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(54) **PACKAGING FOR MULTIPLE CHEST WOUND SEALS FOR PREVENTING PNEUMOTHORAX**

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(57) **ABSTRACT**

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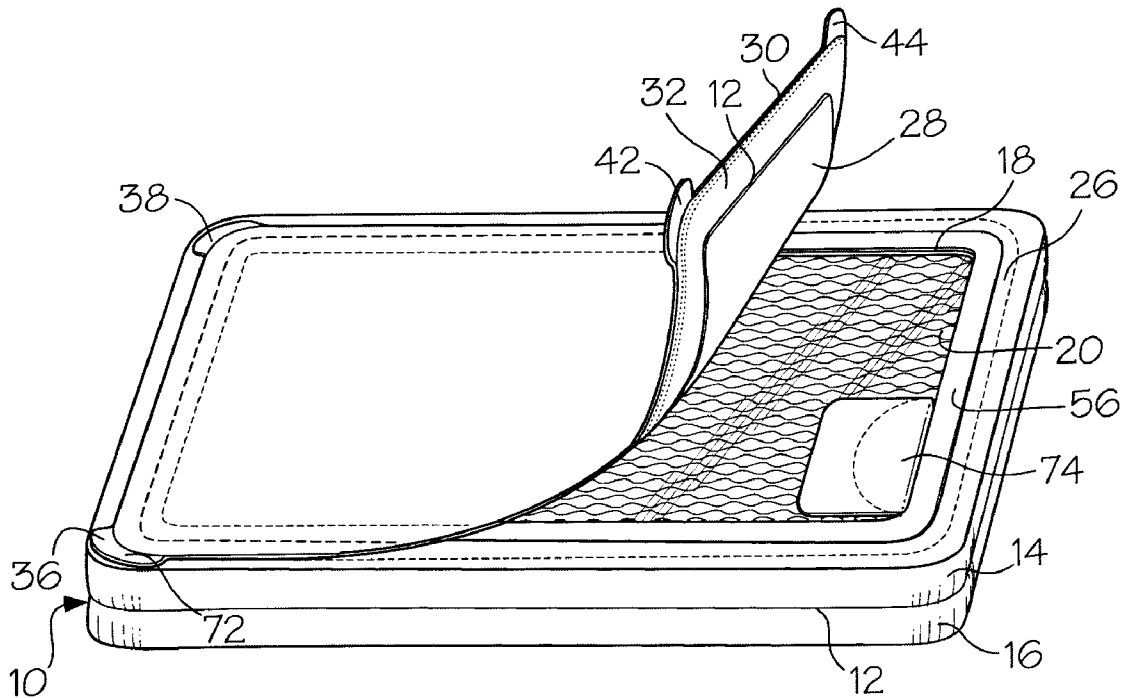
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**Related U.S. Application Data**

(60) Provisional application No. 61/370,836, filed on Aug. 5, 2010.

This invention is directed to an occlusive dressing container having a pouch; a central divider included in the interior of the pouch for defining a first and a second package cavity within the pouch wherein each package cavity contains an occlusive dressing; a first package seal attached to the pouch further defining the first package cavity; a first outer cover removably attached to the pouch and attached to the first package seal; and, whereas when the first outer cover is removed from the pouch, a portion of the first package seal is removed with the first outer cover creating a first opening in the pouch and providing access to the interior of the first package cavity thereby allowing the occlusive seal to be removed from the packaging cavity.



