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Glatt

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[54] **BANDAGE CONSTRUCTION**

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[52] **U.S. Cl.** **128/156**

[51] **Int. Cl.²** **A61L 15/00**

[58] **Field of Search** 128/154, 155, 156

[56] **References Cited**

UNITED STATES PATENTS

2,992,644	7/1961	Plantinga et al.	128/156
3,025,854	3/1962	Scholl	128/156
3,156,242	11/1964	Crowe, Jr.	128/156 X
3,301,257	1/1967	Crowe, Jr. et al.	128/156 X
3,665,918	5/1972	Lindquist et al.	128/156

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[57] **ABSTRACT**

A bandage construction that includes a sterile pad of a hygroscopic material is sufficiently porous to admit air therethrough, the pad being covered on the surface facing the wound with a layer of a soft non-woven fabric. A strip-like element is adhered over the outwardly directed surface of the pad and has portions thereof extending beyond each end of the pad, and a width that is substantially identical to that of the pad. The pad is constructed of a cellular plastic foam which is hygroscopic, non-allergenic and non-toxic, while at the same time it is sufficiently porous to pass air therethrough such that the facing surface of the wound is kept dry and provided with a continuous supply of air.

8 Claims, 4 Drawing Figures

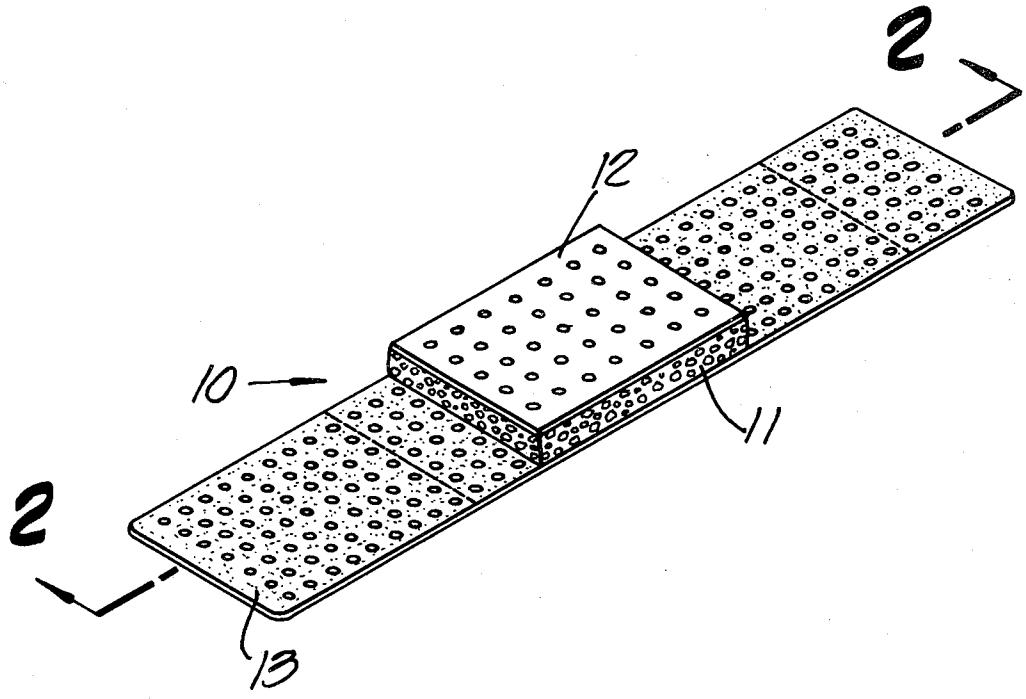
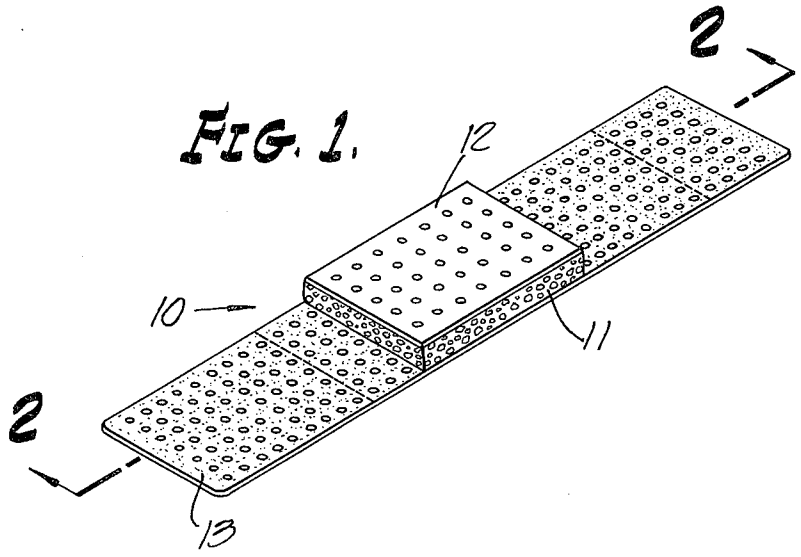


