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(54) PREPACKAGED CHARGE FOR THE PREPARATION OF BEVERAGES

(57) Prepackaged charge of edible material for the preparation of beverages, comprising a vessel container body (1, 101) provided, at the open end (111), with a sealing wall made of airtight material and provided on the bottom wall (201, 211) with the dispensing means (221) of the prepared beverage, being provided a second wall (231) In airtight material close to the said bottom wall (201, 211); said second airtight wall (231) being made with at least one layer of thermoplastic material (2321) facing the inside of the container body, being also provided a support of thermoplastic material (241, 301, 321, 331, 351) intended to be coupled by welding to the said layer of thermoplastic material (2321) of the said second wall (231), said welding being performed along a polygonal path (251) with at least two smaller angles of 90°, in a substantially coaxial position to said dispensing means (221) of the beverage.

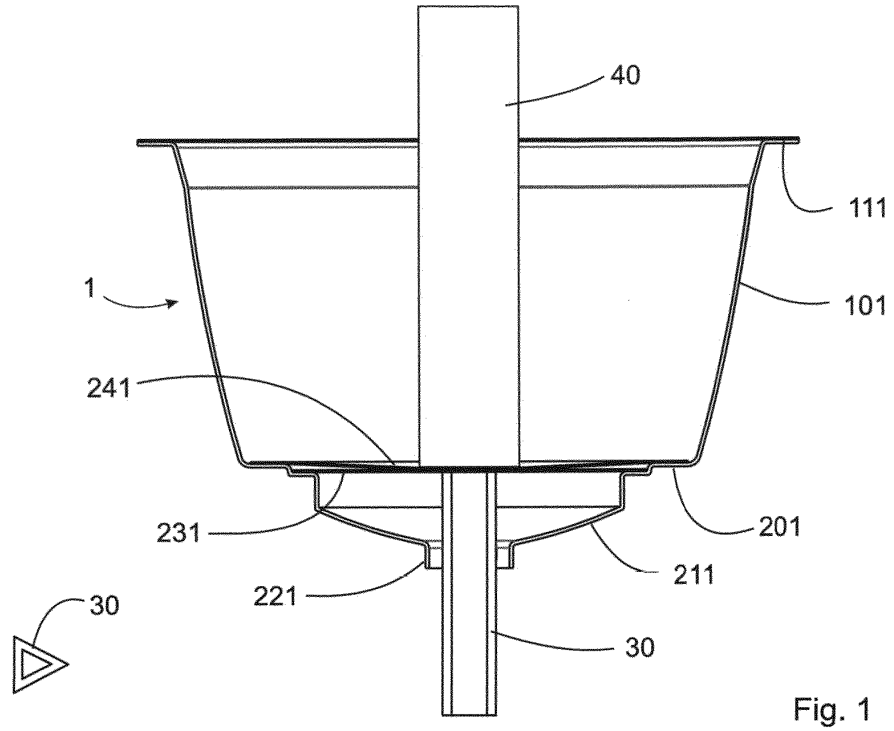

Fig. 1

Fig. 1A

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Description

TEXT OF THE DESCRIPTION

[0001] The present invention relates to prepackaged charges for the preparation of beverages, intended for use in suitable machines; in particular, the invention relates to a self-protected prepackaged charge for the preparation of beverages, and which is capable of directly dispensing the prepared beverage.

[0002] With the progress of technology, the machines that were initially designed especially for the preparation of espresso coffee, were also designed to accommodate prepackaged charges for the preparation of tea, herbal teas, milk or chocolate drinks or soluble broths, and therefore the machine which uses charges of very different drinks, both from the component and the organoleptic point of view, must be able to guarantee a dispensation without residuals from the previous dispensation; the most intuitive solution was precisely that of providing the prepackaged charge of a proper dispensing nozzle, which does not come into contact with the pans of the machine, as for example described in the document EP1579792B1.

[0003] This type of solution, designed typically for coffee, provides a system that forces the charge to reach a given pressure before dispensing the beverage, but does not provide the means that constitute a barrier to oxygen, and therefore to the degradation of edible materials. within the charge itself.

[0004] In the document EP1472156B1 a prepacked charge is described in which the edible material contained therein is enclosed, inside the container body, between two walls of material impermeable to the air; the container body is provided with dispensing means, and is provided inside with means for perforating one of the two walls impermeable to the air, which means interact with the said wall under the action of the internal pressure increase caused by the injection , through the other wall, of hot water under pressure.

