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(54) Titre : BANDAGE SYNTHETIQUE RIGIDE
(54) Title: SYNTHETIC RIGID BANDAGE

(57) **Abrégé/Abstract:**

A synthetic rigid bandage especially for splinting and/or supporting a diseased or injured limb of the human or animal apparatus of locomotion, comprising a curable core which is formed by one or more synthetic resin-impregnated layers of longitudinal strips of a textile fabric, is covered at the one side thereof with a pad and on the other side thereof with a water vapour-pervious, longitudinally and/or transversally elastic film or sheet cover, and is to be stored in a moisture-proof package, said core being mouldable in its ready-for-application state, is characterized in that the said film or sheet cover is separated from the said resin-impregnated layers by means of a spacer.

ABSTRACT

A synthetic rigid bandage especially for splinting and/or
5 supporting a diseased or injured limb of the human or
animal apparatus of locomotion, comprising a curable core
which is formed by one or more synthetic resin-impregnated
layers of longitudinal strips of a textile fabric, is
covered at the one side thereof with a pad and on the other
10 side thereof with a water vapour-pervious, longitudinally
and/or transversally elastic film or sheet cover, and is to
be stored in a moisture-proof package, said core being
mouldable in its ready-for-application state, is charac-
terized in that the said film or sheet cover is separated
15 from the said resin-impregnated layers by means of a
spacer.

Synthetic Rigid Bandage

This invention relates to a synthetic rigid bandage especially for splinting and/or supporting a diseased or injured limb of the human or animal apparatus of locomotion, comprising a curable core which is formed by one or more synthetic resin-impregnated layers of longitudinal strips of a textile fabric, is covered at the one side thereof with a pad and on the other side thereof with a water vapour-pervious, longitudinally and/or transversally elastic film or sheet cover, and is to be stored in a moisture-proof package, said core being mouldable in its ready-for-application state.

The state of the art includes a large number of documents describing orthopaedic splints or supports, whose materials as well as the means for manufacturing are in principle largely similar to those described above. Textile substrates of natural or synthetic and frequently glass fibres are mostly used as starting materials; these are impregnated with a curable synthetic resin and are stored - mostly in the form of a roll - in a film envelope, protected against access of a curing medium.

As curing agents are provided, inter alia:

- a) Ultraviolet or X-rays; e.g. in interaction with polyurethane and a photoinitiator according to US 3 656 475.
- b) Action of heat; for instance, an orthopaedic bandage of thick textile material with a thermoplastic composition containing 60-80%-wt. of saturated linear polyester and 20-40%-wt. of resin with a low crystallization point and a softening temperature of about 45°C is cured according to US 4 326 509.
- c) Air humidity or water; for instance, a textile substrate is impregnated with resin from the group of water-curable isocyanates, stored in a porous envelope and is impregnated in water for curing, according to DE-PS 23 57 931.

- d) Semirigid, resilient supports for injured or diseased limbs are known from US 4 968 542 and are likewise cured by a reaction between resin and curing agent.

From multiple negative experience it has turned out as a disadvantage in the stocking of resin-impregnated textile substrates that in common systems of the above-described kind which comprise resin-impregnated cores after an unpredictable time of storage the resin penetrates or bleeds through the cover. This leads to skin contact with the hands of the user and thereby to a possible risk since the user is to work without a corresponding protective device (gloves). Moreover, the product is rendered unusable.

The object of this invention is to improve a synthetic rigid bandage as described above in such a way that in the stocking of resin-impregnated textile fabrics or nonwovens even for an extended period of time the passage of resin through the cover is securely prevented, using uncomplicated and inexpensive means.

To achieve this object in a synthetic rigid bandage of the kind mentioned at the outset it is proposed according to the invention that a spacer is introduced between the film or sheet cover and the resin-impregnated core which is connected with the said film as the outer layer by a segmental, water vapour-permeable pressure-sensitive adhesive coating.

According to one aspect of the present invention, there is provided a synthetic rigid bandage for splinting or supporting a diseased or injured limb of a human or animal comprising a curable core which is formed by at least one synthetic resin-impregnated layer of longitudinal strips of a textile fabric, said core being covered at the one side thereof with a pad and on the other side thereof with a water vapor-pervious, longitudinally and/or transversely elastic film or sheet cover,

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the bandage being stored in a moisture-proof package, said core being moldable in its ready-for-application state, wherein said film or sheet cover is separated from the resin-impregnated layers by means of a spacer made up of a hydrophobic, air-permeable, longitudinally and/or transversely elastic nonwoven material or of foamed plastic.

