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(54) Benævnelse: **FREMGANGSMÅDE TIL FREMSTILLING AF BLØDE, FORMEDE HALVSTIVE TORTILLAS**

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DESCRIPTION

[0001] The present invention relates to a method for producing soft shaped semi-rigid tortilla products, that can be used to hold various edible fillings.

[0002] Consumers are searching for healthy and yet convenient food options, avoiding foods laden with excess fats. There is a movement away from unhealthy choices such as crispy deep fried foods. As healthier options, low fat options such as Lebanese breads and pita pockets are used as a carrier for toppings or sandwich ingredients. Yet, they can be too thick, and are likely to break while consumers attempt to fold them into shapes that are convenient to hold and carry. They also show a limited shelf life, and can dry out quickly due to their formulation. Mountain breads can (flat square breads sold in Australia) can also be used, but are more suitable for lunch more than dinner. Also, they are too thin to be used with sauces, and show a limited shelf life. Naans and chapatis are exotic choices more suitable for a main meal than as a lunchtime wrap. In addition, they tend to be inflexible, too small, and high in fat.

[0003] By comparison, tortillas are shelf stable, highly soft and flexible, and can fold and bend without breaking. The term "tortilla" is used herein to refer to a Mexican style tortilla, i.e., a generally flat unleavened cooked flexible pan baked dough product generally circular in shape such as from a corn masa dough ("tortilla de maiz") or from a wheat dough ("tortilla de harina"). The two versions of the Mexican tortilla have different textures owing to the grains from which they originate. The maize version is somewhat thicker and heartier in texture, while the wheat version is less easily broken, due to its elevated gluten content, and therefore often larger in circumference. Tortillas are suitable for lunch and dinner, with a unique taste and texture compared to other forms of bread. However despite these advantages, consumers have difficulties "managing" a tortilla. The amount of filling is often miscalculated while folding, sealing and holding can be a challenge. As such, tortillas can be inconvenient, messy, and frustrating, especially for children and their parents. While the art includes moulding precooked tortillas by heating in a microwave, this produces an unsatisfactory product that fails to hold its shape and lacks a true baked texture. Microwaving a precooked tortilla is inadequate for setting the protein structure in the tortilla to form a shape and relies upon drying to form shaped article. With this method, one is forced to overcook the tortilla to produce a hard (e.g., cardboard-like) and excessively tough result.

[0004] WO 03/030658 A1 discloses a process for making a shaped snack chip.

[0005] Thus, there is a need in the art for a soft shaped semi-rigid tortilla product that is easy to use, less messy, delicious to eat, and healthier than other options. Also, there is a need in the art for methods for manufacturing and using such a product.

[0006] The present invention is defined by the claims and relates to:

a method for producing a soft shaped semi-rigid tortilla which is set into preformed 3-

dimensional shape

adapted to hold edible fillings, wherein the shape is other than flat,

wherein the method is selected from the following:

1. a. pressing raw tortilla dough into at least one mould, comprising a shape, and heating the dough in the mould until the dough is fully cooked and formed into the shape of the mould; and
2. b. pressing raw tortilla dough into at least one mould, comprising a shape, heating the dough long enough to form into a shape of the mould, removing shaped dough from the mould, and further heating the shaped dough until fully cooked.

[0007] In the method of the invention, the tortilla may be set into a shape selected from a cup, bowl, U-shaped taco shell, boat or canoe, pita, flower, pie, tube, envelope, pod, bun, and cone. In the method of the invention, the tortilla may comprise at least one of a flat bottom, sealed sides, and edible string.

[0008] In the method of the invention, the tortilla may comprise:

about 1%-10% sugar;

about 4%-15% humectant;

about 1%-15% fat;

about 1%-5% salt;

about 1%-3% of a chemical leavening system including at least one baking acid and soda, and

at least 51% wheat flour.

[0009] In the method of the invention, the mould may be preheated.

[0010] In the method of the invention, the at least one mould may include a male or a female mould, or both.

[0011] In the method of the invention, the further heating may be performed by baking.

[0012] The application generally encompasses (not part of the invention) a low fat shelf stable soft semi-rigid tortilla fabricated from a Mexican tortilla such as a chemically leavened cooked cereal dough that is formed into a variety of thin walled rigid three dimensional shapes that are rigid yet soft and flexible and which are useful for edible containers of loose particulate food stuffing, and wherein the shape is other than (a) flat, (b) other than flat and in the shape of a

cup or bowl, (c) other than flat and boat/canoe shaped or (d) other than flat, in the shape of a cup or bowl or boat/canoe shaped.

[0013] In a particular aspect, the application encompasses (not part of the invention) a soft shaped semi-rigid tortilla that is formed into shape for holding fillings, wherein the shape is other than (a) flat or (b) other than flat and boat/canoe shaped, and wherein the final moisture content of the tortilla is between about 23% to about 25%.

[0014] In one aspect, the tortilla is formed to hold the shape of a cup or bowl.

[0015] In other aspects, the tortilla is formed into the shape of a U- or square bottomed shaped taco shell, boat/canoe, pita, flower, pie, tube, envelope, pod, bun, or cone.

[0016] In still other aspects, the tortilla comprises a flat bottom and sealed sides.

[0017] In yet other aspects, the tortilla comprises an edible string.

[0018] The method can further comprise causing the dough to rise in an irregular manner so as to cause brown points.

[0019] The method can still further comprise using two cooking moulds, wherein the first mould comprises a cavity in the shape of the tortilla product; and the second mould comprises a protrusion shaped to fit into the cavity of the first mould. The moulds can be preheated prior to use.

[0020] While multiple aspects are disclosed, still other aspects of the present invention will become apparent to those skilled in the art from the following detailed description, which shows and describes illustrative embodiments of the invention.

[0021] Accordingly, the drawings and detailed description are to be regarded as illustrative in nature and not restrictive.

FIG. 1 depicts a model of a canoe/boat shaped soft semi-rigid tortilla.

FIG. 1A depicts a model of a canoe/boat shaped soft semi-rigid tortilla with extended sides.

FIG. 2 depicts a model of a pita shaped soft semi-rigid tortilla.

FIG. 3 depicts a model of a flower bud shaped soft semi-rigid tortilla.

FIG. 4 depicts a model of a pie shaped soft semi-rigid tortilla.

FIG. 5 depicts a model of a tube shaped soft semi-rigid tortilla.

FIG. 6 depicts a model of an envelope shaped soft semi-rigid tortilla.

FIG. 7 depicts a model of a bun shaped soft semi-rigid tortilla with edible string.

FIG. 8 depicts a model of pod shaped soft semi-rigid tortilla.

FIG. 9 (for reference) depicts a bowl shaped soft semi-rigid tortilla.

FIG. 10 (not part of the invention) is an exploded perspective view of a meal kit including a carton housing a nested array of shaped tortillas food packaged article as well as a dry pouch and a wet pouch of secondary food ingredients.

[0022] The present invention relates to a method according to claim 1 for producing improved shelf stable consumer packaged food articles including components fabricated from a Mexican tortilla like chemically leavened cooked farinaceous dough in a variety of thin walled three dimensional set or rigid shaped forms yet soft and flexible that are useful for edible containers of loose particulate food stuffing and to methods for their preparation.