[0005] The realization of the perforating means, which in numerous embodiments of the aforementioned patent constitute a severe structural complication, inevitably penalizes the final cost of the container body of the prepackaged charge. Since, as a rule, the cost of the container of edible material, as well as any other cost, must be minimized as much as possible, any structural complication involving additional construction costs is considered detrimental to the correct development of the product.

[0006] It is therefore an aim of the present invention to provide a self-protected prepackaged charge for the preparation of beverages that is capable of directly dispensing the prepared beverage, that is capable of delivering the beverage after a given pressure value has been reached within the prepackaged charge, and at the same time it can be realized with extremely low processing times, methods and costs.

[0007] An object of the present invention is therefore a prepackaged charge of edible material for the preparation of beverages, comprising a vessel-shaped container body, provided at the open end of a closing wall made of an air impermeable material, and provided on the bottom wall of means for dispensing the prepared beverage, a second wall made of material impermeable to air being provided near the bottom wall; said second wall impermeable to air, being made with at least one layer of thermoplastic material facing inwardly of the container body, a support made of thermoplastic material being provided inside said container body, intended to be coupled by welding to said layer of thermoplastic material of said second wall, said welding being performed on a polygonal path, with at least two angles of less than 90°.

[0008] In an embodiment, said support made of thermoplastic material is a wall made of a filter material of polymeric yarn based on a thermoplastic polymer. In another variant, said support is a disk-shaped element, which can be provided in the central portion with a polygonal relief projecting towards the said second impermeable wall.

[0009] In a further embodiment of the prepackaged charge according to the present invention, the dispensing means comprise a dispensing nozzle made in one piece with the bottom wall of said container body, and formed with a poly-lobed profile by thermo-mechanical deformation.

[0010] Further advantages and features of the system according to the present invention will become clear from the following description of some embodiments thereof, given by way of non-limiting example with reference to the attached drawings, in which:

Figure 1 shows a longitudinal section view of a first embodiment of the prepackaged charge according to the present invention during a phase of its production;

Figure 2 is a view of the container body of a prepackaged charge according to the present invention, at the end of the production step illustrated In Figure 1;

Figure 3 is a longitudinal sectional view of a second embodiment of the prepackaged charge according to the present invention during a phase of its realization;

Figure 4 is a plan bottom view of an element constituting the prepackaged charge of Figure 3;

Figure 5 is a variant of the element shown in Figure 4;

Figure 6 is a plan bottom view of a variant embodiment of the prepackaged charge according to the present invention; and

Figure 7 is a diagram of a stress load simulation for the second air-impermeable wall of the prepackaged charge according to the invention.

[0011] Figure 1 illustrates a first embodiment of the prepacked charge according to the present invention, in a phase of its production. The vessel-shaped container body is designated with the numeral 1, and provided with the lateral frustoconical wall 101 which has, at the open end, a radial flange 111 projecting outwards, while the other end has a bottom wall 201, provided with a funnel-shaped portion 211, at the center of which the nozzle 221 is positioned. At the funnel-shaped portion 211 there is a wall of air-impermeable material 231, provided with a layer of thermoplastic material facing the inside of the container body 1. Above the wall 231 there is a wall of filter material 241 made of a thermoplastic material fiber; the wall 231 and the wall 241 are coupled together thanks to the punch 30, with a triangular section, as it appears from the top plan view in figure 1A, overheated and brought into contact with the wall 231, while the wall 241 is contact with the contrast pin 40, cold.

[0012] Figure 2 shows the container body 1 of the prepacked charge of Figure 1, at the end of the processing illustrated therein. In the figure, equal parts correspond to equal numerals; in the center of the wall 241 and of the wall 231, coaxial and concentric to each other, the triangular welding zone 251 has been formed, placed directly above the dispensing nozzle 221.

[0013] Figure 2A shows an enlarged detail in longitudinal section of the container body of Figure 2; as can be seen, following the combined action of the punch 30 and of the pin 40, the welding zone 251 is given by the interpenetration of the materials which make up the filtering wall 241, in particular a non-woven fabric made of polymeric fiber, such as for example polyester, and the layer 2321 in thermoplastic polymer, for example polypropylene, which is included in the wall 231 impermeable to air; said layer 2321 is coupled with an aluminum layer 2311, which at the impact zone of the punch 30 shows a thinning 2331.

