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(54) **Packaged frozen ready-made meal**

(57) Packaged frozen ready-made meal (1) comprising a flared receptacle (2) made of a rigid material permeable to microwaves, containing a first frozen food component (6) at the bottom, a second frozen food component (7) having a substantially plate-like shape, having

a substantially fluid consistency at a temperature above 0°C, and a closure element (3), wherein the second frozen food component (7) having a substantially plate-like shape is engaged in the manner of a plug with the internal wall (5) of the receptacle, spaced apart from the first frozen food component (6).

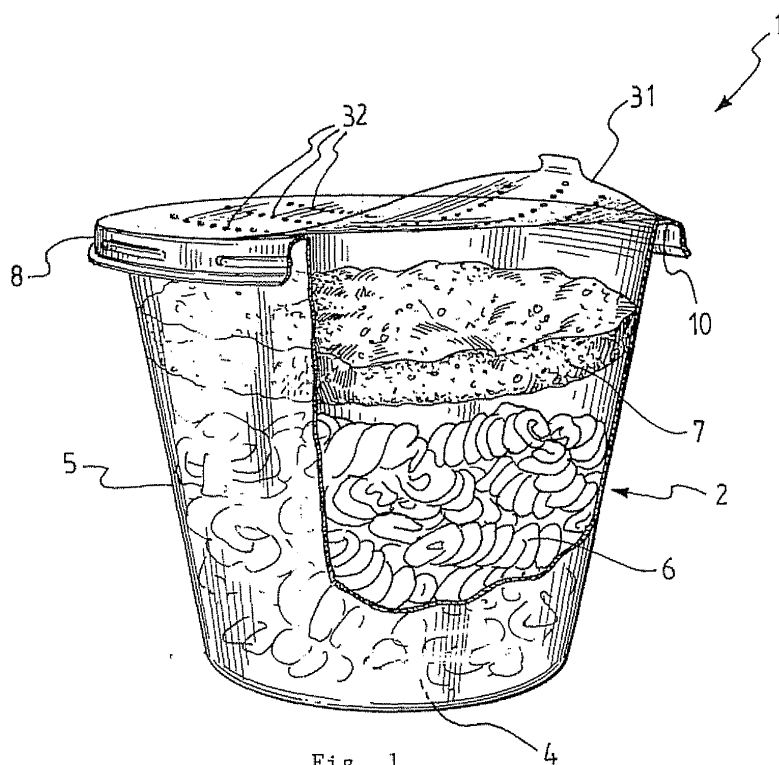


Fig. 1

DescriptionField of application

5 **[0001]** The present invention relates in general to the technical field of frozen ready-made meals.
[0002] More particularly, the present invention relates to a packaged frozen ready-made meal, suitable for heating in a microwave oven, comprising at least two food products intended to come into contact with one another at the time of consumption.
[0003] The present invention also relates to a method for the production of the frozen ready-made meal of the invention.

Prior art

15 **[0004]** To meet the needs of an ever-growing number of consumers who do not always have the time or the means necessary for preparing a hot meal in a conventional manner, the food industry has long been making available various packaged food products suitable for being rapidly cooked, heated or reconstituted, thus allowing the preparation of hot meals in little time and with the aid of few pieces of equipment or kitchen tools.

[0005] Such products are usually referred to as "ready-made meals" or "ready to heat", "heat and go", "ready meal", etc.

[0006] Such products are particularly suitable for meeting the needs of those who wish to eat a hot meal outside the home, such as for example at the workplace, and in general in places where there is no access to the use of a well-equipped kitchen. Such products are also suitable for home use in all those circumstances in which there is not the time, nor the possibility, of cooking a hot meal in a conventional manner.

[0007] Among the wide range of packaged ready-made meals made available by the industry, one specific type consists of first course meals based on two food components: a main component, generally cereal-based, such as pasta or rice, mixed or to be mixed with a condiment, generally of a liquid or semi-liquid consistency. Such ready-made meals can for example consist of pasta, rice, filled pasta, *gnocchi*, cereal grains, and a sauce as a condiment.

[0008] More commonly these products are packaged in sachets, trays, cups or combinations of these, and can be frozen, sterilised or freeze-dried.

[0009] In the case of frozen ready-made meals, they very often exhibit the food components, for example a pasta and a sauce, already mixed and placed in a tray, cup or other type of receptacle suitable for heating in a standard or microwave oven. The consumer is only required to heat the product thus packaged, following the instructions, which may include preparation steps to the process of heating the product, such as the removal of a film or wrapping, or the transfer of the product onto a plate or into a suitable container, or stirring or mixing of the product, depending on the specific cases.

[0010] This solution has the drawback, however, of producing a meal which is often disappointing from an organoleptic point of view, because the prolonged contact between the various components of the product during production of the ready-made meal and during its subsequent thawing and heating causes migration of the water from one component to the other, which causes a deterioration in its texture and flavour. Moreover the product may be unevenly heated, with certain parts of the product which are overcooked or too dry or even burnt, having been exposed to heat for an excessively long time, and with other parts having been exposed for too short a time, for example the innermost parts, which are still cold and in certain cases even still frozen at the time of consumption.

[0011] Moreover the possible need to remove films or even only to mix the product during or after heating obliges the consumer to perform a number of preparation steps with a consequent waste of time, the need to soil kitchen tools and the risk of staining clothes or of soiling the work surfaces and the surfaces of the oven.

[0012] Other solutions involve the separation of the two components up to the time of their consumption, subsequent to their heating, for example in a microwave oven. Please see, by way of example, Japanese patent JP 2296683 (Otsuka Chemical Co. Ltd), which describes a packaging consisting of a receptacle containing a solid food such as for example rice or pasta, underlying a lid which receives inside a frozen condiment which becomes fluid upon heating. The receptacle and the lid are separated by a partition which has a hole. Upon heating, steam is generated by the sauce in the lid and there is an increase in the pressure which pushes the sauce through the hole and into the receptacle.

[0013] This solution, though more satisfactory compared to that described previously, suffers from the drawback of requiring a somewhat complex and therefore relatively costly packaging. Moreover it can happen that, owing to production defects or simply owing to chance, the hole does not allow the easy passage of the fluid condiment, for example in the case wherein the hole becomes clogged at the passage of the condiment. Moreover such packaging is not suitable for use with sauces including granulated ingredients as the latter could clog the hole. This entails a limitation in the range of recipes which are suitable for being used in association with this packaging.

