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DESCRIPTION

Field of the invention

[0001] The present invention belongs to the pre-cooked pizza distribution container industry, i.e. plastic containers whose shape corresponds to a high radius-to-height ratio and which are specially intended for the storage, transport and handling of pre-cooked pizzas by consumers.

Background of the invention

[0002] One of the most common pre-cooked products is pizza. It is distributed in plastic containers comprising a plastic tray having a circular base, a perimeter rim that prolongs the base upwards and a flange that prolongs the upper edge of the perimeter rim outwards and horizontally for joining to the lid, which is made of plastic film.

[0003] Examples of this type of container are those disclosed in ES 1 037 161 U, which describes a basic container design; EP 2189389 A1, which describes a practically flat base; US6257434 B1, which describes the arrangement of radial protuberances on the base; JPH09169377, which describes a combination of radial and circumferential motifs; ES 2 286 940, which describes a base having circular protuberances; and CA2122520, which comprises circular grooves.

[0004] One of the features sought in this type of container is the low degree of adherence between the pre-cooked pizza and the base of the container and, additionally, maximum resistance to flexion and torsion in any direction (d) (see Figure 3), which allows for easy and convenient handling of the container. With respect to these features, the available solutions can be improved upon, particularly for pizzas with heavy toppings and having a high degree of moisture, which are therefore heavier and become adhered more easily.

Description of the invention

[0005] In order to overcome the shortfalls of the state of the art, the present invention proposes a container for pizzas comprising a plastic tray having a circular base, wherein the base is provided with a continuous circular step, such as to define an external crown part disposed at a different height than a central disc part, both parts having spherical cap-shaped reliefs.

[0006] The inventors were able to verify that the combination of the step and the cavities simultaneously provides anti-adhesion and multi-directional (d) flexion resistance capabilities, superior to those of the containers of the state of the art. Specifically, the topographic

variations of differing frequency on the base, understood as spatial frequency, have a very high reducing effect on pizza adherence.

[0007] In the context of the present invention, "step" shall be understood to be a transition providing two clearly distinguishable areas as regards the average level with respect to a general plane of the container.

[0008] According to different optional characteristics of the container:

- The reliefs may be convex or concave, seen from the interior of the container, although concave reliefs are preferred, as this increases the roughness on the exterior of the container and the tray is less likely to slide on holding it by the lower part thereof.
- The step has a height comprised between 0.8 and 1.2 mm and, more preferably, 1 mm.
- The base comprises a circular bulging on the part corresponding to the central disc, which may be convex or concave.

[0009] This bulging contributes to increasing the container's anti-adhesion and flexion/torsion resistance capabilities.

- The convex circular bulging defines a crown having a width of 1 cm.
- According to one variant, the step is ascendant in a centrifugal radial direction, such that the crown is disposed at a greater height than the central disc part.
- According to another variant, the step is descendant in a centrifugal radial direction, such that the crown is disposed at a lower height than the central disc part.
- The container comprises a perimeter rim that prolongs the base upwards, wherein the transition between the base and the perimeter rim has a circular cross-section having a radius comprised between 0,75 and 0,85 cm. This small radius further increases resistance to the local deformation of the container, added to the other rigidity characteristics of the container of the present invention. A right-angle transition would provide even greater rigidity; however, an edge smooth to the touch is also desirable and, furthermore, right angles could cause problems when moulding the container.
- The perimeter rim has an undulating cross-section according to a cutting plane parallel to the general plane of the container, such that undulations are defined along the rim, which allow for easier handling.
- The container comprises a lid consisting of a plastic film and a flange that prolongs the upper edge of the perimeter rim outwards and horizontally for joining to the lid.
- The spherical cap-shaped reliefs are distributed into concentric crowns, wherein the diameter of the reliefs varies among some crowns.
- The constituent material of the tray is a transparent plastic with pigments.
- The green pigments.

[0010] Lastly, the radius-to-height ratio of the container is comprised between 5 and 7.

Brief description of the drawings

[0011] As a complement to the description, and for the purpose of helping to make the characteristics of the invention more readily understandable, in accordance with various practical embodiments thereof, said description is accompanied by a set of figures constituting an integral part thereof, which by way of illustration and not limitation represent the following:

Figure 1 shows a schematic cross-sectional view of the base of the container according to a first variant.

Figure 2 shows a schematic cross-sectional view of the base of the container according to a second variant.

Figure 3 shows a plan view of the container of the invention.

Figure 4 shows a schematic cross-sectional view of the base of the container according to another variant.

Figure 5 shows a particularly preferred embodiment of the container of the invention.

Figure 6 shows a plan view of the embodiment illustrated in figure 5.

