

[54] **SKI CLAMPING DEVICE**
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[52] U.S. Cl. **269/43, 269/153, 269/242, 269/258, 269/321 W**

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[51] Int. Cl. **B25b 1/10**

[58] Field of Search 269/9, 43, 139, 153, 154, 269/218, 242, 244, 321 W, 258, 166, 169, 269/189, 247

[57] **ABSTRACT**

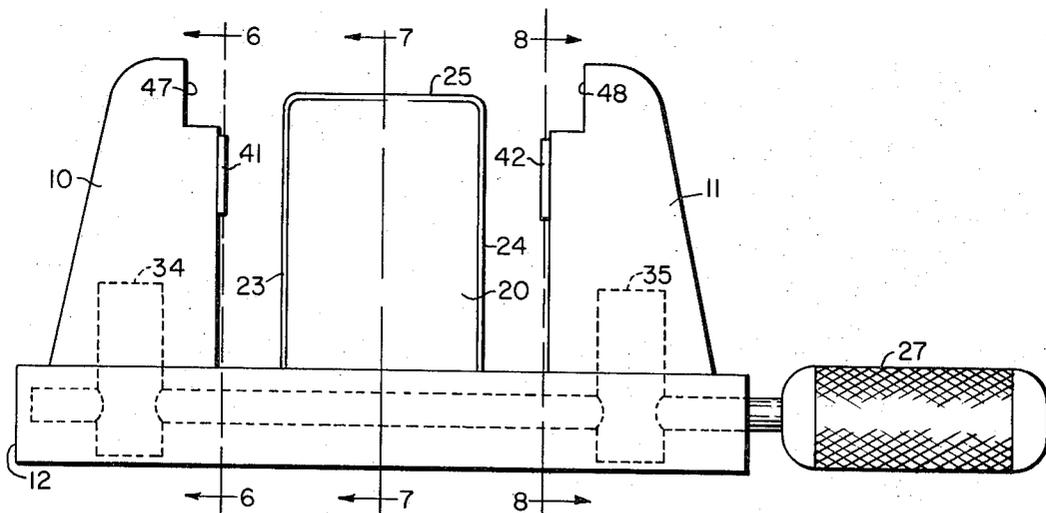
A ski clamp device which permits clamping of skis for bench work in three different positions. Skis are clamped between vise jaws and a floating spacing member which equalizes clamping pressure. Moving parts are slidably mounted on a track and actuated by a screw mechanism providing rotation of the vise jaws to conform with the side curvature of the clamped skis.

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7 Claims, 13 Drawing Figures



