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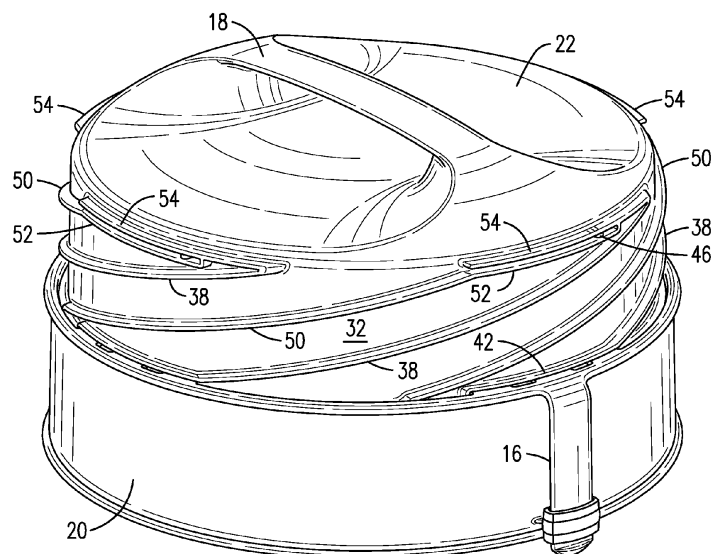
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(54) Expanding food storage container

(57) An expanding food storage container (10) includes a base (12) and a cover (14). The cover (14) includes a support ring (20) and a dome (22) having a side wall (32) closely received in the support ring (20). The support ring (20) includes spaced tabs (30) extending toward the side wall (32) of the dome (22). The outer face of the dome sidewall (32) includes a plurality of camming threads (38) and support threads (50) extending outward along helical paths. There is a pair of threads (38, 50) for each tab (30), with the threads (38, 50) spaced peripherally to closely receive the associated tab (30) therebetween. Rotation of the dome (22) with respect to the sup-

port ring (20) causes the threads (38, 50) to ride up or down the tabs (30), raising or lowering the dome (22) with respect to the support ring (20). The upper and lower ends of the threads (38, 50) include a horizontal slot which closely receives the associated tab (30). The tab (30) includes a depression (47) near its end which receives a lock button (46) extending outward from the dome sidewall (32) within the slot. The lock button (46) may be selectively received within the depression (46) to selectively secure the dome (22) in the expanded or collapsed position.

**FIG. 2****EP 2 792 608 A1**

Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is related to co-pending attorney reference number 131740 - D200, which is incorporated by reference herein.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

[0002] Not applicable.

BACKGROUND OF THE INVENTION

[0003] The present invention relates in general to household food storage containers. In particular, the present invention relates to an improved food storage container which may expand or retract as needed for storage or use.

[0004] It is well known to provide a base with cover to store or transport food. The cover may of course be removed for displaying or serving the food in the base. One common problem with this arrangement is the need to accommodate different amounts of food. For example, a base may have a cover which is slightly domed, defining together an enclosed space for storage. However, some larger food items, such as a roast or a tall cake, may not fit within this enclosed space. The usual solution to this problem is to provide a second cover having a larger dome which will accommodate the larger food item. This solution has drawbacks as it requires the purchase of a second cover, as well as increased storage space needed for the two covers.

[0005] According to the present invention, there is provided an expanding food storage container, comprising: a base and a cover, said cover being formed of a dome and a ring wall.

[0006] Preferably, a series of support threads is provided between said dome and said ring wall.

[0007] Alternatively, a series of support threads is provided on said dome; and a tab is provided on said cover; and

said tab is spaced and located to engage said series of support threads; and

said tab and said series of threads are located so that rotation of said dome relative to said ring wall causes said series of threads to rotate relative to said tab and cause said dome to move longitudinally upward or downward with respect to said ring wall.

[0008] Conveniently, a resting land is provided to prevent continued upward or downward movement of said dome with respect to said ring.

[0009] Advantageously, a resting upper land is provided to prevent continued upward or downward movement of said dome with respect to said ring; and

a resting lower land is provided to prevent continued upward or downward movement of said dome with respect

to said ring.

[0010] Preferably, a resting lower land is provided to prevent continued upward or downward movement of said dome with respect to said ring.