Figure 7 shows another embodiment with a different distribution of cavities and bulgings.

Description of an embodiment of the invention

[0012] As can be observed in the figures, the invention relates to a container 1 for pizzas P, i.e. wherein the radius-to-height ratio of said container 1 is comprised between 5 and 7, which comprises a plastic tray 2 having a circular base 21.

[0013] Said characteristics being known, according to a particularly preferred embodiment of the invention, the base 21 of the container of this invention is provided with a continuous circular step 23 such as to define an external crown part 24 disposed at a different height than a central disc part 25, both parts being provided with spherical cap-shaped reliefs 26. Most preferably, these reliefs are concave, such that, on the one hand they contribute to preventing the adherence of the product to the base and, on the other, increase the roughness on the outer lower part of the container. Said parts could also be envisaged to be convex, as illustrated in figure 4.

[0014] This step has a height comprised between 0.8 and 1.2 mm and, more preferably, has a

height of 1 mm.

[0015] As can be observed in the figures, the base comprises a circular bulging 27 in the central disc part 25 that defines a crown having a width between 0.8 and 1 cm and a depth or height between 0.8 to 1.2 mm. This bulging may be convex, as represented in figures 1 and 2, although it could also be concave, as illustrated in figure 4.

[0016] As illustrated in figure 1, the step 23 may be ascendant in a centrifugal radial direction, such that the crown 24 is disposed at a greater height than the central disc part 25 or, as illustrated in figure 2, the step 23 is descendant in the centrifugal radial direction, such that the crown 24 is disposed at a lower height than the central disc part 25. However, the embodiment illustrated in figure 5 is particularly preferred, wherein the step is ascendant in a centrifugal radial direction, wherein the reliefs are cavities and wherein the circular bulging is convex. This same embodiment is reproduced in a plan view in figure 6.

[0017] Figure 7 shows another embodiment with a different distribution of cavities and bulgings.

[0018] As is known, the container comprises a perimeter rim 22 that prolongs the base 21 upwards, wherein the transition between the base 21 and the perimeter rim 22 has a circular cross-section. However, for the container of the present invention, a radius r comprised between 0,75 and 0,85 cms preferred, and more particularly a radius of 0,8 cm has given very good results. The selection of this radius has shown very efficient for make the unmoulding easier in the process fo manufacture.

[0019] As is known per se and as can be observed in figures 4 and 5, the perimeter rim 22 has an undulated cross-section according to a cutting plane parallel to the general plane of the container, such that undulations 28 are defined along the rim, which allow for easier handling.

[0020] As is also known per se, the container comprises a lid 3 consisting of a plastic film and a flange 29 that prolongs the upper edge of the perimeter rim 22 outwards and horizontally for joining to the lid 3.

[0021] The spherical cap-shaped cavities 26 are distributed into concentric crowns, wherein the diameter of the cavities 26 varies among some crowns.

[0022] In a particularly preferred manner, the constituent material of the tray 2 is a transparent plastic with green pigments. This pigmentation, combined with the high degree of rigidity conferred by the characteristics of the present invention, gives it an appearance similar to that of glass, thereby contributing to the perception of a high-quality product.

[0023] The inventors were able to verify, both in the tests conducted with simulations by means of finite elements and test benches, that deformations are reduced by 50 % with respect to a container that does not comprise a step and that the container of the invention is

therefore clearly superior from this viewpoint with respect to the containers of the state of the art and those currently on the market.

[0024] The invention is not limited to the specific embodiments described, but rather also encompasses, for example, the variants that may be embodied by an average person skilled in the art (for example, with regard to choice of materials, dimensions, components, design, etc.), as inferred by the claims. In particular, the present claims would also encompass the presence of more than one step or more than one bulging, which could contribute even further to resistance to flexion and the anti-adhesion capability of the bottom of the container.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

