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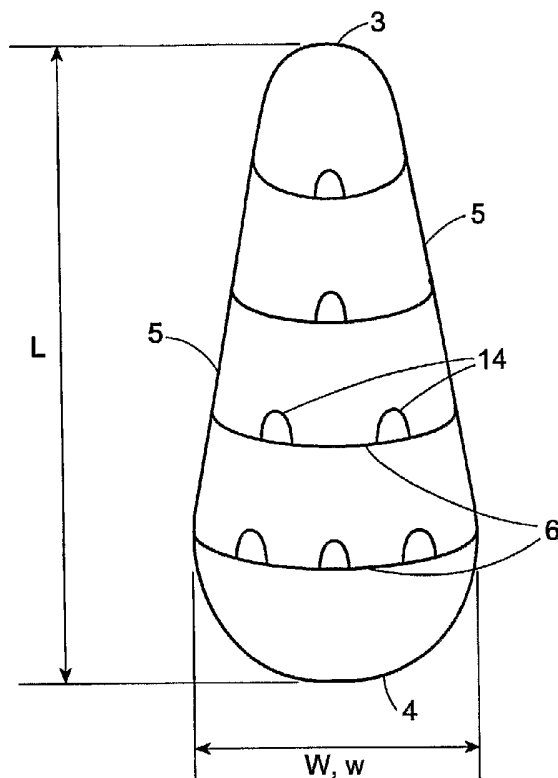
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[Continued on next page]

(54) Title: COOKIE WITH IMPROVED CARRYING ABILITY

(57) Abstract: A cookie with at least one projection extending from its surface is better able to both absorb and to carry on its surface a material into which it is dunked.



WO 2006/060735 A2



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- 1 -

TITLE

COOKIE WITH IMPROVED CARRYING ABILITY

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to cookies having at least one projection extending therefrom with enhanced material carrying capabilities. In other words, a cookie of this invention is better able to both absorb and to carry on its surface a material into which it is dunked. The invention is also directed to methods of making such cookies.

Description of Related Art

[0002] Cookies are a very popular, traditional snack food. Oftentimes cookies are consumed after dunking them in a liquid such as milk or coffee or tea. However, in today's society, even that activity can be challenging due to the wide variety of liquid containers available today. What is more, due to the varying structure of cookies, not all cookies are appropriate for dunking; the cookie's ability to carry

- 2 -

material into which it is dunked, i.e., absorb and carry on its surface, may be limited by cookie structure or consistency.

[0003] Accordingly, a cookie which can effectively carry a liquid or semi-solid into which it is dunked and which easily fits into most commercially-available liquid containers would be very desirable.

SUMMARY OF THE INVENTION

[0004] The present invention is directed to a cookie having an upper surface, a lower surface, a top end, a bottom end, two side surfaces, a length L extending from the top end to the bottom end, a height H extending from the lower surface to the upper surface, a width W extending between the two side surfaces, and at least one projection extending from at least one of said upper and lower surfaces; wherein each projection has a shape defined by angle x , angle y , length l , height h , and width w of the projection, wherein each projection has a y surface which extends across the width w of the projection from a position of maximum height h of the projection sloping down toward the top end of the cookie and an x surface which extends across the width w of the projection from the position of maximum height h of the projection sloping down toward the bottom end of the cookie, wherein angle x is the angle between a line parallel to a cookie surface drawn at the position of maximum height h of the projection and a line drawn along the x surface of the projection from the position of maximum height h , wherein angle y is the angle between a line perpendicular to a cookie surface drawn at the position of maximum height h of the projection and a line drawn along the y surface of the projection from the position of maximum height h , wherein an angle between the line drawn along the x surface of the projection from the position of maximum height h and a line drawn along the y surface of the projection from the position of maximum height h is at least 14° , wherein the ratio of l at a position of maximum length l to L ranges from 1:55 to 1:1.5, and wherein the ratio of h at a position of maximum height h to H ranges from 1:7.2 to 1:0.67.

