March 13, 1945. I. MARKS 2,371,305

METHOD OF MAKING SKIS

Filed Sept. 22, 1941

Fig. 1

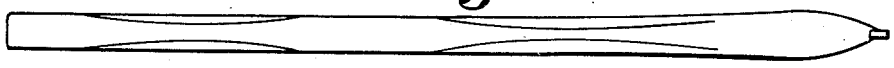


Fig. 2

Fig. 3

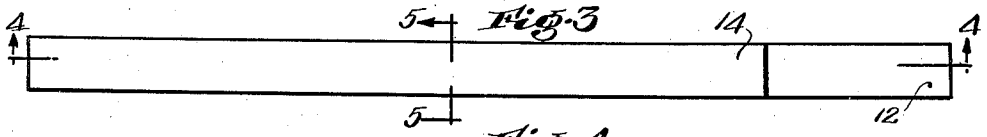


Fig. 4

Fig. 5

Fig. 6

Fig. 7

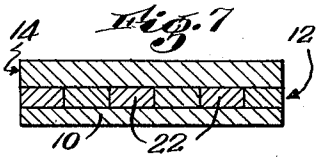


Fig. 9

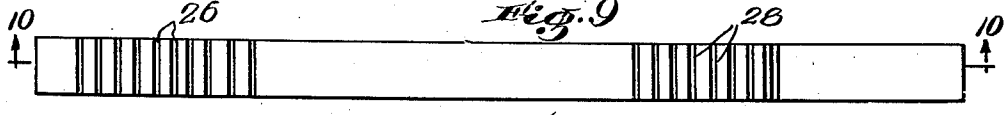


Fig. 10

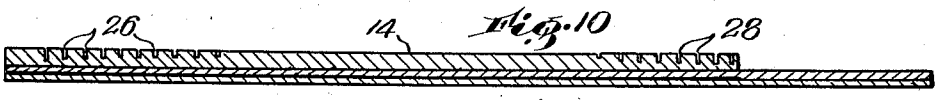


Fig. 11

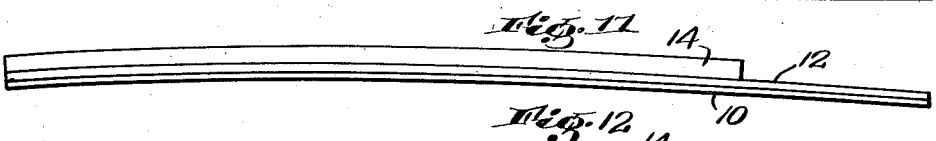


Fig. 12

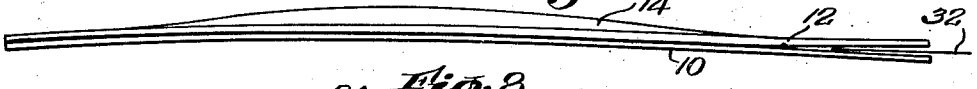


Fig. 8

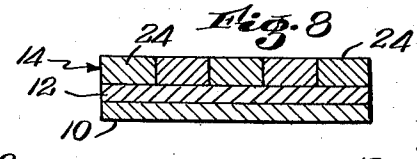


Fig. 13

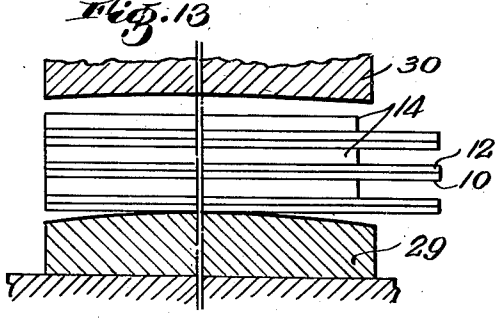
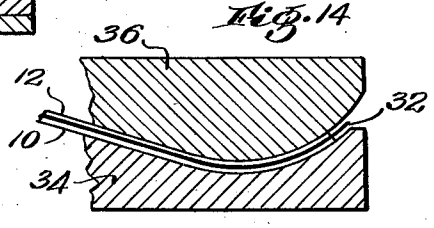


Fig. 14



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UNITED STATES PATENT OFFICE

2,371,305

METHOD OF MAKING SKIS

Isidore Marks, Boston, Mass.

Application September 22, 1941, Serial No. 411,845

4 Claims. (Cl. 144—309)

This invention relates to improvements in skis and the method of making the same, and more specifically relates to improvements in the manufacture of skis of the laminated type.

