



(11) **EP 1 948 998 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
22.07.2009 Bulletin 2009/30

(21) Application number: **06827359.8**

(22) Date of filing: **02.11.2006**

(51) Int Cl.:
F21V 35/00 ^(2006.01)

(86) International application number:
PCT/US2006/042787

(87) International publication number:
WO 2007/056052 (18.05.2007 Gazette 2007/20)

(54) **CANDLEHOLDER WITH A MELTING PLATE ALIGNMENT FEATURE**

KERZENHALTER MIT EINEM SCHMELZPLATTENAUSRICHTUNGSMERKMAL

BOUGEOIR DOTE D' UN MECANISME D' ALIGNEMENT D' UN PLATEAU DE FUSION

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **10.11.2005 US 271356**

(43) Date of publication of application:
30.07.2008 Bulletin 2008/31

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to candleholders.

2. Description of the Background of the Invention

[0002] Many different assemblies for holding a candle are known. In one candle assembly, a wicked candle is disposed inside a cylindrical container having a recessed stepped ring encircling an open top end thereof. A circular shade body fits within the open top end and has an outer peripheral flange that rests on the recessed stepped ring.

[0003] Another candleholder includes a standard for receiving a candlestick, which extends from a base of the candleholder. The standard has a socket with an out-turned flange at an upper end thereof for receiving the candlestick therein. A funneled split tube is disposed in the socket. The split tube has an out-turned peripheral flange that rests on the out-turned flange of the socket. A cap spans the out-turned flange of the socket and rests on a peripheral edge thereof spaced above the split tube.

[0004] An electric candle is known that has a hollow cylindrical body portion extending up from a mounting base. A votive candle is carried within an open upper end of the body portion by a bracket having a plurality of arms extending radially outwardly from a central frustoconical rim. The votive is carried inside the rim, and the peripheral edges of the arms rest on a recessed inner annular rim at the open upper end of the body portion.

[0005] A candle having a constant elevation flame includes a wax body contained within a tubular outer casing. A spring urges the wax body upwardly toward a wick carried over an open end of the outer casing by a thermally-insulated cover. The wick extends through a central aperture in the cover and is retained at a constant elevational position by a wire. An outturned peripheral lip of the cover rests in a peripheral recess in the tubular casing.

GB 161 342 shows a candlestick with a dish having a central stem, which fits into the candlestick in the place of the normal candle. Chips of waste wax are placed in the dish and burned by the wick consisting of used matchsticks, which are held by a metal plate resting in the bottom of the dish. The stem of the dish is hollow. The metal plate is located by a shoulder on the dish, which corresponds to an annular depression in the underside of the metal plate. The metal plate itself has holes enabling liquid wax to pass through and form a pool on the surface of the dish. The pre-characterizing part of claim 1 is based on this document.

SUMMARY OF THE INVENTION

[0006] The invention provides a candleholder as defined in claim 1 below. Optional features are set out in the dependent claims.

[0007] Other aspects and advantages of the present invention will become apparent upon consideration of the figures and the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is an exploded isometric view of a candle assembly of an arrangement described in WO 2006/031669;

[0009] FIG. 2 is an isometric view of a candleholder according to another arrangement described in WO 2006/031669;

[0010] FIG. 3 is an exploded isometric view of a candleholder according to an embodiment of the present invention; and

[0011] FIG. 4 is an exploded cross-sectional view of the candleholder of FIG. 3 along a vertical plane at a centerline thereof.

DETAILED DESCRIPTION

[0012] Referring now to FIG. 1, a candle assembly 100 shown in more detail in document WO2006/031669 includes a support base 102, a melting plate 104, a wick holder 106, a wick 108, and a fuel element 110. The support base 102 carries the melting plate 104, which is generally saucer shaped, and includes a centrally disposed capillary pedestal 112. Optional decorative etchings 114 are disposed on an upper exposed surface of the melting plate 104 to provide enhanced attractiveness or visual information. The wick holder 106 includes a base portion 116 that fits over the capillary pedestal 112, a wick retainer sleeve in the shape of an elongate cylindrical barrel 118, and heat conductive elements, such as fins 120. The barrel 118 receives the wick 108 therein such that the wick extends from the base portion 116 with a portion of the wick exposed above the barrel. The fuel element 110 is disposed over and around the wick holder

106 and includes a duct or slot 122 through which the wick 108 extends. The slot 122 has a width w_1 sufficient to allow the wick 108 to extend through the slot and a length l_1 sufficient to accept at least a portion of the fins 120 therethrough. In one embodiment, the fuel element 110 has a mass of wax approximately 15 grams, and the melting plate candle 100 burns continuously between about 3 and 3 ½ hours on a single fuel element, such as the wax fuel element 110, before the fuel is completely consumed.