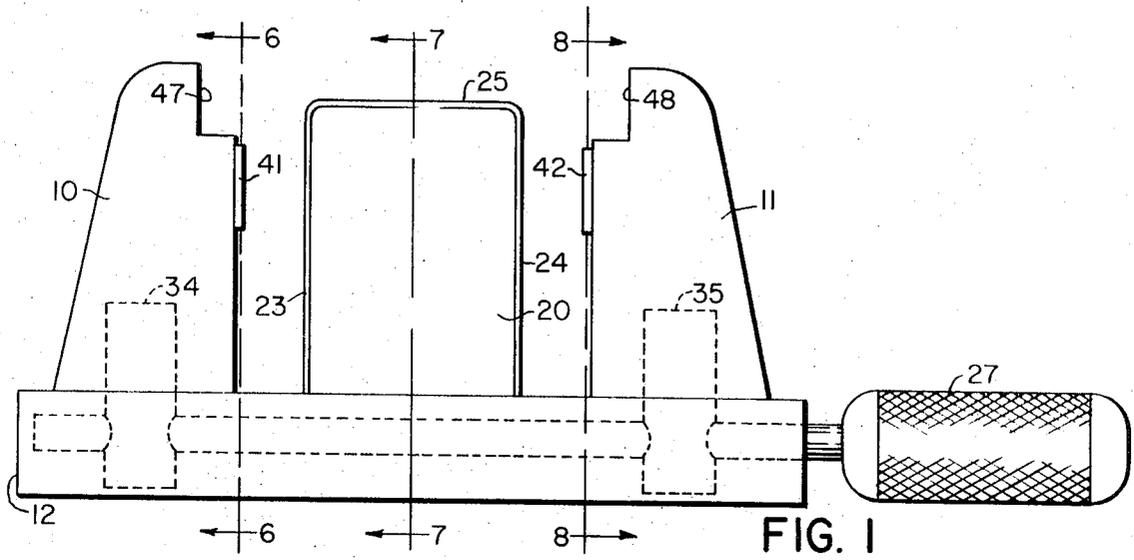


FIG. 1

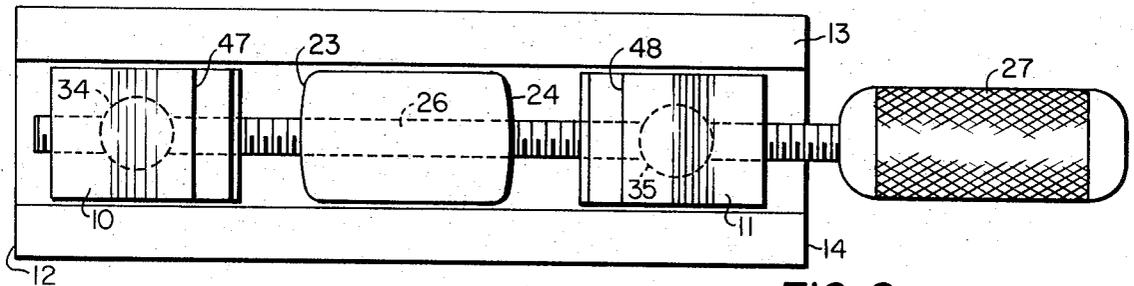


FIG. 2

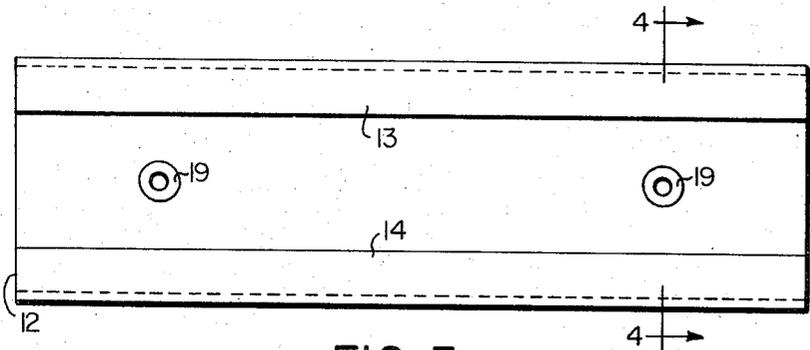


FIG. 3

