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Kanno

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[54] **CLAMPING IRON FOR SKI BOOTS**

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[30] **Foreign Application Priority Data**

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Dec. 29, 1971 Japan 46/2925

[52] **U.S. Cl.** ..... **280/11.35 C**
[51] **Int. Cl.** **A63c 9/00**
[58] **Field of Search** 280/11.35 C, 11.35 E, 11.35 D, 280/11.35 A, 11.35 R, 11.35 K, 11.35 Y, 11.35 H

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Primary Examiner—Kenneth H. Betts
Assistant Examiner—Milton L. Smith
Attorney, Agent, or Firm—McGlew and Tuttle

[57] **ABSTRACT**

Clamping irons for ski boots, comprising a pair of toe-iron and heel-iron connected by means of a metalic band plate fixedly or detachably and adjustably, or by means of a coiled spring detachably and adjustably. Both of such connecting means can be bent vertically but cannot be bent horizontally, thus the ski boots can be easily and exactly clamped to the ski plate, removing any trouble at the time of ski running.

11 Claims, 13 Drawing Figures

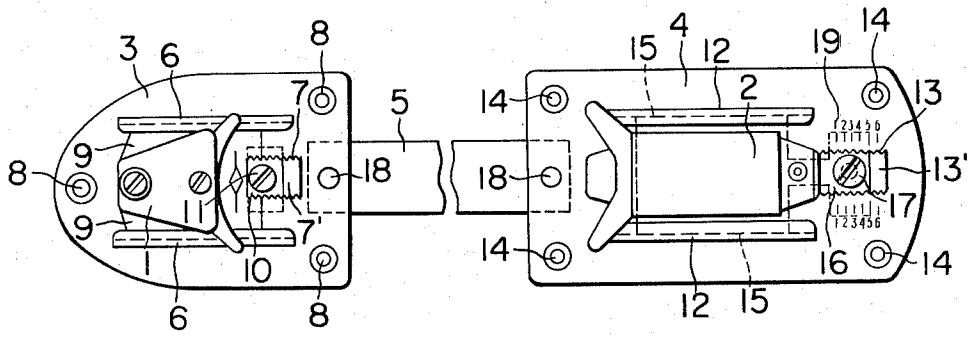


FIG. 1

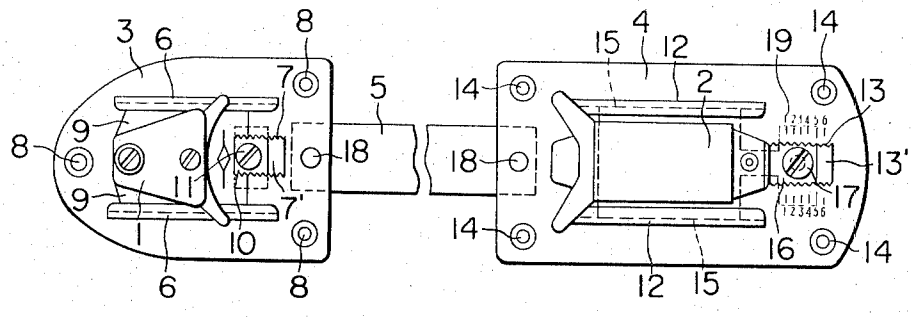


FIG. 2

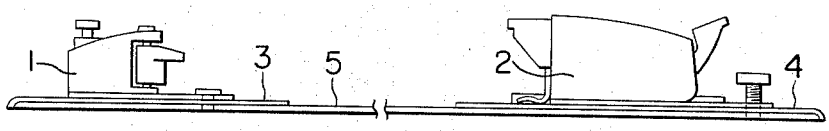


FIG. 3

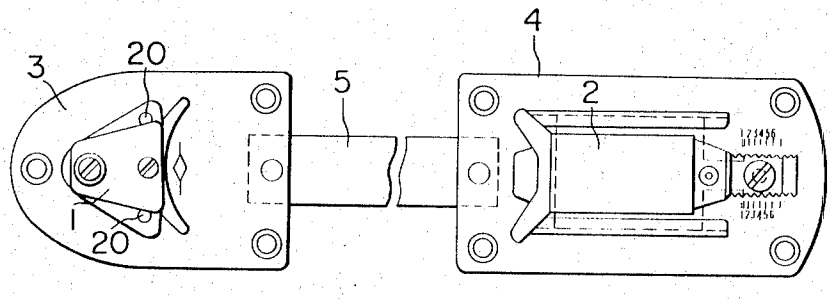


FIG. 4

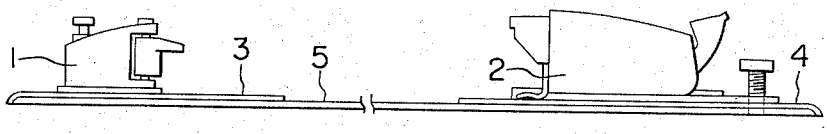


FIG. 5

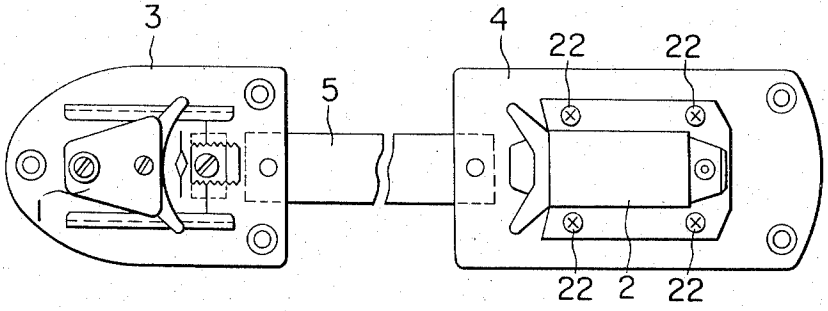


FIG. 6

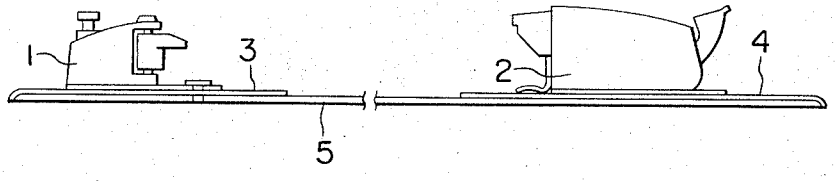


FIG. 7

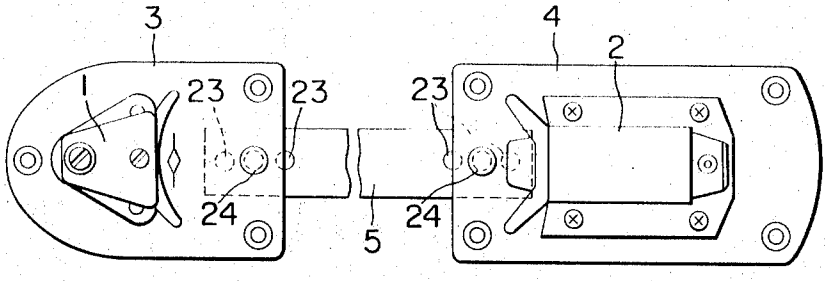


FIG. 8

