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G. ADAM
FIXING DEVICE FOR VERTICALLY ADJUSTABLE
SOLE HOLDERS OF SKI BINDINGS
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3,379,448

FIG. 1

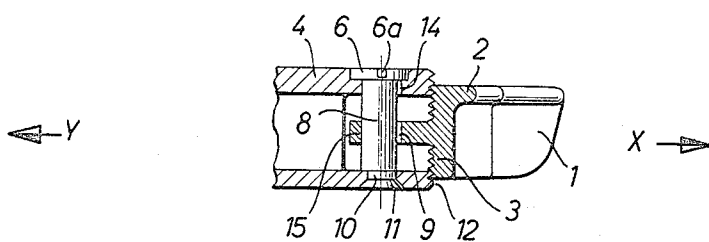
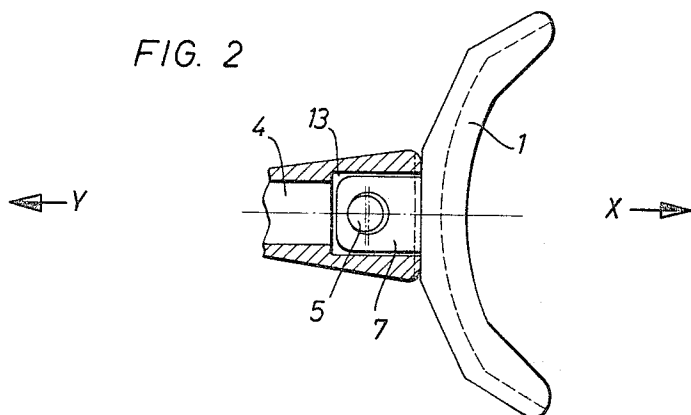


FIG. 2



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FIXING DEVICE FOR VERTICALLY ADJUSTABLE SOLE HOLDERS OF SKI BINDINGS

Günter Adam, Garmisch-Partenkirchen, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany

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5 Claims. (Cl. 280—11.35)

For vertically adjustable sole holders of ski bindings, it is known to provide a fixing device in which the sole holder is provided with a series of transverse teeth on a backing surface which is at right angles to the surface of the ski and said teeth adjustably interengage with a mating series of transverse teeth of a retaining member, and to provide fixing elements, by which the sole holder can be clamped in its vertically adjusted position against the teeth of the retaining member (German Utility Model No. 1,842,726). This arrangement for fixing and adjusting the sole holder is preferable to an arrangement in which the sole holder is pivoted by a pivot pin to a pivoted member because in this case the pivot pin must be very strong in order to be able to absorb the bending forces exerted by the toe iron which bears on the sole. Besides, shakes may cause a rotation of a screw in a vertically adjustable sole holder so that the adjusted level of the sole holder is changed. For this reason, the initially described fixing devices for sole holders are preferable because they provide for an extremely reliable connection to the retaining member and preclude an unintended adjustment. In the known fixing devices of this kind, however, the sole holder is secured to the retaining member by one or a plurality of screws, which are screwed through the sole holder and into a tapped bore in the retaining member. For this reason, the vertical adjustment of the sole holder is relatively difficult because the screw or screws are accessible only with difficulty. Another significant disadvantage resides in that the screw or screws and the sole holder can be detached from the retaining member and may be lost. Unless the screws are sufficiently tightened, continual shakes, e.g., when the ski is carried on a car, may cause the screws to fall out so that the sole holder is lost.

In a fixing device of the kind described initially hereinbefore, these disadvantages are eliminated according to the invention in that a clamping pin, which is rotatably and captively mounted in an eccentric position in the retaining member, is provided and an extension of the sole member protrudes into an aperture of the retaining member and embraces the clamping pin in such a manner that the sole holder is held to the retaining member in one position of the eccentric pin. The captive mounting ensures that the sole holder can never be lost. A particularly quick and simple adjustment is enabled because it is sufficient to effect a rotation of the eccentric pin from its dead center position near the sole holder in order to disengage the faces of the transverse series of teeth so that the sole holder can be upwardly or downwardly adjusted as desired and can then be fixed by another rotation of the eccentric pin through 180°. An unintended movement of the eccentric pin to its release position, resulting in an unintended adjustment of the sole holder, can be avoided in that the eccentric pin is mounted with high friction in the retaining member or by the provision of means for holding the eccentric pin in its clamping position.

The eccentric pin extends suitably approximately at right angles to the surface of the ski because it is particularly easily accessible from above in this case. According to another proposal according to the invention, the eccentric pin is provided at its top end face with a slot for receiving a screwdriver, a coin or the like. It will be under-

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stood that the eccentric pin may be provided with other means to facilitate its actuation, such as a knurled head or the like.

