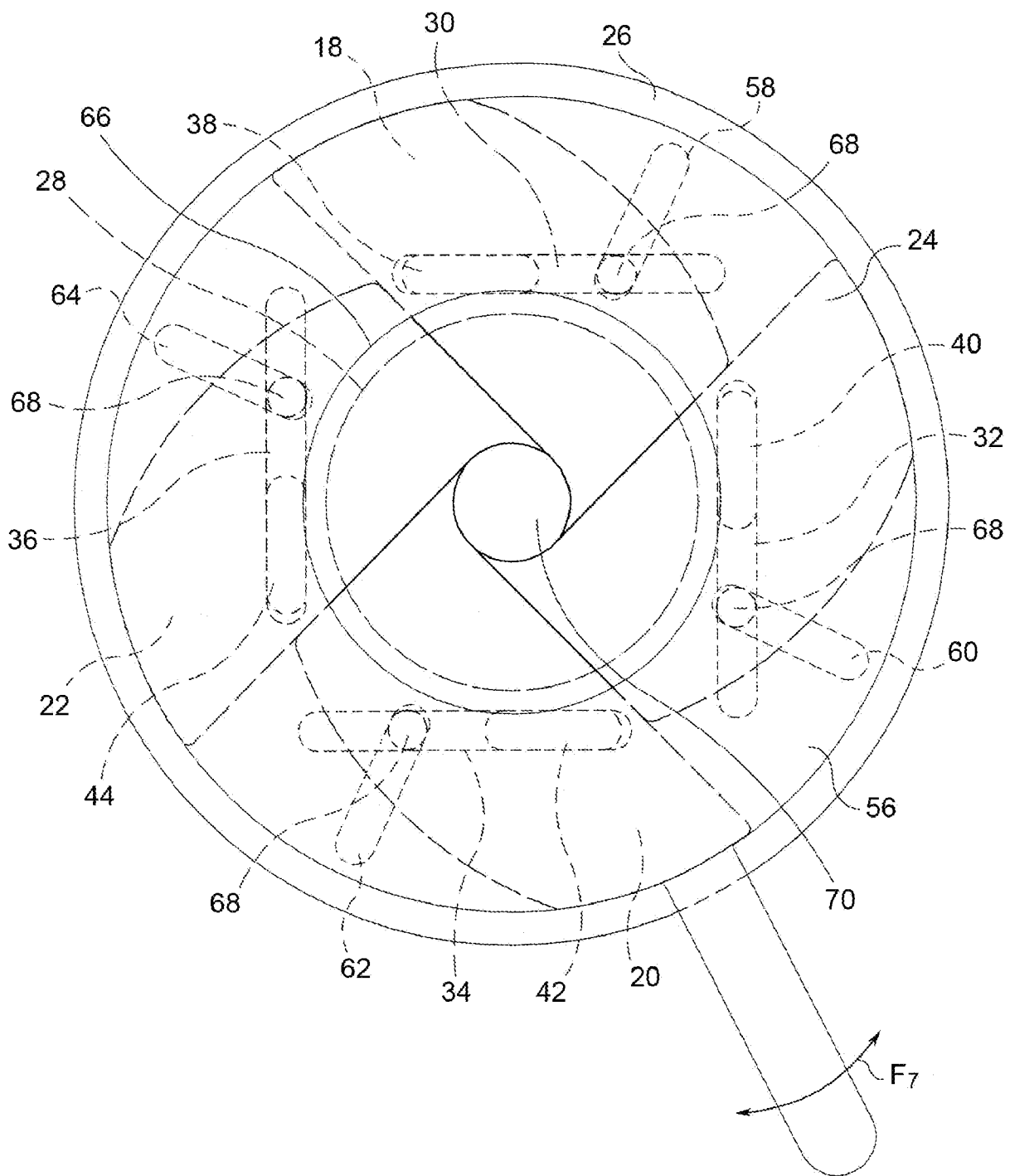


FIG. 8

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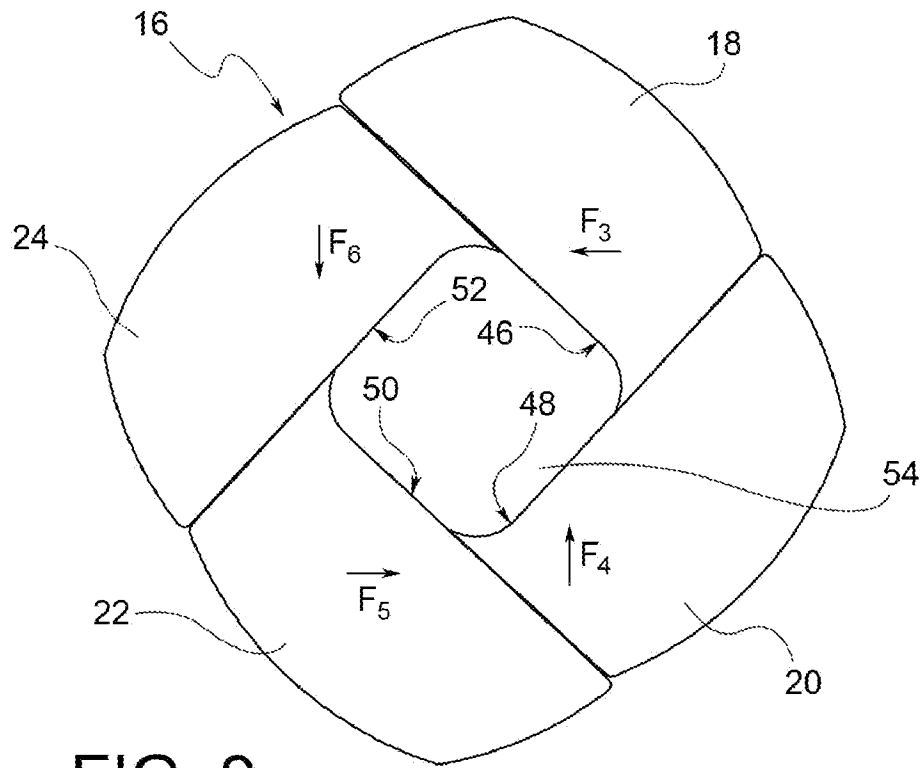


