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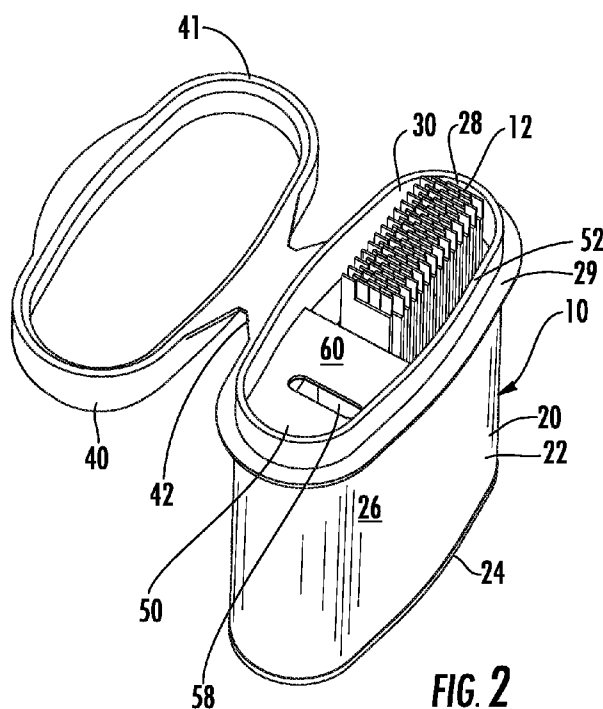
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[Continued on next page]

(54) Title: CONTAINER WITH INSERT



(57) Abstract: A vial and insert assembly includes a vial having an interior and an opening leading to the interior. The assembly further includes an insert configured to fit within the interior. The insert includes a first receptacle for housing a plurality of unused products and a second receptacle for housing a plurality of used products.



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CONTAINER WITH INSERT

Docket No. CSP-0264PC (24726WO01)

FIELD OF INVENTION

[0001] The present invention relates to a vial and insert assembly including a vial having an interior and an opening leading to the interior. The assembly further includes an insert configured to fit within the interior. The insert includes a first receptacle for housing a plurality of unused products and a second receptacle for housing a plurality of used products.

BACKGROUND OF THE INVENTION

[0002] Product containers used for consumer products are typically configured for the packaging and dispensing of new, unused product. Accordingly, after a product that has been removed from the container is used, the consumer typically needs to find a location to dispense of the used product. However, proper dispensing receptacles are not always readily available. Additionally, not all types of used consumer products are dispensed in the same manner, or in the same types of receptacles. Indeed, in some instances, it may be undesirable to dispose of a used product in an exposed manner in a waste receptacle with other types of waste or disposable materials.

BRIEF SUMMARY OF THE INVENTION

[0003] Embodiments of the present invention relate to product containers or dispensers for use with a variety of consumer products or pharmaceutical products and supplies, such as, for example, glucose strips, among other products. Moreover, the present invention relates to product containers dispensers that are configured to allow for both the storage of new or unused consumer product and an area for at least the temporary disposal of that product after the product has been used. Additionally, according to certain embodiments, the product container may include seals that assist in controlling the ingress and/or egress of moisture into/out of an interior space of the product dispenser, and thereby may assist in controlling the conditions in an interior space of the container.

[0004] According to certain embodiments, a vial and insert assembly is provided that includes a vial having an interior and an opening leading to the interior. The assembly also includes an insert that is configured to fit within the interior. The insert has a first receptacle for

housing a plurality of unused products and a second receptacle for housing a plurality of used products.

[0005] According to another embodiment, a vial and insert assembly is provided that includes a vial having an interior and an opening leading to the interior and an insert configured to fit within the interior. The insert includes a first receptacle for housing a plurality of unused products and a second receptacle for housing a plurality of used products. The second receptacle is defined by an interior region of the insert. At least a portion of the second receptacle extends beneath the first receptacle.

[0006] According to another embodiment, a vial and insert assembly is provided that includes a vial having an interior and an opening leading to the interior. The insert is configured to fit within the interior. The insert also includes a first receptacle for housing a plurality of unused products and a second receptacle for housing a plurality of used products. Additionally, the insert has an exterior surface, at least a portion of the exterior surface configured to elevate the unused products housed within the first receptacle. Further the second receptacle is defined by an interior region of the insert. The insert further includes a rib located within the first receptacle for aligning the plurality of unused products positioned within the first receptacle.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWINGS

[0007] FIG. 1 is a rear perspective view of a vial with insert in accordance with an illustrated embodiment of the invention.

[0008] FIG. 2 is a front perspective view of the vial with insert shown in FIG. 1.

[0009] FIG. 3 is a top plan view of the vial with insert shown in FIG. 1.

[0010] FIG. 4 is a cross section taken along line 4-4 of FIG. 3.

[0011] FIG. 5 is a cross section taken along line 5-5 of FIG. 4.

[0012] FIG. 6 is a front perspective view of another embodiment of an insert in accordance with the invention.

[0013] FIG. 7 is a top plan view of the insert of FIG. 6.

[0014] FIG. 8 is front elevation of the insert of FIG. 6.

[0015] FIG. 9 is a right side elevation of the insert of FIG. 6.

[0016] FIG. 10 is a cross section taken along line 10-10 of FIG. 7.

[0017] FIG. 11 is a front perspective view of a vial with another embodiment of an insert in accordance with the invention.

[0018] FIG. 12 is a front perspective view of the insert of FIG. 11.

[0019] FIG. 13 is a top plan view of the vial and insert assembly of FIG. 11.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0020] The present invention will now be described more fully with reference to the accompanying drawings, in which several embodiments are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth here. Rather, these embodiments are examples of the invention, which has the full scope indicated by the language of the claims. Like numbers refer to like elements throughout.

