May 9, 1967 C. R. ROSS 3,318,609

SKI CONSTRUCTION

Filed May 28, 1965

FIG. 1

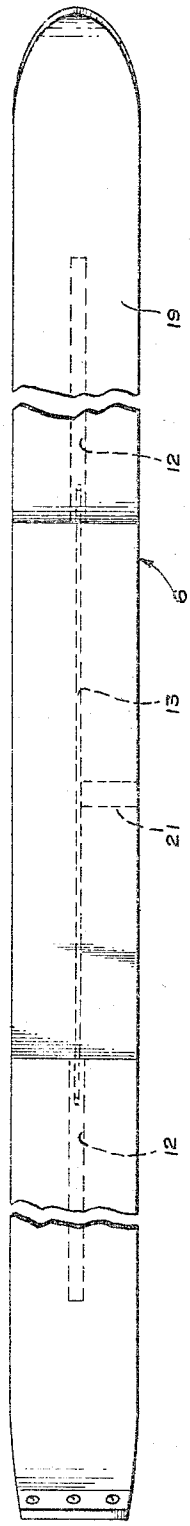


FIG. 2

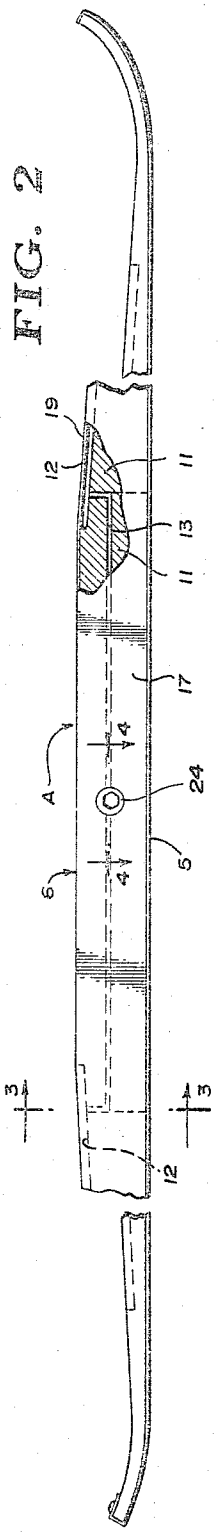


FIG. 4

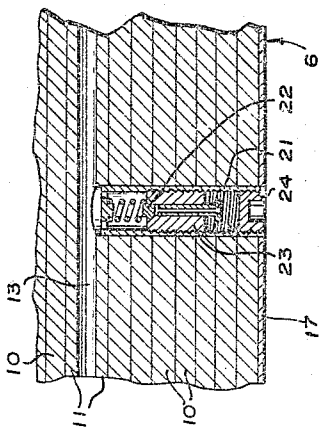
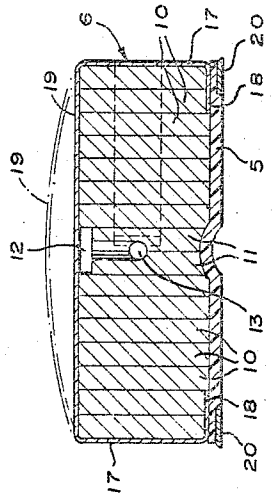


FIG. 3



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SKI CONSTRUCTION

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This invention relates to the art of skis, especially snow skis.

Skis are now customarily produced in various grades of stiffness. Other than for the change which gradually takes place over an extended period of usage, and day-to-day variations reflecting weather conditions, the stiffness characteristic which was built into the ski has remained a constant. Due to the fact that different skiing activities, i.e. slalom or straight racing, or jumping, and skiing under different snow conditions, dictate the use of skis which have different grades of stiffness, the more experienced skiers have thus considered it necessary to carry several pairs of skis. A bending rigidity which may be suited to one type of snow, or one skiing activity, will not be ideal for another. It is usually accepted, at least for the expert skier, that the ski which he uses on hard or icy snow should have a relatively high bending rigidity along its longitudinal axis. Where the snow is soft, the performance is better if the ski has a "softer" bending rigidity.

It is the object of the present invention to provide a ski in which its resistance to bending admits to adjustment, and one in which the adjustment can be made with ease and expedition by the user of the ski.

With the above object in view, the invention consists in the novel construction and in the adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawing:

FIGURE 1 is a fragmentary top plan view of the improved ski.

FIG. 2 is a fragmentary side elevational view thereof, with parts broken away and shown in longitudinal vertical section.

FIG. 3 is a transverse vertical sectional view drawn to an enlarged scale on line 3—3 of FIG. 2; and

FIG. 4 is a fragmentary horizontal sectional view on line 4—4 of FIG. 2 using the same scale as that of FIG. 3.

As is conventional the ski of the present invention has an enclosed core. The enclosure, to be hereinafter more particularly described, comprises a bottom running plate designated by the numeral **5** and a capping sheet **6**. The core prescribes the contour of the ski, which varies in thickness along its length with the thinnest portion at the ends. As is conventional, said ends each have an up-tilt with the front end tapering to a point, and while the ski, between said tilted ends, is here shown as having a straight bottom-edge profile configuration, the same may be cambered.

I have illustrated the core as comprising a laminated block composed of adhesively connected strips of edge-grain plywood. The core could as well be formed from a single piece of wood, and material other than plywood can be used. While the multiple strips composing the core become integrated parts of a solid block when the core is considered as a whole, for purposes of description the core can be said to comprise two comparatively wide flank sections of which the component strips are denoted by **10**, and a rather narrow median section composed of a strip or strips **11**. Each of these sections extends approximately the full length of the ski, but whereas the upper surface of each flank section is or may be unbroken throughout the length there is desirably provided along the top of each end portion of the median section a respective upwardly facing shallow trough **12**. The inner end of each of these troughs lies in rather closely spaced proximity to a bootrest portion A of the ski. The outer end extends, or may extend, to very nearly the front or the rear tip, as the case may be, of the ski. A hole **13** is drilled longitudinally through said median section of the core to connect the inner ends of the two troughs. The drill-hole can follow the path in which it is here illustrated, in which case it is drilled in the center piece of a 3-piece fabricated structure having end pieces butt-joined to the center piece after the drilling, or meeting holes may be drilled diagonally from the inner end of each trough, angling down to a central point of juncture.

