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(71) Applicants:
- **Soremartec S.A.**
  2632 Findel (LU)
  Designated Contracting States:
  AL AT BE BG CH CY CZ DK EE ES FI FR GB GR HR HU IE IS LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
- **Ferrero S.p.A.**
  12051 Alba (Cuneo) (IT)
  Designated Contracting States:
  IT
- **Ferrero Offene Handelsgesellschaft m.b.H.**
  35260 Stadtallendorf (DE)
  Designated Contracting States:
  DE

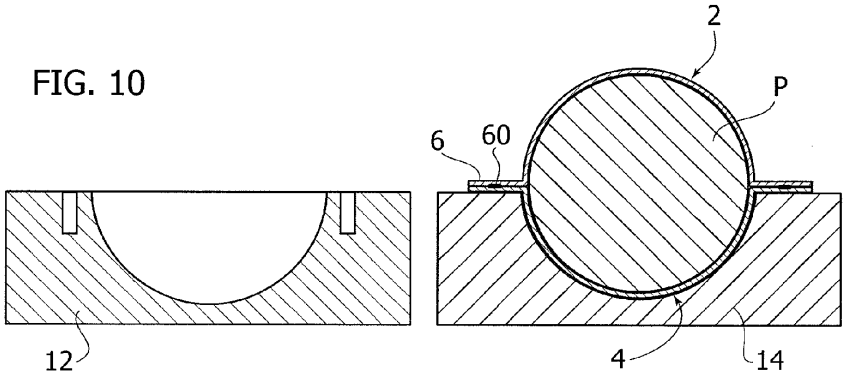
(72) Inventors:
- **Sappa, Enrico**
  12063 Dogliani (Cuneo) (IT)
- **Sobrero, Giovanni**
  12050 Cerretto Langhe (Cuneo) (IT)

(74) Representative: **Frontoni, Stefano**
c/o Buzzi, Notaro & Antonielli d'Oulx S.r.l.
Via Maria Vittoria, 18
10123 Torino (IT)

(54) "Process for making a package for a foodstuff product, in particular a confectionery product"

(57) A process for packaging foodstuff products having a particular shape, representing, for example, characters or animals that are fruit of the imagination, or even objects linked to the traditions of festivities, such as Easter eggs or Christmas bells, in order to make packages that reproduce externally exactly the particular shape thereof. The process described envisages the use of two sheets of wrapping material coupled together and is characterized in that a hermetic sealing of the package is provided via a flange (6) folded back on itself that has a sealing area (60) at its distal side (6b).

FIG. 10



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Description

[0001] The present invention relates to a process for making a package for a foodstuff product, in particular a confectionery product, comprising the steps of:

- providing a first sheet of wrapping material, which presents a first portion for receiving said product and a first peripheral portion surrounding said first receiving portion;
- providing a second sheet of wrapping material, which presents a second portion for receiving said product and a second peripheral portion surrounding said second receiving portion;
- setting said product on said first receiving portion or said second receiving portion;
- coupling said first sheet to said second sheet so that said first and second portions for receiving said product together define a closed cavity in which said product is housed, and so that said first and second peripheral portions are set in contact with one another so as to form a flange surrounding said cavity;
- forming on said flange a sealing area that hermetically closes said cavity; and
- folding said flange along a folding line such as to define a proximal flange part and a distal flange part connected to said proximal part along said folding line, along said folding line said distal part being folded back towards said cavity against said proximal part.

[0002] A process of the type referred to above is known from the European patent No. EP2366631 B1, filed in the name of the present applicant.

[0003] The above type of process is normally used for packaging confectionery products, typically chocolate-based ones, the outer surface of which has a particular shape, representing, for example, characters or animals that are fruit of the imagination, or even objects linked to the traditions of festivities, such as Easter eggs or Christmas bells, in order to make packages that reproduce externally exactly the particular shape thereof. For this purpose, the two sheets of wrapping material of the package are made to adhere to the entire outer surface of the product.

[0004] In this type of package, the aesthetic appearance evidently has the same importance as the protection that is ensured for the product.

[0005] In this connection, precisely to enhance the aesthetic appearance of the package, normally the folded flange mentioned at the start is provided so as to identify as a whole a profile substantially corresponding to the outer contour of the packaged product so that the product will appear as if it were framed.

[0006] The patent referred to above describes in detail how to obtain the aforesaid folded flange, with a view to the possibility of providing a hermetic seal on said flange.

[0007] The present applicant has, however, found that, in general, the provision of the hermetic seal in the framework of the process described in the above patent may cause onset of various aesthetic defects, which involve both the folded flange and the part of product adjacent thereto.

[0008] The present invention fits into such a context in order to provide a process of the type referred to at the start that will enable hermetic sealing of the package without this presenting the aforesaid drawbacks.

[0009] The object referred to above is achieved via a process that presents the characteristics of Claim 1. The present invention moreover relates to a package obtained via the process in question, and a device for implementing the sealing step envisaged in this process.

[0010] The claims form an integral part of the technical teaching provided herein in relation to the invention.

[0011] The invention will now be described purely by way of non-limiting example, with reference to the annexed drawings, wherein:

- Figure 1 is a perspective view of a package obtained according to the process described herein;
- Figure 1A illustrates a detail of the package of Figure 1 in a cross-sectional view according to the line A-A of Figure 1;
- Figures 2 to 22 are schematic representations that illustrate successive steps of the process described herein in a preferred embodiment;
- Figure 23 is a perspective view of a crimping tool used in the context of the process; and
- Figure 24 is a top plan view of the tool of Figure 23, represented in an operative position thereof together with the article on which the tool operates for the crimping operation.

[0012] In the ensuing description, various specific details are illustrated aimed at providing an in-depth understanding of the embodiments. The embodiments may be provided without one or more of the specific details, or with other methods, components, or materials, etc. In other cases, known structures, materials, or operations are not shown or described in detail so that the various aspects of the embodiment will not be obscured.

[0013] The references used herein are provided only for convenience and hence do not define the sphere of protection or the scope of the embodiments.

[0014] Figure 1 illustrates an example of package for a product P, specifically an Easter egg, provided according to the process described herein.

[0015] In general, this type of package, designated in Figure 1 by the reference number 10, comprises a first sheet of wrapping material 2 and a second sheet of wrapping material 4 coupled together.

[0016] The sheet 2 has a portion for receiving the product 2a, and a peripheral portion 2b that surrounds the receiving portion 2a. Likewise, the sheet 4 has a portion for receiving the product 4a and a peripheral portion 4b that surrounds the receiving portion 4a.

[0017] The sheets 2 and 4 are coupled together so that the receiving portions 2a, 4a together define a closed cavity C in which the product P is housed, and so that the peripheral portions 2b, 4b are set in contact with one another so as to form a flange 6 surrounding the cavity C (see Figure 1A).

[0018] With reference to Figure 1A, the flange 6 has a sealing area 60 that hermetically closes the cavity C. The sealing area 60 has a prevalent longitudinal development and extends along a closed path that surrounds the receiving portions 2a, 4a. This area is substantially identifiable as a sealing strip.

[0019] The flange 6 is folded back on itself, identifying a proximal part 6a and a distal part 6b joining together along a folding line "s". Along the line "s" the distal part 6b is folded back towards the cavity C, against the proximal part 6a. It is to be noted that Figure 1A illustrates an enlargement that does not respect the real proportions of the various elements, having the purpose of enabling immediate understanding of the structure of the flange 6; in this figure, the folding line "s" is represented as a perimetral band. However, in the real package the thicknesses of the sheets 2 and 4 are so small, as compared to the structure of the package, that the aforesaid band can in actual fact be equated with a line, namely a folding line.

[0020] In various embodiments, as in the one illustrated, the portions for receiving the product 2a and 4a, which together identify the cavity C, each reproduce the conformation of the outer surface of the corresponding part of the product P so as to be substantially adherent to the product. This configuration enables the package to reproduce, substantially identically, the shape of the product contained therein. The receiving portions 2a and 4a can hence be of any shape depending only upon the shape of the packaged product, and may consequently even differ from one another, for example in the cases where the product has different opposite faces. In this connection, there may, in general, also be embodiments where the receiving portions 2a and 4a are not both of a generic half-shell shape as in the example illustrated, but, instead, one of them is completely plane.

[0021] In various embodiments, as in the one illustrated, the line of joining of the sheets 1 and 2 within the cavity C is - throughout its extension or at least for part thereof - directly in contact with the product P, and the folding line "s" of the flange 6 extends parallel thereto so that as a whole the flange reproduces almost exactly the profile that the product P has in the plane of the flange. The aesthetic effect is that of greater enhancement of the overall form of the product.

[0022] To make a package of the type described above the process in question envisages in general the steps of:

- providing a first sheet of wrapping material, which presents a first portion for receiving said product and a first peripheral portion surrounding said first receiving portion;
- providing a second sheet of wrapping material, which presents a second portion for receiving said product and a second peripheral portion surrounding said second receiving portion;
- setting said product on said first receiving portion or said second receiving portion;
- coupling said first sheet to said second sheet so that said first and second portions for receiving said product together define a closed cavity in which said product is housed, and so that said first and second peripheral portions are set in contact with one another so as to form a flange surrounding said cavity;
- forming on said flange a sealing area that hermetically closes said cavity; and
- folding said flange along a folding line such as to define a proximal flange part and a distal flange part connected to said proximal part through said folding line, said distal part being folded back towards said cavity, against said proximal part, by said folding line.

[0023] The process described herein is characterized in that it envisages providing said sealing area at a minimum distance from the aforesaid first and/or second receiving portions, which is such that, after said folding step, said sealing area comes to be in said distal part of said folded flange, and is not traversed by said folding line.

