

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
2 September 2004 (02.09.2004)

PCT

(10) International Publication Number
WO 2004/073567 A1

(51) International Patent Classification⁷: **A61F 13/02**

[US/US]; 3M Center, Post Office Box 33427, Saint Paul, MN 55133-3427 (US).

(21) International Application Number:

PCT/US2004/003688

(74) Agents: **LAMBERT, Nancy, M.** et al.; Office of Intellectual Property Counsel, Post Office Box 33427, Saint Paul, MN 55133-3427 (US).

(22) International Filing Date: 9 February 2004 (09.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/370,249 19 February 2003 (19.02.2003) US

(71) Applicant (for all designated States except US): **3M INNOVATIVE PROPERTIES COMPANY** [US/US]; 3M Center, Post Office Box 33427, Saint Paul, MN 55133-3427 (US).

(72) Inventors; and

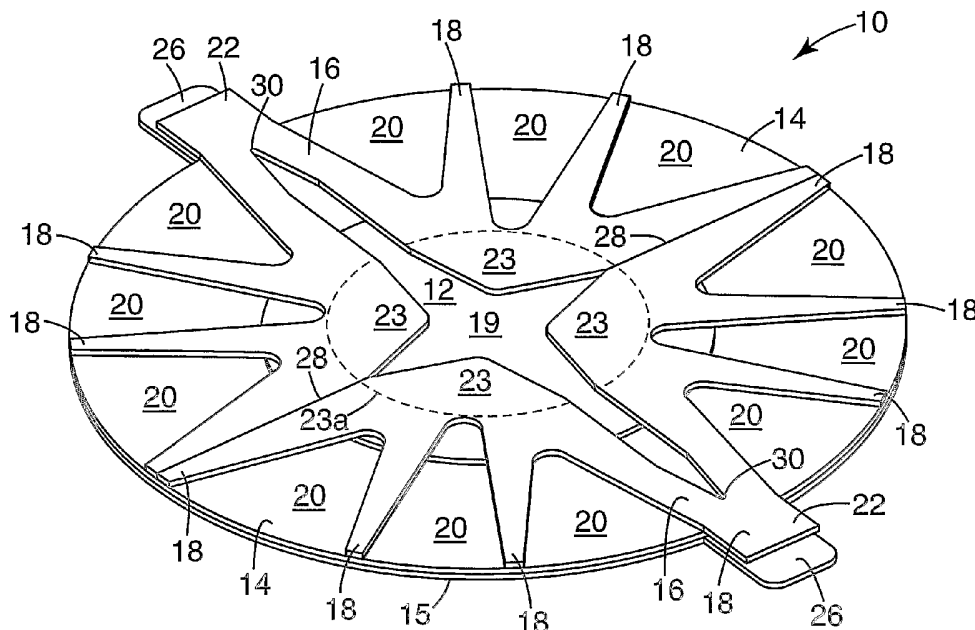
(75) Inventors/Applicants (for US only): **LIEDTKE, Wayne, L.** [US/US]; 3M Center, Post Office Box 33427, Saint Paul, MN 55133-3427 (US). **JACOBSON, Richard, L.**

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,

[Continued on next page]

(54) Title: CONFORMABLE WOUND DRESSING



(57) Abstract: A wound dressing comprising an absorbent pad, an adhesive layer, and a backing layer is described, along with a dressing support layer configured to retain and deliver the wound dressing to a wound, the dressing support layer having a radial configuration that forms a plurality of alternating covered and uncovered portions of the backing layer along the perimeter of the wound dressing.



GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD,

SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

Published:

- with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

CONFORMABLE WOUND DRESSING

Field of the Invention

The invention relates to wound dressings, and more particularly to a thin film
5 composite dressing and a radial support delivery system.

Background of the Invention

Wound dressings using an absorbent central area surrounded by a larger
adhesive film are known. For example, U.S. Patent No. 5,738,642 (the '642 patent)
10 shows a wound dressing and delivery system comprising a thick absorbent pad placed
in the center of a thin backing. A carrier frame surrounds the perimeter of the wound
dressing, providing sufficient support (e.g. rigidity) to the backing to facilitate handling
of the dressing during application to a wound. The dressing taught in the '642 patent is
useful for application to a large variety of wounds. However, a need remains for a
15 wound dressing that can be more effectively applied to irregular surfaces, such as a heel
or shoulder. Currently, wound dressings are sometimes cut toward their center to make
a cone shaped dressing, but these dressings have significant limitations, including the
risk of infection along the line of the cut line, difficulty in applying with one hand, and
leakage of fluids from the wound along the cut line.

20 Therefore, a need remains for an improved wound dressing configured for
application to a rounded or other irregularly shaped body part.

Summary of the Invention

The present invention provides a wound dressing having a thin, flexible
25 periphery and delivery system that facilitates handling the wound dressing. The wound
dressing is constructed so as to have improved adhesion to irregular shaped surfaces,
such as a heel, and to permit easy application to the irregular shaped surfaces. The
wound dressing and delivery system are well suited to positioning an absorbent pad

onto a concave or convex surface. For example, the wound dressing and delivery system are suitable for applying an absorbent pad to the heel of a foot, while maintaining an intact sterile perimeter around the wound dressing.

5 In certain implementations the wound dressing and delivery system include a wound dressing comprising an adhesive layer on a backing layer. Optionally, an absorbent pad or material is applied or attached to the adhesive layer. A dressing support layer is positioned on top of the backing layer, and is configured to retain and deliver the wound dressing to a wound. In particular, the dressing support layer has a radial configuration of extensions that support the backing layer along the perimeter of
10 the wound dressing, while also allowing the dressing to be easily applied to convex surfaces and other non-planar surfaces.

