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(54) **A wafer half-shell, a method for its preparation, and a food product including it**
Waffelhalbschale, Verfahren zur Herstellung derselben, und Lebensmittel enthaltend derselben
Demi-coquille de gaufrette, procédé de sa fabrication, et aliment comprenant cette demi-coquille

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WO-A-97/48282

EP 1 433 384 B9

Description

[0001] The present invention relates to the production of a wafer half-shell of the type usually used in filled food products, comprising a filling contained in the half-shell or, more particularly, enclosed in a shell formed by two half-shells fitted together mouth to mouth.

[0002] Food products of the type mentioned above are widely known particularly in the field of confectionery and pastries; the shell may have various dimensions according to the product and various shapes, for example, spherical shapes, egg-shapes, bar-shapes, double truncated-pyramid shapes, or shapes with a plurality of cells.

[0003] As described in EP-A-0 054 229 and WO 97/48282, a known method for the industrial preparation of the half-shells comprises the preparation of a wafer having a plurality of half-shells interconnected by a continuous, normally flat wall. The intermediate wafer is produced by baking of the wafer batter in a mould comprising a female half-mould constituted by a multi-recessed plate having rows and ranks of recesses that are normally identical to one another and of a shape complementary to that of the half-shells, and a male half-mould which defines with the other half-mould a cavity of a shape corresponding to the intermediate wafer.

[0004] In the intermediate wafer thus obtained, all of the half-shells are in relief on one side of the wafer and the interconnecting wall extends flush with the plane constituting the mouths of the half-shells. The intermediate wafer has a porous or cellular internal structure typical of wafers and an upper and a lower surface having a substantially smooth finish substantially free of large surface pores, resulting from the baking of the wafer mix in contact with the polished surfaces of the half-moulds.

[0005] According to a first known technique, the half-shells are separated from the interconnecting wall by punching performed through the wall, along the entire perimeter of the mouth of each of the half-shells, with the use of a plurality of steel punches of a size and shape corresponding to those of the mouths of the half-shells.

[0006] If the half-shells have straight mouth edges, the separation can also be achieved by a sawing operation in which the saw extends perpendicularly relative to the plane of the wafer.

[0007] When the separation of the shells is performed by punching or sawing, a rough and crumbled annular separation region in which the porous internal structure of the wafer is exposed to the exterior is visible on each half-shell thus cut - around the entire annular surface defining the mouth of the half-shell.

[0008] In general, it is difficult to perform the punching or the sawing perfectly "in register" with the outline of the mouth of the half-shell, that is, perfectly flush with the outer surface of the side wall of the half-shell, with the consequence that a step formed by a radial flange may appear around the mouth of the half shell.

[0009] Even if the punching or sawing operations can be performed perfectly in register, which is desirable per

se, because of the fragility of the wafer structure, there is a high risk of the break in the interconnecting wall being propagated in the flat annular surface defining the mouth of the half-shell. In this case, damage or partial removal of the smooth surface finish of this surface occurs and the porous internal structure of the wafer is exposed thereon.

[0010] The above-mentioned damage to the annular surface of the mouth of the half-shell has been found to be the source of problems particularly when the half-shells thus produced are used for the production of a filled product formed by fitting two half-shells together mouth to mouth and including a filling of liquid, creamy or paste-like consistency.

[0011] In this case, the absence of a good surface finish of the mouth surfaces that are fitted together and the presence of open pores facilitates the migration of the filling into the external wafer structure, causing undesired effects on the internal portion of the wrapping.

[0012] According to another known technique described, for example, in EP-A-0 054 229 and EP-A-0 221 033, the cutting of the wafer-half-shells from the above-described intermediate wafer is performed in a plane parallel to the interconnecting wall. In this case, although the cutting process is advantageous in terms of investment costs for the cutting machines in comparison with the much more complex punching operation performed perpendicular to the plane of the interconnecting wall, in the half-shells thus obtained, the surface resulting from the cutting is situated within the thickness of the wall of the half-shell, that is, it is an end face rather than a side face so that the annular mouth surface is without any surface finishing and has a rough and porous structure.

[0013] The object of the present invention is to provide a novel half-wafer structure suitable for overcoming the problems mentioned above.

[0014] For this purpose, a subject of the invention is a wafer-half-shell and a method for its preparation as defined in the appended claims.

[0015] A further subject of the invention is a wafer useful as an intermediate product for the preparation of the half-shells as well as a food product, particularly a confectionery or pastry product comprising at least one half-shell of the type mentioned above and preferably two half-shells fitted together mouth to mouth, including a filling, as defined in the appended claims.

