(54) Title: PROTECTIVE PACKAGING WITH PRODUCT PREPARATION FEATURES INCORPORATED

(57) Abstract: A protective packaging with one or more product preparation features is provided.

Published:
without international search report and to be republished upon receipt of that report (Rule 48.2(g))
PROTECTIVE PACKAGING WITH PRODUCT PREPARATION FEATURES INCORPORATED

This application claims the benefit of U.S. Provisional Application No. 61/609,015, which was filed March 9, 2012 and is incorporated herein by reference as if fully set forth.

FIELD

A protective packaging with product preparation features.

BACKGROUND

Many products are shipped surrounded by foam with cut-outs for the product geometry and with secure holding features that prevent relative movement during shipping and transportation. However, the packaging for these products is limited to providing a protective state.

SUMMARY

In an aspect, the invention relates to a protective packaging comprising a protective packaging and at least one product preparation feature.

BRIEF DESCRIPTION OF THE DRAWINGS

The following detailed description of the embodiments of the present invention will be better understood when read in conjunction with the appended drawings. For the purpose of illustrating the invention, there are shown in the drawings embodiments which are presently preferred. It is understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown. In the drawings:

FIG. 1 illustrates an embodiment of a multiple layered packaging.
FIG. 2 illustrates an embodiment of a product preparation feature.

FIG. 3 illustrates an embodiment of a hydration cavity with an adjacent tool accessibility space.

FIG. 4 illustrates an embodiment of a closure including a bump/detent for submersion.

FIG. 5 illustrates an embodiment of a product retain-and-release feature.

FIG. 6 illustrates an embodiment of a multiple product packaging.

FIGS. 7A and 7B illustrate an embodiment of product holder.

FIGS. 8A and 8B illustrate an embodiment with a peel-open top.

[0019] DETAILED DESCRIPTION

[0020] Certain terminology is used in the following description for convenience only and is not limiting. The words "right," "left," "top," and "bottom" designate directions in the drawings to which reference is made. The words "a" and "one," as used in the claims and in the corresponding portions of the specification, are defined as including one or more of the referenced item unless specifically stated otherwise. This terminology includes the words above specifically mentioned, derivatives thereof, and words of similar import.

The phrase "at least one" followed by a list of two or more items, such as "A, B, or C," means any individual one of A, B, or C as well as any combination thereof.

[0021] In an embodiment a protective packaging is provided. The protective packaging may include a primary packaging, at least one product space on the primary packaging configured to receive at least one product, and at least one product preparation feature. Referring to FIG. 1, an exemplary protective packaging 100 is illustrated with a primary packaging including first primary packaging 140, second primary packaging 160, and third primary packaging 130. First primary packaging 140, second primary
packaging 160, and third primary packaging 130 may combine to form the primary packaging. A receptacle or product space 146 on the first primary packaging 140 is configured to receive product 150.

[0022] Primary packaging may include any suitable material. Primary packaging may include any material that provides a cushioning or shielding effect to a product to reduce risk of damage during shipping, transportation or handling. Primary packaging may include but is not limited to having a biocompatible and radiation stable material. For example, primary packaging may be polypropylene (PP). For example, primary packaging may be polyethylene (PE). For example, primary packaging may be polyethylene terephthalate or polyethylene terephthalate - glycol modified (PETG). PETG may be useful for a medical device application. Primary packaging may be composed of a material fabricated in any way. Primary packaging may be fabricated by thermoforming. Primary packaging may be porous or non-porous. Primary packaging may be a foam material. Primary packaging may have various closed or open pore structures. Primary packaging may be of any density. Primary packaging may have a density between and including 1 lb./ft\(^3\) and 8 lb./ft\(^3\).

[0023] Primary packaging may be any material that can absorb energy from impact forces and thereby prevent damage to the product. For example, primary packaging may include a material that can absorb energy from impact forces due to dropping or vibrations from shipment. Primary packaging may include a material capable of providing insulation from environmental factors. For example, primary packaging may include a material capable of providing insulation from temperature or humidity. Primary packaging may include a material providing a barrier. For example, primary packaging may include a material providing a sterile barrier.

[0024] Primary packaging may protect a product susceptible to damage. Primary packaging may protect a medical device. For example, primary packaging may protect a medical implant in the form of a scaffold that has a porous structure that is susceptible to plastic deformation or damage from
shipping, transportation or handling. Primary packaging may protect a pharmaceutical drug or component. For example, primary packaging may protect a drug which is sensitive to temperature or humidity.

[0025] The primary packaging with the at least one product space may receive one or more products. The at least one product space may receive products of different shapes or sizes. For example, the at least one product space may receive fifty (50) scaffolds. For example, the at least one product space may receive four (4) different sized scaffolds.

[0026] The at least one product may be a medical device. For example, the medical device may be a medical implant. The medical implant may be a scaffold. The scaffold may be any known to those skilled in tissue engineering. The scaffold may include a gel or hydrogel. Different ones of the at least one product may include different product sizes, shapes, or geometries. The at least one product may include at least two different product sizes. The at least one product may include four different product sizes.