The referred-to capping sheet **6** is composed of a thin-gauge spring metal of high elasticity. It closely overlies the top and the sides of the core and at the bottom has marginal edges turned inwardly and fitted in mating rabbets provided in the core. The interior facing surfaces of the sheet's said side portions, denoted by **17**, and its marginal edges **18** are adhesively secured to the core throughout the length of the sheet. The interior facing surface of the sheet's top portion **19** is also adhesively secured to the core but in this instance the adhesion is limited to the fore-and-aft span of the boot-rest portion A and to the two tip ends of the ski. The portions of the capping sheet which overlie the troughs remain unattached to the core from one to the other side edge of the core's upper face. The running plate **5** is applied after the application of the capping sheet, being adhesively secured boht to the core and to the inturned marginal edges **18** of the capping sheet. This plate is or may be comprised of an aluminum alloy, anodized upon the lower face or coated with plastic to give the ski desirable running characteristics, and along each of the running edges has inset steel strips **20**.

The normal configuration of the capping sheet **6**, on any given cross-section, exactly conforms to the cross-sectional shape of the core. However, as a consequence of the high elasticity previously noted, that part of the sheet's top portion **19** which is unattached to the core can be made to bow itself upwardly by the act of introducing a pressurized fluid to the troughs. Exaggerated for greater clarity, such bowing is shown by phantom line in FIG. 3. The fluid which I prefer to employ is CO_2, and is charged to the drill-hole **13** from a side of the ski through an internally threaded fitting **21**. Within the fitting is a hollow-stemmed valve **22** closing with the pressure of the fluid charge against a seat formed at the inner end of a core-piece **23** threaded into the fitting. The fitting has a removable plug **24** to protect the valve against access of snow or ice.

It will be understood that CO_2 is charged to the interior of the ski when it is desired to increase the ski's resistance to bending, responsively bowing the face **19** of the capping sheet in either a greater or a lesser degree to give to the ski the stiffness desired. The supply tank which I prefer to employ for charging CO_2 into the ski has a delivery nipple which threads into the fitting and unseats the valve **22**. On the tank is a manually operated dispensing valve for releasing the CO_2, and there is provided a gauge to show the pressure which obtains within the ski. Using much the same structure as that which is employed to deliver pressure air to an automobile tire, the gauge gives a reading when the dispensing valve is turned off. The ski is designed to take a maximum of 1200# pressure.

It is believed that the invention will have been clearly understood from the foregoing detailed description of my now-preferred illustrated embodiment. Changes in the details of construction may be resorted to without departing from the spirit of the invention. By way of example, two separated valved openings may be provided for introduction of CO_2, with one opening leading to the trough **12** at the front end of the ski and the other leading to the trough **12** at the rear end of the ski, thus permitting

the forward portion of a ski to be given less bending rigidity than the after portion. As a further variation which should perhaps be noted, the marginal edges **18** can be prolonged inwardly into touching engagement and these touching edges bonded together so that the capping sheet **6** completely envelops the core. In this variation transverse rows of rivets, passing through the core and connecting the top and bottom layers of such envelope, can be provided fore and aft of the troughs **12** as an augmentation of the bond which the adhesive provides. A yet further variation is to bond a layer of rubber at each side of the core between said core and the side sections of the capping sheet. This construction permits the top section to be bowed, and thus stiffened, under a lesser pressure condition than that required with the illustrated embodiment, but reduces the ski's torsional rigidity. This is considered disadvantageous for some types of skiing. With the foregoing and other possible modifications in mind it is my intention that no limitations be implied and that the hereto annexed claims be given the broadest interpretation to which the employed language fairly admits.

What I claim is:

1. A laminated ski construction having a core, with a running plate below and a capping sheet above the same, the capping sheet being composed of a metal high in resiliency and being so attached to the core that there is provided above the core between said capping sheet and the core an interspace having substantial length and a width approximating the width of the ski and sealed along the two side edges and the two end edges, and means for charging said interspace with a fluid pressurized to a level capable of bowing the capping sheet upwardly from the core.

2. A laminated ski construction as claimed in claim **1** in which two of said interspaces are provided one lying to the front and the other lying to the rear of the shoe rest portion of the ski.

3. A laminated ski construction as claimed in claim **2** having a connecting passage providing communication between the two interspaces.

4. A laminated ski construction as claimed in claim **1** in which an opening fitted with a normally closed valve is provided in an exposed wall of the ski for charging said pressurized fluid to the interspace.

5. A laminated ski construction as claimed in claim **4** in which the surface of the core which forms the lower face of the interspace is channeled, and having a passageway leading from the wall opening to the channel.

6. A laminated ski construction as claimed in claim **5**, the channel extending approximately the full length of the interspace on the longitudinal median line thereof.

7. A laminated ski construction as claimed in claim **1** in which the charged fluid is CO_2.

8. A laminated ski construction as claimed in claim **1** in which the capping sheet overlies the sides as well as the top of the core and has its side margins turned under the core and adhesively bonded both to the core and to the running plate.

9. A laminated ski construction as claimed in claim **1** in which the capping sheet is adhesively bonded to the core.

10. A laminated ski construction as claimed in claim **1** in which the material composing the core is wood.

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