[0024] The characteristic indicated, inherent in the formation of the sealing area 60, entails that the next folding step directly involves only non-sealed portions of the flange 6, subjecting them to deformation, and not, instead, also the sealing area itself. This makes it possible to obtain a flange that is perfectly folded back on itself, which stably remains in this condition, without any risk of it elastically returning to a splayed-out condition. In this connection, the present applicant has in fact found that the above phenomenon of elastic return arises when the folding step involves instead - also or only - the sealing area, i.e., in the cases where the latter is traversed by the folding line "s"; the reason for this behaviour is to be put down to the fact that, where the sheets 2 and 4 are welded together, the flange 6 is as a whole more rigid, and consequently assumes a mechanical behaviour substantially more elastic than the remaining parts.

[0025] The characteristic referred to above moreover helps to solve the technical problem of preventing the heat necessary for sealing the two sheets from at the same time causing melting, or in any case a variation of consistency, also of the product P, in the cases where this is of a material that can melt, such as for example chocolate. Provision of the sealing area at a distance from to the portions for receiving the product presupposes, in fact, that the sealing means themselves are positioned at a distance from these portions (which is already in itself able to reduce the amount of heat coming from the sealing means that reaches the product). In the space provided between the sealing means and the product it is possible to insert means for protecting the product from

the heat generated by the sealing means, thus preventing the heat from possibly causing heating of the product.

[0026] Finally, it is to be noted that positioning of the sealing area 60 on the distal portion 6b guarantees that the perimetral end edges of the peripheral portions 2b, 4b are joined together in a mutual condition of perfect alignment, preventing the internal sides thereof, which could be of a colour and an appearance different from that of the external sides, from becoming visible and/or preventing the aforesaid portions from curling and not being perfectly laid out on top of one another.

[0027] In view of the foregoing, it is hence evident that the characteristic of providing the sealing area at the aforesaid minimum distance from the portions for receiving the product of the sheets 2 and 4 is essential for obtaining an optimal aesthetic result on the package.

[0028] The packaging process will now be described in detail, in its different possible embodiments. For this purpose, see Figures 2 to 25, which are schematic illustrations that have the sole purpose of enabling an immediate understanding of the principal aspects of the process and of the means used for implementing it. In particular, in what follows reference will be made to the production of a single package, but it is clear that the same means described may be easily configured for producing simultaneously a number of packages at a time.

[0029] The process first of all envisages providing the first and second sheets of wrapping material 2 and 4 that will come to constitute the package. The sheets 2 and 4 are preferably made of a plastically deformable material, typically aluminium, of a thickness of from 10 μm to 40 μm, and are coated with a layer made of heat-meltable or heat-sealable material, for example polyethylene or any other plastic material of a similar type.

[0030] In various embodiments, as in the one illustrated, the process envisages shaping of the first and second sheets so as to define thereon the portions 2a and 4a for receiving the product referred to in Figure 1.

[0031] In various embodiments, as in the one illustrated, for this purpose the process envisages the use of moulds 8' and 8", which have respective mould cavities 9 and 11 of a shape corresponding to complementary portions of the outer surface of the product to be packaged. The sheets 2 and 4 are arranged on the moulds 8' and 8", and for example with the aid of a plug 10, of a shape complementary to the surface of the mould cavity, are subjected to an operation of drawing via which on the sheets 2 and 4 there are formed the parts 2a and 4a for receiving the product, surrounded, respectively, by the peripheral portions 2b and 4b, of a substantially plane conformation.

[0032] In various embodiments, as in the one illustrated, the shaped sheets 2 and 4 are then transferred into the auxiliary supports 12 and 14, which present respective seats 16 and 18, for receiving the shaped parts 2a and 4a, and respective plane surfaces 20 and 22, surrounding the seats 16 and 18 and suitable for supporting the flange portions 2b and 4b. In various embodiments, as in the one illustrated, one of these supports, the support 12 in the example illustrated, has an annular slot or groove 24 surrounding the seat 16 of the support, the function of which will be illustrated in what follows.

[0033] In various embodiments, as in the one illustrated, the supports 12 and 14 may be moved with respect to one another between an open condition, for example illustrated in Figure 4, and a closed condition, for example illustrated in Figure 7, and moreover, in the latter condition, may be rotated together, about an axis orthogonal to the plane of the figures. The means for providing said movements of the supports 12 and 14 may be of any type already known to the person skilled in the sector and consequently will not be described herein in detail.

[0034] In the condition illustrated in Figure 5, the article P is positioned, by transfer means in themselves known, for example of the suction-cup type, in the receiving part 4a of the sheet 4, and, then, by turning the support 14 over through 180° on the support 12 (Figures 6 and 7), the sheet 2 is coupled to the sheet 4, which overlies the surface portion of the article P that emerges from the seat 18; there is thus obtained a configuration in which the two sheets 2 and 4 are arranged with their peripheral portions 2b and 4b in contact with one another to form the flange 6, and with their receiving portions 2a and 4a that together define the cavity C containing the product P. Then, the supports 12 and 14 are brought back into their open condition as illustrated in Figure 8.

[0035] The process described herein at this point envisages providing the sealing area in order to close the cavity C hermetically and at the same time join the sheets 2 and 4 together.

[0036] As mentioned previously, the process described herein is characterized in that the sealing area is provided at a given minimum distance from the receiving portions of the two sheets of wrapping material. The value of this distance is selected in such a way that, after the folding step, the sealing area comes to be located on the distal part of the folded flange and is not traversed by the folding line defined therein. This value is thus a function of the width of the proximal part of the folded flange and, in general, may be equal to or greater than this width. The width of the same sealing area - measured in a direction transverse to the longitudinal direction of the area - cannot instead be greater than the width of the distal part of the folded flange.

[0037] In various embodiments, as in the one illustrated, to obtain the sealing area the process described herein envisages use of a sealing device 52.

[0038] The above device comprises, in general, supporting means configured for receiving the sheets 2 and 4 coupled together, which identify a seat on which the receiving portion 2a or 4a of these sheets is to be arranged, and a preferably plane contrast surface, on which the peripheral portions 2b, 4b are to be rested. The device 52 further comprises a pressure element 54 presenting a heating edge 54a, which is driven by motor means 53 so that the edge 54a presses the parts 2b, 4b against

the aforesaid contrast surface. In various embodiments, as in the one illustrated, the above supporting means are constituted by one of the supports 12 and 14 themselves, in this case the aforesaid seat being constituted by the seats 16 and 18 of these supports, whilst the aforesaid contrast surface is constituted by their surfaces 20, 22. In alternative embodiments, the supporting means in question are instead constituted by a support altogether similar to the supports 12 and 14 but uniquely designed for use with the sealing device 52. In various preferred embodiments, set on the aforesaid contrast surface is an elastic element 44, for example made of silicone, which presents a conformation such as to identify a plane surface that substantially reproduces in shape and dimensions the heating edge 54a, and against which the latter presses the parts 2b, 4b. The element 44 has the function of compensating, as a result of its elastic consistency, any possible imperfections of the contrast surface and/or of the heating edge. In various embodiments, as in the one illustrated, the elastic element 44 is received in a corresponding groove made in the contrast surface 22.

[0039] In the region where the portions 2b, 4b are pressed by the heating edge 54a, they are welded together, as a result of the combined action of pressure and heat applied by said edge. To obtain the desired sealing area, the heating edge 54a has a width corresponding to that of said sealing area, and extends along a closed path of a length and/or shape corresponding to the length and/or shape of the path along which the sealing area will be located on the portions 2b, 4b. In particular, the edge 54 extends along a path such that, in the operative condition of the element 54, it surrounds the receiving portions 2a, 4a, keeping at a distance equal at least to the aforesaid minimum distance of the sealing area, designated by H in Figure 10A.

[0040] As may be seen in Figures 10 and 10A, in the aforesaid operative position of the element 54, provided between the heating edge 54a and the shaped part 4a is a free space. In various embodiments, as in the one illustrated, the process envisages inserting into the above space means designed to protect the product P from the heat transmitted by the heating edge 54a.

[0041] For this purpose, in various embodiments, as in the one illustrated, the device 52 comprises a cooling body 56, set within the heating edge 54a and configured for covering the shaped part 4a and the portion of product contained therein, preventing any direct exposure thereof to the heating edge 54a and absorbing the heat transmitted by the edge itself. In particular, the body 56 has a cavity 56a, designed to receive the shaped part 4a, and an edge 56b, which surrounds the cavity 56a and is of a width such as that it can fit into the space between the edge 54a and the shaped part 4a.

[0042] The device 52 comprises means (not illustrated) for circulation of a cooling fluid within the body 56. In particular, the body 56 comprises one or more ducts that are arranged around the cavity 56a, and supply means are associated to these ducts, to obtain a circulation of the cooling fluid through them. During operation of the device, the cooling fluid absorbs the heat emanating from the heating edge 54, thus preventing this heat from possibly causing heating of the portion 4a and of the product P.

[0043] The body 56 can be carried by the pressure element 54 itself, or else by a distinct movement structure, driving of which is coordinated with the element 54.

[0044] In alternative embodiments, instead of the cooling body 56 it is possible to envisage simply a body made of insulating material that prevents transfer of the heat generated by the heating edge 54a to the product P.

[0045] The sealing device 52 described above may constitute a station in the framework of a packaging plant, which performs on the line one or more of the operations described previously, or else may constitute a stand-alone device to which the products P, along with the sheets 2 and 4 associated thereto, can be fed by the line of the plant.