[0027] The product may be or include a pharmaceutical drug or component. For example, the product may be a drug which is sensitive to heat or humidity.

[0028] Examples of scaffolds may include those formed by synthetic polymers. Scaffolds may include porous structures. The structures may be any suitable shape and geometry including but not limited to cylinders, tubes, blocks, granules, sheets, or films. Scaffolds may be fabricated with polymers such as those described in PCT/US12/46687 (Poly((lactic-co-glycolic acid)-b-lysine) and process for synthesizing a block copolymer of PLGA {poly(lactic-co-glycolic acid)} and PLL (Poly-ε-Cbz-L-lysine)), which was filed July 13, 2012, is incorporated herein by reference as if fully set forth, and describes polymers containing poly(lactic-co-glycolic acid) conjugated with poly-L-lysine. Examples of scaffolds may include hydrogels which act as drug delivery systems, composed of a matrix with one or more therapeutic agents. The matrix may include a synthetic polymeric implant such as that which may be
found in U.S. Patent Publication No. 2010/0196481, which is the publication of U.S. Appln. No. 12/567,589 filed September 25, 2009, and is incorporated herein by reference as if fully set forth. The one or more therapeutic agents may selected from but are not limited to those in U.S. Patent Publication No. 2010/0196481, which is incorporated herein by reference as if fully set forth. The one or more therapeutic agents may be one or more substance selected from the group consisting of inhibitors of NOS or NO production, an antioxidant, a spin trap, a peroxynitrite scavenger, tempol (4-hydroxy-2,2,6,6-tetramethylpiperidine-1-oxyl), uric acid, minocycline, methylprednisolone, MnTBAP, and dexamethasone, or pharmaceutically acceptable salt of any of the foregoing. The synthetic polymeric implant may comprise multiblock copolymers where the polymers are selected from one or more of the group consisting of ethylene glycol containing polymers, oligoethylene glycol containing polymers, polyethylene glycol polymers, lactide polymers, glycolide polymers, and poly(glycerol-co-sebacic acid). The synthetic polymeric implant may be a hydrogel, or a lyophilized matrix which is configured to absorb aqueous media.

[0029] The product preparation feature may include any feature that assists a user in preparing the product. For example, the product preparation feature may aid in the surgical preparation of the product prior to implantation. The product preparation feature may be incorporated directly into the primary packaging. The product preparation feature may present the product to the user.

[0030] The product preparation feature may be a hydration chamber. The hydration chamber may present the product to the user in such a way that allows hydration of the product in a controlled manner directly in its presented state to minimize handling of the product. This presentation may also allow shaping of the product. The hydration chamber may present the product in an orientation with its surfaces exposed. The hydration chamber may include a cavity or chamber surrounding the product. For example, the cavity or chamber may allow the product to be hydrated in a controlled
manner with a defined volume of wetting agent prior to use. The wetting agent may include an isotonic agent or saline. The cavity or chamber may hold the product in a manner such that it is completely submerged during rehydration.

[0031] The product preparation feature may include a product holder. The product holder may be configured to present the product in an orientation with product surfaces exposed in a fashion such that the product can be shaped or sized. The product holder may be configured to hold the product to be shaped or sized with a trimming device directly in the primary packaging prior to use. The product holder may be configured to position the product in a secure position to prevent/minimize relative movement between the primary packaging and the product while shaping or trimming forces are applied to the product. The product holder may include a cavity or a chamber configured to contain the product in a loose state such that it can be rotated or slid within the cavity or chamber while the user applies an instrument for shaping or trimming. The cavity or chamber may provide a barrier to contain the product and prevent it from moving out of control. This may be critical in an operating room environment when sterility is to be maintained. With both shaping methods described, the cavity may be the same cavity or chamber aforementioned for the hydration chamber.

[0032] The product holder may be configured to hold the product in a secure position and orientation. For example, the product holder may prevent/minimize relative movement between the product and the primary packaging. The product holder may hold the product in direct contact with the protective packaging material. The product holder may limit its surface area contact to the product. For example, the product holder may be configured to allow maximum surface area exposure for the product to allow for hydration and for trimming while the product is located in its packaged state. The product holder may be configured such that the product holder does not apply excessive compressive forces to the product that would plastically deform or damage the product. The product holder may be
configured to hold a product of any geometric shape. For example, the product holder may be configured to hold a cylindrical product. The product holder may be configured to hold a cylindrical product with diameters between and including 1 mm to 8 mm and lengths between and including 3 mm to 25 mm. The product holder may be configured to allow a product to remain submerged, while maximizing exposed surface area when a wetting agent is added to fill the cavity or chamber and surround the product.

