

## **HOUSING FOR RECEIVING FLOWABLE SUBSTANCE**

### **TECHNICAL FIELD**

[0001] This document relates to the technical field of (and is not limited to) a hollow elongated housing configured to receive a flowable substance therein (and method therefor). More specifically, this document relates to the technical field of (and is not limited to) a hollow elongated housing configured to receive a flowable substance therein in synergistic combination with a plunge assembly and a plunge-moving assembly.

### **BACKGROUND**

[0002] Packaging is the science, art and technology of enclosing and/or protecting products for distribution, storage, sale, and/or use.

### **SUMMARY**

[0003] It will be appreciated that there exists a need to mitigate (at least in part) at least one problem associated with the existing housings configured to receive flowable substances (also called the existing technology). After much study of, and experimentation with, the existing housings configured to receive flowable substances, an understanding (at least in part) of the problem and its solution have been identified (at least in part) and are articulated (at least in part) as follows:

[0004] To mitigate, at least in part, at least one problem associated with the existing technology, there is provided (in accordance with a first major aspect) an apparatus. The apparatus includes and is not limited to (comprises) a hollow elongated housing configured to receive a flowable substance therein. A plunge assembly is configured to be movable along, at least in part, the hollow elongated housing; this is done in such a way that the plunge assembly, in use, moves, at least in part, the flowable substance along the hollow elongated housing. A plunge-moving assembly is configured to move the plunge assembly; this is done in such a way that the plunge-moving assembly, in use, urges the plunge assembly to move a predetermined amount of the flowable substance along the hollow elongated housing. In this manner, the user does not have to measure the quantity of material to be removed from the hollow elongated housing.

[0005] To mitigate, at least in part, at least one problem associated with the existing technology, there is provided (in accordance with a second major aspect) an apparatus. The apparatus includes and is not limited to (comprises) a hollow elongated housing having a first open end section configured to receive a flowable substance therein. The plunge assembly is

configured to be movable along a length of the hollow elongated housing; this is done in such a way that the plunge assembly, in use, moves, at least in part, the flowable substance from the hollow elongated housing and out from the first open end section. A sealing device is positioned between the plunge assembly and the hollow elongated housing; this is done in such a way that the sealing device, in use, prevents, at least in part, leakage of the flowable substance between the plunge assembly and the hollow elongated housing. A plunge-moving assembly is configured to move the plunge assembly toward the first open end section; this is done in such a way that the plunge-moving assembly, in use, urges the plunge assembly to move a predetermined amount of the flowable substance from the hollow elongated housing and out from the first open end section. In this manner, the user does not have to measure the quantity of material to be removed from the hollow elongated housing.

[0006] To mitigate, at least in part, at least one problem associated with the existing technology, there is provided (in accordance with a third major aspect) an apparatus. The apparatus includes and is not limited to (comprises) a hollow elongated housing defining a cavity. The hollow elongated housing has a first open end section and a second open end section. The first open end section and the second open end section are spaced apart from each other. The cavity extends between, and is in fluid communication with, the first open end section and the second open end section. The cavity is configured to receive a flowable substance. A dispensing device is configured to be selectively attachable to the first open end section. The dispensing device is configured to be, at least in part, in fluid communication with the first open end section and the cavity (once the dispensing device is selectively attached to the first open end section). A plunge assembly is configured to be received into the cavity via the second open end section. The plunge assembly is also configured to be movable along a length of the cavity (once the plunge assembly is received into the cavity via the second open end section). The plunge assembly is also configured to be movable toward the first open end section; this is done in such a way that the plunge assembly, in use, moves, at least in part, the flowable substance, positioned in the cavity, toward, and out from, the first open end section. The plunge assembly includes a front section configured to contact (engage with) an interior surface of the first open end section to allow departure of the flowable substance from the cavity. A sealing device extends (extends radially) from the plunge assembly. The sealing device is configured to prevent, at least in part, leakage of the flowable substance positioned on the front section of the plunge assembly toward the second open end section (while the plunge assembly, in use, is

moved toward the first open end section). A plunge-moving assembly is configured to be coupled to the plunge assembly. The plunge-moving assembly is configured to move the plunge assembly toward the first open end section; this is done in such a way that the plunge-moving assembly, in use, moves the plunge assembly so that a predetermined amount of the flowable substance is moved, in use, from the cavity and out from the first open end section and into the dispensing device, and out from the dispensing device.

[0007] Other aspects are identified in the claims. Other aspects and features of the non-limiting embodiments may now become apparent to those skilled in the art upon review of the following detailed description of the non-limiting embodiments with the accompanying drawings. This Summary is provided to introduce concepts in simplified form that are further described below in the Detailed Description. This Summary is not intended to identify potentially key features or possible essential features of the disclosed subject matter, and is not intended to describe each disclosed embodiment or every implementation of the disclosed subject matter. Many other novel advantages, features, and relationships will become apparent as this description proceeds. The figures and the description that follow more particularly exemplify illustrative embodiments.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0008] The non-limiting embodiments may be more fully appreciated by reference to the following detailed description of the non-limiting embodiments when taken in conjunction with the accompanying drawings, in which:

[0009] FIG. 1, FIG. 2 and FIG. 3 depict a side view (FIG. 1), a bottom view (FIG. 2) and a perspective view (FIG. 3) of embodiments of an apparatus including a hollow elongated housing; and

[0010] FIG. 4, FIG. 5, FIG. 6 and FIG. 7 depict cross-sectional views of embodiments of the hollow elongated housing of FIG. 1; and

[0011] FIG. 8 and FIG. 9 depict perspective views of embodiments of the hollow elongated housing of FIG. 1; and

[0012] FIG. 10 depicts a cross-sectional view of embodiments of the hollow elongated housing of FIG. 1; and

[0013] FIG. 11, FIG. 12 and FIG. 13 depict a bottom view (FIG. 11), a side view (FIG. 12) and a cross-sectional view (FIG. 13) of embodiments of the hollow elongated housing of FIG. 1; and

[0014] FIG. 14, FIG. 15 and FIG. 16 depict a bottom view (FIG. 14), a side view (FIG. 15) and a cross-sectional view (FIG. 16) of embodiments of the hollow elongated housing of FIG. 1; and

[0015] FIG. 17, FIG. 18 and FIG. 19 depict perspective views of embodiments of the hollow elongated housing of FIG. 1.