[0023] Throughout the specification and claims, percentages are by weight and temperatures in degrees Centigrade unless otherwise indicated. As used herein, a "soft shaped semi-rigid tortilla" or, equivalently, a "shaped soft semi-rigid tortilla" means a fully cooked but non-fried tortilla farinaceous dough product that is formed into a thin walled three dimensional shape of sufficient rigidity to holds its shape at room temperature. Like a flower or a shaped and formed leather item, the walls, while having sufficient rigidity to retain a specific shape, are nonetheless pliable or deformable rather than being crisp, hard or frangible such as potato or fried tortilla chip. That is, the walls have sufficient shape to be self-supporting once formed into a particular shape or configuration in contrast to a conventional soft tortilla. Thus, "tortilla" means a fully cooked product. By comparison, "tortilla dough" means uncooked or partly cooked product. Also, a tortilla dough does not hold a shape but will relax over time under gravity to deform from any initial imparted thereupon. "Fully cooked" is understood to be a product that reaches about 85°C (+/-2 degrees), and is evidenced by substantially all of the starch being gelatinized.

[0024] Traditionally, in northern Mexico, tortillas are cooked unleavened flexible flat breads typically in thin or flat, circular or elliptical shape useful as an edible bread wrap for small quantities of other foods such as meat pieces, rice, and/or vegetables mixture. While the flat tortillas can be rolled to form a roll, when formed into a shape they lack sufficient rigidity to maintain such shape. Thus, the present food articles are to be distinguished from egg or egg omelette based dishes often referred to as "tortillas" (Tortilla de patatas) in other Spanish speaking locations.

[0025] The final moisture content of the soft shaped semi-rigid tortilla is less than about 28% (~ <28%), preferably ~ ≤25%. In preferred form, the soft shaped semi-rigid tortillas are shelf stable and exhibit a water activity value ("A_w") of ~ ≤0.88. In less preferred variations, the soft shaped semi-rigid tortilla pieces are suitable only for refrigerated distribution and sale and exhibit an A_w of ~ ≤0.92.

[0026] The particular selection of ingredients and concentration are selected to provide finished soft shaped semi-rigid tortilla products having a water activity ("Aw") of 0.88 or less and for best results less than 0.85 to about 0.7. Selection of such water activity value is important in achieving a balance between microbial shelf stability and dough handling characteristics. Water activity can also be reduced by using polyols such as glycerol and sorbitol. Good results are obtained when the moisture content of the finished product ranges from about 10% to about 25%, preferably about 15% to 20%.

[0027] In one aspect, the overall size of the soft shaped semi-rigid tortilla is such it is portable to hold, and that the consumer can take mouth sized bites. In this aspect, the width of the soft shaped semi-rigid tortilla is no wider than the distance an average adult mouth may comfortably open when consuming a sandwich. In another aspect, the width of the soft shaped semi-rigid tortilla is no wider than the distance an average child mouth may comfortably open when consuming a sandwich. In one particular aspect, the overall width after forming is about 25 mm or less, or about 12 to about 25 mm, for example, for children. In one other aspect, the width is about 37 mm or less, or about 12 to 37 mm, for example, for adults.

[0028] In another aspect, the height of the soft shaped semi-rigid tortilla is limited to the distance an average adult mouth can comfortably open when consuming a sandwich. In another embodiment, the height of the soft shaped semi-rigid tortilla is limited to the distance an average child's mouth can comfortably open when consuming a sandwich. In a specific aspect, the height of the soft shaped semi-rigid tortilla is about 25 mm or less, or about 12 to about 25 mm, for example, for children. In another aspect, the height is about 37 mm or less, or about 12 to about 37 mm, for example, for adults.

[0029] As a larger size, the soft shaped semi-rigid tortilla will have a width of at least about 25 mm. In another aspect, the width is limited to the bite width of an average adult mouth. In yet another aspect, the width is limited to the bite width of an average child's mouth. In a particular aspect, the width of the soft shaped semi-rigid tortilla is about 25 to about 51 mm, for example, for children. In one other aspect, the width is about 37 to about 75 mm, for example, for adults.

[0030] Depending on the final form of the tortilla, the overall diameter of the soft shaped semi-rigid tortilla (e.g., for the leading part which is directed into the mouth) can be any size from about 10 mm, about 12 mm, about 15 mm, about 20 mm, about 25 mm, about 30 mm, about 35 mm, about 37 mm, and about 40 mm, or for example, from about 12-37 mm.

[0031] Regardless of specific shape, a feature of the present soft shaped semi-rigid tortilla articles is a thin walled construction characteristic of a tortilla. Good results are obtained in terms of sufficient rigidity as to maintain the desired structure while nonetheless providing a soft eating quality characteristic of wheat tortillas, is obtained when the present articles are fabricated with wall thicknesses ranges from 0.5 - 5 mm, preferably from about 1-5mm, more preferably about 2-4mm. For example, in one specific embodiment, the thickness of the soft shaped semi-rigid tortilla can be about 1.3 mm, about 2.3 mm, about 3.3 mm, or about 3.8 mm.

[0032] Good results are obtained when the present shaped tortilla articles are fabricated having a length ranging from about 50 mm to about 250 mm. In certain embodiments, the articles range from about 70 mm to about 200 mm in length. In certain specific embodiments, the articles have a length of, about 150 mm, while in certain other specific embodiments having a length of about 170 mm, about 190 mm, about 200 mm, about 250 mm, or more or in a range of from about 50 mm to about 200 mm.

[0033] In another variation, the shaped tortilla of the present invention can be made using a standard tortilla having a thickness less than 1.5 mm or a thickness greater than or equal to 1.5 mm. As mentioned above, range on thickness could be 0.5-5 mm Consequently, in one aspect, the shaped tortilla can be made from a standard tortilla having a thickness of about 1.5 to about 3.0 mm, or greater. In one aspect, then, the shaped tortilla can be made from a standard tortilla having a thickness of about 1 to about 2.0 mm, or greater.

[0034] The shaped tortilla can hold a greater amount of filling than the conventional tortilla. In this way, the shaped tortilla can be filled with greater amounts of meat and still have room for adequate amounts of all other available fillings. The cavity of the shaped tortilla can also provide consistent wrapping to filling ratio throughout the product. As such, the tortilla fillings can be enjoyed down to the last bite, as opposed to the last bite being a mouthful of dough. This provides for greater eating satisfaction and, as a result, will be preferred by a consumer. In addition, the larger cavity allows a utensil (e.g., spoon) to be used to access the cavity when used to load the filling.

[0035] Notably, each of the disclosed shapes provides benefits to the consumer. The boat/canoe shape (e.g., FIG. 1) is easy to fill, holds a large amount of fillings, and allows layering of fillings. The pita shape (e.g., FIG. 2) is easy to hold and use, fitting naturally into the hands. It is a familiar shape and provides consumers with an indication when maximum filling is reached. The flower bud shape (e.g., FIG. 3) is easy to fill and provides the option to fold or leave open. It allows one handed eating, which is easy for kids and suitable for consumers on the go. The round bottom allows filling down to the last bite. The pie shape (e.g., FIG. 4) is unique, impressive, and ideal for entertaining. It has a large opening which is easy to fill.

[0036] As another option, the tube shape (e.g., FIG. 5) is easy to hold together, making it neater to eat. It has a wide bottom which allows for large amounts of filling. The envelope shape (e.g., FIG. 6) provides a flap to fold over. This looks tidy and prevents ingredients from falling out. It also sits flat on the plate making it easier to fill. The pod shape (e.g., FIG. 8) is unique, fun, and adaptable. The pods can be used separately, for example, for dips, or can be used as a set, for example, to fill with different ingredients. The boat shape (e.g., FIG. 7) is kid friendly and very adaptable, as it can also work as a dessert option. For example, it can be presented as a sweetened tortilla filled with fruit chocolate, cinnamon, etc. In another aspect, the shaped tortilla can be formed into that of a salad bowl (e.g., Fig. 9 for reference). Although not as portable as other shapes, it does offer an alternative for use in restaurant or food service venues, as a non-fried taco salad option.

