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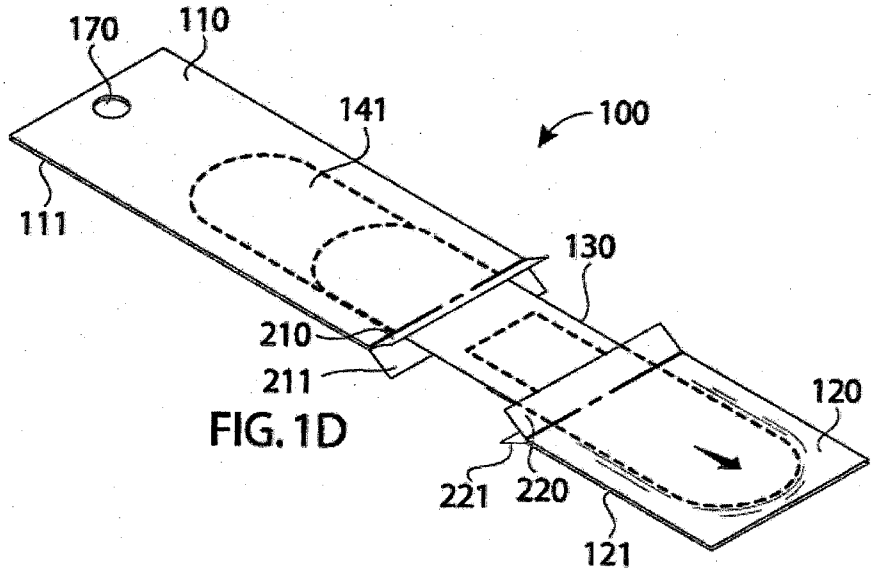

FIG. 1D

(57) Abstract: The invention is a class of medical bandage wrappers that facilitate and expedite bandage removal from the protective wrapper and facilitate and expedite application of the bandage to a wound. The inventive bandage wrappers are comprised of a top layer and bottom layer, each layer comprised of a first sheet and a second sheet. The top layer and bottom layer form a protective cover for a bandage disposed between the top layer and bottom layer. The first sheets are separable from the second sheets upon application of an opposing force that draws the first sheets away from the second sheets. Upon separation, the first sheets of the bandage may be discarded and the second sheets of the bandage may be used to hold a partially exposed bandage for rapid application to a wound.

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Quick-Release Bandage Wrapper

BACKGROUND OF THE INVENTION

[0001] Bandages, such as adhesive bandages, are often used for covering wounds including cuts and burns. Such bandages are often packed in paper or plastic wrappers that may be removed by separating overlapping portions of the wrapper. Removal of many bandage wrappers generally requires visual or tactile confirmation of the overlap portion. Such bandage wrappers may be difficult to open by those with diminished manual dexterity or visual acuity, the very young or the elderly. Application of such bandages to wounds generally requires four discrete steps – first removing the bandage's protective outer wrapper, second removing a first backing tape from the bandage, third removing a second backing tape from the bandage, and fourth applying the bandage.

[0002] It would be advantageous to develop a bandage wrapper that may be opened with minimal effort and in minimal time. It would be advantageous to develop a bandage that may be removed from its wrapper and applied to a wound in a minimal number of steps to facilitate and expedite wound treatment.

SUMMARY OF THE INVENTION

[0003] The invention is a class of medical products designed to facilitate and expedite bandage removal from a wrapper and to facilitate and expedite application of the bandage to a wound. The inventive bandage wrapper comprises a top layer and a bottom layer, each layer comprised of a first sheet and a second sheet. The top layer and bottom layer form a protective cover for a bandage disposed between the top layer and bottom layer. The first sheets are separable from the second sheets upon application of an opposing force that draws the first sheets away from the second sheets. Upon separation, the first sheets of the bandage

may be discarded along with a first anti-stick backing and the second sheets of the bandage may be used to hold a partially exposed bandage. The partially exposed bandage may then be applied to the wound, and the remaining second sheets and any second anti-stick backing may be discarded to permit the bandage to be fully applied.

[0004] The bandage's general design will include a top layer of adhesive material adapted for use on a subject, a middle wound-contacting layer (such as gauze layer, hydrogel layer, or aluminum layer), and a removable backing layer (or layers) adhered to the very bottom of the bandage to protect the adhesive material and wound-contacting portions of the bandage.

[0005] It is preferred that the bandage components are thin and flexible to enhance patient comfort. It is preferred that the bandages assist with wound healing and provide an environment to help control fluid loss, protect against abrasion, friction, desiccation, and contamination. Bandages that may be used in such a system include traditional bandages and, preferably, those described in U.S. Patent No. 8,530,720 to Freer, et al.

[0006] Methods of using the inventive bandage wrapper include facilitating and expediting application of a bandage to assist in the healing of a wound. It is a goal of the invention to permit opening of a bandage wrapper and application of a bandage within about one (1) to about ten (10) seconds, preferably within about five (5) seconds.

[0007] These and other features, aspects and advantages of the present invention will become better understood with reference to the following drawings, description, and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIGS. 1A-1J show a bandage being removed, stepwise, from an inventive bandage wrapper.

[0009] FIG. 2 shows an expanded view of an inventive bandage wrapper and expanded view of a bandage.

[0010] FIGS. 3A-3B show an inventive bandage wrapper top layer with sheets coupled, and decoupled.

[0011] FIG. 4A shows an inventive bandage wrapper top layer first sheet.

[0012] FIG. 5A shows an inventive bandage wrapper top layer second sheet.

[0013] FIGS. 6A-6B show a portion of the inventive bandage wrapper bottom layer with adhered anti-stick backing.

[0014] FIGS. 7A-7B show a portion of the inventive bandage wrapper bottom layer with adhered anti-stick backing as a bandage is removed.

DETAILED DESCRIPTION OF THE INVENTION

[0015] The bandage wrappers of the invention utilize a dual-layer system of double-sheets to facilitate removal of a bandage from the protective wrapper. The inventive bandage wrappers are designed to swiftly and efficiently allow opening of a bandage-containing package, remove the bandage, and apply the bandage to a wound.

[0016] An inventive bandage wrapper comprises a top layer and a bottom layer to form a protective cover for a bandage disposed between the top layer and bottom layer; preferably the protective wrapper maintains the bandage in a sterile and sealed environment. Each of the top layer and bottom layer is comprised of a first sheet and a second sheet and may be formed in the same manner. The first sheet has an interior surface (facing and adjacent to the bandage) and an exterior surface (facing the outside environment); the second sheet has an interior surface (facing and adjacent to the bandage) and an exterior surface (facing the outside environment).

[0017] The first sheet and second sheet are coupled to each other to form a single wrapper layer. The first sheet and second sheet are generally co-planar and positioned co-axially to each other. Part of the interior surface of the first sheet contacts and adheres to part of the interior surface of the second sheet at a separable junction. More specifically, a portion of the interior surface of the first sheet may be bent towards the exterior surface of the first sheet to an angle of about 90 degrees and that portion contacts and adheres to a portion of the interior surface of the second sheet that is bent towards the exterior surface of the second sheet to an angle of about 90 degrees. The portions of the first sheet and second sheet that contact each other and adhere at the junction may then be folded backwards 90 degrees so that the first sheet lays almost perfectly flat, while the second sheet has an approximately 180 degree bend that folds a portion of the exterior of the second sheet back upon itself.

[0018] The top layer and bottom layer form a protective cover for a bandage disposed between the top layer and bottom layer. The bandage may generally be of any type for covering or treating wounds; particularly preferred are those bandages described in U.S. Patent No. 8,530,720 to Freer, et al. The bandage generally includes a top adhesive layer adapted to adhere to the subject and a wound-contacting layer such as gauze, hydrogel, or sheet metal.

[0019] An anti-stick removable backing layer is disposed across the bottom surface of the bandage and adhered to the bottom of the bandage (via the adhesive present in the bandage's top adhesive layer) to protect the adhesive material and wound-contacting portions of the bandage. The removable backing layer is detachably coupled to the adhesive top layer so as to be readily peeled away from the bandage.

[0020] In one embodiment the backing layer extends slightly beyond the boundaries of the top adhesive layer; in one embodiment the backing layer has substantially the same surface area as the top adhesive layer and the backing layer is positioned to be flush with the

top adhesive layer. In one embodiment the anti-stick removable backing layer comprises two or more separate sheets – these sheets are generally co-planar and positioned co-axially to each other. In one embodiment the anti-stick removable backing sheets may be adjacent to each other; in one embodiment the sheets partially overlap each other; in one embodiment the sheets are separated from each other leaving an uncovered gap in between them. In one embodiment the anti-stick removable backing sheets substantially cover the entirety of the bandage; in one embodiment the anti-stick removable backing sheets leave part of the bandage un covered. In one embodiment the anti-stick removable backing layer is a single sheet that partially covers the bandage.

[0021] The first sheet of the wrapper top layer and the first sheet of the wrapper bottom layer substantially overlap and adhere to each other to maintain a protective environment for the bandage; the second sheet of the wrapper top layer and the second sheet of the wrapper bottom layer substantially overlap and adhere to each other.

[0022] The first sheet of the wrapper top layer is separable from the second sheet of the wrapper top layer upon application of an opposing force that draws the first sheet away from the second sheet; the first sheet of the wrapper bottom layer is separable from the second sheet of the wrapper bottom layer upon application of the opposing force that draws the first sheet away from the second sheet. Upon application of the opposing force, the adhered interior surfaces of the first sheet of the wrapper top layer and second sheet of the wrapper top layer become uncoupled and separate so that the first sheet is no longer adhered to the second sheet, and so that the first sheet no longer contacts the second sheet; upon application of the opposing force, the adhered interior surfaces of the first sheet of the wrapper bottom layer and second sheet of the wrapper bottom layer also become uncoupled and separate so that the first sheet is no longer adhered to the second sheet, and so that the first sheet no longer contacts the second sheet.

[0023] As the first sheets are separated from the second sheets (when the first sheet of the wrapper top layer is separated from the second sheet of the wrapper top layer, and when the first sheet of the wrapper bottom layer is separated from the second sheet of the wrapper bottom layer) the bandage itself is removed entirely from the first sheets and remains partially enclosed by the second sheets. In one embodiment, upon removal of the bandage from the first sheets, part of the adhesive portion of the bandage is exposed and may be applied to a wound. In one embodiment, upon removal of the bandage from the first sheets coincides with a removal of an anti-stick backing from part of the adhesive portion of the bandage so that the anti-stick backing remains enclosed by the first sheet of the wrapper top layer and the first sheet of the wrapper bottom layer.

[0024] In a preferred embodiment, a bandage includes two anti-stick backing sheets that partially overlap each other where the overlapping sheet is adhered to the bottom of the wrapper by an adhesive such as glue. In one embodiment, a dab of glue secures one sheet of anti-stick backing to one bottom sheet of the wrapper so that when the bandage is removed from the wrapper, the sheet of anti-stick backing remains in the wrapper leaving one end of the bandage adhesive exposed.

[0025] Once the partially exposed bandage is applied to the wound, the remaining second sheets may be discarded to permit the bandage to be fully applied. In one embodiment an anti-stick backing is removed from the portion of the bandage that is not yet applied to the wound to expose the remainder of adhesive surface. The removal of the anti-stick backing allows the remaining adhesive portion of the bandage to be applied to cover the wound.

