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(12) # EUROPEAN PATENT APPLICATION

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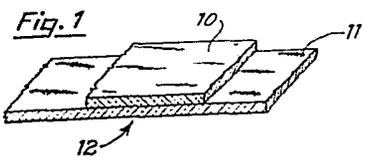
(54) **Running surface for skis.**

(57) The invention relates to a running surface (12), to be fixed with suitable adhesive (15) either to the whole or part of the underside of the ski (16) and comprises an acetal resin mixture (10) with fabric backing (11), preferably of glass fibre fabric, to which the resin mixture (10) is bonded by heat and mechanical means.

The Applicant gives as preferred resin mixture that obtained by mixing a first acetal resin modified by addition of a fluorocarbon resin with a second acetal resin modified by addition of molybdenum.

Another object of this invention is the manufacturing process of said running surface ready to be joined to the ski.



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TITLE MODIFIED
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"RUNNING SURFACE FOR SKIS OR OTHER SIMILAR PRODUCTS CAPABLE OF EXERTING A BRAKING AND ANTI-SLIP ACTION WHEN IN CONTACT WITH DAMP SURFACES, AND PROCESS FOR ITS PREPA ATION READY FOR JOINING TO THE SKI".

Skis, more especially cross-country skis, are already well known, as well as the requirements they must meet.

Also skis, more especially cross-country skis, besides possessing smooth running properties, must also be designed so as to prevent backsliding during pushing motions or when climbing.

Up till now the following measures have been hitherto adopted to satisfy this requirement:

1) application of certain waxes or other chemical substances on the underside of the skis;

2) application of wooden, metal or plastic running surfaces with various types of grooves to the underside of the ski;

3) strapping of strips of skins, for example sealskin, round the bottom of the ski.

Each of these known systems have their own particular advantages, either favouring smooth running or preventing backsliding, but none of them solves the problem entirely with the simultaneous meeting of both conditions.

In order to remedy such problems and to obtain a cross country ski with an ideal running surface which does not permit backsliding of the ski during pushing motions or when climbing, the running surface

in accordance with the present invention has been developed.

The inventor has arrived at such a solution by a really revolutionary procedure involving utilization of a mixture of already known and used acetal resins, where the individual resins possess good anti-friction properties although they also exhibit controlled, slip on damp surfaces, that is, they combine smooth running with anti-back sliding properties as is required.

The running surface in accordance with the invention is characterized above all in that said acetal resin mixture is bonded to a fabric backing preferably of glass fibre fabric; this fabric backing is, in turn, suitable for fixing with adhesive to either the whole or part of the underside of the ski.

The running surface is also characterized in that the acetal resin of which it is made, is preferably formed by mixing a first acetal resin modified by addition of a fluorocarbon resin, to a second acetal resin modified by addition of molybdenum.

Thirdly, the running surface is characterized in that the first acetal resin of the two resins making up the mixture is preferably modified by addition of polytetrafluoroethylene hitherto normally used for injection moulding purposes and possessing special anti-friction properties; the second acetal resin of the two resins making up the mixture is preferably modified by addition of molybdenum and is of type hitherto normally used in extrusion, likewise possessing anti-friction properties as in the case of the first resin, that is, different properties from those required of a running surface.

Fourthly, the running surface in accordance with the invention is characterized in that the resin mixture, which is the most important part of the running surface, that is, the part in contact with the snow preferably consists of 30 to 35% of acetal resin modified by addition of molybdenum and of 65 to 70% of the resin modified by addition of polytetrafluoroethylene.

Fifthly, the running surface in accordance with the invention is characterized in that the resin mixture forming the most important part of the ski running surface can be bonded by heat and mechanical means to a fabric backing, preferably of glass fibre fabric; bonding consists of heating a surface of the resin mixture to a temperature of 200°C to 215°C thereby softening it and applying a pressure of 2 kg/sq.cm to permit subsequent joining to the fabric backing; this fabric backing is, in turn, fixed by means of suitable adhesive to the ski or to part of it.

These main features and other features of minor importance will appear readily apparent from the following detailed description.

Some preferred embodiments of the invention are illustrated in the accompanying drawings which are to be considered as an exemplification of the principles of the invention and are not intended to limit the invention to the embodiments illustrated.