- 3 -

[0005] In certain preferred embodiments of the invention, the width W at the top end of the cookie is less than width W at the bottom end of the cookie and/or w is substantially equal to W . In preferred embodiments of this invention, width W ranges from about 5 mm to about 50 mm, length L ranges from about 5 mm to about 100 mm, and/or height H ranges from about 3 mm to about 20 mm.

[0006] In other preferred embodiments of the invention, angle x ranges from greater than 0° to about 90° and angle y ranges from greater than 0° to less than 90° . In more preferred embodiments, angle x is approximately 22° and angle y is approximately 7° .

[0007] In still other preferred embodiments of this invention, at least one docker hole is present on the y surface of the at least one projection. In more preferred embodiments, a diameter of the at least one docker hole ranges from about 0.1 mm to about 5 mm and an inside wall of the at least one docker hole is angled at greater than 7° toward a center of the docker hole.

[0008] Further preferred embodiments of the invention are directed to cookies wherein the shape of the projection is further defined by a step cut from at least one of the y surface and the x surface of the projection to the surface of the cookie from which the projection extends.

[0009] Still further preferred embodiments are those in which the y surface of the at least one projection is concave across the width W of the cookie, those in which all edges are rounded and those in which the cookie comprises fat in an amount up to about 50% by weight of the cookie, sugar in an amount up to about 50% by weight of the cookie and leavening in an amount up to about 10% by weight of the cookie.

- 4 -

[0010] In certain preferred embodiments of this invention, the at least one projection on the cookie enhances the cookie's ability to carry a material such as milk, tea, coffee, yogurt, and ice cream. Related preferred embodiments include those in which the cookie carries a material in an amount such that a ratio of a weight of the carried material to a weight of the cookie is at least 0.2:1.

[0011] The invention is further directed to a method of making a cookie with at least one projection using a rotary mold or an extrusion apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Figure 1 is a top view of a cookie according to the present invention.

[0013] Figure 2 is a partial side cross-sectional view of the cookie shown in Figure 1.

[0014] Figures 3 and 4 are cross-sectional views of projections with step cuts according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] As used herein, "cookie" refers to a typically baked, sweetened dough product comprising flour, fat, sugar or acceptable replacement ingredients. As used herein, "projection" refers to a three-dimensional bump, ridge, point, etc. which extends from the base of the cookie outward. As used herein, "carry" refers to the ability of a cookie to both absorb and to carry on its surface a material into which it is dunked, dipped or otherwise submerged.

[0016] The first embodiment of the present invention is directed to a cookie as shown in Figures 1 and 2. Though the cookie of Figure 1 has a teardrop shape, the cookie of the present invention can have any shape; for example and without

- 5 -

limitation, the cookie can be oval-shaped, rectangular, triangular, circular, etc. The cookie has an upper surface 1, a lower surface 2, a top end 3, a bottom end 4, two side surfaces 5, a length L extending from the top end to the bottom end, a height H extending from the lower surface to the upper surface, a width W extending between the two side surfaces, and at least one projection 6 extending from at least one of said upper and lower surfaces.

[0017] In certain preferred embodiments of the invention, the width W at the top end 3 of the cookie is less than the width W at the bottom end 4 of the cookie due to tapering of the cookie at one or both ends. Such tapering is illustrated in Figure 1, but does not limit one of ordinary skill in this art. Instead, variation in the width of the cookie is limited only by manufacturing limitations. A preferred embodiment of the present invention is one in which the width W of the cookie tapers from about 28 mm at the bottom end of the cookie to about 10 mm at the top end of the cookie. Overall, the width W preferably ranges from about 5 mm to about 50 mm, more preferably from about 5 mm to about 40 mm, and most preferably from about 10 mm to about 30 mm; however, the width W is only limited by the size of the opening through which the cookie must pass to be dunked in a material and, again, manufacturing limitations.

[0018] The length L of the cookie preferably ranges from about 5 mm to about 100 mm, more preferably from about 10 mm to about 100 mm, still more preferably from about 35 mm to about 100 mm, still further more preferably from about 45 mm to about 85 mm, yet still further more preferably from about 45 mm to about 70, and most preferably is about 60 mm. However, the length L is limited only by considerations such as the distance from the opening through which the cookie must pass to the material in which the cookie is to be dunked and by manufacturing limitations.