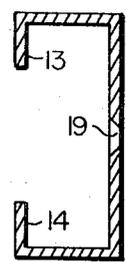


FIG. 4

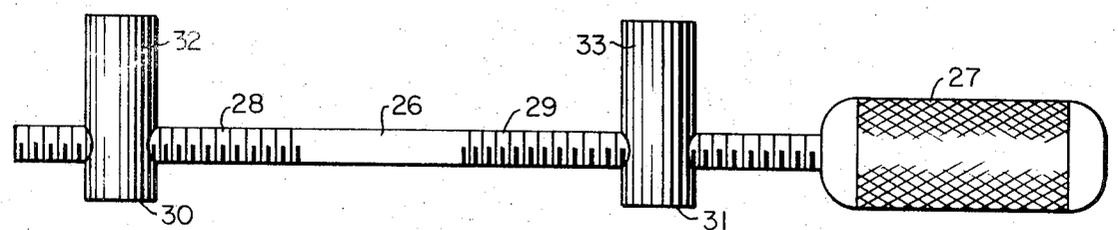


FIG. 5

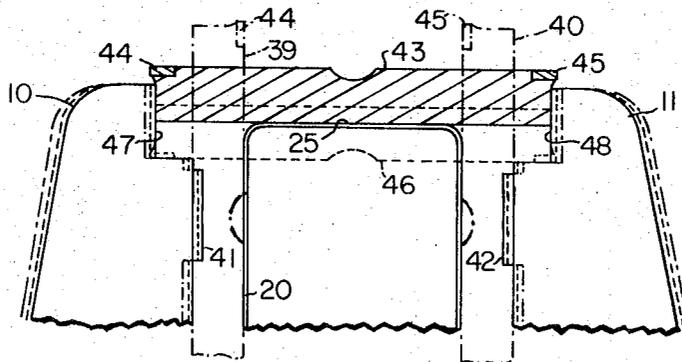
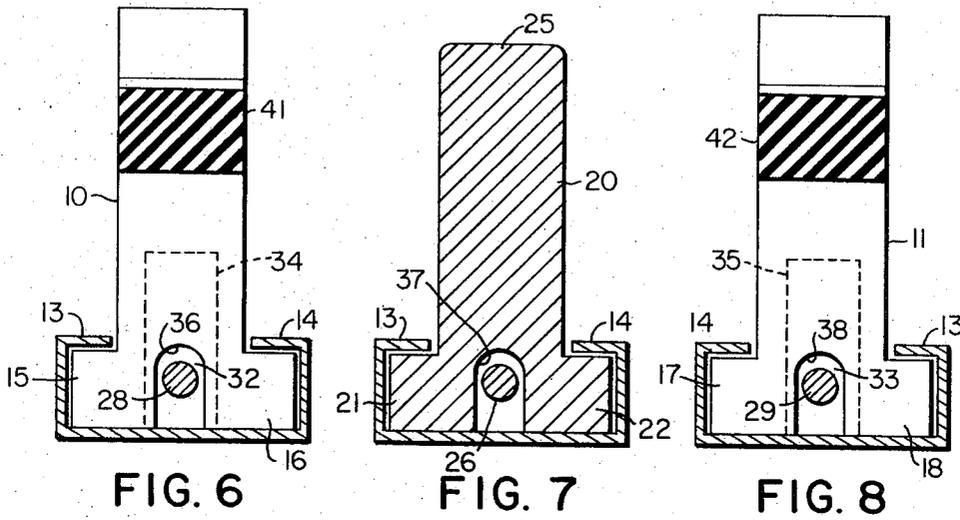