[0016] The degree of smooth finishing of the annular mouth surface and the fact that it is coplanar with any corresponding annular surface coupled therewith prevent leakage of the filling from the wafer.

[0017] Further characteristics and advantages of the invention will become clear from the following detailed description, given with reference to the appended drawings which are provided by way of non-limiting example, and in which:

Figure 1 is a perspective view of a wafer with cells according to the invention,

Figure 2 is a section taken on the line II-II of Figure 1,

Figure 3 is a partially-sectioned view of a food product formed by a pair of half-shells of Figure 2,

Figure 4 is a section through a pair of half-shells but with an L-shaped edge profile, and

Figure 5 is a view from above of a wafer half-shell having a circular annular mouth surface with radial projections.

[0018] According to the invention, a wafer half-shell 2 is produced by separation from a wafer 4 having, for example, the characteristics shown in Figure 1. The wafer comprises a plurality of half-shells 2 arranged in rows and ranks and interconnected by a continuous, substantially flat connecting wall 6 which surrounds the half-shells.

[0019] In another embodiment, shown in broken outline in Figure 1, the half-shells 2 are interconnected by a plurality of interconnecting walls 6a, 6b which are produced by channels or projections of the forming mould.

[0020] Each half-shell 2 has an open upper mouth delimited by an annular surface 8 and a side wall 10 defining the body of the half-shell.

[0021] According to a characteristic of the invention, the interconnecting wall(s) 6, 6a, 6b is (are) connected to the half-shells in a receded position relative to the annular surface 8 defining the mouth.

[0022] In one embodiment of the invention, in the wafer 4, the upper surface 12 of the interconnecting wall 6 is receded relative to the general plane of the annular mouth surface 8 so that - adjacent the mouth - an annular collar 14 is defined.

[0023] The distance between the plane of the annular surface 8 and the upper surface 12 of the walls 6, 6a, 6b may vary within wide limits in dependence on the size and shape of the half-shell 2.

[0024] The wafer 4 may be produced, for example, by the method of forming and baking in a mould as described in WO97/48282. As described in the document cited, to facilitate the removal of the wafer 4 from the mould, the thickness of the interconnecting wall 6, which is, for example, of the order of about 2-2.5 mm, is preferably greater than the wall thickness 10 of the half-shell which may be, for example, of the order of 1-1.5 mm.

[0025] However, in the method of the present invention, a situation is naturally also envisaged in which the thickness of the wall 6 is equal to that of the wall 10 of the half-shell 2, or possibly less, particularly when it is desirable to reduce the depth of the separation surface to the minimum.

[0026] The wafer 4 produced as a result of baking in the mould has an upper surface 12 and a lower surface 16 of the interconnecting wall/s 6 as well as an upper surface 18 and a lower surface 20 of the half-shells 2, which have a good level of surface finishing, that is, a

smooth or polished surface somewhat similar to an outer skin or thin surface crust substantially free of large open pores, although the possible presence of local surface defects cannot be completely excluded. The above-mentioned definition of "smooth surface" is not intended to exclude the possibility that the surface may have a relief or recessed pattern, or that it may be an embossed surface.

[0027] Similarly, the annular mouth surface 8 and the annular collar surface 14 have the same surface finish; the internal structure of the wafer 4, on the other hand, is a porous, cellular structure.

[0028] The half-shells 2 are obtained from the wafer 4 by means of a cutting operation through the wall 6 around the entire perimeter of the mouth in a manner such that the cutting operation does not interfere with the annular surface of the collar 14. This operation is typically performed by punching with the use of a set of punches of a size and shape corresponding to those of the mouths of the half-shells 2.

[0029] As a result of the separation operation, the half-shells thus obtained have, on their side wall or walls - adjacent the mouth but in a position below the general plane of the annular mouth surface 8 - a peripheral cutting region 22 with a rough surface, possibly partially crumbled and with open pores, whereas the annular surfaces of the collar 14 and of the mouth 8 retain the high level of surface finishing which characterizes the entire surface of the wafer 4.

[0030] If the half-shells are connected by a single wall or web 6, this peripheral cutting region will be constituted by a continuous annular stripe whereas, with interconnecting walls 6a, 6b, the cutting region will be a discontinuous stripe.