Heretofore laminated skis have been made by assembling layers of stock which are glued together, the middle layer or one of the central layers being made shorter than the other layers and tapering in thickness from its ends towards the mid-portion thereof. This central layer provides the increased thickness at the middle of the ski which imparts the additional strength for holding the usual foot attachments. Such prior skis, to a considerable extent, require individual pressing and finishing operations.

It is an object of my invention to provide improvements in the methods of manufacturing skis which will reduce the cost of manufacture by enabling the pressing of a number of skis at one time to impart the longitudinal curvature to the skis.

More specifically it is an object of my invention to prepare the rough ski blanks by assembling several layers of stock which are of uniform thickness throughout the length of the ski whereby the ski blanks are flat on the top and bottom surfaces and a number of such blanks may be superposed in a pile and pressed simultaneously.

It is further an object of my invention to make a rough ski blank by assembling three layers of stock, the top layer terminating short of the toe portion while the middle and bottom layers extend the full length of the ski, the layers of stock being glued together except at the toe portions where the middle and bottom layers are left unglued; such rough blanks being superposed in a pile and pressed to impart the longitudinal curvature; the pressed blank being then individually planed and finally, after planing, the toe portions are pressed to shape and glued together.

A still further object of my invention which results from the improved methods of manufacture resides in the novel structure of the skis so manufactured in which the bottom layers of the ski are substantially uniform in thickness throughout the length of the ski while the top layer of the ski is shaped to taper from its ends towards the middle thereof and preferably terminates short of the toe portion of the ski.

Further objects and advantages of my improvements will be more readily apparent from the following description of preferred embodiments thereof as illustrated in the attached drawing in which:

Fig. 1 is a plan view of a finished ski made in accordance with my invention;

Fig. 2 is a side elevation of the ski shown in Fig. 1;

Fig. 3 is a plan view of an assembled blank from which the ski is made;

Fig. 4 is a vertical longitudinal section taken on the plane indicated 4—4 in Fig. 3;

Fig. 5 is a vertical cross-section taken on the plane indicated 5—5 in Fig. 3;

Figs. 6, 7 and 8 are sectional views similar to Fig. 5 but illustrating modified constructions;

Fig. 9 is a plan view of a ski blank showing slots cut in the upper layer thereof to facilitate bending;

Fig. 10 is a vertical longitudinal sectional view taken on the plane indicated 10—10 in Fig. 9;

Fig. 11 is a side elevation of a ski blank after the first bending or pressing operation has been performed;

Fig. 12 is a side elevation of the ski blank after the cutting or planing operation has been performed, showing the tip ends spread apart and diagrammatically illustrating the placing of a sheet of glue between the spread ends;

Fig. 13 is a longitudinal section taken through a pile of ski blanks and illustrating the die members for performing the first bending or pressing operation; and

Fig. 14 is a fragmentary vertical section taken through the tip end of the ski and showing the second pressing operation for bending the tip end.

It has now become commercial practice to have skis of laminated construction. In such prior practice the ski has been made of three layers, the top and bottom layers extending the full length of the ski and being of uniform thickness throughout the length thereof while the middle layer or one of the middle layers is shorter than the length of the ski and tapers from its ends towards the middle thereof to provide the increased thickness for the central portion of the ski where the shoe is attached.

In my novel construction the ski blank is composed of three layers 10, 12 and 14, the bottom layer 10 and the middle layer 12 extending the full length of the ski and substantially of uniform thickness throughout the length of the ski. The top layer 14 is thicker than either of the layers 10 or 12 and may be substantially the thickness of the two layers 10 and 12. The top layer may extend from the heel end of the ski but terminates short of the toe end of the ski, preferably at about the point where the toe portion of the ski is bent upwards.

The rough blank from which the ski is made is disclosed in Figs. 3, 4 and 2. The entire bottom surface of the top layer 14 is glued to the top

surface of the middle layer 12. The layers 10 and 12 are glued together from the heel end of the ski to a point adjacent the end of the top layer 14 leaving the tip end portions 16 and 18 of the layers 10 and 12 respectively unglued. It will be understood that any one or several of the layers 10, 12 and 14 may be made of built-up construction by laterally gluing together strips which extend longitudinally of the ski.

Fig. 6 shows the bottom layer 10 composed of a plurality of strips 20. It will be understood that the bottom layer 10, if made up of separate pieces as in Fig. 6, is relatively thin and will not permit planing of the running face of the ski after the ski has become worn. The middle layer 12 may similarly be made up of a plurality of strips glued together in a lateral direction of the ski, such as the strips 22 shown in Fig. 7. This construction may be preferable to that of Fig. 6 since the glued seams between the pieces 22 will be covered by the solid bottom layer 10 and by the solid top layer 14 except at the top surface of the tip end of the ski. The top layer 14 could also be made up of a plurality of pieces 24 as shown in Fig. 8.