FIG. 1.



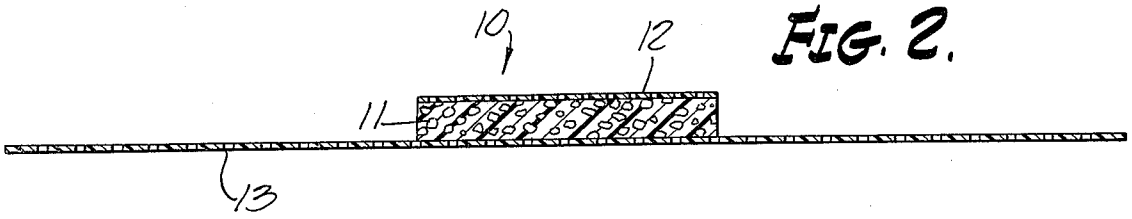
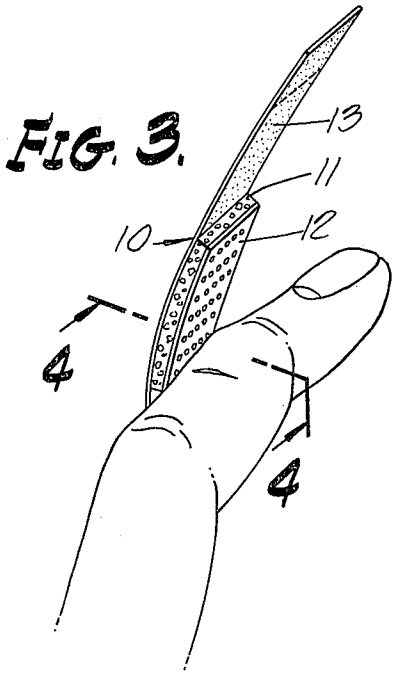


FIG. 2.

FIG. 3.



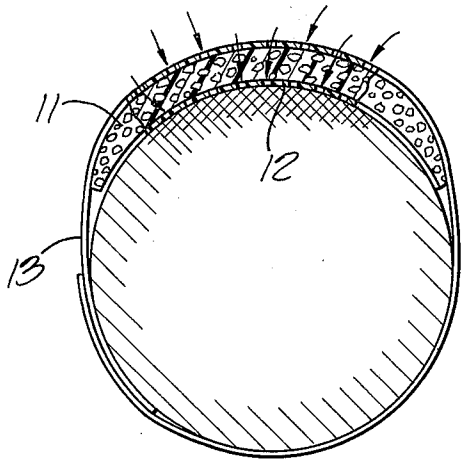


FIG. 4.

BANDAGE CONSTRUCTION

The present invention relates generally to a bandage construction, and, more particularly, to a bandage construction which prevents maceration where the bandage remains in place on the skin for an extended period of time.

