April 26, 1960 J. F. MAPLES 2,933,740

WATER SKI HARNESS

Filed Sept. 18, 1957 2 Sheets-Sheet 1

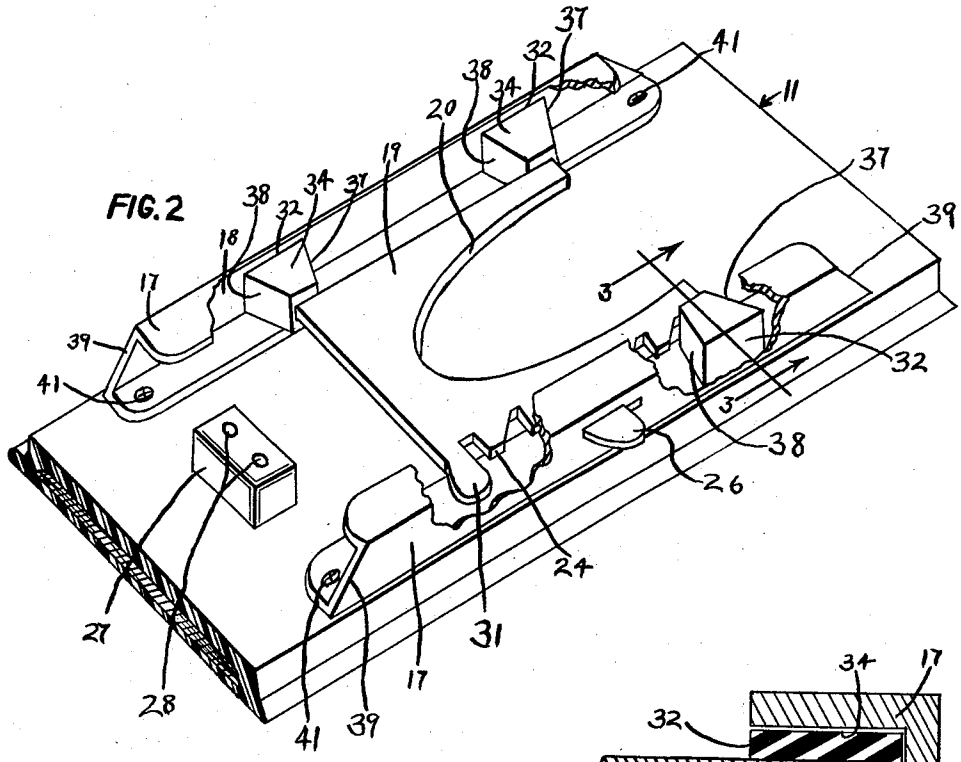


FIG. 2

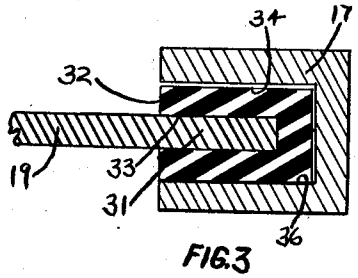


FIG. 3

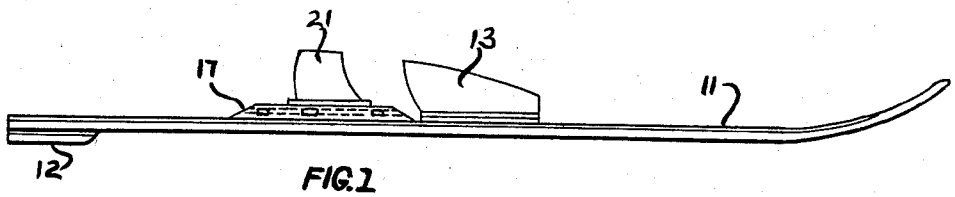


FIG. 1

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WATER SKI HARNESS

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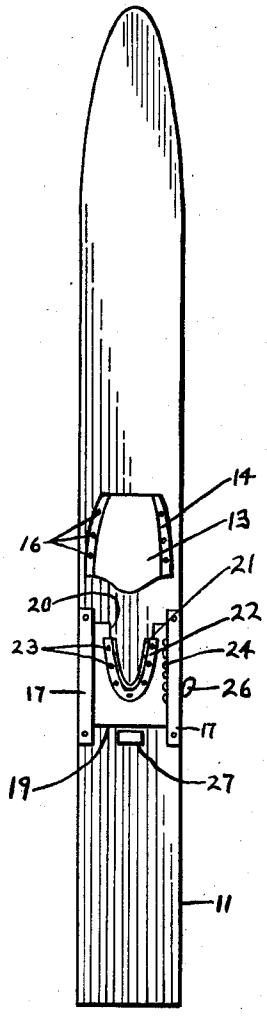


