April 7, 1953 E. TRIBELHORN 2,634,136

LAMINATED SKI

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Fig. 1

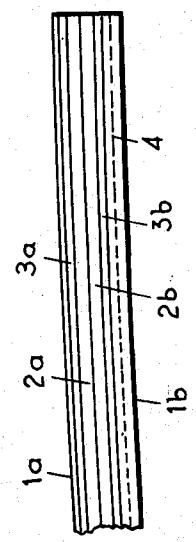


Fig. 2

Inventor
Emile Tribelhorn
By Robert E. Burns
Attorney

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Fig. 3

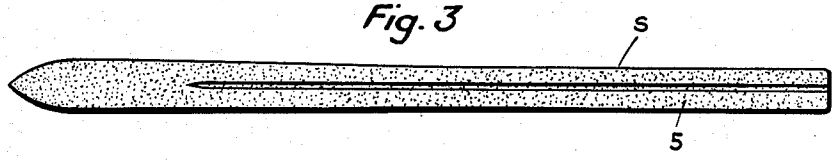


Fig. 4



Fig. 5

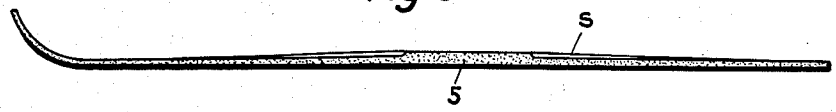


Fig. 6



Fig. 7

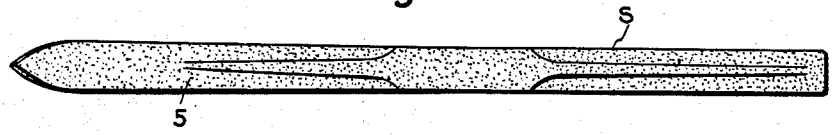


Fig. 8



Fig. 9

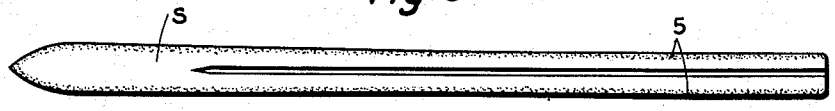


Fig. 10



Inventor
Emile Tribelhorn
By Robert E. Burns
Attorney

Patented Apr. 7, 1953

2,634,136

UNITED STATES PATENT OFFICE

2,634,136

LAMINATED SKI

Emile Tribelhorn, Marly-le-Roi, France

Application February 20, 1951, Serial No. 211,917
In Switzerland August 17, 1948

1 Claim. (Cl. 280—11.13)

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The present invention relates to a ski composed of several layers.

Skis produced of several layers have been known in which the layers consisted of various materials jointed together by being bonded longitudinally. Experience has, however, shown that the skis of the type described have the disadvantage that they become warped more or less rapidly. The tendency to warping can be traced to the fact that the various layers react differently to the influences of weather to which the skis are subjected when being stored as well as when being used. In particular damp and temperature variations favour the warping by which the skis become unusable.

To eliminate this disadvantage it has been proposed to compose the skis of three layers, the middle layer of which is grained transversely. The hope for elimination of warping by this measure was, however, not realized; on the contrary the wood became even more warped and distorted and as regards the elasticity no worth while improvement could be achieved.

It has now been found that by the use of a combination of various layers of material for the manufacture of a ski practical results can only then be attained if the differences of the characteristics inherent in the variation of the layers, such as the differences with regard to moisture absorption, elasticity, resistance, proofness to breakage, heat conductivity, etc., are systematically determined and taken into consideration. The extended tests carried out have shown that for the elimination of distortion in the transverse direction, the top and bottom layer must consist of exactly the same material, it being of advantage to make said two layers moisture repellent. To achieve the necessary elasticity and the resilient resistance of the ski, at least one of the intermediate layers must consist of wood. The ski composed of various layers according to the invention is characterized in that both the top and the bottom layer consist of a heat insulating material harder than wood, which material absorbs no moisture, the thickness and characteristics of the individual layer being so chosen that the stresses occurring have a compensatory effect. With advantage a central wooden batten composed of two layers of wood having different structures can be provided. To protect the ski against a too rapid wear and at the same time to increase the gliding capacity, the purpose is served by providing at least those parts of the ski subjected to great wear and tear with a lining of a material resistant to wear and tear applied by being sprayed on.

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The method according to the invention for producing the ski consists in that the layers of various materials forming the ski are dry-cemented and cold-cemented and bent to shape in a single operation. At the same time the resilience of the ski can be determined by the choice of the pressure die used for the bending.

By way of example various embodiments of the object of the invention are shown in the accompanying drawing in which:

Fig. 1 is the ski in side elevation;

Fig. 2 is an enlarged diagrammatic detailed view of the rear portion of the ski shown in Fig. 1 with the metal lining omitted;

Fig. 3 is a plan view of the gliding surface of a ski with protective lining according to an alternative;

Fig. 4 a cross section through the ski according to Fig. 3 drawn to an enlarged scale;

Fig. 5 a side view of the ski according to a further example of embodiment;

Fig. 6 a cross section through the ski according to Fig. 5 drawn to an enlarged scale;

Fig. 7 a plan view of the ski according to a fourth example of embodiment;

Fig. 8 a cross section through the ski according to Fig. 7 drawn to an enlarged scale;

Fig. 9 a plan view of the gliding surface of the ski according to the fifth example of embodiment, and

Fig. 10 a cross section through the ski according to Fig. 9 drawn to an enlarged scale.