[0014] The document JP 8332040 (Kiyuusai KK) describes packaged frozen noodles wherein a receptacle contains frozen noodles, (separately) packaged crushed ice, a (separately) concentrated and packaged sauce and a (separately) packaged condiment. To prepare this ready-made meal the packagings of ice, sauce and condiment have to be removed from the receptacle and the receptacle with the noodles is then placed in a microwave oven until the noodles are heated.

The receptacle is then removed from the oven, the ice is added to the noodles and mixing is performed to melt the ice. The sauce and condiment are then added and the noodles are cooked.

[0015] Although it may be satisfactory from an organoleptic standpoint, this solution appears, however, somewhat work-intensive in that it involves the consumer performing numerous operations during the entire preparation of the ready-made meal. Moreover, in order to perform these operations, the consumer is forced to interrupt the heating process, with the result that there will be two heating steps. This, as well as being demanding on the consumer who must actively attend to the preparation of the ready-made meal, also entails a slowing-down of the preparation time of the ready-made meal with consequent additional disadvantage for the consumer.

[0016] The need therefore arises to make available a packaged frozen ready-made meal suitable for a simple, easy, rapid, even and, organoleptically satisfactory heating, in a microwave oven, according to a method which does not require any additional expedient, preparation step or tool before or during heating and which thus overcomes all the inconveniences encountered in the prior art.

Summary of the invention

[0017] A similar problem has been solved, according to the invention, by a packaged frozen ready-made meal comprising a flared receptacle made of rigid material permeable to microwaves, containing a first frozen food component, at the bottom, a second frozen food component having a substantially plate-like shape, having a substantially fluid consistency at a temperature above 0°C, and a closure element, **characterised in that** said second frozen food component having a substantially plate-like shape engages in the manner of a plug with the internal wall of said receptacle, spaced apart from said first frozen food component.

[0018] Such flared receptacle is preferably substantially cup-shaped.

[0019] Such flared receptacle is preferably tapered.

[0020] According to a preferred embodiment the flared receptacle has an overturned truncated conical shape and the second frozen food component having a substantially plate-like shape is discoidal in shape.

[0021] The first food component is preferably a cereal-based frozen food chosen from the group consisting of: pasta, rice, spelt, barley, filled pasta, *gnocchi*, vegetables, preferably pasta.

[0022] The second food component is preferably a tomato-, cheese-, oil-, béchamel-based condiment, optionally containing meat or fish, or the like, preferably tomato-based.

[0023] In a preferred embodiment the packaged frozen ready-made meal comprises at the bottom of the abovementioned receptacle a predetermined quantity of ice or frozen aqueous solution, generally 5% or lower based on the total weight of said first and second food components.

[0024] Such aqueous solution can consist of a sodium chloride solution at a concentration of 1-2% in weight over volume.

[0025] The receptacle preferably consists of a rigid plastic material suitable for use in a microwave oven and permeable to microwaves. The closure element comprises a film of plastic material sealed on the edges of the receptacle. Such film is preferably provided with perforations of adequate size for allowing the release of the steam generated during heating, when it exceeds a predetermined pressure, above atmospheric pressure.

[0026] The holes of the closure film generally have a diameter of 0.2-0.4 mm and are found in a number comprised between 50 and 100, preferably arranged in parallel rows.

[0027] A controlled maintenance of a slight excess pressure inside the receptacle, in fact, accelerates the heating of the foods contained therein.

[0028] The closure element may further comprise a lid, also made of a rigid plastic material.

[0029] The abovementioned plastic material is preferably chosen from the group comprising polypropylene (PP), polyethylene (PE) and polyethylene terephthalate (PET).

[0030] The closure element is preferably made of the same material as the receptacle. The abovementioned closure film preferably consists of coupled PP/PET, the side of the film facing the exterior of the packaged frozen ready-made meal consisting of PET.

[0031] The closure film can also consist of a PE-based multilayer film, containing a layer having oxygen barrier properties. The material which makes up the gas barrier layer can be chosen from the group comprising polymers and copolymers of ethylene vinyl alcohol (EVOH), nylon, polyvinylidene chloride (PVDC), poly or copolyamides and their combinations, oxides of metals/silicon. The abovementioned material is preferably a polymer or copolymer of ethylene vinyl alcohol or nylon.

[0032] In the case of use of a film and of a receptacle with gas barrier properties, the holes in the closure film are closed by a barrier label or barrier lacquer and they open up during heating thanks to the temperature and the pressure, allowing the release of steam.

[0033] In a particularly preferred embodiment the packaged frozen ready-made meal according to the present invention further comprises a rigid cardboard container intended to receive and contain the abovementioned flared receptacle

with such clearance as to create an interspace between the container and the receptacle, at the respective lateral walls and optionally also at the respective bottoms. In such way, it is easier for the consumer to handle the packaged ready-made meal, once it has been taken out of the microwave oven, because the abovementioned interspace prevents the external cardboard container from heating up excessively and averts any risk of scalding the consumer.

[0034] Additional protection against accidental scalding is obtained when the aforementioned closure element comprises, in addition to the closure film, also a lid of rigid plastic material, above all when such lid is placed above the closure film spaced apart therefrom, so as to create an interspace.

[0035] According to a particularly advantageous embodiment of the packaged frozen ready-made meal according to the present invention, the abovementioned lid exhibits on its outer upper surface a recess of circular shape suitable for receiving, once it has been removed, by press fit engagement, the bottom of the external cardboard container of the packaged frozen ready-made meal, thus constituting a convenient support stand for such container.

[0036] The packaged frozen ready-made meal according to the invention preferably comprises a quantity of the two food components suitable for forming a single-portion ready-made meal.

[0037] The present invention moreover refers to a method for the production of the packaged ready-made meal of the invention which comprises the steps of:

a) introducing in a flared receptacle as described above an appropriate quantity of a first food component, optionally frozen;

b) introducing a second frozen food component as described above in the flared receptacle containing the first food component in such a way that the second food component is engaged with the internal wall of the receptacle in the manner of a plug and spaced apart from the first component below;

c) closing said flared receptacle (2) by means of said closure element (3);

d) freezing the lot.

[0038] Preferably such flared receptacle is substantially cup-shaped.

[0039] According to a preferred embodiment, the flared receptacle has an overturned truncated conical shape and the second frozen food component having a substantially plate-like shape is discoidal.

[0040] The first food component is preferably a cereal-based food chosen from the group consisting of: pasta, rice, spelt, barley, filled pasta, *gnocchi*, vegetables, preferably pasta, and may be ready-frozen.