[0013] Turning now to FIG. 2, a candleholder 400 for a melting plate candle assembly according to another arrangement described in more detail in WO 2006/031669. It includes a holder or base 402 and a generally concave melting plate 404 carried within a recessed portion 406 of the base. A solid fuel element and wick holder similar to those already described herein that rest on the melting plate are not shown for purposes of clarity. The melting plate 404 has high thermal conductivity and is similar to other melting plates described previously herein, including a capillary pedestal 408 protruding upwardly therefrom at a centrally disposed wick location. The base 402 includes a wall 410 extending around and angularly disposed outwardly at a zenith angle θ from the melting plate 404 and having an uppermost or top edge 412 disposed above the melting plate. In one aspect, the base 402 and the melting plate 404 have a geometry that is adapted to increase or promote substantially laminar air flow (when surrounded by a calm atmospheric environment) over a pool of molten or liquefied fuel when a flame is disposed in close proximity above the pool during a burn, such as, for example, when a flame is present on a wick such as the wick 108. Such laminar air flow controls the overall temperature of the pool by reducing eddy currents over the pool and/or reducing or minimizing localized hot spots in the pool, which slows volatilization of active volatile ingredients in the fuel, such as a fragrance or insecticide, and thereby extends an effective fragrancing period of the fuel until the fuel is completely burned. When all the fuel is liquefied in the pool during the burn of the melting plate candle, air may be drawn in substantially laminar flow over the top edge 412 of the wall 410 into the recessed portion 406, over the melting plate 404 and a pool of liquefied fuel, such as melted wax, by a heat chimney, or upward air currents, caused by a flame on a wick (not shown) disposed over the capillary pedestal 408. The air currents ascending up the heat chimney also distribute the volatilized active ingredient into the surrounding environment.

[0014] In one embodiment, the base 402 and the melting plate 404 have a geometry to increase or promote substantially laminar air flow described by the following equations:

$$1. \quad 20,000 \text{ mm}^2 + (P_{\min}^2 - P_{\max}^2) \geq SA \geq 2,500 \text{ mm}^2 + (P_{\max}^2 - P_{\min}^2);$$

$$2. \quad D_{\max} \leq (SA/1,000 \text{ mm}) + \{[(H_{\min} - P_{\min})/2]\sin\theta\};$$

$$3. \quad P_{\min} \geq 6(D_p)(\cos\theta);$$

and/or

$$4. \quad H_{\min} \cong P_{\min} + 2[R + (D_p - R)\tan\theta];$$

in which:

$P_{\max}$ is a maximum width across the melting plate 404 in mm;

$P_{\min}$ is a minimum width across the melting plate 404 in mm;

SA is a projected surface area, or surface area of a two-dimensional projection of an outline, of the melting plate 404 in square millimeters;

$H_{\min}$ is a minimum width of the base 402 at the top edge 412 in mm;

D_p is a depth of the melting plate 404 from the top edge 412 of the base 402 in mm;

$D_{\max}$ is a maximum value for D_p in mm;

R is an outside radius of the upper edge of the base 402 in mm; and

θ is the zenith angle of the wall 410 in degrees.