[0014] Figure 3 illustrates a second embodiment of the prepackaged charge according to the present invention, in a processing step thereof, similar to that illustrated in Figure 1; to the equal parts correspond equal numerals; in the figure, it is noted that on the end wall 201, an annular support body 301 of thermoplastic material is positioned and suitably coupled, provided with the arms 311 which centrally support the portion 321, coaxial with the dispensing nozzle 221, and provided with the axial polygonal protrusion 331, facing the impermeable wall 231, in its turn provided with a layer of thermoplastic material which interacts with the relief 331 of the central portion 321 of the annular body 301.

[0015] In Figure 3A is proposed a view similar to that of Figure 2A, referred in this case to a longitudinal section of the body of the prepackaged charge at the end of the processing step shown in Figure 3. In this case, a portion of the relief 331 protruding from the portion 321 coaxial with the dispensing nozzle, not shown in this figure, of the supporting annular body made of thermoplastic material, is welded with a part of the layer 231 of thermoplastic material 2321 of the wall 231, impermeable to air thanks to the aluminum layer 2311; also in this case the action of the punch 50 resulted in a thinning 2331 of the wall 231.

[0016] Figure 4 shows the supporting member301 of the container body of Figure 3, in plan bottom view, so as to make the triangular shape of the relief 331 protruding from the central portion 321 of the body 301 shown better. In Figure 5 is shown, in an enlarged detail, an executive variant of the supporting member, in which the relief 351 is in the shape of a star.

[0017] Figure 6 shows a plan view from below of a further variant of the container body 1 of the prepackaged charge according to the present invention; even in this case the numeral equals correspond to the same parts. The figure highlights the fact that the dispensing nozzle 221 comprises an outlet edge 2211 with a three-lobed tapered profile, thus being able to provide the nozzle 221 of a means for diffusing the flow of the beverage to be dispensed.

[0018] The operation of the prepacked charge according to the present invention will be apparent from the following. As shown in Figure 1 of the accompanying drawings and described above, the container body 1 comprises an air-impermeable wall 231 which, in the manner best illustrated in Figure 2A, consists of a layer of thermoplastic polymeric material and an aluminum layer. The welding, which Is carried out with the punch 30 between the wall 231 and the wall 241, has the object of creating a constraint zone which, by tearing or pulling, causes the fracture of the wall 231 which, due to the presence of aluminum, is relatively more fragile than wall 241 in filter material.

[0019] Advantageously, the welding path is made in such a way as to create a welding zone in which there are points where the structural stress is accentuated, as evidenced by the graph of the simulation attached in Figure 7, in which the lighter areas are those subjected to the greatest stress. The vertexes of the welding area appear to be the points where the stress of the wall with respect to the pressure load appears worse absorbed, and therefore in those points, with the increase of pressure inside the container body, it will be reasonable to expect the wall 231 to break. It should also be noted that, as shown in Figure 2A, the aluminum layer 2311 of the wall 231 is affected by the pressure of the punch, and this thinning, which in the figure has been exaggerated but which in any case occurs, accentuates the fragility of the wall in correspondence of the welding area 251, also in consideration of the changed mechanical properties of the same welding zone, which are affected by the features of both components.

[0020] An entirely similar argument can be made for the embodiment illustrated in Figures 3 and 4; in this

case, instead of the layer of filtering material made of thermoplastic material, a rigid support made of thermoplastic material was used, so as to make simpler the welding process on one hand, since the body 301 does not need the pin of contrast, because it is previously welded to the container body and able to disperse the heat of the punch 50. On the other hand, fixing the wall 231 to a rigid element makes the breaking of the wall much easier and more precise , since the deformation capacity of the wall 241 is eliminated. Furthermore, the filtering material 341 coupled to the body 301 can be chosen with greater freedom. The executive variant of Figure 5 allows the introduction of a polygonal relief of a different shape; the number of acute angles is increased, and therefore that of the stress points in which the break more simply occurs. The choice of a polygonal welding path with angles smaller than 90° derives from the evaluations based also on the simulation of Figure 7; the equilateral triangle welding path is the simplest and most balanced one, but the star also has undoubted advantages with a minimum structural complication of the support body, i.e. the welding punch.

[0021] From figure 1 as well as from figure 3 it is evident that, in the construction of both the embodiments described and illustrated herein of the prepackaged charge of the present invention, it is necessary to freely dispose of the space between the dispensing nozzle mouthpiece and the air-impermeable wall placed near the bottom wall. This effectively prevents the use of diffusing means of the flow of the dispensed beverage, which normally find their natural location in this area of the container body of the charge.

