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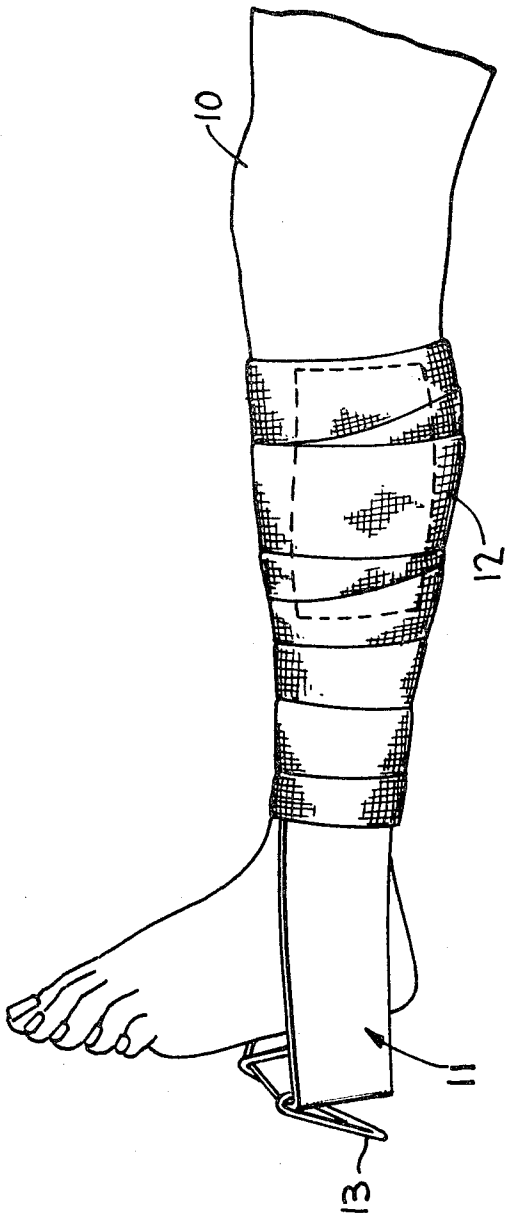
[54] **TRACTION STRIP MATERIAL**
4 Claims, 4 Drawing Figs.

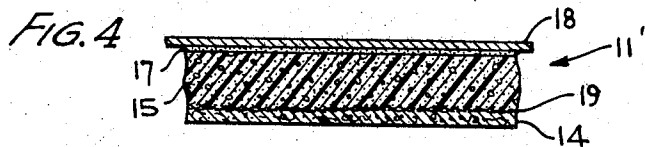
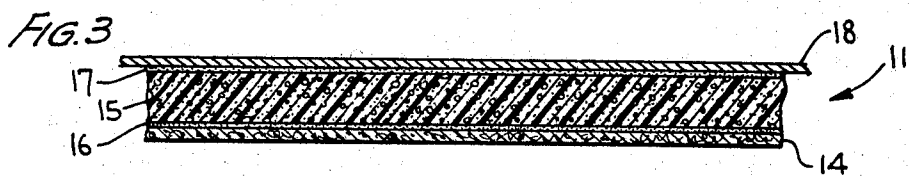
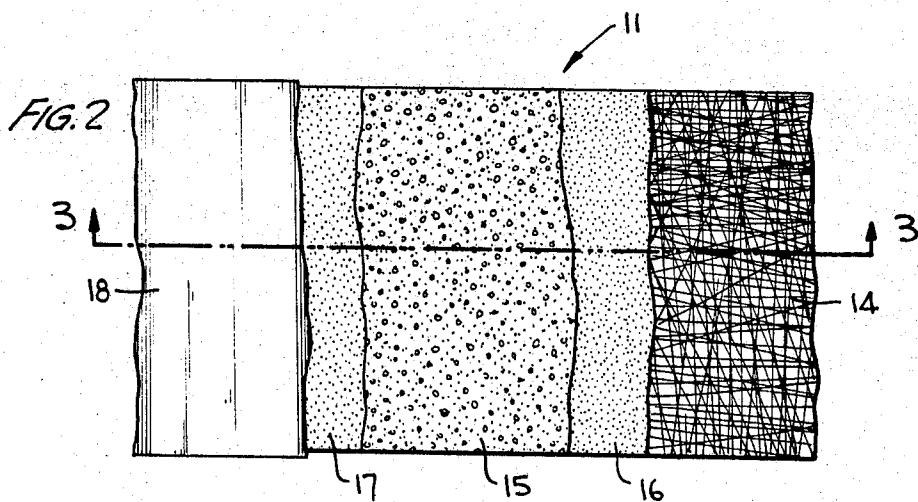
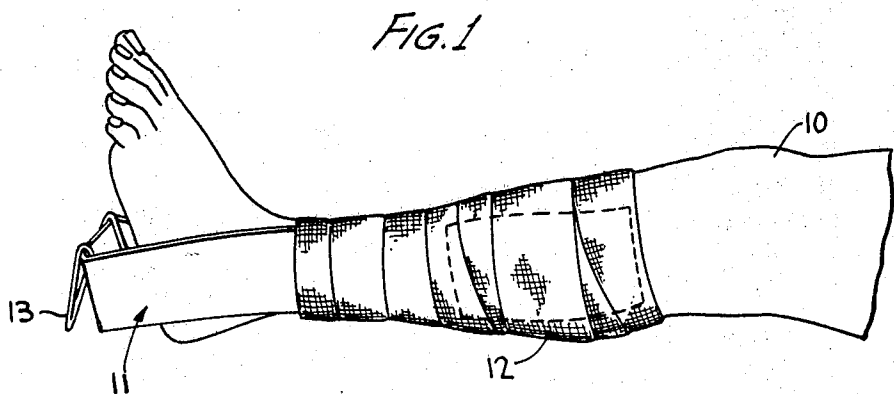
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[50] Field of Search..... 128/87, 89,
82, 157, 169, 170, 171, 156