[0041] The second food component is preferably a tomato-, cheese-, oil-, bechamel-based condiment, optionally containing meat or fish, or the like, preferably tomato-based.

[0042] In a preferred embodiment, the method comprises an additional step of introduction of a predetermined quantity of water or of an aqueous solution inside said flared receptacle before performing the abovementioned step a).

[0043] The quantity of water or of aqueous solution is preferably 5% or lower based on the total weight of said first and second food components.

[0044] Such aqueous solution preferably consists of a sodium chloride solution at a concentration of 1-2% in weight over volume.

[0045] The method preferably uses a receptacle consisting of a rigid plastic material suitable for use in a microwave oven and permeable to microwaves.

[0046] The quantity of the two food components is preferably suitable for forming a single-portion ready-made meal.

Brief description of the drawings

[0047]

Figure 1 is a perspective view of an embodiment of the packaged ready-made meal according to the present invention, with a cut-away section to show the interior of the package.

Figure 2 is an exploded view of the structural parts of an embodiment of the packaged ready-made meal according to the invention, before the introduction of the food components.

Figure 3 is a front view of an embodiment of the packaged ready-made meal according to the present invention.

Figure 4 is a partially cut-away perspective view of an embodiment of the packaged ready-made meal of the present invention at the time of its use by a consumer.

Figure 5 is a photograph from above which shows the packaged ready-made meal according to example 1 of the present application, at the end of heating for the purposes of its consumption.

Figure 6 is a photograph from above which shows the packaged ready-made meal according to example 2 of the present application, at the end of heating for the purposes of its consumption.

Detailed description of the invention

[0048] With reference to the drawings, reference numeral 1 identifies the overall packaged ready-made meal according to an embodiment.

[0049] The receptacle 2 is of the type suitable for being used in a microwave oven and is provided with a closure element 3, consisting of a closure film 31 provided with perforations 32 and a lid 33, preferably of the same material as the receptacle.

[0050] The materials used for making the receptacle 2 and the closure element 3 are all specifically permeable to microwaves and suitable for being exposed to the microwaves without spoiling the organoleptic qualities of the food products with which they come into contact. More particularly they are preferably made with plastic materials suitable for use in a microwave oven, for example polypropylene.

[0051] The receptacle is rigid and flared and may be substantially cup-shaped. According to a preferred embodiment, shown in the drawings, the receptacle 2 has an overturned truncated conical shape and rests on its base 4, which corresponds to the smaller base of the truncated conical frustum. In this embodiment the receptacle is tapered along the entire lateral wall 5.

[0052] On the bottom of the receptacle, resting on the base 4 of the receptacle 2, is housed the first food component 6, which, according to a preferred embodiment, consists of a portion of pasta. Such pasta is partially cooked and unseasoned and may have been frozen in a loose state. The second food component 7, which, according to a preferred embodiment consists of a frozen tomato-based sauce, has a plate-like shape. In a preferred embodiment and as can be seen more clearly in Figure 2, such second component has a disc shape. The dimension of the diameter of such disc is such that, as can be seen in Figure 1, the disc is engaged with the flaring of the receptacle and thus remains spaced apart from the first food component 6 below. Obviously the second food component having a plate-like shape can also have other shapes, provided they are suitable for enabling a spacing apart from the first food component contained in the receptacle; for example, if a receptacle having an oval cross section is used, the second food component having a plate-like shape will also conveniently be oval-shaped.

[0053] It is by virtue of the generally flared, or tapered, shape of the receptacle in fact that the first and the second food components are spaced apart with respect to each other.

[0054] During thawing and heating of the packaged ready-made meal 1 in a microwave oven, both food components 6 and 7 heat up. In particular the first component 6, below, heats up rapidly and evenly by virtue of its relatively large surface of exposure to the microwaves. The second component 7, engaged with the internal lateral surface in the manner of a plug, passes from the solid state to the fluid state as it heats up, thus losing its engagement with such surface and sliding by gravity towards the base of the receptacle, and consequently onto the first component.

[0055] In this way, for most of the heating time, the first 6 and the second 7 food components have all their respective external surfaces exposed to the microwaves. Thanks to this expedient, the heating time is optimised and the heating is therefore even and satisfactory.

[0056] In turn, the reduction in the heating time and the evenness in heating result in a better preservation of the consistency of the end product ready for consumption compared to the prior art, as no part of the food components is subjected to excessive and inadequate heat treatment and, at the same time, it does not occur that there are cold areas left when other areas have already been excessively heated.

[0057] The heating will not spoil, therefore, the original organoleptic properties of the components which will be optimal and thus, for example, the pasta will be "al dente" and the rice will have the desired texture.

[0058] The two food components will then come into contact at a fairly advanced stage of the heating, when the second component is thawed and in the fluid state.

[0059] It has been found in fact that, in order to preserve the optimal properties of consistency and flavour, it is preferable for the first food component, for example the pasta, not to be placed in contact with the second component, for example a tomato-based sauce, during the entire time of production and of subsequent thawing and heating of the frozen packaged ready-made meal. The two components can be characterised, in fact, by different water contents and their prolonged contact during the steps of production and, subsequently, the step of thawing and heating would cause migration of the moisture from the higher moisture component to the lower moisture component, altering the textures of both components and jeopardising their organoleptic characteristics.

[0060] For this reason, in the present invention, the food components do not come into contact one with the other throughout the entire production and storage time of the packaged ready-made meal and for most of its heating time.

[0061] As shown in Figure 1, according to a preferred embodiment of the invention, the second food component 7 is held in engagement with the internal wall of the receptacle thanks to the conicity of the same. Naturally, a person skilled in the art will easily understand that other expedients can be used in order to obtain effective engaging with the internal wall for the purpose of the invention.

[0062] For example, a sharp variation in the section can be made, at a point of the vertical axis, such that the variation in section forms a horizontal support, at the borders, for the second plate-like food component.

[0063] Effective engaging with the internal wall of the receptacle can be obtained also, for example, with the creation of protrusions on the same.

[0064] According to a preferred embodiment of the present invention, the receptacle contains, additionally, on the bottom, a layer of ice or of frozen aqueous solution.

[0065] In fact, although exposure of the frozen cooked pasta to the microwaves may constitute an ideal treatment for thawing and heating of the packaged ready-made meal of the invention, it has been found that an even more homogeneous and therefore even more satisfactory cooking is achieved by providing a source of steam inside the receptacle.