[0022] However, it has to be took into account the fact that, as can be inferred from the simulation of Figure 7, the openings which will form on the wall 231 at the corners of the welding area will be substantially triangles with a vertex facing the dispensing nozzle, but arranged on inclined planes with respect to the plane of the wall 231 before the infusion. Consequently, the flows of the resulting beverage will be directed towards the funnel wall 211 of the bottom wall 201, rather than directly towards the nozzle 221. The flow should therefore be sufficiently widespread even in the absence of specific devices inserted inside the container body.

[0023] In any event, even If one wishes to provide a prepackaged charge of this type of diffuser means without inserting anything in the area between the dispensing nozzle and the second air-impermeable wall, the solution shown in Figure 6 is available. With the structural modification of the profile of the outlet edge of the nozzle 221, which may be effected subsequent to the welding step of the wall 231 to the support 301 or to the filtering wall 241, the nozzle itself is shaped so as to be tapered downwards and deformed in the delivery port, so as to uniform the flow exiting the nozzle, without It being necessary to introduce anything inside it.

[0024] The prepackaged charge according to the present invention is therefore capable of directly dispensing the beverage prepared therein upon the achievement of a given pressure value, without there being complex means of drilling therein, and with decidedly very reduced procedural and structural constraints.

Claims

1. Prepackaged charge of edible material for the preparation of beverages, comprising a vessel container body (1, 101) provided, at the open end (111), with a sealing wall made of airtight material and provided on the bottom wall (201, 211) with the dispensing means (221) of the prepared beverage, being provided a second wall (231) in airtight material close to the said bottom wall (201, 211); said second airtight wall (231) being made with at least one layer of thermoplastic material (2321) facing the inside of the container body, being also provided a support of thermoplastic material (241, 301, 321, 331, 351) intended to be coupled by welding to the said layer of thermoplastic material (2321) of the said second wall (231), said welding being performed along a polygonal path (251) with at least two smaller angles of 90°, in a substantially coaxial position to said dispensing means (221) of the beverage.

2. Prepackaged charge according to claim 1, wherein said thermoplastic material support is a filtering material wall (241) of polymeric yarn based on thermoplastic polymer.

3. Prepackaged charge according to claim 1, wherein said thermoplastic support is a disc-shaped element (301), complementary to the pre-packaged container body, and having wide axial passages and a full portion (321) coaxial to said dispensing means (221) of the container body (1).

4. Prepackaged charge according to claim 3, wherein said disc-shaped element (301) is provided with a polygonal relief (331; 351) in the portion (321) coaxial to said dispensing means (221) with at least two angles smaller than 90°, protruding towards said second airtight wall (231).

5. Prepackaged charge according to claim 4, wherein the said relief is triangular (331).

6. Prepackaged charge according to any one of the preceding claims 1 to 5, wherein the dispensing means comprises a dispensing nozzle (221) made in one piece with the bottom wall (201, 211) of said container body (1), with a lobed profile (2211) and tapered toward the free end by thermo-mechanical deformation.