[0026] In one embodiment, the top wrapper layer, bandage, and bottom wrapper layer are concentric to one another. In another embodiment, the bandage is positioned so as to be off-center from the top wrapper layer and bottom wrapper layer.

[0027] The wrapper top layer first sheet and wrapper bottom layer first sheet may have an optional hole punched through. The optional hole is sized and positioned to ensure it does not go through the bandage itself or alter the integrity of the packaging itself. The optional hole may be used, for example, to allow the packaging of a plurality of wrapped bandages in a row along a common mandrel. Packaging the inventive wrapped bandages on a common mandrel can facilitate the distribution of each individual bandage by allowing a user to grip an individual bandage at one end while the other end is secured by a mandrel. Such packaging eliminates the need for a user to manipulate both ends of the bandage wrapper simultaneously (for example, with both hands). Such packaging is particularly useful when the user is also the subject in need of a bandage.

[0028] Bandages for use in the inventive wrappers may take a variety of forms. In a preferred embodiment the bandage is substantially rectangular; in another embodiment the bandage is substantially square. In one embodiment the bandage is substantially elliptical; in another embodiment the bandage is substantially ovular; in yet another embodiment the bandage is substantially circular. In one embodiment the bandage is substantially triangular; in one embodiment the bandage is substantially trapezoidal. In one embodiment the bandage is substantially heart-shaped. In yet another embodiment the bandage is substantially octagonal. The bandage may be bow-tie shaped or butterfly shaped. The bandages may have corners that are squared or rounded.

[0029] Bandages for use in the inventive wrappers may be shaped to conform to different body contours and body parts such as a glove- or mitt- shape for comfortable use on a burned hand, or an H-shaped bandage to wrap comfortably around a burned finger. The bandage form-factor may be adapted to facilitate application to a part of the body selected from the group consisting of finger, thumb, toe, wrist, elbow, knee, ankle, foot, hand, palm and face.

[0030] Materials suitable for use in the invention include well-known components compatible with bandage construction. Preferred materials for the bandage wrapper include medical grade paper with polypropylene film and medical grade paper without film. Preferred materials for the adhesive layer include single coated medical tape, medical woven or non-woven tape, flexfoams, hydrocolloids , hydrophilic film, hydrogels, metals, latex, rubber, polyethelyne, polyurethane, fabric, cotton, polycarbonate, rayon, or polysulfone. The anti-stick removable backing layer may be made of any appropriate material or composite, including for example kraft paper, glassine paper, polyethylene, polypropylene, or polyester. The anti-stick removable backing layer may be coated, and preferably with release agents such as silicones or fluorochemicals. In a preferred embodiment the anti-stick removable backing layer is paper coated with polyethylene and silicone in one side. In preferred embodiments the anti-stick removable backing layer is made of medical grade poly-coated paper, or polyester film, or high density polyethylene. The wound-contacting layer may be one or more of cotton, synthetic fiber, silk, gauze, hydrogel, hydrogel infused gauze, or metal sheet such as aluminum.

[0031] FIGS. 1A-1J depict a bandage **130** being removed, stepwise, from an inventive bandage wrapper **100**. FIG. 1A shows an inventive bandage wrapper **100** comprised of a wrapper top layer having first sheet **110** and second sheet **120** and a wrapper bottom layer having first sheet **111** and second sheet **121**. Each exterior surface of sheets **110**, **111**, **120**, and **121** may include text and graphics printed on the surface.

[0032] The inventive bandage wrapper **100** encloses bandage **130** (shown in dashed line). One part of the interior surface of wrapper top layer first sheet **110** contacts the top surface of bandage **130** and another part of the interior surface of wrapper top layer first sheet **110** contacts the interior surface of wrapper bottom layer first sheet **111**. One part of the interior surface of wrapper bottom layer first sheet **111** contacts the bottom surface of

bandage **130** and another part of the interior surface of wrapper bottom layer first sheet **111** contacts the interior surface of wrapper top layer first sheet **110**.

[0033] One part of the interior surface of wrapper top layer second sheet **120** contacts the top surface of bandage **130** and another part of the interior surface of wrapper top layer second sheet **120** contacts the interior surface of wrapper bottom layer second sheet **121**. One part of the interior surface of wrapper bottom layer second sheet **121** contacts the bottom surface of bandage **130** and another part of the interior surface of wrapper bottom layer second sheet **121** contacts the interior surface of wrapper top layer second sheet **120**.

[0034] One part of the interior surface of wrapper top layer first sheet **110** contacts one part of the interior surface of wrapper top layer second sheet **120** at a junction – specifically bandage wrapper flap **210** contacts bandage wrapper flap **220**. Bandage wrapper flaps **210** and **220** are flush with the exterior surface of the bandage wrapper on the exterior surface of top layer second sheet **120**. One part of the interior surface of wrapper bottom layer first sheet **111** contacts one part of the interior surface of wrapper bottom layer second sheet **121** at a junction – specifically bandage wrapper flap **211** contacts bandage wrapper flap **221**. Bandage wrapper flaps **211** and **221** are flush with the exterior surface of the bandage wrapper on the exterior surface of bottom layer second sheet **121**. Hole **170** is punched through wrapper top layer first sheet **110** and wrapper bottom layer first sheet **111**.

[0035] FIG. 1B shows inventive bandage wrapper **100** as the wrapper ends are pulled apart from each other, separating the left-hand side of the wrapper from the right-hand side of the wrapper. On the wrapper top layer, bandage flap **210** begins to separate from bandage flap **220**; on the wrapper bottom layer, bandage flap **211** begins to separate from bandage flap **221**.

[0036] FIG. 1C shows inventive bandage wrapper **100** as the wrapper ends are pulled further apart from each other, continuing to separate the left-hand side of the wrapper from the right-hand side of the wrapper.

[0037] FIG. 1D shows inventive bandage wrapper **100** as the wrapper ends are pulled apart so that the left-hand side of the wrapper is separated from the right-hand side of the wrapper. Bandage **130** is shown partially removed from the wrapper. The left-hand side of bandage **130** is exposed from the left-hand side of the wrapper while the right-hand side of the bandage **130** remains within the right-hand side of the wrapper. Anti-stick backing layer **141** remains within the left-hand side of the wrapper due to glue (**300**, not shown).

[0038] FIG. 1E shows bandage **130** partially removed from the wrapper. The left-hand side of bandage **130** is fully exposed from the left-hand side of the wrapper and the adhesive side of bandage **130** is exposed. Anti-stick backing layer **141** remains within the left-hand side of the wrapper due to glue (**300**, not shown). The right-hand side of the bandage **130** remains within the right-hand side of the wrapper (top layer second sheet **120** and wrapper bottom layer second sheet **121**). The left-hand side of the wrapper (top layer first sheet **110** and wrapper bottom layer first sheet **111)** may now be discarded.

[0039] FIG. 1F shows bandage **130** partially removed from the wrapper and ready to be applied to a wound. The left-hand side of the wrapper (top layer first sheet **110** and wrapper bottom layer first sheet **111)** is not shown and has been discarded. Bandage **130** continues to exit the right-hand side of the wrapper (top layer second sheet **120** and wrapper bottom layer second sheet **121**).

[0040] FIG. 1G shows bandage **130** mostly removed from the wrapper. Bandage **130** continues to exit the right-hand side of the wrapper (top layer second sheet **120** and wrapper bottom layer second sheet **121**).

[0041] FIG. 1H shows bandage **130** completely removed from the wrapper. Bandage **130** is fully exposed. Anti-stick backing layer **142** is shown adhered to a portion of bandage **130**. The right-hand side of the wrapper (top layer second sheet **120** and wrapper bottom layer second sheet **121**) may now be discarded.

[0042] FIG. 1I shows bandage **130** completely removed from the wrapper. The right-hand side of the wrapper (top layer second sheet **120** and wrapper bottom layer second sheet **121**) is not shown and has been discarded. Anti-stick backing layer **142** is shown partially removed from bandage **130**.

[0043] FIG. 1J shows bandage **130** completely removed from the wrapper and without any anti-stick backing layer.

[0044] FIG. 2 depicts an expanded view of the components of one embodiment of the inventive bandage wrapper **100**. Inventive bandage wrapper **100** is comprised of a wrapper top layer having first sheet **110** and second sheet **120** and a wrapper bottom layer having first sheet **111** and second sheet **121**. On the wrapper top layer, bandage flap **210** contacts bandage flap **220** and both flaps are flush with the exterior surface of the bandage wrapper on the exterior surface of top layer second sheet **120**. On the wrapper bottom layer, bandage flap **211** contacts bandage flap **221** and both flaps are flush with the exterior surface of the bandage wrapper on the exterior surface of bottom layer second sheet **121**. Hole **170** is punched through wrapper top layer first sheet **110** and wrapper bottom layer first sheet **111**. The bandage is shown in exploded view comprising an adhesive top layer **150**, middle layer **160** of a hydrogel pad, and anti-stick backing layer comprised of a left sheet **141** and right sheet **142**. The anti-stick backing layer comprises two partially overlapping sheets – left sheet **141** and right sheet **142** - sized and oriented to ensure complete coverage of top adhesive layer **150**. Dab of glue **300** is disposed between wrapper bottom layer first sheet **111** and anti-stick backing sheet **141**.

[0045] FIG. 3A shows detail of a wrapper top layer having first sheet **110** and second sheet **120**. Part of the interior surface of wrapper top layer first sheet **110** contacts one part of the interior surface of wrapper top layer second sheet **120** – specifically bandage wrapper flap **210** contacts bandage wrapper flap **220**. Bandage wrapper flaps **210** and **220** are shown flush with each other. Bandage wrapper flaps **210** and **220** are each bent at a 90 degree angle and each wrapper flap is perpendicular to the exterior surface of top layer second sheet **120**.

[0046] FIG. 3B shows detail of a wrapper top layer having first sheet **110** and second sheet **120**, separated. Bandage wrapper flap **210** is not in contact with bandage wrapper flap **220**. Bandage wrapper flaps **210** and **220** are each bent at a 90 degree angle and each is perpendicular to the exterior surface of top layer second sheet **120**.

[0047] FIG. 4A shows detail of wrapper top layer first sheet **110** having hole **170** punched through. Bandage wrapper flap **210** is shown flat in the plane of first sheet **110**.

[0048] FIG. 5A shows detail of wrapper top layer second sheet **120**. Bandage wrapper flap **220** is shown flat in the plane of second sheet **120**.

[0049] FIG. 6A shows a portion of inventive bandage wrapper **100** with hole **170** punched through wrapper top layer. Wrapper bottom layer having first sheet **111** and second sheet **121** are coupled at bandage flap **211** and bandage flap **221** and both flaps are flush with the exterior surface of the bandage wrapper on the exterior surface of bottom layer second sheet **121**. Dab of glue **300** is placed on wrapper bottom layer first sheet **111** and secures anti-stick backing sheet **141** to the wrapper. Dab of glue **300** is positioned to be near the junction between first sheet **111** and second sheet **121.**

[0050] FIG. 6B depicts the left side of anti-stick backing sheet **141** lifting from wrapper bottom layer first sheet **111**. The right side of the anti-stick backing sheet **141** remains fixed to wrapper bottom layer first sheet **111** due to the adhesion from dab of glue **300**.