These and various other advantages and features characterizing the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and
15 objects obtained by its use, reference should be made to the accompanying drawings and descriptive matter, in which embodiments of the invention are illustrated and described.

Brief Description of the Drawings

20 The invention will be further described with reference to the drawings, wherein corresponding reference characters indicate corresponding parts throughout the several views, and wherein:

FIG. 1 is a top perspective view of a wound dressing configured and arranged in accordance with an implementation of the invention.

25 FIG. 2 is a top plan view of the wound dressing of FIG. 1.

FIG. 3 is a side schematic view of the dressing of FIGS. 1 and 2 taken substantially along line 3-3 of FIG. 2.

FIG. 4 is an enlarged side cross-sectional view of the dressing of FIG. 3, the cross section taken along the line 4-4 of FIG. 5.

FIG. 5 is a top plan view of an alternative embodiment of a wound dressing made in accordance with the invention.

5 FIG. 6 is a top plan view of another alternative embodiment of a wound dressing made in accordance with the invention.

FIG. 7 is a top plan view of yet another alternative embodiment of a wound dressing made in accordance with the invention.

10 While the invention is amenable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the invention to the particular embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention.

15

Detailed Description

20 The present invention is directed to a wound dressing and delivery system, as well as to methods of applying the wound dressing and delivery system to a patient. The wound dressing and delivery system are particularly well suited to application over a convex surface of a patient, such as a patient's heel. The wound dressing permits a highly absorbent material to be placed against the wound, while the delivery system aids in forming a seal around the convex or irregularly shaped area surrounding the wound.

25 In some implementations the wound dressing comprises an absorbent pad, a backing layer, and an adhesive layer on the backing layer facing the absorbent pad. The adhesive layer and backing layer form a perimeter around the absorbent pad and hold the absorbent pad in place on a wound. The perimeter formed by the adhesive layer and backing layer keeps the absorbent pad properly positioned, and also helps

maintain a sterile environment around the wound. The adhesive layer and backing layer are typically extremely thin, and generally very flexible. If the adhesive layer and backing layer are not properly supported during application they can easily fold over and adhere to themselves, preventing proper application over a wound. The delivery system of the invention provides an easy and effective way to apply the wound dressing to a patient while effectively supporting the perimeter of the dressing to prevent excessive undesirable folding, while allowing controlled, limited folding of the backing layer sufficient to properly contact the patient's uneven skin surface.

FIGS. 1 and 2 show an example of a wound dressing and delivery system made in accordance with the invention. The wound dressing 10 includes a centrally located absorbent pad 12. The absorbent pad 12 is covered by an adhesive layer 17 on a backing layer 14 that extends out to the perimeter 15 of the wound dressing 10. The backing layer 14 is typically extremely thin, flexible, and either transparent or translucent, allowing the absorbent pad 12 to be viewed through it. The delivery system of this invention is particularly useful in connection with a wound dressing 10 having a relatively heavy or stiff absorbent pad 12 positioned on a highly conformable backing layer 14 that is light and flexible relative to the pad 12.

At least one dressing support layer 16 is positioned over the wound dressing 10. In certain implementations of the invention the dressing support layer 16 has a substantially radial configuration, with a plurality of extensions 18 radiating generally from the center 19 of the dressing 10. The support layer 16 forms a plurality of alternating uncovered portions 20 of the adhesive backing layer 14, separated from one another by the extensions 18 along the adhesive perimeter 15 of the wound dressing. The support layer 16 can be a single piece of material, such as a polymeric film, or can be two or more distinct pieces. The support layer 16 shown in FIGS. 1 and 2 is two separate pieces divided by joint 28.

In most implementations the support layer 16 comprises a plurality of extensions 18 radiating from the interior of the dressing 10 toward its edges. The radial

configuration of the dressing support layer 16 allows the perimeter 15 of the dressing 10 to be pressed around a convex surface. During application, the uncovered portions 20 of the backing layer 14 between the extensions 18 can contract to maintain a good seal around the edges of the wound. This contraction is typically localized so that individual portions 20 will contract and even fold upon themselves. However, folds or contact between the portions 20 is minimized. In this manner, the wound dressing 10 can have a relatively even, smooth edge without major flaps of the backing layer 14 folded over onto itself.

In some implementations, such as those shown in FIG. 1 and 2, at least some of the plurality of extensions 18 narrow as they approach the perimeter 15 of the dressing 10. Also, in some implementations the dressing support layer 16 comprises at least one portion that extends beyond the edge of the backing layer 14 of the wound dressing 10 to form a tab 22. The tab 22 can be held during positioning of the wound dressing 10.

In addition, the wound dressing 10 typically includes a carrier film 24, also having a tab 26. The carrier film 24 covers the surface of the wound dressing applied to the patient, generally making contact with the absorbent pad 12 and the periphery of the adhesive layer 17. The carrier film 24 remains attached to wound dressing 10 until a user is ready to apply the dressing. The carrier film 24 may be a single piece or multiple piece release liner, and may be part of or laminated to the package (not shown) containing the dressing, or merely enclosed along with the dressing within the package. The carrier film 24 keeps the adhesive clean during storage and shipping of the wound dressing 10.

In the implementation shown in FIGS. 1 and 2, the extensions 18 converge on the center 19 of the wound dressing 10 but do not cover the center 19. In general, the perimeter of the dressing support layer 16 is releasably adhered to the backing layer 14, but at least part of the center portion 19 of the dressing support layer 16 is not adhered to the backing layer 14. This results in the formation of a plurality of centrally located tabs 23 configured for removing the dressing support layer from the backing layer after

the dressing 10 has been applied to a patient. In some embodiments, at least part of the center of the dressing support layer 16 is prevented from adhering to the backing layer 14 by means of a liner 23a on the side of dressing support layer 16 facing backing layer 14. This liner 23a also aids in removal of the support layer, and in some embodiments
5 assists in elevating the tabs 23 when the dressing 10 is applied to a wound.