More precisely, fig. 1 is a perspective view of part of the resin mixture bonded to part of the fabric backing;
fig. 2 is an analogous perspective view of a more complex solution in which said components are bonded to another layer of wood, metal or plastic, and the bonded assembly is fixed via an intermediate joining layer to another backing layer or directly to the ski.

Figures 3a, 3b, and 3c show three skis to whose underside is fixed the running surface according to the invention in differently arranged and extensive zones.

Figure 4 is an exploded view of the various members, that is, members detached from one another, in which the ski has a bottom running surface formed as shown in fig. 3a.

As can be seen from the drawings, the running surface in question consists of a mixture of acetal resins 10 which can be bonded to a fabric backing 11, preferably of glass fibre fabric, by heat and mechanical means as stated previously.

The laminate obtained by hot bonding of acetal resins 10 to fabric 11 is designated by the number 12 in the figures.

This laminate can be cut to desired size thereby obtaining various elements 12 which can be joined to other already familar running surfaces 14 of wood, metal or plastic (fig. 2). In this case, both members can be joined with a suitable glue or adhesive 15 to another backing layer or to the actual ski 16.

Fig. 3a illustrates a solution in which a central layer of the running surface in accordance with the invention is bonded to end layers of running surfaces made of already known material 14; fig. 3b, instead, shows just two centrally positioned parallel longitudinal strips of running surface 12 in accordance with the invention, while in fig. 3c, two end sections of the running surface 12, in accordance with the invention are applied to the ski besides the two central longitudinal strips.

The drawings have been enclosed to show that the number of possible solutions is practically infinite as the running surface in accordance with the invention can cover the whole width of the ski, or else different widths, or alternate widths of the actual ski.

As it is possible to vary the ratios and dimensions, so it is possible, in the mixture, to substitute the preferred resins, that is those modified with a fluorocarbon resine or molybdenum respectively, with other resins having similar properties without departing from the scope of the invention.

In this connection it should be stated, even if it is obvious, that the acetal resins can be with random or preferred orientation or with orientated molecules.

Regarding the fabric backing, it has been said that it is preferably of glass fibre fabric, but it is obvious that these fibres can be of any other material providing that it is easy to adher such material to the ski and provided that the material can be efficiently bonded by

heat and mechanical means to the acetal resin mixture in accordance with the invention.

Bonding of the acetal resin mixture to the backing fabric can be carried out with aid of a press, or by a series of hot pressure rolls or pads; the required heat can be gained from that contained in the product itself when emerging from the extruding head after calendering.

CLAIMS OF PATENT

1. Running surface for skis or other similar product capable of exerting a braking and anti-slip action when in contact with damp surfaces, which is therefore suitable for skiers' requirements when pushing along the level and when climbing,
characterized in that it consists of a laminate of an acetal resin mixture bonded to a fabric backing, preferably of glass fibres, which is, in turn, fixed with adhesive to either the whole or part of the underside of the ski.

2. Running surface for skis or other similar products as claimed in claim 1,
characterized in that the acetal resin mixture used consists of a combination of a first acetal resin modified by a fluorinecarbon resin and a second resin modified by molybdenum.

3. Running surface as claimed in claim 2,
characterized in that, with regard to the resin mixture used, the first acetal resin consists of a high strength resin with good anti-friction properties, suitable for injection moulding.

4. Running surface as claimed in claims 1 to 3,
characterized in that regarding the resin mixture used, the fluoro-carbon resin, utilized to modify the first acetal resin, is preferably of the polytetrafluoroethylene type possessing special anti-friction properties.

5. Running surface as claimed in claims 1 to 4,
characterized in that regarding the resin mixture used, the second acetal resin modified by molybdenum is normally used for extruding purposes and likewise possesses good anti-friction properties.

6. Running surface as claimed in the previous claims,
characterized in that the resin mixture of which it is made, contains from 55 to 80% of the first acetal resin modified by a fluorocarbon

resin, and from 20 to 45% of the second acetal resin modified by molybdenum.

7. Running surface as claimed in claim 6, characterized in that the resin mixture of which it is made preferably contains from 65 to 70% of the first acetal resin and from 30 to 35% of the second acetal resin.