[0066] The frozen aqueous solution, or ice, in fact, during heating, generates water vapour which pervades the receptacle, transporting heat and moisture through the first and the second food component. Thus, cooking is achieved in a steam atmosphere which is considerably more effective and faster in bringing the food components 6 and 7 to the desired temperature. Moreover this cooking method allows a more even result to be obtained in shorter times, and helps prevent the formation of excessively dry areas, typical, at times, of microwave cooking. The generation of steam from the ice or from the frozen solution which is found on the bottom of the receptacle compensates the evaporation of water from the food components contained in the receptacle and reduces general drying of the latter.

[0067] According to a particular embodiment of the present invention and with reference to Figs. 2-4, the packaged ready-made meal comprises a rigid receptacle 2, for example in polypropylene, having an overturned truncated conical shape with a bottom 4 and an opposite opening, bordered by an edge 8. The edge 8 of the opening is folded outwards in a U shape so as to form a perimetrical flanging 9 and an underlying perimetrical grooving 10. Near the free rim of the folded edge 8 and along the entire circumference there is a series of protrusions 81 facing inwards.

[0068] The packaged ready-made meal also comprises a container 11, for example of cardboard, having an overturned truncated conical shape, having a bottom 12 and an opposite opening bordered by an edge 13; the container 11 receives in its interior the receptacle 2, which remains suitably centred and positioned thanks to the engaging of the edge 13 of the container 11 to the perimetrical grooving 10 of the receptacle 2 and thanks to the protrusions 81 of the folded edge 8 of the receptacle 2.

[0069] The receptacle 2 must in fact be introduced in the container 11 by exerting a slight pressure in such a way that the protrusions 81 pass beyond the edge 13 of the container 11 and then engage it, thus preventing separation of the container 11 from the receptacle unless a certain force is applied.

[0070] The closure element 3 of the packaged ready-made meal according to the present embodiment comprises a film 31, for example of coupled PP/PET, provided with perforations 32, sealed on the flanging 9 of the edge 8 of the receptacle. It also comprises a lid 33, made for example of the same material as the receptacle 2 and having on its upper surface a circular recess 34, having a diameter substantially corresponding - in practice slightly greater - to the diameter of the bottom 12 of the container 11. The lid 33 is placed on the opening of the receptacle 2 with a light pressure, so as to engage the folded edge 8 of such receptacle. Engaging is ensured thanks to a series of protrusions 35 arranged on the internal surface of the edge 36 of the lid 33, near its free rim, which, once pressed beyond the folded edge 8 of the receptacle 2, engage it and retain it firmly in position.

[0071] As can be seen clearly in Figure 4, the lid 3, thanks to the presence of the circular recess 34, once removed from the packaged ready-made meal ready for use, can receive, by press fit engagement, the bottom 12 of the container 11, so as to form a support stand for such container.

[0072] Thanks to all the features disclosed hitherto, the packaged ready-made meal according to the invention has the advantage of allowing a convenient and easy preparation of the ready-made meal. In fact, for its preparation for consumption by the end consumer, it is not necessary to use any kitchen tool or piece of crockery, just as it is not necessary to perform any step of decanting, transferring or mixing, before or during its heating in the oven.

[0073] The end consumer in fact is only required to introduce the packaged ready-made meal as it is in the microwave oven, at a power setting between for example 750 and 1800 W, for a time comprised between 2 and 6 minutes.

[0074] At the end of the set heating time the consumer may open the packaged ready-made meal and consume the ready-made meal directly, for example, with a fork, straight from the receptacle, after optionally mixing, if desired.

[0075] It has been found experimentally that when using a packaged ready made meal similar in all aspects to that according to the present invention except for the fact of not contemplating the separation of the two food components (for example pasta and sauce) contained in the receptacle (for example mixed and frozen pasta and sauce), the time necessary for thawing and heating to the temperature of consumption is considerably greater, typically by 20-25%.

[0076] Since the food components do not come into contact with one another until shortly before the end of the heating time, and for the reasons disclosed above, it is not in fact necessary to mix the components during heating. As a result

the heating times are considerably reduced as there are no interruptions while the convenience for the consumer is considerably increased.

[0077] Compared to the solutions of the prior art which use separate packagings for each of the two food components (for example pasta and sauce), the consumer will benefit from the fact of not having to pour one component into the other, or interrupt the heating process to mix the food components. He or she will not therefore risk staining clothes or soiling the oven or work surfaces with splashes in any of these steps.

[0078] Another advantageous feature of the present invention is given by the fact that, by virtue of the special positioning of the second component in relation to the first, it is possible to detect any interruption of the cold chain which the packaged ready-made meal may have undergone during its storage and transport. In fact, if it were to be detected, at the time of purchase or of final preparation, that the second component is resting on the first component, this would be clear indication of the fact that the second component has undergone unexpected thawing.

[0079] From the point of view of costs, finally, the present invention entails advantages. The receptacle of the present invention, in fact, has a simple shape and, for the purposes of the invention, there is no need for any grooving, ribbing, partitioning or other similar means, as instead adopted in many cases by the prior art. Therefore the receptacle and the external container of the packaging according to the present invention are economical to produce and easily stackable and therefore convenient for industrial use.

[0080] The present invention will now be described in further detail with reference to a non-limiting illustrative example.

EXAMPLE 1

[0081] A rigid receptacle 2 in polypropylene was set up having an overturned truncated conical shape and a bottom 75 mm in diameter, an opening 105 mm in diameter, and 95 mm in height. The edge 8 of the opening is folded outwards in a U shape so as to create a perimetrical flanging 9 and an underlying perimetrical grooving 10. The maximum diameter at the flanging 9 is of about 115 mm.

[0082] 5ml of water and 130 g of partially cooked and unseasoned pasta, i.e. equivalent to a standard individual portion, were placed on the bottom of the receptacle.

[0083] Aside, a tomato-based sauce was prepared, comprising the following ingredients, in weight percentages based on the total weight of the sauce:

Tomato pulp	83	
Double concentrated tomato paste	6	
Onion	3.5	
Extra-virgin olive oil	3.5	
Salt	1.25	
Garlic	1.33	
Chilli pepper	0.12	
Parsley	1.3	

[0084] Such sauce was then frozen in disc shapes 95 mm in diameter and about 10 mm thick, and 120g in weight.

[0085] Such a disc was then placed inside the receptacle containing the pasta.

[0086] Thanks to the tapering of the receptacle and the dimensions of the sauce disc, the disc remained engaged with the wall of the surface of the receptacle in the manner of a plug, spaced apart from the pasta. The distance between the sauce and pasta was of about 10 mm.