BACKGROUND OF THE INVENTION

A variety of bandage constructions are available on the market, however, all of these are subject to the deficiency of producing relatively extensive maceration about a wound when maintained in place thereover for a period of time, e.g., longer than 24 hours. The term maceration refers to a condition of the skin produced when it is maintained in a damp, generally airless condition and is characterized by a softened, puffy and wastedaway appearance. Cotton gauze is the usual material from which bandages have been made in the past and it hinders the free flow of air about the wound and adjacent covered areas of the skin. Other known constructions have made attempts to overcome or prevent maceration by introducing a plurality of openings in the tape used to secure the bandage in place and thereby direct air onto the skin. Even with such a foraminous structure, the portion of the bandage which is applied directly over the wound has a tendency to adhere closely about the wound, thereby hindering the access of air to the skin in the wound region and producing maceration. Also, although openings have been provided in the tape portion of some bandages, the materials from which that part of the bandage lying over the wound have been made in the past prevented air flow to the wound region.

OBJECTS AND SUMMARY OF THE INVENTION

It is a primary aim and object of the subject invention to provide an improved bandage construction which is readily applied onto and removed from a wound, and which can be maintained thereon for extended periods without inducing maceration.

A further object of the present invention is to provide an improved bandage which provides continuous protection of the wound, while admitting air to the surface of the skin in the wound area.

Yet another object of the invention is the provision of a bandage construction presenting a surface for contacting the wound and adjacent areas thereof which is both hygroscopic and porous to allow air therethrough.

The above and other objects are achieved by a bandage construction which includes a sterile pad of a hygroscopic material which is sufficiently porous to admit air therethrough, which pad is covered on the surface facing the wound with a thin, soft non-woven fabric. A strip-like element is received over the outwardly directed surface of the pad and has portions thereof extending beyond each end of the pad, and a width that is substantially identical to that of the pad. The strip includes a plurality of relatively large openings via which air can pass both to the skin and to the air-permeable pad. An adhesive applied to the facing surface of the strip-like element secures the pad in place and on the outwardly extending portions is used to affix the bandage construction over the wound.

The pad is constructed of a cellular plastic foam which is hygroscopic, non-allergenic and non-toxic, while at the same time it is sufficiently porous to pass air therethrough such that the facing surface of the wound is kept dry and provided with a continuous supply of air.

A further aspect of the invention is that the striplike element portions extending beyond the pad have transverse perforations allowing length modification, e.g., for application about small fingers.

DESCRIPTION OF THE DRAWING

FIG. **1** is a perspective view of a bandage construction made in accordance with this invention.

FIG. **2** is a side elevational view of the bandage construction.

FIG. **3** depicts the bandage construction being applied to a finger.

FIG. **4** is a sectional view taken along line **4—4** of FIG. **3.**

DESCRIPTION OF A PREFERRED EMBODIMENT

With reference now to FIGS. **1** and **2** simultaneously, the bandage construction of this invention, identified generally as at **10,** is seen to include a pad **11** and pad cover **12,** arranged on and affixed to the intermediate regions of an elongated strip or strip-like element **13.**

More particularly, the pad **11,** as seen best in FIG. **3** is constructed of a cellular plastic foam material having a plurality of interconnected pores or hollow cells which enables ready permeation by the air. The pad has a generally rectangular shape with a width dimension substantially identical to that of the strip-like element **13.** A major surface of the pad is affixed to the flat surface of the strip in its central regions with the pad peripheral edges coextensive with the edges of the strip. Any suitable adhesive may be used for affixing the pad to the strip; however, it must be kept in mind that for proper operation of the subject invention, the adhesive must not be absorbed into the pores of the pad to the extent that air permeation is prevented.

The pad cover **12** is preferably constructed of a thin sheet of non-woven fabric which is soft to the touch and yet allows moisture and air to readily pass therethrough. A thin layer of a suitable cementitious material can be used to secure the pad cover onto the pad. Another version of the cover is to construct it from a relatively thin sheet of plastic having a number of openings therethrough, the plastic being any one of a number of such materials that adheres poorly (or not at all) to the skin or portions of the wound.

It is important that the pad thickness, D, and the tensile strength of the pad material be such that in normal application to or about a wound, the pores or passages are not closed off. In an actual construction, a pad constructed of a material to be further described, had a width of ½ inch and a thickness, D, of approximately 3/32 of an inch. This bandage could be wrapped relatively tightly about, say, a finger, as in FIG. **3,** and yet the compressive forces involved did not fully close off the air transmitting pores in the pad.