[0021] A first embodiment of a vial and insert assembly 10 is shown in FIGS. 1-5. As shown, the vial and insert assembly 10 includes a vial 20 and an insert 50. The insert 50 fits within an interior 28 of the vial 20 and includes a first receptacle 52 for elevating and/or placement of a plurality of new products 12 that are to be stored within the vial 20, and a second receptacle 54 for housing a plurality of used products 12. Moreover, new products 12 removed from the first receptacle 52 may subsequently, such as after being used, be disposed of and/or retained in the second receptacle 54.

[0022] The vial 20 includes a body 22 having a base 24 and side wall 26 depending upwardly therefrom. The base 24 and side wall 26 together define an interior 28 of the body 22. An upper edge of side wall 26 may define an opening 30 that leads and/or provides access to the interior 28. In the embodiment shown, the side wall 26 is tubular and has a generally oval cross-sectional shape. However, it should be understood that the side wall 26 can take on a variety of other shapes as well. The vial 20 could take on a variety of other configurations from that disclosed above. Examples of vial 20 configurations include, but are not limited to, any of the configurations disclosed in U.S. Patent Nos. 6,769,558, RE 37,676, 6,303,064, 7,213,720, and 7,950,546, U.S. Pat. Pub. No. 2011/0123416, or WO 2007/065162, each of which is incorporated herein by reference as if fully set forth.

[0023] The vial 20 further includes a cap 40 that, when the vial 20 is in a closed position, is removably affixed over the opening 30. The vial 20 may be moved into an open position, as

shown in FIGS. 1-5 by moving the cap 40 away from the opening 30, such as moving the cap 40 so that the cap 40 is not covering the opening 30, as shown, for example, in FIGS. 1-5.

[0024] In the embodiment illustrated in FIGS. 1-5, the cap 40 is connected to the body 22 by a hinge 42. However, according to other embodiments, the cap 40 may be completely removable from the body 22, such as being a separate, removable component that is not attached to the vial 20. A variety of different types of hinges 42 may be employed to operably attach the cap 40 to the vial body 22. For example, according to certain embodiments, the hinge 42 may be a “living hinge,” such that the vial body 22 and cap 40 are formed integrally and connected by a section of material sufficiently thin so to be foldable and therefore allow for pivoting therebetween. According to other embodiments, the hinge 42 may be a separate mechanical element that connects the body 22 and cap 40 and permits pivoting therebetween.

[0025] According to certain embodiments, the vial 20 and cap 40 are configured for engagement with each other to form a moisture-tight seal when in the closed position. For example, an upper lip portion 25 of the sidewall 26 may be positioned and sized such that the upper lip portion 25 is engaged by the cap 40 when the cap 40 is placed into to the closed position. According to certain embodiments, when engaged by the cap 40, the upper lip portion 25 may deform, bend, and/or deflect so as to create a relatively secure engagement between the upper lip portion 25 and cap 40 that provides a seal that prevents or minimizes moisture outside of the vial and insert assembly 10 from entering into the interior 28 through the opening 30. Alternatively, according to other embodiments, at least portions of the cap 40 that engage the upper lip portion 25 when the cap 40 is in the closed position may be configured to deform, bend, and/or deflect in a manner that allows for the formation of a seal between the cap 40 and the vial 20. Alternatively, according to other embodiments, the vial body 22 and/or cap 40 may be operably connected to an upper seal 23, such as, for example, as shown in FIG. 4, an elastomeric seal, that is configured to deform and/or press against the adjacent cap 40 and/or body 22 when the cap 40 is in a closed position so as to form the seal that prevents or minimizes the entry of moisture into the interior 28.

[0026] Additionally, the vial body 22 may include a shoulder 29 which a lower portion 41 of the cap 40 may abut against when the cap 40 is in the closed position. According to certain embodiments, the shoulder 29 may provide a stop that limits the portion or amount of the

sidewall 26 that the cap 40 may abut against and/or be secured to when the cap 40 is in the closed position. Such a stop may be intended to prevent the cap 40 from becoming undesirably difficult to move from the closed to open position due any forces created by the engagement between the cap 40 and the sidewall 26 and/or any seal formed there between. Additionally, as shown in FIG. 4, according to certain embodiments, a lower seal 31, such as an elastomeric seal, may be placed on the lower portion 41 and/or shoulder 29 so as to provide a seal between the lower portion 41 and shoulder 29 when the cap 40 is in a closed position that prevents the ingress of moisture from the environment outside of the vial and insert assembly 10 into the interior 28.

[0027] According to certain embodiments, the vial body 22 and cap 40 may be made from, for example, polyethylene or polypropylene, among other materials. Additionally, according to certain embodiments, the vial 20 includes a desiccant plastic material, such as a desiccant plastic liner 70. For example, according to certain embodiments, the desiccant liner 70 may line at least a portion of the inner surface 27 of the sidewall 26, as shown, for example, in FIGS. 4 and 5. The desiccant plastic material may be, for example, of the type disclosed in EP 0892673, which is incorporated herein by reference as if fully set forth.

[0028] The assembly 10 further includes an insert 50. As shown in FIGS. 1-5, the insert 50 is positioned within the interior 28 of the vial 20. According to certain embodiments, the insert 50 is of a similar shape and/or size of at least a portion of the interior 28 of the vial body 22. Moreover, at least a portion of the outer surface(s) 51 of the insert 50 is configured to generally match and/or mate the shape of at least a portion of the interior 28 and/or at least a portion of the desiccant liner 70. Such a configuration of the insert 50 may allow the insert 50 to securely fit within the interior 28 of the vial body 22. For example, according to certain embodiments, the vial 20 and/or insert 50 may be configured to allow the insert 50 to be secured in the interior 28 of the vial 20 by a press or snap fit.