[0051] FIG. 7A depicts an inside-view of the bandage wrapper as bandage **130** is removed from a wrapper portion. Bandage **130** remains adhered to a portion of the anti-stick backing sheet **141**, while another portion of the anti-stick backing sheet **141** remains fixed to wrapper bottom layer first sheet **111** due to the adhesion from dab of glue **300**. Wrapper top layer first sheet **110** as well as wrapper top layer second sheet **120** and wrapper bottom layer second sheet **121** are not shown in FIG 7A to better show the interaction of bandage **130** with anti-stick backing sheet **141** and wrapper bottom layer first sheet **111**

[0052] FIG. 7B depicts a further inside-view of the bandage wrapper as bandage **130** is removed from a wrapper portion. Bandage **130** is free from the anti-stick backing sheet **141** and the adhesive surface of bandage **130** is exposed. Anti-stick backing sheet **141** remains fixed to wrapper bottom layer first sheet **111** due to the adhesion from dab of glue **300**. The wrapper and anti-stick backing are free to be discarded and bandage **130** is ready to be applied to a subject. As with FIG 7A, wrapper top layer first sheet **110** as well as wrapper top layer second sheet **120** and wrapper bottom layer second sheet **121** are not shown in FIG 7B to better show the interaction of bandage **130** with anti-stick backing sheet **141** and wrapper bottom layer first sheet **111**.

FURTHER EMBODIMENTS

[0053] Bandages for use in the inventive wrappers optionally contain a thin substrate of a thermally conductive metal. Various metals or alloys may be used in the bandages and preferred metals or alloys are those with efficient heat-transfer qualities. Metals or metal alloys may also be chosen based on additional qualities such as biocompatibility, chemical reactivity, or machinability. A particularly preferred metal aluminum because of its thermal conductivity.

[0054] Preferred thermally conductive metals include aluminum, silver, gold, copper, zinc, magnesium, tungsten, titanium, and platinum. Other preferred metals include iron, nickel, zinc, tin, and palladium. In one preferred embodiment the metal is aluminum. Preferably the metal contains 98.00% minimum aluminum. In one embodiment aluminum ASTM B479 1145 is used due to its ease of procurement in sizeable manufacturing quantity.

[0055] Alloys substantially based on these metals and other biocompatible metal alloys may also be used. Such alloys include aluminum alloys, chromium/molybdenum/iron alloys, or aluminum/magnesium alloys. One preferred aluminum alloy contains at least about 90% aluminum. One preferred aluminum alloy contains at least 92% aluminum and about 5% magnesium. Other metals can be used in specific quantities to fulfill a specific requirement of wound care.

[0056] One layer of metal or more than one layer of metal suitably bonded may be used in the metal substrate. In one embodiment a layer of aluminum and a layer of copper are bonded to form the thermally conductive layer. In one embodiment a layer of aluminum-clad copper is used.

[0057] The metal or metal alloy in the invention is preferably sized as a thin sheet or foil. As the metal thickness is increased, conductive performance is reduced. Additionally, as the metal thickness is increased, the bandage will increase in rigidity due to the increased force required for deformation. However, as the metal thickness is reduced, machinability and foil integrity may be reduced. The metal or metal alloy in the bandage may be annealed to enhance the ductility and flexibility of the metal layer.

[0058] The metal or metal alloy preferably has a thickness in the range from about 0.00025 inches to about 0.006 inches. In one embodiment the metal or metal alloy layer is about 0.0005 inches to about 0.005 inches thick. The metal may be about 0.0005 inches, about 0.0010 inches, about 0.0015 inches, about 0.0020 inches, about 0.0025 inches, about

0.0030 inches, about 0.0035 inches, about 0.0040 inches, about 0.0045 inches or about 0.0050 inches thick. In one embodiment, the metal is about 0.0005 inches thick. In one embodiment, the metal is about 0.0020 inches thick. In a preferred embodiment, the metal is about 0.0010 inches thick. In one embodiment, the metal substrate layer is about 0.0010 inches thick.

[0059] In one embodiment the metal or metal alloy layer is substantially flat. In another embodiment the metal or metal alloy layer is textured to increase the surface area of metal in contact with the heat-sink and thus increase the efficiency of heat transfer. In one embodiment the metal layer is an aluminum sheet or foil. In one embodiment the metal layer is a sheet that has on one side a substantially smooth surface; in one embodiment the metal layer is a sheet that has on one side a dull, matte or brushed surface. In one embodiment the metal layer is an aluminum sheet that has on one side a textured surface having a plurality of discrete protrusions as depicted in FIGS 9A-9B, 10A-10I, 11B, 12A-12B of U.S. Patent No. 8,530,720 to Freer, et al.

[0060] In an embodiment where the metal layer is a substantially smooth sheet or foil, the metal substrate has a thickness in the range from about 0.00025 inches to about 0.006 inches. In an embodiment where the metal layer has a plurality of discrete protrusions, the metal substrate has a thickness of about 0.00025 inches to about 0.040 inches as measured from the bottom side of the metal substrate to the average peak height of the plurality of protrusions on the top side of the metal substrate.

[0061] Bandages for use in the inventive wrappers optionally contain a hydrogel layer. In one embodiment the bandages contain a hydrogel layer and a metal substrate; in a preferred embodiment the hydrogel substrate is sized larger than the metal substrate; in a preferred embodiment the perimeter of the hydrogel layer completely surrounds the perimeter

of the metal layer. In one embodiment the bandages contain a hydrogel layer without a metal substrate.

[0062] Bandages for use in the inventive wrappers can be further enhanced by the inclusion of a thermochromic indicator member, wherein the thermochromic indicator member is in thermal communication with a burn wound via the top adhesive layer. A thermochromic compound – similar to what is typically found in mood rings – provides visual feedback regarding the heat removed from the subject's burn. The thermochromic indicator member is comprised of material calibrated to indicate when a burn on which said bandage is applied is still too warm for safe removal of said bandage, based on a predetermined threshold, and indicate when a burn has cooled to at least a predetermined threshold such that said bandage can be safely removed and/or changed-out for a new medical dressing.

[0063] In one embodiment the thermochromic indicator member provides color-based indications as to the thermal status of the burn to which said bandage is applied. In another embodiment the thermochromic indicator member provides icon-based indications as to the thermal status of the burn to which the bandage is applied. In some applications, the thermochromic indicator member is comprised of material selected from the group consisting of thermochromic liquid crystals, leuco dyes, and thermochromic inks.

[0064] In one embodiment a metal substrate has an extended member that extends beyond the border of a hydrogel layer to be under, and in direct contact with the thermochromic compound present in the top adhesive layer such that the metal extension provides thermal communication between a burn and the thermochromic compound. In one embodiment the thermochromic indicators have compounds calibrated to indicate when a burn is sufficiently cooled (for example by providing a color indicator such as green and/or an icon indicator such as a happy face) or still too warm (for example by providing a color

indicator such as red and/or an icon indicator such as sad face). In one embodiment the bandage has a thermochromic compound that does not present a visible color at room temperature; upon application of the bandage to a burn the thermochromic compound turns red (indicating the subject should keep the bandage in place); after time passes and the burned tissue cools the thermochromic compound turns green (indicating the subject may remove the bandage).

[0065] In one embodiment the thermochromic indicator changes color on an end closest to a metal substrate more quickly than the end farthest from a metal substrate due to a temperature gradient across the indicator. Stratification of the color change of the thermochromic indicator provides indication regarding the rate and amount of cooling.

[0066] Additional components may also be included with the bandage such as antibacterial agents to suppress bacterial growth and assist with wound healing or anesthetics and analgesics to reduce pain. Antibacterial agents may include metal ions (such as silver ions) or metal salts (such as silver nitrate, lactate or citrate, or aluminum diacetate), metal nanoparticles (such as silver nanoparticles), sulfates and silvers, antibacterial peptides, quaternary ammonium compounds, triclosan, iodine, PVP-iodine, phenol compounds, chlorhexidine gluconate, polyhexamide, silver sulfadiazine, octenidine, as well as antibiotics such as sulfate, beta-lactams, fluoroquinolones, aminoglycosides, glycopeptides, oxazolidinones, bacteriocin, or tetracycline. Anesthetics and analgesics may include lidocaine, benzocaine, procaine, aloe, menthol, paracetamol, non-steroidal anti-inflammatory drugs and opioid drugs. In one embodiment heparan sulfate is included in the bandage as a promoter of wound healing. In one embodiment heparan derived glycosaminoglycans including dermatan sulfate, keratan sulfate, chondroitin-4 and chondroitin-6-sulfate, and hyaluronic acid may be added to accelerate wound healing.

[0067] While the present inventions have been illustrated and described in many embodiments of varying scope, it will at once be apparent to those skilled in the art that variations may be made within the spirit and scope of the inventions. Accordingly, it is intended that the scope of the inventions set forth in the appended claims not be limited by any specific wording in the foregoing description, except as expressly provided.

EXAMPLES

EXAMPLE 1

[0068] The following example is meant to be illustrative and prophetic only. In this example, an inventive wrapper is comprised of a wrapper top layer and wrapper bottom layer.

[0069] WRAPPER TOP LAYER: The wrapper top layer is comprised of two sheets - a first sheet and a second sheet. The wrapper top layer first sheet is substantially rectangular with dimensions of about 76.50 millimeters long by about 30.00 millimeters wide with a thickness of about 0.10 millimeters; the wrapper top layer second sheet is substantially rectangular with dimensions of about 41.45 millimeters long by about 30.00 millimeters wide with a thickness of about 0.10 millimeters. The wrapper top layer first sheet has an interior surface (that will face the bandage) and an exterior surface (that will face the environment); the wrapper top layer second sheet has an interior surface (that will face the bandage) and an exterior surface (that will face the environment).

[0070] The first sheet of the wrapper top layer has a first end and a second end. A hole is disposed through the first sheet at the first end, about 5.00 millimeters in from the edge of the first end and centered along the about 30.00 millimeter width; the second end will be coupled to the second sheet of the wrapper top layer. The second sheet of the wrapper top layer has a first end and a second end. The second end of the second sheet of the wrapper top layer will be coupled to the first sheet of the wrapper top layer.

[0071] The first sheet and second sheet of the wrapper top layer are coupled to each other at their respective second ends (flaps); part of the interior surface of the first sheet at the second end contacts and adheres to part of the interior surface of the second sheet at the second end. About 5.50 millimeters at the second end of the interior surface of the about 76.50 millimeter length of the first sheet contacts and adheres to about 5.50 millimeters at the second end of the interior surface of the about 41.45 millimeter length of the second sheet. The portions of the first sheet and second sheet that contact each other and adhere are folded so that the first sheet lays almost perfectly flat, while the second sheet has an approximately 180 degree bend at the 5.50 millimeter mark resulting in a fold of a portion of the exterior of the second sheet back upon itself.

[0072] WRAPPER BOTTOM LAYER: The wrapper bottom layer is comprised of two sheets - a first sheet and a second sheet. The wrapper bottom layer first sheet is substantially rectangular with dimensions of about 76.50 millimeters long by about 30.00 millimeters wide with a thickness of about 0.10 millimeters; the wrapper bottom layer second sheet is substantially rectangular with dimensions of about 41.45 millimeters long by about 30.00 millimeters wide with a thickness of about 0.10 millimeters. The wrapper bottom layer first sheet has an interior surface (that will face the bandage) and an exterior surface (that will face the environment); the wrapper bottom layer second sheet has an interior surface (that will face the bandage) and an exterior surface (that will face the environment).