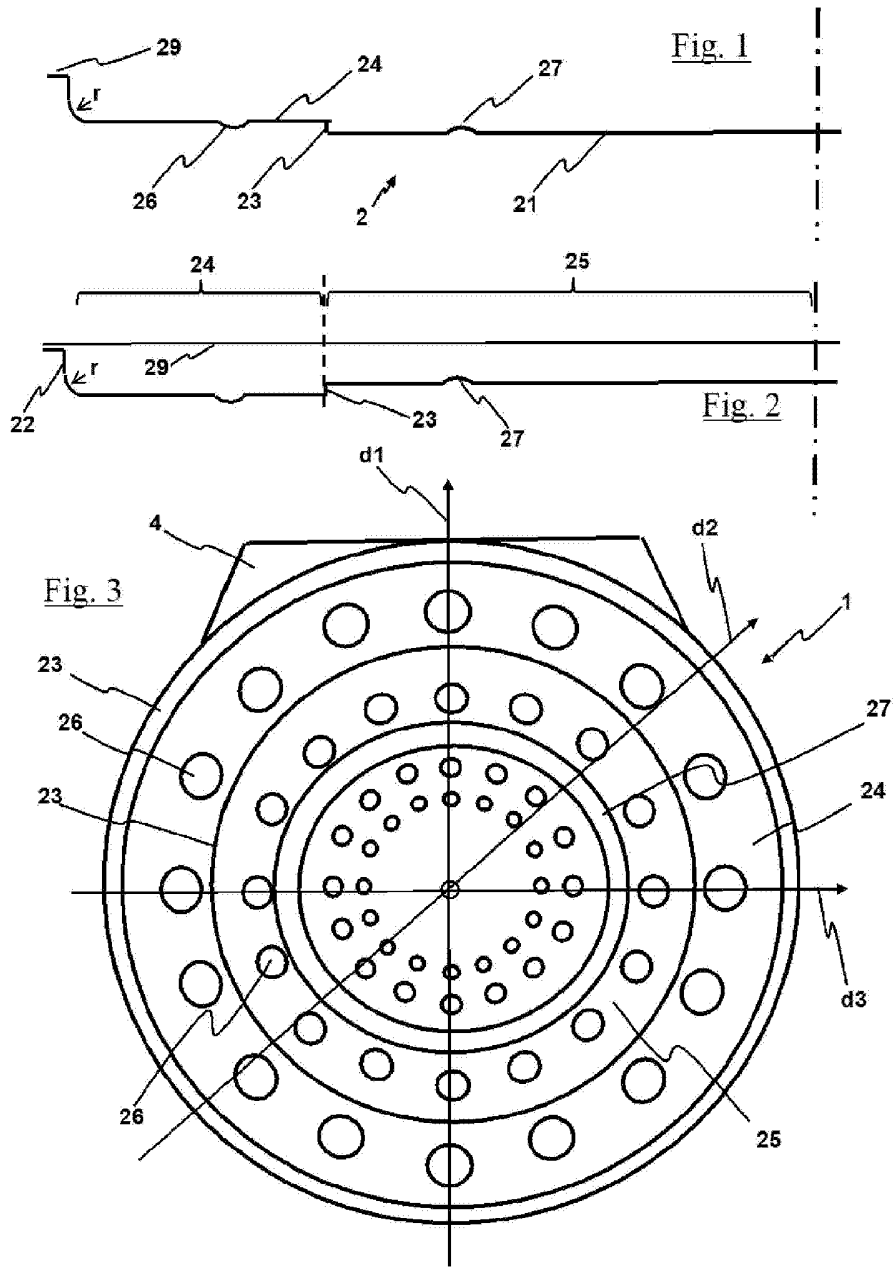
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- [CA2122520 \[0003\]](#)

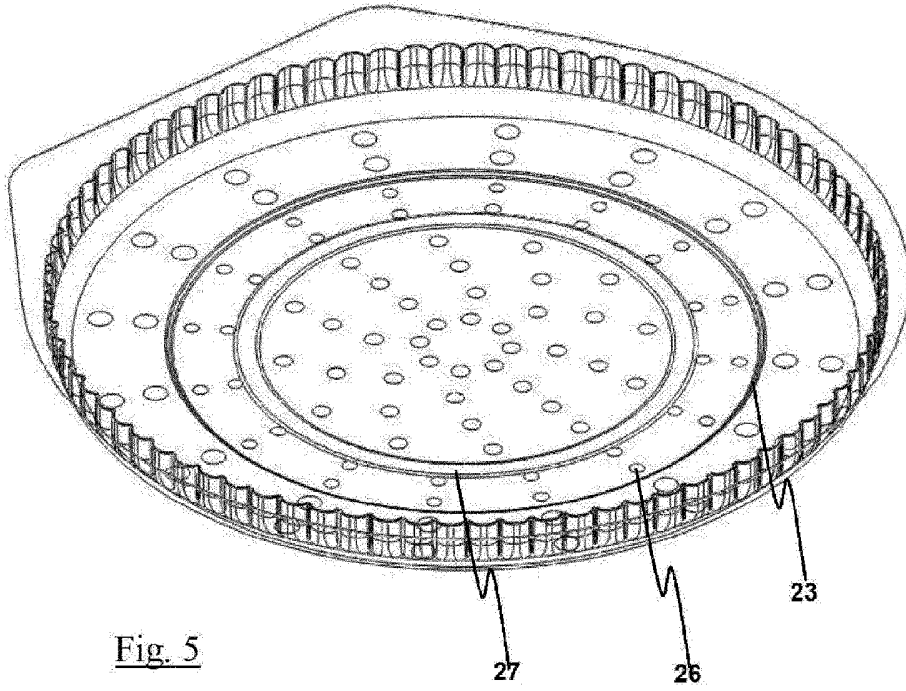
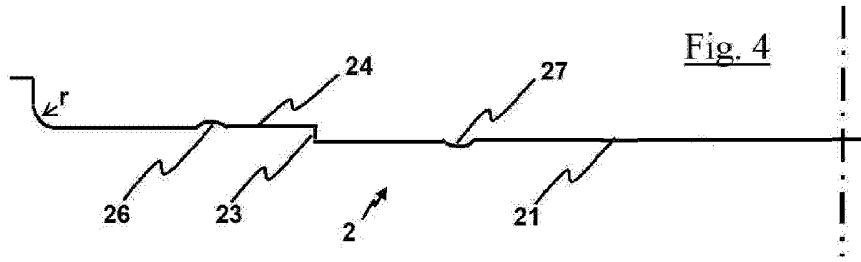
Patentkrav