[0037] In a preferred aspect, the precooked tortilla or tortilla dough is formed into a rounded shape, e.g., a cup or a bowl, or optionally, a taco shape (i.e., U-shaped taco shell), boat/canoe shape, pita shape, flower shape, pie shape, tube shape, bun shape, or cone shape. Yet, it is understood that the disclosed shapes are exemplary, and that any shape can be utilized in accordance with the invention. In addition, each of the described shapes can be modified as needed, for example, for the boat/canoe shape, one or more of the ends can be folded high, and for the pita shape, the product can include a flap that folds over.

[0038] It will be further understood that the shaped tortillas can be prepared from a variety of cereal flours, for example, with white flour, corn flour, masa flour, whole wheat flour, multigrain flour, whole grain flour, rice flour, gluten-free flour, or any combination thereof. The dough can additionally include added herbs, seasonings and flavour ingredients to provide general flavours such as Mexican, Italian, Mediterranean, Asian, Caribbean, and Indian; and specific flavours such as jalapeno, chipotle, cheese, black bean, red chilli, pesto, herb, garlic, rosemary, vegetable, spinach, sundried tomato, basil, cilantro, or any combination thereof; and dessert flavours such as chocolate, blueberry, pineapple, banana, honey, and apple cinnamon, or any combination thereof.

[0039] In one aspect, the shaped tortillas (e.g., bun shaped products) are used in conjunction with edible string. This can be used to provide fun for kids and increased portability for work lunches. In various aspects, one or more different flavours of string can be used with one tortilla.

[0040] In accordance with the invention, the shaped tortillas can be used as "blank canvas' allowing consumers to create own taste preferences and also experiment as tortilla taste compliments all kinds of flavours and ingredients. The shaped tortillas allow a large number of options for fillings and folding. The texture and thickness of the shaped tortillas is ideal for a variety of meal choices. It is flexible enough to hold fillings and avoid breakage, and moist enough to please the palate.

[0041] In particular, the shaped tortillas can be used as a breakfast alternative (e.g., with cooked eggs, omelettes, ham, bacon, or VEGEMITE™ brand food paste (which is a dark brown food paste made from yeast extract, used mainly as a spread on sandwiches, toast and cracker biscuits, as well as a filling of pastries. VEGEMITE™ food paste is made from leftover brewers' yeast extract, a by-product of beer manufacturing, and various vegetable and spice additives), for lunch (cold fillings such as salad, ham, lunch meats, etc.), and for dinner (hot fillings such as meats, vegetables, etc.). It will be understood that Mexican fillings (e.g., taco, burrito fillings) are specifically envisioned, including lettuce, beans, peppers, cheese, cooked meat or poultry, sauce, sour cream, guacamole, etc.

[0042] The present invention features a number of advantages. It allows consumers to place many types of fillings (e.g., salad greens, taco fillings, etc.) inside, but is lighter and healthier than a fried shell or a bread bowl. It gives the advantage of being able to hold the fillings in the

tortilla while reducing the problem of filling falling out the sides of a typical taco shell or tortilla. The ends of the formed tortilla can be sealed, so there is minimized leaking out of the end of the tortilla. The sides of the tortilla can rise from the base slightly so that fillings are less likely to leak out during filling. Optional side extensions can make the tortilla enclosed.

[0043] In this way, the invention provides the convenience of a pre-formed shell, in pliable, healthier, low mess presentation. The invention gives consumers the option of a soft, neater to eat tortilla. The shaped tortillas remain tender and malleable to give the true tortilla eating experience with minimal cracking. The shaped tortillas of the invention are clearly distinguished from shells which are deep fried and crispy. The invention is unique in that it provides for tortillas to retain a predetermined shape without the need for frying, while maintaining a soft texture. Also, the present products are to be distinguished from smaller bite-sized tortilla chips which are crisp and frangible whether made by deep fat frying or baking or other bite sized carriers, or holders.

[0044] As further advantages, the shaped tortillas can be made on a sheeting line with high throughput. The shapes can be stackable for compact packaging. The tortilla products can be provided in a shelf stable format with re-sealable packaging. The soft format of the formed tortillas avoids the breakage and wastage associated with hard shelled holders. The portability of the shaped tortillas gives consumers the freedom to eat at home, at work or on the go. It provides consumers with convenient eating solutions, including spontaneous and last minute meal options.

[0045] It should be noted that, while the present invention finds particular suitability for use in connection with the provision of white flour based recipes, the skilled artisan will appreciate that the present invention finds usefulness in provision of recipes encompassing corn flour, masa flour, rice flour, wheat flour, multigrain flour, whole grain flour, or any combination thereof, including wheat/white blends, multigrain/white blends, masa/white blends. The shaped tortillas can be prepared as products that are reduced fat (i.e., reduced or lower in fat compared or relative to fried tortilla shells) having a fat content of 20% or less, or low fat, reduced or low carbohydrate, or reduced or low sodium, or "lite", or any combination thereof. By "low fat" is meant herein a product having a fat content of 10% or less. In certain preferred embodiments, the present tortilla products have fat levels ranging from about 5-9% fat.

[0046] For corn tortillas, masa dough can be formed. This can be done by purchasing masa dough from a vendor, purchasing masa flour, and mixing it with water, annatto (an optional yellow colouring), salt, and rework to form the dough, or by purchasing raw corn and processing it to make the masa dough. If raw corn is purchased, the raw corn is cooked with lime and then steeped. The corn is then washed and ground into masa flour, which is then mixed with other ingredients to form the dough.

[0047] The dough (i.e., any type or flavour) can be processed through a sheeting machine to form flat raw tortilla dough. The flat raw highly developed tortilla dough is placed onto moulds prior to heating.

[0048] According to the invention, the moulds can be solid, or vented and/or perforated, or conventional forms having upper and lower plates.

[0049] The tortillas or tortilla dough can then be heated to adopt the form of the moulds. For this heating, the tortillas or tortilla dough can optionally be baked, resulting in tortillas with toast marks. This also reduces moisture content. After heating, the moulded products exit as one or more shapes described herein. Since the formed tortillas are still pliable for short periods while still hot immediately after heating, care is taken to preserve the desired shape. The shapes become more rigid as the tortillas cool.

[0050] The shaped products are heated to reduce the moisture content. For this, any warm heat source can be used. Baking is preferred, including baking by conventional ovens, convection ovens, rotary rack ovens, brick ovens, infra-red ovens, tortilla ovens, and toaster ovens. Grilling can also be used. In certain aspects, the invention specifically excludes the use of microwave heating. Preferably, the shaped tortillas are heated to retain softness while avoiding a tough, chewy, or soggy texture. In various aspects, the moisture content of the final product can be in a range from about 23% to about 28%, or specifically, about 24%, about 25%, or about 26%. In particular aspects, the water activity of the final product can be in a range of about 0.82 to about 0.92, or less than 0.88.

[0051] In the preferred embodiment, the shaped soft semi-rigid tortilla piece is fabricated from a dough formulation from a chemically leavened wheat based or farinaceous baked developed or gluten structured dough. Batters and doughs as used herein are distinguishable compositions even though each comprises some number of common ingredients. "Dough" as used herein refers to an intermediate food product that has a gluten-based structure. In dough, the gluten forms a continuous dough elastic medium into which other ingredients are embedded. A dough is typically prepared by mixing, and kneading or "working" and is often stiff enough to cut into various shapes.

[0052] In contrast, "batter" as used herein refers to an intermediate food product that comprises flour, water, eggs and salt and optionally fat and sugars that are a starch batter-based composition. In a batter, gluten development is purposefully minimized. Batters are inelastic. Liquid added to make the batter forms a continuous batter medium in which other ingredients are dispersed. A batter cooks into a soft, moist and sometimes crumbly product. A batter is typically prepared by blending, creaming, stirring or whipping and is generally thin enough to pour or scoop or squeeze out of container. Thicker batters in the form of a paste have certain properties of thickness similar to doughs but nonetheless are quite different therefrom.