[0011] Conveniently, a lock button is formed on the dome, and continued rotation of said dome relative to said ring wall causes said tab to ride over said lock button and due to elastic deformation serve to selectively hold said dome against unintended rotation.

[0012] Advantageously, a lock button is formed on the dome, and continued rotation of said dome relative to said ring wall causes said tab to ride over said lock button and due to elastic deformation serve to selectively hold said dome against unintended rotation.

[0013] Conveniently, a lock button is formed on the dome, and continued rotation of said dome relative to said ring wall causes said tab to ride over said lock button and due to elastic deformation serve to selectively hold said dome against unintended rotation.

SUMMARY OF THE INVENTION

[0014] An object of the present invention is to provide an expanding food storage container with a base and a cover where the cover may selectively expand or collapse as needed.

[0015] Another object of the present invention is to provide a cover for a food storage container which may expand or collapse as needed.

[0016] A further object of the present invention is to provide such an expanding cover which may be locked in the expanded or collapsed positions.

[0017] Yet another object of the present invention is to provide such an expanding cover which may suspend the entire container and food in either the expanded or collapsed positions.

[0018] These and other objects are achieved by an expanding food storage container. The cover includes a support ring and a dome having a side wall closely received in the support ring. The support ring includes spaced tabs extending toward the side wall of the dome. The outer face of the dome sidewall includes a plurality of camming threads and support threads extending outward along helical paths. There is a pair of threads for each tab, with the threads spaced peripherally to closely receive the associated tab therebetween. Rotation of the dome with respect to the support ring causes the threads to ride up or down the tabs, raising or lowering the dome with respect to the support ring. The upper and lower ends of the threads include a horizontal slot which closely receives the associated tab. The tab includes a depression near its end which receives a lock button extending outward from the dome sidewall within the slot. The lock button may be selectively received within the depression to selectively secure the dome in the expanded or collapsed position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The objects and features of the invention noted above are explained in more detail with reference to the drawings, in which like reference numerals denote like elements, and in which:

FIG. 1 is a top perspective view of the collapsible food storage container according to the present invention in the collapsed configuration;

FIG. 2 is a top perspective view of the container cover in the expanded configuration;

FIG. 3 is an exploded top perspective view thereof;

FIG. 4 is a side view of the container cover the expanded configuration;

FIG. 5 is a detailed cross-sectional view along line 5 - 5; and

FIG. 6 is a detailed cross-sectional view along line 6 - 6.

DETAILED DESCRIPTION OF THE INVENTION

[0020] With reference to FIG. 1, a collapsible food storage container according to the present invention is generally designated by reference numeral 10. The container 10 generally includes a base 12 and a cover 14. The base 12 is shown as a generally flat disc in Fig. 1, but could alternatively be a shallow or deep bowl. The cover 14 may be secured to the base 12, such as by a peripheral interlocking seal commonly known for food storage containers, a series of locking clamp tabs, etc. as are known in the art. In the preferred embodiment cover 14 is selectively secured to base 12 by a known arrangement of a locking tongue 16 received within a mating aperture in the base 12, as shown in US D389,018. As will be discussed more fully below, securing the cover 14 to the base 12 allows the user to lift the entire unit (with food inside) using a handle 18 on the top of cover 14.

[0021] As the base may be of a variety of forms, and the invention resides mainly in the cover 14, the description below and the majority of the Figures will focus on cover 14. The cover 14 includes a support ring 20 upon which is mounted a dome 22, both of which are preferably formed of a suitable plastic. The support ring 20 generally takes the form of a section of a cylinder, with a cylindrical ring wall 24 having an upper end 26 and lower end 28. As is best shown in Fig. 3, cover 14 includes at least two tabs 30 spaced about the periphery of the upper end 26 and extending radially inward.

[0022] The dome 22 includes a generally cylindrical side wall 32 having an upper end 34 and lower end 36. The ring wall 24 and the side wall 32 are sized such that one will closely fit within the other but still allow free relative rotation and longitudinal movement between the two. A series of camming threads 38 extend radially outward from side wall 32 and have a helical form as they extend from a position at or near the upper end 34 to the lower end 36 in a manner similar to screw threads. The

tabs 30 on the support ring and the threads 38 extend toward one another and are sized so as to overlap. The threads 38 are also spaced about the periphery of the side wall 32 in a like manner corresponding to the spacing of the tabs 30, and it is desired that there be at least one thread 38 associated with each tab 30. Further, where there is one thread associated with each tab 30, the threads 38 will all be spaced so as to contact a like edge of their associated tab 30. For example, in the preferred embodiment shown, the threads are right-handed, and when viewed from above the threads 38 will all engage the tabs 30 at the right hand edge of the tabs 30 such that the camming thread 38 lies above (rather than below) the tab 30. Stated another way, the camming threads 38 will each contact a leading edge 40 of the tabs 30.