[0019] The height H from the upper surface 1 to the lower surface 2 preferably ranges from about 3 mm to about 20 mm, more preferably from about 5 mm to

- 6 -

about 15 mm, still more preferably from about 7 mm to about 10 mm, and most preferably is about 7.2 mm. However, the height H is limited only by considerations such as the size of the opening through which the cookie must pass to be dunked, the ease of eating (upper end limit), the strength of the cookie (lower end limit) and, again, manufacturing limitations. If the overall height of the cookie varies within the cookie, height H should be measured from the bottom surface to the lowest point on the upper surface (not including any optional docker holes).

[0020] Cookies, according to the first embodiment of the present invention, have at least one projection 6 extending from at least one of said upper and lower surfaces 1 and 2. In a preferred embodiment of the present invention, there are four ridge-like projections across the width W along the length L of the cookie as shown in Figure 1. Projections can extend from the upper surface 1 of the cookie or both the upper surface 1 and the lower surface 2. What is more, the number of projections can vary. The position and number of projections is limited only by manufacturing limitations and by the various ratio and other limitations set forth below.

[0021] Each projection has a shape defined by the following parameters: angle x, angle y, length l, height h, and width w as shown in Figure 3. Further, each projection has a y surface 7 which extends across the width w of the projection from a position 8 of maximum height h of the projection sloping down toward the top end 3 of the cookie and an x surface 9 which extends across the width w of the projection from the position 8 of maximum height h of the projection sloping down toward the bottom end 4 of the cookie.

[0022] Angle x, as shown in Figure 2, is the angle between a line 10 parallel to a cookie surface drawn at the position 8 of maximum height h of the projection and a line 11 drawn along the x surface 9 of the projection from the position 8 of maximum height h. Preferably angle x ranges from greater than 0° to about 90°, more preferably from about 10° to about 83°, still more preferably from about 15°

- 7 -

to about 45° , still further preferably from about 17° to about 35° , and most preferably is about 22° .

[0023] Angle y , as shown in Figure 2, is the angle between a line 12 perpendicular to a cookie surface drawn at the position 8 of maximum height h of the projection and a line 13 drawn along the y surface 7 of the projection from the position 8 of maximum height h . Preferably angle y ranges from greater than 0° to less than about 90° , more preferably from greater than 0° to about 45° , still more preferably from greater than 0° to about 25° , still further preferably from about 5° to about 10° , and most preferably is about 7° . It is desirable to employ an angle y such that the y surface 7 is almost perpendicular to the upper surface 1 of the cookie. In this way, the holding area for a material into which a cookie is dunked can be maximized, and rotary molding applications for the cookie can be readily employed.

[0024] Importantly, the angle between the line 11 drawn along the x surface of the projection from the position of maximum height h and a line 13 drawn along the y surface of the projection from the position of maximum height h is at least 14° . In addition, the maximum for such an angle would be less than 180° .

[0025] Equally important is that the ratio of l at a position of maximum length l to L ranges from 1:55 to 1:1.5, preferably ranges from 1:16.7 to 1:2.7 and more preferably ranges from 1:12 to 1:4. In addition, the ratio of h at a position of maximum height h to H ranges from 1:7.2 to 1:0.67, preferably ranges from 1:4.8 to 1:1, more preferably ranges from 1:3.6 to 1:1.2 and most preferably ranges from 1:2.4 to 1:1.4.

[0026] In certain preferred embodiments of the present invention, length l of the projection preferably ranges from about 1.1 mm to about 40 mm, more preferably ranges from about 3.6 mm to about 22 mm, and most preferably ranges from about 5 mm to about 15 mm. In other preferred embodiments of this invention, height h of the projection preferably ranges from about 1 mm to 10.8 mm, more preferably

- 8 -

from about 1.5 mm to about 7.2 mm, still more preferably from about 2 mm to about 6 mm, and most preferably from about 3 mm to about 5 mm. If the overall height of the cookie varies within the cookie, height h should be measured from the lowest point on the upper surface (not including any optional docker holes) of the cookie to the position of maximum height h .