In reference now to FIGS. 3 and 4, a side elevational view of the wound dressing 10 from FIGS. 1 and 2 is depicted in FIG. 3, while FIG. 4 is a cross section of a wound dressing 10 made in accordance with the invention, taken along lines 4-4 of FIG. 3. This cross section shows an absorbent pad 12 that is covered by a thin, flexible
10 backing layer 14, which in turn is partially covered by support layer 16 and adhesive layer 17. FIG. 3 shows important aspects of one implementation of the invention. However, various other implementations are appropriate in order to add or take away from the aspects shown in FIG. 4. For example, the backing layer 14 can be multiple films or coatings without diverging from the invention or deviating from the meaning
15 of the term "film" as used herein. Similarly, the absorbent pad 12 can include multiple sub-layers, including films, webs, sheets, etc. Also, additional layers and films of other materials can be added between the materials described herein without deviating from the invention.

The number of exposed areas 20 of backing layer 14 along the perimeter 15 of the wound dressing 10 can vary in number, shape, and size. However, typically there
20 are at least six distinct exposed areas, generally at least eight, and more commonly twelve or more distinct areas. In some implementations less than 80 percent of the periphery (that portion outside of the absorbent) of the backing layer 14 is covered by the support layer 16, while in other implementations less than 60 percent of the
25 periphery of the backing layer 14 is covered by the support layer 16, while in yet other implementations less than 40 percent of the periphery of the backing layer 14 is covered by the support layer 16.

In some embodiments, separation of the extensions 18 is provided by precut paths or lines dividing extensions 18, such as joint 28 shown in FIGS. 1 and 2. In another embodiment, represented in FIG. 7, lines or paths 29 are included between extensions 18. Paths 29 provide controlled tear of the dressing support layer 16 when tabs 23 are lifted to remove the dressing support layer 16 during and /or after application of the dressing 10 to a patient. However, alternative configurations are possible including but not limited to linear, angled, Y-shaped, dual-angled offset, circular holes, and alternating combinations thereof. In FIG. 7, path 29 is shown with a plurality of perforations in an arrow configuration.

The wound dressing 10 is typically applied to a patient by first cleaning the wound and making sure the area around the wound is ready to receive a dressing. The carrier film 24 is then removed from the dressing, exposing the bottom of the absorbent pad 12 and the perimeter of the adhesive layer 17 and the backing layer 14. This perimeter of the backing layer 14 is maintained in a generally planer or stretched orientation by the numerous extensions 18 in the support layer 16. The center of the absorbent pad 12 is brought in contact with the wound, and then the edges of the dressing 10 are gently and smoothly pressed against the patient, thereby bringing the exposed adhesive perimeter of the backing layer 14 in contact with the patient. Generally the areas 20 of the backing layer 14 intermediate the extensions 18 contract to conform around the skin surface. When applied to convex surfaces, the contractions can cause the tabs 23 to rise off the surface of the backing layer 14. After the dressing 10 is properly in position and adhered to a patient's skin, the support layer 16 can be removed. Generally removal of support layer 16 is accomplished by grasping tabs 23 and then using a peeling motion toward the edges of the dressing 10 to remove the support layer 16.

Pressure sensitive adhesive layer 17 is generally provided on one major surface of the backing layer 14 in order to make it adhesive, and a low adhesion coating (low adhesion backsize or LAB) is provided on the other major surface of the backing layer

14 on the side that comes in contact with the support layer 16. The low adhesion coating reduces the need to change the dressing 10 due to unwanted dressing removal when other tapes or devices are placed on the dressing 10 and removed, and reduces the surface friction of the dressing 10 on linen or other fabrics, thereby offering additional protection against the accidental removal of dressing 10. A description of a low adhesion backing material suitable for use with the present invention can be found in U.S. Pat. Nos. 5,531,855 and 6,264,976, which are compatible with a heat seal bond described below.

When the support layer 16 is removed from the backing layer 14, the force applied to the edge of the backing layer 14 is generally perpendicular to the perimeter of the dressing 10. This force contrasts with peel forces of conventional support layers, which are parallel to the perimeter of the wound dressing, and which often lift the perimeter off the surface of the patient, potentially loosening the dressing or creating a path for leakage of fluids from the wound.

The absorbent pad 12 of dressing 10 is sometimes referred to as an "island pad" because the backing layer 14 extends substantially beyond the absorbent pad 12, typically beyond the entire periphery of the absorbent pad 12. For example, the length and width of the absorbent pad can be 6 cm by 6 cm, while a backing for this pad can be 9 cm by 9 cm. The pressure sensitive adhesive layer 17 on the peripheral portion of the backing layer 14 is thus not supported or reinforced by the relatively heavy and stiff absorbent pad 12, and absent the benefits of dressing support layer 16 would be difficult to handle without folding, wrinkling or otherwise adhering to itself, rather than adhering to the skin, before and during application.

The support layer 16 is preferably attached to the second major surface of the backing layer 14 (over the low adhesion backing). The bond between the support layer 16 and the backing layer 14 is stronger than the bond between the pressure sensitive adhesive 17 and the carrier layer 24 so that the backing layer 14 remains attached to the support layer 16 when the carrier layer 24 is removed from the dressing 10. Once the

carrier layer 24 and dressing 10 are separated, only the support layer 16 and absorbent pad 12 provide significant rigidity to the backing layer 14.

The absorbent pad 12 can comprise a hydrocolloid and hydrogel pad having a thickness of at least 1 mm (e.g., most preferably 3-9 mm), and the backing layer 14 can
5 comprise a transparent elastic polymeric film (e.g., urethane) having a thickness no greater than 0.1 mm (e.g., most preferably 0.021-0.051 mm). It will be appreciated that in this embodiment the absorbent pad 12 is much thicker, stiffer and heavier than the backing layer 14.