[0046] At the end of the sealing operation, the sheets 2 and 4 are joined together to form a hermetically sealed wrapper.

[0047] After the sealing step, the process described herein finally envisages creating the folded flange of the package.

[0048] In general, this step envisages folding the flange 6 on itself along the folding line "s" so as to identify the proximal part 6a and the distal part 6b. By the folding line "s", the distal part 6b is folded back towards the cavity C, until it is brought up against the proximal part 6a. From what has been said previously, the operation of folding of the flange 6 does not subject the sealing area 60 to deformation, and, at the end thereof, this area comes to be located in the distal part 6b (see Figures 1A and 15 to 23).

[0049] Optionally, prior to the operation of folding referred to above, a cutting operation is envisaged to reduce the flange 6 to the desired width.

[0050] In various embodiments, as in the one illustrated, the operations of cutting and folding referred to above are carried out using the methods and devices presented in the patent No. EP2366631 discussed at the start, which will also be described in detail hereinafter for completeness of exposition. It is clear, however, that the operations in question can be provided also via alternative methods and/or devices. It is to be noted in this connection that the advantages discussed above linked to positioning of the sealing area at a distance from the product P are clearly obtained also in the case where methods and/or devices different from the ones described in what follows are used.

[0051] In various embodiments, as in the one illustrated, starting from the condition represented in Figure 11, the wrapping material obtained by the sealing operation is transferred from the support 14 to the support 12. For this purpose, a movement of the supports 12 and 14 is performed comprising in succession: i) turning over through 180° the support 12 on the support 14 (Figure

12); ii) turning over through 180° the set of the supports 12 and 14 (Figure 13), so that the product and the wrapping material pass from being carried by the support 14 to being carried by the support 12; and finally iii) removing the support 14 from the support 12 (Figure 14).

[0052] In various embodiments, as in the one illustrated, the process then envisages an operation of cutting the flange 6, aimed at obtaining the desired width of the flange.

[0053] The above cutting operation is preferably performed so as to realize, simultaneously with cutting, folding of a distal portion of the above flange at an angle, preferably of 90°, with respect to the remaining proximal portion so as to identify already in this step the aforesaid proximal and distal parts 6a and 6b that will come to form the folded flange in the next process step.

[0054] In various embodiments, as in the one illustrated, this operation can be performed by means of a device of the type illustrated in Figure 15, which co-operates with the support 12, provided with the annular groove 24. This cutting device comprises a vertically mobile support 26, associated to which is an annular cutting or dinking member 28, and pressure means 30, 32, preferably elastically constrained to the support 26, which surround the annular cutting member 28 internally and externally. The cutting device is positioned with the pressure means 30, 32 in contact with the flange 6 and with the cutting member 28 that is able to penetrate into the groove 24. The cutting end 28a of the cutting member 28 is able to penetrate into the groove 24 at a slight radial distance from the radially internal wall 24a of the groove 24, this distance being sized so that the folded flange part can be received therein.

[0055] In this way, in the course of the cutting operation, the pressure means 30, 32 constrain the flange 6, and lowering of the cutting member inside the groove 24 causes, simultaneously with cutting of the peripheral portions of the flange, simultaneous folding downwards of the distal portion 6b with respect to the proximal portion 6a. The offcuts, designated as a whole by 13, can be removed after cutting, for example by suction, in a next step of the process.

[0056] Then, the process preferably contemplates an operation of turning-over through 180° of the wrapping material so as to position the folded flange parts upwards. This operation may, for example, be performed according to the operating steps of Figures 16, 17, 18, and 19, which comprise turning over the support 14 on the support 12 to obtain the configuration of Figure 17, where the wrapping material is closed between the supports 12, 14, turning-over through 180° of the two associated supports 12, 14 (Figure 18), and subsequent opening of the top support 14 to obtain the configuration of Figure 19.

[0057] The process then envisages folding the distal part 6b of the flange against the corresponding proximal part 6a.

[0058] In various embodiments, as in the one illustrated, in order to perform this operation, the process described herein envisages the use of the crimping device described in the European patent No. EP2366631. The term "crimping", which in mechanical technologies is used to indicate the operation of clinching the edge of riveted sheets of metal, is here used in a sense such as to indicate an operation of deformation, folding and/or clinching of the flange 6.

[0059] The aforesaid device may constitute a station that operates on the line in the framework of a packaging plant, or else may constitute a stand-alone device to which the wrappers to be treated can be supplied by the line of the plant.

[0060] The device in question can be provided for co-operating directly with one of the supports 12 or 14 described previously, or else, alternatively, it may comprise its own means for supporting the wrapping material, which, like the supports 12 and 14, in general comprise a seat designed to support one of the two shaped parts 4a or 2a of the wrapping material, and a substantially plane surface, which surrounds the aforesaid seat and is designed to support the flange 6.

[0061] The device in question comprises crimping means provided for bringing about folding and/or clinching of the distal part 6b with respect to the article P, starting from a configuration of the type illustrated in Figure 20, where this part is already folded in an angled position, generally practically orthogonal to the surface 22 of the support 14.

[0062] The aforesaid crimping means comprise a crimping tool, designated by 36, which may be a body shaped like a plate provided with an opening 38 (Figure 25), having a homologous perimetral profile 40 enlarged with respect to the perimetral profile defined by the end of the flange 6.

[0063] The crimping tool 36 may thus be positioned in contact with the surface 22 of the support 14, with the opening 38 in a position surrounding, at a distance, the distal portion 6b, i.e., in the configuration of Figure 24, visible in which are the receiving portion 2a, the perimetral profile defined by the distal portion 6b, and the profile 40 of the opening 38, which is positioned at a practically uniform distance from the portions 6a, 6b.

[0064] The crimping tool is vertically mobile with respect to the supporting means between a raised position and a lowered position, where it is practically in contact with the surface 22. The crimping tool 36 is likewise mobile in a horizontal plane. Motor means 42 are provided for actuating the crimping tool for the vertical and horizontal movement.

[0065] In particular, the motor means 42 are provided for bringing consecutive or non-consecutive stretches of the profile 40 of the opening 38 into contact with a homologous stretch of the profile defined by the previously folded distal portion 6b. This operation can be performed in the position in which the bottom end of the crimping tool is in contact with the surface 22 and is useful also for achieving, whenever necessary, a correct positioning of the distal portion 6b at right angles to the surface 22

(Figure 20). Then, the crimping tool is subjected to a vertical movement for a distance d greater than the thickness of the flange 6 and such that the bottom end of the profile 40 and of the opening 38 is still able to interfere, following upon a horizontal displacement, with the top end of the distal portion 6b (Figure 21).

[0066] Next, the crimping tool 36 is subjected to a horizontal movement of approach to the body of the article P so as to cause further folding inwards of the distal portion 6b (Figure 22) in such a way that it is set on top of the proximal portion 6a.

[0067] Optionally and in any case preferably, the crimping tool 36 is then subjected to a vertical movement of approach to the surface 22 of the support 14, for carrying out clinching (Figure 23).

[0068] The aforesaid operations, i.e., the operations represented in Figures 20, 21, and 22 and optionally also the operations of Figure 23 (and clinching) are carried out for further consecutive or non-consecutive stretches of the profile of the flange. For instance, when the article has a generally quadrangular profile, the aforesaid operations are carried out for each side defining the profile.

[0069] In various embodiments, as in the one illustrated, in order to reach the consecutive or non-consecutive stretches of the flange 6, the crimping tool is driven according to a translational movement in two mutually orthogonal directions. In the case of the ovoidal profile represented in the figures, the crimping tool may alternatively be pre-arranged for a rotary and eccentric movement in the horizontal plane so as to bring one after another consecutive or non-consecutive stretches of the profile 40 of the opening 38 into contact with the corresponding portions of the flange 6.

[0070] It is to be noted that performing the crimping operation along the entire flange profile does not constitute an essential and imperative aspect of the process, in so far as - in given applications - it may be desirable to maintain a portion of the flange profile not crimped, i.e., maintain a stretch of the flange profile not folded back on itself. The process according to the invention thus also presents the advantage of enabling execution of the crimping operation only on a portion of the perimetral profile of the flange or on specific portions thereof that may even not be adjacent to one another.

[0071] As mentioned above, the final clinching operation is optional. For instance, in the case of the ovoidal body illustrated in the figures, the clinching operation (whenever necessary) can be performed in a subsequent stage with an auxiliary tool 36b (Figure 23), vertically mobile under the action of motor means 42a, and provided with an opening, the internal profile of which substantially corresponds to the profile formed by the folded distal part 6b (i.e., by the folding line "s"). The aforesaid auxiliary tool 36b can be driven in a vertical movement until it comes into contact with the flange folded back on itself so as to perform clinching along its entire contour, in a single operation.

[0072] The crimping device described makes it possible to operate on articles of different shapes, by simply modifying the profile 40 of the opening or openings 38.

[0073] Of course, without prejudice to the principle of the invention, the details of construction and the embodiments may vary, even significantly, with respect to what is illustrated herein purely by way of non-limiting example, without thereby departing from the scope of the invention, as is defined by the annexed claims.