- 5 **1.** Beholder (1) til pizzaer (P), omfattende en plastbakke (2) med en cirkulær basisdel (21), **kendetegnet ved, at** basisdelen (21) er forsynet med et kontinuerligt cirkulært trin (23) på en sådan måde, at der defineres en udvendig kransdel (24), som er anbragt i en anden højde end en central skivedel (25), hvor begge dele er forsynet med sfæriske kappeformede udsparinger (26).
- 10 **2.** Beholder ifølge krav 1, hvor udsparingerne set fra beholderens (1) indre er konkave.
- 15 **3.** Beholder ifølge krav 1, hvor udsparingerne set fra beholderens (1) indre er konvekse.
- 20 **4.** Beholder ifølge et af de foregående krav, hvor trinnet har en højde på mellem 0,8 og 1,2 mm.
- 25 **5.** Beholder ifølge et af de foregående krav, hvor trinnet har en højde på 1 mm.
- 30 **6.** Beholder ifølge et af de foregående krav, omfattende en cirkulær udbuling (27) på den centrale skivedel (25), hvilken udbuling er konkav eller konveks.
- 7.** Beholder ifølge krav 6, hvor den cirkulære udbuling (27) definerer en krans med en bredde på mellem 0,8 og 1 cm og en dybde eller højde på mellem 0,8 og 1,2 mm.
- 8.** Beholder ifølge et af de foregående krav, hvor trinnet (23) er opadgående i en centrifugal radial retning, således at kransen (24) er anbragt i en højere højde end den centrale skivedel (25).
- 9.** Beholder ifølge et af kravene 1 til 7, hvor trinnet (23) er nedadgående i en centrifugal radial retning, således at kransen (24) er anbragt i en lavere højde end den centrale skivedel (25).

- 5 **10.** Beholder ifølge et af de foregående krav, omfattende en perimeterrand (22), der forlænger basisdelen (21) i opadgående retning, hvor overgangen mellem basisdelen (21) og perimeterranden (22) med cirkulært tværsnit har en radius (r) på mellem 0,75 og 0,85 cm.
- 10 **11.** Beholder ifølge krav 10, hvor perimeterranden (22) har et bølgeformet tværsnit i henhold til et skæreelement parallelt med beholderens generelle plan for at definere bølger (28) langs kanten, der muliggør nemmere håndtering.
- 15 **12.** Beholder ifølge et af de foregående krav, omfattende et låg (3), der består af plastfilm og en flange (29), som forlænger den øvre kant af perimeterranden (22) i udadgående retning og horisontalt til sammenføjning med låget (3).
- 20 **13.** Beholder ifølge et af de foregående krav, hvor de sfæriske kappeformede udsparinger (26) er fordelt i koncentriske kranse, hvor udsparingernes (26) diameter varierer blandt nogle kranse.
- 14.** Beholder ifølge et af de foregående krav, hvor bakkens (2) grundmateriale er gennemsigtig plast med pigmenter.
- 15.** Beholder ifølge krav 14, hvor pigmenterne er grønne.
- 25 **16.** Beholder ifølge et af de foregående krav, hvor beholderens (1) radius-til-højde-forhold er mellem 5 og 7.

