

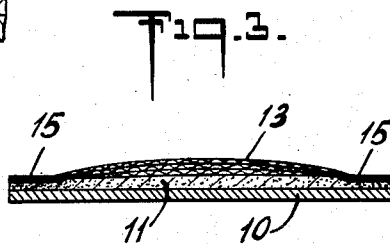
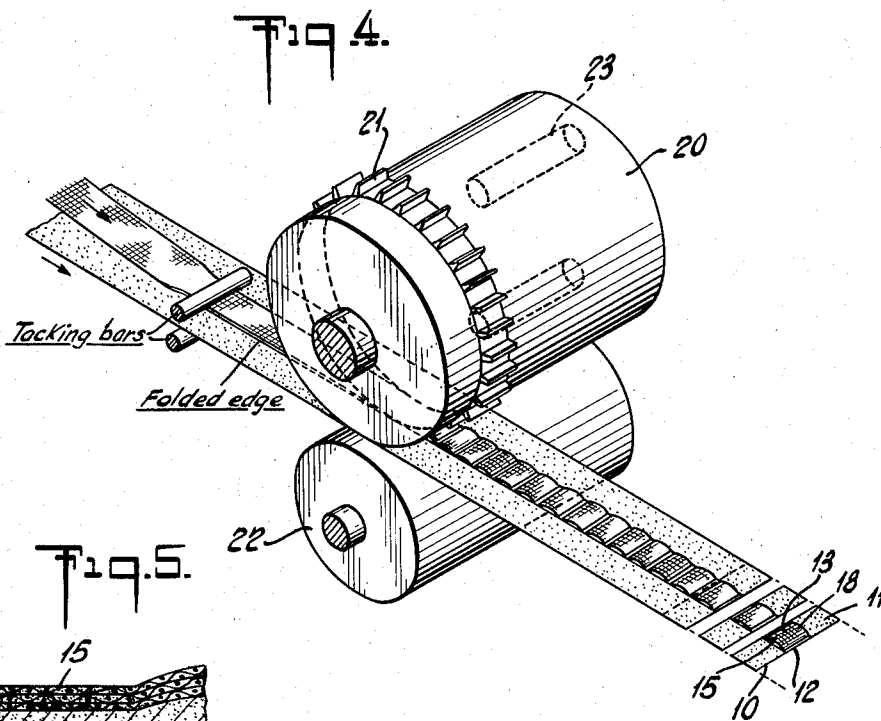
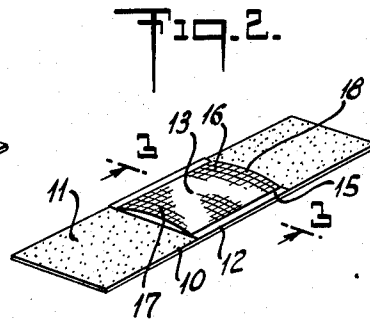
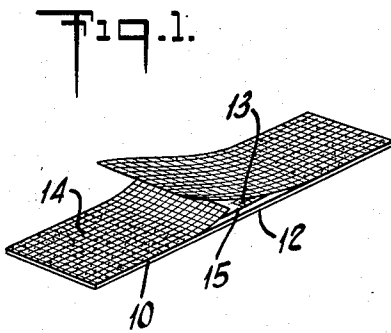
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2,633,128

PAD CONSTRUCTION AND PROCESS

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PAD CONSTRUCTION AND PROCESS

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This invention relates to surgical dressings, bandages and similar products and is concerned particularly with surgical bandages of the type wherein a soft pad is attached to an adhesive coated carrier strip and which are known as adhesive bandages or as adhesive compresses and with methods of making such products.

Surgical dressings and more particularly adhesive bandages, are intended mainly for the use of emergency treatment of cuts, burns, abrasions and other injuries. Adhesive bandages comprise usually a carrier strip of surgical adhesive tape, a soft pad which is usually highly absorbent or a dressing deposited thereon, and a removable coating or protective layer overlying the tacky side of the adhesive tape and protecting the adhesive coating and the dressing prior to use.

Adhesive bandages are made using pads or dressings, which are relatively weak and frayable because for maximum porosity they are composed of gauze, scrim, tobacco cloth, tissue paper, or other porous and loose fabrics. In other words, individual strands or fibers are held loosely by the fabric that they are a part of and unless treated properly tend to separate, particularly near the margins of the pad. During manufacture, packaging, and storage of some prior art products the loose margins of the pad exhibited fraying effects and frayed strands had a tendency to attach to the uncovered part of the adhesive coating, giving the adhesive bandage an appearance of untidiness and affecting its usefulness. After application of the frayable pads to the wound surface, frayed strands can stray into the wound and adhere in some cases to the scab, making removal of the pad or of residual strands difficult and sometimes painful. Moreover, the presence, near the margins of the pad, of individual highly absorbent cut strands may in some cases cause absorption and accumulation of considerable impurities in use, and contamination of the adhesive bandage. Looseness of the pad also tended to cause deformation and partial separation of this essential part of the adhesive bandage, and accordingly sometimes resulted in poor contact with the center of the wound when the carrier strip was extended in the natural movement of the body.