[0033] Referring to FIG. 7A, an example protective packaging 700 with a product holder 710 on primary packaging 740 is illustrated. Referring to FIG. 7B, the example protective packaging 700 with a product holder 710 is illustrated defining a recess between two protruding at least partially resilient walls, with the recess having a partial cylindrical surface that is adapted to hold a cylindrical product 750. This allows the ends of the product to be accessible for trimming.

[0034] The product preparation feature may include a cavity or indentation in the primary packaging. The cavity may include a space for a tool to access the product while in the primary packaging. The cavities or indentations in the primary packaging may be configured for handling of the product with specific tools. For example, the primary packaging may include extensions to the cavities containing the product to allow space for pick-and-placement of the product using forceps. Primary packaging may include a space for tools to accompany the product. For example, primary packaging may include a space for accompanying forceps or scalpels.

[0035] Referring to FIG. 3, an example protective packaging 300 is illustrated with a hydration cavity 320 which is doubly used as a tool cavity 310, product 350, and primary packaging 340. As illustrated, tool cavity 310 may be part of the hydration cavity 320 and may be located adjacent. The tool cavity 310 may be configured to allow a tool to access product 350 in hydration cavity 320 on primary packaging 340.

[0036] The product preparation feature may include an indicator. The indicator may be a measurement scale. The indicator may be a timer. The
measurement scale may gauge the size of the product. The timer may control the length of hydration time. The indicator may include characteristics about the product or product modification guidelines. Product modification guidelines may include measurements necessary for modification of the product for a particular use.

[0037] The primary packaging may include a translucent or transparent material to visualize product preparation.

[0038] The primary packaging may include characters, colors, or signals to aid the user. For example, primary packaging may include numbers indicating product size or arrows indicating where to hydrate.

[0039] The protective packaging may include a closure. The closure may include a barrier or closure feature. The closure may be a screen, a membrane, a lid or a cap. The closure may be incorporated in the primary packaging. The closure may be incorporated at or near the surface of a cavity or chamber in the primary packaging. The closure may be removed or replaced by means of sliding, peeling, sealing, or snapping on or off. The closure may be configured to allow controlled exposure of the product. For example, a sliding lid may allow only some of the products to be exposed at a given time, while others remain covered.

[0040] Referring to FIG. 6, an example protective packaging 600 is illustrated with primary packaging 660, and sliding closure 670. The primary packaging 660 may engage with a third primary packaging 630. As illustrated, sliding closure 670 is configured to slide along tracks 662 and to cover product in product space on primary packaging 660. As illustrated, primary packaging 660 may be configured to include multiple product spaces configured to receive multiple products.

[0041] Referring to FIG. 8A, a side view of an example protective packaging 800 is illustrated with peel-open top 870 and primary packaging 860 with hydration cavity 810 and product. The peel-open top 870 may be transparent plastic or foil. The peel-open top 870 may cover hydration cavity 810 and product. The peel open top 870 may engage the first primary
packaging (not shown). The hydration cavity 810 may be sized to fit the
product plus enough space for a desired amount of wetting solution. Referring
to FIG. 8B, a top view of an embodiment of the protective packaging 800 of
FIG. 8A is depicted with the peel-open top 870, the hydration cavity 810, and
the product. The peel-open top 870 is provided with peel-open top ports or
orifices 820. These peel-open top ports or orifices 820 allow the hydration
cavity 810 to be filled with wetting solution to keep the product submerged.
[0042] The closure may include a product submersion feature. The
product submersion feature may be configured to prevent a product with a
buoyant characteristic from floating to the surface and keep the product
submerged. By keeping the product submerged, the wetting procedure may be
controlled and may induce less variability that would affect product
performance. For example, the product submersion feature may be a bump, a
protrusion, or a detent on the closure to contact the product.
[0043] Referring to FIG. 4, an example protective packaging 400 is
illustrated with product submersion feature 410, cavity, product 450, second
primary packaging 460, first primary packaging 440, and closure or outer
sealed barrier 470. As illustrated, the product submersion feature 410 on
second primary packaging 460 is configured to hold the product 450 in the
cavity 420 on the first primary packaging 440.
[0044] The closure may include at least one hydrating orifice. The
hydrating orifice may be of sufficient size to allow a wetting agent to pass
through in order to fill the cavity or chamber below. For example, hydration
can be controlled by a defined cavity size and two hydrating orifices on the
closure, one for filling and one for air escape and/or overflow of excess wetting
agent. The hydrating orifices may be sized such that they are not too large so
as to contain the product and keep the product submerged in the fluid filled
cavity. The at least one hydration orifice may be covered by a protective top.
The protective top may be a peel-open top. The peel-open top may be plastic
or foil.
Referring to FIG. 2, an example protective packaging 200 is illustrated with hydrating orifices 210, wetting agent applicator 220, first primary packaging 240, secondary primary packaging 260, and product 250. Second primary packaging 260 may include two hydrating orifices 210. Wetting agent applicator 220 may be inserted into one of hydrating orifice 210 to fill a cavity (not shown) in the first primary packaging 240.