In reference now to FIGS. 5, 6, and 7, alternative wound dressing
10 implementations are shown. In FIGS. 5 and 6, different shapes for the wound dressings are shown. The embodiment shown in FIG. 5 is an oval shaped wound dressing 50 with an absorbent pad 52, adhesive backing 54, and support 56. The embodiment shown in FIG. 6 is a square shaped wound dressing 60 with an absorbent pad 62, adhesive backing 64, and support 66. In FIG. 7, the various portions of the support
15 layer are shown connected by a tear path of perforations.

Additional aspects of various components of the invention will now be described in greater detail.

Absorbent pad

20 Absorbent pad 12 can be manufactured of any of a variety of materials including, but not limited to, woven or nonwoven cotton or rayon. Absorbent pad 12 is useful for containing a number of substances, optionally including antimicrobial agents, drugs for transdermal drug delivery, chemical indicators to monitor hormones or other substances in a patient, etc.

25 The absorbent may include a hydrocolloid composition, including the hydrocolloid compositions described in U.S. Pat. Nos. 5,622,711 and 5,633,010. The hydrocolloid absorbent may comprise, for example, a natural hydrocolloid, such as pectin, gelatin, or carboxymethylcellulose (CMC) (Aqualon Corp., Wilmington, Del.),

a semi-synthetic hydrocolloid, such as cross-linked carboxymethylcellulose (X4ink CMC) (e.g. Ac-Di-Sol; FMC Corp., Philadelphia, Pa.), a synthetic hydrocolloid, such as cross-linked polyacrylic acid (PAA) (e.g., CARBOPOL™ No. 974P; B.F. Goodrich, Brecksville, Ohio), or a combination thereof. Generally, the hydrocolloid absorbent component comprises from about 5 percent to about 60 percent by weight of the absorbent composition. When preparing an absorbent composition for use in a wound dressing the hydrocolloid absorbent preferably comprises from about 20 percent to about 40 percent by weight of the composition. Absorbent materials may also be chosen from other synthetic and natural hydrophilic materials including polymer gels and foams.

Backing Materials

Suitable backing materials for backing layer 14 include, for example, nonwoven fibrous webs, woven fibrous webs, knits, films and other familiar backing materials. The backing materials are typically translucent or transparent polymeric elastic films. The backing can be a high moisture vapor permeable film backing. U.S. Pat. No. 3,645,835, describes methods of making such films and methods for testing their permeability.

The backing advantageously should transmit moisture vapor at a rate equal to or greater than human skin. In some embodiments, the adhesive coated backing layer transmits moisture vapor at a rate of at least $300 \text{ g/m}^2/24 \text{ hrs}/37^\circ\text{C}/100\text{-}10\% \text{ RH}$, frequently at least $700 \text{ g/m}^2/24 \text{ hrs}/37^\circ\text{C}/100\text{-}10\% \text{ RH}$, and most typically at least $2000 \text{ g/m}^2/24 \text{ hrs}/37^\circ \text{ C }/100\text{-}10\% \text{ RH}$ using the inverted cup method.

The backing layer 14 is generally conformable to anatomical surfaces. As such, when the backing layer 14 is applied to an anatomical surface, it conforms to the surface even when the surface is moved. The backing layer 14 is also conformable to animal anatomical joints. When the joint is flexed and then returned to its unflexed position, the backing layer 14 can be made such that it stretches to accommodate the

flexion of the joint, but is resilient enough to continue to conform to the joint when the joint is returned to its unflexed condition.

A description of this characteristic of backing layers 14 for use with the present invention can be found in issued U.S. Pat. Nos. 5,088,483 and 5,160,315. Specific
5 suitable backing materials are elastomeric polyurethane, co-polyester, or polyether block amide films. These films combine the desirable properties of resiliency, high moisture vapor permeability, and transparency found in backings.

Support Layer

10 The material used to form the support layer 16 is generally substantially more rigid than the backing layer 14 to prevent the backing layer 14 from improperly wrinkling during application to a patient. The support layer 16 can be heat-sealable to the backing layer 14 with or without a low adhesion coating described above. In
15 general, the support layer materials can include, but are not limited to, polyethylene/vinyl acetate copolymer-coated papers and polyester films. One example of a suitable support layer material is a polyethylene/vinyl acetate copolymer coated
super calendared Kraft paper (1-80BKG-157 PE; DCP-Lohya of Dixon, Ill.).

The support layer 16 can include perforations to aid in separating portions of the support layer 16 after application of the dressing 10 in a patient. Spacing and shape of
20 the perforations are adjusted to give a support layer with relatively easy to tear performance on removal of the support layer from the applied dressing. The perforations may be shaped in accordance with any of the accepted perforation patterns including linear, angled, Y-shaped, V-shaped, dual-angled offset, sinusoidal, etc.

25 Pressure Sensitive Adhesive

Various pressure sensitive adhesives can be used to form adhesive layer 17 on the backing layer 14 to make it adhesive. The pressure sensitive adhesive is usually reasonably skin compatible and "hypoallergenic", such as the acrylate copolymers

described in U.S. Pat. No. RE 24,906. Particularly useful is a 97:3 iso-octyl acrylate: acrylamide copolymer, as is 70:15:15 isooctyl acrylate: ethyleneoxide acrylate: acrylic acid terpolymer described in U.S. Pat. No. 4,737,410 is suitable. Additional useful adhesives are described in U.S. Pat. Nos. 3,389,827, 4,112,213, 4,310,509, and
5 4,323,557. Inclusion of medicaments or antimicrobial agents in the adhesive is also contemplated, as described in U.S. Pat. Nos. 4,310,509 and 4,323,557.