[0073] The first sheet of the wrapper bottom layer has a first end and a second end. A hole is disposed through the first sheet at the first end, about 5.00 millimeters in from the edge of the first end and centered along the about 30.00 millimeter width; the second end will be coupled to the second sheet of the wrapper bottom layer. The second sheet of the wrapper bottom layer has a first end and a second end. The second end of the second sheet of the wrapper bottom layer will be coupled to the first sheet of the wrapper bottom layer.

[0074] The first sheet and second sheet of the wrapper bottom layer are coupled to each other at their respective second ends (flaps); part of the interior surface of the first sheet at the second end contacts and adheres to part of the interior surface of the second sheet at the second end. About 5.50 millimeters at the second end of the interior surface of the about 76.50 millimeter length of the first sheet contacts and adheres to about 5.50 millimeters at the second end of the interior surface of the about 41.45 millimeter length of the second sheet. The portions of the first sheet and second sheet that contact each other and adhere are folded so that the first sheet lays almost perfectly flat, while the second sheet has an approximately 180 degree bend at the 5.50 millimeter mark resulting in a fold of a portion of the exterior of the second sheet back upon itself.

[0075] BANDAGE: A bandage is as described in U.S. Patent No. 8,530,720 to Freer, et al. is enclosed by the wrapper top layer and wrapper bottom layer. The bandage is approximately 86.50 millimeters long by about 20.00 millimeters wide. The bandage is comprised of a top adhesive layer, a middle aluminum layer, and a bottom anti-stick backing layer. The anti-stick backing layer is comprised of two equally sized sheets each about 46.92 millimeters long by about 20.00 millimeters wide and about 0.05 millimeters thick – the backing sheets overlap each other by about 7.34 millimeters to facilitate removal from the bandage.

[0076] A dab of adhesive glue secures a portion of the bottom-most anti-stick backing sheet to the wrapper bottom layer. The bandage is then enclosed so that the first sheet of the wrapper top layer is concentric with the first sheet of the wrapper bottom layer, and so that the second sheet of the wrapper top layer is concentric with the second sheet of the wrapper bottom layer. The first sheet of the wrapper top layer is coupled to the first sheet of the wrapper bottom layer, and the second sheet of the wrapper top layer is coupled to the second

sheet of the wrapper bottom layer. The bandage is enclosed and sealed within the wrapper and sterilized.

EXAMPLE 2

[0077] The following example is meant to be illustrative and prophetic only. In this example, a bandage wrapper of Example 1 is opened and the bandage is applied to a burn. The right-hand side of the bandage wrapper is grasped in a user's right hand and pulled opposite the left-hand side of the bandage wrapper which is grasped in a user's left hand. The opposite force applied to the bandage ends serves to completely remove the bandage from the left-hand side of the bandage wrapper. The left-hand anti-stick sheet is adhered to, and remains within, the left-hand side of the bandage wrapper. The adhesive portion of the bandage's left-hand side is exposed. The user discards the left-hand wrapper and left-hand anti-stick backing and applies the exposed adhesive portion of the bandage near a subject's burn positioned so that the bandage's aluminum layer will contact the subject's burn when fully applied. The user removes the right-hand side of the bandage wrapper and then removes the right-hand anti-stick backing sheet remaining on the bandage. The bandage is then fully applied to the subject's burn.

EXAMPLE 3

[0078] The following example is meant to be illustrative and prophetic only. In this example, a bandage wrapper of Example 1 is opened and the bandage is applied to a burn. The wrapped bandage is secured on a mandrel inserted through the hole in the wrapper. The left-hand side of the bandage wrapper is secured to a mandrel while the right-hand side of the bandage wrapper is grasped in a user's right hand and pulled away from the mandrel in a direction perpendicular to the mandrel's axis. The force applied to the bandage serves to completely remove the bandage from the left-hand side of the bandage wrapper. The left-hand anti-stick sheet is adhered to, and remains within, the left-hand side of the bandage

wrapper. The adhesive portion of the bandage's left-hand side is now exposed. The left-hand wrapper portion with left-hand anti-stick sheet remains on the mandrel. The user applies the exposed adhesive portion of the bandage near a subject's burn positioned so that the bandage's aluminum layer will contact the subject's burn when fully applied. The user removes the right-hand side of the bandage wrapper and then removes the right-hand anti-stick backing sheet remaining on the bandage. The bandage is then fully applied to the subject's burn.

What is claimed is:

1. A bandage wrapper comprising:

a first side comprising (a) a first top sheet having a top surface and a bottom surface and (b) a first bottom sheet having a top surface and a bottom surface, where a portion of the bottom surface of the first top sheet is coupled to a portion of the bottom surface of the first bottom sheet;

a second side comprising (a) a second top sheet having a top surface and a bottom surface and (b) a second bottom sheet having a top surface and a bottom surface, where a portion of the bottom surface of the second top sheet is coupled to a portion of the bottom surface of the second bottom sheet; and

where said first side is releasably connected to said second side.

2. A bandage wrapper of claim 1 further comprising:

(a) a portion of the bottom surface of the first top sheet releasably adhered to a portion of the bottom surface of the second top sheet at a first junction; and

(b) a portion of the bottom surface of the first bottom sheet releasably adhered to a portion of the bottom surface of the second bottom sheet at a second junction.

3. A bandage wrapper of claim 2 further comprising a hole through the first side, said hole positioned opposite the first junction.

4. A wrapped bandage comprising:

(a) a bandage; and

(b) a wrapper,

said wrapper comprising (i) a first side comprising (1) a first top sheet having a top surface and a bottom surface and (2) a first bottom sheet having a top surface and a bottom surface, where a portion of the bottom surface of the first top sheet is coupled to a portion of the bottom surface of the first bottom sheet; and (ii) a second side

comprising (1) a second top sheet having a top surface and a bottom surface and (2) a second bottom sheet having a top surface and a bottom surface, where a portion of the bottom surface of the second top sheet is coupled to a portion of the bottom surface of the second bottom sheet; and

where said first side is releasably connected to said second side.

5. A wrapped bandage of claim 4 where said wrapper further comprises:

(a) a portion of the bottom surface of the first top sheet releasably adhered to a portion of the bottom surface of the second top sheet at a first junction; and

(b) a portion of the bottom surface of the first bottom sheet releasably adhered to a portion of the bottom surface of the second bottom sheet at a second junction.

6. A wrapped bandage of claim 5 where said wrapper further comprises a hole through the first side, said hole positioned opposite the first junction.

7. A wrapped bandage of claim 4 where said bandage comprises an adhesive layer and two anti-stick backing sheets.

8. A wrapped bandage of claim 7 where a portion of one anti-stick backing sheet is adhered to the top surface of the first bottom sheet.

9. A wrapped bandage of claim 8 where said bandage comprises an aluminum sheet.

10. A wrapped bandage of claim 8 where said bandage comprises a thermally conductive metal substrate.

11. A wrapped bandage of claim 8 where said bandage comprises a hydrogel layer.

12. A wrapped bandage of claim 8 where said bandage comprises a gauze layer.

13. A wrapped bandage of claim 10 where said bandage further comprises a hydrogel layer.

14. A wrapped bandage of claim 8 where said bandage comprises a thermochromic indicator member.

15. A wrapped bandage of claim 11 where said hydrogel comprises polyvinylpyrrolidone.

16. A bandage dispensing system comprising:

(a) a mandrel, and

(b) a plurality of wrapped bandages disposed along said mandrel,

each of said wrapped bandages comprising a wrapper and a bandage;

each wrapper containing a hole through the wrapper sized to accept said mandrel; and

said mandrel positioned through each hole in each wrapper.

17. A bandage dispensing system of claim 16 where each bandage comprises a thermally conductive metal substrate.

18. A bandage dispensing system of claim 16 where each bandage comprises an aluminum sheet.

19. A bandage dispensing system of claim 16 where each bandage comprises a hydrogel layer.

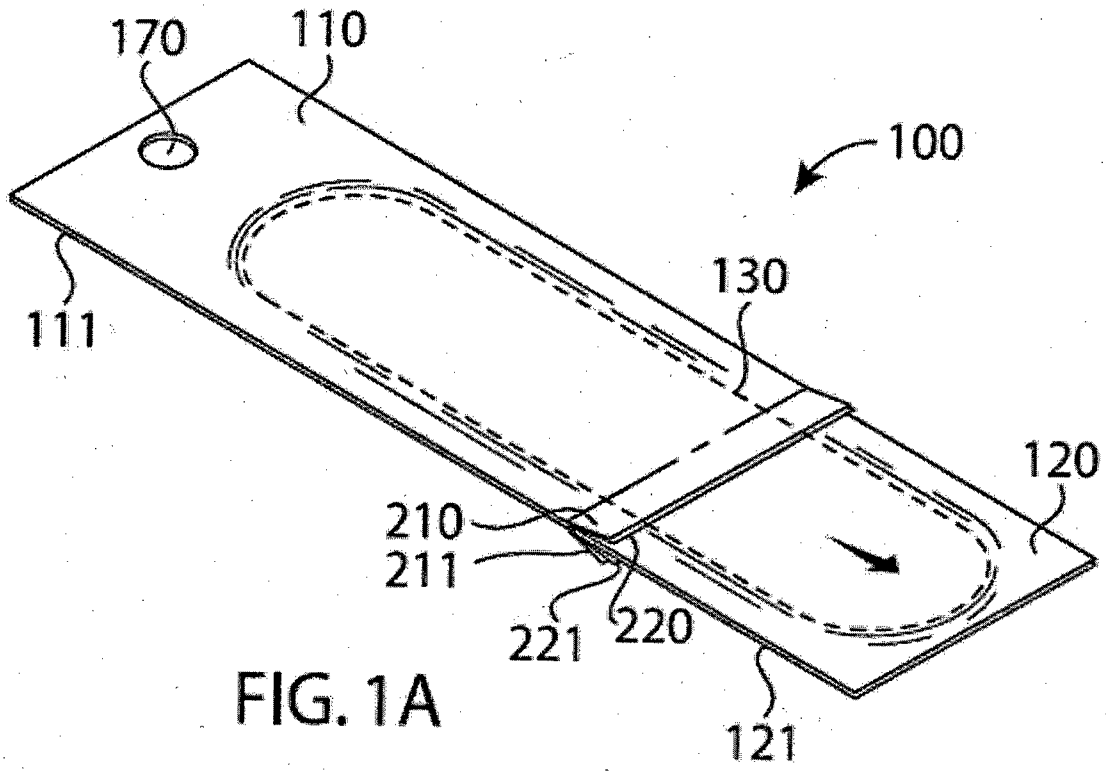
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FIG. 1A