[0031] Depending on the cutting and detachment method, the surface of the cutting region may be slightly in relief relative to the surface of the wall 10 or even slightly recessed. It is intended that the height of the cutting region 22 can be restricted by reducing the thickness of the interconnecting wall 6 within the limits permitted with regard to the structural strength of the intermediate wafer 4.

[0032] When the two half-shells 2a and 2b are fitted together mouth to mouth to form a shell of the type shown in Figure 3, the annular surfaces 8 that are fitted together are thus free of surface defects or large pores which - as mentioned - may cause deterioration of the food product.

[0033] Although the invention has been described herein with reference to the production of a hemispherical half-shell, the invention is intended to be applicable to the production of half-shells of any shape or size.

[0034] Naturally, the term "annular surface" relating to the surface of the mouth of the half-shell is intended to indicate a surface that is closed onto itself and does not exclude non-circular annular surfaces, for example, polygonal surfaces or circular surfaces with star-like radial productions (Figure 5). The surface defining the mouth will preferably comprise at least one annular surface

which extends in a (horizontal) plane; however, mouth surfaces with profiles in the shape of a Greek key pattern, toothed, or L-shaped surfaces, for example, with two flat meeting surfaces 8a, 8b (Figure 4) may also be envisaged.

[0035] Similarly, the filled food product is not intended to be limited to products formed by two half-shells fitted together mouth to mouth as shown in Figure 3, but may include products including a single wafer half-shell coupled mouth to mouth with a half-shell made of another food product such as, for example, a moulded chocolate shell, or a single wafer half-shell the base of which is closed by a flat base of wafer or another food substance.

Claims

1. A wafer half-shell having a mouth delimited by at least one annular surface (8) and one or more side walls (10), in which the mouth surface (8) and the surfaces (18, 20) of the side wall (10) have a substantially smooth surface finish, **characterized in that** the outer surface (20) of the side wall (10) has a porous, continuous or discontinuous region (22) which extends peripherally and is receded relative to the mouth surface (8) of the half-shell.
2. A half-shell according to Claim 1, **characterized in that** the porous region (22) is the surface obtainable by the cutting of one (6) or more (6a, 6b) radial walls connected to the side wall (10) of the half-shell in a receded position relative to the annular surface (8) defining the mouth of the half-shell.
3. A half-shell according to Claim 1 or Claim 2, **characterized in that** it can be produced by cutting from an intermediate wafer (4) comprising a plurality of half-shells (2) interconnected by at least one interconnecting wall (6, 6a, 6b) extending from the side wall (10) of each half-shell (2) and connected to the half-shells in a receded position relative to the annular mouth surface (8).
4. A wafer comprising a plurality of half-shells (2) with at least one containing side wall (10) and interconnected by at least one interconnecting wall (6), **characterized in that** the interconnecting wall (6) is connected to the half-shells in a receded position relative to the annular mouth surface (8) of each half-shell (2).
5. A wafer according to Claim 4, **characterized in that** the half-shells (2) are interconnected by means of a plurality of interconnecting walls (8a, 8b) which extend radially from the containing side walls (10) of the half-shells (2).
6. A food product comprising a half-shell according to

any one of Claims 1 to 3 and including a mass of filling contained in the half-shell (2).

7. A food product according to Claim 6, comprising a pair of half-shells according to any one of Claims 1 to 3, fitted together mouth to mouth and including a mass of filling.
8. A method for the preparation of a wafer half-shell (2) with a mouth (8) and a containing side wall (10), **characterized in that** it comprises the steps of:
 - preparing a wafer (4) comprising a plurality of the half-shells (2) connected by at least one interconnecting wall (6) connected to the half-shells in a receded position relative to the annular mouth surface (8) of the half-shells (2), and
 - separating the individual half-shells (2) from the interconnecting wall (6) by cutting in a direction perpendicular to the general plane of the interconnecting wall (6).
9. A method according to Claim 8, **characterized in that** the wafer (4) is a product obtainable by baking a wafer batter in a mould.