[0029] Additionally, similarities between the size and/or shape of the insert 50 and the interior 28 and/or desiccant liner 70 may allow the insert 50 to serve as a reinforcing member that prevents undesirable deformation of at least a portion of the side wall 26 of the vial body 22. For example, the insert 50 may provide reinforcement to prevent portions of the side wall 26 from deforming while the cap 40 is being moved to the closed position about the opening 30, while also allowing those portions of the sidewall 26, if any, that are intended to be deformed for

purposes of forming the above-discussed seal. Additionally, such reinforcement may enhance the ability to obtain and/or retain a seal formed between the vial 20 and cap 40 when the cap 40 is in the closed position, as disclosed in U.S. Patent Pub. No. 2011/0127269, which is incorporated herein by reference as if fully set forth.

[0030] As best shown in FIG. 5, the insert 50 includes a first receptacle 52 for housing a plurality of new products 12 and a second receptacle 54 for housing a plurality of used products 12. In the illustrated embodiment, the products 12 are in the form of elongate strips, such as diagnostic test strips, for example blood glucose test strips. However, a variety of other types of products, including products having different shapes and/or configurations than the products 12 illustrated in Figure 5, could be contained within the assembly 10.

[0031] Referring still to FIG. 5, the first receptacle 52 is defined, at least in part, by an elevating surface 56 of the insert 50. As shown, according to certain embodiments, the first receptacle 52 may be a recess 53 that is formed in the insert 50 and/or along a top portion of the insert 50. In the embodiment illustrated in Figure 5, new or unused products 12 sit on the elevating surface 56 of the insert 50 that is positioned within or below the recess 53. The elevating surface 56 elevates the new or unused products 12 so those products 12 can be readily accessed by a user and removed from the assembly 10.

[0032] According to certain embodiments, the second receptacle 54 is defined by an interior region 53 of the insert 50. For example, according to certain embodiments, the interior region 53 may be at least partially positioned within the interior 28 of the vial body 22 beneath an outer surface 60 of the insert 50. According to certain embodiments, the interior region 53 may also be defined by a vertical portion 62 of the insert 50 that is positioned against and/or adjacent to the desiccant liner 70 or side wall 26 of the vial body 22. Further, as shown in at least FIG. 5, according to certain embodiments, the bottom portion of the interior region 53 may be defined by the bottom wall 64 of the vial body 22 and/or desiccant liner 70. Alternatively, the insert 50 may include a lower wall that extends at the bottom of the vertical portion 62.

[0033] The insert 50 includes an opening 58 that is formed in the outer surface 60 of the vial 50 and which is in communication with the interior region 53. In the illustrated embodiment, the opening 58 is formed in an uppermost surface 60 of the insert 50, formed atop the vertical portion 62 of the insert 50, so as to be easily accessible to a user of the assembly 10. The opening

58 in the embodiment shown is in the form of a slot, which is sized and shaped to accept the strips 12 housed in this embodiment of the assembly. In other embodiments the opening 58 could take on other shapes to accept products 12 having other shapes.

[0034] In the illustrated embodiment, the insert 50 has a substantially “L” shape, which may be formed by inwardly offsetting a portion of the vertical portion 62' away from other portions of the vertical portion 62 that are adjacent to the side wall 26 (and associated desiccant liner 70) of the vial body 22. Moreover, such offset may be provided by the extension of the elevating surface 56 away from the side wall 26 of the vial body 22 and toward an inner portion of the interior 28 of the vial body 22. As shown in FIG. 5, the elevating surface 56 is also located at a position in the interior 28 that is lower than the position of the upper most surface 60. Additionally, a horizontal portion 64 of the vial body 22 and/or desiccant liner 70 extends beneath both the uppermost surface 60 and the elevating surface 56 of the insert 50 in a horizontal direction.

[0035] In use, the products 12 are supplied in the first receptacle 52 with the assembly 10 in the closed position. The products 12 are elevated by the elevating surface 56 of the first receptacle, as shown in FIG. 5, to be easily reached by a user. The user may move the cap 40 into the opened position, as shown in FIGS. 1-5 and remove one or more products 12 from the first receptacle 52. The user can then use any retrieved products 12 and then dispose of the used products 12 by inserting them into opening 58 and into the second receptacle 54. According to certain embodiments, when all products 12 from the first receptacle 52 have been used and placed into the second receptacle 54 the user can reclose and dispose of the entire assembly 10. According to other embodiments, the assembly 10 may be opened and closed over a period of time as new or unused products 12 are used by the user. Further, according to certain embodiments, the insert 50 may be removable from the vial body 22 such that the second receptacle 54 may be at least periodically be emptied of used products 12.

[0036] The insert 50 may be formed from a variety of different materials, including, for example, polyethylene or polypropylene, among other materials. According to certain embodiments, the insert 50 may be formed of a desiccant plastic material, such as that disclosed in EP 0892673.

[0037] Another illustrated embodiment of an insert 150 is shown in FIGS. 6-10. The insert 150 of this illustrated embodiment is also adaptable for use with a number of different vial configurations, such as, for example, the vial 20 shown in FIGS. 1-5.

[0038] The insert 150 of FIGS. 6-10 differs from that shown in FIGS. 1-5 in that it takes on a substantially inverted “T” shape, rather than the “L” shape of the insert 50 shown in FIGS. 1-5. Accordingly, the vertical portion 162 extends upward from a substantially central location along the length of the horizontal portion 164. This results in the first receptacle 152 being divided into first and second portions 152A, 152B, and elevating surface 156 being divided into first and second portions 156A, 156B. As shown, the unused products 112 are divided into two portions that are housed in the first and second portions 152A, 152B of the first receptacle 152. While FIGS. 6-10 illustrate the vertical portion 162 at a substantially central location along the length of the horizontal portion 164, vertical portion 162 may be positioned at a variety of different locations along the horizontal portion 164. Additionally, the first and second portions 156A, 156B may or may not have similar sizes and/or shapes. As shown, Figures 7-9 provide some exemplary dimensions for the insert 50.