[0016] The drawings are not necessarily to scale and may be illustrated by phantom lines, diagrammatic representations and fragmentary views. In certain instances, details unnecessary for an understanding of the embodiments (and/or details that render other details difficult to perceive) may have been omitted. Corresponding reference characters indicate corresponding components throughout the several figures of the drawings. Elements in the several figures are illustrated for simplicity and clarity and have not been drawn to scale. The dimensions of some of the elements in the figures may be emphasized relative to other elements for facilitating an understanding of the various disclosed embodiments. In addition, common, and well-understood, elements that are useful in commercially feasible embodiments are often not depicted to provide a less obstructed view of the embodiments of the present disclosure.

[0017] LISTING OF REFERENCE NUMERALS USED IN THE DRAWINGS

hollow elongated housing 102	rear plunger extension 132
cavity 104	first device 134
first cavity section 104A	second device 136
second cavity section 104B	passageway 138
first open end section 106	connector 140
interior surface 107	connection feature 141
second open end section 108	channel 142
dispensing device 110	longitudinal axis 144
neck extension 111	removable lid 146
plunge assembly 112	exit portal 148
front section 114	first surface 150
rear section 115	second surface 152
sealing device 116	hollow elongated housing 202
inner sealing device 117	open end section 206
plunge-moving assembly 118	rotation movement direction 300
screw assembly 120	hollow elongated housing 302
neck portion 122	open end section 306
groove 124	linear movement direction 402
first edge portion 126	installation direction 404
second edge portion 128	removal direction 406
front plunger extension 130	user 900

**DETAILED DESCRIPTION OF THE NON-LIMITING EMBODIMENT(S)**

[0018] The following detailed description is merely exemplary and is not intended to limit the described embodiments or the application and uses of the described embodiments. As used, the word “exemplary” or “illustrative” means “serving as an example, instance, or illustration.” Any implementation described as “exemplary” or “illustrative” is not necessarily to be construed as preferred or advantageous over other implementations. All of the implementations described below are exemplary implementations provided to enable persons skilled in the art to make or use the embodiments of the disclosure and are not intended to limit the scope of the disclosure. The scope of the disclosure is defined by the claims. For the description, the terms “upper,” “lower,” “left,” “rear,” “right,” “front,” “vertical,” “horizontal,” and derivatives thereof shall relate to the examples as oriented in the drawings. There is no intention to be bound by any expressed or implied theory in the preceding Technical Field, Background, Summary or the following detailed description. It is also to be understood that the devices and processes illustrated in the attached drawings, and described in the following specification, are exemplary embodiments (examples), aspects and/or concepts defined in the appended claims. Hence, dimensions and other physical characteristics relating to the embodiments disclosed are not to be considered as limiting, unless the claims expressly state otherwise. It is understood that the phrase “at least one” is equivalent to “a”. The aspects (examples, alterations, modifications, options, variations, embodiments and any equivalent thereof) are described regarding the drawings. It should be understood that the disclosure is limited to the subject matter provided by the claims, and that the disclosure is not limited to the particular aspects depicted and described. It will be appreciated that the scope of the meaning of a device configured to be coupled to an item (that is, to be connected to, to interact with the item, etc.) is to be interpreted as the device being configured to be coupled to the item, either directly or indirectly. Therefore, “configured to” may include the meaning “either directly or indirectly” unless specifically stated otherwise.

[0019] FIG. 1, FIG. 2 and FIG. 3 depict a side view (FIG. 1), a bottom view (FIG. 2) and a perspective view (FIG. 3) of embodiments of a hollow elongated housing 102 for receiving a flowable substance.

[0020] Referring to the embodiment as depicted in FIG. 1 (a side view), the hollow elongated housing 102 is configured to receive a flowable substance therein. The hollow elongated housing 102 includes (preferably) a plastic material, and/or any equivalent thereof. The hollow elongated

housing 102 may be manufactured by a molding system (known and not depicted) known by those skilled in the art. The flowable substance (known and not depicted) may include a fluid, a slurry, a flowable solid, a food item, etc., and/or any equivalent thereof. The flowable substance is moveable (pushable) from a first open end section 106 (also called an exit portal) of the hollow elongated housing 102. A bottom portion (section) of the hollow elongated housing 102 is removed (such as by a cutting operation) to thereby form a second open end section 108 (also called an entrance portal). The first open end section 106 and the second open end section 108 are spaced apart from each other and are, preferably, positioned at opposite end portions (sections) of the hollow elongated housing 102.