[0087] The receptacle 2 was then closed with a film 31, of coupled PP/PET, provided with perforations 32, sealed on the flanging 9 of the edge 8 of the receptacle. The holes 32 were arranged, in a total number of 83, in three parallel rows spaced apart by 18 mm, one of which passing through the diameter of the opening of the receptacle 2. Each hole had a diameter of 0.3 mm and was spaced apart from the adjacent hole/holes by 3.7 mm. This configuration has been shown to allow the maintenance of a slight excess pressure inside the receptacle without the risk of creating tensions in the film such as to cause its detachment.

[0088] The receptacle 2 was then placed inside a cardboard container 11 having an overturned truncated conical shape, whose bottom 12 has a diameter of about 83 mm and whose opening has a diameter of about 115 mm. The container 11 is about 100 mm in height and can receive in its interior the receptacle 2, which remains suitably centred and positioned thanks to the engaging of the edge 13 of the container 11 to the perimetrical grooving 10 of the receptacle 2 and thanks to the protrudings 81 found inside the edge 8 of the receptacle 2.

[0089] A lid 33 made of the same material as the receptacle 2, having a diameter of 120 mm and exhibiting on its upper surface a circular recess 34, having a diameter of about 85 mm, is finally placed on the opening of the receptacle

2 with a light pressure in such a way as to engage the folded edge 8 of such receptacle. Engaging is ensured thanks to a series of protrudings 35 arranged on the internal surface of the edge 36 of the lid 33, near its clear rim, which, once pressed beyond the folded edge 8 of the receptacle 2, engage it and retain it firmly in position.

[0090] The packaged frozen ready-made meal completed in this way is then frozen and stored in the freezer at a temperature of -18°C or lower.

EXAMPLE 2 (COMPARATIVE)

[0091] The same receptacle 2, the same container 11 and the same lid 33 used in the preparation of the packaged frozen ready-made meal according to example 1 were used.

[0092] Also in this case, 5ml of water and then 130g of partially cooked pasta and 120g of the tomato-based sauce of example 1 were placed in the receptacle on the bottom of the receptacle 2.

[0093] The receptacle 2 was then closed with the same film of coupled PET/PP as per example 1, having the same perforations.

[0094] The packaged frozen ready-made meal was completed by the same procedures as per example 1, using the same container 11 and the same lid 33, and was then frozen and finally stored in the freezer at a temperature of -18°C or lower.

EXAMPLE 3

[0095] The packaged ready-made meals according to Examples 1 and 2 were prepared with a microwave oven to assess their organoleptic properties.

[0096] The two packaged ready-made meals were placed in a microwave oven, still sealed with the lid, and a power of 900 W was applied. The time of treatment in the microwave oven was 4 minutes for the packaged ready-made meal according to example 1 and 5 minutes for the packaged ready-made meal according to example 2.

[0097] At the end of the set time the packaged ready-made meals were opened and their content was inspected.

[0098] As can be seen in Figure 5, referring to a packaged ready-made meal according to example 1 and therefore according to the present invention, the pasta contained in the cup is completely covered with the tomato-based sauce.

[0099] In Figure 6, referring to the comparative example 2, it can be seen that some pieces of pasta emerge from the sauce and exhibit clear signs of burning (above all those which are found near the wall of the receptacle).

[0100] The average temperature of the product contained in each of the two packaged ready-made meals was also measured and it was found that in both cases such average temperature was around 65°C.

[0101] The pasta contained in the packaged ready-made meal as per example 1 has, in an even manner, the moisture content and the consistency typical of freshly cooked conventional pasta whereas the pasta contained in the packaged ready-made meal according to example 2 is uneven as regards moisture content and consistency, with single pieces of pasta being particularly dehydrated and occasionally burnt in the uppermost layers and above all near the wall of the receptacle.

[0102] Without wishing to be bound by theory, it is believed that the frozen disc of sauce protects the underlying pasta from excessive dehydration, preventing the release from the container of the water vapour generated during heating.

The steam retained below the sauce also contributes to the even and rapid heating of the pasta.

[0103] Obviously a person skilled in the art, for the purpose of satisfying contingent and specific needs, may make numerous modifications and variations to the invention described above, all moreover contained within the scope of protection of the invention as defined by the following claims.

Claims

1. Packaged frozen ready-made meal (1) comprising a flared receptacle (2) made of a rigid material permeable to microwaves, containing a first frozen food component (6) at the bottom, a second frozen food component (7) having a substantially plate-like shape, having a substantially fluid consistency at a temperature above 0°C, and a closure element (3), **characterised in that** said second frozen food component (7) having a substantially plate-like shape is engaged in the manner of a plug with the internal wall (5) of said receptacle, spaced apart from said first frozen food component (6).

2. Packaged frozen ready-made meal (1) according to claim 1 wherein said flared receptacle (2) is substantially cup-shaped and tapered.

3. Packaged frozen ready-made meal (1) according to any one of the previous claims wherein said flared receptacle

(2) has substantially an overturned truncated conical shape and the second frozen food component (7) having a substantially plate-like shape is discoidal.

4. Packaged frozen ready-made meal (1) according to any one of the previous claims wherein said first food component (6) is a cereal-based frozen food chosen from the group consisting of: pasta, rice, spelt, barley, filled pasta, *gnocchi*, vegetables, preferably pasta.

5. Packaged frozen ready-made meal (1) according to any one of the previous claims wherein said second food component (7) is a tomato-, cheese-, oil-, béchamel-based condiment, optionally containing meat or fish, or the like, preferably tomato-based.

6. Packaged frozen ready-made meal (1) according to any one of the previous claims wherein said packaged frozen ready-made meal comprises at the bottom of said receptacle (2) a predetermined quantity of ice or of frozen aqueous solution.

7. Packaged frozen ready-made meal (1) according to any one of the previous claims wherein said receptacle (2) is made of a rigid plastic material suitable for use in a microwave oven and permeable to microwaves.

8. Packaged frozen ready-made meal (1) according to any one of the previous claims wherein said closure element (3) comprises a film (31) of plastic material sealed on the edges of the receptacle (2), preferably provided with perforations (32).

9. Packaged frozen ready-made meal according to claim 8, wherein said closure element (3) further comprises a lid (33) of rigid plastic material, preferably of the same rigid plastic material in which said receptacle (2) is made,

10. Packaged frozen ready-made meal according to any one of the previous claims, further comprising a rigid container (11), preferably of cardboard, intended to receive and contain said flared receptacle (2) with a clearance such as to create an interspace between container (11) and receptacle (2), at least at the respective lateral walls.