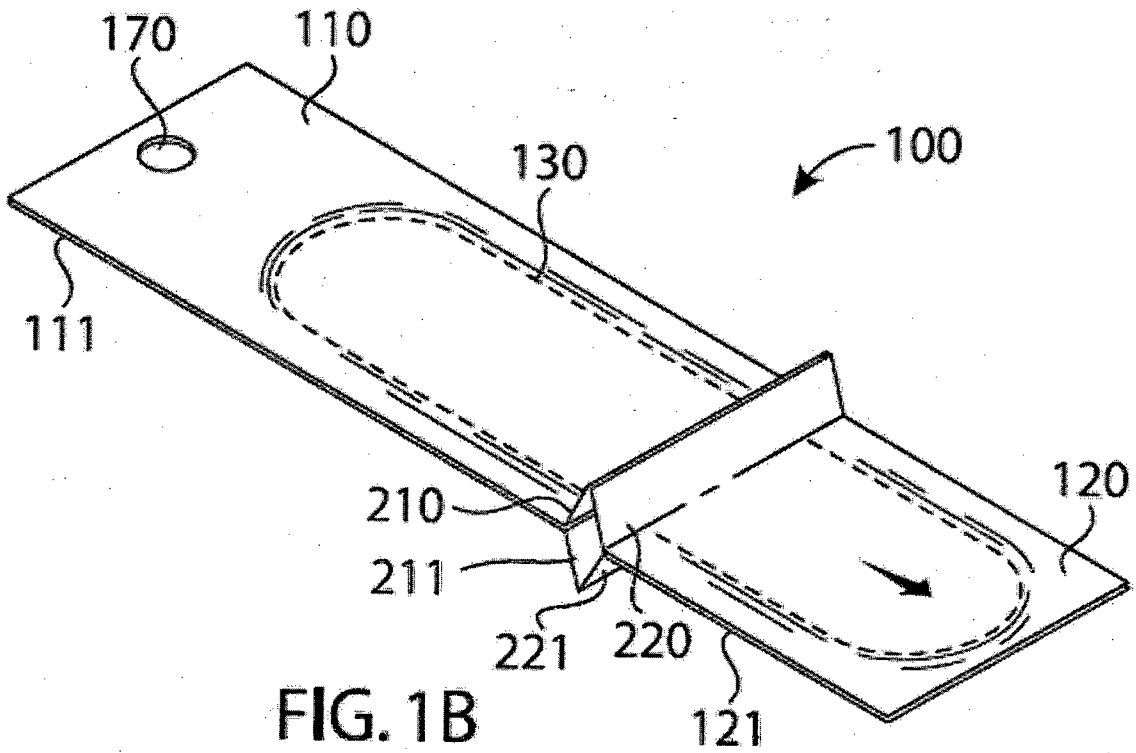
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FIG. 1B

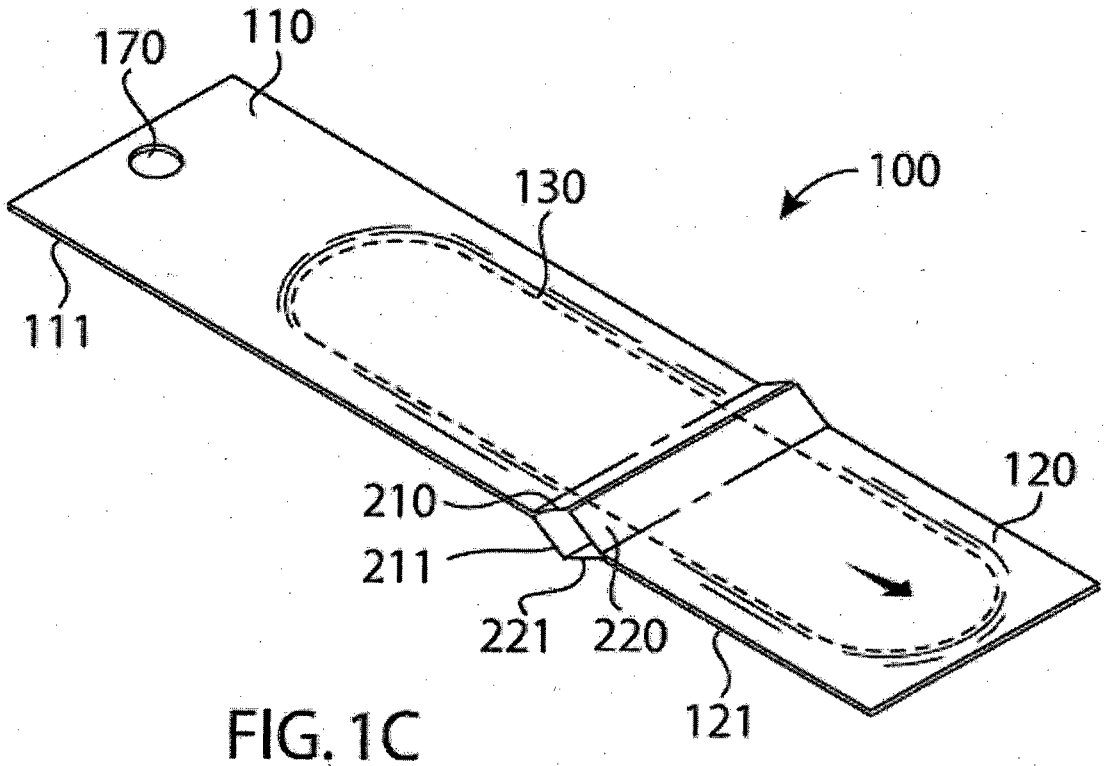
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FIG. 1C

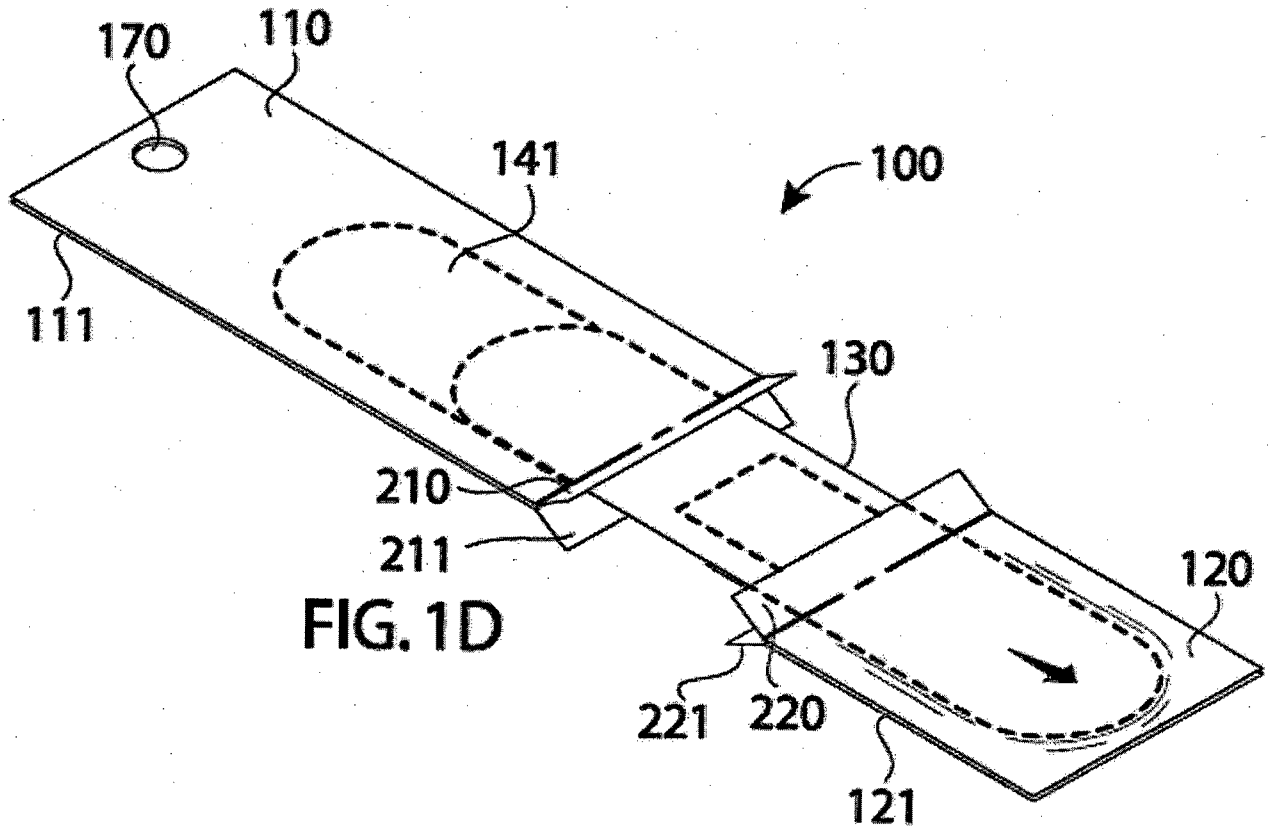
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FIG. 1D