Carrier Films

Carrier films 24 suitable for use with the invention can be made of kraft papers,
10 polyethylene, polypropylene, polyester or composites of any of these materials. The films are preferably coated with release agents such as fluorochemicals or silicones. For example, U.S. Pat. No. 4,472,480, describes low surface energy perfluorochemical liners. The liners are papers, polyolefin films, or polyester films coated with silicone release materials. Examples of commercially available silicone coated release papers
15 are POLYSLIK™, silicone release papers available from Rexam Release (Bedford Park, Ill.) and silicone release papers supplied by DCP-Lohya Co. (Dixon, Ill.).

As various changes could be made in the above constructions, compositions and methods without departing from the scope of the invention as defined in the claims, it is intended that all matter contained in the above description or shown in the
20 accompanying drawings be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A wound dressing and delivery system comprising:
a wound dressing comprising a backing layer with a first and second major
5 surface, and an adhesive layer on at least a portion of the first major surface of the
backing layer; and
a dressing support layer releasably attached to the second major surface of the
backing layer, wherein the dressing support layer has a radial configuration that forms a
plurality of alternating covered and uncovered portions of the backing layer along the
10 perimeter of the wound dressing.
2. The wound dressing and delivery system of claim 1, wherein the support layer
comprises a plurality of extensions radiating from the interior of the dressing toward
the edges of the dressing.
15
3. The wound dressing and delivery system of claim 2, wherein a path of
separation is located between at least two adjacent extensions.
4. The wound dressing and delivery system of claim 3 wherein the path of
20 separation comprises a plurality of perforations.
5. The wound dressing and delivery system of claim 2, wherein at least some of
the plurality of extensions narrow as they approach the edge of the dressing.
- 25 6. The wound dressing and delivery system of claim 2, wherein the dressing
support layer comprises at least one portion that extends beyond the edge of the
backing layer of the wound dressing.

7. The wound dressing and delivery system of claim 6, wherein the portion that extends beyond the edge of the backing layer is configured to be held during positioning of the wound dressing.
- 5 8. The wound dressing and delivery system of claim 1, wherein the dressing support layer comprises at least two portions extending beyond the edge of the backing layer to aid in positioning of the dressing.
9. The wound dressing and delivery system of claim 2, wherein the extensions
10 converge on the center of the wound dressing but do not cover the center of the dressing.
10. The wound dressing and delivery system of claim 2, wherein the extensions are flexible.
- 15 11. The wound dressing and delivery system of claim 1, wherein the perimeter of the dressing support layer is releasably adhered to backing layer, but at least part of a center portion of the dressing support layer proximate the center of the dressing is not adhered to the backing layer.
- 20 12. The wound dressing and delivery system of claim 1, further comprising a plurality of centrally located tabs configured for removing the dressing support layer from the backing layer after the dressing has been applied to a patient.
- 25 13. The wound dressing and delivery system of claim 1, wherein the support layer covers less than 80 percent of the perimeter of the backing layer.

14. The wound dressing and delivery system of claim 1, wherein the support layer covers less than 60 percent of the perimeter of the backing layer.
- 5 15. The wound dressing and delivery system of claim 1, wherein the support layer covers less than 40 percent of the perimeter of the backing layer.
16. The wound dressing and delivery system of claim 1, further comprising a release liner in contact with the backing layer of the wound dressing, wherein the backing layer is intermediate the release liner and the support layer.
- 10 17. The wound dressing and delivery system of claim 1, wherein the perimeter of the wound dressing comprises at least eight distinct uncovered portions of the backing layer.
- 15 18. The wound dressing and delivery system of claim 1, wherein the perimeter of the wound dressing comprises at least twelve distinct uncovered portions of the backing layer.
19. The wound dressing and delivery system of claim 1, further comprising an
20 absorbent material.
20. The wound dressing and delivery system of claim 19, wherein the absorbent material is selected from the group consisting of a hydrogel, a hydrocolloid, a foam, a swelling synthetic polymer, a synthetic nonwoven material, and a natural nonwoven
25 material.
21. The wound dressing and delivery system of claim 1, further comprising two or more layers of absorbent material.

22. The wound dressing and delivery system of claim 1, wherein the backing layer comprises a transparent or translucent polymeric film and a pressure sensitive adhesive.
- 5 23. The wound dressing and delivery system of claim 1, wherein the alternating uncovered portions of the backing layer are configured to partially adhere to themselves during application to a patient.
24. A wound dressing and delivery system comprising:
- 10 a wound dressing substrate configured to be placed on a wound, the dressing substrate having an absorbent interior surrounded by a flexible less absorbent periphery; and
- a dressing delivery substrate configured to be retained on the wound dressing substrate before placement of the wound dressing substrate on a wound and removed
- 15 from the wound dressing substrate after it has been applied to the wound;
- wherein the delivery substrate has one or more central portions positioned proximate the interior and a plurality of extensions radiating from the one or more central portions toward the periphery of the dressing substrate.
- 20 25. The wound dressing and delivery system of claim 24, wherein at least some of the plurality of extensions narrow as they approach the edge of the wound dressing substrate
26. The wound dressing and delivery system of claim 24, wherein the dressing
- 25 delivery substrate comprises at least two extensions beyond the edge of the wound dressing substrate to aid in positioning of the dressing.

27. The wound dressing and delivery system of claim 24, wherein the extensions converge on the center of the wound dressing but do not cover the center of the dressing.

5 28. The wound dressing and delivery system of claim 24, wherein the perimeter of the delivery substrate is reversibly adhered to the wound dressing substrate, but at least part of each of the central portions are not adhered to the wound dressing substrate.

10 29. The wound dressing and delivery system of claim 24, further comprising a plurality of centrally located tabs configured for removing the delivery substrate from the dressing substrate after the dressing has been applied to a patient.