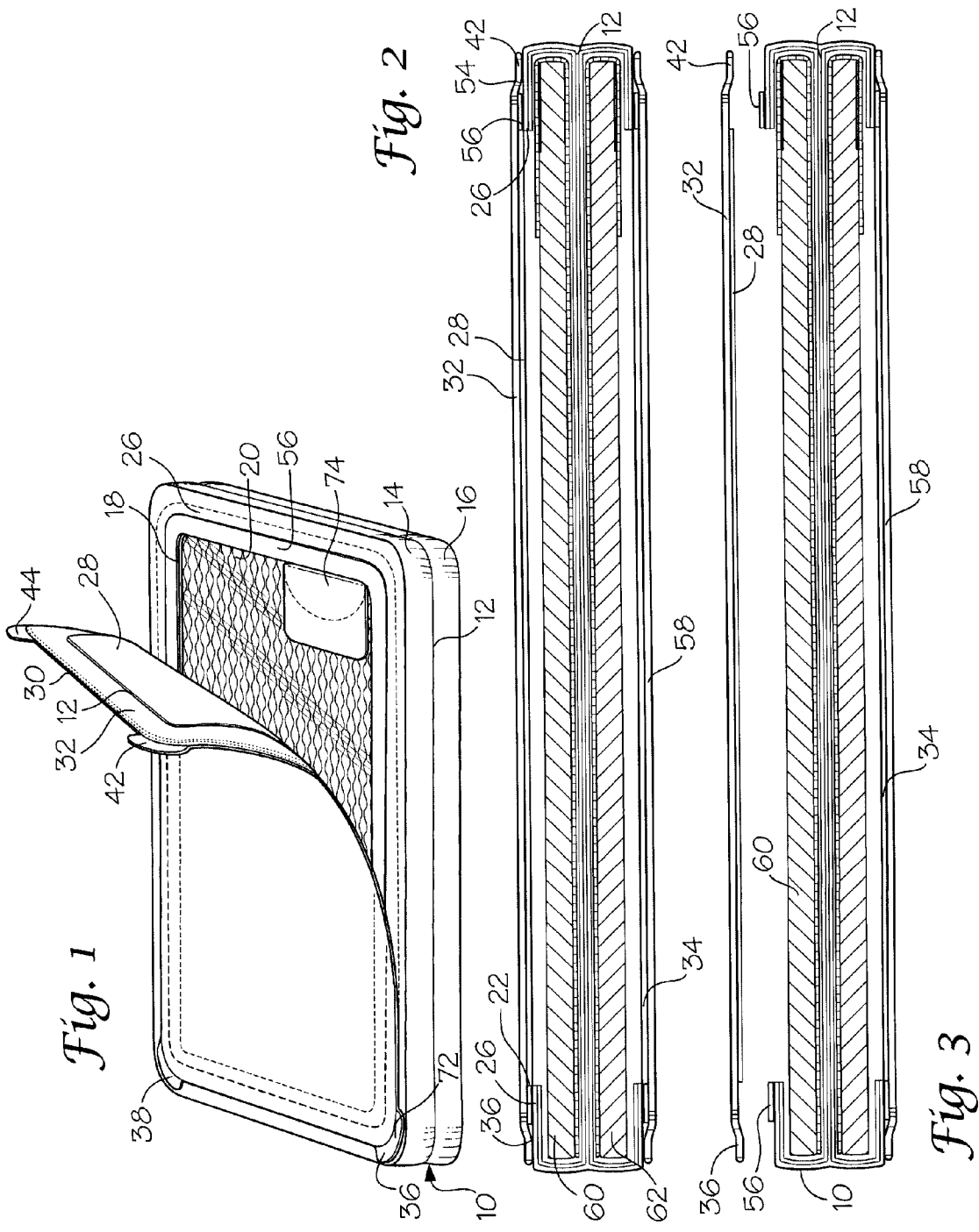


Fig. 1

Fig. 2

Fig. 3

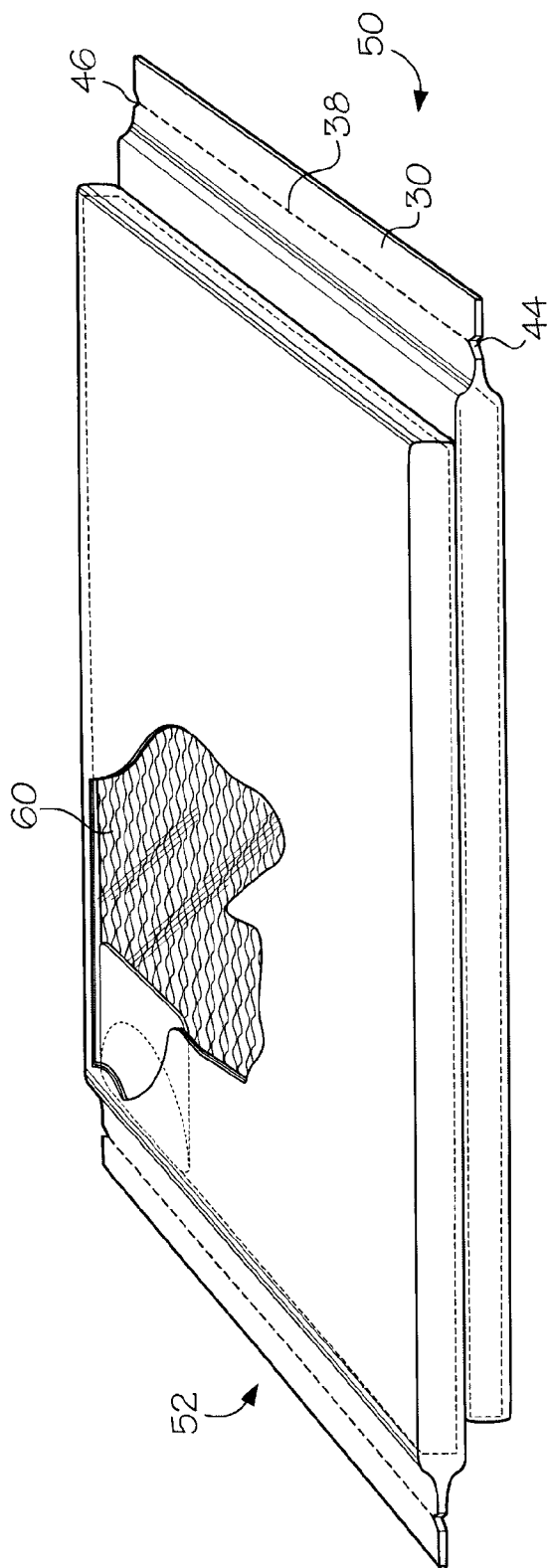


Fig. 4