[0023] Given the overlapping nature of the threads 38 to the tabs 30 it may be envisioned that the dome 22 is supported by the underside of threads 38 resting upon the associated tabs 30 at the leading edge 40. It may also be envisioned that manual rotation of the dome 22 relative to the support ring will cause the dome 22 to move longitudinally upward or downward with respect to the support ring 20 in a manner similar to the screw moving inward or outward during placement or removal. In this way, it may be seen that the cover 14 may be moved from a collapsed configuration where the dome 22 is mainly received within the support ring 20 (Fig. 1) to an expanded configuration where the dome 22 extends upward beyond the support ring 20 (Fig. 2). With this expansion or collapse, it may be seen that the volume enclosed within the cover 14 will increase as the cover 14 expands and decrease as it collapses.

[0024] The tabs 30 and the camming threads 38 will support the dome 22 and hold it against gravity relative to the support ring 20. However, the camming threads 38 are inclined, and this support may not be as stable as desired. To help hold the dome 22 in the expanded position, one or more of the camming threads 38 may transition to a lower resting land 42. Each of the lower resting lands 42 takes the form of a radially outward ledge extending horizontally about a portion of the periphery of the dome side wall 32 parallel to the lower end 36. The depth of the lands 42 are preferably equal to that of the camming threads 38. The length of the resting lands 42 is such to allow the tabs 30 to be received thereunder a sufficient amount so as to provide a stable resting position against gravity for the dome 22 when in the expanded position of Figs 2 and 4.

[0025] While not required, it is preferred that the resting lands 42 be spaced from the lower end 36, and that the lower end 36 include a peripheral flange 44 extending radially outward therefrom and having a depth similar to that of the lands 42. The spacing between the lands 42 and the peripheral flange preferably forms a close sliding fit about the associated tabs 30. This will provide a stable feel for the user when in the expanded position.

[0026] It is also possible to form a lock button 46 protruding radially outward from the dome side wall 32 at a

position between the resting lands 42 and the peripheral flange 44. The tab 30 would then include a mating depression 47 extending radially inward. As may be envisioned, rotation of the dome 22 with respect to the ring 20 would cause the tabs 30 to move into the slots formed between the lands 42 and the flange 44, with continued rotation causing the tab 30 to ride over the lock button 46 due to elastic deformation until that button 46 is received within the mating depression 47. This would serve to selectively hold the dome 22 against unintended rotation. Further, the tabs 30 being closely received between the lands 42 and flange 44 would prevent upward or downward movement of the dome 22 relative to the ring 20. In this manner, the cover 14 may be placed into a very secure expanded position. In fact, this can be so secure as to allow carrying of the fully loaded container 10 in this expanded position. Even so, the user may manually turn the dome 22 in the opposite direction to cause the tab 30 to again ride over the button 46 to release the dome and allow it to move to the collapsed position.

[0027] While moving between the expanded and collapsed positions the camming threads 38 will support the dome 22 against gravity as described. However, there may be a tendency for the user to lift the dome 22 during rotation, causing the camming threads 38 to disengage from the tabs 30 and giving a loose feel to the container 10. To avoid this, it is possible to space the camming threads a distance approximately equal to the length of the tabs 30 (not shown). In this manner the leading edge 40 of the tabs 30 would support the under side of a first camming thread 38, while a trailing edge 48 of the same tab 30 would be closely adjacent to the upper side of the next adjacent camming thread 38. This arrangement would be repeated about the cover 14. As may be imagined, this would greatly reduce the amount of free vertical movement between the dome 22 and ring 20, forcing a smooth rise and fall of the dome 22 with its rotation.