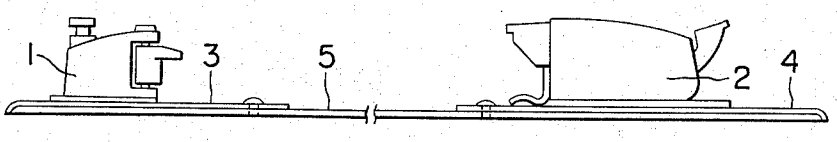


FIG. 9

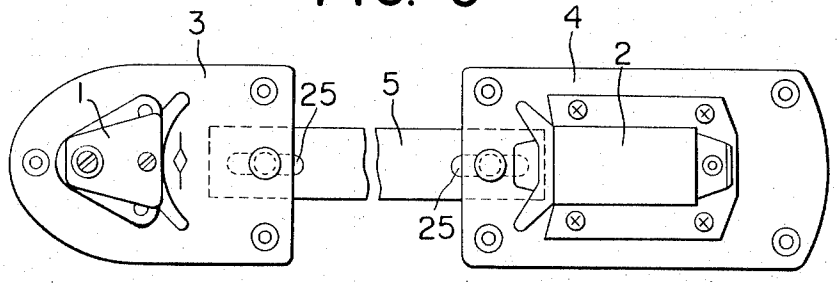


FIG. 10

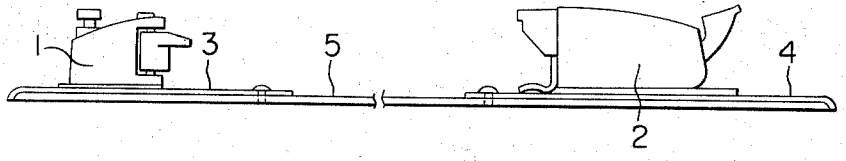


FIG. 11

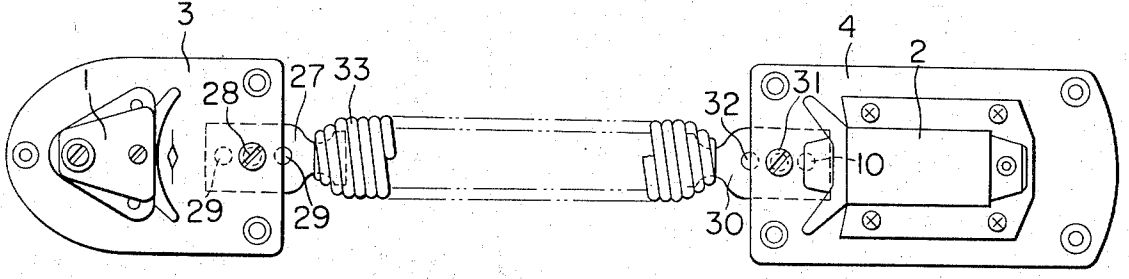


FIG. 12

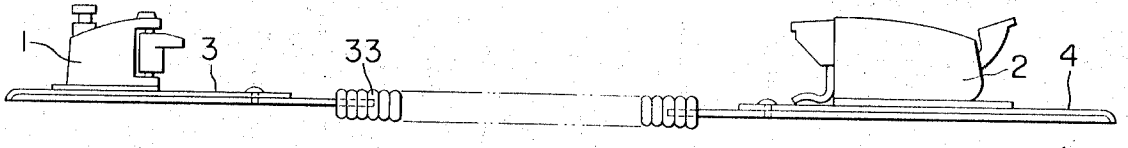
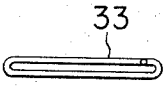


FIG. 13



CLAMPING IRON FOR SKI BOOTS

BACKGROUND OF INVENTION

Usually, the toe-iron and the heel-iron for the ski boots are respectively independent, so that when both of these irons are attached to the foot plate, it takes much time to arrange the interval between the toe-iron and the heel-iron or the attaching position on the direction of these irons, thus there have been many inconveniences in the work for attaching these irons to the foot plate.

And, in usual cases, the foot plate for heel-iron was elongated to be able to clamp the ski boots of various sizes, however, there have been many faults at the time of attaching or in use, to say nothing of bad form thereof.

SUMMARY OF INVENTION

This invention relates to clamping irons for ski boots made by connecting the toe-iron and the heel-iron with a band plate preliminarily.

It is an object of this invention to eliminate the above mentioned defects and to improve the clamping irons for ski boots, in such a manner that the toe-iron and the heel-iron may be very easily and surely attached to the ski plate, as well as the adjustment of attaching position may be effected according to the ski boots of various sizes, and simple and reliable clamping force for the ski boots may be obtained.

BRIEF DESCRIPTION OF DRAWINGS