The product preparation feature may be a product release mechanism. The product release mechanism may be incorporated into the primary packaging. The product release mechanism may be configured to release the product from a secure state. The product release mechanism may be a tab. The product release mechanism may be a removable top, a removable screen, or a removable membrane. The product release mechanism may be configured to release the product by squeezing or spreading the primary packaging. The product release mechanism may release product to the user after hydrating as described herein. The product release mechanism may release the product to the user after the shaping preparation described herein. The product release mechanism may also be a peel-open top. For example, the peel-open top may be a transparent plastic or foil. The product release mechanism may be a removable portion that releases the compression force holding the product in a secure state. The product release mechanism may include squeezing or spreading a portion of the primary packaging. For example, squeezing or spreading a portion of foam primary packaging may free the product for the user to remove the product from its packaged state. The product release mechanism may include a removable screen or membrane that provides access to the product. The product release mechanism may include a peel-open top with ports or holes. The ports or holes in peel-open top may allow filling the chamber or cavity with a wetting agent.

The product preparation feature may include a retain-and-release mechanism. The retain-and-release mechanism may be activated by a handling tool. The retain-and-release mechanism may be spring-loaded. The retain-and-release mechanism may be designed in such a way so as not to
limit the product preparation feature. For example, the retain-and-release feature may include pores so as to allow hydration of the product uniformly. The retain-and-release mechanism may also act as the product submersion feature.

[0048] Referring to FIG. 5, an example protective packaging 500 is illustrated with retain-and-release mechanism 510, product 550 and a first primary packaging 540. As illustrated, retain-and-release mechanism 510 may be configured to retain product 550 on the first primary packaging 540 until it is activated to release product 550.

[0049] The protective packaging may include multiple levels of packaging. The protective packaging may include a secondary packaging. The protective packaging may include a tertiary packaging. The protective packaging may include a primary packaging, a secondary packaging and a tertiary packaging similar to that of contact lenses. The primary packaging may include the one or more product preparation features. The primary packaging may be a transparent or translucent plastic material. The secondary packaging may include a peel-open foil. The peel-open foil may surround the primary packaging. The peel-open foil may include a desiccant. The tertiary packaging may include a container with a desired number of the primary or the secondary packaging. The tertiary packaging may include a cardboard box with a desired number of the secondary packaging.

[0050] Referring to FIG. 1, an example protective packaging 100 is illustrated with tertiary packaging 110, secondary packaging 120, primary packaging including first primary packaging 140, second primary packaging 160, third primary packaging 130, product 150, cover 170, and product space or receptacle 146. Secondary packaging 120 may receive and enclose the assembled parts of primary packaging 100 including first primary packaging 140, second primary packaging 160, third primary packaging 130, product 150, and cover 170. Tertiary packaging 110 may receive secondary packaging 120.
The tertiary packaging 110 may define a cavity 112. The cavity 112 may be on an axial end of the tertiary packaging 110. A closure 114 may be provided at an axial end of the tertiary packaging 110 for closing the cavity 112. The cavity 112 may be defined such that the secondary packaging 120, and the primary packaging 100 may be slidably arranged within the cavity 112 of the tertiary packaging 110. The closure 114 may be shut after the secondary packaging 120 and the primary packaging 100 are within the cavity 112.

The secondary packaging 120 may include a cavity 122. A closure 124 may be provided on an end of the secondary packaging 120. The closure 124 may include a seal or other suitable fastening arrangement for sealing the cavity 122. The cavity 122 defines a receptacle for the primary packaging 100, i.e. the first primary packaging 140, the second primary packaging 160, the product 150, the third primary packaging 130, and the cover 170. The closure 124 may be sealed after the primary packaging 100 is arranged within the cavity 122.

The third primary packaging 130 includes an outer shell 132 and an inner cradle portion 134. The outer shell 132 defines an inner hollow portion of the first primary packaging 130. The cradle portion 134 extends from a base of the third primary packaging 130 and defines an engagement portion for a bottom surface of the first primary packaging 140.

The first primary packaging 140 includes an outer shell or shell portion 142 and rests within the outer shell 132 of the third primary packaging 130. Inner wall surfaces of the outer shell 132 of the third primary packaging 130 engage outer wall surfaces of the shell portion 142 of the first primary packaging 140. The first primary packaging 140 may snap into engagement with the third primary packaging 130 via clips or any other fastening arrangement. The first primary packaging 140 includes a raised portion or island 144. The raised portion 144 may include a receptacle 146 on a top surface. The receptacle 146 can hold the product 150. The receptacle 146
may be a cavity. The raised portion 144 may define a reservoir for aqueous solution.