The ski shown in Figs. 1 and 2 consists of a number of layers of various materials independently bonded together by gluing. The top and the bottom layers *1a* and *1b* are made of a material that is harder than wood and does not absorb moisture. In particular, plastics, such as synthetic resin mass, might come into consideration as such a material. These plastics do not absorb any moisture and are exceedingly hard, thus at the same time strengthening the ski. With advantage the top layer *1a* is thinner than the bottom layer *1b* in the latter of which a guiding groove *4* is countersunk. For preference, the top layer might e. g. be of 1 mm. thickness and the bottom layer of 4 mm. thickness. To make the projecting point of the ski resilient and keep it from warping, the bottom layer *1b* of 4 mm. thickness is made to taper out to 1 mm. thickness at the start of the curvature of the point.

To achieve the necessary elasticity and resilient resistance a central wooden batten is provided between the two plastic layers, said batten being jointed together by two layers *2a*, *2b*. Both layers

2a, 2b are made for example of ash-wood each of 2.5 mm. thickness with perpendicular yearly circles, but with differing structure. Between the two wooden layers 2a, 2b and the plastic layers 1a, 1b two reinforcing battens 3a, 3b, e. g. of vulcanized fibre of 1 mm. thickness are provided, said vulcanized fibre possessing the characteristic, without influencing the elasticity of the two layers of wood bonded together, of giving the ski a high proofness against breakage, which proofness is much superior to that of a conventional ski of wood.

The ski is further reinforced by the outer layers of a chosen plastic material described which is moisture repellent and has an exceptional degree of hardness. The inside layers disposed to absorb moisture are covered and insulated. Thus the ski is to a large extent immune against the influence of the weather, such as cold, heat, moisture, etc., and does not warp. This all the more so as the bottom layer 1b, having a thickness of 4 mm., at the same time acts as a stress equalizer of the two layers of wood.

The method for the manufacture of the skis described is carried out in dies provided with the curvature required. The various layers forming the ski are formed in corresponding dies in the dry condition after previously having been coated with glue. The dies are fashioned for the reception of sheets to be bonded together, said sheets being e. g. of the size of 2.20 m. x 1.20 m., from which sheets 12 skis (6 pairs) can be cut out by means of a circular saw. The ski blanks thus produced can immediately be treated further without the usual dry storing of 2–3 months' duration. Thus the usual steam drying plants are eliminated. By changing the shape of the die, e. g. by its curvature being stiffer or flatter by a few millimeters, the ski can be given a greater or smaller elasticity, since the shape given to it initially is retained permanently and unchangeably.

With the ski according to the example of embodiment shown in Figs. 3 and 4 the gliding surface is reinforced with a lining 5 of material resistant to wear and tear. This lining is with preference applied by spraying on and by way of example consists of metal or plastics such as synthetic resin. By the lining 5 the gliding surface of the ski batten S is protected against wear and tear, and depending on the type of the lining, the gliding capacity of the ski is increased.

In the example of embodiment according to Figs. 5 and 6, the lining 5 does not only extend over the whole gliding surface of the ski, but also over the side parts thereof, so that the lining 5 at the same time serves as a protection of the edges. In the example of embodiment last described the provision of special ski-edges is unnecessary and thus a weakening of the ski by the application of screw holes for securing the ski edges does not take place.

In the example of embodiment according to Figs 7 and 8 the ski batten S is provided completely with the lining 5 by which said batten is

fully protected against atmospheric influences, so that the warping of the ski is impossible. In this case the lining 5 can consist of two different materials; thus, e. g. the gliding surface with the side edges can have a lining of material resistant to wear and tear, whereas a lining of less resistant material can be applied to the top of the ski.

In the example of embodiment according to Figs. 9 and 10 only the two side edges and the parts of the gliding surface adjacent to them are provided with a lining 5 of a material resistant to wear.

An example of embodiment can also be visualized according to which the gliding surface of the ski is provided strip-fashion with linings of different materials. Thus side by side with a strip of metal, one of plastic can be provided.

Furthermore another example of embodiment can be visualized in which the gliding surface of the ski is mainly provided with a lining of synthetic resin and only single, narrow, longitudinal strips are of metal.

As advantages of the ski described, mention can be made of the fact that they no longer need to be waxed, inasmuch as the layer serving as a gliding surface is very hard and acts as polished gliding surface; furthermore the fixing of metal edges becomes superfluous.

By the cold bonding and the dry bending, the ski is given a durable, unchangeable shape as well as a high elasticity and proofness against breakage.

The method described has the advantage of simplicity and economy.

What I claim is:

A laminated ski comprising a wooden core formed from two wooden plies, an upper layer and a lower layer of vulcanized fiber adhesively secured to each side of said core in the longitudinal direction of said ski, a layer of plastic water repellent material adhesively secured to said upper layer, and a layer of said plastic water repellent material adhesively secured to said lower layer, and a continuous lining of sprayed metal completely enclosing the ski.

EMILE TRIBELHORN.

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