15 30. The wound dressing and delivery system of claim 24, wherein less than 80 percent of the less absorbent periphery of the wound dressing substrate is covered by the dressing delivery substrate.

20 31. The wound dressing and delivery system of claim 24, wherein less than 60 percent of the less absorbent periphery of the wound dressing substrate is covered by the dressing delivery substrate.

32. The wound dressing and delivery system of claim 24, wherein less than 40 percent of the less absorbent periphery of the wound dressing substrate is covered by the dressing delivery substrate.

25 33. The wound dressing and delivery system of claim 24, further comprising a release liner in contact with the wound dressing substrate.

34. The wound dressing and delivery system of claim 24, wherein the less absorbent periphery of the wound dressing comprises at least eight distinct uncovered areas.

5 35. The wound dressing and delivery system of claim 24, wherein the absorbent interior comprises a hydrocolloid absorbent sheet material.

36. The wound dressing and delivery system of claim 24, wherein the less absorbent periphery comprises a transparent or translucent polymeric film.

10

37. A wound dressing and delivery system comprising:

a wound dressing comprising: an elastic film backing having first and second major surfaces and a periphery; an adhesive on the first major surface of the backing; and an absorbent pad on the first major surface of the backing, the absorbent pad having a size and position along the backing such that the periphery of the backing extends substantially beyond the absorbent pad, the absorbent pad including hydrocolloid or hydrogel materials, the absorbent pad being substantially thicker, heavier and stiffer than the elastic film backing; and

15

a delivery system comprising: a support layer removably mounted on the second major surface of the backing, the support layer overlapping the absorbent pad with the backing sandwiched between the support layer and absorbent pad, the support layer comprising a plurality of extensions radiating from one or more central areas toward the outer edge of the periphery of the wound dressing, the support layer being substantially more rigid than the backing to facilitate handling of the dressing.

20

25

38. The wound dressing and delivery system of claim 37, wherein the plurality of extensions form a plurality of alternating covered and uncovered portions of the periphery of the wound dressing.

39. The wound dressing and delivery system of claim 37, wherein the plurality of extensions converge on the center of the wound dressing but do not cover the center of the dressing.

5

40. The wound dressing and delivery system of claim 37, wherein at least some of the plurality of extensions narrow as they approach the outer edge of the wound dressing.

10

41. The wound dressing and delivery system of claim 37, wherein at least a portion of the support layer proximate the center of the wound dressing is not adhered to the wound dressing.

15

42. The wound dressing and delivery system of claim 37, wherein the radial extensions are separated from adjacent radial extensions by an average of at least 30 degrees measured from the center of the extension at their exterior edge.

20

43. The wound dressing and delivery system of claim 37, wherein the radial extensions are separated from adjacent radial extensions by an average of at least 20 measured from the center of the extension at their exterior edge.

25

44. The wound dressing and delivery system of claim 37, wherein the support layer has at least one primary axis terminating in handles for holding the wound dressing.

45. The wound dressing and delivery system of claim 37, wherein the primary axis has an elongate interior hole through the support layer along at least 50 percent of the axis.

46. A method of applying a wound dressing to a wound on a convex surface, the method comprising:

(a) providing a wound dressing comprising:

(i) an absorbent pad and an adhesive layer and backing layer, wherein the adhesive layer and backing layer form an adhesive perimeter around the absorbent pad; and

(ii) a dressing support layer configured to retain and deliver the wound dressing to a wound, the dressing support layer having a plurality of extensions in a radial configuration that forms a plurality of alternating covered and uncovered portions of the backing layer along the adhesive perimeter of the wound dressing;

(b) positioning the adsorbent layer over the wound;

(c) applying a surface pressure to the plurality of extensions along the perimeter of the wound dressing to conform perimeter of the wound dressing to the convex surface and secure it to skin surrounding the wound.