The invention aims to improve and simplify the production and use of adhesive bandages. An object of the invention is the prevention of fraying in pads that include otherwise frayable layers. Other objects are the provision of a bandage that can be extended without fraying; the provision of a pad the inside portions of

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which are held securely and prevented from displacement; the provision of an adhesive bandage wherein the pad is anchored securely and the provision of an adhesive bandage wherein the pad adheres securely to the carrier strip even during and after extension of the latter.

While some of the objects have been stated, the other objects and the nature of the invention will be understood readily from the following description of the invention which provides an adhesive bandage having a pad wherein two opposite margins of the frayable fabric pad are penetrated by the adhesive of the carrier strip and compressed, providing two securely welded adhesively laminated anchored sides for the pad. In preferred embodiments of the invention the two remaining sides of the quadrangular pad have the margins of the frayable fabric folded inwardly and spread over a uniform exposed layer of fabric.

The description should be read in connection with the accompanying drawing, and the novel features will be pointed out more particularly in the appended claims. In the drawing in which certain preferred embodiments of the invention are shown:

Fig. 1 is a plan view of an adhesive bandage prior to use and embodying the features of the invention;

Fig. 2 is a perspective view similar to Fig. 1 of an adhesive bandage ready for use with the protective layers removed;

Fig. 3 is a vertical enlarged sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a schematic view in perspective illustrating the method of preparing the product of the invention;

Fig. 5 is an enlarged fragmentary perspective view showing one side of Fig. 3 in more detail.

The illustrated bandage is of an elongated shape and may be used to bandage small or large wound surfaces depending upon the size of the pad. A carrier strip 10 is based on cloth, paper, plastic, or other fibrous or non-fibrous material and has on at least one side a coating of a normally tacky and pressure-sensitive adhesive 11, for instance, zinc oxide plaster. Superimposed on the center portion 12 of the adhesive coating 11 is a pad 13 which may be soft and/or absorbent and which comprises a piece of frayable fabric treated in accordance with the invention. The bandage may be protected by removable, overlapping, protective gauze strips 14 as illustrated in Fig. 1.

The treatment of the pad is best illustrated

in Figs. 3 and 4. After the pad material is pressed onto the surface of the adhesive coating 11 in the usual manner, the material undergoes pressure and preferably heat treatment by a wheel 20 having spaced teeth 21 pressing against an anvil roll 22. In preferred embodiments of the invention the wheel 20 is heated intensively, e. g., by built-in heating elements 23 so as to bring the temperature of the adhesive coating 11 during the brief contact with each tooth 21 near the flow point of the adhesive or above it. Pressure of the individual teeth 21 through the pad 13 onto the adhesive coating 11 of the bandage 10 and the anvil press 22 forces exposed marginal areas 15 of the pad 13 into the adhesive coating 11 and causes the adhesive to penetrate and enter the thickness of the pad in these areas. The adhesive bandage including its pad is then cut as desired and shown at the lower right of Fig. 4. The exact temperatures obviously may be varied by those skilled in the art in accordance with the amount of pressure that is provided, the flow point of the adhesive, the speed of the machine, and the intensity of the treatment that is desired or required.

The resulting adhesive bandage has marginal areas 15 (lengthwise of the bandage in the illustration) of the pad firmly and securely bonded by the adhesive coating so that any tendency of individual strands 16 or fibers of the pad to fray at these exposed areas is minimized. Moreover, the bonded portion of the marginal areas tends to cause relative protrusion of the center portion 17 of the pad and accordingly promotes good contact between wound and dressing in the very area where such good contact is needed.

In preferred embodiments of the invention such as illustrated in the drawings the end edges 18 of the gauze pad may be folded under so as to make a multi-ply edge wherein there are no raw edges or severed strands of fabric at these end edges. It should be understood, however, that these end edges of the pad may be sealed or embedded in the adhesive coating in the manner described for margins or side edges 15. The term "side edge" for pad 13 has been adopted since the edges 15 coincide with the side edges of carrier strip 10 while the end edges 18 of the pad are generally parallel to but not coincidental with the ends of carrier strip 10.

As has been mentioned above, the weight and temperature of the impression roller and the speed of the impression roller and of the adhesive bandages may be varied widely in accordance with the broad principles stated above. In order to illustrate one suitable set of conditions and to explain the invention even better but not so as to limit the scope thereof there but not so as to limit the scope thereof there follows an example of suitable running conditions.