[0053] "Dough" as used herein further refers to an intermediate food product that has a low water concentration. Prior to piece forming and case hardening, the dough, has a water activity within a range of about 0.95 to 0.99 and a moisture content ranging from about 30-40%

[0054] In the present invention, in the preferred embodiment, at least a major portion (about 51% or greater) of the flour used to prepare the dough is a wheat flour. The flour ingredients can further include a minor portion (less than about 49%) of additional flour types. For example, in certain variations, the minor portion can includes corn flour, corn masa, masa harina and mixtures thereof. Good results are obtained when a medium protein of "all-purpose" wheat flour (having a gluten based protein content ranging from about 9-12% is used to supply wheat flour. Bread flour (having a higher gluten protein content ranging from about 12% to 16%) can also be used. Lower protein content cake flours (having a protein content of less than 6%) are less preferred although blends of cake or pastry flours and bread flour (to achieve an averaged wheat flour protein content ranging from about 6-9%) can be used. In a preferred embodiment, a flour is employed having about 11.5% protein.

[0055] The doughs can also comprise added ingredients to increase dough stability, to improve eating quality, and to prolong palatability.

[0056] Unlike traditional fresh tortilla dough formulations, the present dough formulation of the present invention, in highly preferred embodiments, comprise from about 1% to about 15% of an edible fat or shortening ingredient, preferably about 4-10% and for best results about 9%. A shortening component adds richness to the eating properties of the finished baked goods as well as aids in the leavening process. Most importantly, the shortening component provides additional flexibility or pliability to the tortilla product over its extended shelf life.

[0057] Preferred for use herein are shortening ingredients that are solid at room temperature to provide physical stability. Useful herein to provide such room temperature solid fats are hydrogenated fats such as obtained from common vegetable oils such as soy, corn, canola, safflower, cottonseed, and the like. However, since hydrogenated fats can be sources of undesirable trans fatty acids, current health trends disfavour usage of hydrogenated fats. Thus, preferred for use herein are those naturally occurring fats that are solid at room temperature without hydrogenation. Among these, preferred for use herein are palm, coconut, palm kernel oil, and fractions and mixtures thereof. Of course, mixtures of naturally solid fats and fats obtained by hydrogenation are contemplated.

[0058] The present invention can further comprise about 2% to about 15% of a humectant on a dry weight basis, preferably about 4% to about 15%, more preferably about 4% to about 8%. Humectant addition is helpful in achieving the present water activity levels and the microbial shelf stability at room temperature provided by the present food products. The humectant can be any commonly employed humectants ingredient. Preferred humectants for use herein are selected from the group consisting of glycerin, glycerol, mannitol, propylene glycol, sorbitol, xylitol and mixtures thereof. Preferred for use herein is glycerin by itself or a mixture of sorbitol and glycerin.

[0059] The dough can additionally include about 0.1% to about 5% salt, preferably about 1% to about 5%, more preferably about 0.5% to 3% salt.

[0060] Furthermore, the dough can include about 1% to about 10% sugar.

[0061] Unlike traditional fresh tortilla dough formulations, the dough of the invention can and in preferred embodiments do, also comprise a chemical leavening system or baking powder to provide a chemically leavened wheat dough. The chemical leavening or baking powder useful herein are such as those containing sodium bicarbonate and the combination of one or more baking acids with sodium bicarbonate. Baking acids useful for chemical leavening and dough mixtures include monocalcium phosphate, glucano-deltalactone, potassium hydrogen tartrate, dimagnesium phosphate, and mixtures thereof. One or more baking acids can be combined with the sodium bicarbonate to form the chemical leavening agent. Preferably, the dough comprises about 1% to 3% of a chemical leavening system.

[0062] Baking acids useful for chemical leavening and dough mixtures include monocalcium phosphate monohydrate, sodium aluminum sulfate, sodium aluminum phosphate, dicalcium phosphate, glucano-deltalactone, potassium hydrogen tartrate, dimagnesium phosphate, and mixtures thereof. One or more baking acids can be combined with the sodium bicarbonate to form the chemical leavening agent.

[0063] One preferred leavening system which provides this combination of fast and slow acting leaveners is baking powder that combines baking soda or sodium bicarbonate with any of sodium aluminum sulfate, sodium aluminum pyrophosphate, monocalcium phosphate and mixtures thereof. In another preferred embodiment, medium acting leaveners such as SAPP 28 (sodium acid pyrophosphate) can be used. (SAPPs can react in a range of rates with SAPP 28 being about in the middle). It is believed that the fast acting leavening agent provides improved texture or rheology when the dough is heat set, and the slow acting leavening agent provides desired textural attributes when the dough is finish cooked such as by baking.

[0064] Optionally, the formulations for the dough from which the present shaped tortilla pieces are fabricated additionally can include one or more emulsifiers. Specifically, the present formulations can further comprise about 0.2% to about 1.5% of a emulsifier on a dry weight basis, preferably about 0.4% to about 0.8%. Emulsifiers, which strengthen the dough, give improved mixing and handling tolerance, increase loaf volume, improve mechanical slicing characteristics, and can retard staling. Emulsifiers typically are surface active agents that stabilize mixtures of hydrophobic and hydrophilic substances by lowering the interfacial tension between usually immiscible substances. Emulsifying agents which can be used include mono- and diglycerides of fatty acids, propylene glycol mono- diesters of fatty acids, glycerol-lactose esters of fatty acids, ethoxlated or succinylated mono- and diglycerides, lecithin, diacetyl tartaric acid esters or mono- diglycerides, sucrose esters of glycerol, or equivalents thereof and mixtures thereof. Preferred emulsifiers include mixtures of diacetyl tartaric acid esters, and succinylated mono- and diglycerides. Emulsifying agents can be used singly or in combination with typical usage levels of less than 3 % by weight.

[0065] The formulations for the dough from which the present shaped tortilla pieces are fabricated additionally can include one or more dough conditioners. The present formulations

can further comprise about 0.2% to about 1.5% of a dough conditioners on a dry weight basis, preferably about 0.4% to about 0.8%. The dough conditioners used herein can be of the oxidizing type, reducing type or both. Oxidizing agents or oxidizing type dough conditioners strengthen the dough. Thus employment of oxidizing dough conditions can lead to economies with shortened makeup times or by compensating for low protein in the flour. More commonly used oxidizers today include azodicarbonamide (ADA), which can be used at up to 45 ppm in the United States, and L-ascorbic acid (LAA), or vitamin C, for which there is no usage limit in the United States. ADA works very quickly, and can easily be overused, producing dry dough that is hard to work, low volume and cracked bread surfaces. LAA works slowly; moderate overuse has no deleterious effect on quality and it is commonly used at about 75 ppm. LAA is currently the only oxidizing agent permitted in the European baking industry.

[0066] Useful dough conditioners can also include reducing agents, which serve to encourage the development of gluten, thus shortening the mixing time and decreasing the amount of mixing energy that is needed. The most commonly used reducing agent, L-cysteine. Also useful is sodium metabisulfite.

[0067] The chemically leavened dough of the present invention optionally includes a variety of ingredients suitable for rendering finished baked goods prepared therefrom more organoleptically desirable. These optional components include an anti-mycotic agent, anti-oxidants or preservatives, and flavor/coloring agents.

[0068] Especially preferred for use herein are flavour and color additives intended to mimic the yellow color of traditional yellow corn. While in certain jurisdictions, certain synthetic yellow colorants are permitted, especially useful herein for such color additives are those natural yellow colorants such as turmeric, beta carotene, and/or annatto and mixtures thereof. Also, while any edible vegetable oil can be used, preferred for flavor and color is corn oil.