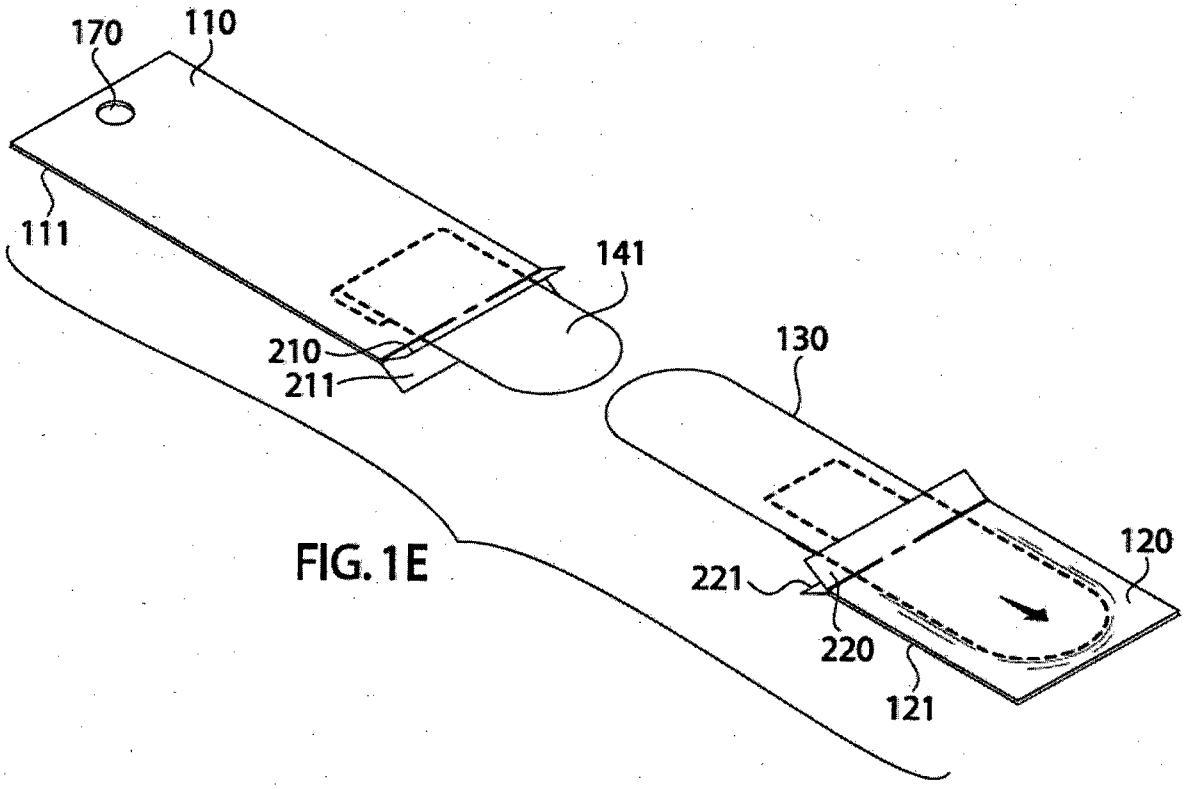

FIG. 1E

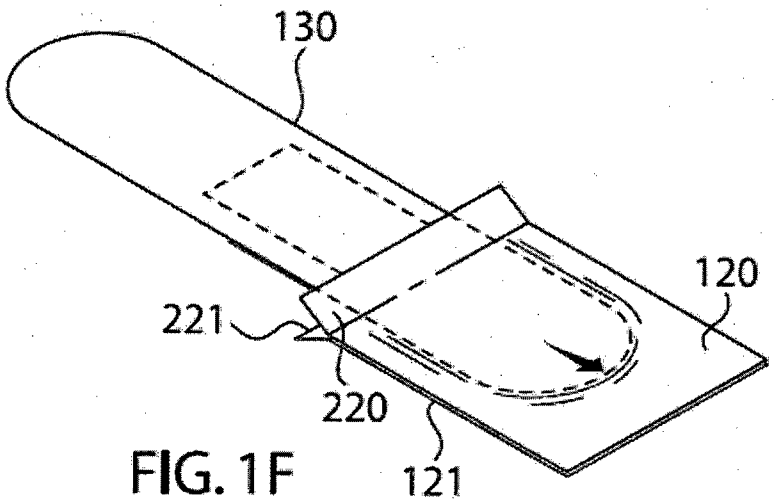

FIG. 1F

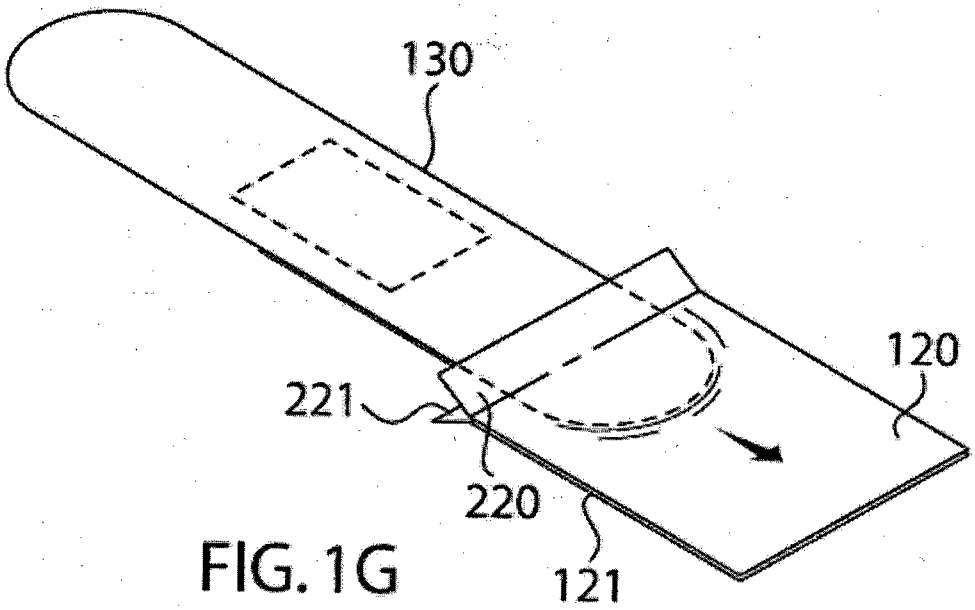

FIG. 1G

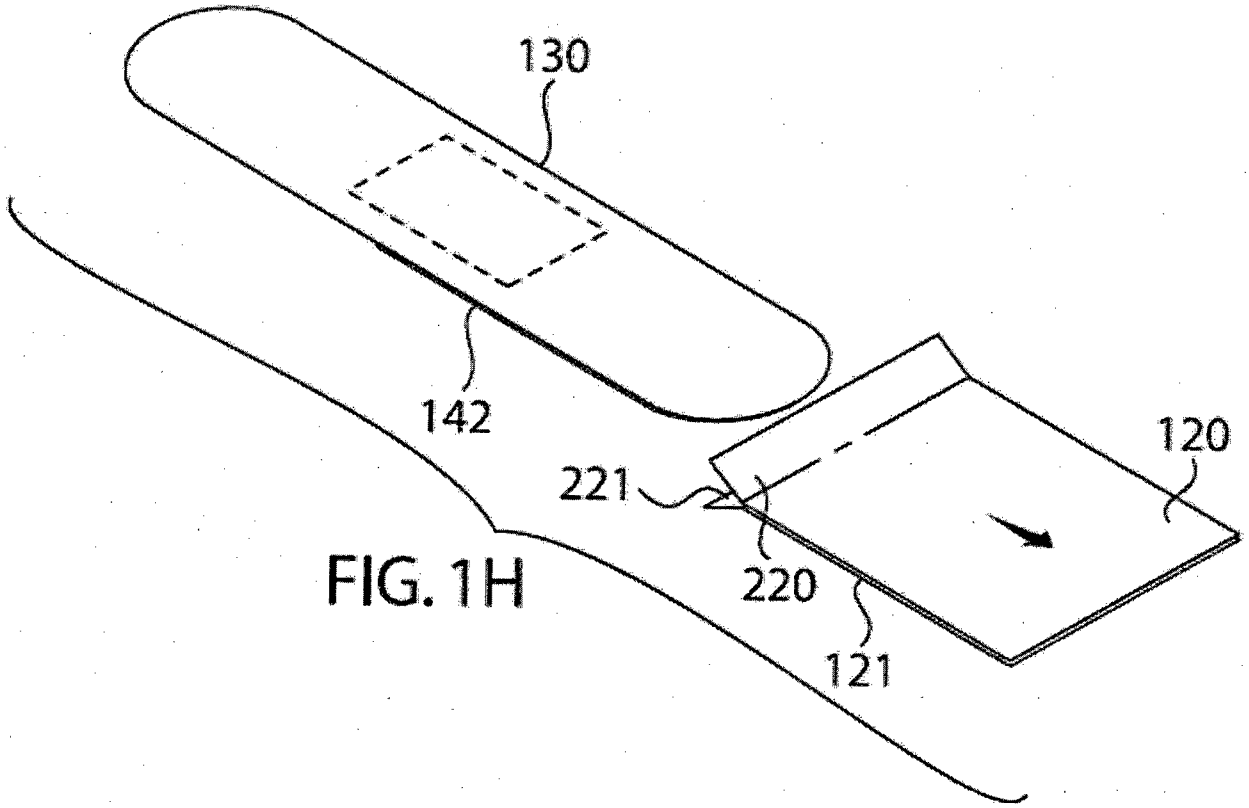

FIG. 1H

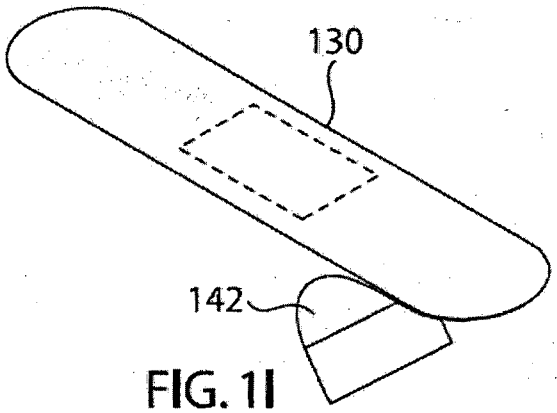

FIG. 1I

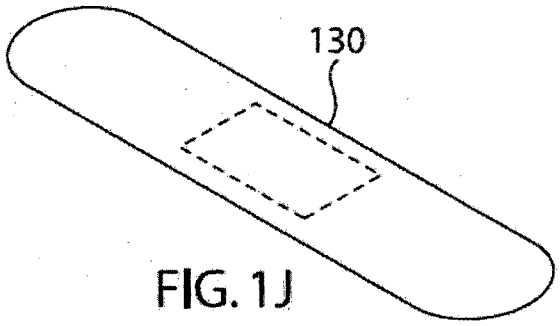

FIG. 1J

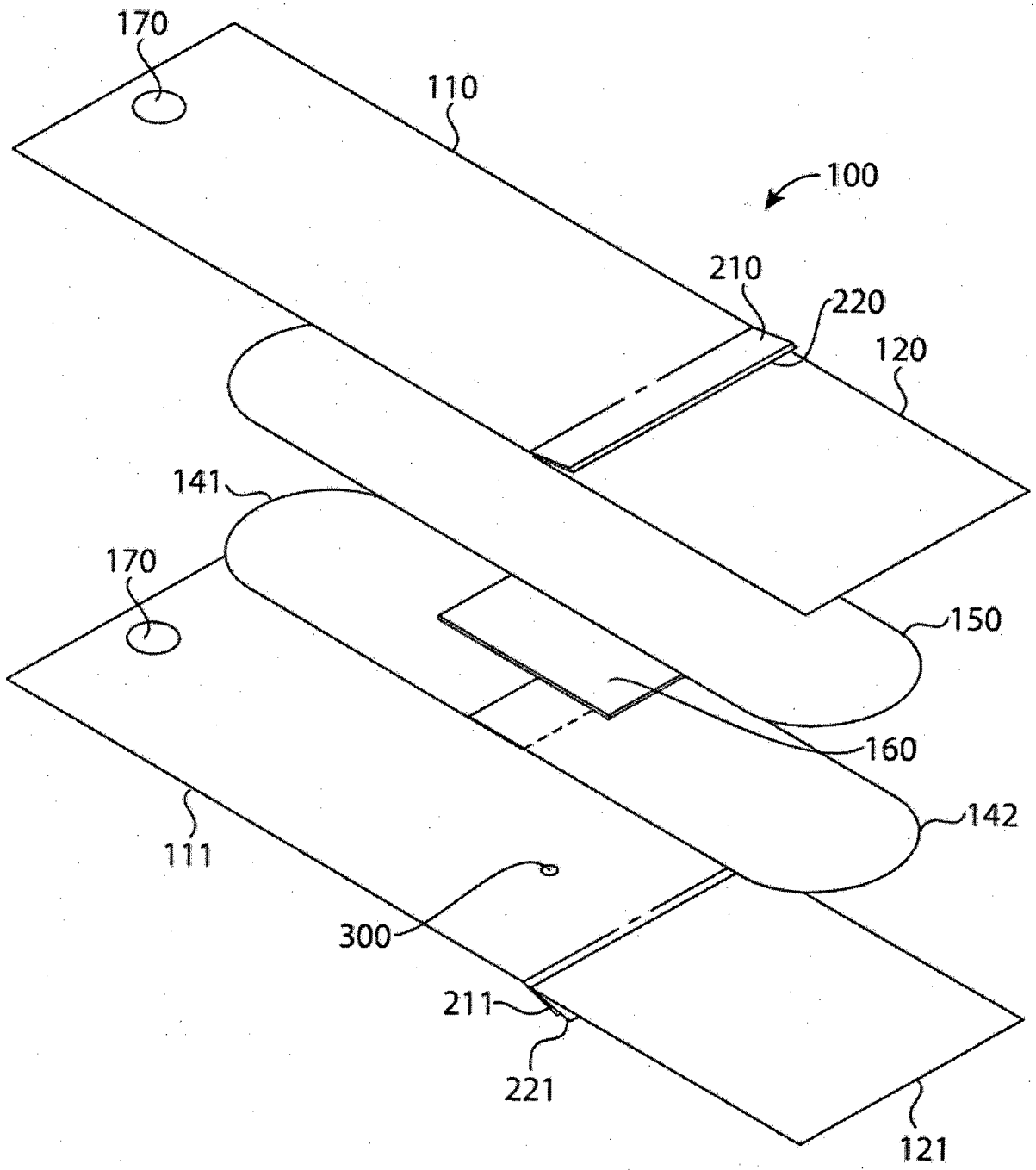

FIG. 2

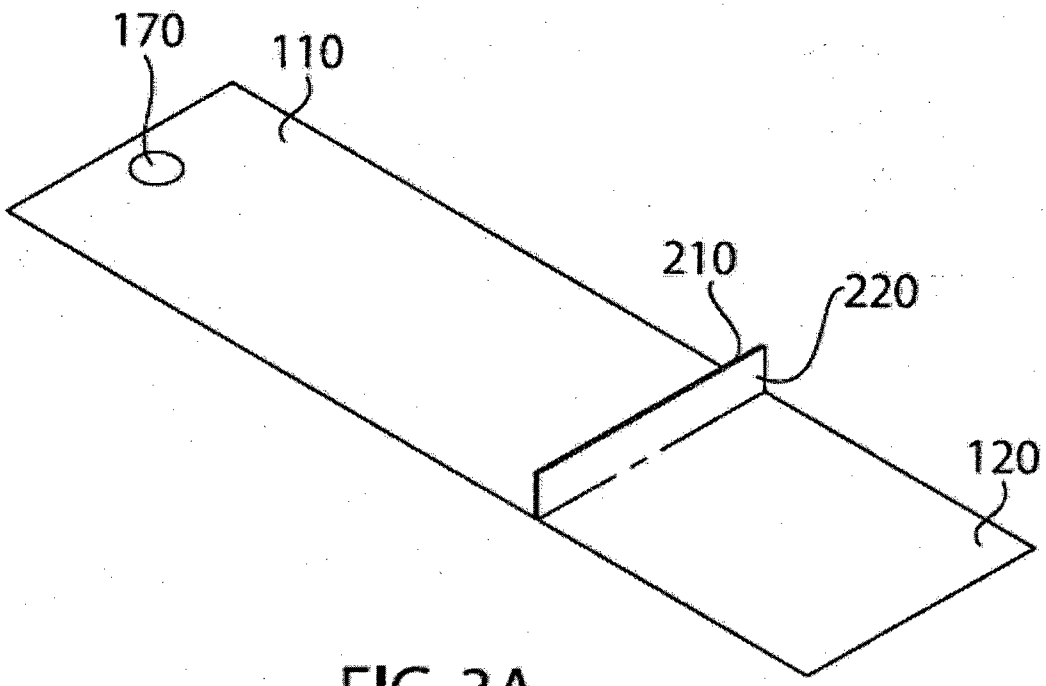

FIG. 3A

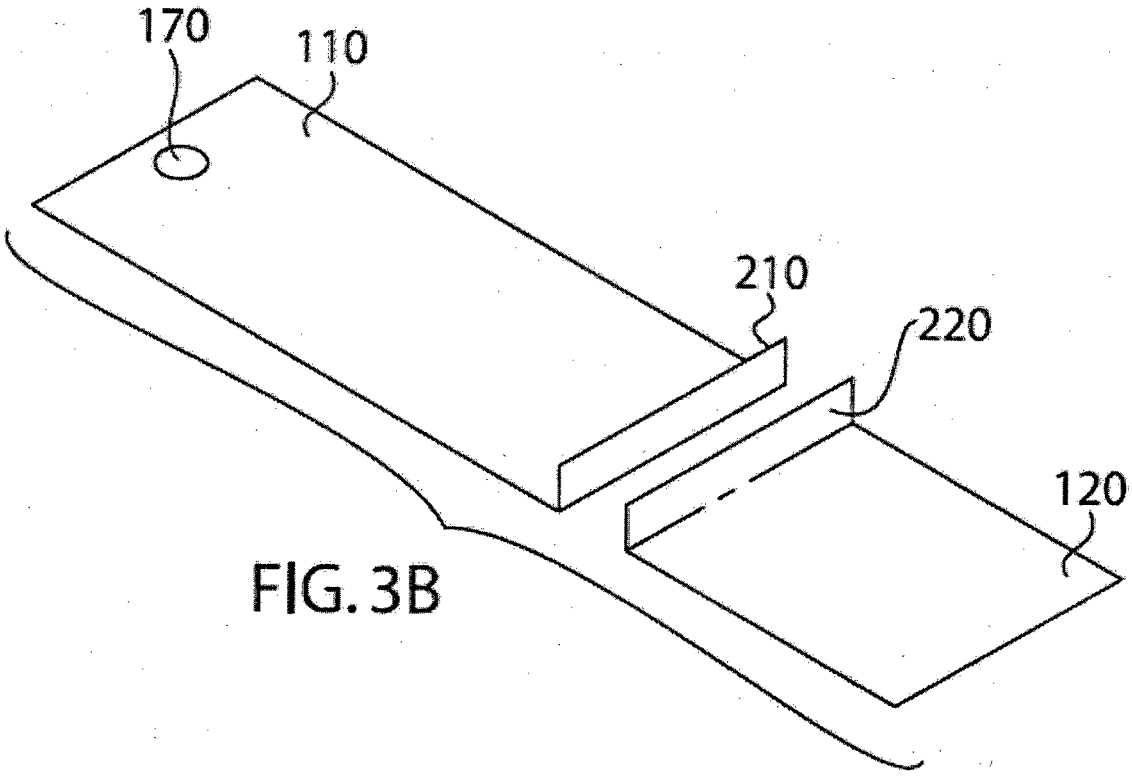

FIG. 3B

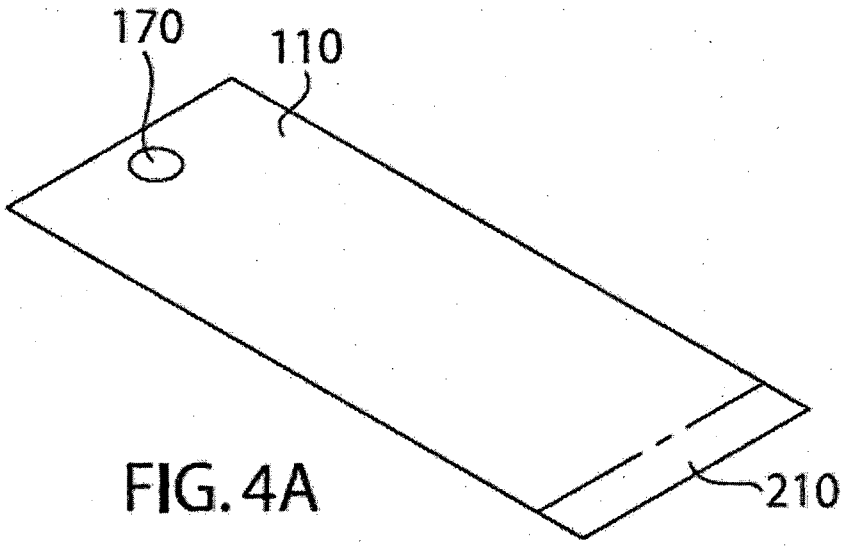

FIG. 4A

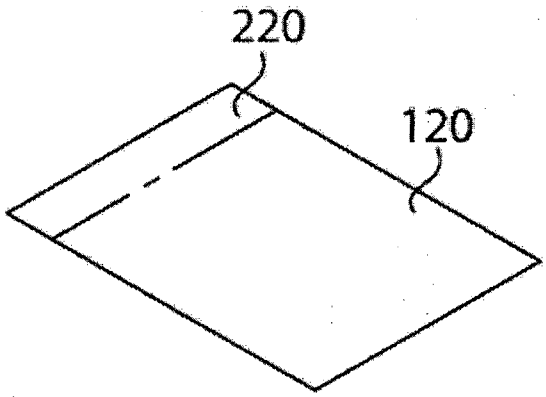

FIG. 5A

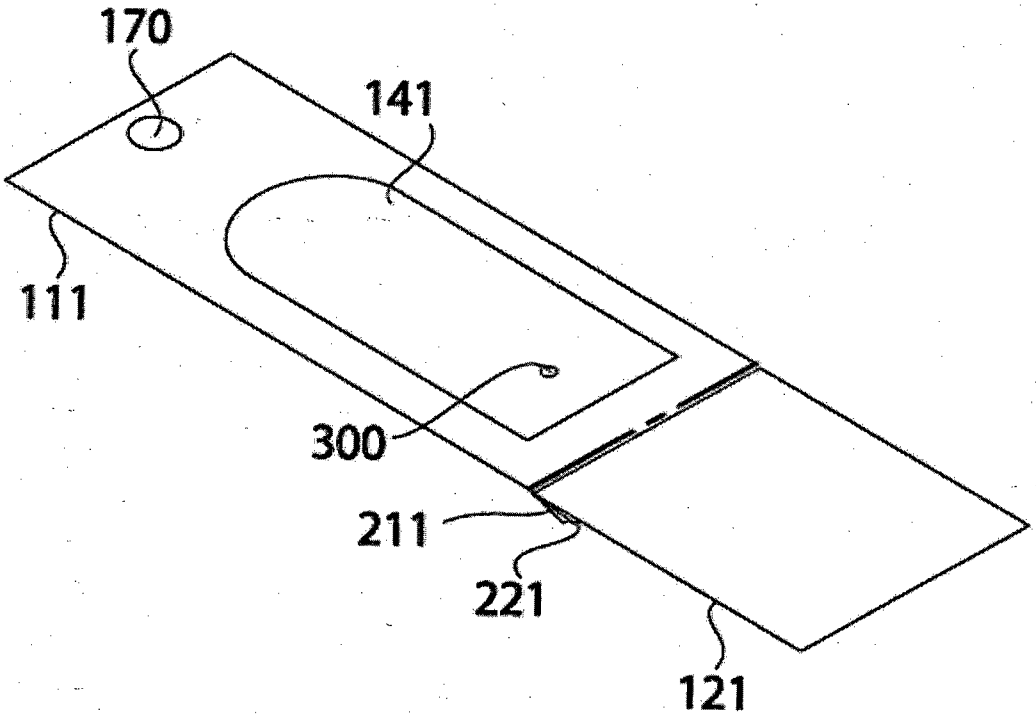

FIG. 6A

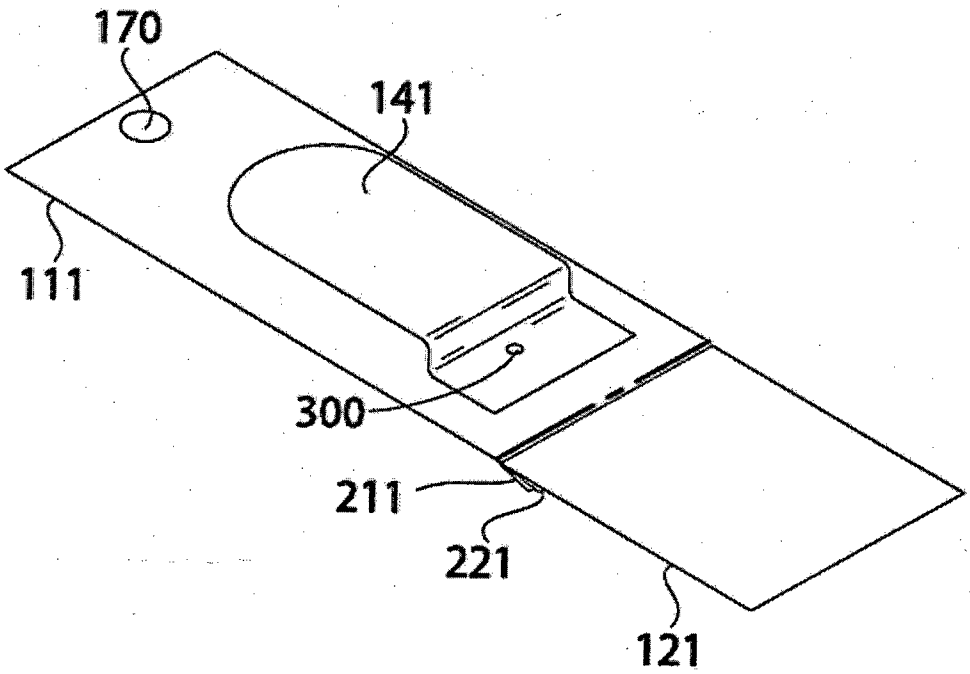

FIG. 6B

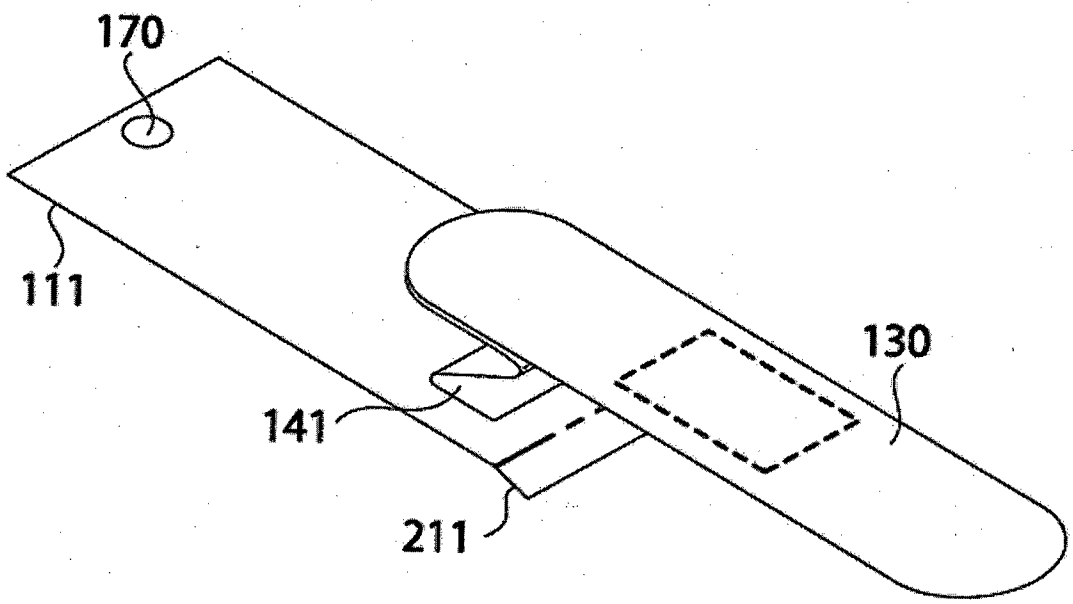

FIG. 7A

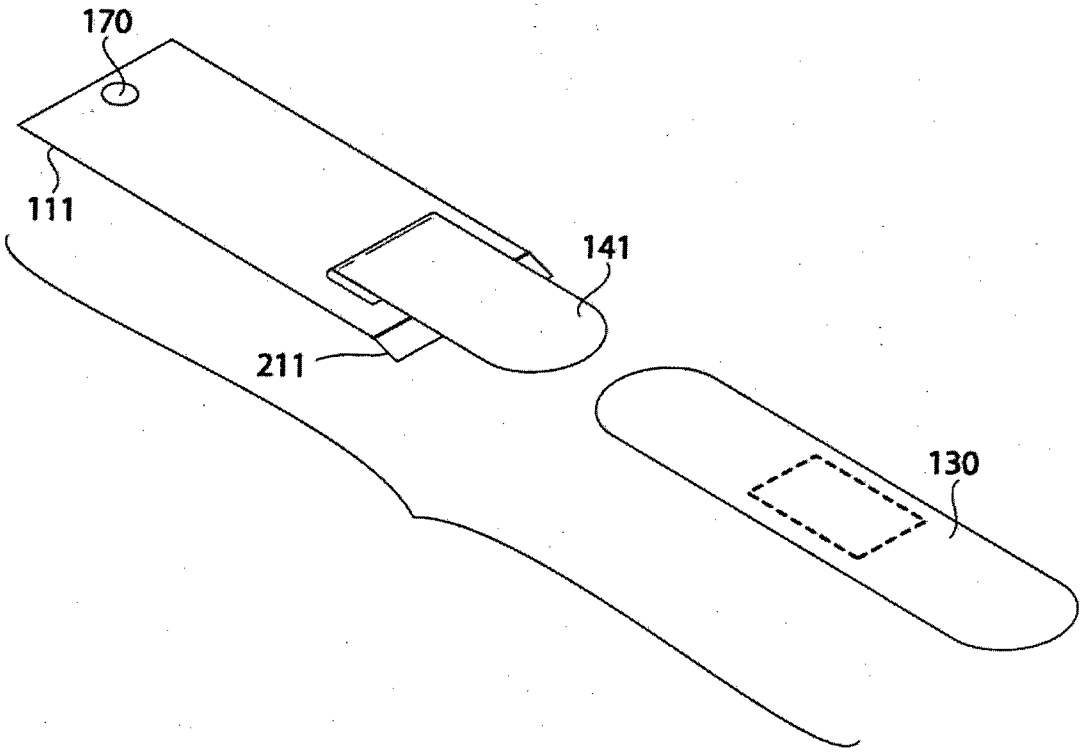

FIG. 7B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG2014/000284

A. CLASSIFICATION OF SUBJECT MATTER

A61F 15/00 (2006.01) A61F 13/02 (2006.01)

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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

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

EPODOC, WPI, TXTE (TXTUS5, TXTUS4, TXTUS3, TXTUS2, TXTUS1, TXTUS0, TXTEP1, TXTGB1, TXTWO1, TXTAU1, TXTCA1, TXTSG1); IPC/CPC: A61F15/001/IC/CN, A61F15/002/IC/CN, A61F15/LOW/IC/CN, A61F13/02/LOW/IC/CN; Keywords: Bandage, Wrapper, Hole, First Side, Second Side, Sheet, Releasable, Connected, Mandrel, Hook, Mount, Anchor, Stack, Aluminium, Polyvinylpyrrolidone, Hydrogel and like terms.

Espace, Google Patent and Google Scholar: Keywords: Bandage, Wrapper, Hole, First Side, Second Side, Sheet, Releasable, Connected, Mandrel, Hook, Mount, Anchor, Aluminaid, Stack, Aluminium, Polyvinylpyrrolidone, Hydrogel and like terms.

Espace: Applicant/Inventor Search: "ADVANCED FIRST AID RESEARCH PTE. LTD.", "FREER, CARL", "MARTEN, JOSEPH", "CAROLL, STEPHEN"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 August 2014	27 August 2014
Name and mailing address of the ISA/AU	**Authorised officer**