If the top layer 14 is relatively thick it may be found desirable to cut slots in the top layer to facilitate bending thereof as illustrated in Figs. 9 and 10 in which a plurality of parallel transverse slots 26 have been cut at the rear and of the layer 14 and similar slots 28 have been cut at the front end of the block or layer 14. As shown by the sectional view of Fig. 10, these slots 26 and 28 may be cut vertically downward from the top surface and the depth of the slots is greatest at the ends of the block 14 and decreases towards the middle thereof. It will be understood that in subsequent operations the block or layer 14 will be planed away at its ends to a finished surface below the bottom of the slots.

Since the rough blanks are flat on the top and bottom surfaces thereof they may be placed in a pile as shown in Fig. 13 so that the first bending or pressing operation may be performed upon a number of the blanks at one time. Thus the pile of rough blanks in Fig. 13 may be pressed between the bottom die member 28 and the top die member 30 and the blanks held under pressure so as to impart the longitudinal curvature to the ski blanks. It will be understood that during this first pressing operation the free ends 16 and 18 of the layers 10 and 12 are still unglued and are not shaped in the press. The ski blank after the first pressing operation has been performed is shown in Fig. 11.

The next step is to perform the planing and trimming operations on the pressed blank. The cutting or planing may be conveniently performed either by machine or by hand since the tip end of the ski has not yet been bent. Fig. 12 is a side elevation of the ski after the planing operation. It will be noted that the front and rear portions of the top layer 14 have been cut down so that the ends of the blank are relatively thin and taper towards the thick central portion.

The tip end of the ski may then be glued and shaped. A convenient manner of gluing the ends 16 and 18 of the layers 10 and 12 is to spread the ends 16 and 18 and slip in a sheet of glue, such as a sheet of resin or resin-impregnated paper, although liquid glue may be used if desired. The toe portion may be then be shaped by the presser members 34 and 36 as shown in Fig. 14. These presser members may be heated so as to melt the glue and cause bonding of the layers of the toe portion at the same time as the shaping. The skis may be finished in any desired manner after the toe has been shaped.

The novel method of manufacturing skis disclosed herein will materially reduce the cost of manufacture and will permit the use of automatic machines, thus eliminating hand operations. The making of rough blanks as disclosed enables the pressing of a plurality of ski blanks at one time. The planing of the blanks can more readily be carried out by machine when performed before shaping the toe end of the ski. Furthermore, it is relatively less expensive to cut and plane the top layer of the rough blank as disclosed rather than to fit a specially shaped middle layer between the top and bottom layers of a ski.

I claim:

1. The method of making a laminated ski which consists in providing three pieces of stock, each piece being uniform in thickness throughout the length thereof, one of said pieces being shorter and thicker than the other two pieces, gluing said pieces together to form a blank with the short piece on top and terminating short of the toe portion of the blank, the toe portions of the two bottom layers being left unglued, pressing the assembled blank so as to impart a longitudinal curvature thereto, planing the short top layer of the blank, then gluing and pressing the toe portions of the two bottom layers.

2. The method of making a laminated ski which consists in gluing together a pair of laminations which extend the full length of the ski but leaving the toe portions of said laminations unglued, then gluing to the top surface thereof a third lamination which extends from the heel end of the ski to a point short of the toe portion, then pressing said assembled laminations to impart a longitudinal curvature thereto, then planing the top lamination, then gluing and pressing the toe portions of the first pair of laminations.

3. The method of manufacturing skis which consists in preparing a ski blank having a plurality of laminations, each of said laminations being of uniform thickness throughout the length thereof, the laminations being glued together except at the toe portion of the blank, pressing the ski blank to impart a longitudinal curvature thereto, then planing the top lamination of the ski blank to shape the blank with the ends thicker than an intermediate portion thereof and then gluing and pressing to shape the toe portion of the blank.

4. The method of manufacturing skis which consists in assembling three layers of stock, each layer being substantially uniform in thickness throughout the length thereof, said three layers being glued together to form a rough blank having flat top and bottom surfaces, superimposing a plurality of such blanks in a pile, the individual blanks being unsecured with respect to each other, and then pressing the pile of blanks to simultaneously impart a longitudinal curvature to all the blanks in the pile, then cutting and trimming the top layer of each of the ski blanks whereby said top layer decreases in thickness from its central portion towards the ends thereof, then separately pressing the toe portions of the individual blanks and finishing the skis.

ISIDORE MARKS.