[0028] While it is preferred to have this smooth rise and fall with rotation, for reasons made clear below it is not preferred to space the threads 38 equal to the tabs 30. Instead, it is preferred that the camming threads 38 be spaced twice the length of the tabs 30. To still have this smooth rise and fall, the dome side wall 32 further includes a plurality of support threads 50 extending radially therefrom. These support threads 50 are equal in number to the camming threads 38 and have a substantially identical depth and incline to threads 38, but with each of the support threads 50 being spaced from its associated camming thread 38 by a distance just slightly greater than the length of the tab 30. As such, there will be an alternating arrangement of camming thread 38, support thread 50, camming thread 38, support thread 50, etc. about the periphery of dome side wall 32. In a manner similar to that described above, the leading edge 40 of a tab 30 will be in close proximity or contact with the under side of the associated camming thread 38, while the trailing edge 48 of the tab 30 will be in close proximity or contact with the upper side of the associated support

thread 50. As with the first described arrangement, this would greatly reduce the amount of free vertical movement between the dome 22 and ring 20, forcing a smooth rise and fall of the dome 22 with its rotation.

[0029] In a manner similar to that described above for the camming thread 38, it is preferred that one or more of the support threads have an upper resting land 52 transitioning therefrom, and extending in the opposite radial direction to that of the lower resting lands 42. The upper lands 52 would preferably have a similar length to that of the lower lands 42. As may be envisioned, these upper lands 52 would prevent continued upward or downward movement of the dome 22 with respect to the ring 20. Also similarly to the previous arrangement, an upper peripheral flange 54 extends radially outward from the upper end 34 of the dome side wall 32, thus combining with the upper resting lands 52 creating one or more slots to receive the tab 30 when in the collapsed position. Also as before, a lock button 46 may protrude from the dome side wall 32 within this slot so as to selectively mate with a depression 56 in the outer face of the tab 30.

[0030] The tab 30 may include one centrally located mating depression, such that the depression 47 and the depression 56 are one and the same and would mate with either the upper or the lower lock button 46. In practice, however, this is not preferred, and the tab 30 would include separate depressions 47 and 56 each located near a respective end of the tab 30. This is because the tab 30 must ride over the button 46 via elastic deformation of the tab 30 (or more likely the entire ring wall 24). To provide the desired strength, however, it is desired that the tabs 30 be relatively long. As such, it is preferred that the two depressions be used at positions relatively close to the ends of the tab 30 to make this locking function easier to perform for the user.

[0031] Yet another variation is preferred for the container 10, this one allowing improved assembly. As may be envisioned, to initially assemble the dome 22 with the ring 20 the tabs 30 must elastically deform to ride over either the peripheral flange 44 or the upper peripheral flange 54. To avoid this, it is preferred that the upper peripheral flange be discontinuous, as shown. In particular, the upper peripheral flange would be present only in those areas immediately over the upper resting lands 52. This will form gaps or openings in the upper flange 54 corresponding to the pairs of threads 38 and 50 which contain the tabs 30. As such, the dome 22 could freely fall downward relative to the ring 20 when so aligned. When the ring 20 is mounted to the base 12 this is prevented by the base blocking this motion. However, when the cover 14 is removed from the base 12, this assembly or disassembly of the dome 22 from the ring 20 becomes quite simple.

[0032] As may be seen, with this arrangement the dome 22 may be locked in either the expanded or the collapsed positions due to engagement of the buttons 46 with the appropriate depressions 47 or 56, and with the resting lands and peripheral flanges fully supporting the

tabs 30. In this manner, the user may lift, carry and transport the container 10 using handle 18 in both the collapsed and the expanded condition. Further, even during the rotating transition between expanded and collapsed positions the container will feel stable due to the use of the camming threads 38 and support threads 50 each closely receiving the tabs 30.

[0033] From the foregoing it will be seen that this invention is one well adapted to attain all ends and objects set forth above together with the other advantages which are inherent within its structure.

[0034] It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

[0035] Since many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth of shown in the accompanying drawings is to be interpreted as illustrative, and not in a limiting sense.

[0036] When used in this specification and claims, the terms "comprises" and "comprising" and variations thereof mean that the specified features, steps or integers are included. The terms are not to be interpreted to exclude the presence of other features, steps or components.

[0037] The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

Claims

1. An expanding food storage container, comprising:

a base and a cover, said cover being formed of a dome and a ring wall.