[0021] Referring to the embodiment as depicted in FIG. 1, the hollow elongated housing 102 may include, for instance, a plastic bottle, etc., and/or any equivalent thereof. The hollow elongated housing 102 may be manufactured (as known by those skilled in the art) by an extrusion blow molding process (and/or any equivalent thereof). Once molded or formed, the hollow elongated housing 102 (specifically, the bottom section thereof) may be cut or trimmed, etc. For this case, during the trimming process or operation, a hot blade cuts off (removes) unwanted material from the hollow elongated housing 102. The trimming may be modified to include a router, etc. The router (also called a cutter) is configured to router (form) the second open end section 108 at a base (a lower section) of the hollow elongated housing 102 to an appropriate shape (dimension, etc.). A hot blade press (or a hot blade reamer) may be utilized to cut the second open end section 108. The hollow elongated housing 102 may be manufactured (as known by those skilled in the art) by an injection stretch blow molding process (and/or any equivalent thereof).

[0022] Referring to the embodiment as depicted in FIG. 1, the hollow elongated housing 102 includes, preferably, a neck portion 122. The neck portion 122 extends away from the hollow elongated housing 102. The neck portion 122 provides (defines) the first open end section 106.

[0023] Referring to the embodiment as depicted in FIG. 1, a dispensing device 110 is configured to be selectively connected to (and selectively removable from) the neck portion 122; this is done in such a way that the first open end section 106 is covered by the dispensing device 110 (once the dispensing device 110 is selectively connected to the neck portion 122). The dispensing device 110 includes, preferably, a neck extension 111 configured to be selectively coupled (connected) to (and selectively disconnectable from) the neck portion 122. For instance, the neck extension 111 and the neck portion 122 each (preferably) includes (provides)

compatible mating threads, etc., for twist-on installation and twist-off removable interaction between the neck extension 111 and the neck portion 122.

[0024] Referring to the embodiment as depicted in FIG. 1, the hollow elongated housing 102 defines, preferably, a cavity 104 extending between the first open end section 106 and the second open end section 108. The cavity 104 may be configured to be in fluid communication with the first open end section 106 and the second open end section 108 (for the case when or once the cavity 104 of the hollow elongated housing 102 remains without any material or devices positioned therein).

[0025] Referring to the embodiment as depicted in FIG. 2 (a bottom view), the hollow elongated housing 102 includes a first edge portion 126 and a second edge portion 128 each extending towards a longitudinal axis 144 (a central axis) extending along a central section of the hollow elongated housing 102. The first edge portion 126 and the second edge portion 128 are spaced apart from each other. The first edge portion 126 and the second edge portion 128 each extend from the peripheral edges of the hollow elongated housing 102. The second open end section 108 is positioned (located) between the first edge portion 126 and the second edge portion 128.

[0026] Referring to the embodiment as depicted in FIG. 3 (a perspective view), the hollow elongated housing 102 defines, preferably, a square-shaped cross section (and/or any equivalent thereof). This is done in such a way that the hollow elongated housing 102 may be positioned adjacently to a hollow elongated housing 202 (having an open end section 206) in an abutment relationship. The hollow elongated housing 202 is depicted in an abutment relationship with a hollow elongated housing 302 (having an open end section 306). It will be appreciated that the hollow elongated housing 102 may define any cross-sectional shape (if desired).

[0027] Referring to the embodiment as depicted in FIG. 3, the hollow elongated housing 102 is configured to be free-standing and/or free stackable (and/or any equivalent thereof). The hollow elongated housing 102 is configured (preferably) to avoid being positioned every which way in the compartments of a refrigerator door or pantry, etc.

[0028] FIG. 4, FIG. 5, FIG. 6 and FIG. 7 depict cross-sectional views (taken along a cross-sectional line A-A as depicted in FIG. 1) of embodiments of the hollow elongated housing 102 of FIG. 1.

[0029] Referring to the embodiment as depicted in FIG. 4, the second open end section 108 of the hollow elongated housing 102 is configured to receive the plunge assembly 112. The plunge



assembly 112 is configured to be received (moved into) via the second open end section 108 of the hollow elongated housing 102. The plunge assembly 112 includes (and is not limited to) a front section 114 (also called a forward side), a rear section 115, a sealing device 116, a front plunger extension 130, and a rear plunger extension 132. The front section 114 and the rear section 115 are spaced apart from each other. The sealing device 116 is positioned radially along the outer circumference edge of the plunge assembly 112. The front plunger extension 130 extends from the front section 114. The rear plunger extension 132 extends from the rear section 115. The plunge assembly 112 defines (preferably) a passageway 138 extending centrally thereof. The passageway 138 extends through the plunge assembly 112, the front section 114, the rear section 115, the front plunger extension 130, and the rear plunger extension 132. The sealing device 116 includes, preferably, a lubricious material (with a relatively lower coefficient of friction) having a slippery quality while also being able to, at the same time, perform as a sealing material. For instance, the lubricious material may include the QUNITON (TRADEMARK) lubricious material ((manufactured by Minnesota Rubber & Plastics), and/or any equivalent thereof.

[0030] Referring to the embodiments as depicted in FIG. 5 and FIG. 6, the second open end section 108 of the hollow elongated housing 102 is configured to receive, at least in part, the plunge-moving assembly 118. The plunge-moving assembly 118 is configured to be received, at least in part, into the second open end section 108 of the hollow elongated housing 102. The plunge-moving assembly 118 includes (and is not limited to) a first device 134 (also called a rotatable device) and a second device 136. The second device 136 is configured to be positioned between the second open end section 108 and the plunge assembly 112.

[0031] Referring to the embodiments as depicted in FIG. 5 and FIG. 6, the second device 136 includes (preferably) a first surface 150, a second surface 152 and a connector 140 (also called a snap-fit type connector). The second device 136 defines a channel 142 extending between the first surface 150 and the second surface 152. The connector 140 extends from the second surface 152. Once the second device 136 is received in the cavity 104 of the hollow elongated housing 102, the connector 140 faces the second open end section 108 of the hollow elongated housing 102.