[0039] As shown, the new or unused products 112 may be housed in the first and/or second portions 152A, 152B of the first receptacle 152. After use, products 112 may subsequently be inserted through an opening 158 in the uppermost surface 160 of the insert 150 and into the second receptacle 154.

[0040] Another exemplary embodiment of an insert 250 is illustrated in FIGS. 11-13. The insert 250 illustrated in FIGS. 11-13 differs from the insert 150 shown in FIGS. 6-10 in that the insert 250 includes two ribs 266A, 266B. As illustrated, the ribs 266A, 266B extend vertically upwards from elevating surfaces 256A, 256B and extend across from the vertical portion 262 to opposite sides of vial 20 in a direction that is substantially parallel with the longitudinally extending portion of vial side wall 22.

[0041] As shown in FIG. 13, new or unused products 212 may be stored behind the ribs 266A, 266B, between the ribs 266A, 266B and the rear portion of vial side wall. Ribs 266A, 266B thus function to align unused products 212 stored in the first receptacles 252A, 252B, and to protect products from contact with vial lid 240, which could occur for example during closing of the vial 20 and potentially damage products. After use, used products 212 may subsequently

be inserted through an opening 258 in the uppermost surface 260 of the insert 250 and into the second receptacle 154.

[0042] While the vial 20 and inserts 50, 150, 250 have been illustrated in particular shapes and configurations, the vials and inserts 50, 150, 250 can take on a variety of other, different sizes and shapes.

CLAIMS

What is claimed is:

1. A vial and insert assembly, comprising:
a vial having an interior and an opening leading to the interior; and
an insert configured to fit within the interior, the insert having a first receptacle for housing a plurality of unused products and a second receptacle for housing a plurality of used products.
2. The assembly of claim 1, wherein the vial further comprises a cap that removably affixes over the opening to move the vial between an opened position and a closed position.
3. The assembly of claim 2, wherein the cap and vial are configured to engage in a moisture tight seal.
4. The assembly of any one of claims 1-3, at least one of the vial and the insert includes a desiccant plastic material.
5. The assembly of any one of claims 1-4, wherein the vial comprises a base and a side wall depending upwardly therefrom, the base and the side wall defining the interior, and wherein the insert serves as a reinforcement to prevent deflection of the side wall.
6. The assembly of any one of claims 1-5, wherein at least a portion of the first receptacle is defined by an exterior surface of the insert.
7. The assembly of claim 6, wherein the exterior surface elevates the unused products housed within the first receptacle.
8. The assembly of any one of claims 1-7, wherein the second receptacle is defined by an interior region of the insert.

9. The assembly of any one of claims 1-8, wherein the insert includes an opening leading to the second receptacle.

10. The assembly of any one of claims 1-9, wherein a first portion of the second receptacle extends in a horizontal direction beneath the first receptacle, and a second portion of the second receptacle extends along a side of the first receptacle in a vertical direction.

11. The assembly of claim 9, wherein the second portion of the second receptacle extends upward from a substantially central location along a length of the first portion.

12. The assembly of any one of claims 1-11, further comprising a rib located within the first receptacle for aligning the plurality of unused products positioned within the first receptacle.

13. The assembly of any one of claims 1-11, wherein the first receptacle comprises at least two receptacles, each of the at least two receptacles having a centrally located rib for aligning the plurality of unused products positioned within each of the at least two first receptacles.

14. A vial and insert assembly, comprising:
a vial having an interior and an opening leading to the interior; and
an insert configured to fit within the interior, the insert having a first receptacle for housing a plurality of unused products and a second receptacle for housing a plurality of used products, the second receptacle being defined by an interior region of the insert, at least a portion of the second receptacle extending beneath the first receptacle.

15. The assembly of claim 14, wherein the first receptacle comprises two first receptacles, the second receptacle including a first portion extends in a horizontal direction beneath the two first receptacles, the second receptacle also including a second portion that

extends upward from a substantially central location along a length of the first portion and between the two first receptacles.

16. The assembly of claim 14 or 15, wherein the vial further comprises a cap that removably affixes over the opening to move the vial between an opened position and a closed position, and wherein the cap and vial are configured to engage in a moisture tight seal.

17. The assembly of any one of claims 14-16, wherein the vial further includes a desiccant liner.

18. A vial and insert assembly, comprising:
a vial having an interior and an opening leading to the interior; and
an insert configured to fit within the interior, the insert having a first receptacle for housing a plurality of unused products and a second receptacle for housing a plurality of used products, the insert having an exterior surface, at least a portion of the exterior surface configured to elevate the unused products housed within the first receptacle, and wherein the second receptacle is defined by an interior region of the insert, and wherein the insert further includes a rib located within the first receptacle for aligning the plurality of unused products positioned within the first receptacle.

19. The assembly claim 18, wherein a first portion of the second receptacle extends in a horizontal direction beneath the first receptacle, and a second portion of the second receptacle extends along a side of the first receptacle in a vertical direction.

20. The assembly of any one of claims 18 or 19, wherein the second portion of the second receptacle extends upward from a substantially central location along a length of the first portion.