Claims

1. A process for making a package for a foodstuff product, in particular a confectionery product, comprising the steps of:

   - providing a first sheet (2) of wrapping material, which presents a first portion for receiving said product (2a) and a first peripheral portion (2b) surrounding said first receiving portion;
   - providing a second sheet (4) of wrapping material, which presents a second portion for receiving said product (4a) and a second peripheral portion (4b) surrounding said second receiving portion;
   - setting said product (P) on said first receiving portion or said second receiving portion;
   - coupling said first sheet (2) to said second sheet (4) so that said first and second receiving portions (2a, 4a) together define a closed cavity (C) in which said product is housed and so that said first and second peripheral portions (2b, 4b) are set in contact with one another so as to form a flange (6) surrounding said cavity (C);
   - forming on said flange (6) a sealing area (60) that hermetically closes said cavity (C); and
   - folding said flange (6) along a folding line ("s") such as to define a proximal flange part (6a) and a distal flange part (6b) connected to said proximal part through said folding line, said distal part being folded back towards said cavity, against said proximal part, by said folding line,

   said process being **characterized in that** it envisages providing said sealing area at a predetermined minimum distance (H) from said first and/or second receiving portions, which is such that, after said folding step, said sealing area (60) comes to be in said distal part (6b) of said folded flange (6), and is not traversed by said folding line ("s").

2. The process according to Claim 1, wherein said distance is equal to or greater than the value of the width of said proximal part (6b) of said folded flange.

3. The process according to any one of the preceding claims, wherein said sealing area (60) has a prevalent longitudinal development and extends along a

closed path that surrounds said first and second receiving portions (2a, 4a).

4. The process according to any one of the preceding claims, wherein said sealing area (60) has a width smaller than or equal to the width of said distal part (6b) of said folded flange.

5. The process according to any one of the preceding claims, wherein said step of formation of said sealing area (60) envisages the following steps:

- providing sealing means (54) configured for pressing together and heating said first and second peripheral portions (2b, 4b) so as to obtain said sealing area (60);
- setting said sealing means (54) on said first and second peripheral portions (2b, 4b) so as to obtain a space between said sealing means and said first and/or second receiving portions;
- providing in said space means (56) designed to protect the product (P) from the heat generated by said sealing means (54); and
- obtaining via said sealing means said sealing area (60).

6. The process according to Claim 5, wherein said means designed to protect said product comprise a cooling body (56).

7. The process according to any one of the preceding claims, wherein said step of providing said first and/or said second sheets of wrapping material (2, 4) comprises the step of forming said first and/or second receiving portions (2a, 4a) in the form of the outer surface of the part of said corresponding product (P).

8. A package for a foodstuff product, in particular a confectionery product, comprising:

- a first sheet (2) of wrapping material, which presents a first portion for receiving said product (2a) and a first peripheral portion (2b) surrounding said first receiving portion;
- a second sheet (4) of wrapping material, which presents a second portion for receiving said product (4a) and a second peripheral portion (4b) surrounding said second receiving portion;

wherein said first and second sheets (2, 4) are coupled together so that said first and second portions (2a, 4a) for receiving said product together define a closed cavity (C) in which said product is housed (P), and said first and second peripheral portions (2b, 4b) are in contact with one another so as to form a flange (6) surrounding said cavity (C),
wherein said flange (6) comprises a sealing area (60) that hermetically closes said cavity (C), and wherein said flange (6) is folded back on itself along a folding line (s) defining a proximal flange part (6a) and a distal flange part (6b) connected to said proximal part through said folding line, said distal part being folded back (6b) towards said cavity (C) against said proximal part (6a), by said folding line,
said package being **characterized in that** said sealing area (60) comes to be in said distal part (6b) and is not traversed by said folding line ("s").

9. The package according to Claim 8, wherein said sealing area (60) has a width smaller than or equal to the width of said distal part (6b) of said folded flange (6).

10. A device for implementing the sealing step in a process according to Claims 1 to 7, comprising:

- supporting means (14), which are configured for supporting said first and second sheets (2, 4) coupled together and identify a seat or area (18) on which to set said first receiving portion (2a) or said second receiving portion (4a), and a contrast surface (22, 44) on which to set said flange (6) formed by said first and second peripheral portions (2b, 4b) in contact with one another;
- sealing means, comprising a pressure element (54) which has a heating edge (54a), and means for actuating said pressure element (54) in an operative position, in which said heating edge (54a) presses said flange against said contrast surface (22) so as to weld together said first and second peripheral portions (2b, 4b),

said device being **characterized in that** said heating edge (54a) extends along a closed path the shape and/or length of which are such that in said operative position said heating edge (54a) surrounds said seat or area (18) at a given distance therefrom,
said device moreover being **characterized in that** it comprises a body (56) for protecting said product (P), set within said heating edge (54a), which has a cavity (56a) designed to receive said second receiving portion (2a) or first receiving portion (4a), and an edge (56b) surrounding said cavity (56a), which is of a width such as to fit into the space comprised in said distance between said heating edge (54a) and said seat or area (18) in order to cover said first receiving portion (2a) or said second receiving portion (4a) from said heating edge (54a).

11. The device according to Claim 10, wherein said body comprises one or more ducts arranged around said cavity (56a), and wherein supply means are associated to said ducts for ensuring circulation of a cooling

fluid through them.