[0032] Referring to the embodiment as depicted in FIG. 6, the plunge-moving assembly 118 includes (preferably) a screw assembly 120 (also called an elongated screw assembly). For instance, the screw assembly 120 defines (provides) an exterior facing thread extending along

an elongated length of the screw assembly 120. The screw assembly 120 is configured to be received into the passageway 138 of the plunge assembly 112. The inner surface, which faces the passageway 138 of the plunge assembly 112, defines a compatible mating surface configured to thread engage with the screw assembly 120.

[0033] Referring to the embodiment as depicted in FIG. 6, the first device 134 is configured to be rotated along a rotation movement direction 300. As the screw assembly 120 (extending from the first device 134) is inserted into (and threadably engages) the passageway 138 of the plunge assembly 112, the first device 134 moves along a linear movement direction 402.

[0034] Referring to the embodiment as depicted in FIG. 6, the first device 134 provides a connection feature 141 (such as a groove, etc.) configured to selectively connect with the connector 140 of the second device 136. This is done in such a way that the first device 134 and the second device 136 rotatably engage with each other. Continued rotation of the first device 134 urges linear movement of the plunge assembly 112 toward the first edge portion 126 and the second edge portion 128 of the hollow elongated housing 102, thereby urging movement of the second device 136 toward the first edge portion 126 and the second edge portion 128 of the hollow elongated housing 102.

[0035] Referring to the embodiment as depicted in FIG. 7, the connection feature 141 and the connector 140 are selectively connected with each other, with the second device 136 being trapped against (in a fixed relationship with) the first edge portion 126 and the second edge portion 128. The second device 136 has an outer peripheral profile that matches with the inner cross-sectional profile of the hollow elongated housing 102 (this is done in such a way that the second device 136 cannot rotate relative to the interior of the hollow elongated housing 102). The first device 134 may be rotated while the first device 134 remains fixed in position relative to the hollow elongated housing 102. The first device 134 may be rotated so that the screw assembly 120 (which extends from the first device 134), in use, urges movement of the plunge assembly 112 along the longitudinal axis 144.

[0036] Referring to the embodiment as depicted in FIG. 6, the plunge-moving assembly 118 includes a screw assembly 120. The screw assembly 120 is configured to extend along a longitudinal axis of the hollow elongated housing 102 (once the screw assembly 120 is received into the cavity 104 of the hollow elongated housing 102).

[0037] Referring to the embodiment as depicted in FIG. 6, the plunge assembly 112 includes a rear section 115. The rear section 115 is configured to fully descend (move) into a groove 124

of the plunge-moving assembly 118 (also called a base unit). The rear section 115 is configured (preferably) to reduce wastage of the flowable substance once the rear section 115, in use, becomes fully received into the groove 124 of the plunge-moving assembly 118.

[0038] Referring to the embodiments as depicted in FIG. 6 and FIG. 7, the screw assembly 120 is configured to threadably couple the plunge assembly 112.

[0039] Referring to the embodiment as depicted in FIG. 6, the plunge-moving assembly 118 includes a first device 134 (also called a rotation assembly) configured to be coupled to the screw assembly 120. The first device 134 is configured to rotate the screw assembly 120 in response to rotation action applied to the first device 134; this is done in such a way that the screw assembly 120, in use, urges movement of the plunge assembly 112 toward the first open end section 106.

[0040] Referring to the embodiment as depicted in FIG. 6, the rear plunger extension 132 (also called a stem portion) of the plunge assembly 112 is configured to extend at least one plunge diameter below the plunge portion in order to provide engagement; a technical advantage for this embodiment is that at least one plunge diameter space may be gained between the first open end section 106 and the front section 114 (also called a front portion) of the plunge-moving assembly 118, used for filling procedure clearances; more robust troche threshold, etc.

[0041] FIG. 8 and FIG. 9 depict perspective views of embodiments of the hollow elongated housing 102 of FIG. 1.

[0042] Referring to the embodiments as depicted in FIG. 8 and FIG. 9, there is depicted, in accordance with a first major aspect, an apparatus which includes and is not limited to (comprises) a synergistic combination of a hollow elongated housing 102, a plunge assembly 112 and a plunge-moving assembly 118.

[0043] Referring to the embodiments as depicted in FIG. 8 and FIG. 9 (in accordance with the first major aspect), the hollow elongated housing 102 is configured to receive a flowable substance (known and not depicted) therein. The flowable substance may include a fluid, a slurry, a flowable solid, a food item, etc.

[0044] Referring to the embodiments as depicted in FIG. 8 and FIG. 9 (in accordance with the first major aspect), the plunge assembly 112 is configured to be movable along, at least in part, the hollow elongated housing 102; this is done in such a way that the plunge assembly 112, in use, moves, at least in part, the flowable substance along the hollow elongated housing 102. The plunge assembly 112 is configured, preferably, to provide airless delivery (movement) of the

flowable substance (also called a product), and/or avoid, at least in part, contact of air with the flowable substance, and/or avoid having the air reach equilibrium (with the exterior of the hollow elongated housing 102); therefore, the plunge assembly 112 may result in longer shelf life of the flowable substance (by reducing the oxidation of the flowable substance).