Patentansprüche

1. Waffelhalbschale mit einer Öffnung, die wenigstens durch eine ringförmige Fläche (8) begrenzt ist, und einer oder mehreren Seitenwänden (10), wobei die Öffnungsfläche (8) und die Oberflächen (18, 20) der Seitenwand (10) eine im Wesentlichen glatte Oberflächenbeschaffenheit aufweisen, **dadurch gekennzeichnet, dass** die äußere Fläche (20) der Seitenwand (10) einen porösen, kontinuierlichen oder diskontinuierlichen Bereich (22) aufweist, der sich umfangsmäßig erstreckt und relativ zu der Öffnungsfläche (8) der Halbschale zurückversetzt ist.
2. Halbschale nach Anspruch 1, **dadurch gekennzeichnet, dass** der poröse Bereich (22) der Oberfläche entspricht, die durch das Schneiden einer (6) oder mehrerer (6a, 6b) radialer Wände, die mit der Seitenwand (10) der Halbschale verbunden sind, relativ zu der ringförmigen Fläche (8), die die Öffnung der Halbschale definiert, in einer zurückversetzten Position erreichbar ist.
3. Halbschale nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** sie durch Schneiden aus einer Zwischenproduktwaffel (4) geschnitten wird, die mehrere Halbschalen (2) umfasst, die durch wenigstens eine sie verbindende Wand (6, 6a, 6b), die sich von der Seitenwand (10) jeder Halbschale (2) erstreckt und mit den Halbschalen relativ zu der ringförmigen Öffnungsfläche (8) in einer zurückversetz-

ten Position verbunden ist, miteinander verbunden sind.

4. Waffel, umfassend mehrere Halbschalen (2) mit wenigstens einer fassenden Seitenwand (10), die durch wenigstens eine Verbindungswand (6) verbunden sind, **dadurch gekennzeichnet, dass** die Verbindungswand (6) mit den Halbschalen relativ zu der ringförmigen Öffnungsfläche (8) jeder Halbschale (2) in einer zurückversetzten Position verbunden ist. 10
5. Waffel nach Anspruch 4, **dadurch gekennzeichnet, dass** die Halbschalen (2) mittels mehrerer Verbindungswände (8a, 8b) verbundener sind, die sich von den fassenden Seitenwänden (10) der Halbschalen (2) radial erstrecken. 15
6. Lebensmittelprodukt, umfassend eine Halbschale nach einem der Ansprüche 1 bis 3 und umfassend eine Füllung, die in der Halbschale (2) enthalten ist. 20
7. Lebensmittelprodukt nach Anspruch 6, umfassend ein Paar Halbschalen gemäß einem der Ansprüche 1 bis 3, die Öffnung auf Öffnung zusammengefügt sind und eine Füllung enthalten. 25
8. Verfahren zur Vorbereitung einer Waffelhalbschale (2) mit einer Öffnung (8) und einer fassenden Seitenwand (10), **dadurch gekennzeichnet, dass** es die Schritte umfasst: 30
 - Vorbereiten einer Waffel (4), umfassend mehrere Halbschalen (2), die durch wenigstens eine Verbindungswand (6) verbunden sind, die relativ zu der ringförmigen Öffnungsfläche (8) der Halbschalen (2) in einer zurückversetzten Position verbunden ist, und 35
 - Trennen der einzelnen Halbschalen (2) von der Verbindungswand (6) durch Schneiden in einer Richtung senkrecht zu der allgemeinen Ebene der Verbindungswand (6). 40
9. Verfahren nach Anspruch 8, **dadurch gekennzeichnet, dass** die Waffel (4) ein Produkt ist, das durch Backen eines Waffelteigs in einer Gießform erzielbar ist. 45

Revendications

1. Demi-coque de plaque comprenant une embouchure délimitée par au moins une surface annulaire (8) et une ou plusieurs parois latérales (10), dans laquelle la surface de l'embouchure (8) et les surfaces (18, 20) de la paroi latérale (10) ont une finition de surface substantiellement lisse, **caractérisée en ce que** la surface extérieure (20) de la paroi latérale (10) comprend une zone poreuse (22), continue ou 55

discontinue, qui s'étend périphériquement et qui est en retrait par rapport à la surface de l'embouchure (8) de la demi-coque.