11. Packaged frozen ready-made meal according to claim 10, wherein said flared receptacle (2) has a bottom (4) and an opposite opening, bordered by an edge (8) folded outwards in a U-shape in such a way as to form perimetrical flanging (9) and an underlying perimetrical grooving (10).

12. Packaged frozen ready-made meal according to claim 11, wherein, near the free rim of said folded edge (8) and along the entire circumference of said edge there is a series of protrusions (81) facing inwards.

13. Packaged frozen ready-made meal according to claim 12, wherein said container (11), having a bottom (12) and an opposite opening bordered by an edge (13), receives in its interior said receptacle (2), which remains firmly positioned and suitably centred thanks to the engaging of the edge (13) of said container (11) to the perimetrical grooving (10) of the receptacle (2) and thanks to the protrusions (81) of the folded edge 8 of the receptacle (2).

14. Packaged frozen ready-made meal according to claim 10, wherein said lid (33) exhibits on its external upper surface a recess (34) circular in shape suitable for receiving, by press-fit engagement, the bottom (12) of said container (11), thus forming a support stand for such container (11).

15. Packaged frozen ready-made meal according to any one of claims 9 to 14, wherein said lid (33) exhibits a series of protrusions (35) arranged on the internal surface of its edge (36), near its free rim, which are suitable, once pressed beyond the folded edge (8) of the receptacle (2), for engaging it and retaining it firmly in position.

16. Method for the production of the packaged frozen ready-made meal (1) according to any one of claims 1 to 11, comprising the steps of:

a) introducing in said flared receptacle (2) an appropriate quantity of said first food component (6), optionally frozen;

b) introducing said second frozen food component (7) having a substantially plate-like shape in said flared receptacle (2) containing said first food component (6) in such a way that the second food component (7) is engaged with the internal wall (5) of said receptacle in the manner of a plug and spaced apart from said first component (6) below;

- c) closing said flared receptacle (2) by means of said closure element (3);
- d) freezing the lot.

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17. Method according to claim 12 which comprises an additional step of introduction of a predetermined quantity of water or of aqueous solution inside said flared receptacle (2) before performing said step a).

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18. Method according to claim 13 wherein said quantity of water or of aqueous solution is 5% or lower based on the total weight of said first and second food components (6,7).

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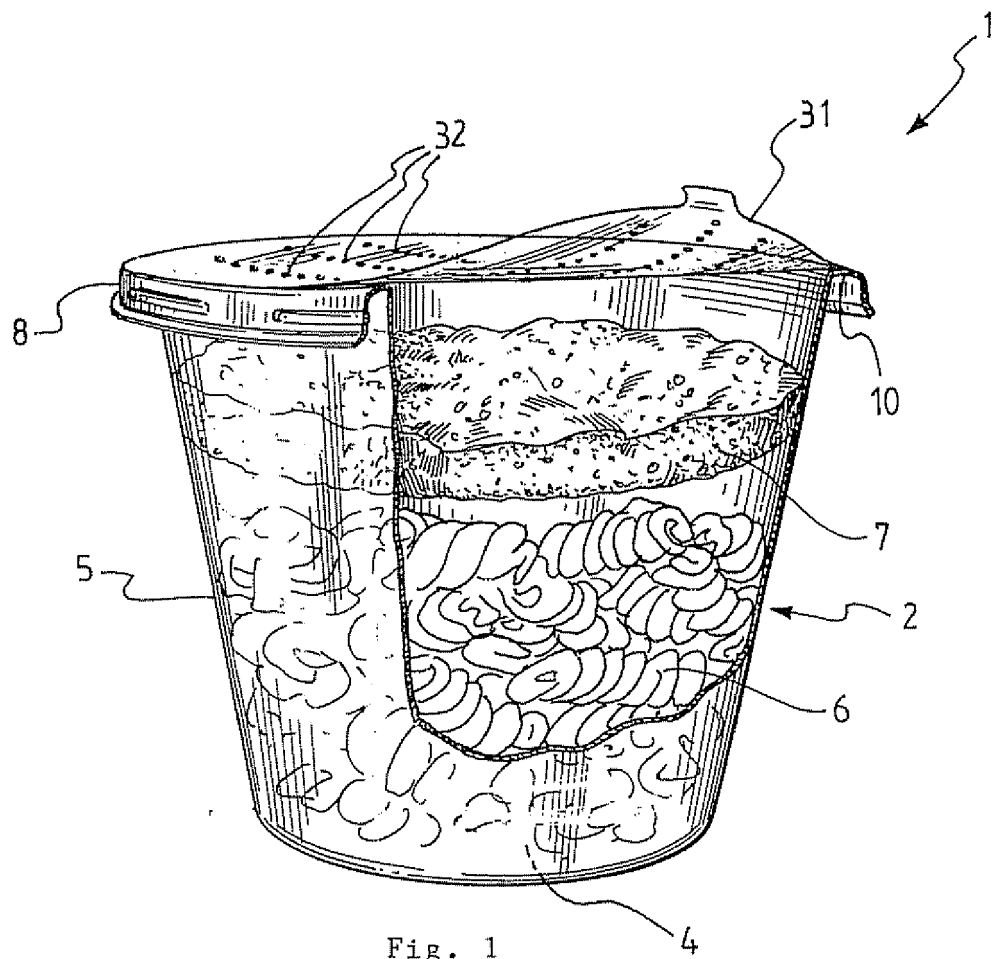