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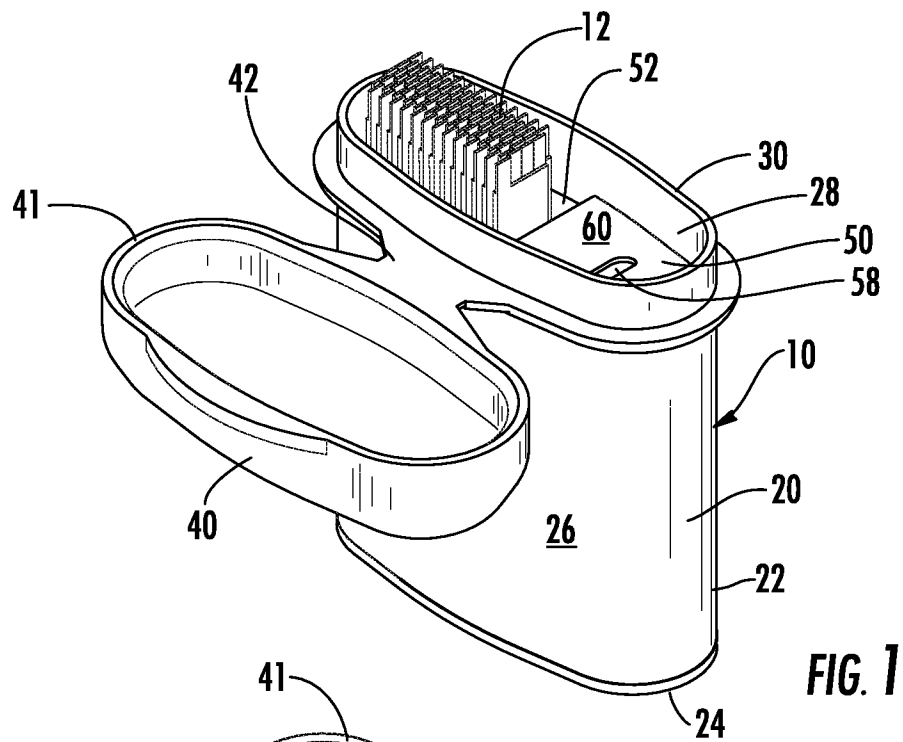


FIG. 1

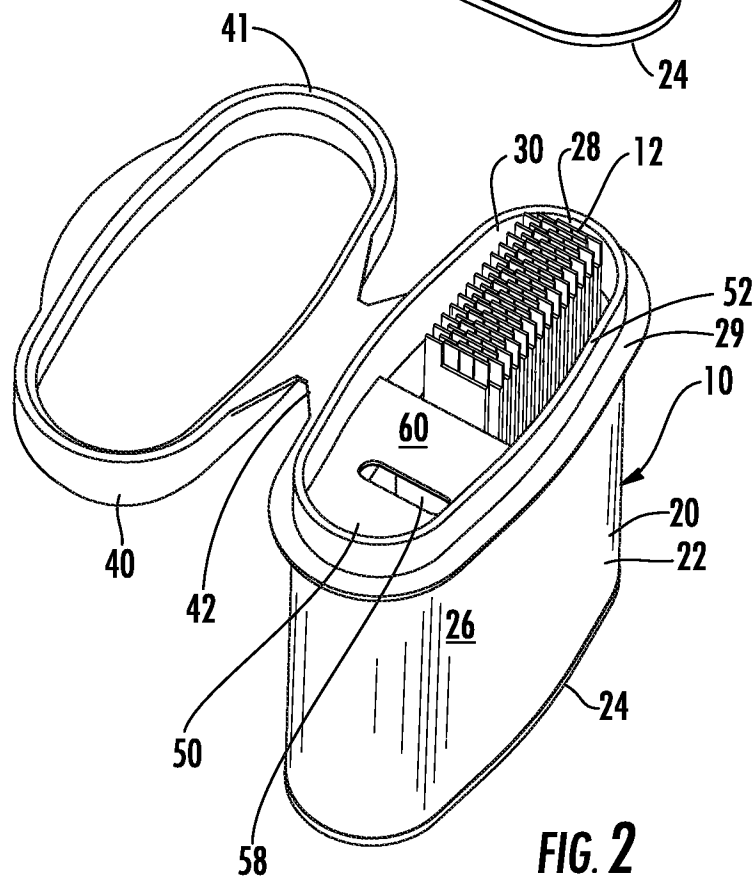


FIG. 2

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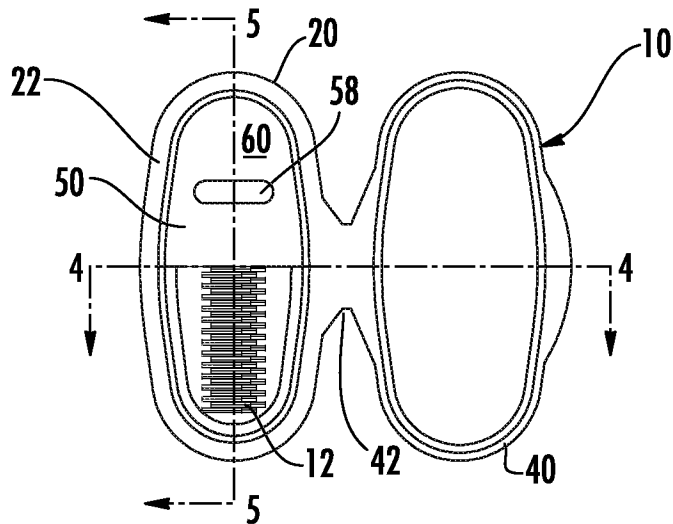