FIG. 9

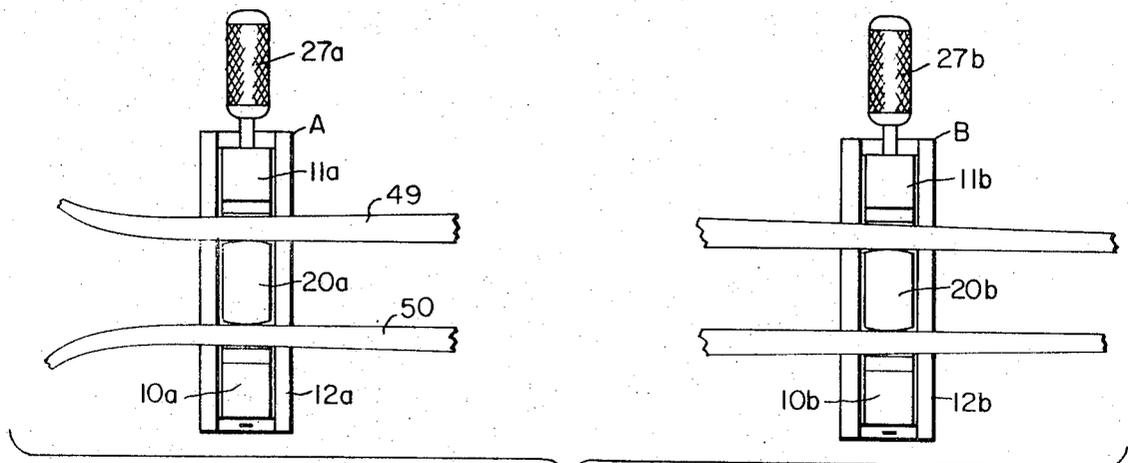


FIG. 10

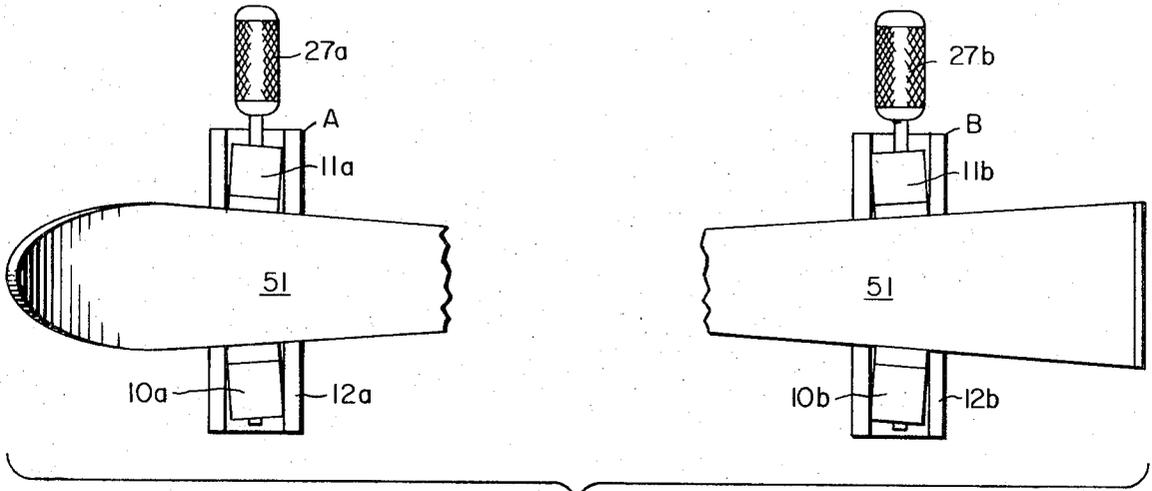


FIG. II

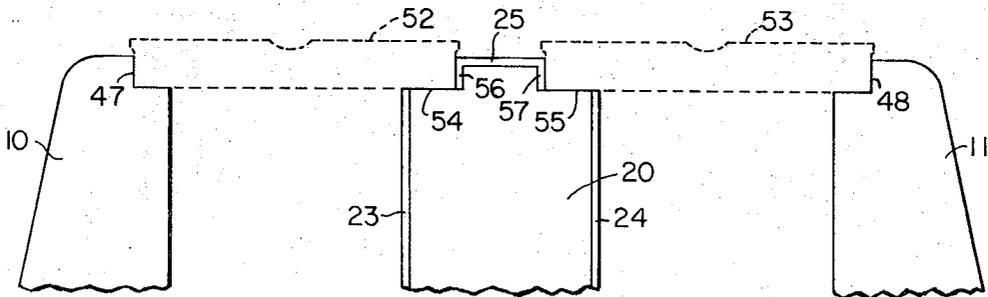


FIG. 12

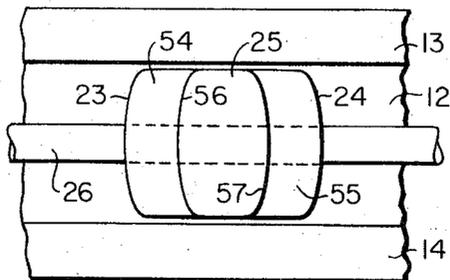


FIG. 13

SKI CLAMPING DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to a ski clamping device used to position skis for bench work such as edge filing, flat filing, binding work, waxing, etc.

Skis are commonly provided with steel edges which must be occasionally sharpened to maintain gripping power on icy slopes. The sharpening is usually done by filing and to hold skis in a proper parallel edge-up position for edge filing a bench vise is used. Also, work known as flat filing is often done on the bottoms of skis to make the running surfaces as flat as possible as well as to make them smooth after holes and nicks have been filled with plastic or other suitable filling material. To hold skis in a horizontal position for such flat filing work and also for binding work, waxing, etc., a bench jig is often used. Such vises and jigs now in use are expensive, bench space consuming and quite awkward to use. Also, such clamping devices are apt to dent the skis due to contact with sharp edges of the vise and jig.