[0027] In a preferred embodiment of the present invention, w is substantially equal to W . In other embodiments, it is possible to have more than one projection extend from the surface of the cookie across its width W ; in other words, instead of one ridge-like projection across the width W of the cookie, there could be more than one narrower projections.

[0028] In still other preferred embodiments of this invention, at least one docker hole 14 is present on the y surface 7 of the at least one projection 6. Such docker holes are useful in maintaining cookie shape during baking, as well as holding more dunking material and providing more surface area into which dunking material can be absorbed. Docker holes in the present invention are preferably aligned at the intersection of the y surface 7 and the upper surface 1 of the base of the cookie as shown in Figure 1. The diameter of a docker hole typically ranges from about 0.1 mm to about 5 mm, preferably from about 1 mm to about 4 mm, and most preferably from about 1.5 mm to about 3 mm. The depth of a docker hole is typically about 2 mm, though it is well within the skill of one of ordinary skill in this art to adjust the depth of the docker hole based on the height H of the cookie. Finally, dockers holes are typically wider on the outside of the cookie than on the inside of the cookie; accordingly, an inside wall of a docker hole is usually angled at greater than 7° , preferably greater than 10° and more preferably about 15° , toward a center of the docker hole.

[0029] As shown in Figures 3 and 4, further preferred embodiments of the invention are directed to cookies wherein the shape of the projection is further defined by a step cut 15 from at least one of the y surface 7 and the x surface 9 of the projection 6 to the upper surface 1 of the cookie from which the projection

- 9 -

extends. Such step cuts are necessary when either or both of angles x and y are so small or so large, respectively, that the size of the projection would fail to fall within the ratio limitations set forth above for $l:L$ and $h:H$. The angle of the step cut made, as well as the number of step cuts made, could vary so long as the overall projection created falls within the ratio limitations set forth above for $l:L$ and $h:H$.

[0030] Optionally, the y surface of the at least one projection is concave across the width W of the cookie as shown in Figure 1. Additionally, the y surface may be concave in the direction of the height h of the projection. The x surface need not be concave in any way. In fact, the only limitations placed on the curvature of a given projection are those due to manufacturing concerns.

[0031] Typically all edges of the cookie are rounded as a result of baking and processing. The radius of curvature is typically at least 0.5 mm, while a radius of curvature of 0.75 or greater is preferred. The edges need not be curved or only some may be curved, if such an effect can be achieved with commercial manufacturing equipment.

[0032] The composition of the cookie is not critical. However, given the purpose of the present invention to increase carrying ability, the cookie should be porous and have enough resilience/rigidity not to fall apart or disintegrate in a material into which it is dunked. One of ordinary skill in this art would readily be able to derive an appropriate cookie recipe.

[0033] Preferably, a cookie according to the present invention comprises fat in an amount up to about 50% by weight of the cookie, more preferably from about 5% to about 30% by weight, and most preferably from about 7% to about 20% by weight. Further a cookie according to the present invention preferably comprises sugar/sweeteners in an amount up to about 50% by weight of the cookie, more preferably from about 10% to about 35% by weight, and most preferably from

- 10 -

about 15% to about 30% by weight. In addition, a cookie according to the present invention preferably comprises leavening in an amount up to about 10% by weight of the cookie, more preferably from 0.05% to about 5% by weight, and most preferably from about 0.1% to about 2%. Any conventional food grade ingredients are suitable for use in the present invention; it would also be possible to use suitable replacements for any of the typical ingredients, i.e., fat or sugar substitute.

[0034] Cookies according to this invention also may contain other ingredients customarily included in cookies such as inclusions like nuts and chips and flavors.

[0035] In certain preferred embodiments of this invention, the at least one projection on the cookie enhances the cookie's ability to carry a material such as milk, tea, coffee, yogurt, and ice cream. Indeed, the cookies of the present invention can effectively absorb and carry on the cookie surface any desired liquid or semi-solid material due at least in part to the increased surface area of the cookie. Furthermore, the effects of the present invention are more pronounced with respect to cold materials such as milk and yogurt. Related preferred embodiments of this invention include those in which the cookie carries a material in an amount such that a ratio of a weight of the carried material to a weight of the cookie is at least 0.2:1, more preferably 0.25:1, still more preferably 0.3:1, still further more preferably 0.35:1, yet still further more preferably 0.40:1, and most preferably 0.45:1. Other preferred embodiments are those in which the ratio of a weight of the carried material to a weight of the cookie ranges from 0.2:1 to 0.6:1, more preferably from 0.25:1 to 0.55:1, still more preferably from 0.3:1 to 0.5:1, and most preferably from 0.35:1 to 0.45:1.