8. Running surface as herein described and illustrated in the accompanying drawings.

9. Ski provided with a running surface as claimed by any one of the claims from 1 to 8.

10. Process for obtaining running surfaces as claimed in claims 1 to 8, applicable to the ski by means of adhesives such as epoxy resins or other known resins, consisting of the bonding by heat and mechanical means of the acetal resin mixture to the fabric backing which is preferably of glass fibre fabric.

11. Process for obtaining running surfaces for skis as claimed in claim 10 in which the mechanical-heat bonding procedure consists of softening one of the acetal resin mixture surfaces by heating to about 200°C to 215°C and in the joining of the acetal resin mixture to the glass fibre fabric backing at a pressure of 2 kg/sq.cm.

12. Process as claimed in claim 11, characterized in that the heat required for bonding the acetal resin mixture to the glass fibre fabric backing is that contained by the product when emerging from the extruding head after calendering.

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Fig. 1

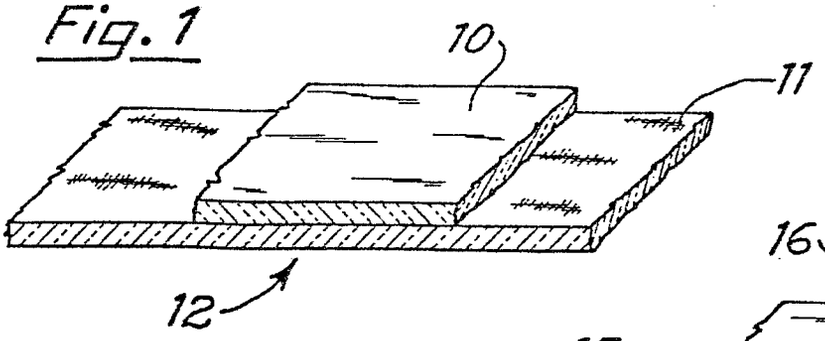


Fig. 2

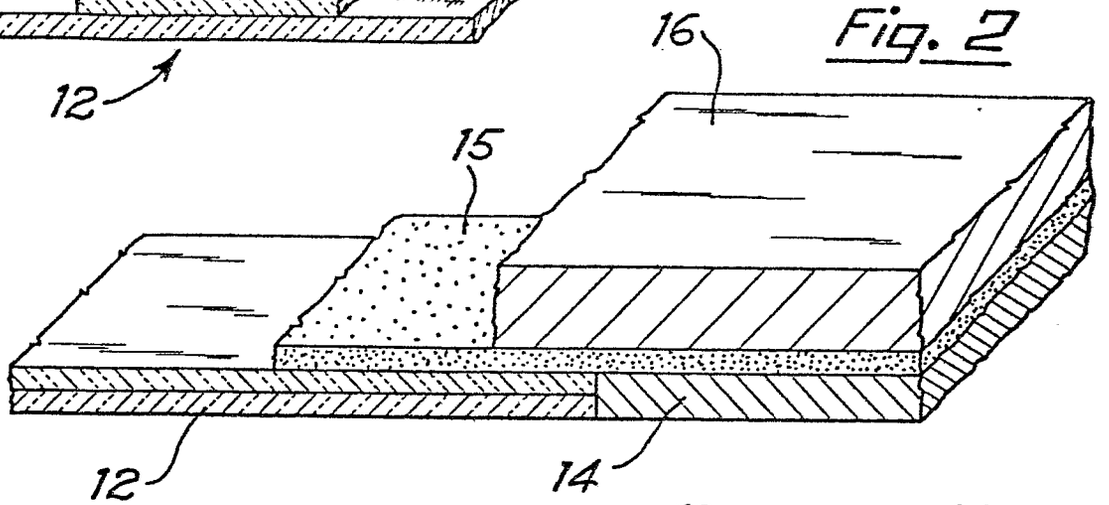


Fig. 3a

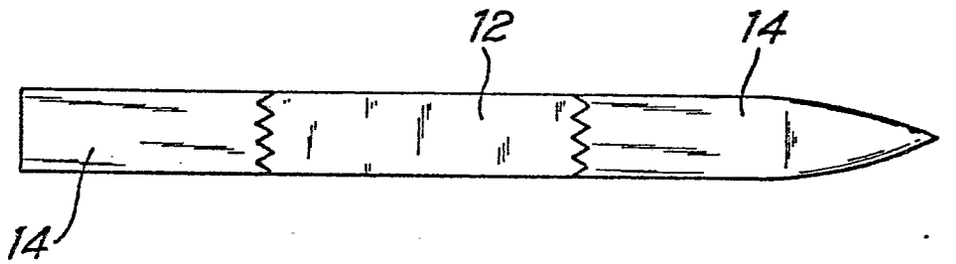


Fig. 3b

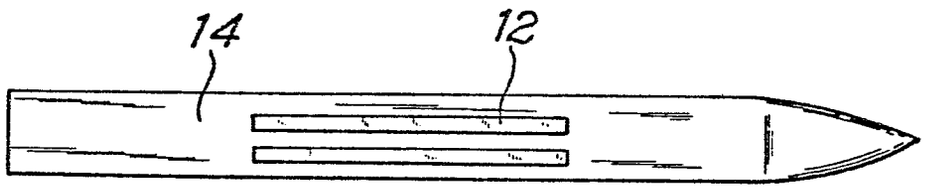


Fig. 3c

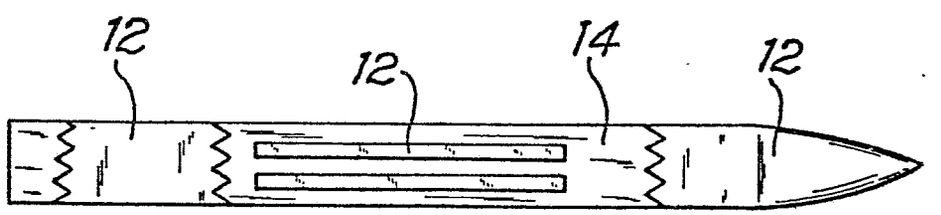
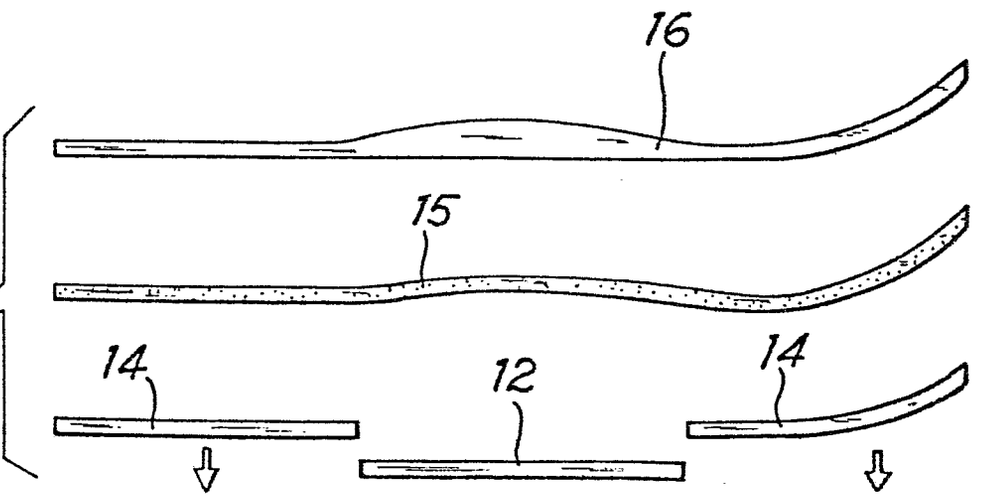


Fig. 4



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European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 81 10 4990

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication where appropriate of relevant passages	Relevant to claim
	AT - A - 311 228 (ISOVOLTA) * Claims 1,2 *	1,2,4,8,9
	DE - A - 2 748 177 (PENNEKAMP) * Claim 3 *	2,4
	DE - A - 1 961 487 (SEMPERIT) * Claims 7,8 * & US - A - 3 698 731	2
	US - A - 4 115 506 (SHIMA) * Abstract *	3
	CH - A - 570 178 (SUOMI-TRADING) * Complete document *	8
	AT - A - 349 366 (ISOPORT) * Claim 1 *	10-12
A	DE - A - 2 512 336 (KARHU-TITAN OY)	

CLASSIFICATION OF THE APPLICATION (Int Cl.³)

A 63 C 5/12

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

A 63 C

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	02-11-1981	SCHLESIER