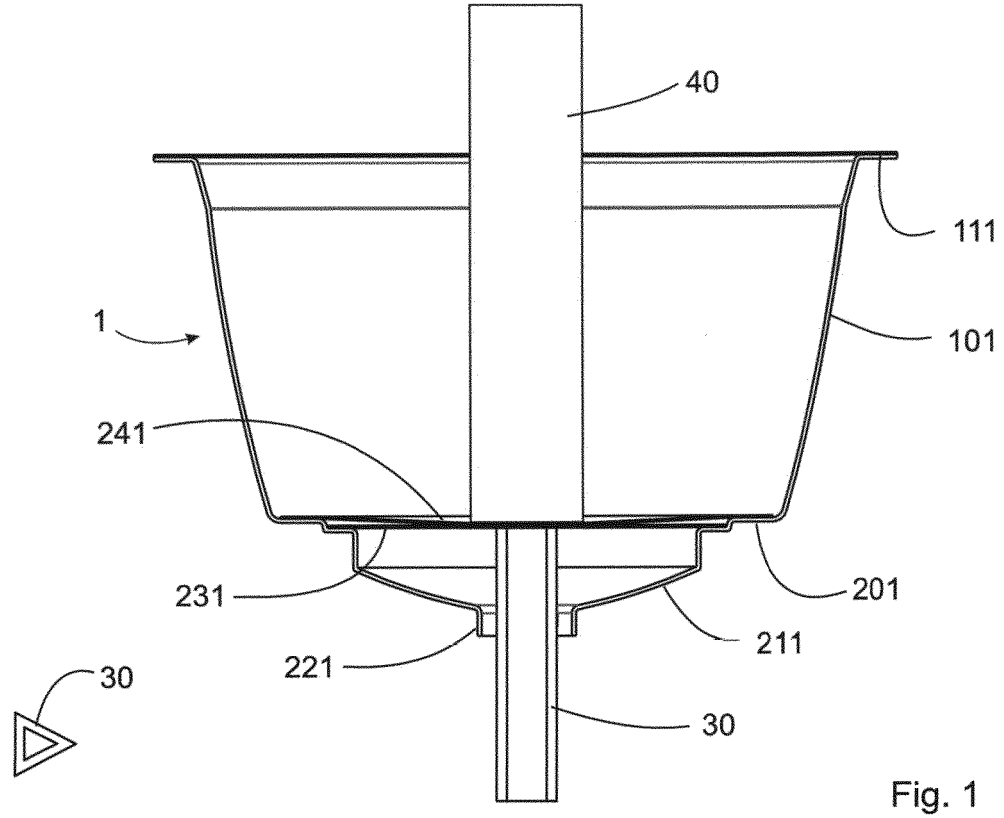

Fig. 1A

Fig. 1

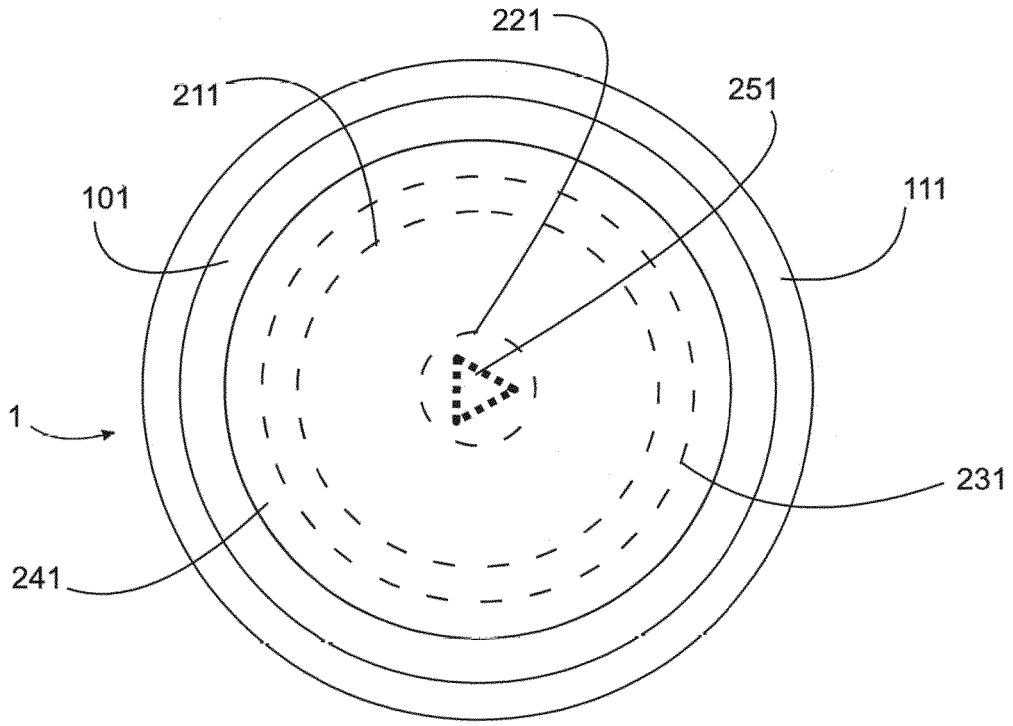

Fig. 2

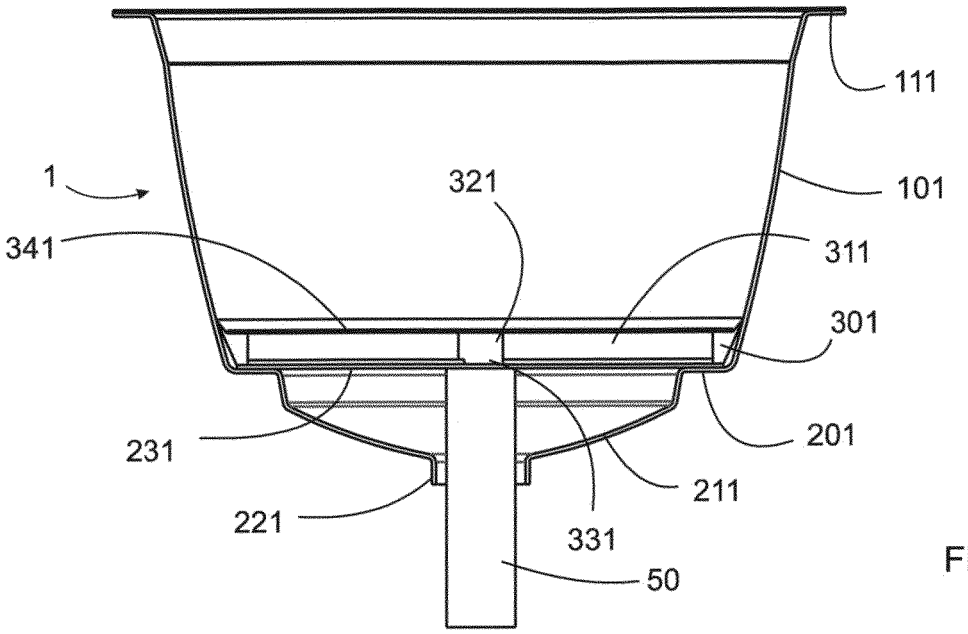

Fig. 3

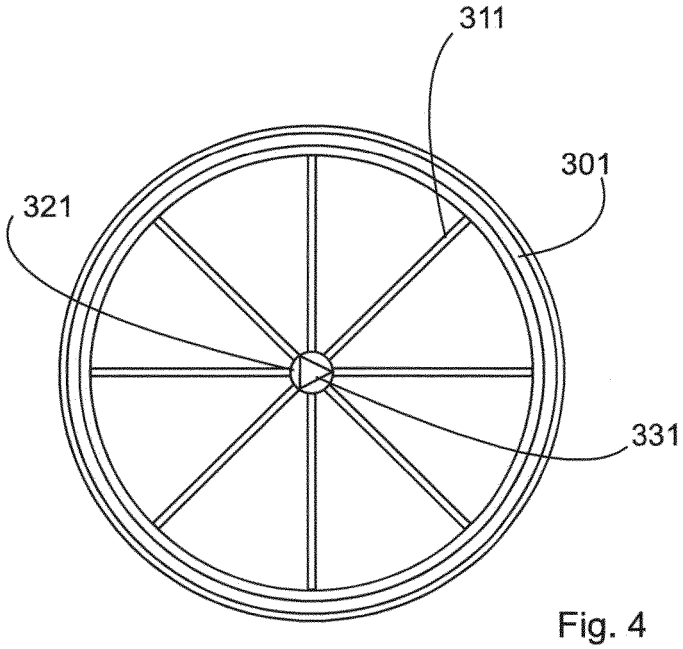