FIG. 3

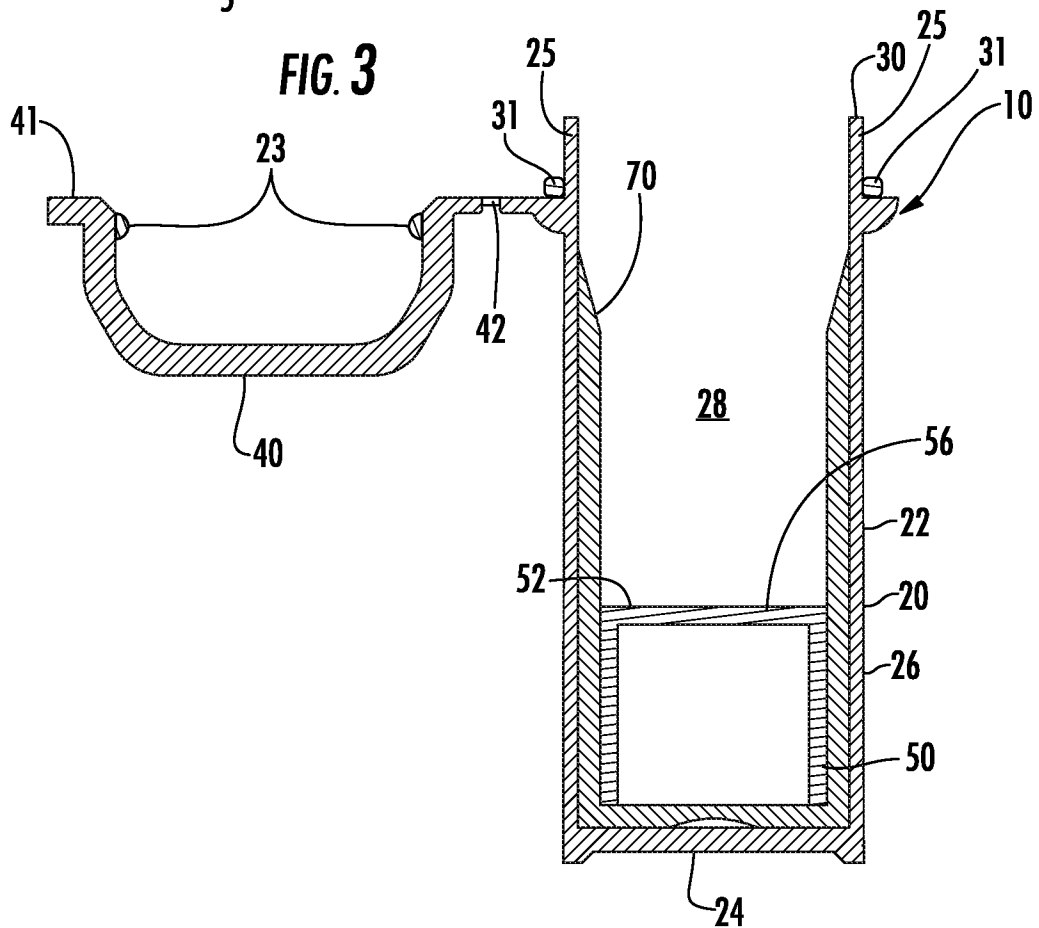


FIG. 4

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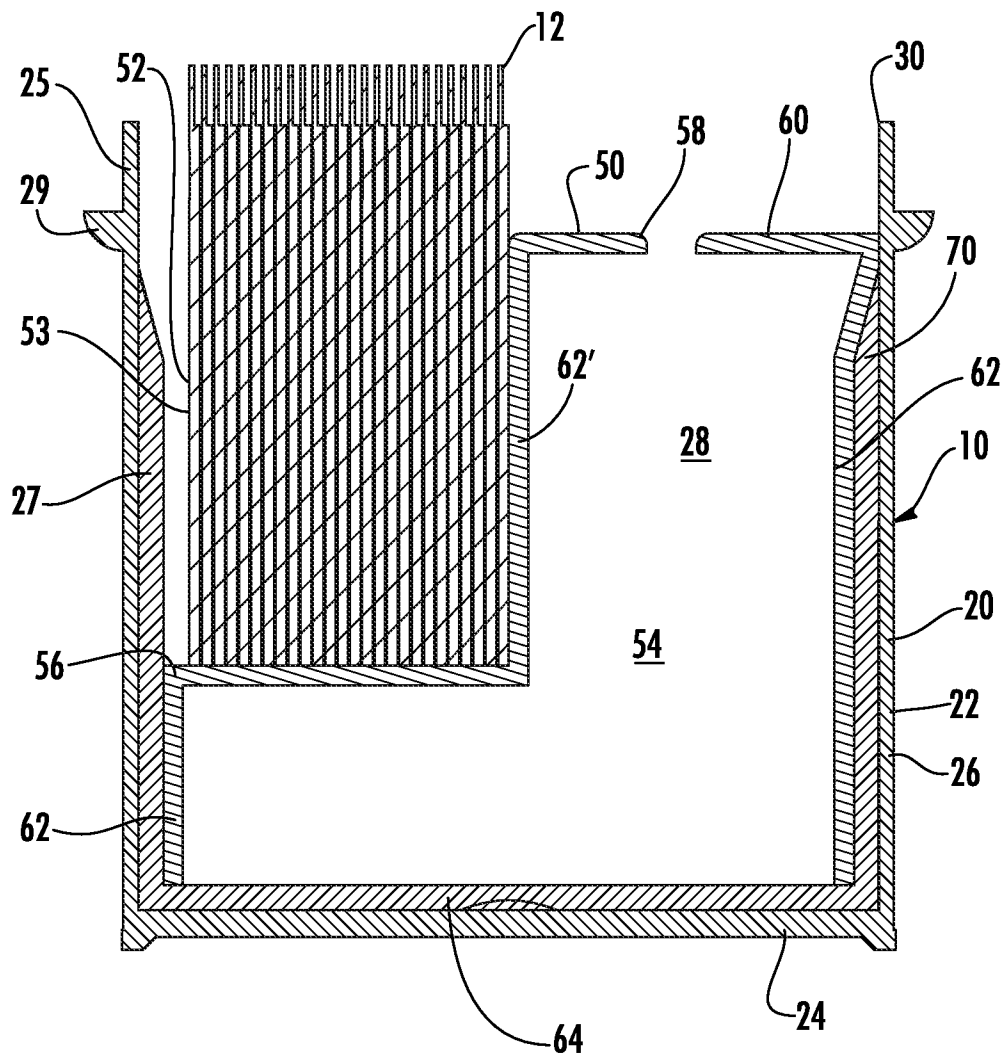