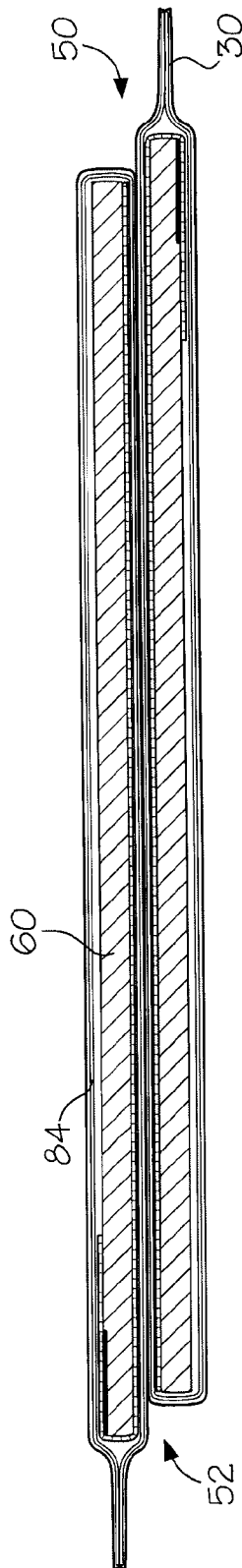
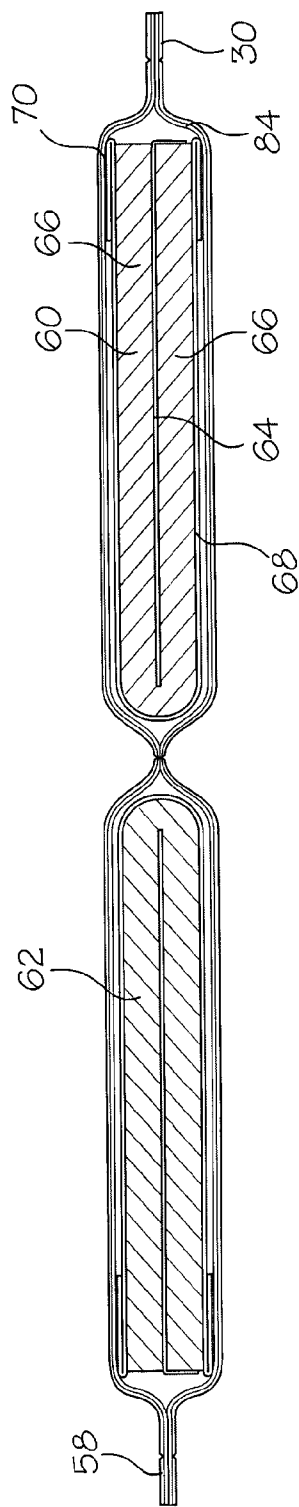
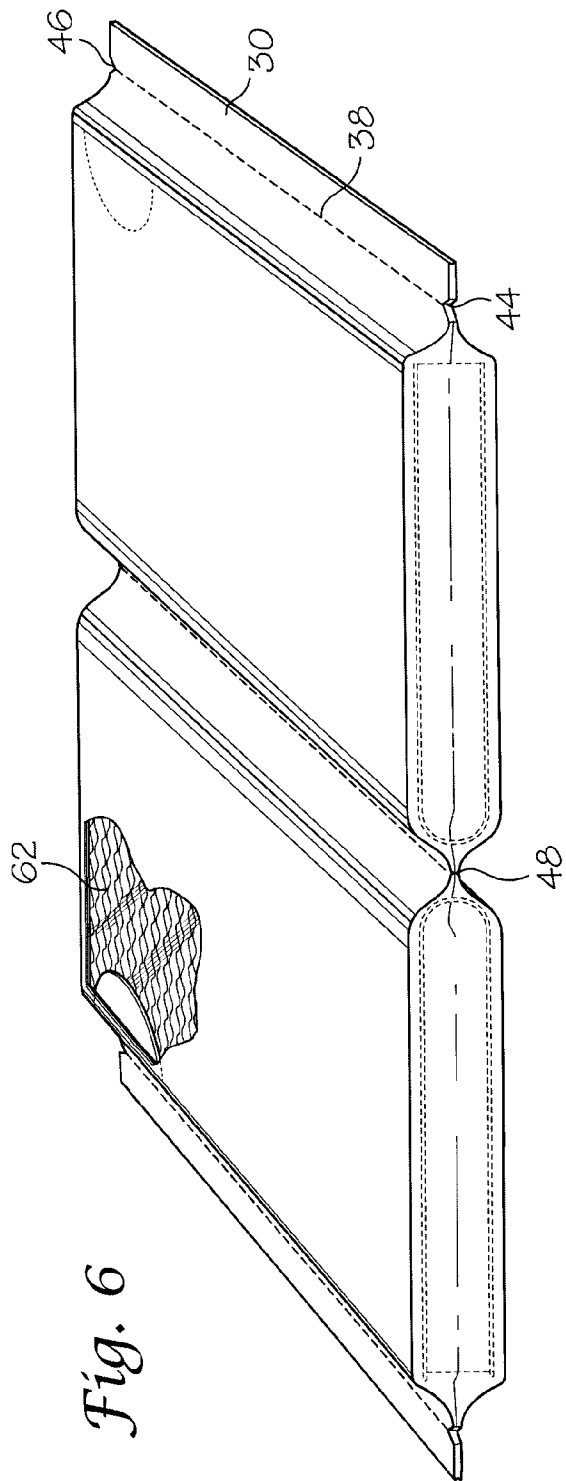