[0055] The second primary packaging 160 engages with the first primary packaging 140. The second primary packaging 160 may include a fastening arrangement on a bottom surface that engages with the raised portion 144 of the first primary packaging 140 or the outer shell 142 of the first primary packaging 140. The second primary packaging 160 defines a top cover or cap for the first primary packaging 140. The second primary packaging 160 may be a cap that snaps into engagement with the first primary packaging 140. The second primary packaging 160 may include a receptacle (not shown) on a bottom surface for holding the product 150. The receptacle on the bottom surface of the second primary packaging 160 may correspond with the receptacle 146 of the first primary packaging 140. The second primary packaging 160 may include a product submersion feature for pressing the product 150 down in the receptacle 146 of the first primary packaging 140. The second primary packaging 160 may include an indent feature to keep the product 150 submerged within the cavity 146 of the first primary package 140.

[0056] An outer edge of the cover 170 seals with the outer shell 132 of the third primary packaging 130. The outer edge of the cover 170 may wrap over an edge of the outer shell 132 to seal an area defined between the third primary packaging 130 and the cover 170.

[0057] In an embodiment, a primary package 240 may include a closure 260 extending from an inner surface of the primary package 240. A top surface of the closure 260 may include one or more hydrating orifice 210. The hydrating orifices 210 may be located proximal to a product space 280 defined on the closure 260 for housing the product 250. The closure 260 may include an indent 280 to keep the product submerged. The wetting agent applicator 220 may be a needle, syringe, or other device capable of transferring liquid or other medium from a hydrating orifice 210 to the product space 280. The closure 260 may be removably coupled with the primary package 240. The
closure 260 may snap into engagement or otherwise fasten to the primary package 240.

[0058] In an embodiment, a tool cavity 310 is located on a top surface of a raised portion or island 370 extending from a bottom surface of the primary packaging 340. The tool cavity 310 may define a lateral recess in the raised portion 370. The hydration cavity 320 may extend longitudinally on the top surface of the island 370. The hydration cavity 320 and the tool cavity 310 may intersect with each other to define one continuous cavity. The tool cavity 310 is shaped to allow for a user to reach into the tool cavity 310 with a device such as forceps to pick up a product 350 positioned within the hydration cavity 320.

[0059] In an embodiment, the protective packaging 400 includes the product submersion feature 410. The product submersion feature 410 may include a bump or detent that engages a top surface of the product 450. The product submersion feature 410 may be located on a bottom surface of a second primary package 460. The product submersion feature 410 engages the product 450 to ensure the product 450 is submerged in a medium or other fluid. The first primary package 440 forms the cavity for supporting the product 450.

[0060] In an embodiment, the primary package 540 includes a retain-and-release mechanism 510. The retain-and-release mechanism 510 may include two walls 512, 514 extending from a top or bottom surface of the primary package 540. The walls 512, 514 may be parallel to each other and the walls 512, 514 may be shaped such that a space defined between the walls 512, 514 decreases closer to the top surface of the primary package 540. The walls 512, 514 may include recessed portions or cavities 516, 518 that allow for a user to pick up the product 550 using forceps or a pick-and-place tool. The pick-and-place tool can access the product 550 through the cavities 516, 518. The product 550 can rest between the two walls 512, 514 of the retain-and-release mechanism 510. The walls 512, 514 may have lengths such that the product 550 extends beyond terminal end portions of the walls 512, 514.
The primary package 540 may be small enough to fit within the receptacle 146 of the first primary package 140. The walls 512, 514 may be spring loaded such that the walls 512, 514 can bend and stretch based on a user grabbing the product 550 with a tool. The walls 512, 514 may also be pressed to fall away and release the product 550. The walls 512, 514 may retain the product 550 through an interference fit. The retain-and-release mechanism 510 may be within a product space and the walls 512, 514 may extend from a bottom surface of the product space. The two walls 512, 514 may be configured to retain the product through an interference fit or other suitable holding configuration.

[0061] In an embodiment the primary packaging 660 may include a slot, detent, or other receiving portion or track 662 for the sliding closure 670. The sliding closure 670 may slidably engage with the receiving portion 662 on the primary packaging 660. The primary packaging 660 may include multiple product spaces such that the sliding closure 670 may slide and reveal any number of product spaces in the primary package 660. The multiple product spaces may be arranged in parallel rows. Exposure to the product spaces may be controlled based on how far the sliding closure 670 is slidable within the receiving portion 662 of the primary packaging 660. The sliding closure 670 may include grips or other features for allowing a user to move the sliding closure 670 within the receiving portion 662.

[0062] In an embodiment, the product holder 710 extends from a top surface of the primary packaging 740 and includes walls 712, 714 for retaining the product 750. The product 750 may be held by the product holder 710 in an elevated position above the top surface of the primary packaging 740. The product 750 may extend beyond terminal portions of the product holder 710. The product 750 may be trimmed or otherwise modified by a user while the product 750 rests within the product holder 710 of the primary packaging 740. The primary packaging 740 may rest within the receptacle 146 of the first primary package 140.
In an embodiment, a method of preparing a product using a protective packaging is provided.

Embodiments

The following list includes particular embodiments of the present invention. The list, however, is not limiting and does not exclude alternate embodiments, as would be appreciated by one of ordinary skill in the art.