Accompanying drawings show some examples of clamping irons for ski boots, in which FIG. 1 is a plan of the 1st example, FIG. 2 is a side view thereof, FIG. 3 is a plan of the 2nd example, FIG. 4 is a side view thereof, FIG. 5 is a plan of the 3rd example, FIG. 6 is a side view thereof, FIG. 7 is a plan of the 4th example, FIG. 8 is a side view thereof, FIG. 9 is a plan of the 5th example, FIG. 10 is a side view thereof, FIG. 11 is a plan of the 6th example, FIG. 12 is a side view thereof, and FIG. 13 is a section of the coiled-spring shaped connecting member in said example.

DESCRIPTION OF PREFERRED EMBODIMENTS

In the following, this invention will be explained in details for each example shown in the accompanying drawings.

In FIG. 1 to FIG. 10 inclusive, 1 denotes a clamping toe-iron, 2 a clamping heel-iron, of which the former is attached to a front base plate 3 and the latter to a rear base plate 4, and both of these plates are connected with a metallic band plate 5, which can bend in vertical direction but cannot bend in horizontal direction.

In each of said drawings from FIG. 1 to 10, above mentioned fundamental construction is the same, however, the construction for attachment between the clamping toe-iron 1 and the front base plate 3, the construction for attachment between the clamping heel-iron 2 and the rear base plate 4, and the construction for connection by connecting means in the form of the metallic band plate 5 between the front base plate 3 and the rear base plate 4 are different in each example, which will be explained as follows.