2. Demi-coque selon la revendication 1, **caractérisée en ce que** la zone poreuse (22) est la surface qui peut être obtenue par la découpe d'une (6) ou de plusieurs (6a, 6b) parois radiales raccordées à la paroi latérale (10) de la demi-coque dans une position en retrait par rapport à la surface annulaire (8) qui définit l'embouchure de la demi-coque. 10
3. Demi-coque selon la revendication 1 ou la revendication 2, **caractérisée en ce qu'elle** peut être produite en découpant une plaque intermédiaire (4) comprenant une pluralité de demi-coques (2) raccordées par au moins une paroi de raccordement (6, 6a, 6b) qui s'étend depuis la paroi latérale (10) de chaque demi-coque (2) et raccordée aux demi-coques dans une position en retrait par rapport à la surface de l'orifice annulaire (8). 15
4. Plaque comprenant une pluralité de demi-coques (2) avec au moins l'une contenant la paroi latérale (10) et raccordée par au moins une paroi de raccordement (6), **caractérisée en ce que** la paroi de raccordement (6) est raccordée aux demi-coques dans une position en retrait par rapport à la surface de l'embouchure annulaire (8) de chaque demi-coque (2). 20
5. Plaque selon la revendication 4, **caractérisée en ce que** les demi-coques (2) sont raccordées au moyen d'une pluralité de parois de raccordement (8a, 8b) qui s'étendent radialement depuis les parois latérales de contention (10) des demi-coques (2). 25
6. Produit alimentaire comprenant une demi-coque selon l'une quelconque des revendications 1 à 3 et comprenant une masse de garniture contenue dans la demi-coque (2). 30
7. Produit alimentaire selon la revendication 6, comprenant une paire de demi-coques selon l'une quelconque des revendications 1 à 3, montées ensemble embouchure contre embouchure, et comprenant une masse de garniture. 35
8. Procédé pour la préparation d'une demi-coque de plaque (2) avec une embouchure (8) et une paroi latérale de contention (10), **caractérisé en ce qu'il** comprend les étapes de : 40
 - préparation d'une plaque (4) comprenant une pluralité de demi-coques (2) raccordées par au moins une paroi de raccordement (6) reliée aux demi-coques dans une position en retrait par rapport à la surface de l'embouchure annulaire 45

(8) des demi-coques (2) ; et
- séparation des demi-coques individuelles (2)
de la paroi de raccordement (6) par une découpe
dans un sens perpendiculaire au plan général
de la paroi de raccordement (6).

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9. Procédé selon la revendication 8, **caractérisé en ce que** la plaque (4) est un produit qui peut être obtenu en cuisant une pâte de plaque dans un moule.