[0015] Equation 1 quantifies an approximate relationship of the projected surface area of the melting plate and the width across the melting plate, within upper and lower constant boundaries, to promote the laminar air flow. Equation 2

quantifies an approximate relationship of the projected surface area of the melting plate 404 and the depth of the melting plate 404 from the top edge 412 of the base 402 to promote the laminar air flow. Equation 3 quantifies an approximate relationship of the minimum melting plate across the melting plate and the depth of the melting plate 404 from the top edge 412 of the base 402 and the zenith angle of the base wall 410 to promote the laminar air flow. Equation 4 quantifies an approximate minimum width of the base 402 at the top edge 412 as a function of the geometries of the melting plate 404 and the base to promote the laminar airflow. Although the equations 1-4 above have been described in relation to a generally rectangular base and holder, the relationships may also be used with other candleholder shapes, such as oval and circular, in order to approach an optimized candleholder geometry. For example, in one arrangement comprising a circular base and melting plate. Hmin is approximately 3.94" (100 mm), Pmax and Pmin are both equal to approximately 3.15" (80 mm), Dp is approximately 0.4" (10 mm), R is approximately 0.08" (2 mm), and θ is approximately 45°.

[0016] FIGS. 3 and 4 show a candleholder 500 embodying the present invention. it is generally similar to the candleholder 400 except that the candleholder 500 includes an alignment mechanism for ensuring proper alignment of a melting plate 504 with a base portion 502. The candleholder 500 includes the base portion 502 and the melting plate 504 for supporting a votive candle such as the combination of the fuel element 110, wick holder 106, and wick 108. The base portion 502 is made of a non-flammable material with low heat transmissivity, such as glass or ceramic, and the melting plate is made of a non-flammable material with high heat transmissivity, such as aluminum or other metal, although other materials may also be used. The base portion includes a recess 506 in a top end thereof defined by four upstanding sidewalls 508 and a medial wall 510 spanning the sidewalls spaced below an upper rim 512 of the sidewalls. A bottom end of the base 502 is hollow under the medial wall 510. It is to be understood that the specific shape and configuration of the sidewalls 508 and the bottom end of the base 512 may take almost any shape and form and are not limited to the specific shapes described herein. The melting plate 504 is dish- or bowl-shaped that concaves upwardly with a bottom surface shaped generally complementary to the recess 506 so as to be received in the recess in an operative position. The melting plate 504 has a generally square footprint with a relatively flat bottom wall 514 surrounded by a raised or upwardly curved peripheral portion 516 adjacent an outer peripheral edge 518 and a capillary lobe 520 protruding upwardly from a central portion of the bottom wall 518 for receiving the votive candle (not shown) disposed centrally thereon in a similar manner as described previously herein. An alignment mechanism for ensuring proper alignment of the melting plate 504 within the recess 506 of the base 502 includes a shoulder, such as horizontal step 522, that projects inwardly from an interior side 524 of the sidewalls and extends entirely around the recess 506, and a complementary ledge, such as horizontal ledge 526, that rests on the shoulder. The ledge 526 extends around the melting plate and is vertically disposed between the peripheral edge 518 and the bottom wall 514 of the melting plate 504 and rests on the horizontal step 522 with the peripheral edge pressed against the inner surface 524 of the sidewalls 508 around the entire recess 506. The entire melting plate, including the capillary lobe 520 and the peripheral edge 518, is disposed below the upper rim 512. The melting plate 504 is spaced above the medial wall 510 in the recess 506 with the raised peripheral edge portions 516 pressed against the inner surface 524 of the sidewalls 508 and the capillary lobe 520 projecting upwardly. The melting plate 504 is secured to the base 502 with a bead of adhesive, such as the adhesive 166 (not shown), disposed between the ledge 526 and the shoulder 522. The adhesive may also provide a seal between the peripheral edge 518 of the melting plate 504 and the interior surface 524 of the sidewalls 508 to prevent melted wax or other liquids from seeping under the melting plate. Other substantially complementary alignment configurations may also or alternatively be used for alignment mechanisms within the scope of the present invention. For example, the base shoulder may only include one or more discrete spaced apart step portions, and the melting plate ledge may be continuous or match the discrete ledge portions to provide only one possible correct mating fit between the melting plate and the base. In one embodiment, the alignment feature helps ensure that the melting plate 504 is located in a predetermined relation to the base 502 so that the bottom wall 514 of the melting plate is substantially level and spaced above the medial wall 510 to ensure that melted wax pools around the capillary lobe when the candleholder 450 is placed on a level support surface and minimize heat loss from the melted wax into the base. Of course, the alignment feature may be readily modified to cause a melting plate to rest within the recess in other alignment configurations, such as with the bottom wall 514 contacting the medial wall 510 and/or with the bottom wall 514 disposed at a non-level angle. In yet another embodiment (not shown), the alignment feature may include one or more raised protrusions disposed anywhere within the recess 506 that engage complementary ledges or cavities in the melting plate 504 so as to provide a predetermined alignment between the base 502 and the melting plate. Further, the protrusions may be integral with the base 502, or the protrusions may be formed by a separate object, such as a wire or button (not shown), placed in the cavity. Another alignment mechanism (not shown) within the scope of the present invention may include only one of the ledge and the shoulder without an opposing complementary shoulder or ledge, respectively, wherein the ledge or shoulder urges the melting plate into a predetermined alignment or orientation to the base.