[0069] Useful anti-mycotic agents include sorbic acid and its derivatives such as sodium or potassium sorbate, propionic acid and its derivatives, sodium diacetate, monocalcium phosphate, lactic acid, citric acid parabens and so on. These agents are present in an amount to aid in the inhibition of growth of undesirable yeast and/or molds, typically about 0.01 to 1.0% of dry weight basis ingredient such as sodium propionate, potassium sorbate, calcium propionate, sorbic acid and mixtures thereof. The anti-mycotic ingredient can be present in a range of about 0.01% to about 1.0% on a dry weight basis of the dry mix composition.

[0070] Where legally permitted, the products herein can additionally include common levels and types of anti-oxidants and preservatives such as vitamin E, BHA (butylated hydroxyanisole), BHT (butylated hydroxytoluene), TBHQ (tert-butyl hydroquinone), and mixtures thereof, up to levels permitted by current food laws.

[0071] The tortilla dough is preferably not acidified and thus ranges in pH from about 6.0 to 8.0.

[0072] Chemically leavened doughs are prepared by blending the essential and optional components such as wheat flour, optionally corn flour or corn masa, salt, sugar, shortening or oil, water; glycerol or other polyol; and leavening system together in such a conventional manner as to produce a well blended developed gluten dough. Conveniently, the chemically leavened dough can be prepared from a first liquid premix blend and a second dry premix blend. The liquid premix blend can include the oil or liquid shortening, eggs, glycerol, emulsifiers and so on. The dry blend can include flour(s), sugar(s), salt; leavening and so on. The dry blend and liquid blend are then combined to form a gluten based plastic or viscoelastic dough. The chemically leavened dough is, for example, prepared in a batch or a continuous mixing device. The moisture content of the dough can range from about 20% to about 40% resulting in an A_w ranging from about 0.95 to about 0.99.

[0073] In a preferred variation, the dough is a highly developed dough as expressed in Brabender units. Characterization of the doughs in Brabender unit ("BU's") is well known in the dough art and these units measure the doughs resistance to turning on a mixer hook. More highly developed or worked doughs exhibit greater resistance to turning. Good results are obtained herein when the present doughs have a Brabender value ranging from about 500 to 1000 BU. In more preferred variations, the dough is developed to its peak or, otherwise expressed, to maximum gluten strength development.

[0074] The dough is provided in small measured quantities useful herein for making the present sized and shaped pieces. In a preferred embodiment in the preparation of smaller base pieces, these quantities range from about 5-25g each. For larger soft shaped tortilla base pieces, a larger quantity (e.g., 40-60g) can be used. Any technique or apparatus can be used to provide such measured quantities of dough. For example, the dough can be formed into a continuous shape such as a rope, sheet or ribbon and the continuous strand sectioned (such as by a reciprocating guillotine knife) into desired uniform (±10%) quantities, e.g., if a 10g quantity is desired, then each quantity will be 10g ±1g. In small scale commercial production, simple manual cutting the dough into such small quantities is the preferred technique.

[0075] In preferred embodiments, the preparation methods additionally comprise a step of resting the measured quantity of dough to provide a measured quantity of rested dough. Good results are obtained when the measured quantities of dough, e.g., dough balls, are allowed to rest for 5-10 minutes at ambient temperatures. A resting step is useful for better facility of the dough conforming to the shape of the dough without thickness variations or weak spots in the finished pieces.

[0076] The present method can further include a step finish cooking the set par cooked base piece to form a finished soft shaped semi-rigid tortilla base piece food product. In preferred form, the finish cooking is a baking step that reduces the moisture content of the par cooked set piece from an initial value of about 26%-30% moisture to a finish moisture content ranging from about 28% or less, preferably about 25% or less and an A_w of 0.88 or less. (There is actually only a small reduction in moisture in the press, the moisture went from 37 to 33% moisture. Most of the moisture loss is in the oven.) Conveniently, the par cooked base piece

items are baked at about 175°C to 210°C for about 1-5 minutes, preferably about 2-4 minutes. Preferred for use herein is a belt oven using a combination of radiant, and conduction heating to provide a finished product having not only the desired finished moisture content but also the desirable toast points described above. In commercial form, a moving belt conveys the par cooked pieces into an elongated oven of sufficient length and at a line speed sufficient to provide a residence time within the oven to provide the desired baking or finish cook times herein. In other variations, a combination of one or more baking and heating steps can be practiced to provide not only the finish cooking of any raw portions of the piece but also to provide any desired toast points feature herein. The preferred method for us is to use a tortilla baking oven that is a series of plates or belts where the soft shaped semi-rigid tortilla are heated by conduction and radiant heat. An impingement oven using high velocity hot air would also work but the belt oven is preferred.

[0077] The finished base pieces so prepared are generally entirely cooked and any raw dough such as in the peripheral ring portion is finish cooked to at least 90% starch gelatinized.

[0078] More specifically, Fig. 10 depicts a meal or dinner kit (not part of the invention). Fig. 10 depicts that the meal kit can include a carton or other container. The kit includes at least one packaged soft shaped semi-rigid tortilla base pieces article or the like as described above disposed within a container. The container can be a conventional paperboard carton optionally having an easy open feature such as tear strip. The kit also includes at least one sealed container of secondary ingredients. The container of secondary ingredients can be, for example, either a wet and/or a dry pouch. The kit can further include one or more preparation instruction legends. Legend(s) can include reheating suggestions, recipes for making toppings, or instructions on how to prepare a seasoned meat toping ingredient. Such legends can be on the carton as depicted and/or on the individual pouches (not shown). The kit container does not need to have a modified atmosphere. In certain variations, the kit can additionally include a clear film overwrap (not shown) to provide extra packaging protection. In still other variations, the kit can include a sealed container such as can or cup for including additional ingredients, e.g., refried beans in addition or in substitution for the wet or dry pouches. In still other variations, the kit can include a tray or other supplemental packaging support element (not shown) to prevent component movement within the carton.

[0079] For example, the pouch can contain a wet sauce such as a salsa sauce or cheese sauce. Wet sauce pouches are typically aseptically packaged for extended shelf lives. In another variation, the pouch can include a dry mix of seasoning ingredients to add to meat to form a flavored meat topping such as a taco seasoning blend. In this variation, dry blends of solid seasonings, salt, colors, seasoning, can be blended with pre-gelatinized starch. The dry seasonings can be mixed by the consumer with water, heated to form a flavored thickened liquid or thin paste and blended with consumer supplied cooked meat to form the flavored or seasoned meat topping ingredient or component. While a variety of seasoning mixes can be prepared, since cumin is a component of many Mexican dishes, the dry mix preferably includes at least cumin and salt. In still other variations, the pouch can include a cream ingredient such as a ready-to-spread topping frosting for those executions wherein the soft shaped semi-rigid

tortilla is used as a dessert foundation. In certain variations, the kit can contain one or more pouches of dry and/or wet secondary kit ingredients such as pouches.

EXAMPLES

[0080] The examples described herein are for purposes of illustrating embodiments of the invention.