[0045] Referring to the embodiments as depicted in FIG. 8 and FIG. 9 (in accordance with the first major aspect), the plunge-moving assembly 118 is configured to move the plunge assembly 112; this is done in such a way that the plunge-moving assembly 118, in use, urges the plunge assembly 112 to move a predetermined amount of the flowable substance along the hollow elongated housing 102. In this manner, the user does not have to measure the quantity of material to be removed from the hollow elongated housing 102. The plunge-moving assembly 118 is configured, preferably, to provide a predetermined measurement of the amount of flowable substance to be moved or dispensed from the hollow elongated housing 102.

[0046] Referring to the embodiments as depicted in FIG. 8 and FIG. 9, there is depicted, in accordance with a second major aspect, an apparatus which includes and is not limited to (comprises) a synergistic combination of a hollow elongated housing 102, a plunge assembly 112, a sealing device 116 and a plunge-moving assembly 118.

[0047] Referring to the embodiments as depicted in FIG. 8 and FIG. 9 (in accordance with the second major aspect), the hollow elongated housing 102 having a first open end section 106 is configured to receive a flowable substance therein (such as a fluid, slurry, a food item, etc., such as via the first open end section 106, etc.).

[0048] Referring to the embodiments as depicted in FIG. 8 and FIG. 9 (in accordance with the second major aspect), the plunge assembly 112 is configured to be movable along a length of the hollow elongated housing 102; this is done in such a way that the plunge assembly 112, in use, moves, at least in part, the flowable substance from the hollow elongated housing 102 and out from the first open end section 106.

[0049] Referring to the embodiments as depicted in FIG. 8 and FIG. 9 (in accordance with the second major aspect), the sealing device 116 is positioned (positionable) between the plunge assembly 112 and the hollow elongated housing 102; this is done in such a way that the sealing device 116, in use, prevents, at least in part, leakage of the flowable substance between the plunge assembly 112 and the hollow elongated housing 102. The sealing device 116 is configured, preferably, to keep the interior of the hollow elongated housing 102 in a clean condition (self-cleaning) in such a way that rinsing of the hollow elongated housing 102 is not

required (before the hollow elongated housing 102 is recycled in a municipal recycling program, etc.).

[0050] Referring to the embodiments as depicted in FIG. 8 and FIG. 9 (in accordance with the second major aspect), the plunge-moving assembly 118 is configured to move the plunge assembly 112 toward the first open end section 106; this is done in such a way that the plunge-moving assembly 118, in use, urges the plunge assembly 112 to move a predetermined amount of the flowable substance from the hollow elongated housing 102 and out from the first open end section 106. In this manner, the user does not have to measure the quantity of material to be removed from the hollow elongated housing 102. The plunge-moving assembly 118 is configured, preferably, to provide predetermined metering (measurement) of the amount of flowable substance to be dispensed from the interior of the hollow elongated housing 102.

[0051] FIG. 10 depicts a cross-sectional view (taken along a cross-sectional line A-A as depicted in FIG. 1) of embodiments of the hollow elongated housing 102 of FIG. 1.

[0052] Referring to the embodiment as depicted in FIG. 10, there is depicted, in accordance with a third major aspect, an apparatus which includes and is not limited to (comprises) a synergistic combination of a hollow elongated housing 102, a plunge assembly 112, a sealing device 116 and a plunge-moving assembly 118.

[0053] Referring to the embodiment as depicted in FIG. 10 (in accordance with the third major aspect), the hollow elongated housing 102 defines a cavity 104. The hollow elongated housing 102 has a first open end section 106 and a second open end section 108. The first open end section 106 and the second open end section 108 are spaced apart from each other (preferably at opposite end sections of the hollow elongated housing 102). The cavity 104 extends between, and in is fluid communication with, the first open end section 106 and the second open end section 108. The cavity 104 is configured to receive a flowable substance.

[0054] Referring to the embodiment as depicted in FIG. 10 (in accordance with the third major aspect), the dispensing device 110 (also called a dispensing tip) is configured to be selectively attachable to (and selectively removable from) the first open end section 106. The dispensing device 110 is configured, preferably, to prevent, at least in part, contact between the flowable substance and an exterior of the hollow elongated housing 102 (in a storage condition, such as during shipment, etc.). The dispensing device 110 is also configured to be, at least in part, in fluid communication with the first open end section 106 and the cavity 104 once the dispensing device 110 is selectively attached to the first open end section 106.

[0055] Referring to the embodiment as depicted in FIG. 10 (in accordance with the third major aspect), the plunge assembly 112 is configured to be received into the cavity 104 via the second open end section 108. The plunge assembly 112 is also configured to be movable along a length of the cavity 104 once the plunge assembly 112 is received into the cavity 104 via the second open end section 108. The plunge assembly 112 is also configured to be movable toward the first open end section 106; this is done in such a way that the plunge assembly 112, in use, moves, at least in part, the flowable substance, positioned in the cavity 104, toward, and out from, the first open end section 106. The plunge assembly 112 includes (for instance) a front section 114 configured to engage, at least in part, (or preferably fully engage) with an interior surface 107 of the first open end section 106 to allow departure of the flowable substance from the cavity 104.

[0056] Referring to the embodiment as depicted in FIG. 10 (in accordance with the third major aspect), the sealing device 116 extends from the plunge assembly 112. The sealing device 116 is configured to prevent, at least in part, leakage of the flowable substance positioned on the front section 114 of the plunge assembly 112 toward the second open end section 108 while the plunge assembly 112, in use, is moved toward the first open end section 106.