[0017] A retainer feature for a magnet 528, such as a circular ring 530 projecting upwardly from a central area of the medial wall 510, is disposed below a cavity 532 in the bottom surface of the melting plate 504 underneath the capillary lobe 520. The ring 530 extends upwardly into the cavity 532 without engaging the bottom surface of the melting plate. The ring 530 acts as a retainer for the magnet 528, which is glued to the melting plate 504 inside the cavity 532, in case

the magnet should become unglued from the melting plate. In one embodiment, the ring 530 does not engage, or is spaced from, the bottom surface of the melting plate in order to minimize loss of heat from the melted wax to the base. The retainer is not limited to the specific circular ring form shown in the drawings, but may take other shapes that would help retain the magnet 528 in a predetermined position underneath the capillary lobe 520. For example, the retainer may be a plurality of spaced projections that partially surround the magnet 528, and the magnet may be shaped so as to interfit with the spaced projections in a predetermined orientation. In another example, the retainer may engage the bottom surface of the cavity 532 to help align the melting plate 504 within the recess 506 in addition to the shoulder 522 and ledge 526. In addition, the alignment feature and retainer feature may be readily adapted to work with any other combination of base and melting plate disclosed herein, such as the base 102 and circular melting plate 104, and are not limited to the particular base and melting plate of this embodiment.

[0018] The invention having been described in an illustrative manner, it is understood that the terminology used is intended to be in the nature of description rather than of limitation. The various components of the various melting plate candle assemblies described herein may be packaged as an assembled unit, as an unassembled kit including all or a portion of the components, as individual components, and in any combination thereof. Different and various combinations of the above-mentioned components of the various melting plate candle assemblies can also be used in the apparatuses, methods, kits, and combinations herein described. Other variations, modifications, and equivalents of the present invention possible in light of the above teachings are specifically included within the scope of the impending claims.

INDUSTRIAL APPLICABILITY

[0019] The candleholder of the present invention may be used to support a votive-type candle, such as the fuel element described herein, to provide rapid melting of the candle wax fuel charge and rapid dispersion of any volatile active contained in the fuel charge. Further, the alignment feature is useful for providing positive placement of a non-circular melting plate in a pre-determined location within a complementary recess, such as the generally square melting plate and recess shown in FIGS. 3 and 4. In addition, the retainer feature in one embodiment may help maintain a magnet in a predetermined location under the capillary lobe.

[0020] Numerous modifications to the present invention will be apparent to those skilled in the art in view of the foregoing description. Accordingly, this description is illustrative only and is presented for the purpose of enabling those skilled in the art to make and use the invention and to teach the best mode of carrying out the same. The exclusive rights to all modifications within the scope of the impending claims are reserved.

Claims

1. A candleholder for carrying a fuel element thereon, the candleholder comprising:

a base portion (502) including a sidewall defining a recess (506) at a top end of the base portion (502) and a shoulder (522) spaced from the top end projecting from the wall within the recess; and
 a melting plate (504) disposed within the recess (506) and adapted to retain the fuel element, the melting plate (504) having a peripheral edge and a ledge (526) spaced from the peripheral edge defined in a bottom surface of the plate, wherein the ledge (526) engages the shoulder (522); and
 a medial wall (510) spaced from the top end, the recess (506) defined by the sidewall (508) and the medial wall, the medial wall (510) defining a bottom of the recess;
characterized in that the candle holder further comprises a retainer (530) projecting from the medial wall (510) into the recess (506); and
 a cavity (532) defined in the bottom surface of the melting plate (504), wherein the retainer (530) is disposed inside the cavity (532).