Fig. 4

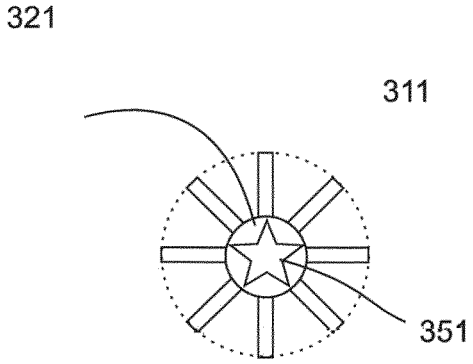

Fig. 5

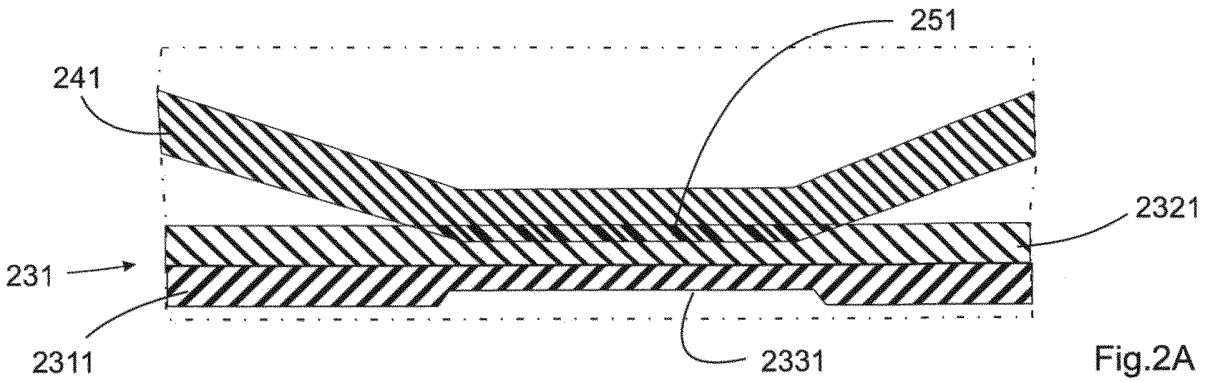

Fig.2A

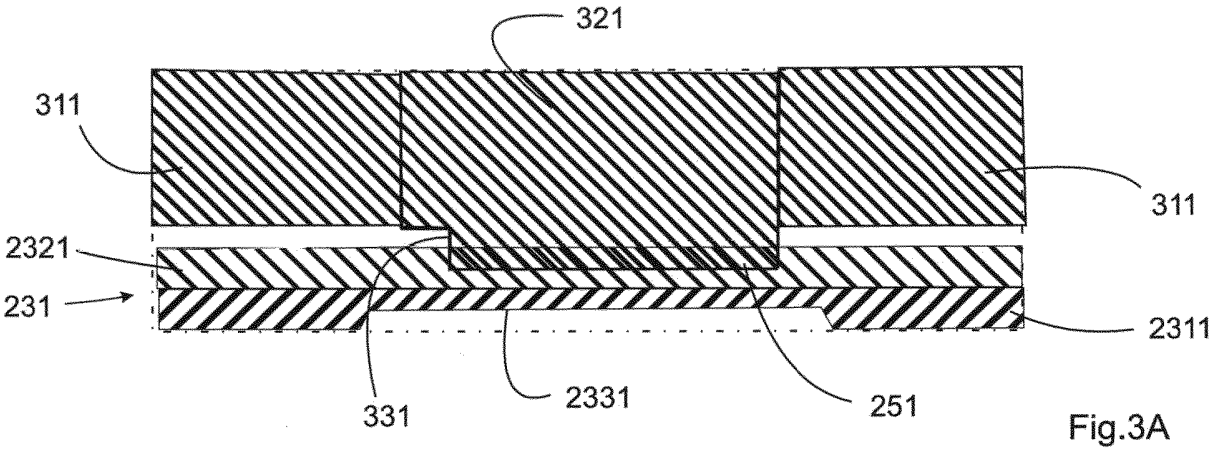

Fig.3A

