

Oct. 10, 1944.

A. E. P. KJELLSTROM

2,360,240

SKI STICK

Filed Jan. 27, 1941

2 Sheets-Sheet 1

Fig. 1

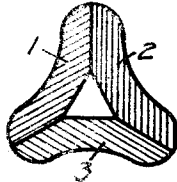


Fig. 2

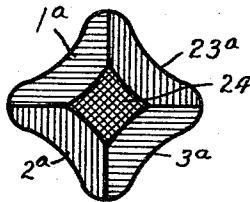


Fig. 3

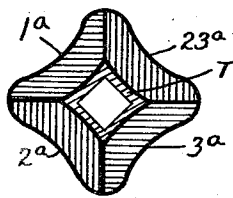


Fig. 4

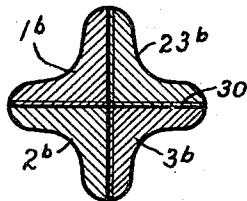


Fig. 5

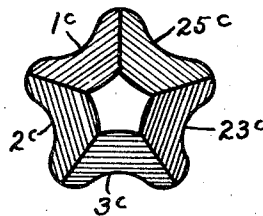


Fig. 6

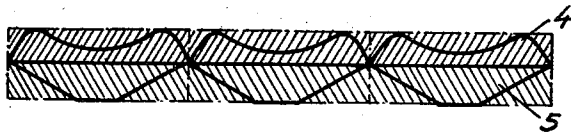


Fig. 7

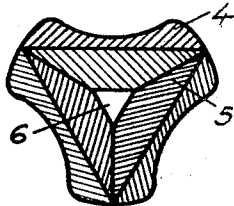
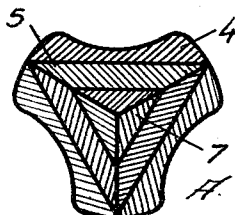


Fig. 8



Inventor
A. E. P. Kjellstrom

By: Glasgow Downing & Seibold
Attys.

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Fig. 9

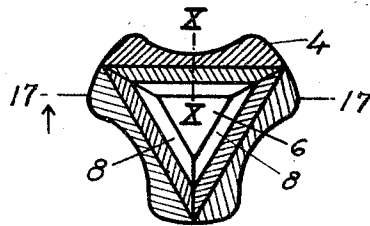


Fig. 10

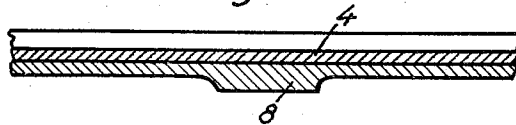


Fig. 11

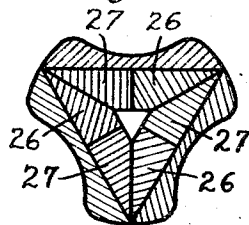


Fig. 12

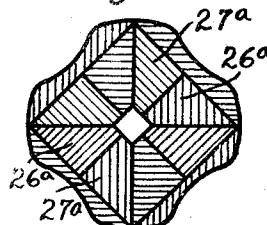


Fig. 13

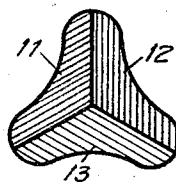


Fig. 14

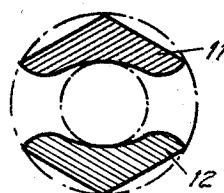


Fig. 15

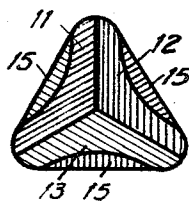


Fig. 16

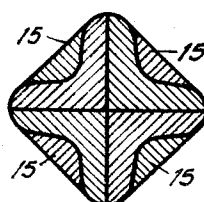
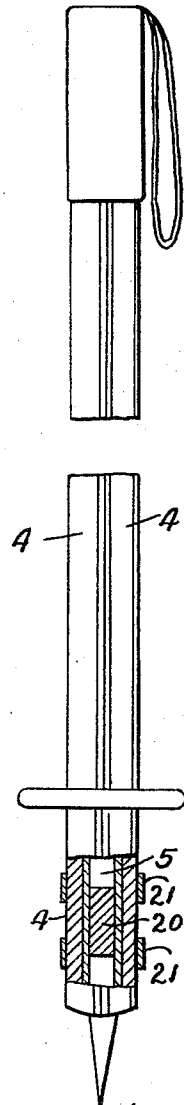


Fig. 17



Inventor,
H. E. P. Kjellström

By: *Glascop Downing & Sebold*
ATTORNEYS

UNITED STATES PATENT OFFICE

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SKI STICK

Alvar Eskil Petrus Kjellstrom,
Stockholm, Sweden

Application January 27, 1941, Serial No. 376,243
In Sweden May 23, 1939

11 Claims. (Cl. 280—11.37)

Ski-sticks are generally made of bamboo, tonkin or the like or also in solid form of some hard kind of wood such as hickory. A common disadvantage encountered with such ski-sticks, however, is that they have a marked tendency to split both due to temperature variations and also under the influence of more intense sources of strain.