2. The candleholder of claim 1, wherein the melting plate (504) is spaced from the medial wall (510).

3. The candleholder of claim 1, wherein the retainer (530) at least partly surrounds a magnet (528) disposed in the cavity.

4. The candleholder of claim 3, wherein the retainer (530) comprises a circular, ring-shaped protrusion.

5. The candleholder of claim 4, wherein the retainer (530) is spaced from the bottom surface (514) of the melting plate (504).

6. The candleholder of claim 1, wherein the melting (504) plate has a substantially non- circular peripheral footprint.

7. The candleholder of claim 6, wherein the ledge (526) extends entirely around a central portion of the melting plate (504).
8. The candleholder of claim 7, wherein the sidewall (508) extends entirely around the recess (506), and the shoulder (522) extends entirely around the recess (506).
9. The candleholder of claim 1, wherein the ledge (526) is disposed in an upturned peripheral portion.
10. The candleholder of claim 1 further comprising an adhesive disposed between the ledge (526) and the shoulder (522).
11. The candleholder of claim 10, wherein the adhesive forms a seal between the melting plate (504) and the base portion (502), the seal extending completely around the melting plate (504).

Patentansprüche

1. Kerzenhalter zur Aufnahme eines Brennstoffelements, wobei der Kerzenhalter Folgendes umfasst:

ein Unterteil (502) mit einer Seitenwand, die am oberen Ende des Unterteils (502) eine Aussparung (506) und eine vom oberen Ende beabstandete Schulter (522) definiert, die von der Wand innerhalb der Aussparung hervorspringt; und
eine Schmelzplatte (504), die in der Aussparung (506) angeordnet und geeignet ist, das Brennstoffelement aufzunehmen, wobei die Schmelzplatte (504) eine Umfangskante und einen von der Umfangskante beabstandeten Absatz (526) aufweist, der auf einer Bodenfläche der Platte definiert ist, wobei der Absatz (526) mit der Schulter (522) in Eingriff steht; und
eine vom oberen Ende beabstandete Mittelwand (510), wobei die Aussparung (506) durch die Seitenwand (508) und die Mittelwand definiert wird, wobei die Mittelwand (510) einen Boden der Aussparung definiert;
dadurch gekennzeichnet, dass der Kerzenhalter weiterhin einen Halter (530), der von der Mittelwand (510) in die Aussparung (506) hervorspringt; und
einen Hohlraum (532) aufweist, der in einer Bodenfläche der Schmelzplatte (504) definiert ist, wobei der Halter (530) innerhalb des Hohlraums (532) angeordnet ist.

2. Kerzenhalter nach Anspruch 1, bei dem die Schmelzplatte (504) von der Mittelwand (510) beabstandet ist.
3. Kerzenhalter nach Anspruch 1, bei dem der Halter (530) mindestens zu einem Teil einen Magneten (528) umgibt, der in dem Hohlraum angeordnet ist.
4. Kerzenhalter nach Anspruch 3, bei dem der Halter (530) einen kreisförmigen, ringförmigen Vorsprung umfasst.
5. Kerzenhalter nach Anspruch 4, bei dem der Halter (530) von der Bodenfläche (514) der Schmelzplatte (504) beabstandet ist.
6. Kerzenhalter nach Anspruch 1, bei dem die Schmelzplatte (504) eine im Wesentlichen nicht-kreisförmige Umfangs-Anschlussfläche aufweist.
7. Kerzenhalter nach Anspruch 6, bei dem sich der Absatz (526) gänzlich um einen zentralen Abschnitt der Schmelzplatte (504) erstreckt.
8. Kerzenhalter nach Anspruch 7, bei dem sich die Seitenwand (508) gänzlich um die Aussparung (506) erstreckt, und bei dem sich die Schulter (522) gänzlich um die Aussparung (506) erstreckt.
9. Kerzenhalter nach Anspruch 1, bei dem der Absatz (526) in einem nach oben gewandten Umfangsabschnitt angeordnet ist.
10. Kerzenhalter nach Anspruch 1, der weiterhin ein Klebemittel aufweist, das zwischen dem Absatz (526) und der Schulter (522) angeordnet ist.
11. Kerzenhalter nach Anspruch 10, bei dem das Klebemittel eine Abdichtung zwischen der Schmelzplatte (504) und

dem Unterteil (502) bildet, wobei sich die Abdichtung komplett um die Schmelzplatte (504) erstreckt.