FIG. 5

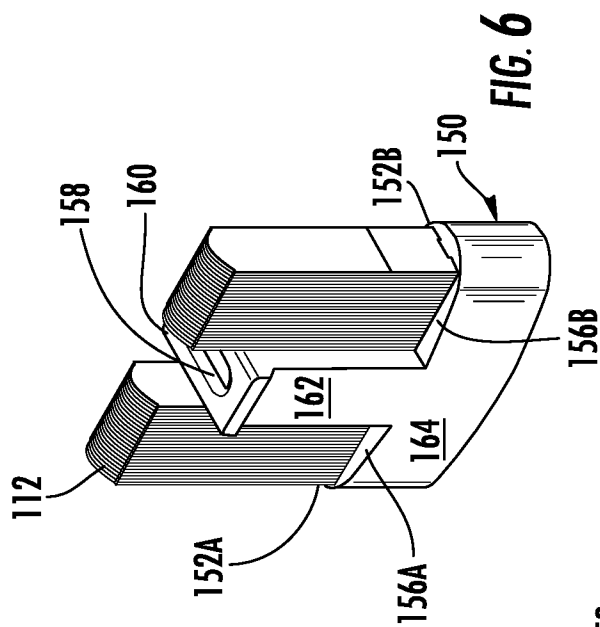


FIG. 6

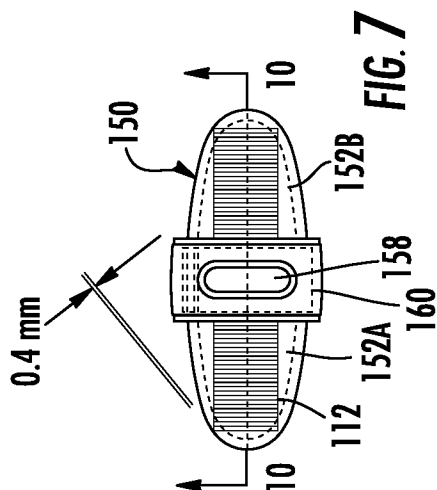


FIG. 7

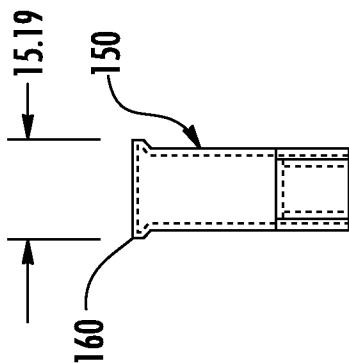


FIG. 8

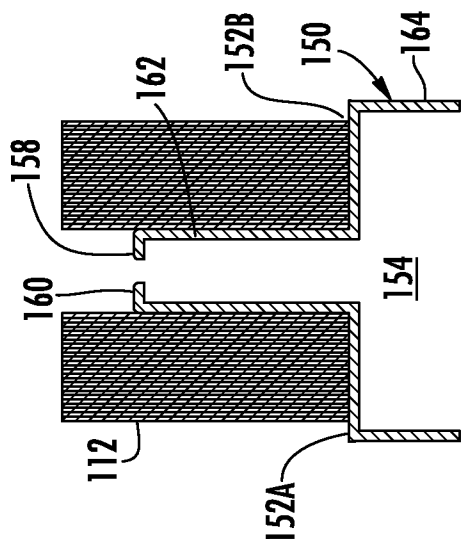


FIG. 9

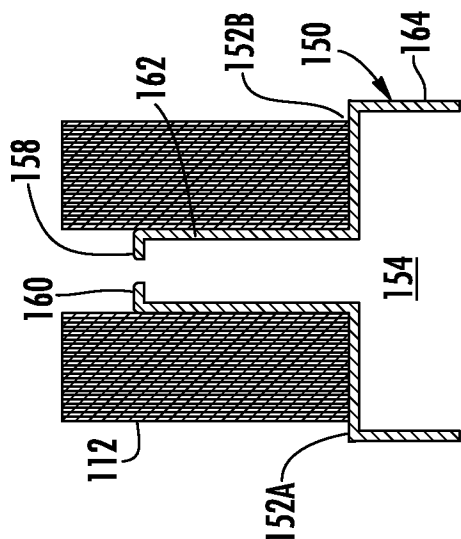
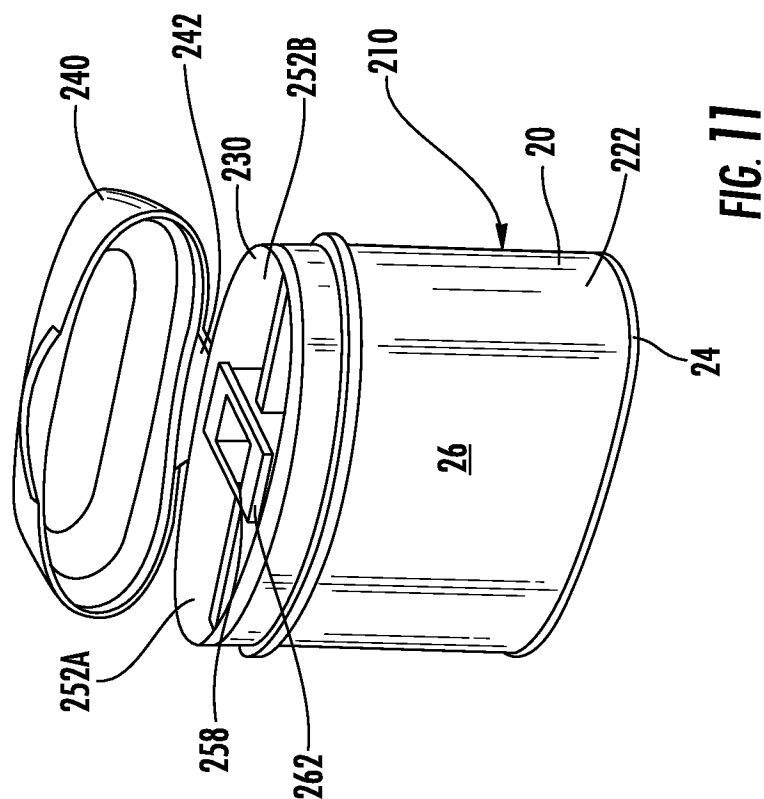
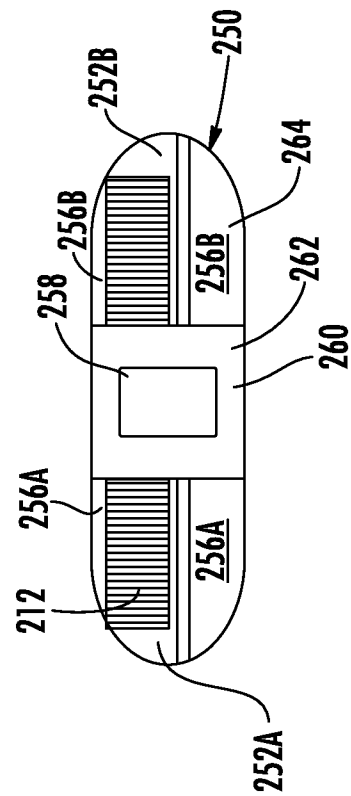
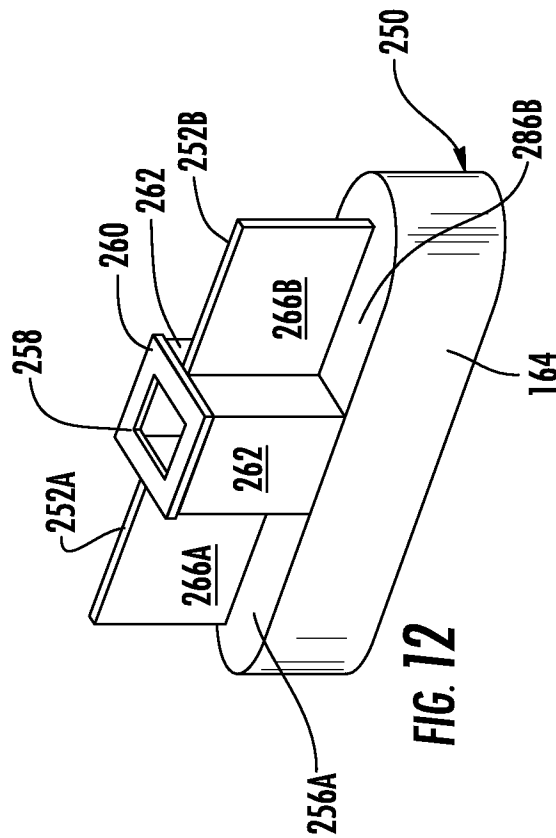


FIG. 10



A. CLASSIFICATION OF SUBJECT MATTER***B65D 83/00(2006.01)i, B65D 25/04(2006.01)i, B65D 41/16(2006.01)i, B65D 77/02(2006.01)i***

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D 83/00; B65D 83/04; B65D 83/10; B65D 1/00; B65D 83/02; B65D 85/24; B65D 81/26; B65D 41/28

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: vial, insert, used product, receptacle, and desiccant

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 2003-118781 A (MATSUSHITA ELECTRIC IND. CO., LTD.) 23 April 2003 See paragraphs [0020],[0023] and figure 2.	1-4, 18 14-16, 19, 20
Y	US 7413083 B2 (BELFANCE et al.) 19 August 2008 See column 4, lines 23-32, and figure 1.	1-4
Y	JP 2003-146381 A (MATSUSHITA ELECTRIC IND. CO., LTD.) 21 May 2003 See paragraph [0017] and figures 2-4.	18
A	KR 20-0389372 Y1 (JI, JAE HO) 14 July 2005 See page 3 and figure 3.	1-4, 14-16, 18-20
A	US 2006-0219585 A1 (CHO, YOUNG KOOK) 5 October 2006 See paragraphs [0026],[0026] and figures 2,3.	1-4, 14-16, 18-20