2. An expanding food storage container as in claim 1, wherein:

a series of support threads is provided between said dome and said ring wall.

3. An expanding food storage container as in claim 1, wherein:

a series of support threads is provided on said dome; and
a tab is provided on said cover; and
said tab is spaced and located to engage said series of support threads; and
said tab and said series of threads are located

so that rotation of said dome relative to said ring wall causes said series of threads to rotate relative to said tab and cause said dome to move longitudinally upward or downward with respect to said ring wall.

4. An expanding food storage container as in claim 3, wherein:

a resting land is provided to prevent continued upward or downward movement of said dome with respect to said ring.

5. An expanding food storage container as in claim 3, wherein:

a resting upper land is provided to prevent continued upward or downward movement of said dome with respect to said ring; and
a resting lower land is provided to prevent continued upward or downward movement of said dome with respect to said ring.

6. An expanding food storage container as in claim 3, wherein:

a resting lower land is provided to prevent continued upward or downward movement of said dome with respect to said ring.

7. An expanding food storage container as in claim 6, wherein:

a lock button is formed on the dome, and continued rotation of said dome relative to said ring wall causes said tab to ride over said lock button and due to elastic deformation serve to selectively hold said dome against unintended rotation.

8. An expanding food storage container as in claim 5, wherein:

a lock button is formed on the dome, and continued rotation of said dome relative to said ring wall causes said tab to ride over said lock button and due to elastic deformation serve to selectively hold said dome against unintended rotation.

9. An expanding food storage container as in claim 4, wherein:

a lock button is formed on the dome, and continued rotation of said dome relative to said ring wall causes said tab to ride over said lock button and due to elastic deformation serve to selectively hold said dome against unintended rotation.