[0036] It should be noted that to improve the surface carrying of a given cookie (as opposed to the absorbance), the cookie recipe could be adjusted to decrease porosity or part of the cookie could be coated with a material which would resist moisture (i.e., a fat-based coating such as chocolate). Preferably such a coating would coat only the y surface of the projection(s) and the top surface of the cookie

- 11 -

to maximize carry on the surface, while still absorbing dunking material into the cookie through other surfaces.

[0037] The invention is further directed to a method of making a cookie with at least one projection using a rotary mold or an extrusion apparatus. Rotary molds and extrusion apparatuses are well known in the art. It is within the skill of one of ordinary skill in this art to use such well known equipment to produce a cookie according to this invention, given the detailed specifications of the cookie as outlined above.

[0038] The examples which follow are intended as an illustration of certain preferred embodiments of the invention, and no limitation of the invention is implied.

EXAMPLE 1 - Cookie

[0039] A cookie having four projections and shown in Figure 1 was made using the ingredients listed in Table 1 below.

- 12 -

Table 1.

ingredient	% by weight
flour	56.47
sugar	11.86
high fructose corn syrup-41	7.91
partially hydrogenated soy bean oil-6027	11.29
corn flour	1.69
whey powder/non-fat dry milk	1.16
soda	0.14
salt	0.54
water	4.97
vanillin	0.11
soy lecithin	0.19
fortification blend	3.67
total	100

[0040] The cookie was formed in a rotary mold and baked in a 3-zone convection oven.

Milk Carrying Test

[0041] The cookie of Example 1 as well as an Oreo cookie were tested to determine how much milk could be carried upon dunking. Each cookie was held vertically at its top. A container of skim milk was placed on a scale and a weight taken. The cookie was then dipped into the milk up to where the fingers held the cookie. It was not held in the milk for any length of time. The milk and container were weighed again to determine the total weight of milk removed via the cookie. The results of this test over five trials for both the cookie of Example 1 and an Oreo are set forth in Table 2.

Table 2.

trial	milk (g) absorbed by cookie of Example 1	ratio of milk weight to cookie of Example 1 weight	milk (g) absorbed by Oreo	ratio of milk weight to Oreo weight
1	2.13	0.31:1	0.9	0.08:1
2	2.4	0.35:1	1.42	0.12:1
3	3.2	0.47:1	1.18	0.10:1
4	2.8	0.41:1	1.51	0.13:1
5	3.08	0.45:1	1.56	0.14:1

[0042] Upon observation immediately after dipping, the cookie of Example 1 had milk sitting on the surface of the cookie for a few seconds before absorbing into the surface. This was not observed for the Oreo; only milk absorbed in the Oreo during the dip was removed from the container.

[0043] As can be seen from the results of Table 2, the cookie of Example 1 consistently carried more milk than an Oreo cookie.

[0044] Other variations and modifications of this invention will be obvious to those skilled in this art. This invention is not to be limited except as set forth in the following claims.

- 14 -

WHAT IS CLAIMED IS:

1. A cookie having an upper surface, a lower surface, a top end, a bottom end, two side surfaces, a length L extending from the top end to the bottom end, a height H extending from the lower surface to the upper surface, a width W extending between the two side surfaces, and at least one projection extending from at least one of said upper and lower surfaces;

wherein each projection has a shape defined by angle x , angle y , length l , height h , and width w of the projection,

wherein each projection has a y surface which extends across the width w of the projection from a position of maximum height h of the projection sloping down toward the top end of the cookie and an x surface which extends across the width w of the projection from the position of maximum height h of the projection sloping down toward the bottom end of the cookie,

wherein angle x is the angle between a line parallel to a cookie surface drawn at the position of maximum height h of the projection and a line drawn along the x surface of the projection from the position of maximum height h ,

wherein angle y is the angle between a line perpendicular to a cookie surface drawn at the position of maximum height h of the projection and a line drawn along the y surface of the projection from the position of maximum height h ,

wherein an angle between the line drawn along the x surface of the projection from the position of maximum height h and a line drawn along the y surface of the projection from the position of maximum height h is at least 14° , wherein the ratio of l at a position of maximum length l to L ranges from 1:55 to 1:1.5, and

wherein the ratio of h at a position of maximum height h to H ranges from 1:7.2 to 1:0.67.