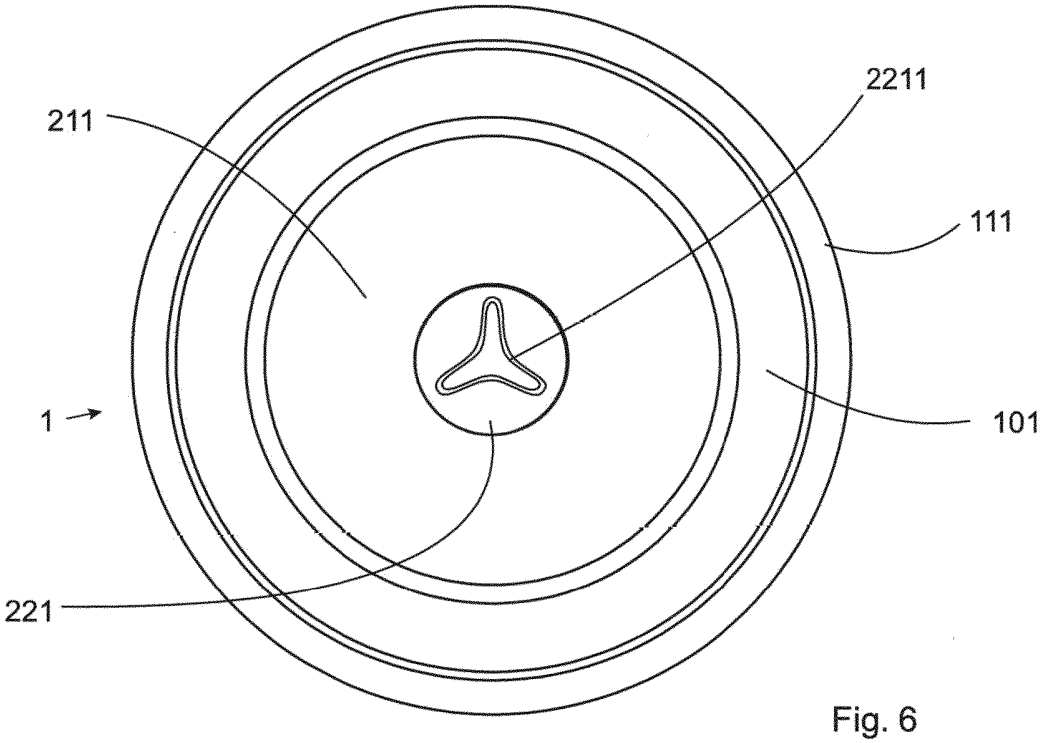

Fig. 6

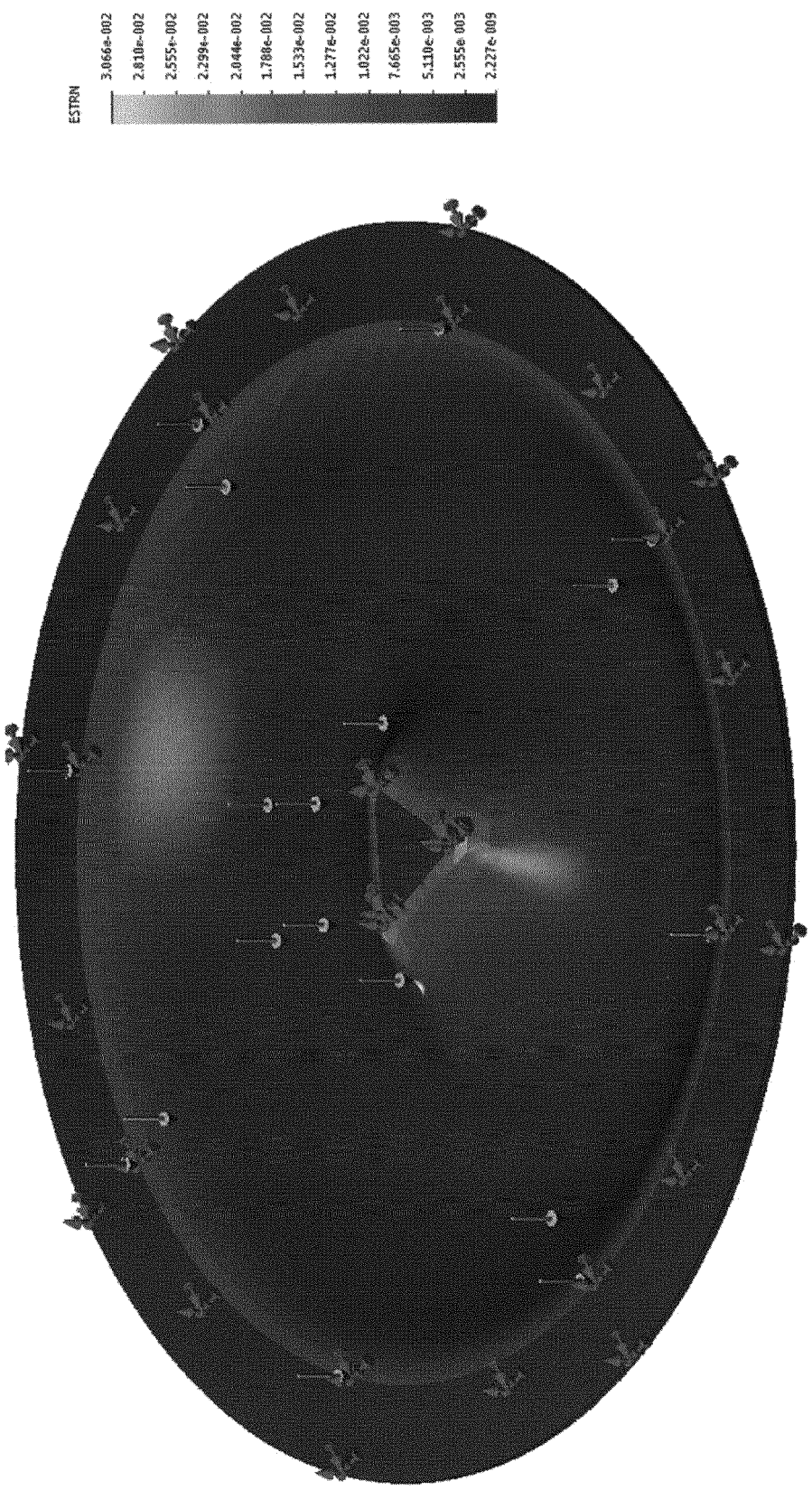
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Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 18 00 0437

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 July 2018	Rodriguez Gombau, F

CATEGORY OF CITED DOCUMENTS

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