Revendications

1. Bougeoir pour supporter un élément combustible dessus, le bougeoir comprenant :

une partie de base (502) incluant une paroi latérale définissant un évidement (506) en une extrémité supérieure de la partie de base (502) et un épaulement (522) espacé de l'extrémité supérieure faisant saillie depuis la paroi dans l'évidement ; et
une plaque de fusion (504) disposée dans l'évidement (506) et adaptée pour retenir l'élément combustible, la plaque de fusion (504) ayant un bord périphérique et un rebord (526) espacé du bord périphérique défini dans une surface inférieure de la plaque, dans lequel le rebord (526) vient en prise avec l'épaulement (522) ; et
une paroi intermédiaire (510) espacée de l'extrémité supérieure, l'évidement (506) étant défini par la paroi latérale (508) et la paroi intermédiaire, la paroi intermédiaire (510) définissant un fond de l'évidement ;
caractérisé en ce que le bougeoir comprend en outre un élément de retenue (530) faisant saillie depuis la paroi intermédiaire (510) dans l'évidement (506) ; et
une cavité (532) définie dans la surface inférieure de la plaque de fusion (504), dans lequel l'élément de retenue (530) est disposé à l'intérieur de la cavité (532).

2. Bougeoir selon la revendication 1, dans lequel la plaque de fusion (504) est espacée de la paroi intermédiaire (510).

3. Bougeoir selon la revendication 1, dans lequel l'élément de retenue (530) entoure au moins en partie un aimant (528) disposé dans la cavité.

4. Bougeoir selon la revendication 3, dans lequel l'élément de retenue (530) comprend une saillie circulaire, en forme d'anneau.

5. Bougeoir selon la revendication 4, dans lequel l'élément de retenue (530) est espacé de la surface inférieure (514) de la plaque de fusion (504).

6. Bougeoir selon la revendication 1, dans lequel la plaque de fusion (504) a une empreinte périphérique sensiblement non circulaire.

7. Bougeoir selon la revendication 6, dans lequel le rebord (526) s'étend entièrement autour d'une partie centrale de la plaque de fusion (504).

8. Bougeoir selon la revendication 7, dans lequel la paroi latérale (508) s'étend entièrement autour de l'évidement (506), et l'épaulement (522) s'étend entraînement autour de l'évidement (506).

9. Bougeoir selon la revendication 1, dans lequel le rebord (526) est disposé dans une partie périphérique tournée vers le haut.

10. Bougeoir selon la revendication 1 comprenant en outre un adhésif disposé entre le rebord (526) et l'épaulement (522).

11. Bougeoir selon la revendication 10, dans lequel l'adhésif forme un joint entre la plaque de fusion (504) et la partie de base (502), le joint s'étendant complètement autour de la plaque de fusion (504).