2. The cookie according to claim 1, wherein width W at the top end of the cookie is less than width W at the bottom end of the cookie.

- 15 -

3. The cookie according to claim 1, wherein width W ranges from about 5 mm to about 50 mm.
4. The cookie according to claim 1, wherein w is substantially equal to W.
5. The cookie according to claim 1, wherein length L ranges from about 5 mm to about 100 mm.
6. The cookie according to claim 1, wherein height H ranges from about 3 mm to about 20 mm.
7. The cookie according to claim 1, wherein angle x ranges from greater than 0° to about 90° and wherein angle y ranges from greater than 0° to less than 90°.
8. The cookie according to claim 7, wherein angle x is approximately 22° and wherein angle y is approximately 7°.
9. The cookie according to claim 1, wherein length l ranges from about 1.1 mm to about 40 mm.
10. The cookie according to claim 1, wherein height h ranges from about 1 mm to 10.8 mm.
11. The cookie according to claim 1, wherein the y surface of the at least one projection is concave.
12. The cookie according to claim 1, wherein at least one docker hole is present on the y surface of the at least one projection.

- 16 -

13. The cookie according to claim 12, wherein a diameter of the at least one docker hole ranges from about 0.1 mm to about 5 mm and wherein an inside wall of the at least one docker hole is angled at greater than 7° toward a center of the docker hole.

14. The cookie according to claim 1, wherein the shape of the projection is further defined by a step cut from at least one of the y surface and the x surface of the projection to the surface of the cookie from which the projection extends.

15. The cookie according to claim 1, wherein all edges are rounded.

16. The cookie according to claim 1, wherein said cookie comprises fat in an amount up to about 50% by weight of the cookie, sugar in an amount up to about 50% by weight of the cookie and leavening in an amount up to about 10% by weight of the cookie.

17. The cookie according to claim 1, wherein the at least one projection enhances the carrying of a material selected from the group consisting of milk, tea, coffee, yogurt, ice cream, and combinations thereof.

18. The cookie according to claim 1, wherein the cookie carries a material in an amount such that a ratio of a weight of the carried material to a weight of the cookie is at least 0.2:1.