[0057] Referring to the embodiment as depicted in FIG. 10, the plunge assembly 112 (preferably) is configured to provide seal that mitigates, at least in part, leakage (preferably prevent leakage) between the outer surface of the screw assembly 120 (also called the spine) and the inner surface (specifically, the inner threads) positioned in the passageway 138 of the plunge assembly 112. More preferably, the sealing device 116 also includes an inner sealing device 117 that is positioned between the outer surface of the screw assembly 120 (also called the spine) and the inner surface (specifically, the inner threads) positioned in the passageway 138 of the plunge assembly 112. The inner sealing device 117 is configured to provide seal that mitigates, at least in part, leakage (preferably prevent leakage) between the outer surface of the screw assembly 120 (also called the spine) and the inner surface (specifically, the inner threads) positioned in the passageway 138 of the plunge assembly 112. For instance, a gasket may be applied to the outer surface of the plunge assembly 112, and the screw assembly 120 extends through the gasket (similar to a baby bottle nipple that gets stretched, etc.). The sealing device 116 and the inner sealing device 117 (or the gasket) may be tight so that not too much of the flowable material (product) travels through passageway 138 of the plunge assembly 112.

[0058] Referring to the embodiment as depicted in FIG. 10 (in accordance with the third major aspect), the plunge-moving assembly 118 is configured to be coupled to the plunge assembly 112. The plunge-moving assembly 118 is configured to move the plunge assembly 112 toward the first open end section 106; this is done in such a way that the plunge-moving assembly 118, in use, moves the plunge assembly 112 so that a predetermined amount of the flowable substance is moved, in use, from the cavity 104 and out from the first open end section 106 and into the dispensing device 110, and out from the dispensing device 110.

[0059] Referring to the embodiment as depicted in FIG. 10 (in accordance with an option for any major aspect), the hollow elongated housing 102 is configured to be free standing once the second open end section 108 is positioned on a horizontal working surface; this is done in such a way that the hollow elongated housing 102 extends vertically upwardly (technical advantage: reduction of the footprint of the hollow elongated housing 102).

[0060] Referring to the embodiment as depicted in FIG. 10, the plunge assembly 112 has been moved along a length of the cavity 104 (also called an internal cavity), away from the second device 136 and toward an interior surface 107 (inner face) positioned proximate to the first open end section 106. The plunge assembly 112 separates the cavity 104 into a first cavity section 104A and a second cavity section 104B.

[0061] Referring to the embodiment as depicted in FIG. 10, a selectively removable lid 146 is positioned over the first open end section 106 (above the neck portion 122). The selectively removable lid 146 is positioned to adhere to the exit portion of the neck extension 111. The selectively removable lid 146 is removable along a removal direction 406 (by a user 900).

[0062] Referring to the embodiment as depicted in FIG. 10, once the selectively removable lid 146 is removed, the dispensing device 110 is moved, along the installation direction 404, to cover the neck portion 122 (so that the flowable item contained in the hollow elongated housing 102 may exit the interior of the hollow elongated housing 102).

[0063] FIG. 11, FIG. 12 and FIG. 13 depict a bottom view (FIG. 11), a side view (FIG. 12) and a cross-sectional view (FIG. 13) of embodiments of the hollow elongated housing 102 of FIG. 1. For FIG. 13, the cross-sectional view is taken along a cross-sectional line B-B as depicted in FIG. 11.

[0064] Referring to the embodiments as depicted in FIG. 11, FIG. 12 and FIG. 13, the second device 136 has a square-shaped outer peripheral edge. The channel 142 is positioned centrally of the second device 136. The connector 140 surrounds (at least in part) the channel 142. The

connector 140 extends from the second surface 152 of the second device 136. The first surface 150 and the second surface 152 are spaced apart from each other. The channel 142 extends between the first surface 150 and the second surface 152.

[0065] FIG. 14, FIG. 15 and FIG. 16 depict a bottom view (FIG. 14), a side view (FIG. 15) and a cross-sectional view (FIG. 16) of embodiments of the hollow elongated housing 102 of FIG. 1. For FIG. 16, the cross-sectional view is taken along a cross-sectional line C-C as depicted in FIG. 14.

[0066] Referring to the embodiments as depicted in FIG. 14, FIG. 15 and FIG. 16, the rear section 115 and the front section 114 are spaced apart from each other. The rear plunger extension 132 extends from the rear section 115. The front plunger extension 130 extends from the front section 114. The passageway 138 is formed through the plunger assembly 112, through the front plunger extension 130 and the rear plunger extension 132. The passageway 138 is positioned centrally of the plunger assembly 112.

[0067] FIG. 17, FIG. 18 and FIG. 19 depict perspective views of embodiments of the hollow elongated housing 102 of FIG. 1.

[0068] Referring to the embodiment as depicted in FIG. 17, the dispensing device 110 includes the neck extension 111 and an exit portal 148. The exit portal 148 is positioned at the outer edge of the neck extension 111.

[0069] Referring to the embodiment as depicted in FIG. 18, the dispensing device 110 includes the neck extension 111 and the exit portal 148. The exit portal 148 forms an elongated tapered member (portion0 extending from the outer edge of the neck extension 111.

[0070] Referring to the embodiment as depicted in FIG. 19, the dispensing device 110 includes the neck extension 111 and the exit portal 148. The exit portal 148 forms an elongated slot formation positioned proximate to the outer edge of the neck extension 111.