2/4

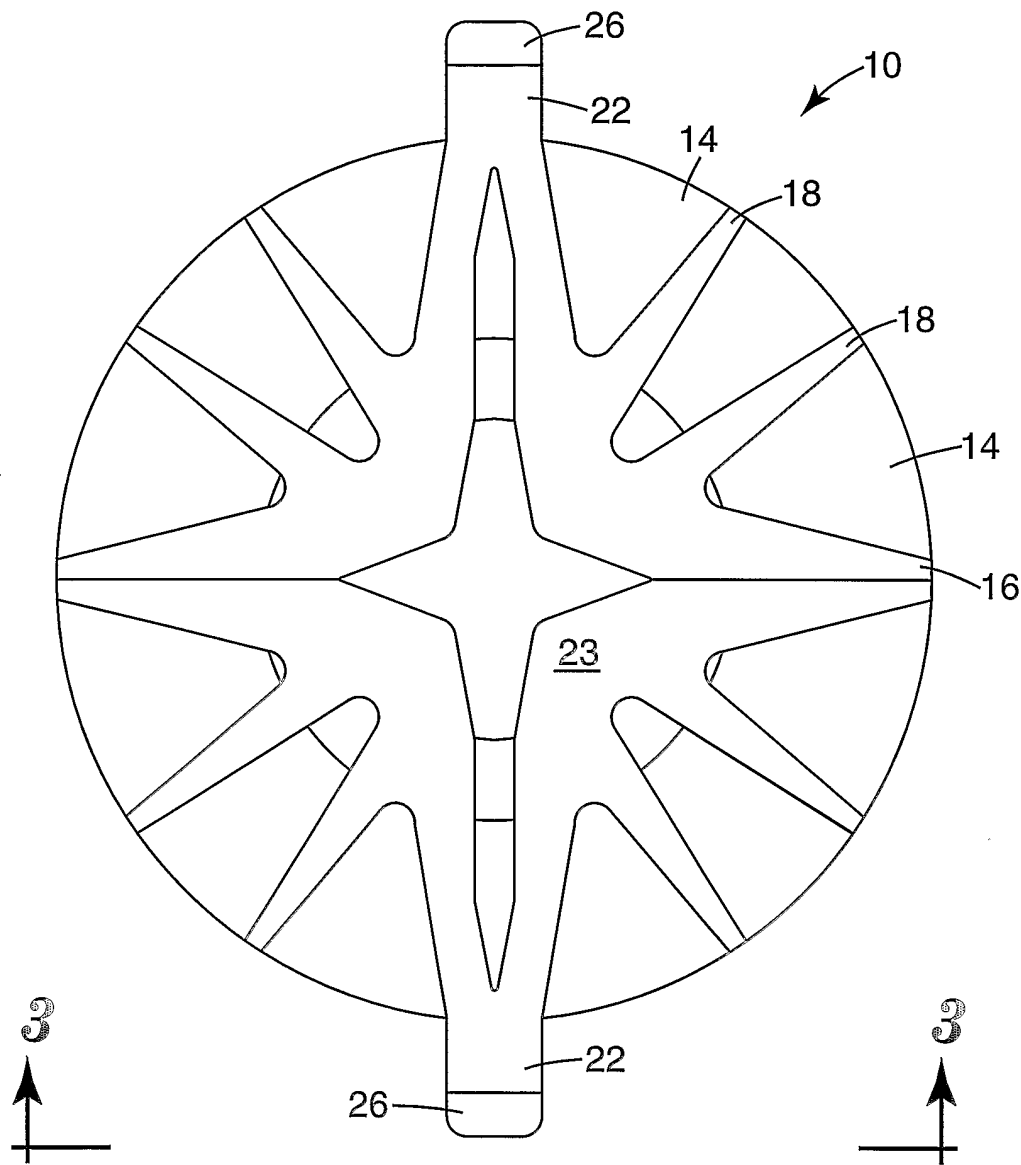


Fig. 2



Fig. 3

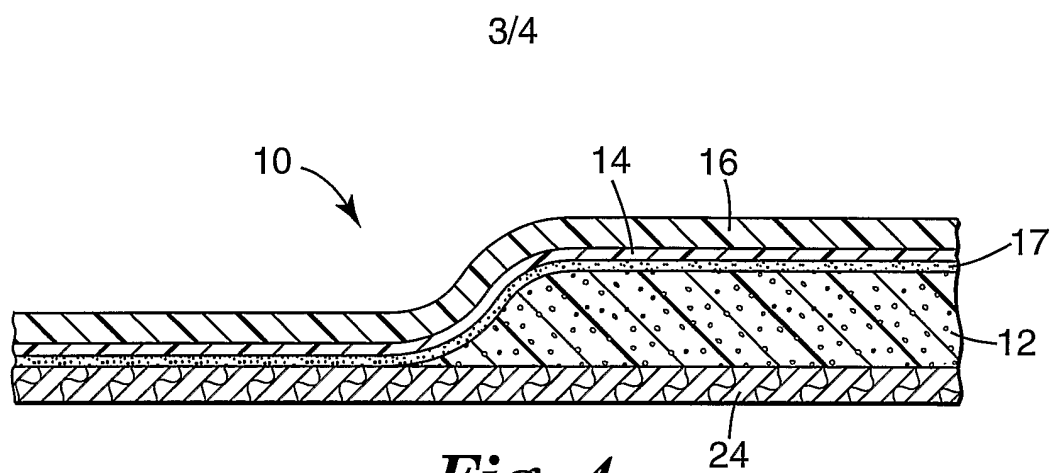


Fig. 4

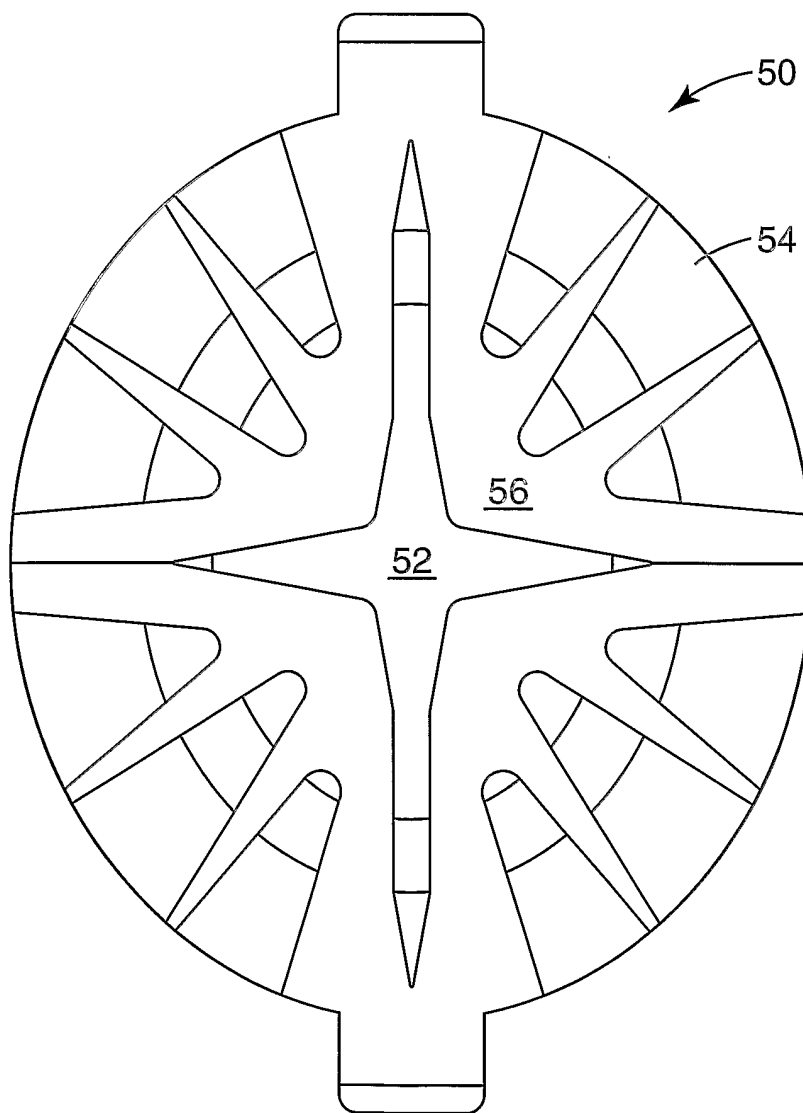


Fig. 5

4/4

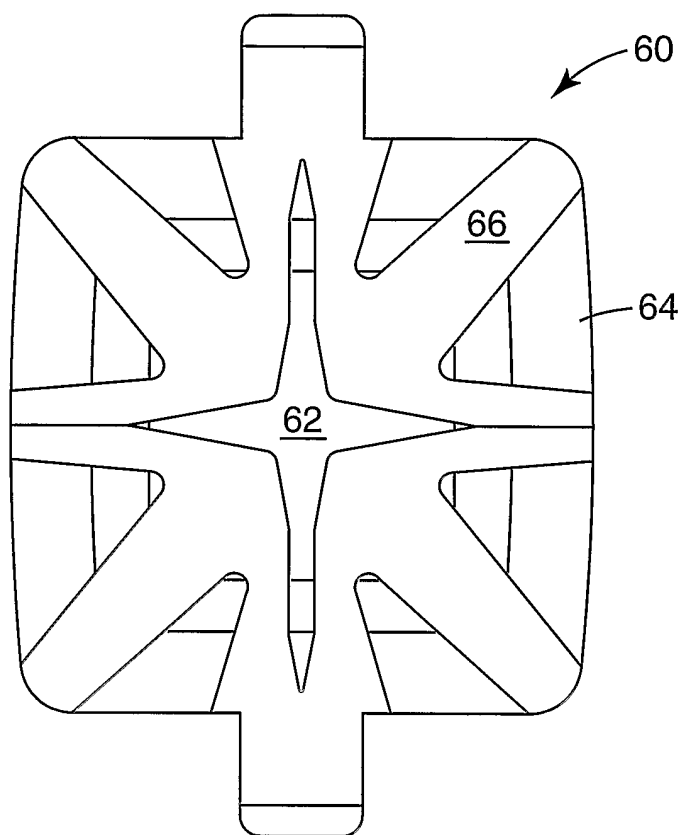


Fig. 6

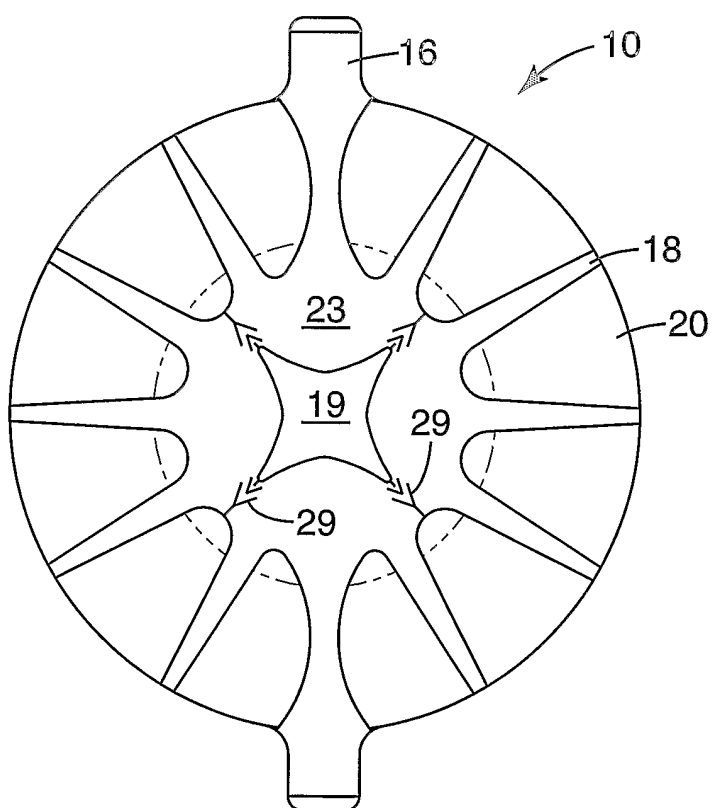


Fig. 7

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/003688

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61F13/02

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)

IPC 7 A61F

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 practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 303 422 A (FASLINE RONALD JOSEPH ; HARTWIG RANDALL JOSEPH (US)) 15 February 1989 (1989-02-15) column 6, line 21 - line 41; figure 4 -----	1,24,37, 46
A	WO 97/07760 A (INNOVATIVE TECH LTD ; GILDING KEITH DENIS (GB); BRENWALL RONALD EUGENE) 6 March 1997 (1997-03-06) cited in the application claims; figures -----	1,24,37, 46

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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 document 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

9 June 2004

Date of mailing of the international search report

16/06/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31-651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Mirza, A

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/003688

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0303422	A	15-02-1989	US 4732146 A	22-03-1988
			AU 2053488 A	16-02-1989
			CA 1320086 C	13-07-1993
			EP 0303422 A2	15-02-1989
			JP 1259860 A	17-10-1989
<hr/>				
WO 9707760	A	06-03-1997	AU 6832996 A	19-03-1997
			EP 0847262 A1	17-06-1998
			WO 9707760 A1	06-03-1997
			JP 11511349 T	05-10-1999
<hr/>				