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	Aaron Giles AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. 0262832302

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG2014/000284

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

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

1. ☐ Claims Nos.:

because they relate to subject matter not required to be searched by this Authority, namely:

the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including

2. ☐ Claims Nos.:

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos:

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

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

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

See Supplemental Box for Details

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

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/SG2014/000284**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 6053318 A (PETTERSON) 25 April 2000 Figure 1,2, 6, 7; Item 12, 14, 28, 32, 36, 38, 44, 50, 60, 64a, 64b; Column 3 line 29-35, Column 4 line 53-59 Figure 1,2, 6, 7; Item 12, 14, 28, 32, 36, 38, 44, 50, 60, 64a, 64b; Column 3 line 29-35, Column 4 line 53-59	1-2, 4-5, 7-8 3, 6, 9-15
X Y	US 6124522 A (SCHROEDER) 26 September 2000 Figure 2, 6-9; Item 12, 18; Column 7 line 52 – Column 8 line 9 Figure 2, 6-9; Item 12, 18; Column 7 line 52 – Column 8 line 9	16 3, 6, 17-19
Y	WO 2013/019372 A2 (ALUMINAID INTERNATIONAL, AG, et al.) 07 February 2013 Figure 25; Item 15, 40, 45; Page 21 line 15-18, Page 49 line 18-20	9-15, 17-19
X	US 4997092 A (DUPONT) 05 March 1991 Figure 1-5, Column 4 line 35 – Column 5 line 42	1-2, 4-5
A	US 8522976 B2 (HOLSTEIN) 03 September 2013 Figure 11; Item 120; Column 3 line 65 – Column 4 line 5	16-19
A	US 2001/0031370 A1 (KUNDEL) 18 October 2001 Paragraph [0028]-[0029]	11-15

Supplemental Box

Continuation of: **Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-15 are directed towards a wrapper for a bandage. The feature of a wrapper including first and second releasably connected sides is specific to this group of claims.