Fig. 5



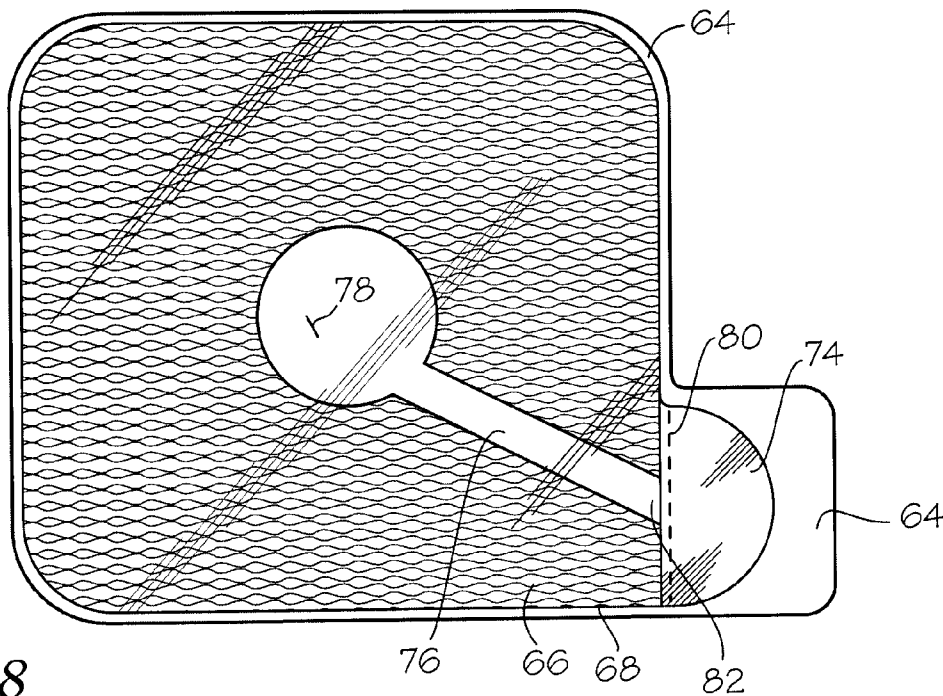


Fig. 8

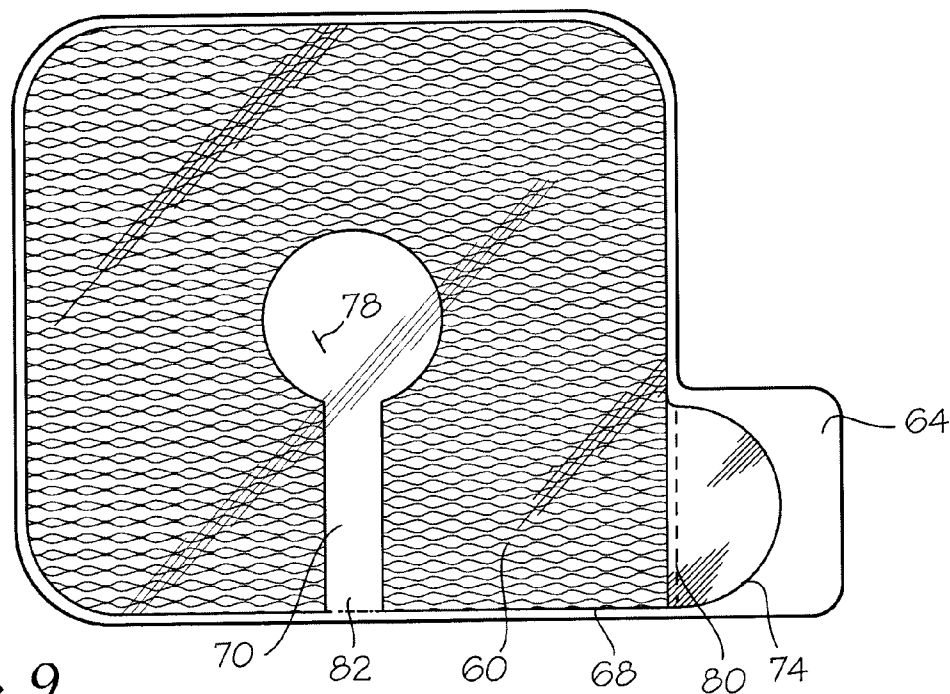


Fig. 9

**PACKAGING FOR MULTIPLE CHEST WOUND SEALS FOR PREVENTING PNEUMOTHORAX**

**CROSS-REFERENCE TO RELATED APPLICATION**

[0001] This application is a nonprovisional application claiming priority from U.S. Provisional Application No. 61/370,836, filed Aug. 5, 2010.