It is also important that the pad be constructed of a material which absorbs moisture, e.g., mucus, perspiration and the like directly from the wound and adjacent areas. By being suitably hygroscopic, the pad maintains the area of the skin covered by the pad dry, which also deters maceration and thereby promotes healing. Also, in absorbing blood and the like, this promotes early formation of a scab and thus, early healing.

An excellent material from which to construct the pad is a cellular hydrophilic polyurethane foam having

the trade designation of Acquell foam, manufactured and sold by the Scott Paper Company of Chester, Pennsylvania. This material not only has the desirable porous structure permitting ready permeation by the air, but it is also absorptive of liquids from the skin to the extent that it can hold liquids many times its own weight in its body portion that surrounds the cells and has the ability to retain fluids that is far in excess of materials presently being used.

The above mentioned foam material differs from, say, conventional urethane foams, in that it freely absorbs and tenaciously holds liquids within the polymer material itself, as well as within the void areas of the foam cells. It is this property of the foam to take liquids directly into the foam mass or body rather than merely into the foam pores that is referred to herein as "hydrophilic."

The strip-like element **13** is preferably an elongated rectangular structure constructed of a relatively thin, highly pliant plastic. A plurality of openings are formed in the element for allowing the air to readily pass therethrough, both through the pad and directly to the skin. The perforations enable tearing off selective parts of the strip portions to accommodate application about, say, a small finger or to otherwise decrease overall size for ease of application.

In assembly, a suitable adhesive is applied over one entire major surface of the strip-like element **13.** The pad is then pressed onto the strip with its edges being coextensive with those of the element. Lastly, the pad cover **12** is similarly adhered onto the pad outwardly directed major surface, care being taken that the cover is kept in registry with the pad and does not close in the pad edges. The purpose of maintaining the cover in registry and locating the pad edges coextensive to the strip edges is to insure that during use the pad edges are not enclosed, since this is the primary part of the pad through which the air can gain access to the wound area.

A further material for constructing the pad consists of a foamed polyurethane having cellulosic materials incorporated which not only enhances absorption of fluids, but also positively retains the absorbed fluids within the bandage.

What is claimed is:

1. A bandage construction comprising:

a pliable strip;

a quantity of adhesive substantially covering one surface of said strip; and

a hydrophilic pad of a porous air permeable cellular material, the body portion surrounding the cells constituting a means for tenaciously holding body fluids, said pad adhering to said strip for being located in use over the wound and immediately adjacent areas.

2. A bandage construction as in claim **1** in which said strip has portions extending beyond the pad and which portions each include at least one tear line of perforations.

3. A bandage construction as in claim **1** in which said pad is constructed of a hydrophilic polyurethane foam.

4. A bandage construction as in claim **1** in which said pad and strip are assembled such that they have common edges coextensive with each other.

5. A bandage construction as in claim **1** in which the pad is constructed of a foamed hydrophilic polyurethane having a thickness sufficient to maintain permeability to air when compressed onto a wound.

6. A bandage construction comprising:

an elongated rectangular foraminous strip of a flexible plastic;

a pad of a hydrophilic air permeable foamed cellular plastic material, the body portion surrounding the cells defining a means for holding body fluids and having a width dimension substantially identical to that of the strip and adhered to said strip separating first and second portions of said strip extending beyond the pad; and a cover of nonwoven material received over the pad exposed surface.

7. A bandage constructionn as in claim **6,** in which said cover includes a relatively thin foraminous plastic sheet constructed of a material which does not adhere to the skin or wound.

8. A bandage construction comprising:

an elongated pliable strip; and

a quantity of adhesive substantially covering one surface of said strip;

a pad of porous air permeable hydrophilic cellular material having a body portion surrounding the cells constituting a means for holding body fluids when adhering to said strip for being located in use over the wound and immediately adjacent areas, said pad being constructed of a polyurethane foam having cellulosic material incorporated therein.

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