FIG. 9

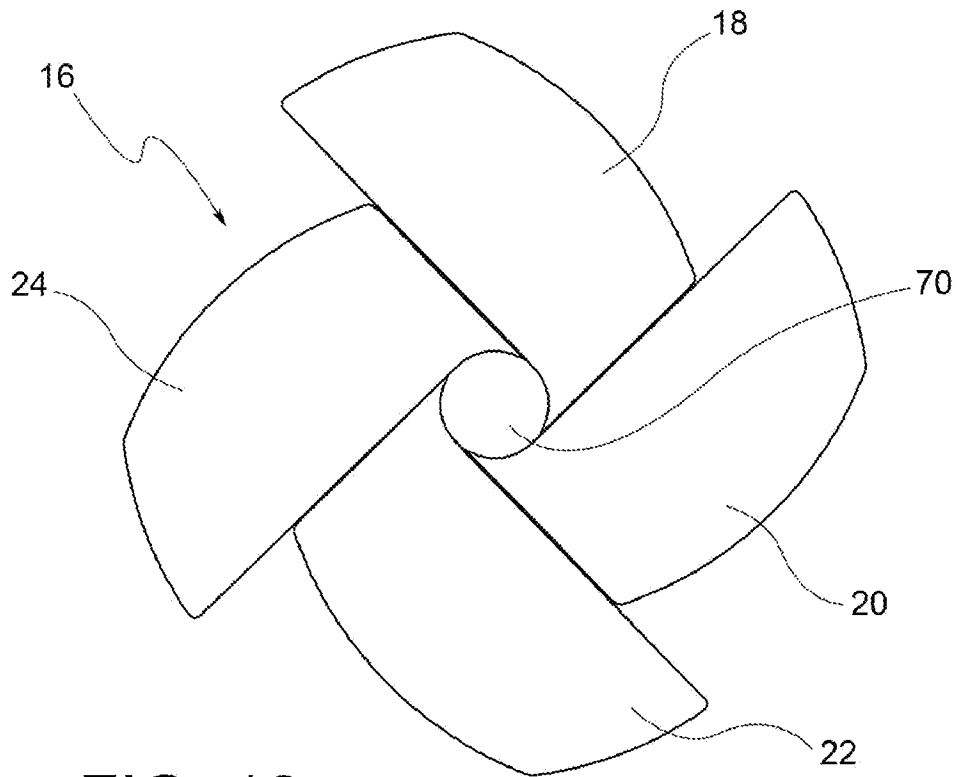


FIG. 10

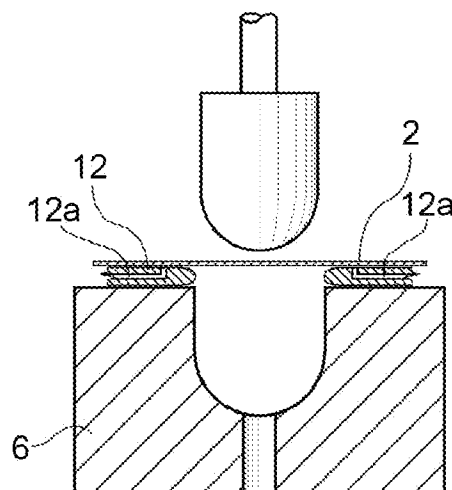


FIG. 1a

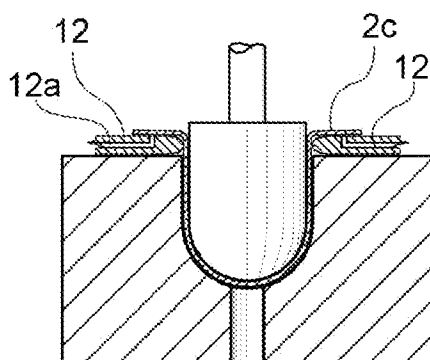


FIG. 2a

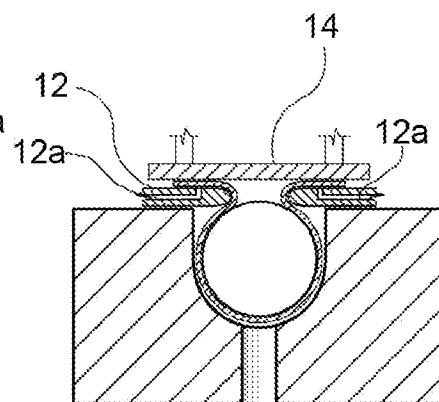


FIG. 6a

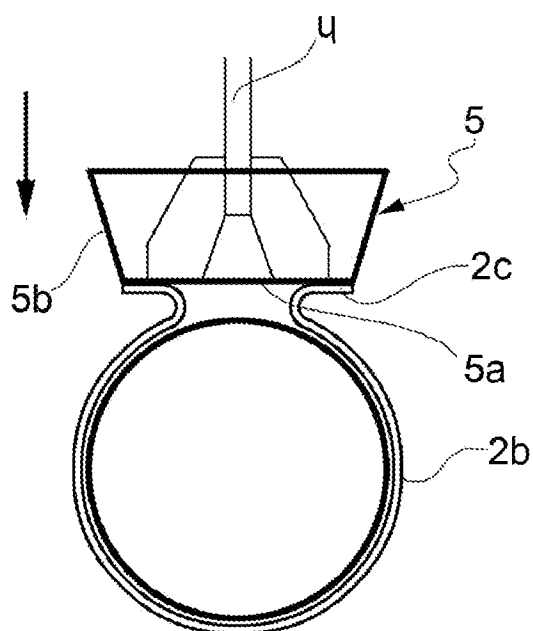


FIG. 12

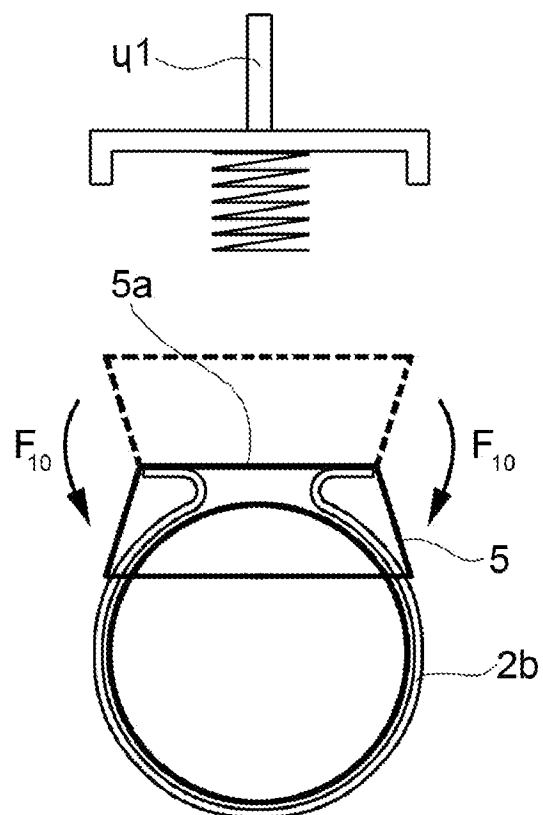


FIG. 13

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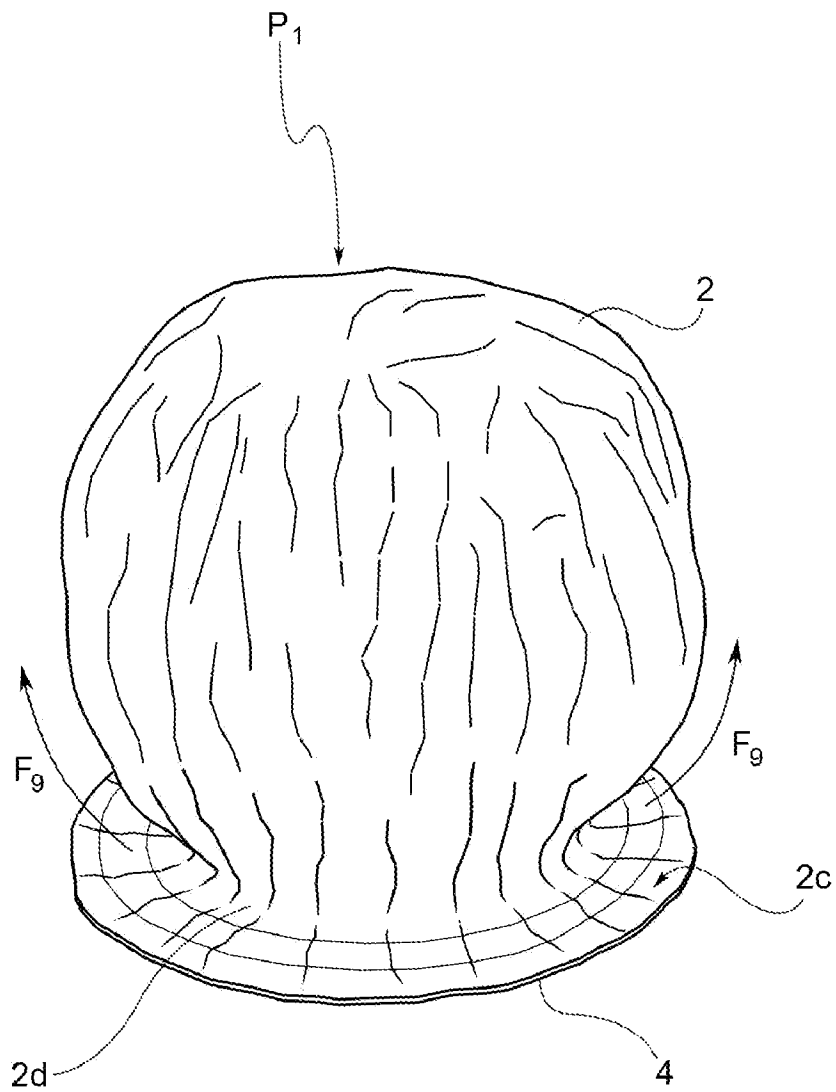


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2012/050275

A. CLASSIFICATION OF SUBJECT MATTER INV. B65B11/50 B65B25/00 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) B65B A23G B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2008/018008 A1 (SOREMARTEC SA [BE]; FERRERO SPA [IT]; FERRERO OHG [DE]; MANSUINO SERGI) 14 February 2008 (2008-02-14) abstract; figures 1-9 -----	1,13
A	EP 0 199 995 A1 (WICKERSHEIM VERPACKUNGSTECHNIK [DE]) 5 November 1986 (1986-11-05) abstract; figures 1-29 -----	1,13
A	US 3 851 440 A (HORSKY E) 3 December 1974 (1974-12-03) abstract; figures 1-16 -----	1,13
A	GB 2 426 498 A (BOWLEN PACKAGING LTD [GB]) 29 November 2006 (2006-11-29) abstract; figures 1-13 -----	1,13
-/-		
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 14 May 2012	Date of mailing of the international search report 23/05/2012	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Garlati, Timea	

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2012/050275

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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X	US 3 966 045 A (PERDUE RICHARD R) 29 June 1976 (1976-06-29) column 5, lines 3-21; figures 1-6 -----	11,12

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