FIG. 1

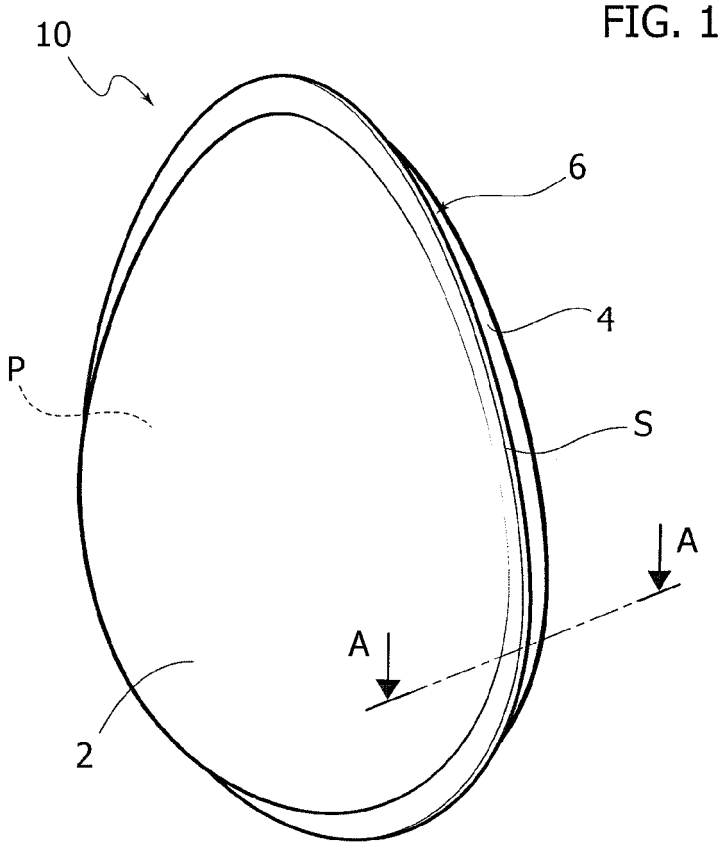


FIG. 1A

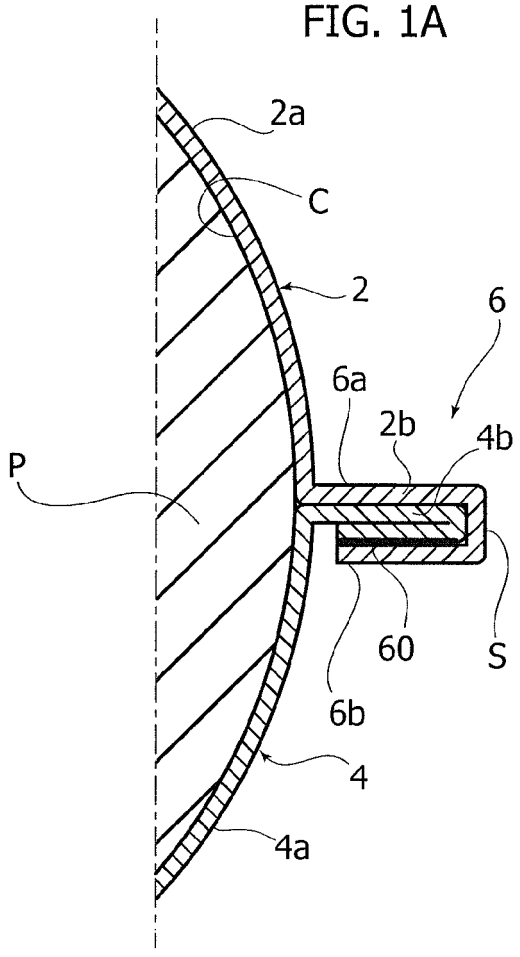


FIG. 2

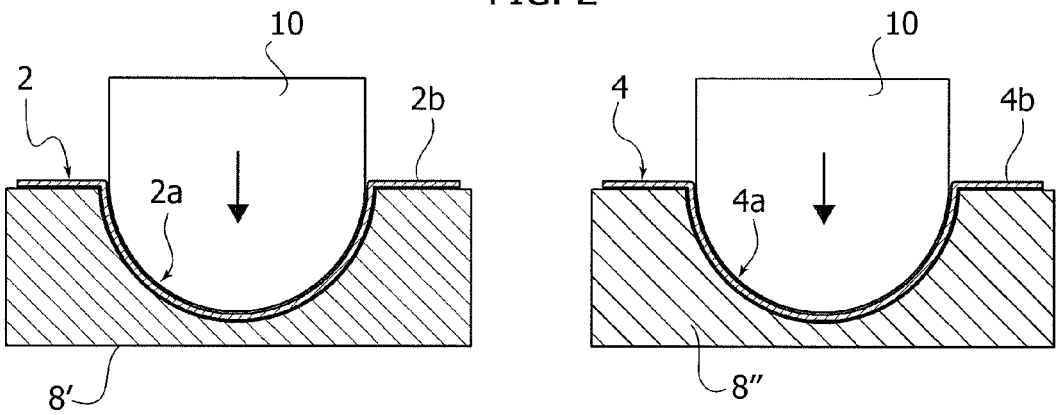


FIG. 3

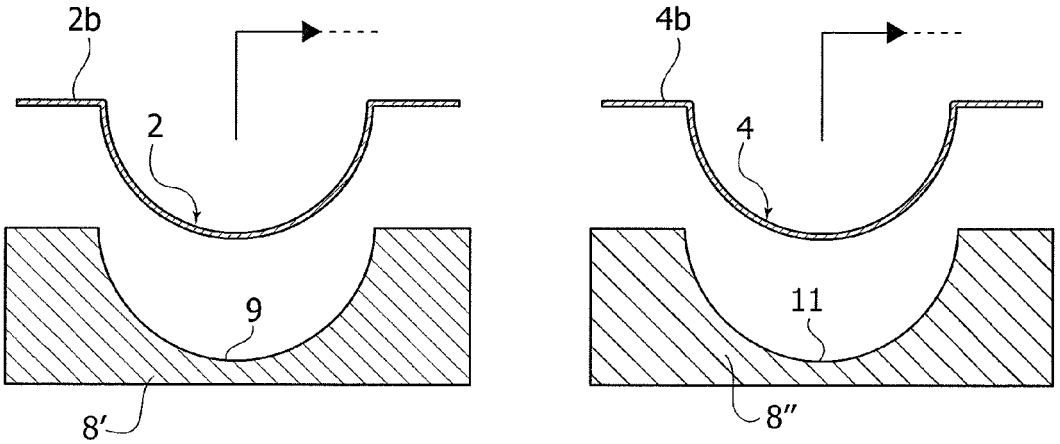


FIG. 4

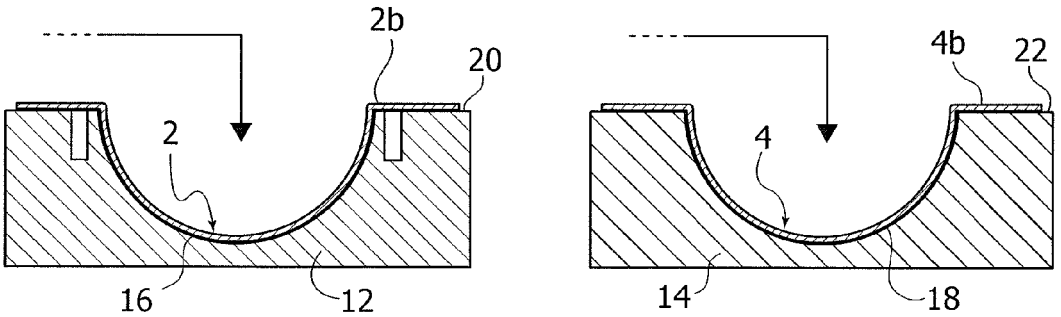
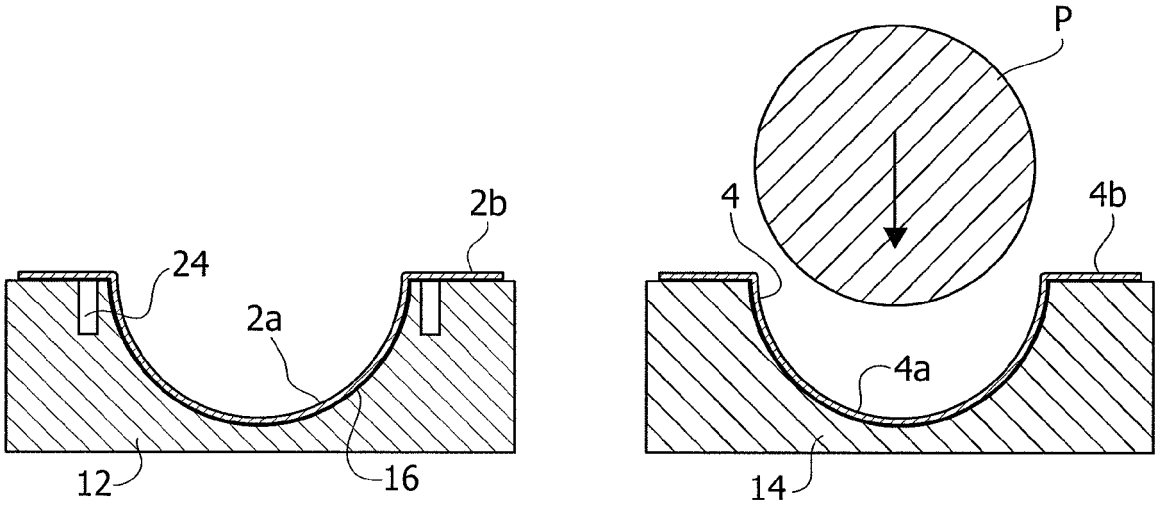