- Claims 16-19 are directed towards a bandage dispensing system. The feature of a mandrel, wherein wrapped bandages are disposed along said mandrel via a hole in each wrapper is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. Therefore there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/SG2014/000284**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
US 6053318 A	25 April 2000	AU 5919200 A	22 Jan 2001
		WO 0102270 A1	11 Jan 2001
US 6124522 A	26 September 2000	AU 758969 B2	03 Apr 2003
		AU 1610700 A	13 Jun 2000
		BR 9915598 A	15 Jan 2002
		CA 2352151 A1	02 Jun 2000
		CN 1333671 A	30 Jan 2002
		EP 1175193 A1	30 Jan 2002
		ID 30174 A	08 Nov 2001
		IL 143291 A	31 Oct 2007
		JP 2002530150 A	17 Sep 2002
		MX PA01005205 A	04 Jun 2002
		NO 20012535 A	23 Jul 2001
		NZ 511857 A	25 Jul 2003
		US 6225522 B1	01 May 2001
		US 2002064619 A1	30 May 2002
		US 7521586 B2	21 Apr 2009
		WO 0030579 A1	02 Jun 2000
WO 2013/019372 A2	07 February 2013	CA 2852702 A1	07 Feb 2013
		CN 103096943 A	08 May 2013
		EP 2736543 A2	04 Jun 2014
		US 2013030341 A1	31 Jan 2013
		US 8530720 B2	10 Sep 2013
		US 2014046237 A1	13 Feb 2014
		US 2014221896 A1	07 Aug 2014
		WO 2013019266 A1	07 Feb 2013
US 4997092 A	05 March 1991	None	
US 8522976 B2	03 September 2013	US 8522976 B2	03 Sep 2013
		CA 2858838 A1	11 Jul 2013
		WO 2013103849 A1	11 Jul 2013
US 2001/0031370 A1	18 October 2001	US 6468383 B2	22 Oct 2002
		AU 5238093 A	30 Jun 1994
		AU 674546 B2	02 Jan 1997
		BR 9305045 A	26 Jul 1994

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/SG2014/000284**

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Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
		CA 2111476 A1	16 Jun 1994
		EP 0604103 A1	29 Jun 1994
		EP 0604103 B1	17 Mar 1999
		GR 93100507 A	31 Aug 1994
		GR 1002321 B	15 May 1996
		JP H06315526 A	15 Nov 1994
		JP 3532235 B2	31 May 2004
		US 5480717 A	02 Jan 1996
		US 5674346 A	07 Oct 1997
		US 6228390 B1	08 May 2001

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.