**FIELD OF THE INVENTION**

[0002] This invention is directed to a packaging for medical supplies and more specifically, for a packaging container for keeping a plurality of chest seals in an airtight and watertight container.

**BACKGROUND OF THE INVENTION**

[0003] In the battlefield, the majority of wounds in combat are caused by penetrating trauma. The percentages of penetrating wounds from gunshots are approximately 23%, shrapnel 62%, and blast injuries 3%. This data has been relatively unchanged since World War I.

[0004] When a penetrating chest wound occurs, the negative pressure within the pleural space that prevents the lungs from collapsing during normal breathing can be disrupted, resulting in a life threatening situation. The flow of air and other fluids through the wound into the chest cavity can significantly reduce or eliminate this negative pressure. Once this occurs, the lungs lose the ability to inflate. This condition is referred to as a pneumothorax, where air can both enter and exit from the pleural space through the wound, making breathing extremely difficult.

[0005] Certain penetrating chest wounds, known as a tension pneumothorax, occur when a one-way valve is formed by the wound that allows airflow into the pleural space while preventing airflow out. In a tension pneumothorax, each inhalation traps air in the chest, increasing pressure on the lungs and ultimately causing them to collapse. Additionally, the increasing pressure pushes important structures in the center of the chest, such as the heart, major blood vessels, and airways, towards the sides of the chest. This shifting can cause further compression of the lungs and may affect the flow of blood returning to the heart. These additional complications in a tension pneumothorax make it a life threatening condition that requires immediate treatment.

[0006] Tension pneumothorax is the second leading cause of preventable death on the battlefield. In combat, the three preventable causes of death are: extremity hemorrhage, tension pneumothorax, and airway compromise.

[0007] Concerning penetrating chest wound caused by a gunshot (projectile) or shrapnel, an entrance wound will be created. With penetrating wounds, there are entrance and exit wounds. The treating individual should examine the injured individual for both types of wounds. Having two occlusive dressing in a package would assist in reminding the treating individual to check for both potential wounds. With there are both wounds presents, two occlusive dressing or chest seals should be used when treating a chest wound having an entrance and exit point.

[0008] Further, when treating penetrating chest wounds in combat, typically, time is of the essence as the injured individual and treating individual are under fire, transportation of the injured individual should be conducted as soon as possible

and generally the environment surrounding the injured individual is hostile. Valuable time is lost when having to locate and open two chest seals to treat the entrance and exit wound under these conditions.

[0009] One preferred chest seal that is on the market includes a thin flexible sheet with an adhesive layer carried on a bottom side of the sheet for adhering the sheet to skin surrounding the chest wound. The adhesion layer is hydrogel polymeric composition which allows it to mold exactly to body contours to eliminate potential air gaps, while also flexing and stretching with the skin as the body moves without becoming even slightly dislodged. Further, it can be reapplied numerous times without losing its adhesive properties. Hydrogel provides an airtight seal over the wound and has the added benefits of absorbing wound excreta, does not stick to the wound, can be made transparent to allow for monitoring of the wound without removing the seal, is non-antigenic and non-allergenic, and is easy to store and apply.

[0010] Some attempts to reduce treatment time include packaging two chest seals in a single package. However, the use of hydrogel requires that the packaging of the chest seal be airtight and watertight or over time the hydrogel adhesive will cease being effective. Therefore, in the case where two chest seals are packaged together, once the packaging is opened, both chest seals must be used, else the risk of one chest seal drying out and ultimately failing is greatly increased. Practically, therefore, once the packaging is opened, both chest seals should be used or discarded. In the event that there is no need for the second chest seal, the second chest seal is wasted.

[0011] Therefore, it is an object of this invention to provide a chest wound packaging container which contains multiple chest seals, and allows one chest seal to be removed from the packaging while leaving a second chest seal in airtight and watertight packaging for subsequent use.

**SUMMARY OF THE INVENTION**

[0012] The above objective is accomplished by providing a packaging container for storing multiple occlusive dressings in an airtight and watertight environment comprising: a flexible pouch; a central divider included in the interior of the flexible pouch defining a first and second package cavity within the flexible pouch wherein each package cavity contains an occlusive dressing; a first opening included in the flexible pouch providing access to the interior of the first package cavity, and a second opening included in the flexible pouch providing access to the interior of the second package cavity; a first package seal covering the first opening making the first cavity watertight and airtight, the first package seal having a perimeter attached to the flexible pouch, an area larger than the area of the first opening, a central portion having an area equal to or less than the area of the first opening and scoring arranged between the perimeter and the central portion of the first packaging seal allowing the central portion to tear away from the perimeter; a first outer cover removably attached to the flexible pouch and attached to the central portion of the first package seal; a second package seal covering the second opening attached to a second outer cover wherein the second outer cover is removably attached to the flexible pouch; and, whereas when the first outer cover is removed from the flexible pouch, the central portion of the package seal is removed with the first outer cover and the first opening is uncovered, thereby providing access to the interior

of the first package cavity allowing the occlusive seal to be removed from the first package cavity of the flexible pouch.