19. A method of making a cookie according to claim 1 comprising the use of a rotary mold or extrusion apparatus.

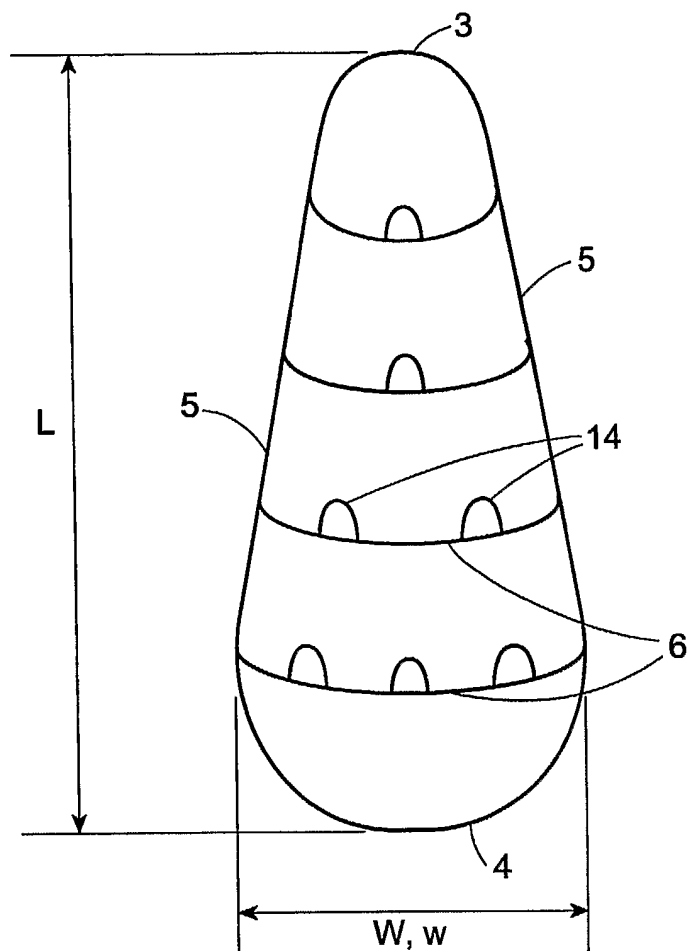
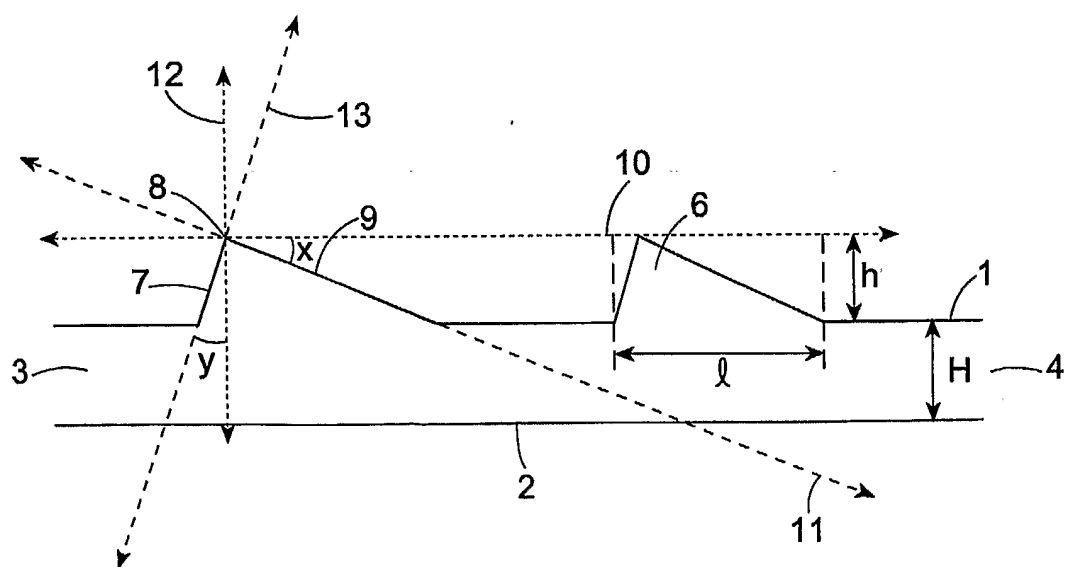
FIG. 1**FIG. 2**

FIG. 3

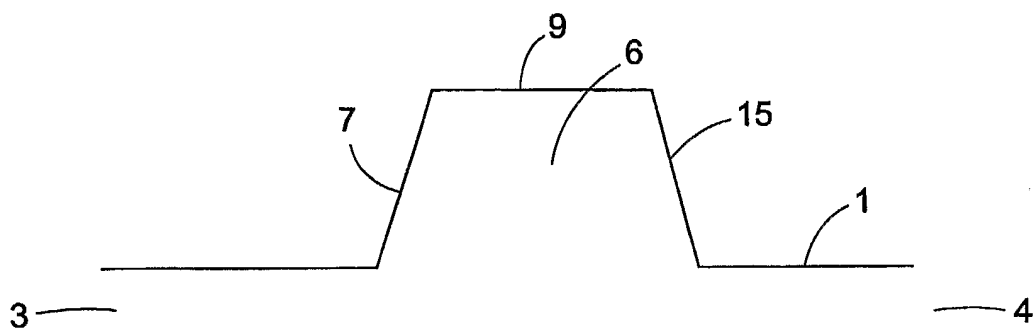


FIG. 4