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Fig.1

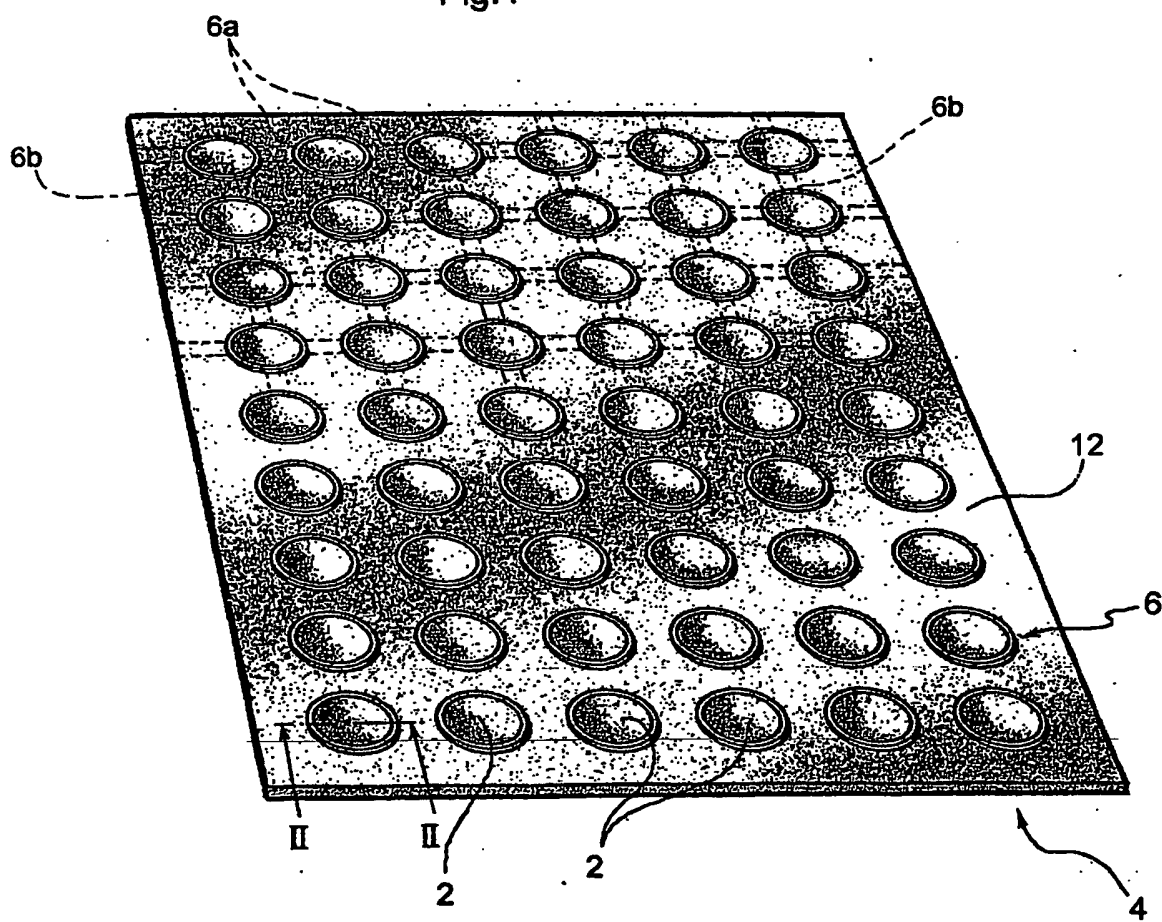


Fig.5

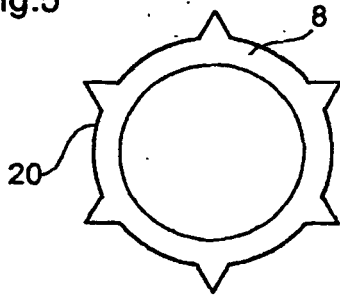


Fig.4

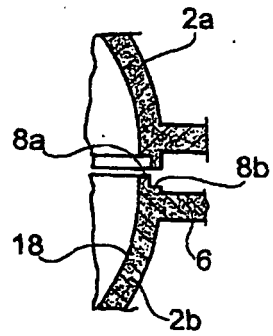


Fig.2

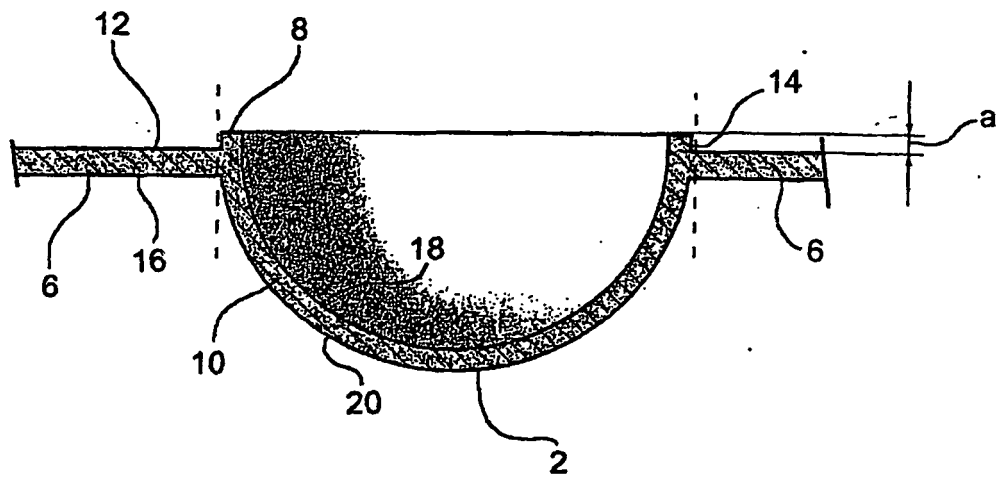
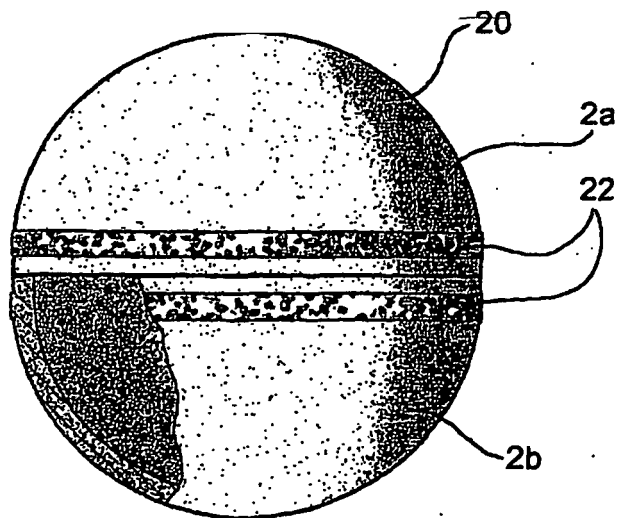


Fig.3



REFERENCES CITED IN THE DESCRIPTION

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