[0071] The following is offered as further description of the embodiments, in which any one or more of any technical feature (described in the detailed description, the summary and the claims) may be combinable with any other one or more of any technical feature (described in the detailed description, the summary and the claims). It is understood that each claim in the claims section is an open ended claim unless stated otherwise. Unless otherwise specified, relational terms used in these specifications should be construed to include certain tolerances that the person skilled in the art would recognize as providing equivalent functionality. By way of example, the term perpendicular is not necessarily limited to 90.0 degrees, and may include



a variation thereof that the person skilled in the art would recognize as providing equivalent functionality for the purposes described for the relevant member or element. Terms such as “about” and “substantially”, in the context of configuration, relate generally to disposition, location, or configuration that are either exact or sufficiently close to the location, disposition, or configuration of the relevant element to preserve operability of the element within the disclosure which does not materially modify the disclosure. Similarly, unless specifically made clear from its context, numerical values should be construed to include certain tolerances that the person skilled in the art would recognize as having negligible importance as they do not materially change the operability of the disclosure. It will be appreciated that the description and/or drawings identify and describe embodiments of the apparatus (either explicitly or inherently). The apparatus may include any suitable combination and/or permutation of the technical features as identified in the detailed description, as may be required and/or desired to suit a particular technical purpose and/or technical function. It will be appreciated that, where possible and suitable, any one or more of the technical features of the apparatus may be combined with any other one or more of the technical features of the apparatus (in any combination and/or permutation). It will be appreciated that persons skilled in the art would know that the technical features of each embodiment may be deployed (where possible) in other embodiments even if not expressly stated as such above. It will be appreciated that persons skilled in the art would know that other options may be possible for the configuration of the components of the apparatus to adjust to manufacturing requirements and still remain within the scope as described in at least one or more of the claims. This written description provides embodiments, including the best mode, and also enables the person skilled in the art to make and use the embodiments. The patentable scope may be defined by the claims. The written description and/or drawings may help to understand the scope of the claims. It is believed that all the crucial aspects of the disclosed subject matter have been provided in this document. It is understood, for this document, that the word “includes” is equivalent to the word “comprising” in that both words are used to signify an open-ended listing of assemblies, components, parts, etc. The term “comprising”, which is synonymous with the terms “including,” “containing,” or “characterized by,” is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. Comprising (comprised of) is an “open” phrase and allows coverage of technologies that employ additional, unrecited elements. When used in a claim, the word “comprising” is the transitory verb (transitional term) that separates the preamble of the claim

from the technical features of the disclosure. The foregoing has outlined the non-limiting embodiments (examples). The description is made for particular non-limiting embodiments (examples). It is understood that the non-limiting embodiments are merely illustrative as examples.

CLAIMS

WHAT IS CLAIMED IS:

1. An apparatus, comprising:

a hollow elongated housing being configured to receive a flowable substance therein; and

a plunge assembly being configured to be movable along, at least in part, the hollow elongated housing in such a way that the plunge assembly, in use, moves, at least in part, the flowable substance along the hollow elongated housing; and

a plunge-moving assembly being configured to move the plunge assembly in such a way that the plunge-moving assembly, in use, urges the plunge assembly to move a predetermined amount of the flowable substance along the hollow elongated housing.

2. An apparatus, comprising:

a hollow elongated housing having a first open end section being configured to receive a flowable substance therein; and

a plunge assembly being configured to be movable along a length of the hollow elongated housing in such a way that the plunge assembly, in use, moves, at least in part, the flowable substance from the hollow elongated housing and out from the first open end section; and

a sealing device being positioned between the plunge assembly and the hollow elongated housing in such a way that the sealing device, in use, prevents, at least in part, leakage of the flowable substance between the plunge assembly and the hollow elongated housing; and

a plunge-moving assembly being configured to move the plunge assembly toward the first open end section in such a way that the plunge-moving assembly, in use, urges the plunge assembly to move a predetermined amount of the flowable substance from the hollow elongated housing and out from the first open end section.

3. An apparatus, comprising:

a hollow elongated housing defining a cavity; and

the hollow elongated housing having a first open end section and a second open end section, in which the first open end section and the second open end section are spaced apart from each other; and

the cavity extending between, and being in fluid communication with, the first open end section and the second open end section; and

the cavity being configured to receive a flowable substance; and

a dispensing device being configured to be selectively attachable to the first open end section; and

the dispensing device being configured to be, at least in part, in fluid communication with the first open end section and the cavity once the dispensing device is selectively attached to the first open end section; and

a plunge assembly being configured to be received into the cavity via the second open end section; and

the plunge assembly also being configured to be movable along a length of the cavity once the plunge assembly is received into the cavity via the second open end section; and

the plunge assembly also being configured to be movable toward the first open end section in such a way that the plunge assembly, in use, moves, at least in part, the flowable substance, positioned in the cavity, toward, and out from, the first open end section; and

the plunge assembly includes a front section being configured to contact an interior surface of the first open end section to allow departure of the flowable substance from the cavity; and

a sealing device extending from the plunge assembly; and

the sealing device being configured to prevent, at least in part, leakage of the flowable substance positioned on the front section of the plunge assembly toward the second open end section while the plunge assembly, in use, is moved toward the first open end section; and

a plunge-moving assembly being configured to be coupled to the plunge assembly; and

the plunge-moving assembly being configured to move the plunge assembly toward the first open end section in such a way that the plunge-moving assembly, in use, moves the plunge assembly so that a predetermined amount of the flowable substance is moved, in use, from the cavity and out from the first open end section and into the dispensing device, and out from the dispensing device.

4. The apparatus of claim 3, wherein:

the hollow elongated housing is configured to be free standing once the second open end section is positioned on a horizontal working surface in such a way that the hollow elongated housing extends vertically upwardly.

5. The apparatus of claim 3, wherein:

the plunge assembly includes a rear section being configured to fully move into a groove of the plunge-moving assembly.

6. The apparatus of claim 3, wherein:

the plunge-moving assembly includes a screw assembly configured to extend along a longitudinal axis of the hollow elongated housing.