Fig. 1

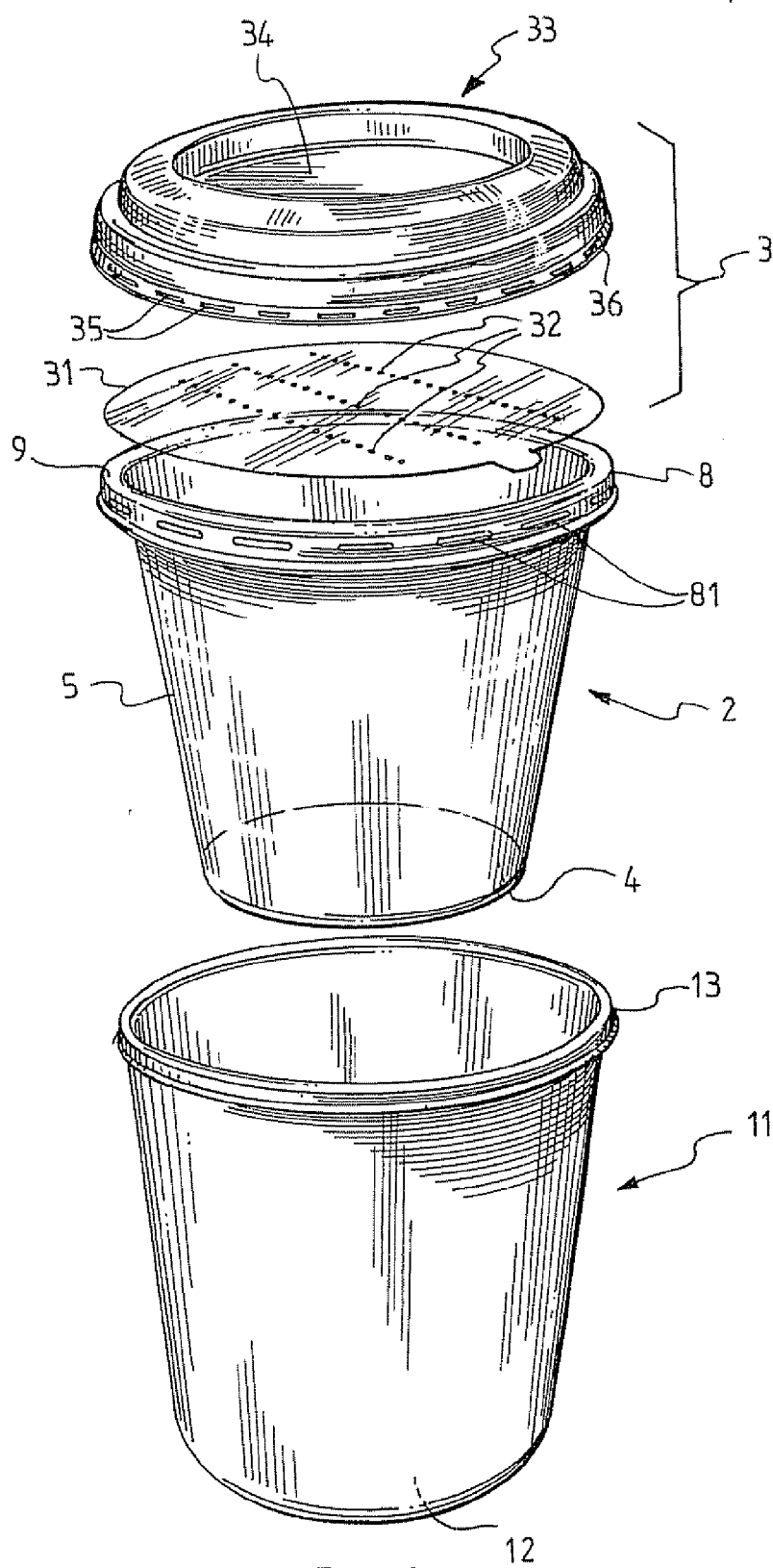
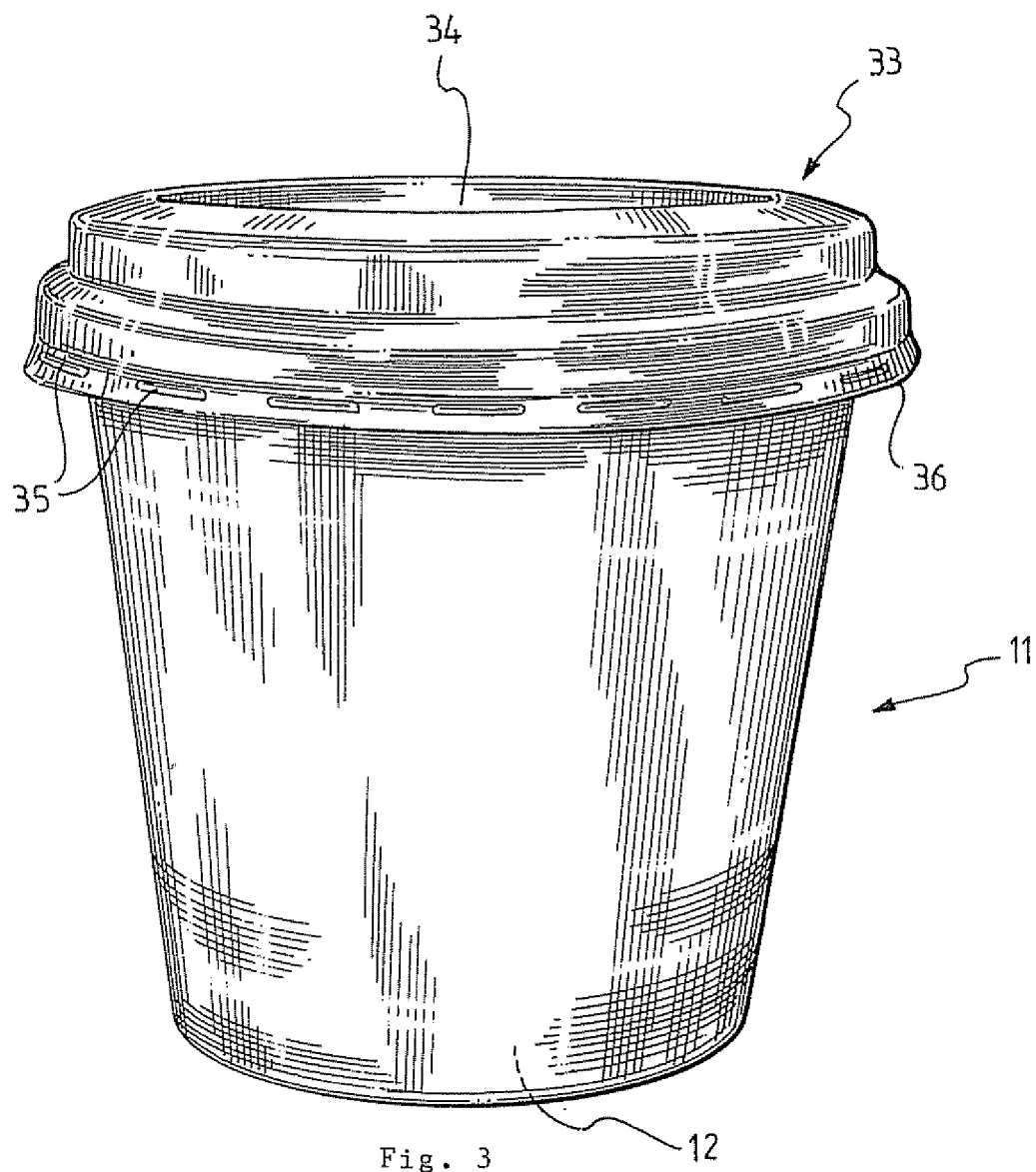