EXAMPLE I

In FIG. 1 and FIG. 2, the front base plate 3 is provided with a pair of right and left guide grooves 6 along the longitudinal direction of a ski plate (not shown), a through hole 7' having teeth 7 on both side edges thereof, and fitting holes 8 to the ski plate at suitable positions, and the clamping toe-iron 1 is provided with brims 9 which are slidable along said guide grooves 6 as well as a piece 10 having teeth, which will engage with said teeth 7, is connected by means of a screw 11.

So that, when the screw 11 is loosened and the piece 10 is engaged at a desired position of the through hole 7', then the screw 11 is tightened up again, the clamping toe-iron 1 is fixed at a desired position of said front base plate 3.

The rear base plate 4 is provided with a pair of right and left guide grooves 12 along the longitudinal direction of a ski plate, a through hole 13' having teeth 13 on both side edges thereof, and fitting holes 14 to the ski plate at suitable positions, and the clamping heel-iron 2 is provided with brims 15 which are slidable along said guide grooves 12 as well as a piece 16 having teeth, which will engage with said teeth 13, is connected by means of a screw 17.

So that, when screw 17 is loosened, the piece 16 is engaged at a desired position of the through hole 13', then the screw 17 is tightened up again, the clamping heel-iron 2 is fixed at a desired position of said rear base plate 4.

And, the front base plate 3 and the rear base plate 4 are connected through a metallic band plate 5 which is fixed by means of rivets 18.

19 denotes measuring lines showing fixing positions of clamping iron.

EXAMPLE II

In FIG. 3 and FIG. 4, the clamping toe-iron 1 is fixed to the front base plate 3 by means of rivet or screw 20, etc., and about the central portion of said front base blate 3 a standard line indicating hole 21 is provided to make sure the attaching position of said front base plate when it is fixed to the ski plate, so that when the indicating hole 21 is set to the standard line which is preliminarily marked on the ski plate, the front base plate can be surely fixed at the desired position.

The mechanism for attachment between the clamping heel-iron 2 and the rear base plate 4, and the mechanism for connection by means of the band plate 5 between the front base plate 3 and the rear base plate 4 are the same as said Example I.

EXAMPLE III

In FIG. 5 and FIG. 6, the construction for attachment between the clamping toe-iron 1 and the front base plate 3 and the construction for connection between the front base plate 3 and the rear base plate 4 are the same as said Example I, however, the clamping heel-iron 2 is fixed to the rear base plate 4 by means of rivets 22.

EXAMPLE IV

In FIG. 7 and FIG. 8, both of end portions of the band plate 5 are provided with several through holes 23 for adjusting the position of attachment, and any of these through holes 23 are provided with tightening screws 24, thus the front base plate 3 and the rear base plate 4 are detachably connected to both of end portions of the band plate 5 respectively, and the construction for attachment between the front base plate 3 and the

clamping toe-iron 1 is the same as said Example II, and the construction for connection between the rear base plate 4 and the clamping heel-iron 2 is the same as said Example III.

EXAMPLE V

In FIG. 9 and FIG. 10, both of end portions of the band plate 5 are provided with long holes 25 for adjusting the position of attachment, and tightening screws 26 are inserted in said long holes 25, thus the front base plate 3 and the rear base plate 4 are connected to both of end portions of the band plate 5 respectively, and the construction for attachment between the clamping toe-iron 1 and the front base plate 3 as well as between the clamping heel-iron 2 and the rear base plate 4 are the same as said Example IV.

And, in the above examples, the clamping toe-iron 1 and the front base plate 3 as well as the clamping heel-iron 2 and the rear base plate 4 are explained as respectively separated ones, however, the iron 1 and the base plate 3 as well as the iron 2 and the base plate 4 may be respectively in one united body.

The above-mentioned are explanations for each example shown in FIG. 1 to FIG. 10 inclusive, and in these examples, such a band plate is used that can bend in vertical direction but cannot bend in horizontal direction, to connect both of front and rear clamping irons for ski boots.

While, an example will be explained in the following, wherein instead of above mentioned band plate, spring material having restoration property is used to connect both of front and rear clamping irons for ski boots.