FIG. 5



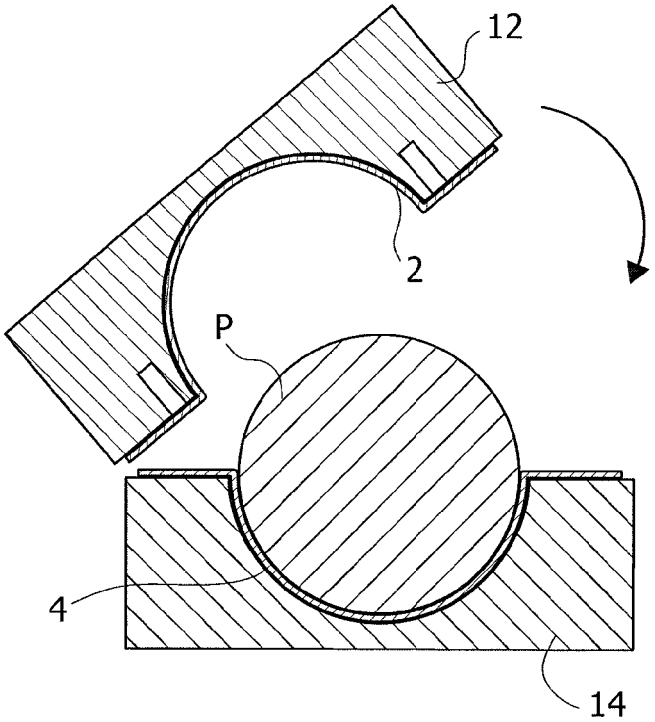


FIG. 6

FIG. 7

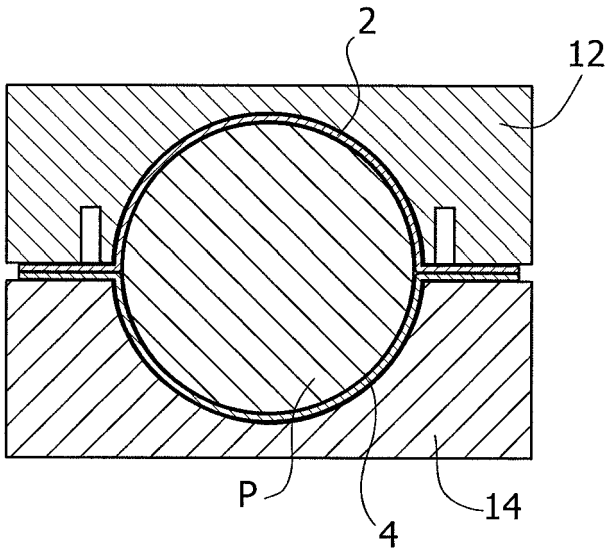


FIG. 8

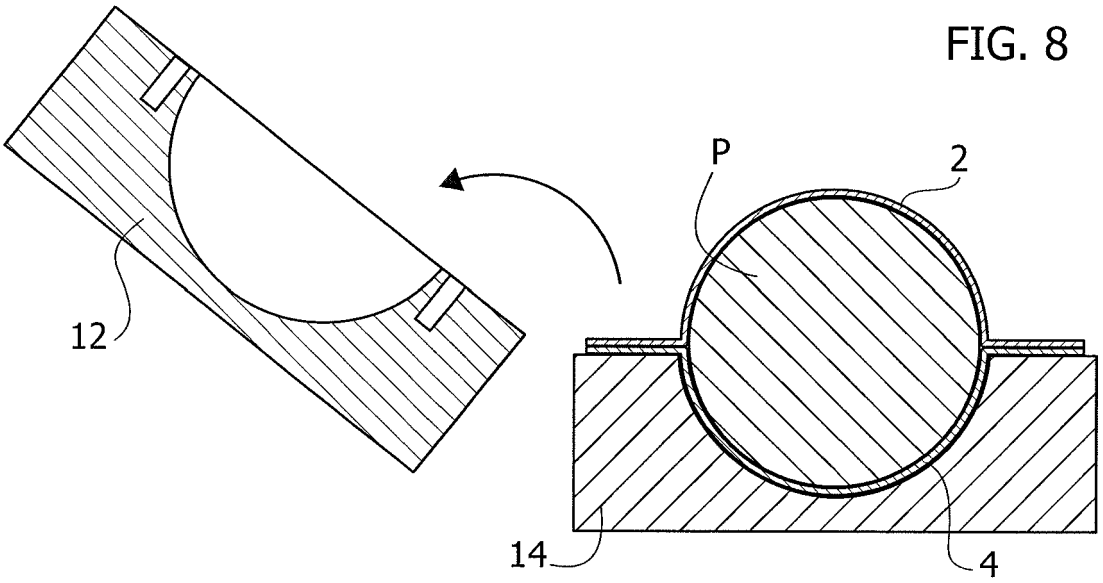
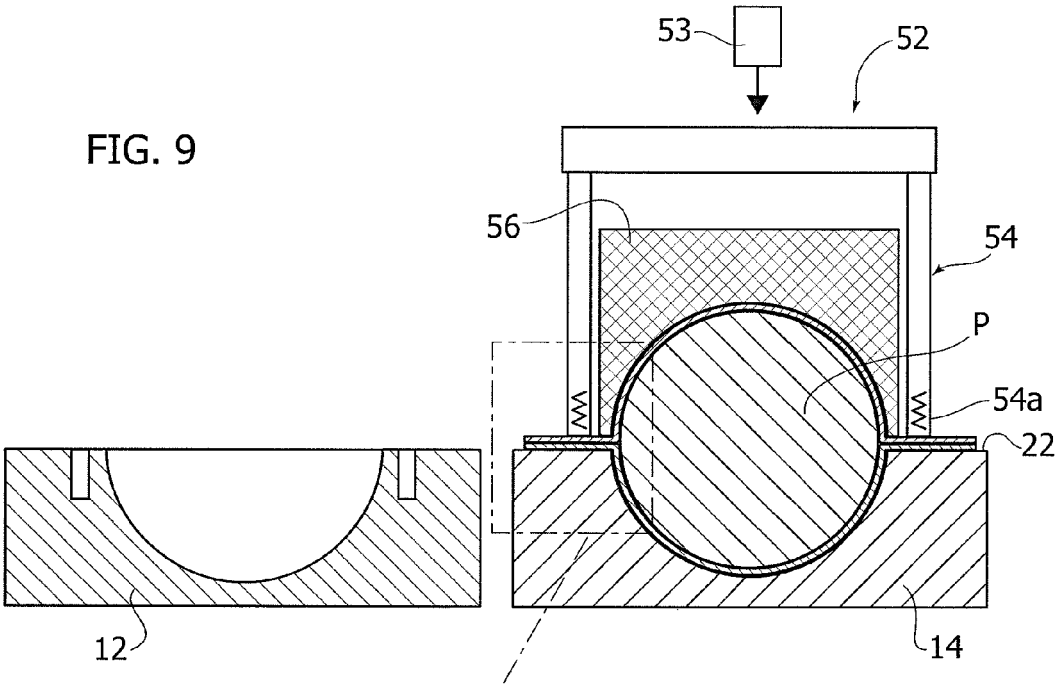