Fig. 2



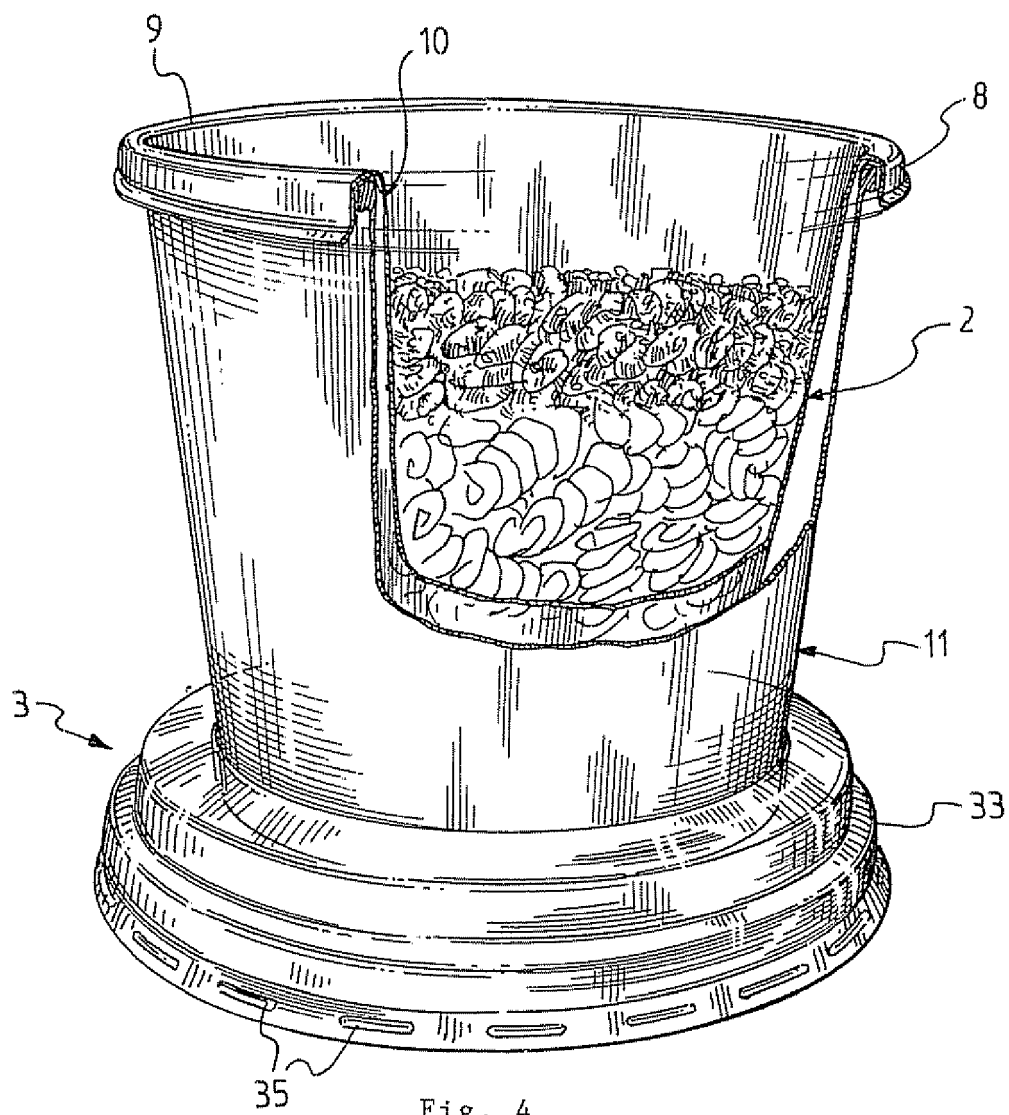


Fig. 4

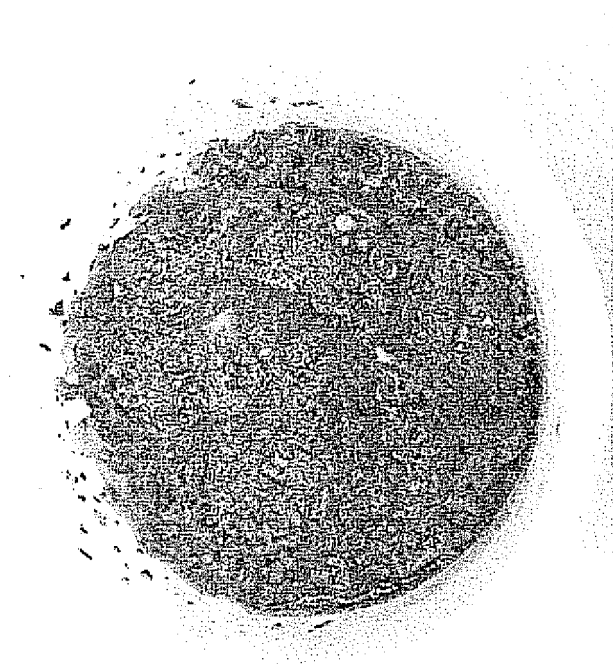


Fig. 5



Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 09 42 5293

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2004/108313 A1 (CUTLER BRENT L [US] ET AL) 10 June 2004 (2004-06-10)	1-9	INV. B65D81/34
Y	* paragraph [0036] - paragraph [0044]; claims 1,9-11,14,17; figures 1-11 *	10,11,13	
Y	DE 100 35 059 A1 (YANG CHUN TSE [TW]) 31 January 2002 (2002-01-31) * paragraph [0011] - paragraph [0012]; claims 1,2; figures 1-4 *	10,11,13	
A	WO 96/07604 A (DEELEY STEPHANIE TAMSIN [AU]; ABOUAV DAVID M [AU]) 14 March 1996 (1996-03-14) * page 4, line 9 - page 5, line 35; claims 3,7,9; figures 1-20 *	1-3,7	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 November 2009	Examiner Janosch, Joachim
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 09 42 5293

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11-11-2009

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