Accordingly, it is an object of the present invention to provide an improved ski clamping device designed to hold skis in all positions commonly used for filing, waxing and binding work that is simple, easy to use and relatively inexpensive.

Another object of the invention is to provide a ski clamping device that will not dent or otherwise injure skis while clamped therein for bench work.

Further objects and advantages of the invention will become apparent as the following description proceeds.

SUMMARY

Briefly, in accordance with the invention a ski clamping device is provided wherein two skis in a parallel edge-up position may be clamped for edge filing between two movable vise jaws and a spacing member located therebetween. The spacing member is arranged to move freely or "float" as the vise jaws are closed whereby the pressure exerted on the skis by the jaws and spacing member are equalized thereby reducing the possibility that one of the skis will be dented or otherwise damaged by excessive localized pressure. Also, to further prevent damage the surfaces of the spacing member are curved to avoid ski contact with a sharp edge due to bending of the skis during clamping. Still further protection is afforded by the use of resilient pads on the vise jaws.

Another feature of the invention is a simplified clamp construction wherein the vise jaws and spacing member are mounted on a track in which they are guided for proper movement during the clamping operation. Clamping is provided by a double threaded screw mechanism arranged to permit the vise jaws to pivot whereby they adjust automatically to fit the side curvature of the ski thereby further avoiding excessive localized clamping pressure. This arrangement permits use of the clamp to hold one or more skis in a horizontal upright or inverted position for flat filing, binding work and waxing.

For a better understanding of the invention reference should be made to the following detailed description taken in connection with the accompanying drawings.

BRIEF-DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a ski clamp device embodying the present invention.

FIG. 2 is a top view of the clamp shown in FIG. 1.

FIG. 3 is a detail view of the track used to guide the vise jaws and spacing member of the clamp of FIG. 1.

FIG. 4 is a cross sectional view of the track taken along the section line 4-4 of FIG. 3.

FIG. 5 is a detail view of the screw mechanism used to actuate the clamp.

FIGS. 6, 7 and 8 are sectional views of the clamp taken along the section lines 6-6, 7-7 and 8-8 of FIG. 1.

FIG. 9 is a partial view of the top portion of the clamp illustrating how skis are clamped in various positions for bench work.

FIG. 10 illustrates how two clamps may be used to clamp two skis in a parallel edge-up position for edge filing.

FIG. 11 shows how two clamps may be used to clamp a ski in a horizontal position.

FIG. 12 is a partial side view of a modified form of the invention, and

FIG. 13 is a partial top view of the construction of FIG. 12 showing certain structural details.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

Referring now to FIG. 1 of the drawing, there is shown a ski clamp construction embodying the invention. As shown the ski clamp comprises two oppositely disposed vise jaws 10 and 11 mounted and guided for sliding movement toward and away from each other on an elongated track 12. As shown in FIGS. 3 and 4, the track has a C-shaped cross section with inwardly projecting flanges 13 and 14 which extend over and retain shoulders 15 and 16 on vise jaw 10 and shoulders 17 and 18 of vise jaw 11. There is provided sufficient clearance between the jaw shoulders and the track to permit free guided movement of the jaws along the track and also to permit some rotary movement of the jaws for a purpose later to be described. Also, as shown, the track is provided with spaced countersunk holes 19 to permit mounting of the track on a work bench with flatheaded screws that will not interfere with sliding movement of the jaws. Preferably the track is made of metal having suitable strength such as cold rolled steel.

Mounted on the track 12 for free sliding movement between the vise jaws 10 and 11 is a spacing member 20 having shoulders 21 and 22 retained by track flanges 13 and 14. The spacing member has upstanding side surfaces 23 and 24 and a top supporting surface 25.