7. The apparatus of claim 6, wherein:

the screw assembly is configured to threadably couple the plunge assembly.

8. The apparatus of claim 7, wherein:

the plunge-moving assembly includes a first device configured to be coupled to the screw assembly; and

the first device is configured to rotate the screw assembly in response to rotation action applied to the first device in such a way that the screw assembly, in use, urges movement of the plunge assembly toward the first open end section.

9. The apparatus of claim 3, wherein:

a rear plunger extension of the plunge assembly extends one plunge diameter below a plunge portion in order to provide engagement.

10. The apparatus of claim 3, wherein:

the hollow elongated housing includes a neck portion; and

the neck portion extends away from the hollow elongated housing; and

the neck portion defines the first open end section.

11. The apparatus of claim 10, wherein:

a dispensing device is configured to be selectively connected to, and selectively removable from, the neck portion of the hollow elongated housing in such a way that the first open end section is covered by the dispensing device once the dispensing device is selectively connected to the neck portion; and

the dispensing device includes a neck extension configured to be selectively connected to, and selectively disconnectable from, the neck portion.

12. The apparatus of claim 3, wherein:

the hollow elongated housing includes a first edge portion a second edge portion each extending towards a longitudinal axis extending along a central section of the hollow elongated housing; and

the first edge portion and the second edge portion are spaced apart from each other; and

the first edge portion and the second edge portion each extend from peripheral edges of the hollow elongated housing; and

the second open end section is positioned between the first edge portion and the second edge portion.

13. The apparatus of claim 3, wherein:

the hollow elongated housing defines, preferably, a square-shaped cross section.

14. The apparatus of claim 3, wherein:

the plunge-moving assembly includes a screw assembly configured to extend along a longitudinal axis of the hollow elongated housing; and

the plunge assembly is configured to be received via the second open end section of the hollow elongated housing; and

the plunge assembly further includes:

a rear section spaced apart from the front section; and

a front plunger extension; and

a rear plunger extension; and

the front section and the rear section are spaced apart from each other; and

the sealing device is positioned radially along an outer circumference edge of the plunge assembly; and

the sealing device also includes an inner sealing device positioned between an outer surface of the screw assembly and an inner surface positioned in a passageway of the plunge assembly, and wherein the inner sealing device is configured to provide seal that mitigates, at least in part, leakage between the outer surface of the screw assembly and the inner surface positioned in the passageway of the plunge assembly; and

the front plunger extension extends from the front section; and

the rear plunger extension extends from the rear section; and

the plunge assembly defines a passageway extending along centrally of the plunge assembly; and

the passageway extends through the plunge assembly, the front section, the rear section, the front plunger extension, and the rear plunger extension.

15. The apparatus of claim 14, wherein:

the plunge-moving assembly is configured to be received, at least in part, into the second open end section of the hollow elongated housing; and

the plunge-moving assembly includes:

a first device; and

a second device configured to be positioned between the second open end section and the plunge assembly.

16. The apparatus of claim 15, wherein:

the second device includes:

a first surface; and

a second surface; and

a connector; and

the second device defines a channel extending between the first surface and the second surface; and

the connector extends from the second surface, and once the second device is received in the cavity of the hollow elongated housing, the connector faces the second open end section of the hollow elongated housing.

17. The apparatus of claim 15, wherein:

the plunge-moving assembly includes:

a screw assembly configured to be received into the passageway of the plunge assembly; and

an inner surface, which faces the passageway of the plunge assembly, defines a compatible mating surface configured to thread engage with the screw assembly.

18. The apparatus of claim 15, wherein:

the plunge-moving assembly includes:

a screw assembly configured to be received into the passageway of the plunge assembly; and

the screw assembly is configured to threadably couple the plunge assembly; and

the first device is configured to be rotated along a rotation movement direction;  
and

as the screw assembly, extending from the first device, is inserted into and engages the passageway of the plunge assembly, the first device moves along a linear movement direction.

19. The apparatus of claim 15, wherein:

the first device provides a connection feature configured to selectively connect with a connector of the second device in such a way that the first device and the second device rotatably engage with each other; and

continued rotation of the first device urges linear movement of the plunge assembly toward a first edge portion and a second edge portion of the hollow elongated housing, thereby urging movement of the second device toward the first edge portion and the second edge portion of the hollow elongated housing.

20. The apparatus of claim 15, wherein:

the plunge-moving assembly includes:

a screw assembly configured to be received into the passageway of the plunge assembly; and

wherein a connection feature and a connector are selectively connected with each other, with the second device being trapped against, and being in a fixed relationship with, a first edge portion and a second edge portion of the hollow elongated housing; and

the second device has an outer peripheral profile that matches with an inner cross-sectional profile of the hollow elongated housing in such a way that the second device cannot rotate relative to the cavity of the hollow elongated housing; and

the first device is rotatable while the first device remains fixed in position relative to the hollow elongated housing; and

the first device is rotatable so that the screw assembly, extending from the first device, in use, urges movement of the plunge assembly along an longitudinal axis extending through the hollow elongated housing.



**ABSTRACT**

A hollow elongated housing is configured to receive a flowable substance therein. A plunge assembly is configured to be movable along, at least in part, the hollow elongated housing. This is done in such a way that the plunge assembly, in use, moves, at least in part, the flowable substance along the hollow elongated housing. A plunge-moving assembly is configured to move the plunge assembly; this is done in such a way that the plunge-moving assembly, in use, urges the plunge assembly to move a predetermined amount of the flowable substance along the hollow elongated housing.