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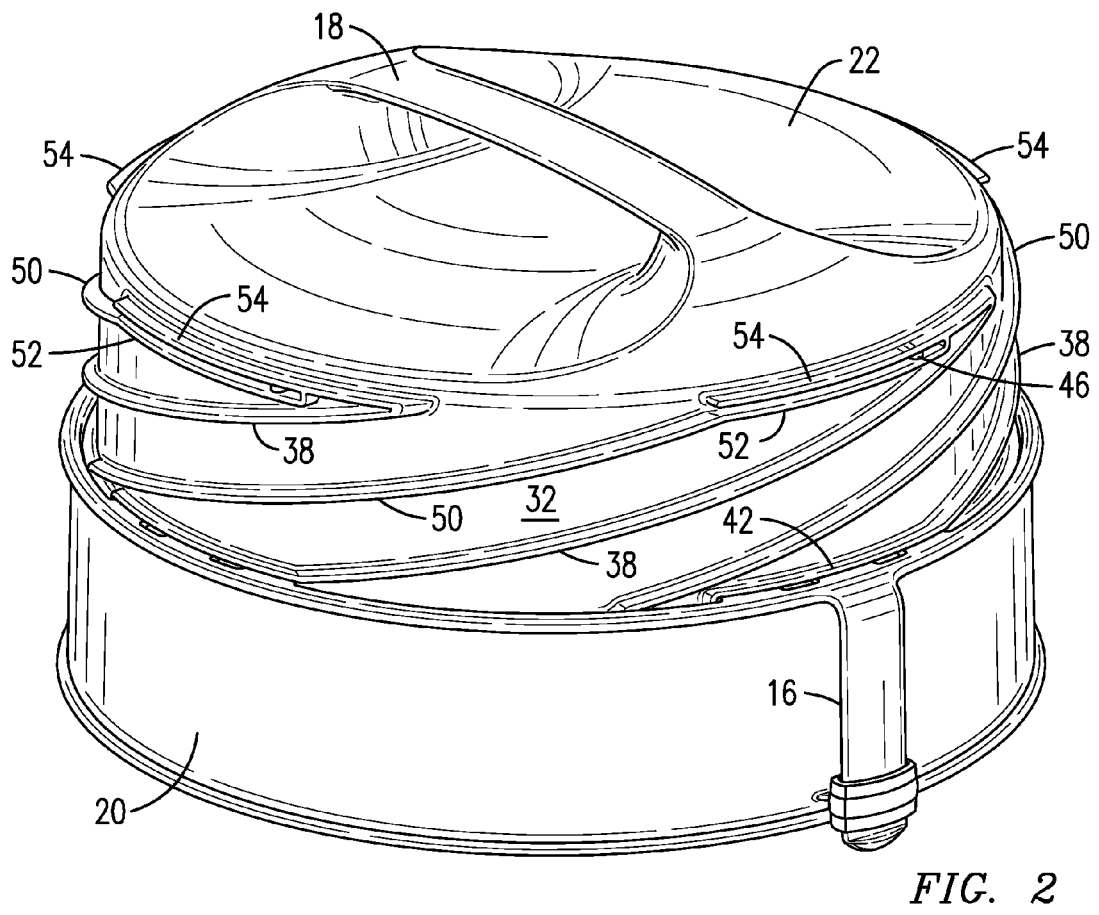
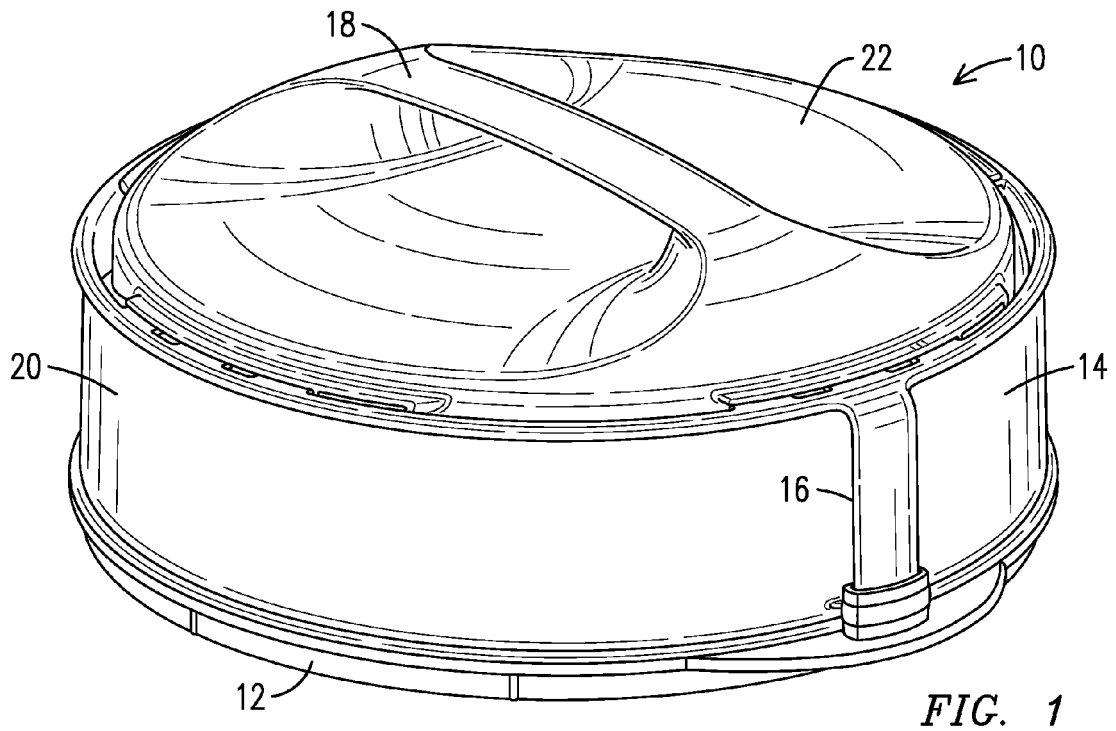