ABSTRACT: A traction strip comprising an outer layer of a spun bonded polyester and an inner layer of polyester urethane foam adhered to one surface of the outer layer thereby forming a laminate. A pressure sensitive adhesive is applied to the exposed surface of the inner layer for application of the laminate to the fractured limb of a patient.





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TRACTION STRIP MATERIAL

This invention relates generally to a band or strip usable as a hospital or clinical supply item for application to various parts of the patient's body and more particularly to a traction strip capable of being adhesively attached to the limb of the patient so as to facilitate attachment of traction means thereto for applying tension after the limb has been set.

Presently, the means for attaching a tensioning apparatus or other such device to the patient's fractured limb includes mainly use of the ordinary surgical adhesive tape. Such a technique has proven relatively unsuccessful because of the painful consequences it sometime produced such as allergic reactions by the patient or even the removal of a slight layer of skin during tape removal after long duration of use. Also, the use of adhesive tape failed to provide any cushioning for the comfort of the patient and most of all, permitted no ventilation into the wrapped portion of the patient's limb. Accordingly, traction bands had been devised in an attempt to avoid these problems by providing a spongy material for aiding in the patient's comfort during the period of applied traction and, by providing a backing material for the spongy layer and a means for adhesively securing the traction band to the fractured limb for attachment of the tension applying apparatus in the normal manner. Although these traction bands or strips were improvements as compared to use of the ordinary surgical adhesive tape, they were shown to weaken somewhat during extended use by a fraying or unraveling of the backup strip or by actually yielding under tension in one or several directions because of the low tensile strength of the backing. Therefore, some of these traction bands were designed to include the use of a plastic film on the adhesive side of the spongy layer thereby, in effect, attempting to strengthen the traction band. This approach attacked the problem to some degree but only at the expense of a more complex design which did not involve the problem of backup strip weakening and deterioration over long periods of use. Accordingly, it is an object of the present invention to provide a traction strip which will not unravel or fray in any direction, has a higher break elongation property, has a high-tensile strength in all directions, and a higher tear strength during the use, for example, of buckle prongs inserted through the traction band.

Another object of this invention is to provide an improved traction strip which may be applied longitudinally along each side of the fractured limb so as to form a loop around the free end of the limb for attachment of the ordinary tension applying apparatus.

A further object of the present design is to provide a traction strip comprising an outer layer of a spun bonded polyester which will adequately provide those properties as mentioned above, and further comprising a layer of spongy material having thereon a layer of pressure-sensitive adhesive for permitting the traction band to be easily applied and removed from the patient's limb.

Other objects, advantages and novel features of the invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is a side elevational view of a traction strip in accordance with the present invention applied in a typical manner to the patient's limb as shown fragmentarily;

FIG. 2 is a slightly enlarged plan view showing a portion of the traction strip with parts broken away in order to more clearly show the various layers thereof;

FIG. 3 is a sectional view taken substantially along line 3-3 in of FIG. 2; and

FIG. 4 is a view similar to FIG. 3 but with a modified manner of bonding the backup layer to the layer of spongy material.