1. A protective packaging comprising a first primary packaging having a top surface, a bottom surface, and at least one product space on the top surface, wherein the at least one product space has an opening and is configured to receive a product.

2. The protective packaging of embodiment 1 further comprising a cover that engages the top surface of the first primary packaging and extends over the first primary packaging and the at least one product space.

3. The protective packaging of any one or more of embodiments 1-2 further comprising a third primary packaging including an outer shell and a cradle portion, wherein the first primary packaging rests within the outer shell and on top of the inner cradle portion.

4. The protective packaging of any one or more of embodiments 1-3 further comprising a second primary packaging that engages the top surface of the first primary packaging.

5. The protective packaging of any one or more of embodiments 1-4 wherein the second primary packaging is a cap and engages the opening of the first primary packaging.

6. The protective packaging of any one or more of embodiments 1-5 further comprising a secondary packaging including a first cavity and a first closure, wherein the first primary packaging, the second primary packaging, and the third primary packaging are slidably supported within the cavity and the closure may be sealed to enclose the first primary packaging, the second primary packaging, and the third primary packaging within the cavity.
7. The protective packaging of any one or more of embodiments 1-6 further comprising a tertiary packaging having a second cavity and a second closure, wherein the secondary packaging is supported within the second cavity.

8. The protective packaging of any one or more of embodiments 1-7 wherein the second primary packaging further includes at least one hydrating orifice configured to open into the product space.

9. The protective packaging of any one or more of embodiments 1-8 further comprising a raised portion extending from a bottom surface of the first primary packaging and including a tool cavity and a hydration cavity, wherein the tool cavity intersects with the hydration cavity and the product space is within the tool cavity and the hydration cavity.

10. The protective packaging of any one or more of embodiments 1-7, wherein the tool cavity extends laterally across the raised portion and the hydration cavity extends longitudinally on the raised portion.

11. The protective packaging of any one or more of embodiments 1-10 further comprising a product submersion projection located on the bottom surface of the second primary packaging.

12. The protective packaging of any one or more of embodiments 1-11 wherein the product submersion projection engages a top surface of the product.

13. The protective packaging of any one or more of embodiments 1-12 wherein the product space is a cavity that houses the product.

14. The protective packaging of any one or more of embodiments 1-13 further comprising a retain and release mechanism within the product space and having two walls extending from a bottom surface of the product space, wherein the two walls are configured to retain the product through an interference fit.

15. The protective packaging of any one or more of embodiments 1-14 wherein the walls include recessed portions on inner surfaces facing each other, wherein the recessed portions allow a user to access the product.
16. The protective packaging of any one or more of embodiments 1-15 wherein the first primary packaging includes a slot for slidably receiving a sliding closure.

17. The protective packaging of any one or more of embodiments 1-16 wherein the sliding closure is configured to slide in the slot to reveal a desired number of the at least one product space on the first primary packaging.

18. The protective packaging of any one or more of embodiments 1-17 further comprising a peel-open top cover that engages over the first primary packaging and the second primary packaging.

19. The protective packaging of any one or more of embodiments 1-18 wherein the peel-open top cover engages an edge of the third primary packaging.

20. The protective packaging of any one or more of embodiments 1-19 wherein the peel-open top cover includes a plurality of ports aligned with the product space and configured to open into the product space.

21. The protective packaging of any one or more of embodiments 1-20, wherein the protective packaging includes a biocompatible and radiation stable material.

22. The protective packaging of any one or more of embodiments 1-21, wherein the protective packaging includes polypropylene or polyethylene terephthalate.

23. The protective packaging of any one or more of embodiments 1-22, wherein the protective packaging is a porous material.

24. The protective packaging of any one or more of embodiments 1-23, wherein the protective packaging has a density of 1lb./ft$^3$ and 8lb./ft$^3$.

25. The protective packaging of any one or more of embodiments 1-24, wherein the at least one product is a medical device.

26. The protective packaging of any one or more of embodiments 1-25, wherein the at least one product space is configured to receive a product of multiple sizes.

27. The protective packaging of any one or more of embodiments 1-26, wherein the at least one product space is a hydration chamber.
28. The protective packaging of any one or more of embodiments 1-27, wherein the hydration chamber is configured to fully submerge the product.

29. The protective packaging of any one or more of embodiments 1-28, wherein the at least one product space includes a cavity for a tool to access the product.

30. The protective packaging of any one or more of embodiments 1-29, wherein the protective packaging includes an indicator of at least one of product properties or product modification guidelines.

31. The protective packaging of any one or more of embodiments 1-30, wherein the cover is at least one closure selected from the group consisting of a screen, a membrane, a lid, and a cap.

32. The protective packaging of any one or more of embodiments 1-31, wherein the at least one product is a medical implant.

33. The protective packaging of any one or more of embodiments 1-32, wherein the at least one product is a scaffold.

34. The protective packaging of any one or more of embodiments 1-33, wherein the at least one product space is configured to receive two or more different product sizes.