The present invention aims at remedying this disadvantage and is characterized by the feature that the stick is made up of three or more longitudinal ribs glued together, which have been cut out of some initial material from a suitable vegetable source, such as tonkin, bamboo, rattan, ash, hickory or the like. Investigations carried out have revealed that it is probably the layers of glue which impart to such sticks made up of narrow ribs their extremely remarkable strength and that, therefore, instead of glueing being regarded as a necessary evil, it should be sought to obtain as large a number of glued joints as possible.

According to one embodiment of the invention this is achieved by each rib being composed of two or more parts glued together and of the same or different kind of wood, so that in cross-section the stick will present glueing lines which partly form one or more polygons and partly three or more radially directed, relatively symmetrical distributed lines. It has been shown that by such an arrangement uncommonly good strength properties are imparted to the stick.

In the cut-out ribs that part which is to form the outer part of the ski-stick is preferably of a relatively hard kind of wood such as hickory or beech, whilst the inner part may be composed of a softer kind of wood, such as ash or deal. If the ribs are composed of three parts glued together, the outermost part may be of hickory or beech, the intermediate part of ash and the inner part of some suitable kind of deal.

If the ski-sticks are made up of ribs of bamboo, tonkin or some tubular cane-like material equivalent thereto, it is possible according to one embodiment of the invention to use a less coarse cane-like initial material and yet obtain adequately large glueing surfaces of the required size, by the ribs being glued together in such a way that the substance which is turned inwardly in the original initial material will be so disposed as to turn outwardly in the glued-together ski-stick.

The inwardly curving or concave external parts of the glued-together ski-stick can be filled in by glued-on ribs of the same or other material.

Other features characteristic of the invention will be further set forth in the following description with reference to the embodiments illustrated in the accompanying drawings, in which:

Fig. 1 is a transverse sectional view through a

ski-stick constructed in accordance with the invention.

Figs. 2 to 5 are similar views of modified forms of the invention.

Fig. 6 is a diagrammatic sectional view illustrating the manner in which the ribs constructing the stick are cut and assembled.

Figs. 7 to 9 illustrate three further embodiments of the invention.

Fig. 10 is a fragmentary longitudinal sectional view along the line X—X of Fig. 9.

Figs. 11 to 13 illustrate three further modifications of the invention.

Fig. 14 is a diagrammatic view illustrating the manner of cutting ribs from strips of bamboo and like tubular material.

Figs. 15 and 16 are transverse sectional views of two further forms of the invention, and

Figure 17 is a side elevation partly broken away and partly in section showing a reinforcing filling applied to the hollow ski-stick and an external reinforcement surrounding it, the stick being of the type illustrated in Figure 9 and the line 17—17 of the latter figure indicating the plane in which the sectional part is taken.

In Fig. 1 is shown in cross-section a stick composed of three ribs 1, 2 and 3, which is triangular in cross-section.

Fig. 2 shows a stick made up of four such ribs designated 1a, 2a, 3a and 23a. The quadrangular stick is in this case designed to have a core piece 24 of the same or other kind of wood. The embodiment shown in Fig. 3 is designed on similar lines to that shown in Fig. 2, but the core piece can, however, be replaced by a quadrangular tube T. In the embodiment according to Fig. 4 there is no inner hollow space, but instead, a reinforcing rib 30, which in cross-section has the shape of a cross and is composed of aluminum for example, can be inserted into the core portion of the stick composed of the ribs 1b, 2b, 3b and 23b. Fig. 5 further shows a stick made up of five ribs 1c, 2c, 3c, 23c and 25c. In Fig. 6 there is shown a slab or block composed of different kinds of wood glued together, from which ribs 4, 5 are to be cut out. A hollowed-out concave form is given to the ribs on that side of the stick which will be turned outwards. From the other side of the slab or block the ribs are cut out to follow inclined surfaces, which upon the glueing together of the stick will lie contiguous to one another, so that a stick having three or more edges is formed. The shape which the ribs receive can be such that after they have been joined together to form a stick, a hollow space 6 will be left at the center of the stick, as shown in Figs. 7 and 9. According to Fig. 8 the hollow space is filled by a rib 7 of the same or different kind of wood. This rib may consist of several, for example three parts as shown.

In Figs. 9 and 10 there is shown in cross-section and longitudinal section respectively an embodiment, according to which the inner part of the ribs at certain points along its length is provided with inwardly projecting thickened portions 8, similarly to the case for example of a naturally-grown bamboo cane, which at its joints presents such thickened portions. These thickened portions along the ribs contribute still further towards increasing the strength of the stick against snapping off.

The ribs are joined together in such a way as to form a stick with a polygonal, for example triangular, cross-section.