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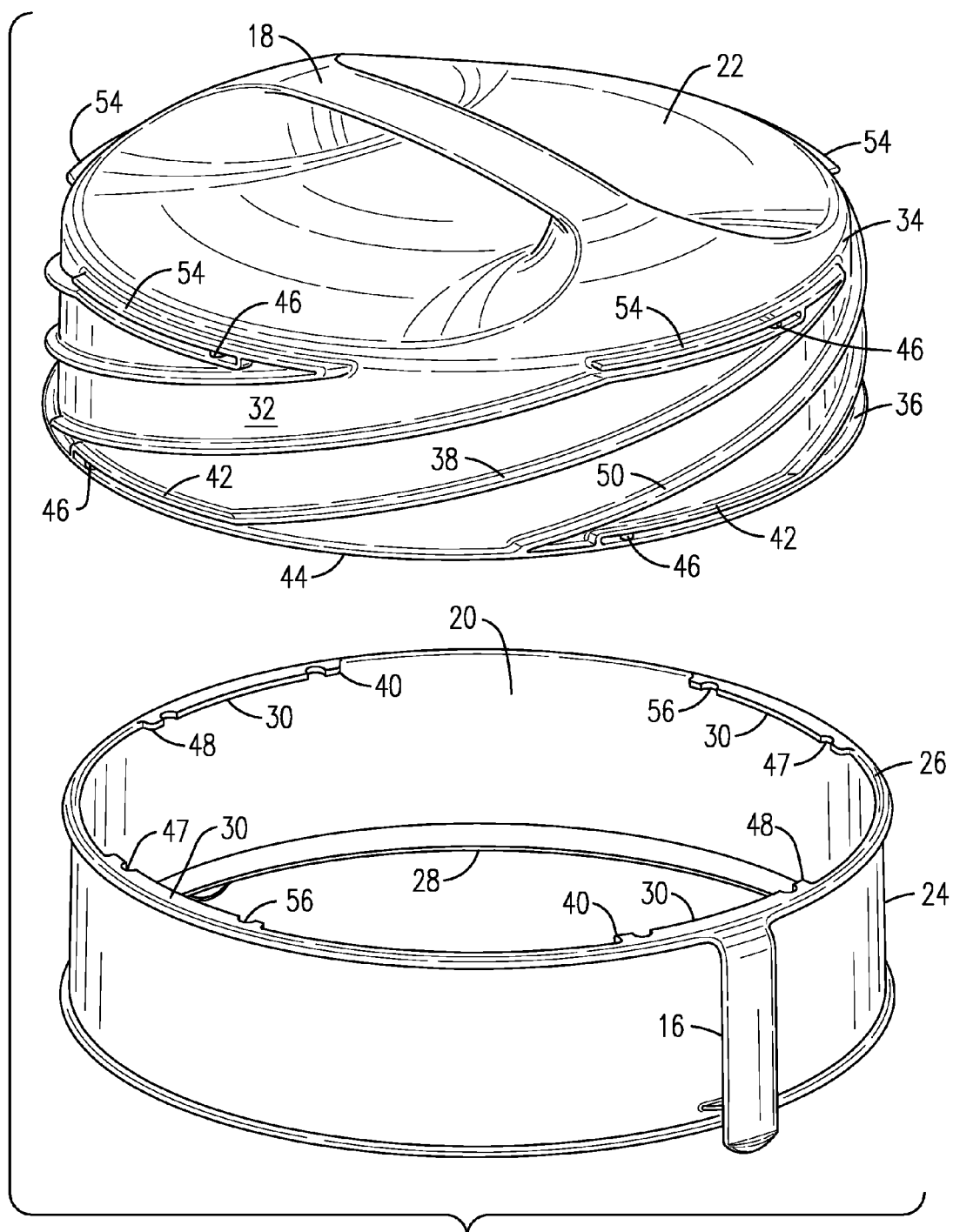