Referring now to the drawings wherein like reference characters refer to like and corresponding parts throughout the several views, there is shown in FIG. 1 a portion of the patient's leg 10 to which the traction band 11 is applied in a suitable manner as by bandages 12 after the fractured leg 10

has been set. The traction band, having a layer of adhesive along its inner surface to be hereinafter described, is applied to the limb longitudinally on both sides so as to form a loop at the distal or free end of the foot for insertion of a spreader bar 13. Of course, the conventional traction cord (not shown) is tied to the bar 13 at one end and to a system of weights and pulleys at its other end.

In FIGS. 2 and 3, it can be seen that the traction band 11 comprises a lamination including a backup layer or strip 14 to which a spongy strip of cushioning material 15 is bonded by means of adhesive 16. The layer 15 may comprise any hydrophobic or hydrophilic sponge material having intercommunicating cells in its structure thereby rendering it resilient and suitably flexible for cushioning the traction strip during periods of use. For example, a polyester urethane foam layer, a polyether urethane foam and other like materials which will remain flexible and resilient may be used as the spongy material for carrying out the invention.

The backup layer 14 is bonded to one surface of the spongy layer 15 by means of an adhesive layer 16 as clearly shown in FIG. 3. The layer 14, forming the outer lamination for the traction strip 11, may be comprised of a spun bonded polyester sold under the trademark REEMAY manufactured by DuPont. Such material is known to possess a higher break elongation property over like backup strips being currently used in traction bands. Also, because this product involves an integrated process of spinning and bonding polyester fibers, tendency to unravel or fray in any direction is lessened so that the traction strip is not apt to deteriorate during long periods of use. Moreover, this type of backup layer affords a very high tensile strength for the traction strip in all directions since it is substantially a sheet product of continuous filament, polyester fibers randomly arranged, highly dispersed and bonded at the filament junctions. Also, with the use of pins or prongs inserted into the traction strip the backup layer 14 affords a higher tear strength than with most other materials used for this purpose.

In FIG. 3 it can be also seen that another layer of adhesive 17, of the pressure sensitive type, is applied to the other surface of the spongy layer 15 thereby permitting the strip 11 to be easily applied and removed from the patient's limb. Since the traction strip may be marketed as a roll or packaged in a suitable container, a protective sheet 18 is provided over the exposed adhesive surface 17 and may be of any suitable material such as glassine paper or the like.

Reference is now made to FIG. 4 of the drawings wherein an alternative embodiment of the traction strip 11' is shown which is substantially the same in all respects as the strip 11 except that the bond between the spongy material 15 and the backup layer 14 comprises a layer 19 of the cushioning layer 15 which has been melted or sufficiently softened by a flame process. In this way, the backup layer is conveniently maintained in place without the use of an adhesive.

From the foregoing, it can be seen that a traction strip has been devised which possesses all the advantages of the current type of traction band except that the spongy cushion layer has been bonded to a backup strip having those properties which permit a longer life and a higher tensile and tear strength for the instant traction strip as compared to any other form of traction band. Also, the device herein described is less costly, easier to manufacture and of a more simple design than most known devices currently in use.

Also, it should be noted that the traction strip laminate according to the instant invention may be used without the pressure-sensitive adhesive layer 17 if desired. For example, such a strip may be used as a rib or pelvic belt, arm sling, clavicle strap and any of the related applications on the patient's body. Since the backup layer 14 is alone responsible for providing the strength properties to the traction strip, numerous other uses for the strip 11 or 11' are made possible, as briefly suggested above, which may not require provision of an adhesive on the inner surface of cushion layer 15.

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Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than specifically described.

I claim:

1. A traction strip comprising an outer layer of a spun bonded polyester having a high tensile strength in all directions, a flexible inner layer of cellular hydrophobic sponge material bonded to one surface of said outer layer thereby forming a laminate, and a first layer of pressure-sensitive adhesive on the other surface of said inner layer.

2. The traction strip according to claim 1 wherein the bond

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between said inner and outer layers comprises a layer of said sponge material which is softened in the presence of heat.

3. The traction strip according to claim 1 wherein the bond between said inner and outer layers comprises a second layer of adhesive.

4. A traction strip comprising an outer layer of a spun bonded polyester having a high tensile strength in all directions, a flexible inner layer of cellular hydrophillic sponge material bonded to one surface of said outer layer thereby forming a laminate, and a first layer of pressure sensitive adhesive on the other surface of said inner layer.

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