The vise jaws 10 and 11 are moved on track 12 toward and away from each other by means of a screw mechanism. As best shown in FIG. 5 the screw mechanism comprises a screw shaft 26 which is manually rotated by means of a handle 27. The screw shaft has reversely threaded portions 28 and 29 on which ride in threaded engagement nuts 30 and 31. The nuts have cylindrical exterior surfaces 32 and 33 which project into corresponding bores 34 and 35 in vise jaws 10 and 11 whereby the jaws are moved in opposite directions by rotation of shaft 26 and handle 27. There is sufficient clearance between the surfaces 32, 33 and bores 34, 35 so that the vise jaws 10 and 11 are free to rotate

a limited amount about the axes of the nuts. This motion permits the vise jaws to conform to the contour of skis clamped thereby as will be further described. In order to provide clearance for the screw shaft 26 the vise jaws and the spacing member are provided with cut away portions 36, 37 and 38 as shown. It will be noted that since there is no nut on the central portion of shaft 26 the spacing member 20 is free to ride on track 12 between the vise jaws.

The ski clamp functions to clamp skis in three positions for bench work. These are referred to hereinafter as Mode 1, Mode 2 and Mode 3.

In Mode 1, two skis may be clamped in an edge-up parallel bottom-to-bottom position for edge filing of the skis. The two skis in this position are indicated by dot dash lines 39 and 40 in FIG. 9. To hold the skis in this position without damage to the skis from denting, the inside surfaces of the vise jaws 10 and 11 are provided with resilient pads 41 and 42. These bear against the top surfaces of the skis and force the bottom surfaces into engagement with the sides 23 and 24 of the spacing member 20. In this position the bottom edges of the skis rest on top of the track 12. Because the spacing member 20 is free to ride or "float" on track 12 it seeks automatically a central position in which the pressure exerted by the vise jaws is equally distributed between the two skis. This feature helps to prevent damage to the skis from excessive clamping pressure exerted by one vise jaw due to unsymmetrical positioning of the spacing member. Also, the curved edges 23 and 24 of the spacing member prevent contact of the skis with sharp edges that might damage the skis.

The pads 41 and 42 are preferably made of a resilient material such as rubber to avoid any damage to the skis and are secured to the vise jaws in any suitable way as by cementing. The thickness and deformation characteristic of the pads are selected such that the pads are not completely flattened when the vise jaws are clamped against the skis. Since the force exerted on the vise jaws by the clamped skis is concentrated in the areas of the pads which are displaced from the screw shaft, torques are exerted on the jaws. As viewed in FIGS. 1 and 9 the torque exerted on jaw 10 is counter-clockwise and on jaw 11 is clockwise. These torques cause a slight rotation of the vise jaws to a point where shoulders 15, 16 and 17, 18 move into cramping engagement with the underside of flanges 13 and 14 of track 12. In this manner the vise jaws are locked in the clamped position until the mechanism is released by a reverse rotation of handle 27.

In Mode 2 one ski may be clamped between the vise jaws in a horizontal inverted position for flat filing repairing or waxing the bottom of the ski. The ski in this position is indicated by the solid lines 43 in FIG. 9. The height of the top surface 25 of the spacing member may, as shown, be selected so that it supports the ski at the proper height for clamping. In this position steel edges 44 and 45 of the ski should be above the top of the vise jaws 10 and 11 so that the filing tool will clear the vise jaws.

In Mode 3 one ski may be clamped in a horizontal upright position for work on the ski binding. This position is indicated by the dash lines 46 in FIG. 9. For use of the clamp in this mode the spacing member is first removed. This is easily done by releasing the screw mechanism and sliding the jaws and spacing member assembly out of the track. The spacing member is then lifted

off the screw shaft and the two jaws and screw mechanism are replaced in the track. In order to provide a convenient support for the ski in this mode prior to clamping, the jaws 10 and 11 are provided with notches 47 and 48 so that the ski is supported in the bottom of the notches.

To obtain adequate support for skis during bench work it is usually desirable to use two ski clamps in the manner illustrated in FIG. 10 and FIG. 11. In FIG. 10 two ski clamps A and B are shown supporting a pair of skis 49 and 50 in the Mode 1 position; i.e., the skis are mounted in an edgeup, bottom-to-bottom, parallel position for edge filing. As shown, clamp A is located toward the front of the skis and clamp B toward the back. Each clamp is identical having the same construction as that already described. Corresponding parts have the same numbers with appropriate subscripts to differentiate between the two clamps A and B. In this mode the jaws 10a, 11a and 10b, 11b bear against straight ski surfaces and hence are parallel to tracks 12a and 12b as shown.