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

27 March 2013 (27.03.2013)

Date of mailing of the international search report

29 March 2013 (29.03.2013)

Name and mailing address of the ISA/KR

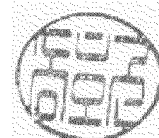
Korean Intellectual Property Office
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City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/063803**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 7,11
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

Claims 7 and 11 are unclear because they respectively refer to multiple dependent claims 6 and 9 which do not comply with PCT Rule 6.4(a). Therefore, claims 7 and 11 do not meet the requirements of PCT Article 6.
3. ☒ Claims Nos.: 5,6,8-10,12,13,17
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/063803

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2003-118781 A	23.04.2003	None	
US 7413083 B2	19.08.2008	AT 334072 T CA 2482200 A1 DE 60306977 D1 DE 60306977 T2 EP 1352844 A1 EP 1352844 B1 ES 2272895 T3 JP 2005-522384 A JP 2009-196717 A US 2005-0016873 A1 WO 03-086900 A1	15.08.2006 23.10.2003 07.09.2006 15.03.2007 15.10.2003 26.07.2006 01.05.2007 28.07.2005 03.09.2009 27.01.2005 23.10.2003
JP 2003-146381 A	21.05.2003	JP 3786258 B2	14.06.2006
KR 20-0389372 Y1	14.07.2005	None	
US 2006-0219585 A1	05.10.2006	CN 2900408 Y KR 10-2005-0033598 A	16.05.2007 12.04.2005