An illustrative embodiment of the invention will be explained more fully in the subsequent description with reference to the drawing, which shows a portion of a retaining member of a toe iron with the sole holder secured thereto.

In the drawing:

FIG. 1 is a sectional view showing a portion of the retaining member of the toe iron with the sole holder secured thereto and

FIG. 2 is a top plan view, also partly in section, of the portion shown in FIG. 1.

As is apparent from FIG. 1, the illustrated portion of a safety toe iron comprises the sole holder proper, designated 1, and the retaining member 4. In the case of a safety toe iron having two pivoted joints, the retaining member 4 may be pivoted to a pivoted member (not shown), which is pivoted about a pivot pin that is secured to the ski. The sole holder is provided with a flange 2, which engages the top of the sole. The sole holder 1 has also an extension in the form of a lug 7 and a series of transverse teeth 3. The lug 7 extends into an oversize aperture 13 of the retaining member 4 and has a bore 9, through which an eccentric pin 5 extends. The diameter of the bore 9 is selected so that the play of the shank 8 of the eccentric pin 5 is sufficient to enable a rotation of said shank in the bore 9 in spite of the eccentric mounting. The eccentric pin 5 is guided in the retaining member 4 in such a manner that the head 6 and the foot 10 are mounted in bores of the retaining member 4. The head 6 is provided with a slot 6a, which enables a rotation of the eccentric pin 5 by means of a coin or a screwdriver. To prevent the eccentric pin 5 from falling out, its foot 10 is riveted at 11 in the illustrated embodiment in such a manner that the pin remains rotatable. The bore 14 in the retaining member 4 is so large that the eccentric pin 5 can be rotated in spite of its eccentric shank 8.

The retaining member 4 is provided at its rear surfaces with a series of transverse teeth 12, which have a tooth profile that is complementary to the tooth profile of the series of transverse teeth 3 of the sole holder 1. The depth of the teeth must not exceed twice the eccentricity of the eccentric pin 5 in order to ensure a reliable clamping and release. To release the sole holder 1, the eccentric pin 5 is rotated until the eccentric shank has reached its dead center position in the direction X. In this case the series of teeth 3 and 12 of the sole holder 1 and of the retaining member 4 are disengaged and the sole holder can be vertically adjusted in accordance with the thickness of the sole of the skiing boot which is used. To clamp the sole holder 1, the eccentric pin 5 is simply rotated through about 180° by means of a coin or a screwdriver. This causes the eccentric shank 8 of the eccentric pin to move adjacent to its dead center position in direction Y so that the shank 8 engages that wall 15 of the bore 9 which is forwardly disposed in the longitudinal direction of the ski, and pulls the sole holder 1 by means of the lug 7 against the retaining member 4. To prevent an unintended rotation of the eccentric pin 5, it may be mounted in the retaining member 4 with relatively high friction. An additional means may be provided, if desired, which serves to retain the eccentric pin in its dead center position in direction Y. In use, the skiing will force the sole holder in any case against the retaining member 4 so that there can be no inadvertent adjustment under this condition and any pressure forces which occur will be transmitted directly by the tooth faces rather than by the eccentric pin 5.

The drawing illustrates the use of the fixing device according to the invention in a safety toe iron for ski bindings. It will be understood that the fixing device may also

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be applied to heel holders which are provided with a retaining member, which carries a sole holder.

What is claimed is:

1. In a fixing device for vertically adjustable sole holders of ski bindings, in which the sole holder is provided with a series of transverse teeth on a backing surface which is at right angles to the surface of the ski, with said teeth being adjustably interengageable with a mating series of transverse teeth of a retaining member, and fixing means by which the sole holder can be fixed in its vertically adjusted position against the teeth of the retaining member, the improvement comprising said fixing means comprising a clamping pin, which is rotatably and captively mounted in an eccentric position in the retaining member, and the sole holder including an extension which protrudes into an aperture of the retaining member and is embraced by the clamping pin in such a manner that the sole holder is held securely to the retaining member in one eccentric position of the clamping pin.

2. In a fixing device according to claim 1, the improvement of the clamping pin extending approximately at right angles to the surface of the ski.

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3. In a fixing device according to claim 2, the improvement of the clamping pin being provided at its top end face with a slot for receiving a screwdriver or the like.

4. In a fixing device according to claim 1, the improvement of the clamping pin being mounted in the retaining member with high friction.

5. In a fixing device according to claim 1, the further improvement of means for holding the clamping pin in its said one eccentric position.

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LEO FRIAGLIA, *Primary Examiner.*

L. D. MORRIS, *Assistant Examiner.*