Adhesive bandages were made in accordance with the illustration using 80 square cotton sheet coated by an adhesive comprising a polyisobutylene-factice base¹ tackified by hydrogenated rosin, using a zinc oxide filler and having a Williams' plasticity² of 1.8-1.9. The pad was made from 44 x 36 count gauze. Using this combination of materials very satisfactory welded bandages were obtained at an impression load

of 200-280 pounds, a material speed of 80 inches per minute with impressions at three eighths of an inch intervals and a temperature of the impression rolls of 225-300° F. Slightly lower temperatures may be used at slower running conditions or higher impression loads, and inversely higher speeds may be used at higher temperatures or higher impression loads. The quantities given above appear to be satisfactory for most pressure-sensitive adhesive masses but lower speeds or temperatures may be possible with adhesive masses having extremely low flow points. Higher temperatures and lower speeds may be necessary with masses having extremely high flow points.

The adhesive bandage of the invention has a securely located pad which exhibits little or no tendency to fray, provides good contact with the center portion of any wound to which it is applied symmetrically and may be removed from a wound with considerably more ease than adhesive bandages of the prior art wherein the cut margins of the pad were not anchored.

What is claimed is:

1. In the art of making an adhesive bandage comprising a carrier strip, an adhesive coating thereon, and a pad adhered to said adhesive coating; the step of pressing said pad firmly onto and into said adhesive coating and fusing said adhesive coating to penetrate said pad, at intervals spaced to provide pressure and penetration at marginal portions of said pad but not at intermediate portions thereof.

2. In the process of making adhesive bandages comprising a carrier strip, an adhesive coating thereon, and a pad adhered to said adhesive coating, the improvement which comprises: pressing said pad lightly onto said adhesive coating; and pressing opposed margins of said pad onto and into said adhesive coating using heat and firm pressure sufficient to fuse said adhesive coating causing it to penetrate said margins; said last-mentioned pressure step being spaced so as to skip intermediate portions of said pad.

3. An adhesive bandage comprising a carrier strip, an adhesive coating on one face of said strip and an absorbent pad adherently mounted on said adhesive coating, said pad comprising a piece of frayable, loosely woven, substantially compressible fibrous fabric having two side margins at least one of which terminates in a raw edge characterized by severed, frayable strands, said raw edge margin, including said severed strands, being substantially compressed and sealed in and substantially penetrated by said adhesive coating for an appreciable distance measured inwardly from the ends of said severed strands, said pad being attached relatively more loosely at points other than said marginal edges, said pad having at a transverse section substantially the same amount of material through the thickness thereof at points in said margins as at corresponding points in the central area intermediate said margins.

4. An adhesive bandage comprising a carrier strip, an adhesive coating on one face of said strip, and a pad adherently mounted on said adhesive coating, said pad comprising a piece of frayable, loosely woven, substantially compressible fibrous fabric the side margins of which terminate coincidentally with the side edges of said carrier strip, in raw edges characterized by severed frayable strands, said side margins, including said severed strands, being

¹ For instance, in accordance with Henry J. Wing patent application 542,829, filed June 29, 1944, now issued as U. S. Patent 2,484,060.

² Williams plasticities were taken in accordance with the procedure outlined in the Vanderbilt Handbook except that the pellet size was 2 grams, the conditioning 30 minutes, the temperature 100° F. and the plastometer time 15 minutes.

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substantially compressed and embedded within said adhesive coating for an appreciable distance measured inwardly from said raw edges, said pad being attached relatively more loosely at points other than said marginal edges, said pad having at a transverse section substantially the same amount of material through the thickness thereof at points in said margins as at corresponding points in the central area intermediate said margins.

5. An adhesive bandage comprising a carrier strip, an adhesive coating thereon, and a pad adherently attached to said adhesive coating and composed of a multiple of layers of frayable gauze; said pad having side edges and a center portion, said pad being sealed securely onto and into said adhesive coating at a plurality of the pad edges and penetrated substantially by said adhesive coating at said edges, the sealed and penetrated edges comprising marginal areas of appreciable width, said pad center being relatively less compact and being attached relatively more loosely than said marginal areas to said adhesive; said fabric being folded inwardly and toward said adhesive coating on at least one of its other edges.

6. An adhesive bandage comprising a carrier strip, an adhesive coating thereon, and a substantially compressible pad adherently attached to said adhesive coating, composed of a frayable fibrous substantially compressible fabric having side edges and a center portion, said pad side edges coinciding with underlying edges of said carrier strip; said side edges being substantially compressed and sealed securely onto and into said adhesive coating and penetrated substantially by said adhesive coating, the sealed and

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penetrated edges comprising marginal areas of appreciable width, said pad center being relatively less compact and being attached relatively more loosely than said marginal areas to said adhesive, and forming a raised central area intermediate said marginal areas.

7. An adhesive bandage comprising a carrier strip, an adhesive coating thereon, and a substantially compressible pad adherently attached to said adhesive coating and composed of a frayable fibrous substantially compressible fabric having side edges and a center portion; a plurality of said pad side edges being substantially compressed and sealed securely onto and into said adhesive coating and penetrated substantially by said adhesive coating, the sealed and penetrated edges comprising marginal areas of appreciable width, said pad center being relatively less compact and being attached relatively more loosely than said marginal areas to said adhesive.

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