35. The protective packaging of any one or more of embodiments 1-34, wherein the at least one product space is configured to receive four different product sizes.

36. The protective packaging of any one or more of embodiments 1-35, wherein the product preparation feature is product holder.

37. The protective packaging of any one or more of embodiments 1-36, wherein the product holder is configured to allow shaping and trimming of the product.

38. The protective packaging of any one or more of embodiments 1-37, wherein the product holder is configured to hold a cylindrical product.

39. The protective packaging of any one or more of embodiments 1-38, wherein the cylindrical product has a diameter of 1 mm to 8 mm.
40. The protective packaging of any one or more of embodiments 1-39, wherein the cylindrical product has a length of 3 mm to 25 mm.
41. The protective packaging of any one or more of embodiments 1-40, wherein the product preparation feature is an indicator.
42. The protective packaging of any one or more of embodiments 1-41, wherein the indicator is a measurement scale.
43. The protective packaging of any one or more of embodiments 1-42, wherein the indicator is a timer.
44. The protective packaging of any one or more of embodiments 1-43, wherein the product submersion feature is a bump, a protrusion or a detent.
45. The protective packaging of any one or more of embodiments 1-44, wherein the at least one hydration orifice is covered by a protective cover.
46. The protective packaging of any one or more of embodiments 1-45, wherein the protective top is a peel-open top.
47. The protective packaging of any one or more of embodiments 1-46, wherein the peel-open top is plastic or foil.
48. The protective packaging of any one or more of embodiments 1-47, wherein the product preparation feature is a product release mechanism.
49. The protective packaging of any one or more of embodiments 1-48, wherein the product release mechanism is configured to release the product from a secure state.
50. The protective packaging of any one or more of embodiments 1-49, wherein the product release mechanism is a tab.
51. The protective packaging of any one or more of embodiments 1-50, wherein the product release mechanism is a removable top, a removable screen or a removable membrane.
52. The protective packaging of any one or more of embodiments 1-51, wherein the product release mechanism is configured to release the product by squeezing or spreading the primary packaging.
53. The protective packaging of any one or more of embodiments 1-52, wherein the retain-and-release mechanism is activated by a handling tool.
54. The protective packaging of any one or more of embodiments 1-53, wherein the retain-and-release mechanism is spring-loaded.

55. A method of preparing a product comprising:
   - supporting a product in the at least one product space of the protective packaging of any one or more of embodiments 1-54, and
   - modifying at least one of the shape or composition of the product while the product is supported in the at least one product space.

56. The method of embodiment 55, wherein modifying the composition includes exchanging or adding liquid around the product by adding a solution in the product space that includes a substance to add to the product or lacking a substance to remove from the product.

57. The method of embodiment 56, wherein the substance to add is a therapeutic agent.

58. A method of hydrating a product comprising:
   - supporting a product in the at least one product space of the protective packaging of any one or more of embodiments 8-54, and injecting wetting solution through the at least one hydrating orifice into the at least one product space.

59. The method of hydrating a product of any one or more of embodiments 1-54, wherein the product is lyophilized prior to the step of injecting.

60. A method of treating an injury comprising:
   - removing a product from the at least one product space of the protective packaging of any one or more of embodiments 1-54, and
   - implanting the product at a site of an injury in a patient in need thereof, wherein the method optionally includes the method of any one or more of embodiments 55—59 or 61—72.

61. A method of preparing a product comprising:
   - acquiring a product in a protective packaging comprising:
     - a primary packaging;
     - at least one product space on the primary packaging configured to receive
at least one product; and

preparing the product.

62. The method of embodiment 60, wherein the at least one product preparation feature is a hydration chamber.

63. The method of any one or more of embodiments 61-63, wherein preparing includes hydrating the product.

64. The method of any one or more of embodiments 61-64, wherein the at least one product preparation feature is a product holder.

65. The method of any one or more of embodiments 61-64, wherein preparing includes shaping the product.

66. The method of any one or more of embodiments 61-65, wherein preparing includes trimming the product.

67. The method of any one or more of embodiments 61-66, wherein the at least one product preparation feature is a timer.

68. The method of any one or more of embodiments 61-67, wherein preparing includes controlling time of hydration of the product.

69. The method of any one or more of embodiments 59-68, wherein the at least one product preparation feature is a measurement scale.

70. The method of any one or more of embodiments 61-69, wherein preparing includes measuring the product size.

71. The method of any one or more of embodiments 61-70, wherein the at least one product preparation feature is a product release mechanism or a retain-and-release mechanism.

72. The method of any one or more of embodiments 61-71, wherein preparing includes releasing the product.

[0066] Further embodiments herein may be formed by supplementing an embodiment with one or more element from any one or more other embodiment herein, and/or substituting one or more element from one embodiment with one or more element from one or more other embodiment herein.
Having thus described various embodiments of the present invention in detail, it is to be appreciated and will be apparent to those skilled in the art that many physical changes, only a few of which are exemplified in the detailed description above, could be made in the apparatus without altering the inventive concepts and principles embodied therein. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore to be embraced therein.