EXAMPLE 1

Wheat Tortilla Formula

[0081]

Ingredient	Formula % ranges	Typical usage levels
Wheat flour; 11-1.3% protein	45-60%	45%, 50%, 55%, 60%
Water	15-30%	15%, 20%, 25%, 30%
Hydrogenated Vegetable fat such as canola, cottonseed, corn, soy, safflower; naturally solid fats such as palm, coconut,	5-10%	5%, 7.5%, 10%
Glycerine	0-10%	0%, 2%, 4%, 6%, 8%, 10%
Salt	1-2%	1%, 1.5%, 2%
Leaveners; Baking powder, baking soda, leavening acids such as MCP, SAPP, SALP	0.5-1%	0.5%, 0.6%, 0.7%, 0.8%, 0.9%, 1%
Dough conditioners; Mono-glycerides, Diglycerides, SSL, L-cysteine, DATEM	0.25-1%	0.25%, 0.5%, 0.75%, 1%

REFERENCE EXAMPLE 2

Standard Tortilla Procedure

[0082]

1. 1.) Combine ingredients in mixer
2. 2.) Mix 4-10 minutes on medium speed until dough is fully developed
3. 3.) Allow dough to rest five minutes
4. 4.) Divide dough into 40 gram balls
5. 5.) Press dough balls in tortilla press @ 400°F (~205°C) for 1-3 seconds
6. 6.) Bake in tortilla oven @400°F (~205°C) for 30-90 seconds
7. 7.) Cool five minutes on cooling rack
8. 8.) Package tortillas
9. 9.) Final tortilla moisture content of 23-28%, Water Activity at < 0.880

EXAMPLE 3

Soft Shaped Semi-Rigid Tortilla Procedure 1

[0083]

1. 1.) Ingredients were combined in mixer
2. 2.) These were mixed 4-10 minutes on medium speed
3. 3.) The dough was allowed to rest five minutes
4. 4.) The dough was divided into 40-60 gram balls
5. 5.) The dough balls were pressed in press comprising a preheated male and female mould with desired shape @400°F (~205°C) for 1-3 seconds
6. 6.) The shapes were removed from the moulds and baked in a tortilla oven @400°F (~205°C) for 30-90 seconds
7. 7.) The shapes were cooled five minutes on cooling rack
8. 8.) The soft shaped semi-rigid tortillas were packaged
9. 9.) Final tortilla moisture content was measured at 23-28%, Water Activity at < 0.880

EXAMPLE 4

Soft Shaped Semi-Rigid Tortilla Procedure 2

[0084]

1. 1.) Ingredients were combined in mixer
2. 2.) These were mixed 4-10 minutes on medium speed

3. 3.) The dough was allowed to rest five minutes
4. 4.) The dough was divided into 60 gram balls
5. 5.) The dough balls were pressed in press comprising preheated male and female moulds with desired shape @400°F (~205°C) for 15-90 seconds
6. 6.) The shapes were removed from the moulds and cooled 5 minutes on cooling rack
7. 7.) The soft shaped semi-rigid tortillas were packaged
8. 8.) Final tortilla moisture content was measured at 23-28%, Water Activity at <0.880

REFERENCE EXAMPLE 5

Soft Shaped Semi-Rigid Tortilla Procedure 3

[0085]

1. 1.) Ingredients were combined in mixer
2. 2.) These were mixed 4-10 minutes on medium speed
3. 3.) The dough was allowed to rest five minutes
4. 4.) The dough was divided into 40 gram balls
5. 5.) The dough balls were pressed in tortilla press @400°F (~205°C) for 1-3 seconds
6. 6.) These were baked in tortilla oven @400°F (~205°C) for 30-90 seconds
7. 7.) The baked tortillas were pressed into male and female moulds of desired shapes
8. 8.) These were cooled, while still in the moulds, five minutes on cooling rack
9. 9.) The soft shaped semi-rigid tortillas were packaged
10. 10.) Final tortilla moisture content was measured at 23-28%, Water Activity at <0.88

EXAMPLE 6

Soft Shaped Semi-Rigid Tortilla Procedure 4

[0086]

1. 1.) Ingredients were combined in mixer
2. 2.) These were mixed 4-10 minutes on medium speed
3. 3.) The dough was allowed to rest five minutes
4. 4.) The dough was sheeted to a thickness of 1-3 mm
5. 5.) The sheeted dough was folded around male mould

6. 6.) The sheeted dough was cut around male mould
7. 7.) The sheeted dough was pressed into female mould
8. 8.) The dough was in heated in the preheated moulds at 400°F (~205°C) for 1-3 seconds
9. 9.) The shapes were removed from the moulds and baked in tortilla oven @ 400°F (~205°C) for 30-90 seconds
10. 10.) The shapes were cooled five minutes on cooling rack
11. 11.) The soft shaped semi-rigid tortillas were packaged
12. 12.) Final tortilla moisture content was measured at 23-28%, Water Activity at <0.88

EXAMPLE 7

Soft Shaped Semi-Rigid Tortilla Procedure 5

[0087]

1. 1.) Ingredients are combined in mixer
2. 2.) These are mixed 1-10 minutes on medium speed
3. 3.) Dough or batter is injected into preheated mould at 400°F (~205°C) for 1-3 seconds.
4. 4.) The shapes are removed from mould.
5. 5.) The shapes are baked in tortilla oven @400°F (~205°C) for 30-90 seconds
6. 6.) The shapes are cooled 5 minutes on cooling rack
7. 7.) The soft shaped semi-rigid tortillas are packaged
8. 8.) Final tortilla moisture content is measured at 23-28%, Water Activity at <0.88

EXAMPLE 8

Soft Shaped Semi-Rigid Tortilla Procedure 6

[0088]

1. 1.) Ingredients are combined in mixer
2. 2.) These are mixed 1-10 minutes on medium speed
3. 3.) Dough or batter is injected into preheated mould at 400°F (~205°C) for 3-20 seconds.
4. 4.) The shapes are removed from mould

5. 5.) The shapes are cooled 5 minutes on cooling rack
6. 6.) The soft shaped semi-rigid tortillas are packaged
7. 7.) Final tortilla moisture content is measured at 23-28%, Water Activity at <0.88

[0089] Throughout this specification, and any sections which follow, unless the context requires otherwise, the words "comprise," "comprising" and the like, are to be construed in an inclusive sense as opposed to an exclusive sense, that is to say, in the sense of "including, but not limited to".

REFERENCES CITED IN THE DESCRIPTION

Cited references

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO03030658A1 **[0004]**

Patentkrav

1. Fremgangsmåde til fremstilling af en blød, formet halvstiv tortilla, som er anbragt i en præformet 3-dimensionel form, der er beregnet til at holde spiseligt fyld, hvor formen ikke er flad, hvor fremgangsmåden er valgt blandt følgende:
a. presning af rå tortilladej ind i mindst én form, der omfatter en fysisk form, og opvarmning af dejen i formen, indtil dejen er helt bagt og formet inde i formens fysiske form, og
b. presning af rå tortilladej ind i mindst én form, der omfatter en fysisk form, opvarmning af dejen længe nok til at formes ind i en fysisk form af formen, fjernelse af formet dej fra formen og yderligere opvarmning af den formede dej, indtil den er gennembagt.

2. Fremgangsmåde ifølge krav 1, hvorved tortillaen sættes i en fysisk form, der er valgt blandt en kop, en skål, en U-formet tacoskal, en båd eller en kano, et pitabrød, en blomst, en tærte, en tube, et hylster, en kapsel, en bolle og en kegle.

3. Fremgangsmåde ifølge krav 1 eller krav 2, hvorved tortillaen omfatter en flad bund og/eller forseglede sider og/eller spiselig snor.

4. Fremgangsmåde ifølge et hvilket som helst af kravene 1 til 3, hvorved tortillaen omfatter:
ca. 1 % til 10 % sukker
ca. 4 % til 15 % fugtighedsbevarende midler
ca. 1 % til 15 % fedt
ca. 1 % til 5 % salt
ca. 1 % til 3 % af et kemisk hævesystem, der omfatter mindst én bagesyre og natriumbicarbonat, og
mindst 51 % hvedemel.

5. Fremgangsmåde ifølge et hvilket som helst af kravene 1 til 4, hvorved formen er forvarmet.

6. Fremgangsmåde ifølge et hvilket som helst af kravene 1 til

5, hvorved den mindst ene form omfatter en han- eller en hunform eller begge.