In FIG. 11 the two clamps A and B are shown in the position they occupy in the Mode 2 and Mode 3 positions wherein a single ski 51 is clamped in a horizontal upright or inverted position. The sides of skis usually have substantial curvature being wider toward the ends and relatively narrow in the middle. As pointed out above, the vise jaws 10 and 11 are mounted on the cylindrical nuts 30 and 31 so that they are free to rotate a limited amount determined by the clearance between the shoulders 15, 16 and 17, 18 and the sides of the track 12. As shown in FIG. 11 this construction permits the jaws 10a, 11a and 10b, 11b to rotate sufficiently to conform to the side curvature of the ski 51. Thus, jaws 10a and 11a are rotated in a direction to conform with the curvature of the ski near the front end, while jaws 10b and 11b are rotated in appropriate directions to conform to the curvature near the rear end of the ski. The amount of jaw rotation and ski curvature shown is somewhat exaggerated for clarity of illustration.

In FIG. 12 and FIG. 13 there is shown a modification of the invention wherein the configuration of the spacing member 20 is changed so that two skis indicated by dash lines 52 and 53 may be clamped simultaneously in a Mode 2 or Mode 3 horizontal position for bench work. Here, the spacing member is provided with two notched portions 54 and 55 adapted to receive and support adjacent sides of skis 52 and 53 the opposite sides of which are received and supported by the notches 47 and 48 of vise jaws 10 and 11. The sides of the notches 54 and 55 have curved surfaces 56 and 57 so that there will be no sharp edges in contact with the skis during clamping. In this variation the track 12 is made longer so that there will be sufficient clearance between the vise jaws in the outer position at the extremities of the track to accommodate two skis. If desired, the ski clamp assembly may be supplied with extra spacing members and vise jaws having different height and notch dimensions to accommodate various types of skis. Such use of interchangeable parts is practical because of the ease with which the ski clamp assembly may be assembled and disassembled.

From the foregoing it will be apparent that there has been provided a ski clamp construction that will not damage the skis, supports the skis in three different positions and is simple, versatile and easy to use. By making the jaws and spacing member of a suitable plastic

material such as highdensity polyethelene the clamp may be manufactured at a relatively low cost.

While there have been shown what are presently considered to be preferred embodiments of the invention, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit and scope of the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

- 1. A ski clamping device comprising:
 - a. a pair of movably mounted vise jaws,
 - b. a spacing member having two upstanding side surfaces disposed between the vise jaws,
 - c. clamping means for simultaneously moving the vise jaws in opposite directions toward the spacing member so as to clamp a ski in a position between one vise jaw and one of the side surfaces of the spacing member and another ski in a position between the other vise jaw and the other of the side surfaces of the spacing member, and
 - d. means mounting the spacing member to permit free movement thereof in a direction to equalize the pressure exerted on the skis when the vise jaws are moved to a ski clamping position.
- 2. The ski clamping device of claim 1 wherein the

side surfaces of the spacing member have a slight curvature to prevent damage to the skis by contact with sharp edges.

3. The ski clamping device of claim 1 wherein the spacing member has notched side portions adapted to support adjacent edges of two horizontally positioned skis clamped between the vise jaws and the spacing member.

4. The ski clamping device of claim 1 wherein the vise jaws are mounted on an elongated track and are provided with shoulders engaging the track to guide movement of the jaws along the track.

5. The ski clamping device of claim 4 wherein the spacing member also has shoulders engaging the track for guiding movement of the spacing member along the track.

6. The ski clamping device of claim 1 wherein the clamping means for moving the vise jaws comprises a screw having two reversely threaded portions and a pair of threaded nuts separately engaging the threaded portions of the screw, the nuts being connected to actuate the vise jaws in opposite directions.

7. The ski clamping device of claim 5 wherein the vise jaws are provided with resilient pads engaging the skis in the clamped position.

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