[0013] The invention can include a pouch; a central divider included in the interior of the pouch for defining a first and a second package cavity within the pouch wherein each package cavity contains an occlusive dressing; a first package seal attached to the pouch further defining the first package cavity; a first outer cover removably attached to the pouch and attached to the first package seal; and, whereas when the first outer cover is removed from the pouch, a portion of the first package seal is removed with the first outer cover creating a first opening in the pouch and providing access to the interior of the first package cavity, thereby allowing the occlusive seal to be removed from the packaging cavity.

[0014] The occlusive dressing can include a flexible sheet, an adhesive layer attached to the flexible sheet, and a lifting tab attached to the flexible sheet wherein the lifting tab has a width at least one-third the width of the edge of the flexible sheet attached to the lifting tab and the lifting tab can be folded against the flexible sheet. The vent opening can be adjacent to the lifting tab or on an edge which does not attach to the lifting tab.

#### DESCRIPTION OF THE DRAWINGS

[0015] The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings forming a part thereof, wherein an example of the invention is shown and wherein:

[0016] FIG. 1 is a perspective view of one embodiment of the invention;

[0017] FIG. 2 is a cross section of the invention;

[0018] FIG. 3 is a cross section of the invention with an outer cover removed;

[0019] FIG. 4 is a perspective of one embodiment of the invention;

[0020] FIG. 5 is a cross section of the invention;

[0021] FIG. 6 is a perspective of one embodiment of the invention;

[0022] FIG. 7 is a cross section of the invention;

[0023] FIG. 8 is a top view of an occlusive dressing; and,

[0024] FIG. 9 is a top view of an occlusive dressing.

#### DESCRIPTION OF A PREFERRED EMBODIMENT

[0025] Referring to the drawings, the invention will be described in more detail. Referring to FIG. 1, a pouch 10 is shown. The pouch can be a flexible pouch or rigid pouch. In one embodiment, the pouch is manufactured from a flexible material that can include oriented polypropylene (OPP), polyethylene, linear low-density polyethylene and poly foil. In one embodiment, the volume of the pouch is greater than 96 g.

[0026] A central divider 12 is included in the pouch and defines a first package cavity 14 and a second package cavity 16. A first opening 18 is defined in the pouch allowing access to an interior of first package cavity 14 allowing a chest seal 20 to be removed from the first package cavity. The first opening is sealed by a first package seal 22. The first packaging seal has a first packaging seal perimeter 24 attached to a first edge opening 26 so that the first packaging seal closes the opening to the first package cavity. A first packaging seal central portion 28 is attached to a first outer cover 30. The first outer cover has its perimeter 32 releasably attached to the

pouch so that the first outer cover can be lifted and pulled away from the pouch. When the first outer cover is pulled away from the pouch, the first packaging seal central portion 28 is torn away from the first packaging seal creating an opening in the first packaging seal allowing access to the interior of the first packaging cavity. When the first outer cover is removed, the second packaging cavity 16 remains sealed by a second packaging seal 34. The first packaging cover can be attached to a distal end of the pouch and the second packaging cover can be attached to a proximate end of the pouch.

[0027] In one embodiment, removal tabs 36 through 42 are attached to the first outer cover and do not include adhesive. Therefore, the removal tabs assist with the removal of the first outer cover by providing a means for gripping the first outer cover to pull it away from the pouch. In one embodiment, shown in FIG. 4, the first outer cover 30 can include perforations for assisting with the removal of the first outer cover from the pouch. Tear notches 44 and 46 can also be included to assist with the removal of the first outer cover. In one embodiment, shown in FIG. 6, the central divider can include a central perforation 48 allowing the first packaging cavity to be separated from the second packaging cavity while maintaining the airtight and watertight seal of the first and second package cavity.

[0028] In one embodiment, shown in FIG. 4, the first outer cover is attached to a distal end 50 of the pouch and the second outer cover is attached to a proximal end 52 of the pouch. The arrangement allows the first outer cover to be removed from the pouch without interference from the second outer cover and also maintaining an airtight and watertight seal of the second package cavity. As shown in an alternative embodiment in FIGS. 4 and 5, the package cavities can be arranged so that a portion of the first package cavity extend laterally beyond a distal end portion of the second package cavity, and vice versa, so that the first and second package cavities are staggered to define an offset arrangement.

[0029] Referring to FIG. 5, the packaging seal can include first package seal liner portion 84 which remains attached to the interior of the packaging cavity. In one embodiment, the first package seal liner portion is attached to a portion of the interior of the first package cavity adjacent to the first opening so that it does not line the entire interior of the first package cavity.