7. Fremgangsmåde ifølge et hvilket som helst af kravene 1 til 6, hvorved den yderligere opvarmning udføres ved bagning.

DRAWINGS

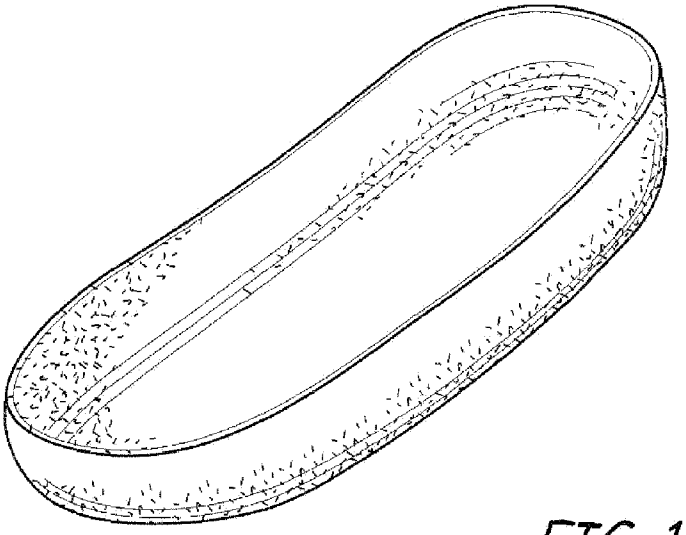

FIG. 1

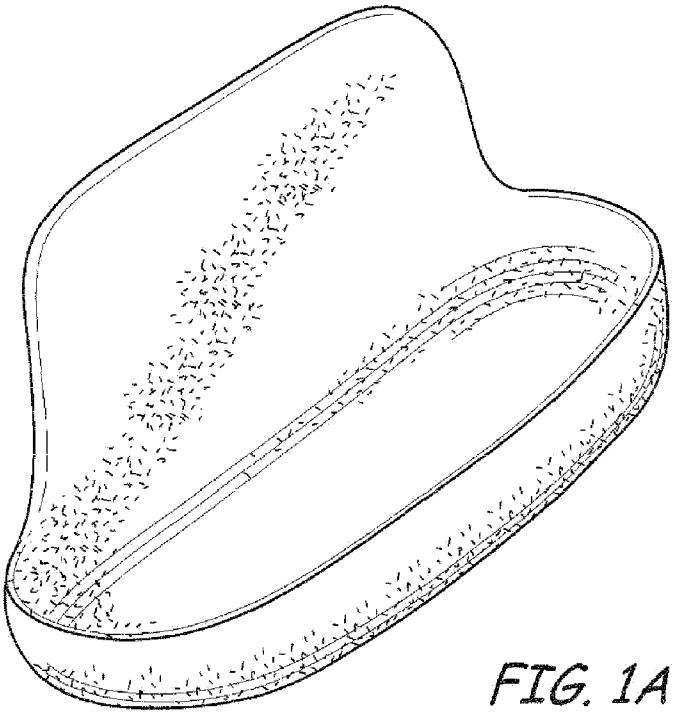

FIG. 1A

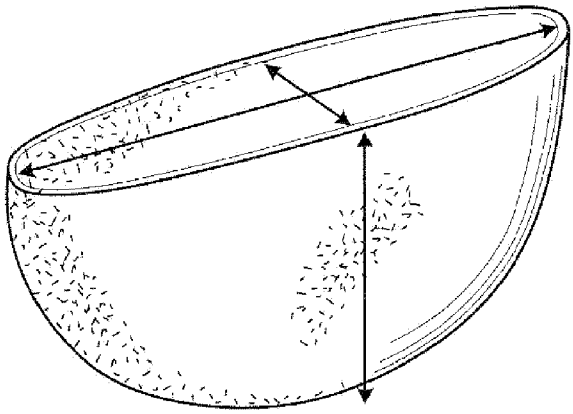

FIG. 2

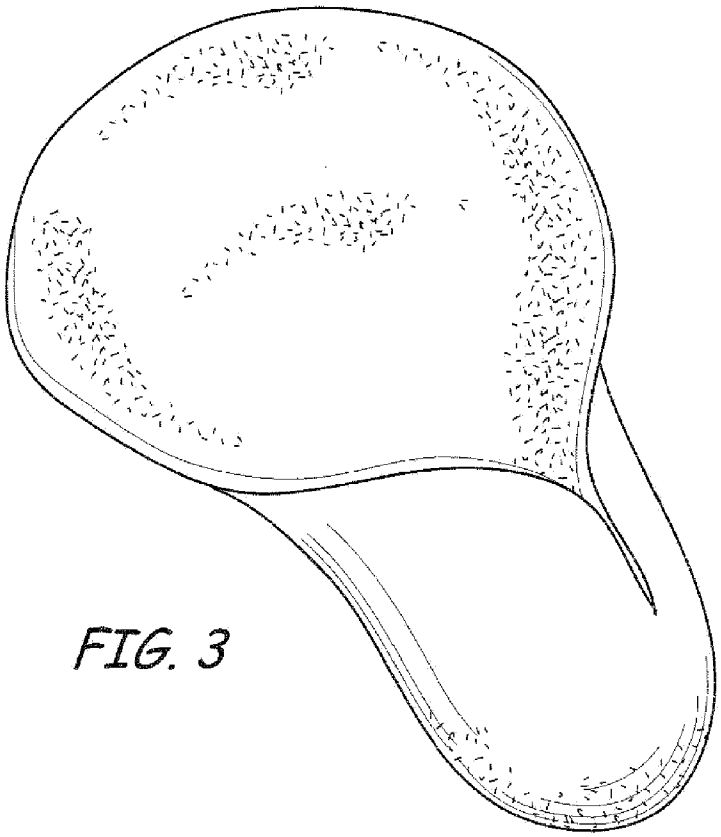