* * * *
What is claimed is:

1. A protective packaging comprising:
   a first primary packaging having a top surface, a bottom surface, and at least one product space on the top surface, wherein the at least one product space has an opening and is configured to receive a product.

2. The protective packaging of claim 1 further comprising a cover that engages the top surface of the first primary packaging and extends over the first primary packaging and the at least one product space.

3. The protective packaging of claim 1 further comprising a third primary packaging including an outer shell and a cradle portion, wherein the first primary packaging rests within the outer shell and on top of the inner cradle portion.

4. The protective packaging of claim 1 further comprising a second primary packaging that engages the top surface of the first primary packaging.

5. The protective packaging of claim 4 wherein the second primary packaging is a cap and engages the opening of the first primary packaging.

6. The protective packaging of claim 5 further comprising a secondary packaging including a first cavity and a first closure, wherein the first primary packaging, the second primary packaging, and the third primary packaging are slidably supported within the cavity and the closure may be sealed to enclose the first primary packaging, the second primary packaging, and the third primary packaging within the cavity.
7. The protective packaging of claim 6 further comprising a tertiary packaging having a second cavity and a second closure, wherein the secondary packaging is supported within the second cavity.

8. The protective packaging of claim 4 wherein the second primary packaging further includes at least one hydrating orifice configured to open into the product space.

9. The protective packaging of claim 1 further comprising a raised portion extending from a bottom surface of the first primary packaging and including a tool cavity and a hydration cavity, wherein the tool cavity intersects with the hydration cavity and the product space is within the tool cavity and the hydration cavity.

10. The protective packaging of claim 9, wherein the tool cavity extends laterally across the raised portion and the hydration cavity extends longitudinally on the raised portion.

11. The protective packaging of claim 1 further comprising a product submersion projection located on the bottom surface of the second primary packaging.

12. The protective packaging of claim 11 wherein the product submersion projection engages a top surface of the product.

13. The protective packaging of claim 12 wherein the product space is a cavity that houses the product.

14. The protective packaging of claim 1 further comprising a retain and release mechanism within the product space and having two walls extending
from a bottom surface of the product space, wherein the two walls are configured to retain the product through an interference fit.

15. The protective packaging of claim 14 wherein the walls include recessed portions on inner surfaces facing each other, wherein the recessed portions allow a user to access the product.

16. The protective packaging of claim 1 wherein the first primary packaging includes a slot for slidably receiving a sliding closure.

17. The protective packaging of claim 16 wherein the sliding closure is configured to slide in the slot to reveal a desired number of the at least one product space on the first primary packaging.

18. The protective packaging of claim 4 further comprising a peel-open top cover that engages over the first primary packaging and the second primary packaging.

19. The protective packaging of claim 18 wherein the peel-open top cover engages an edge of the third primary packaging.

20. The protective packaging of claim 19 wherein the peel-open top cover includes a plurality of ports aligned with the product space and configured to open into the product space.

21. The protective packaging of claim 1, wherein the protective packaging includes a biocompatible and radiation stable material.

22. The protective packaging of claim 1, wherein the protective packaging includes polypropylene, polyethylene, polyethylene terephthalate, or polyethylene terephthalate —glycol modified.
23. The protective packaging of claim 1, wherein the protective packaging is a porous material.

24. The protective packaging of claim 1, wherein the protective packaging has a density of 11lb./ft³ and 81lb./ft³.

25. The protective packaging of claim 1, wherein the at least one product is a medical device.

26. The protective packaging of claim 1, wherein the at least one product space is configured to receive a product of multiple sizes.

27. The protective packaging of claim 1, wherein the at least one product space is a hydration chamber.

28. The protective packaging of claim 27, wherein the hydration chamber is configured to fully submerge the product.

29. The protective packaging of claim 28, wherein the at least one product space includes a cavity for a tool to access the product.

30. The protective packaging of claim 1, wherein the protective packaging includes an indicator of at least one of product properties or product modification guidelines.

31. The protective packaging of claim 2, wherein the cover is at least one closure selected from the group consisting of a screen, a membrane, and a lid.

32. The protective packaging of claim 2, wherein the cap is at least one closure selected from the group consisting of a screen, a membrane, and a lid.
33. A method of preparing a product comprising:
   supporting a product in the at least one product space of the protective packaging of claim 1, and
   modifying at least one of the shape or composition of the product while the product is supported in the at least one product space.

34. A method of hydrating a product comprising:
   supporting a product in the at least one product space of the protective packaging of claim 8, and injecting wetting solution through the at least one hydrating orifice into the at least one product space.

35. The method of hydrating a product of claim 34, wherein the product is lyophilized prior to the step of injecting.

36. A method of treating an injury comprising:
   removing a product from the at least one product space of the protective packaging of claim 1, and
   implanting the product at a site of an injury in a patient in need thereof.