[0030] Referring to FIG. 2, a cross section of the packaging container is shown. First outer cover 30 is removably attached to the pouch 10 at its perimeter 54. Central portion of the first packaging seal 28 is attached to the outer cover. Perimeter 56 of the first packaging seal is attached to the edge 26 of first opening 18 of the pouch, thereby sealing first opening 18. In one embodiment, first opening 18 has a perimeter smaller than that of the packaging seal. In one embodiment, the perimeter of the first outer cover is larger than the first packaging seal. In one embodiment, the perimeter of the pouch is larger than the perimeter of the first outer cover. The first packaging seal can include scoring or perforations 28 so that when the first outer cover is removed, the central portion of the first packaging seal is removed uncovering first opening 18.

[0031] As shown in FIG. 3, when first outer cover 30 is removed, central portion 28 of the first packaging seal is removed with it. The second packaging cavity 16, second outer cover 58, and second package seal 34 can be similarly

constructed. Occlusive dressings (or chest seals) **60** are **62** are contained in the first and second packaging cavity respectively.

**[0032]** Referring to FIG. 7, the occlusive dressings **60** and **62** can be placed in the first and second packaging cavity in a folded arrangement. In the folded arrangement, the adhesive would be in contact with itself as it is folded. To prevent the adhesive from sticking to itself, a removable film **64** is removably attached to the adhesive **66** which is in turn attached to a flexible sheet **68**. A lifting tab **70** can be attached to flexible sheet **68** to assist with the lifting of the occlusive dressing to relieve pressure from the wound. When placed in the packaging cavity, the lifting tab can be folded back along the flexible sheet to reduce the perimeter of the occlusive dressing allowing it to be better contained in the packaging cavity. The removal tabs can include differentiating areas such as **72** that are of a different contrast to their background to assist the identification of the lifting tab. In one embodiment, the removal tabs are contrasting colors to the pouch to create such contrast. The lifting tab can also include a differentiating area **74** to create contrast with its background to assist in the identification of the lifting tab. Contrasting feature for the differentiating areas can include colors, brightness, patterns, textures, or any combination.

**[0033]** In one embodiment, the occlusive dressing includes a vent as shown in FIG. 9. Vent **76** can be a defined channel in the adhesive layer **66** and in fluid connection with a well **78**. The well can be arranged centrally in said adhesive so that the well is placed over the wound allowing fluid pressure buildup from the wound to escape into the well and out through the vent. Lifting tab **74** can be arranged at the end of the vent so that when the lifting tab is used to lift the occlusive dressing up from the wound area, fluid pressure can further be relieved. In one embodiment, the vent opening **82** is located on a side of the adhesive that does not attach to the lifting tab as shown in FIG. 9. The lifting tab can include a lifting tab scoring or perforation allowing the lifting tab to be folded back on the flexible sheet when the occlusive dressing is placed on the packaging cavity.

**[0034]** While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.

What is claimed is:

1. A packaging container for storing multiple occlusive dressings in an airtight and watertight environment comprising:

- a flexible pouch;
- a central divider included in the interior of said flexible pouch defining a first and second package cavity within said flexible pouch wherein each package cavity contains an occlusive dressing;
- a first opening included in said flexible pouch providing access to the interior of said first package cavity and a second opening included in said flexible pouch providing access to the interior of said second package cavity;
- a first package seal covering said first opening making said first cavity water and airtight, said first package seal having a perimeter attached to said flexible pouch, an area larger than the area of said first opening, a central portion having an area equal to or less than the area of said first opening and scoring arranged between said

perimeter and said central portion of said first packaging seal allowing said central portion to tear away from said perimeter;

a first outer cover removably attached to said flexible pouch and attached to said central portion of said first package seal;

a second package seal covering said second opening attached to a second outer cover wherein said second outer cover is removably attached to said flexible pouch; and,

whereas when said first outer cover is removed from said flexible pouch, said central portion of said package seal is removed with said first outer cover and said first opening is uncovered, thereby providing access to the interior of said first package cavity allowing said occlusive seal to be removed from said first package cavity of said flexible pouch.

2. The packaging container of claim 1 wherein said occlusive dressing includes a flexible sheet, an adhesive layer attached to said flexible sheet and a lifting tab attached to said flexible sheet wherein said lifting tab has a width at least one third the width of the edge of said flexible sheet attached to said lifting tab and said lifting tab can be folded against said flexible sheet.

3. The packaging container of claim 1 wherein said first packaging cavity is in an offset arrangement with said second packaging cavity.

4. The packaging container of claim 1 wherein said first outer cover is attached to a distal end of said flexible pouch and said second outer cover is attached to a proximal end of said flexible pouch.

5. The apparatus of claim 1 including a removal tab attached to said outer cover.

6. The apparatus of claim 1 wherein said first outer cover includes a perforation for assisting in the removal of said first outer cover from said flexible pouch.

7. The apparatus of claim 1 having a perforation included in said central divider allowing said first package cavity to be separated from said second package cavity while maintaining an airtight and watertight seal in said first and second package cavity.