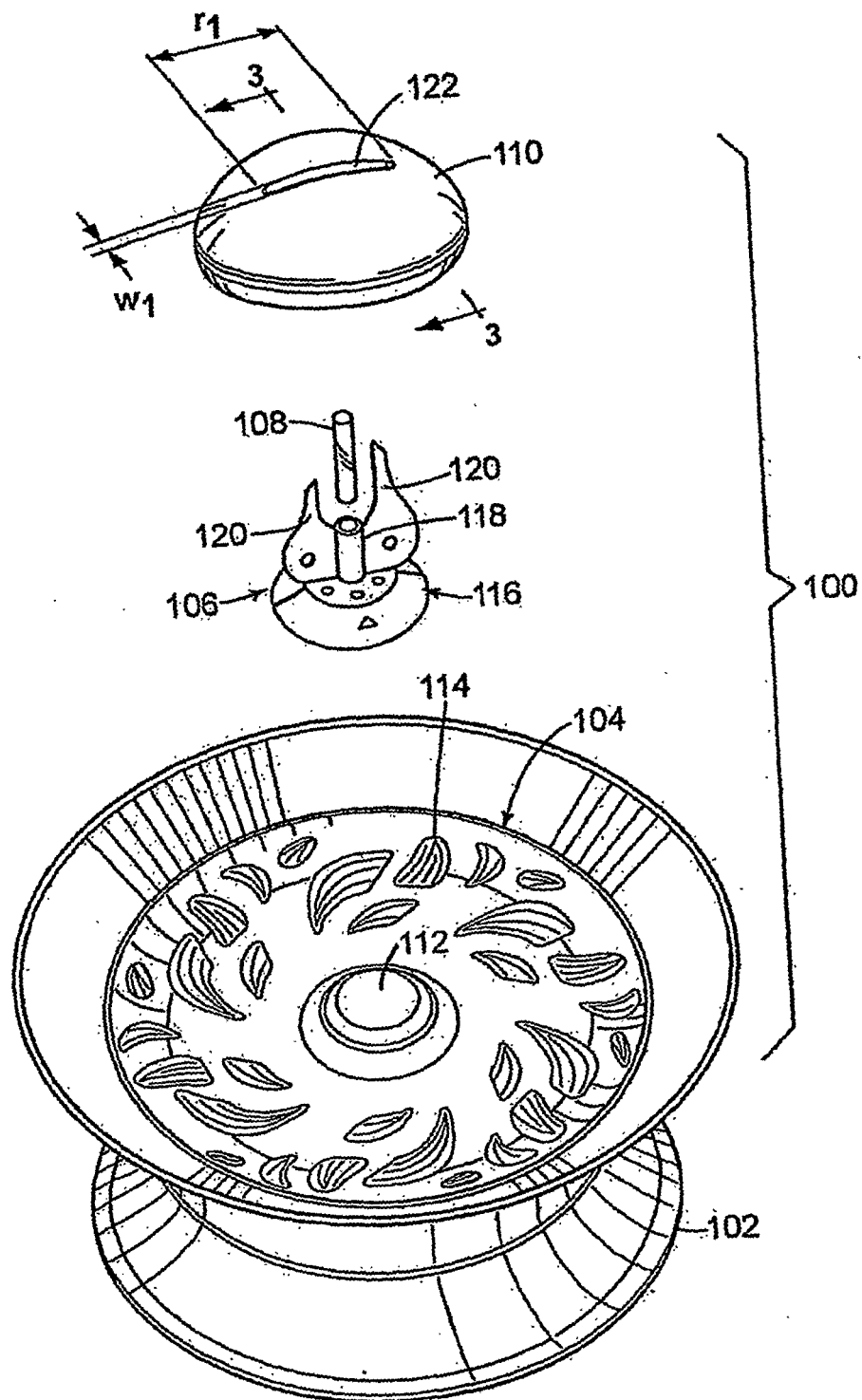


FIG. 1

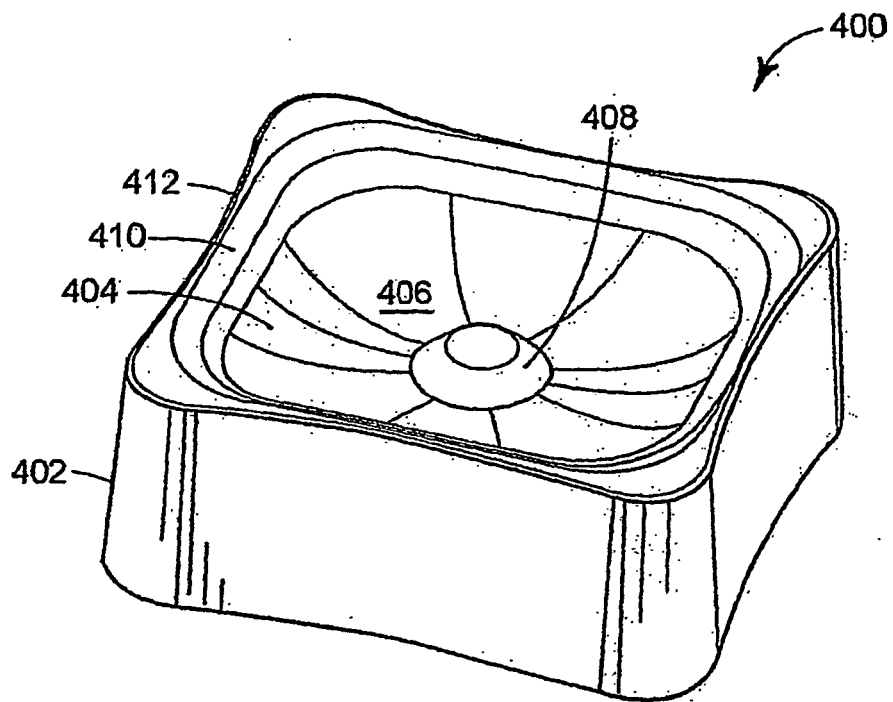


FIG. 2

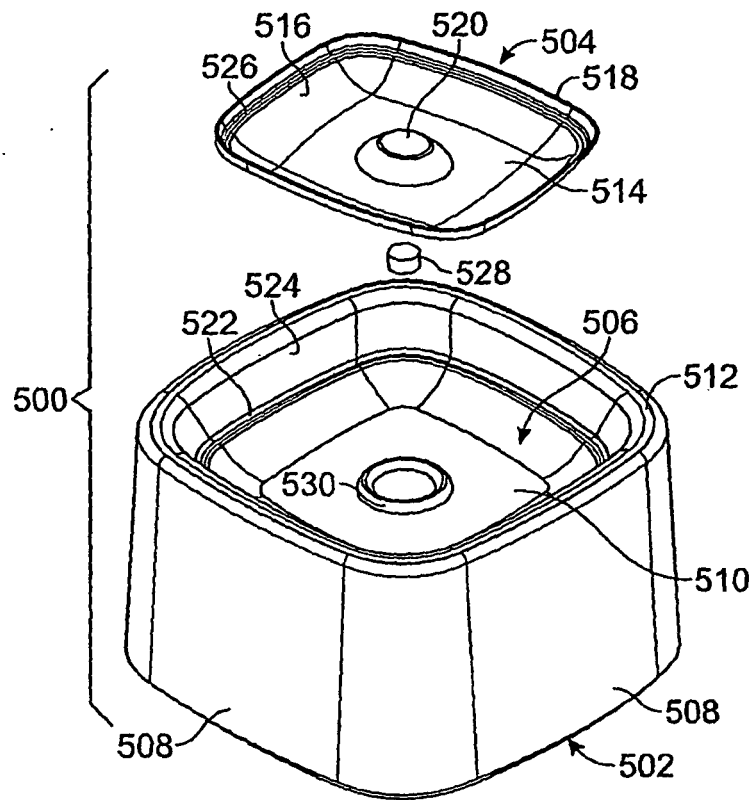


FIG. 3

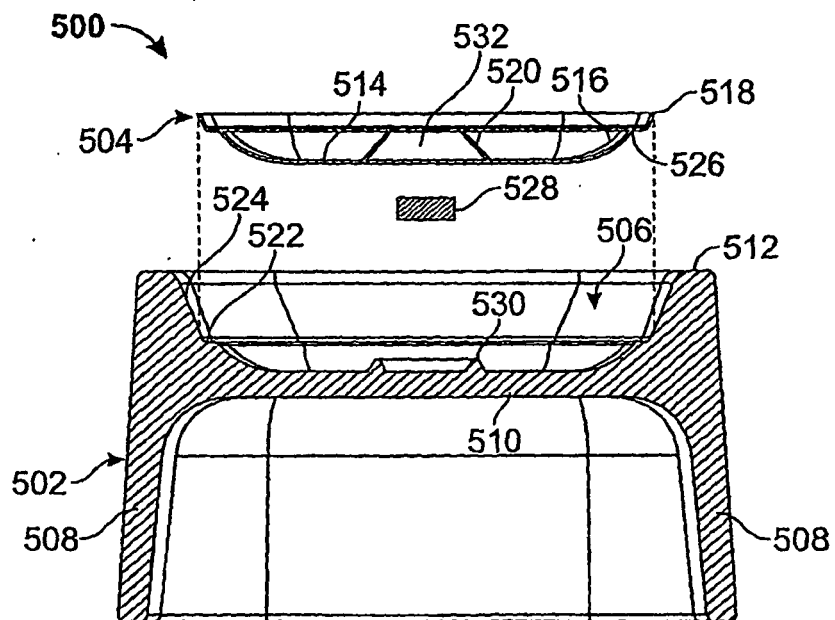


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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.

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