FIG. 9



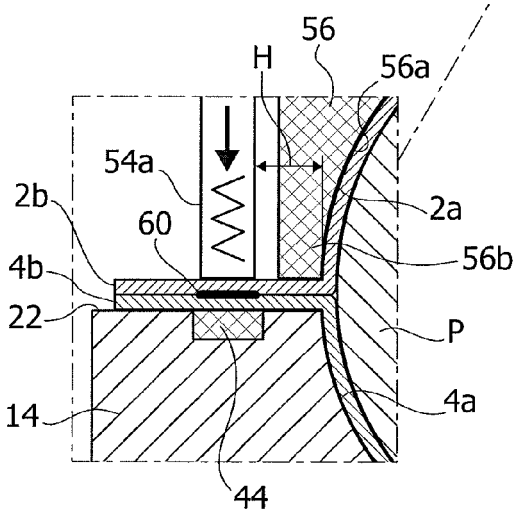


FIG. 9A

FIG. 10

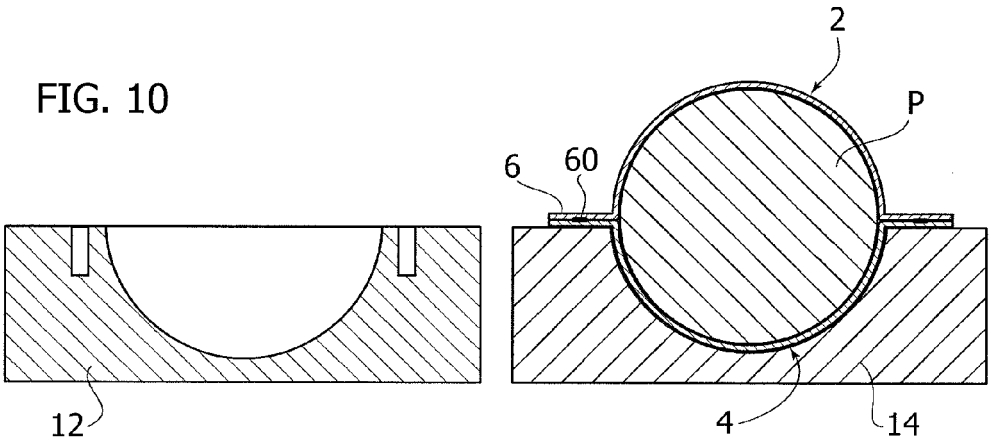


FIG. 11

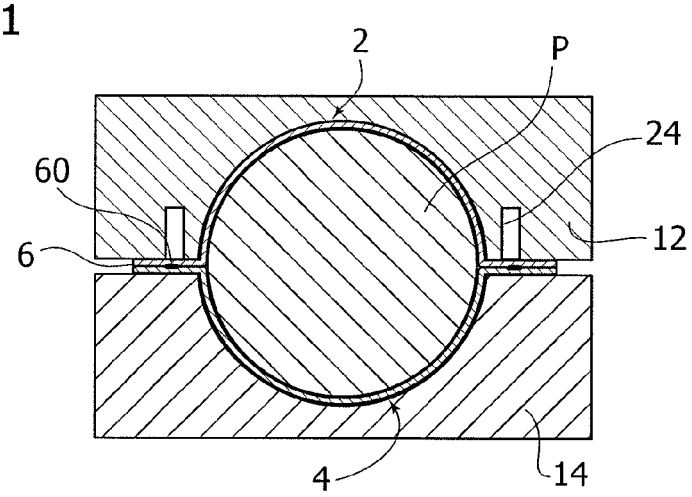


FIG. 12

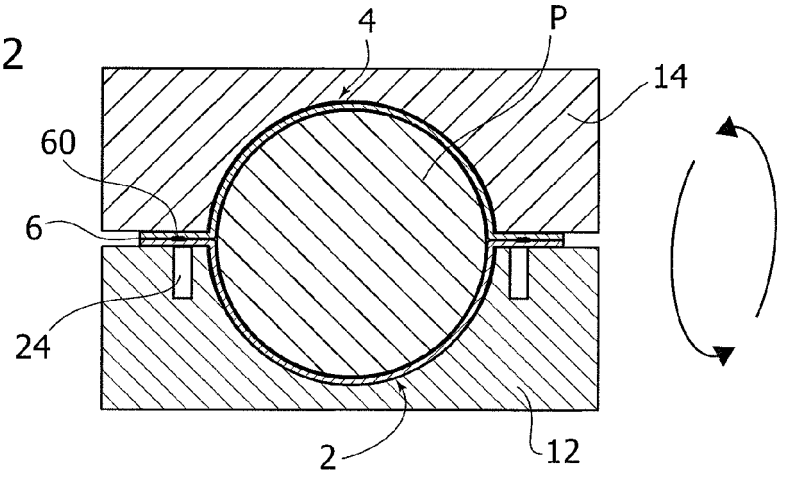


FIG. 13

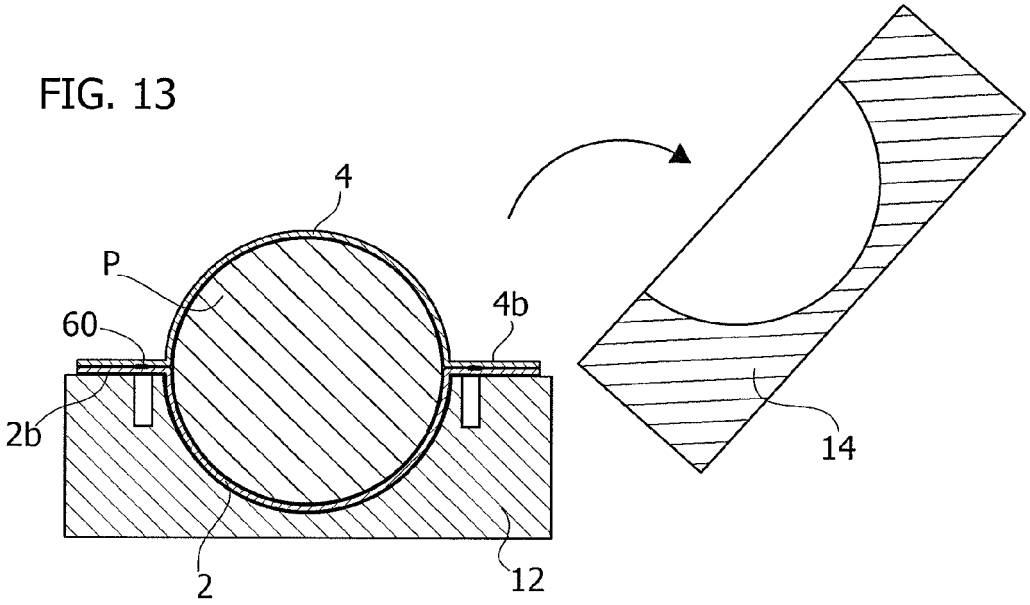


FIG. 14

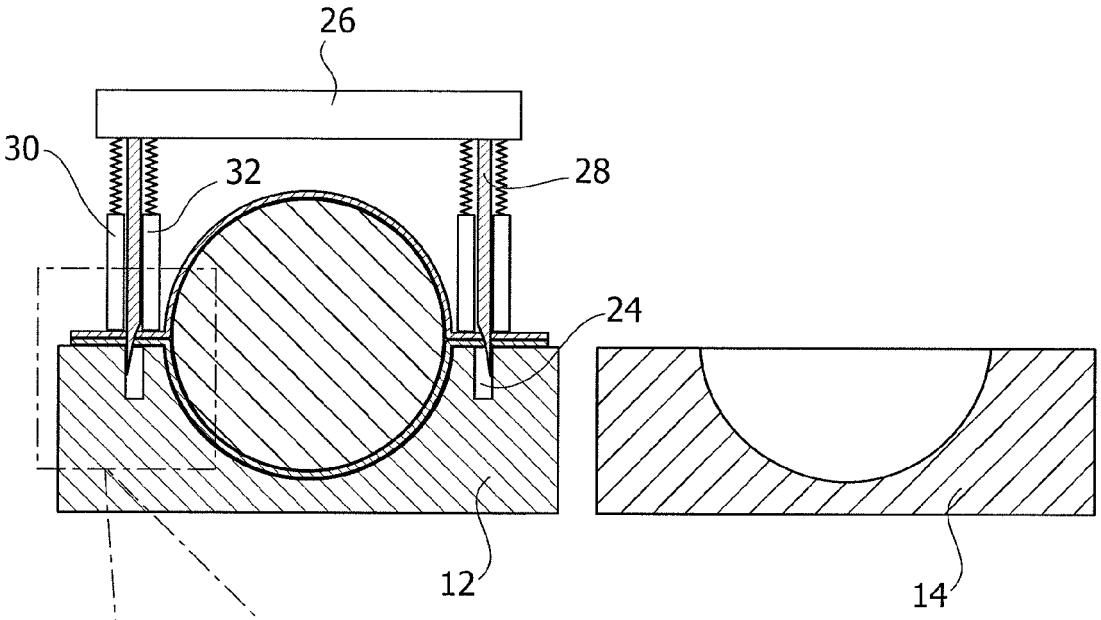


FIG. 14A

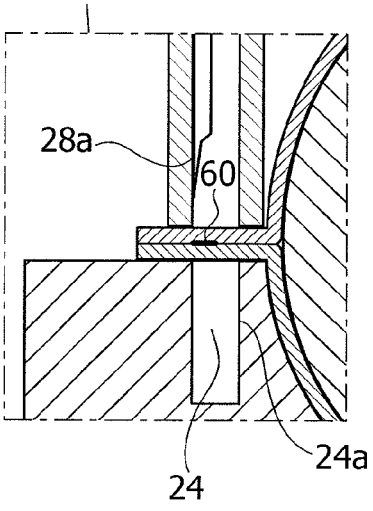
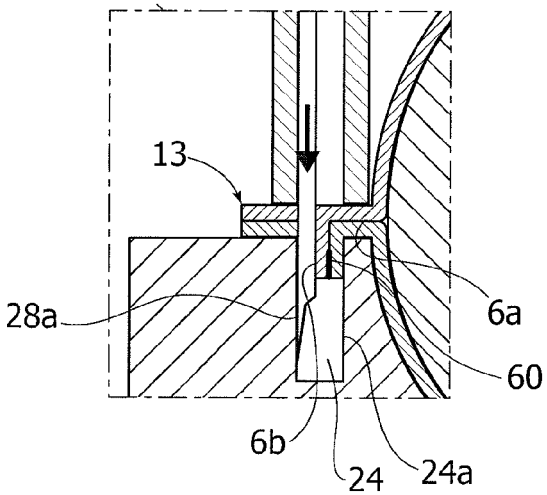