FIG. 3

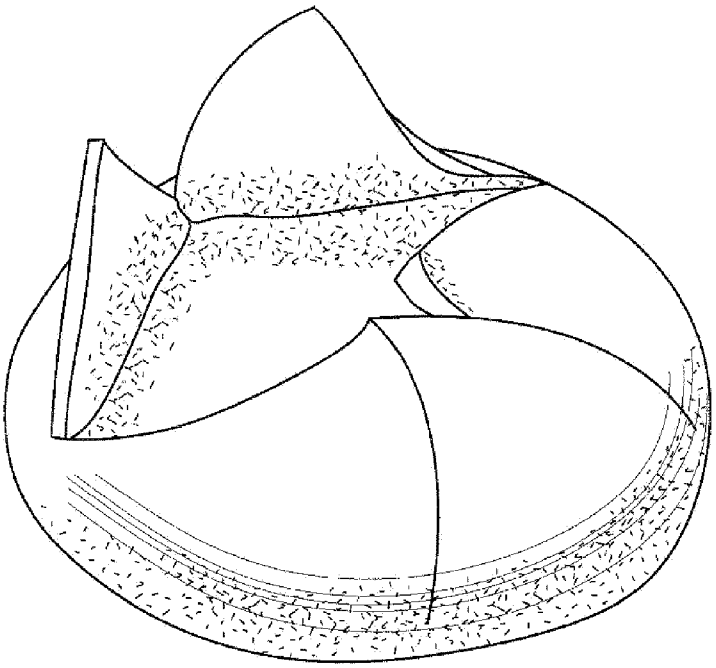

FIG. 4

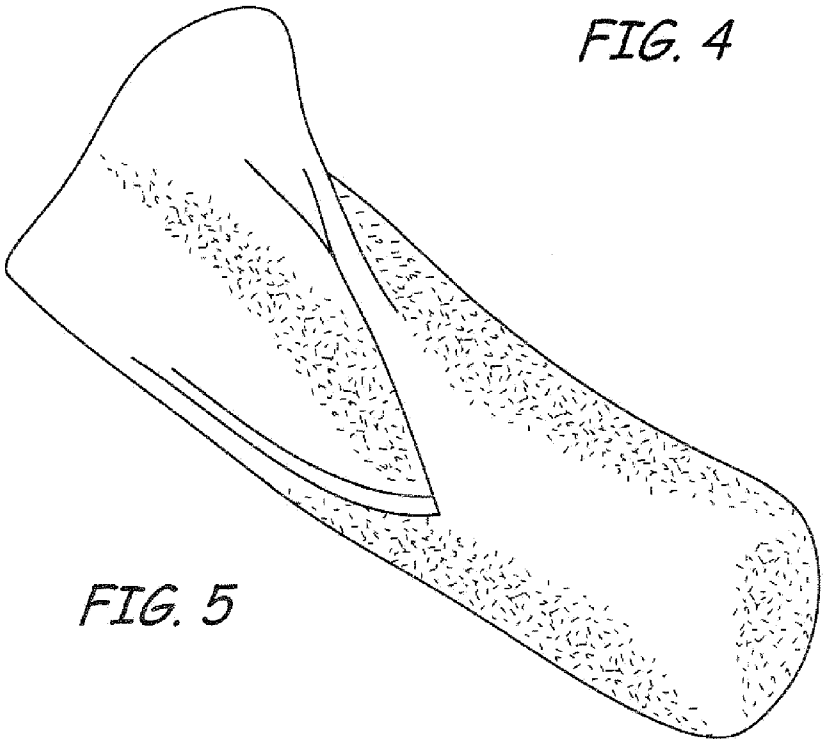

FIG. 5

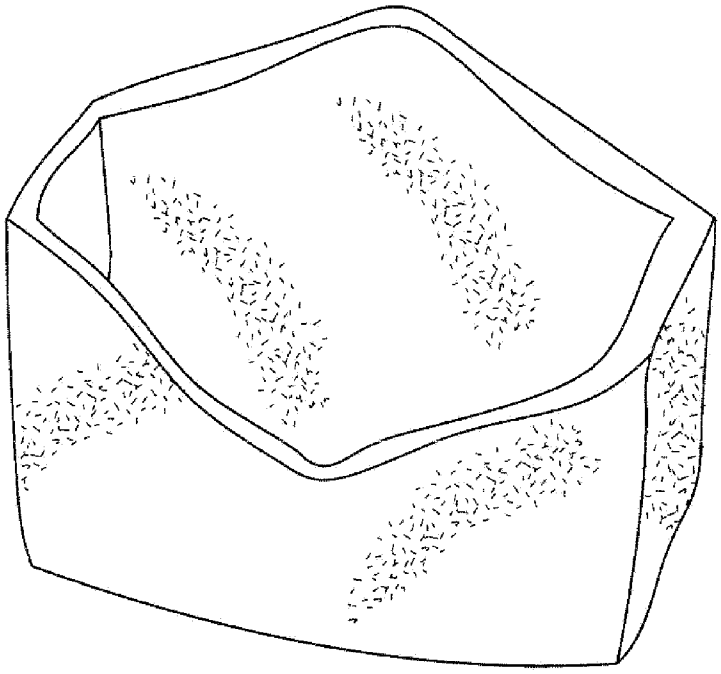

FIG. 6

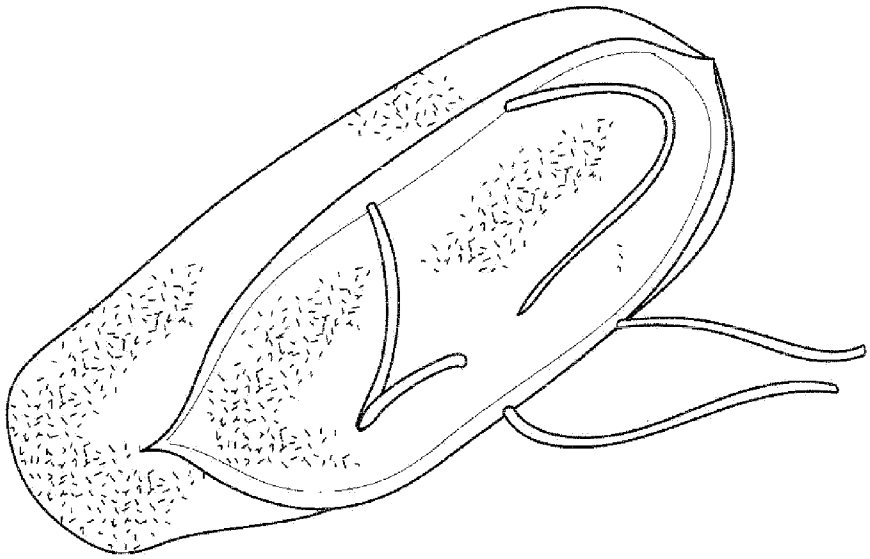

FIG. 7

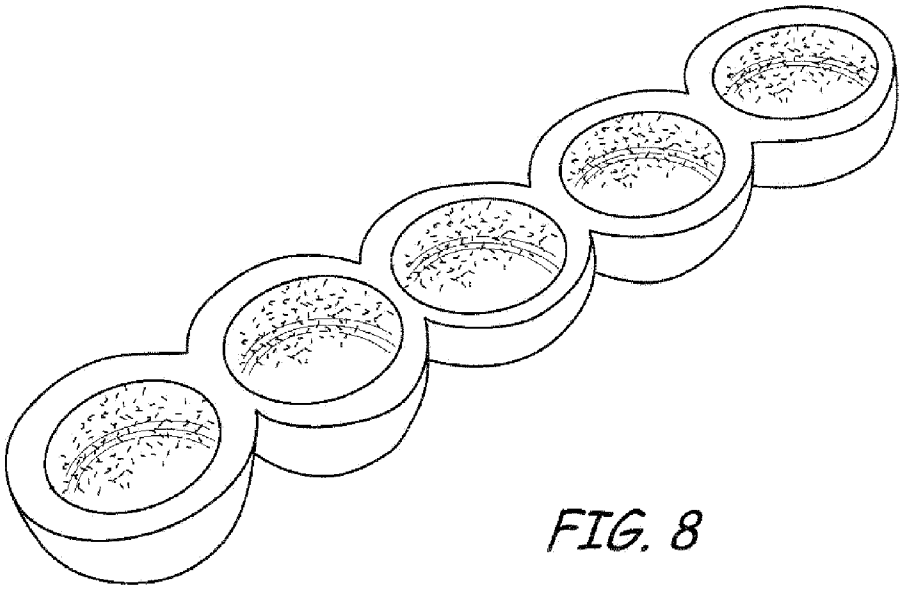

FIG. 8

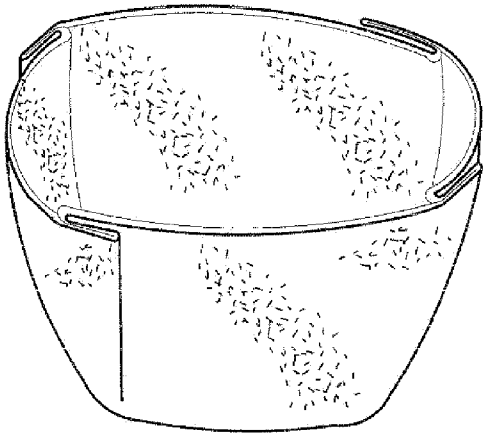

FIG. 9

FIG. 10