FIG. 3

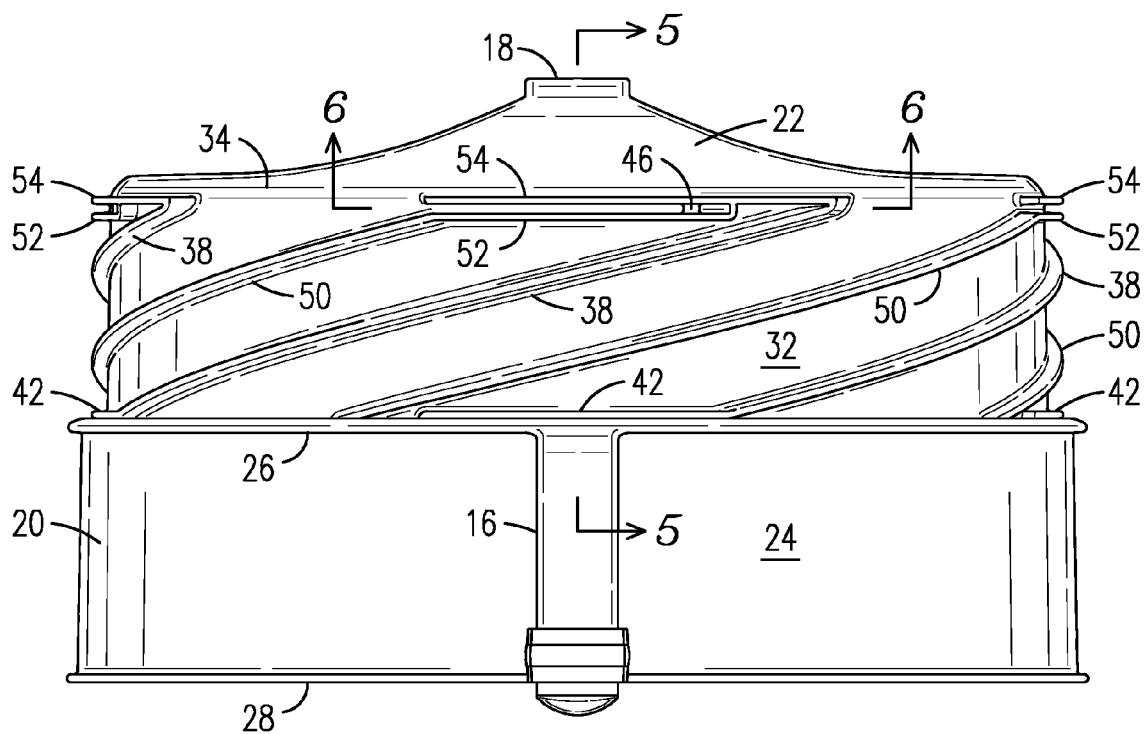


FIG. 4

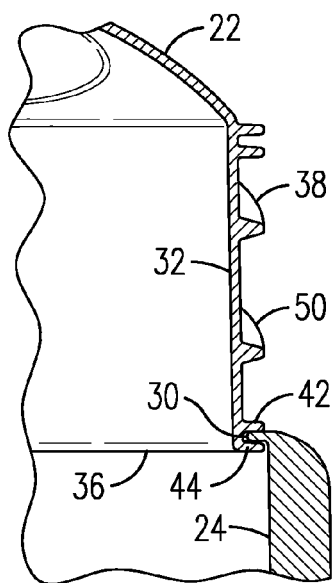


FIG. 5

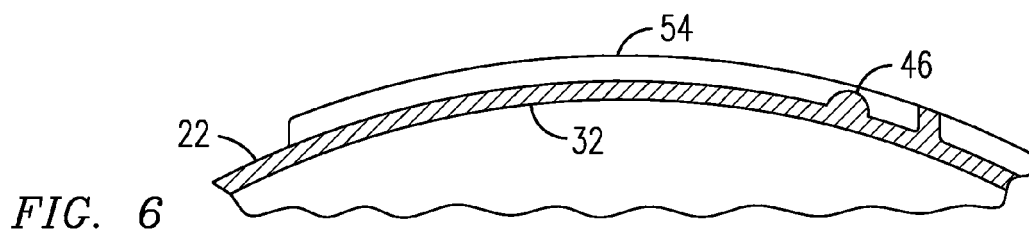


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
EP 14 16 3802

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 100 545 A1 (PIACENZA RAFFAELE [IT]; PIACENZA MARCO ALESSANDRO [IT]) 16 September 2009 (2009-09-16)	1,4	INV. B65D21/08 B65D43/02 A47G19/26
Y	* paragraph [0015] - paragraph [0018];	2,3	
A	figures 1, 2, 6b * * paragraph [0034] - paragraph [0041] * * paragraph [0051] *	5,6	
Y	----- CN 202 714 639 U (PHOTO USA ELECTRONIC GRAPHIC INC) 6 February 2013 (2013-02-06) * abstract; figure 1 *	2,3	
X	----- US 2005/061764 A1 (TAMASHIRO MASAHARU [BR]) 24 March 2005 (2005-03-24)	1	
A	* paragraph [0016]; figure 1 *	2,3	
A	----- US 5 072 850 A (GAGNON ROBERT M [US] ET AL) 17 December 1991 (1991-12-17) * column 3, line 53 - line 59; figure 1 *	1,7-9	
			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 August 2014	Examiner Czerny, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 16 3802

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26-08-2014

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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