FIG. 14B



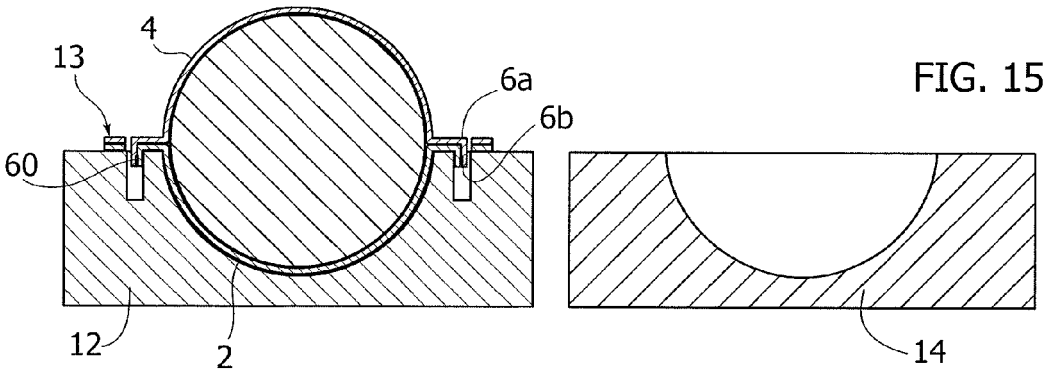


FIG. 15

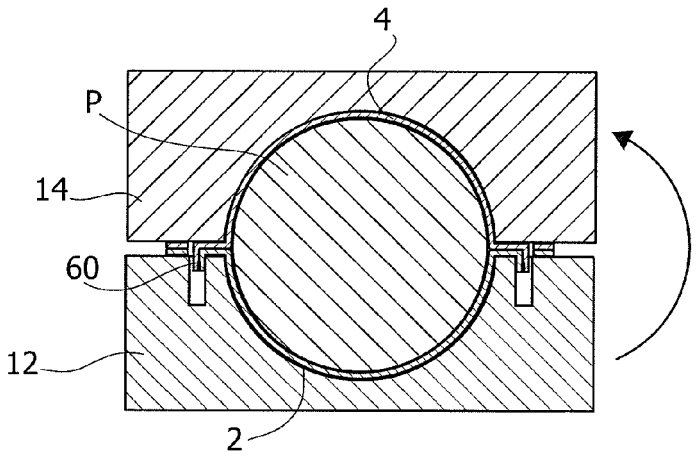


FIG. 16

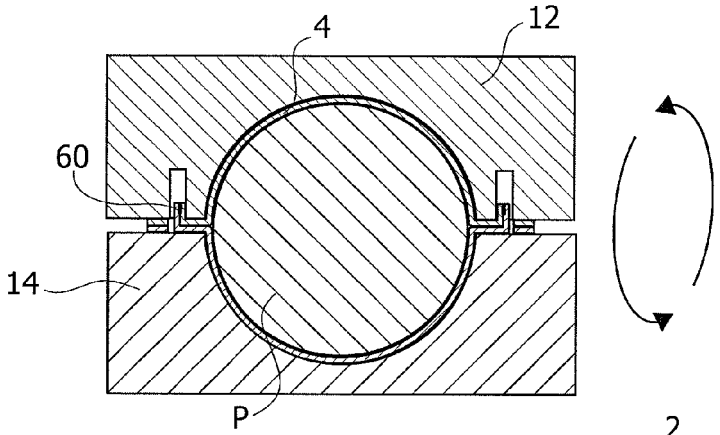


FIG. 17

FIG. 18

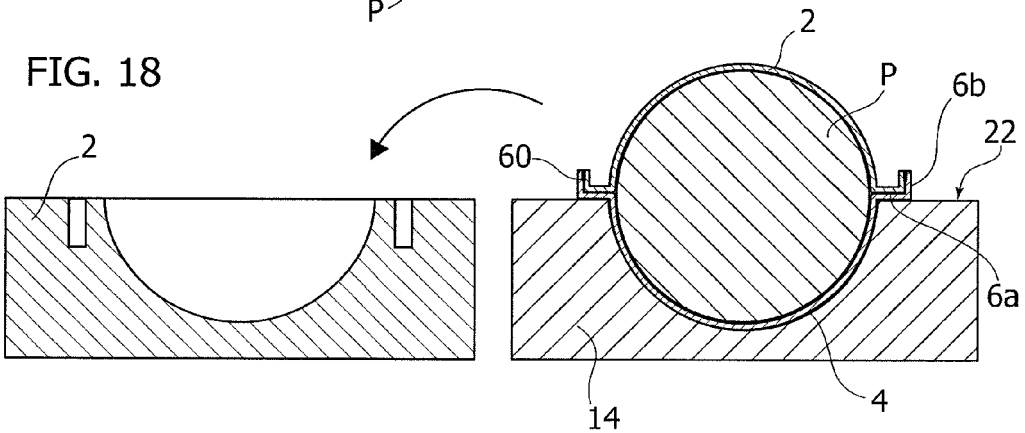


FIG. 19

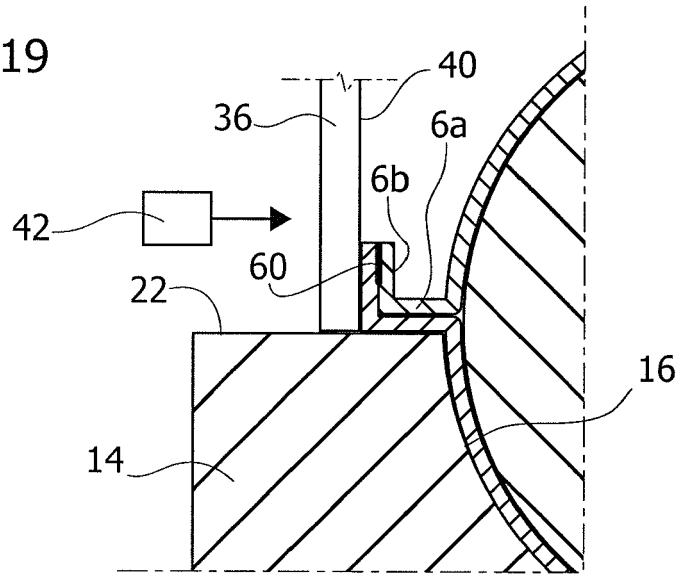


FIG. 20

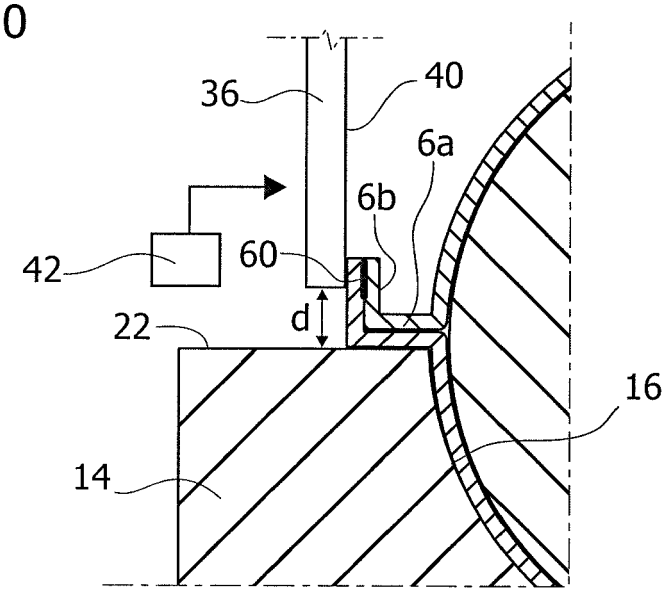


FIG. 21

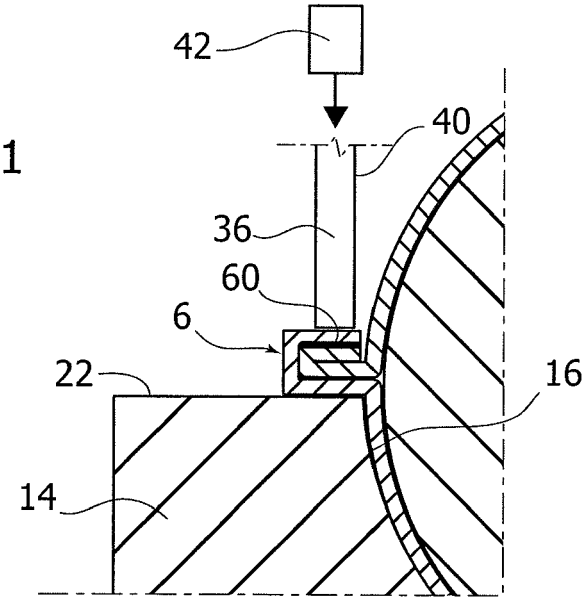


FIG. 22

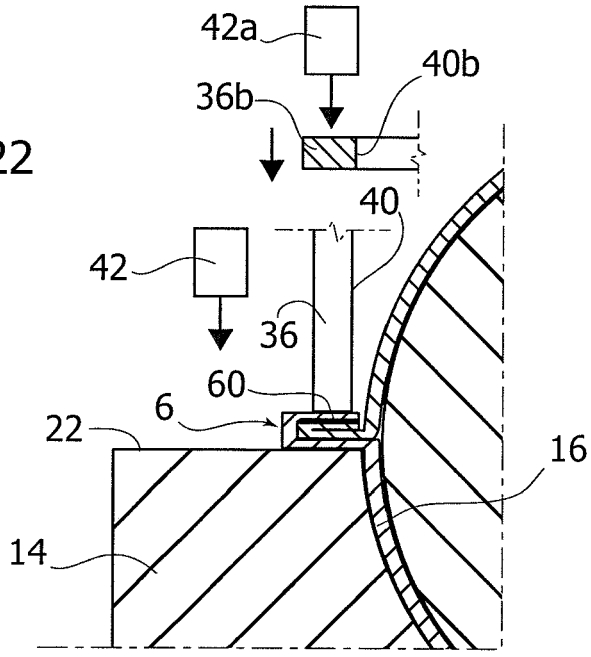


FIG. 23

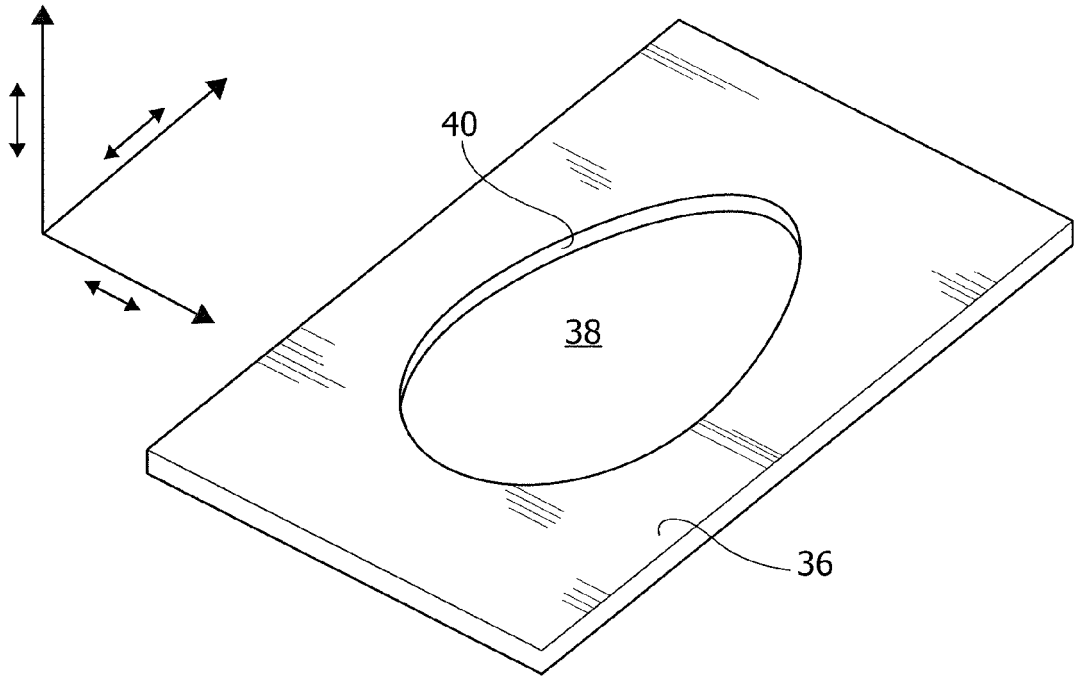
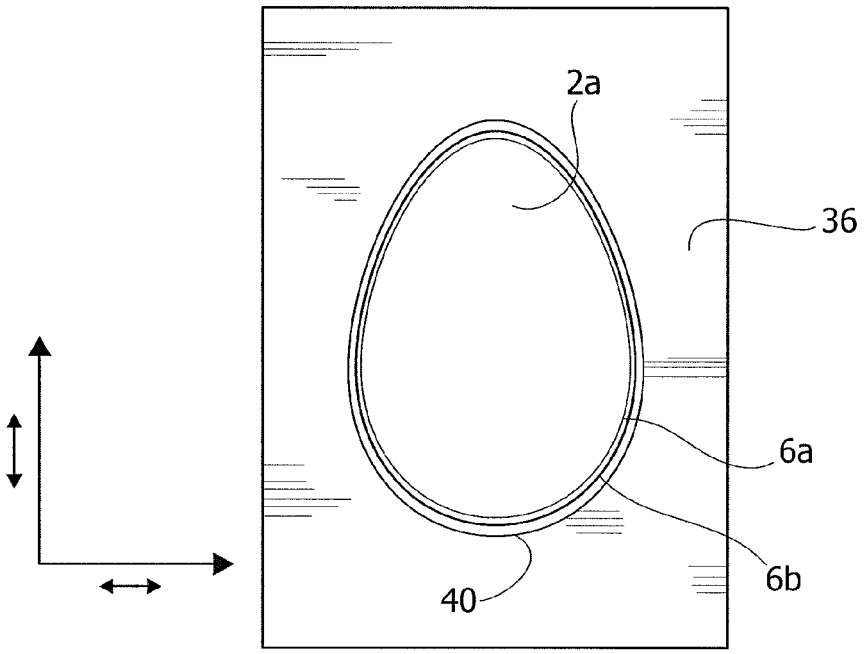


FIG. 24



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EUROPEAN SEARCH REPORT

Application Number
EP 14 15 2892

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,D	EP 2 366 631 A1 (SOREMARTEC SA [BE]; FERRERO SPA [IT]; FERRERO OHG [DE]) 21 September 2011 (2011-09-21) * the whole document *	1-11	INV. B65B11/50 B65B25/00 B65B47/06 B65B7/28
A	DE 17 84 647 U (WILHELM RASCH KOMMANDITGESELLS [DE]) 5 March 1959 (1959-03-05) * page 5, line 19 - page 11, line 13 * * figures 1-14 *	1-11	
A	DE 12 60 949 B (MALBA G M B H; NAHRUNGS U GENUSSMITTELFABRIK; CHOCAL G M B H) 8 February 1968 (1968-02-08) * column 1, line 1 - column 7, line 11 * * figures 1-7 *	1-11	

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B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 March 2014	Rodriguez Gombau, F

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18-03-2014

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