By applying, for example, a hydrophobic, air-permeable and longitudinally and/or transversally elastic nonwoven, a cotton wool, a plastic foam or a textile fabric onto the inner wall of the cover film, a disadvantageous contact between resin and film is prevented so that bleeding-through of the resin and its disadvantageous consequences are prevented completely.

The spacer does not suck the resin out from the layers of the core and the segmental pressure-sensitive adhesive coat between spacer and film leads to an optimal comprehensive solution which on the one hand does not diminish the water vapour-pervious property of the film and on the other can be performed at negligibly low cost. Also, the laminate formed in this manner remains longitudinally and transversally elastic so that the rigid bandage can be applied to a part of the body, e.g. an arm or a leg, free from folds or creases and moreover dries within an appropriate time.

Further embodiments of the invention are described below. One embodiment of the rigid bandage provides that the layers of longitudinal strips forming the core are impregnated with polyurethane resin.

This resin is especially suitable for curing by means of air humidity or water.

In one embodiment of the present invention, the spacer comprises a water-repellent textile fabric.

One may make use of the measure that the nonwoven consists 100% of polyester fibres.

Furthermore the invention provides that the layer of nonwoven forms a laminate with the cover film, said laminate being longitudinally and transversally elastic and being water vapour-permeable.

Finally, one embodiment provides that the layer of the hydrophobic synthetic cotton wool has a thickness between 1 and 8 mm, preferably between 1.5 and 5 mm, and especially preferred 2.5 mm.

The use of the synthetic rigid bandage according to the invention is uncomplicated and time-saving since the padding of a simple rigid bandage can be dispensed with. Handling is easy, gloves are not required, the so-called
5 plaster room remains clean.

The width and length of the rigid bandage is chosen in accordance with the indication, and the required length is removed from the package.

The site of the cut is immediately closed carefully in
10 order to avoid curing caused by access of air humidity. For this purpose, the material end is preferably folded inwardly over several centimetres and closed moisture-tight. Then, the severed rigid bandage is dipped into water tempered to about 20-30 °C, is subsequently folded and
15 excess water is pressed out. Then, by slightly stretching, the pad is drawn over the glass fibre cutting edges. For application, the mouldable material is fixed with an elastic bandage at an end thereof, subsequently it is moulded by hand to the body part to be supported, and then
20 one has to wait, if possible without movement, until the rigid bandage has set in 3 to 5 minutes.

The invention is uncomplicated and inexpensive and prevents the unwanted contact between resin and film, so that the
25 bleeding-through of the resin is prevented along with its disadvantages.

In this respect the invention constitutes an optimum solution of the task posed at the outset.

What is claimed is:

1. A synthetic rigid bandage for splinting or supporting a diseased or injured limb of a human or animal comprising a curable core which is formed by at least one synthetic resin-impregnated layer of longitudinal strips of a textile fabric, said core being covered at the one side thereof with a pad and on the other side thereof with a water vapor-pervious, longitudinally and/or transversely elastic film or sheet cover, the bandage being stored in a moisture-proof package, said core being moldable in its ready-for-application state, wherein said film or sheet cover is separated from the resin-impregnated layers by means of a spacer made up of a hydrophobic, air-permeable, longitudinally and/or transversely elastic nonwoven material or of foamed plastic.
2. The rigid bandage according to claim 1, wherein the textile fabric forming the core is impregnated with polyurethane resin.
3. The rigid bandage according to claim 1 or 2, wherein the spacer is connected with the covering film or sheet by means of a water vapor-permeable pressure-sensitive adhesive coating.
4. The rigid bandage according to claim 3, wherein the pressure-sensitive adhesive coating is segmental.
5. The rigid bandage according to any one of claims 1 to 4, wherein the spacer of the film is selected from the group consisting of a water-repellant textile fabric, and nonwoven plastic.
6. The rigid bandage according to any one of claims 1 to 5, wherein the spacer forms a laminate with the longitudinally and/or transversely elastic film or cover sheet, said laminate being longitudinally and transversely elastic.
7. The rigid bandage according to any one of claims 1 to 6, wherein the spacer has a thickness of between 1 and 8 mm.