EXAMPLE VI

In FIG. 11 to FIG. 13 inclusive, 1 denotes a clamping toe-iron, 2 a clamping heel-iron, of which the former is attached to a front base plate 3 and the latter to a rear base plate 4. 27 denotes a front connection member, which can be tightened to the front base plate 3 through a screw 28 and on this front connection member 27, suitable numbers of screw hole 29 are provided so that any position for attaching said member 27 may be selected. 30 denotes a rear connection member, which can be tightened to the rear base plate 4 through a screw 31 and on this rear connection member 30, suitable numbers of screw hole 32 are provided so that any position for attaching said member 30 may be selected. In the embodiment the connection means comprises a coiled spring shaped connecting body, 33 which interconnects said front connection member 27 and said rear connection member 30 assuring a constant length, and this coiled spring shaped connecting body 33 is formed in such a manner that it maintains a constant length between the front and rear base plates 3 and 4 as well. Further, it is of course that said front connection member 27 and said rear connection member 30 will be detached from the base plate 3 or 4 by disengaging the screw 28 or 31. And, since the cross section of said coiled spring shaped connecting body 33 is flat-shape as shown in FIG. 13, it will never become an obstacle when the ski boots are clamped and used while this connecting body 33 is always attached between both members 27 and 30.

And, in this example, the clamping toe-iron 1 and the front base plate 3 as well as the clamping heel-iron 2 and the rear base plate 4 are explained as respectively separated ones, however, the iron 1 and the base plate 3 as well as the iron 2 and the base plate 4 may be respectively in one united body.

As mentioned above, in this invention, the clamping toe-iron 1 and the clamping heel-iron 2 to be fixed to the ski plate are connected and combined by the band plate 5, which can bend in vertical direction but cannot bend in horizontal direction, or by the coiled spring shaped connecting body 33, which cannot bend in vertical and horizontal directions unless any external force is exerted thereon, so that the invention has such a characteristic that when these clamping irons are attached to the ski plate, the setting of interval and position for attachment of both clamping irons, or the attaching operation thereof, etc. are easily and exactly effected.

And, in this invention, it is constructed in such a manner that the interval between the front base plate 3, to which the clamping toe-iron 1 is fixed, and the rear base plate 4, to which the clamping heel-iron 2 is fixed, can be freely adjusted, so that the interval can be adjusted according to the size of ski boots of any user, effecting sure clamping.

Further, the band plate 5 and the coiled spring shaped connecting body 33 can be bent in vertical direction by external force, so that when the ski plate is bent during ski running, they can bend accordingly without any trouble at the time of running.

What is claimed is:

1. A ski clamp for securing the front and rear ends of a ski boot to a ski, comprising a front base plate, a rear base plate, a vertically bendable but transversely substantially rigid flat connection band extending between, connected to and substantially narrower than said front base plate and said rear base plate maintaining said base plates in laterally fixed, spaced apart relationship, first securing means securing said band to said front base plate, second securing means securing said band to said rear base plate, a clamping toe iron on said front base plate, third securing means securing said clamping toe iron to said front base plate, a clamping heel iron said rear base plate, fourth securing means securing said clamping heel iron to said rear base plate, at least one of said first, second, third and fourth securing means being adjustable in longitudinal directions for varying the longitudinal spacing between said clamping toe iron and said clamping heel iron, said front and rear base plates having means for securing said plates to the ski after they are adjusted longitudinally to the size of the boot to be used.

2. A ski clamp, according to claim 1, wherein said band comprises a flat metal band.

3. A ski clamp, according to claim 1, wherein said band comprises a flattened coil spring.

4. A ski clamp, according to claim 1, wherein said first and second securing means are adjustable.

5. A ski clamp, according to claim 4, wherein said first securing means includes a plurality of longitudinally spaced through openings on said band which are selectively alignable with at least one opening on said front base plate.

6. A ski clamp, according to calim 1, wherein said first and second securing means are adjustable, said band having a plurality of longitudinally extending openings adjacent each end, said front and rear base plates having at least one opening therein alignable with a selective one of the longitudinal openings of the respective end of said band and clamping bolt means

extendable through the aligned openings for securing said band to said front base plate and said rear base plate, respectively.

7. A ski clamp, according to claim **1**, wherein said first and second securing means are adjustable and wherein said band has a longitudinally elongated slot, said front and rear base plates each having at least one slot alignable over the longitudinally elongated slot of the adjacent end of the band, and clamping means engaging through the slot of the associated rear and front base plates and the elongated slot of the band for securing said band to the associated front and rear base plate.

8. A ski clamp according to claim **1** wherein said third securing means is adjustable.

9. A ski clamp, according to claim **8**, wherein said third securing means comprises a holding plate carrying said clamping-toe iron, and means defining guide rails extending longitudinally alongside said clamping toe iron on said front base plate, said supporting plate being slidably adjustable along said guide rails.

10. A ski clamp, according to claim **1**, wherein said fourth securing means is adjustable.

11. A ski clamp, according to calim **1**, wherein said fourth securing means is adjustable and comprises a guide rail defined on said rear base plate, said clamping-heel iron being carried on a plate which is slidable on said guide rails.

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