DRAWINGS





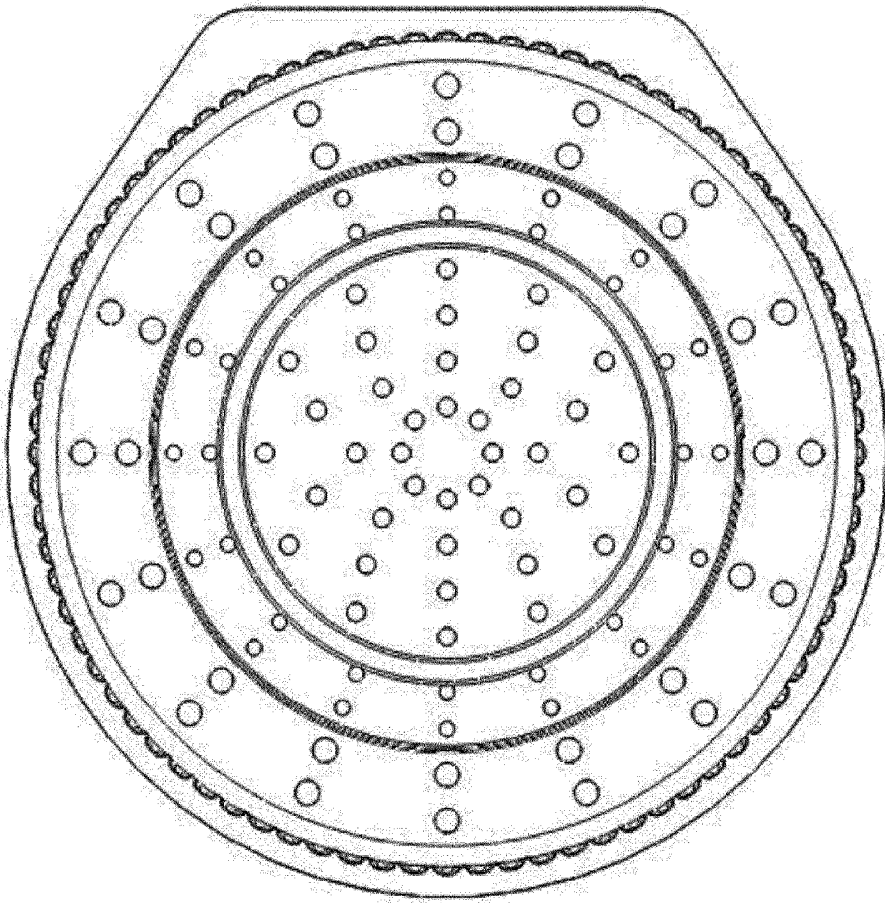


Fig. 6

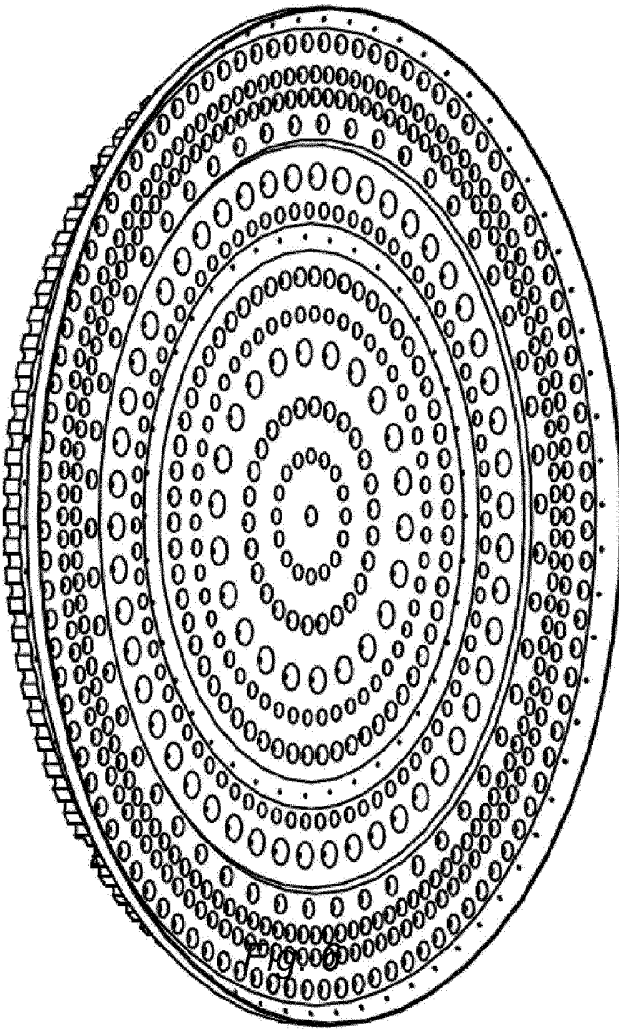


Fig. 7