8. A packaging container for multiple occlusive dressings comprising:

- a flexible pouch;
- a central divider included in the interior of said flexible pouch for defining a first and second package cavity within said flexible pouch;

a first opening included in said flexible pouch providing access to the interior of said first package cavity and a second opening included in said flexible pouch providing access to the interior of said second package cavity;

a first package seal covering said first opening;

a first outer cover removably attached to said flexible pouch and attached to said first package seal;

a second package seal covering said second opening attached to a second outer cover wherein said second outer cover is removably attached to said flexible pouch; and,

whereas when said first outer cover is removed from said flexible pouch, a portion of said package seal is removed with said first outer cover providing access to the interior of said first package cavity and allowing said occlusive seal to be removed from said first package cavity of said flexible pouch.

9. The packaging container of claim 8 wherein said first packaging seal includes scoring between a first packaging seal perimeter and a first packaging seal central portion wherein said first outer cover is attached to said first packaging seal central portion so that said first packaging seal central portion is removed with said first outer cover when said first outer cover is removed from said flexible pouch thereby creating said first opening and allowing access to said occlusive dressing contained in said first packaging cavity.

10. The packaging container of claim 8 including: a perforation included in said first package seal between a first packaging seal perimeter and a first packaging seal central portion wherein said first outer cover is attached to said first packaging seal central portion so that said first packaging seal central portion is removed with said first outer cover when said first outer cover is removed from said flexible pouch; and, said first outer cover and said first package seal provide an airtight and watertight seal for said first package cavity.

11. The packaging container of claim 8 wherein said first packaging cavity is in an offset arrangement with said second packaging cavity so that said first outer cover can be removed from said flexible pouch without interference from a portion of said flexible pouch defining said second packaging cavity.

12. The packaging container of claim 8 wherein said first outer cover includes a perforation for assisting in the removal of said first outer cover from said flexible pouch.

13. The packaging container of claim 8 having a perforation included in said central divider allowing said first package cavity to be separated from said second package cavity while maintaining an airtight and watertight seal in said first and second package cavities.

14. The packaging container of claim 8 wherein said occlusive dressing includes a vent having a vent opening so that when said lifting tab is lifted, said occlusive dressing is partially removed from an injured individual and fluids from the wound are allowed to escape from under the occlusive dressing through said vent opening.

15. The packaging container of claim 14 wherein said vent opening is adjacent to said lifting tab.

16. The packaging container of claim 8 wherein said flexible pouch is heat sealed.

17. The packaging container of claim 8 including tear notches included in said first and second outer covers.

18. A packaging container for multiple occlusive dressings comprising:

- a flexible pouch having a central divider defining a first package cavity and a second package cavity;
- an occlusive dressing included in each package cavity;
- a first package seal, covering a first opening in said flexible pouch, attached to said flexible pouch and a central portion attached to a first outer cover, said first outer cover is removably attached to said flexible pouch;
- a second package seal, covering a second opening in said flexible pouch, attached to said flexible pouch and a central portion attached to a second outer cover, said second outer cover is removably attached to said flexible pouch; and;

whereas when said first outer cover is removed from said flexible pouch, said central portion of said first package seal is removed with said first outer cover providing

access to the interior of said first package cavity and allowing said occlusive seal to be removed from said first package cavity of said flexible pouch.

19. The packaging container of claim 18 wherein each occlusive dressing includes a flexible sheet, an adhesive layer attached to said flexile sheet and a lifting tab having a width greater than a third of the width of the side of the occlusive dressing to which it is attached.

21. The packaging container of claim 18 wherein said first packaging seal includes scoring.

22. The packaging container of claim 18 wherein said first packaging seal includes a perforation.

23. The packaging container of claim 18 wherein said first outer cover is attached to a distal end of said flexible pouch and said second outer cover is attached to a proximal end of said flexible pouch.

24. The packaging container of claim 19 wherein said first packaging cavity is in an offset arrangement with said second packaging cavity.

25. A packaging container for multiple occlusive dressings comprising:

- a pouch;
  - a central divider included in the interior of said pouch for defining a first and a second package cavity within said pouch wherein each package cavity contains an occlusive dressing;
  - a first package seal attached to said pouch further defining said first package cavity;
  - a first outer cover removably attached to said pouch and attached to said first package seal; and,
- whereas when said first outer cover is removed from said pouch, a portion of said first package seal is removed with said first outer cover creating a first opening in said pouch and providing access to the interior of said first package cavity, thereby allowing said occlusive seal to be removed from said first packaging cavity.

26. The packaging container of claim 25 wherein said first packaging seal includes scoring defining a first packaging seal liner portion and a first packaging seal central portion wherein said first outer cover is attached to said first packaging seal central portion so that said first packaging seal central portion is removed with said first outer cover when said first outer cover is removed from said pouch.

27. The packaging container of claim 25 wherein said first packaging cavity is in an offset arrangement with said second packaging cavity so that said first outer cover can be removed from said flexible pouch with interference from a portion of said flexible pouch defining said second packaging cavity.

28. The apparatus of claim 25 having a perforation included in said central divider allowing said first package cavity to be separated from said second package cavity while maintaining an airtight and watertight seal in said first and second package cavity.

29. The packaging container of claim 25 wherein said first outer cover is attached to a distal end of said pouch and said second outer cover is attached to a proximal end of said pouch.

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