The inner part of each rib can, as will be seen from Figs. 11 and 12 be composed of two parts 26 and 27, Fig. 11 and 26a and 27a, Fig. 12, glued together. The glue lines which, viewed in the cross-section of the stick, are radially directed and also the glue lines forming the triangular in Figs. 7-11 or quadrangular polygons in Fig. 12 contribute as already pointed out above to increasing the strength in different directions.

As stated the stick parts can be so glued together as to form a quite solid stick or also the stick can have at its center a hollow space of polygonal or round cross-section respectively. The lower part of this hollow space can possibly be filled with a reinforcing rib 20 of hard wood or with a metal rod as shown in Fig. 17. At the point where the internal reinforcement ceases an external reinforcement 21 should be arranged, for example in the form of threads or bands.

In Figure 13 there is shown in cross-section a ski-stick made up of three ribs 11, 12 and 13, wherein the ribs have been shaped out of the initial material in the manner as illustrated in Fig. 14. In order to obtain a ski-stick as according to Fig. 13 three ribs of the tubular cane-like original material are used, which may, for example, be made up of bamboo or tonkin. It may clearly be seen from Fig. 14 that only a very small part of the material in each original rib need be removed. It may also be seen in Figs. 13 and 14 that glueing surfaces of considerable size are obtained, assuring good cohesion between the ribs in the finished stick. Furthermore it is evident that an uncommonly favourable cross-section for the stick is obtained as regards bending- and shear-stresses, whilst using small quantities of material. Of course sticks with the cross-sections shown in Figs. 2-5 can also be produced in accordance with this embodiment of the invention.

In the embodiment according to Fig. 15 which is almost identical with that according to Fig. 13 the concave ribs of the stick, that is to say the inner walls of the hollow bamboo stick used as a starting material are covered with glued-on extra ribs 15 of wood, bamboo or the like. Figure 16 shows a stick similar to Fig. 4 made in a similar way.

The glued-on ribs can extend along the whole of the length of the stick or only a part thereof, for example at the upper handle part of the stick.

Having now particularly described the nature of my invention and the manner of its operation what I claim is:

1. A ski-stick consisting of at least three longitudinal ribs glued-together cut out from vegetable matter, the external surfaces of said ribs being substantially concave in shape.

2. A ski-stick, consisting of at least three longitudinal ribs glued together and cut out from a vegetable matter, the external surfaces of said

ribs being substantially concave, each rib being composed of at least two glued together parts in such a manner that said stick presents in cross-section glueing lines which form at least one polygon and also at least three radially disposed relatively symmetrically distributed lines, the outer part of each rib being of a harder kind of vegetable matter than the inner part.

3. A ski-stick, consisting of at least three longitudinal ribs glued together and cut out from a vegetable matter, the external surfaces of said ribs being substantially concave in shape, each rib being composed of at least two glued together parts in such a manner that said stick presents in cross-section glueing lines which form at least one polygon and also at least three radially disposed relatively symmetrically distributed lines.

4. A ski-stick comprising at least three longitudinal ribs glued together cut out from vegetable matter, the external surfaces of said ribs being substantially concave, and a metal reinforcement.

5. A ski-stick consisting of at least three longitudinal ribs glued together cut out from vegetable matter, the external surfaces of said ribs being substantially concave, said ribs forming a longitudinal hollow space in the stick.

6. A ski-stick consisting of at least three longitudinal ribs glued together and cut out from a vegetable matter, the external surfaces of said ribs being substantially concave in shape, each rib being composed of at least two glued together parts in such a manner that said stick presents in cross-section glueing lines which form at least one polygon and also at least three radially disposed relatively symmetrically distributed lines, said ribs forming a longitudinal hollow space in said stick.

7. A ski-stick comprising at least three longitudinal ribs glued together cut out from vegetable matter, the external surfaces of said ribs being substantially concave, said ribs forming a longitudinal hollow space, at least the lower part of said hollow space being filled up.

8. A ski-stick, consisting of at least three longitudinal ribs glued together and cut out from a vegetable matter, the external surfaces of said ribs being substantially concave in shape, each rib being composed of at least two glued together parts in such a manner that said stick presents in cross-section glueing lines which form at least one polygon and also at least three radially disposed relatively symmetrically distributed lines, said ribs surrounding a longitudinal hollow space in said stick, at least the lower part of said hollow space being filled up.

9. A ski-stick comprising at least three longitudinal ribs glued together cut out from vegetable matter, the external surfaces of said ribs being substantially concave, the inner, preferably the innermost part of each rib being provided at certain intervals with inwardly projecting thickened portions, which contribute towards raising the stability of the stick.

10. A ski-stick comprising at least three longitudinal ribs formed of vegetable matter and glued together to form a body solid in cross section, the external surfaces of said ribs being substantially concave in shape.

11. A ski-stick comprising at least three longitudinal ribs formed of vegetable matter and glued together to form a hollow body, and a core piece in said hollow body, the external surfaces of said ribs being substantially concave in shape.

ALVAR, ESKIL PETRUS KJELLSTROM.