FIG. 4

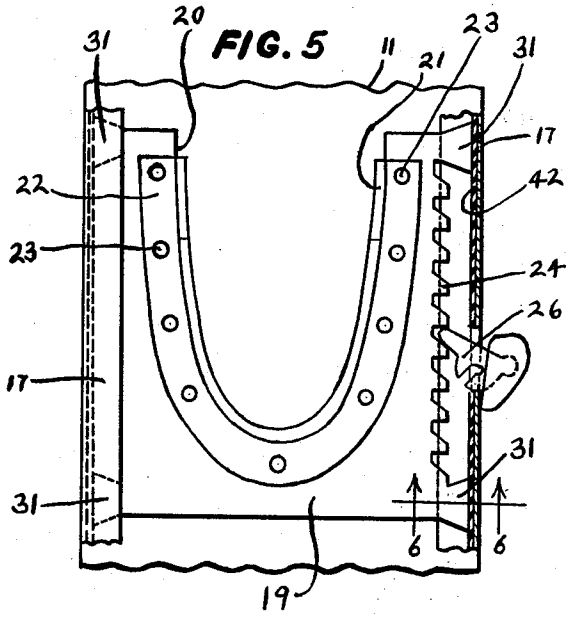


FIG. 5

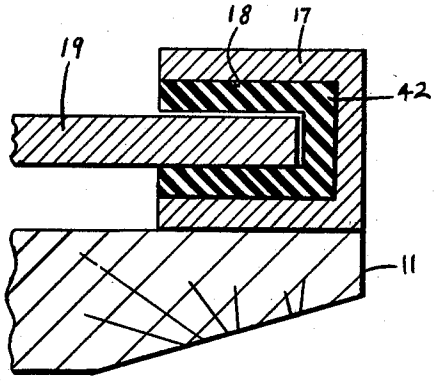


FIG. 6

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WATER SKI HARNESS

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Application September 18, 1957, Serial No. 684,795

8 Claims. (Cl. 9—310)

This invention pertains to skis and similar devices for attachment to the foot of a wearer, and more particularly to a non-binding water-ski harness.

Many devices for attachment to the foot of a wearer such as water skis, snow skis, snow shoes, skates, and the like, include, as an essential part thereof, a harness to retain the foot of the wearer in a fixed position with respect to the devices. It is desirable, and often absolutely necessary, that such devices be easily and quickly engageable with and disengageable from the foot of the wearer. For example, it is imperative that water skis be quickly disengageable from the foot in those instances where, during use, the wearer loses his balance and falls into the water. Ease of harness operation is also, of course, highly desirable during ordinary use of skis, as in positioning the foot in the harness and adjusting the harness to the size of the foot of the wearer.

It is common practice in the construction of water skis to provide a harness including a fixed toe piece or vamp for the reception of the forward portion of the foot of the wearer, the vamp being secured to the upper surface of the body of the ski. A heel support is commonly provided and is most generally slidably mounted upon the ski rearwardly of the vamp. Both vamp and heel support are commonly constructed of suitable, flexible material such as rubber, plastic, cloth or the like. Exemplary of prior art water ski harness structures is that disclosed in co-pending application Serial No. 576,292, now Patent No. 2,823,397 of Wagner wherein a flexile heel support is mounted upon a rigid heel plate which is slidable in grooved guide rails secured to the upper surface of a ski body rearwardly of a flexible vamp.

During the use of water skis, particularly those of the type having a slidably mounted heel support, it is often found that a binding action occurs which locks the heel support and resists strenuous efforts to move the same. This binding of the elements of a ski harness is most frequently caused by an entrapment of foreign particles of a hard material between the opposed surfaces of the movable element and its supporting means. For example, where skis are used in the neighborhood of sandy beaches, grains of sand invariably find their way into the movable harness mechanism and frequently causes binding thereof.

In addition to the undesirable binding or locking of movable metallic elements of the ski harness, these elements and those against which they move are quickly scratched and worn by the abrasive action of intruded sand and other foreign matter. The wear produced by the movement of metallic parts of the ski harness against one another frequently results in an objectionably noisy and often unsafe mechanism, particularly when the parts have become extremely worn.

Therefore, it is an object of the present invention to provide a non-binding foot harness for water skis and like structures.

It is another object of the invention to provide a non-binding foot harness which is wear-resistant, smooth and quiet in operation.

In order to obtain these and other objectives, and in accordance with the general features of the invention, one embodiment thereof includes a water ski comprising a body, a flexible vamp secured to an upper surface of the body, a pair of grooved guide rails secured to the body rearwardly of the vamp, a heel plate slidably mounted within the grooves of the guide rails, and a resiliently deformable liner interposed between the heel plate and the guide rails whereby particles of foreign matter such as sand grains which have intruded into the grooves and become entrapped between the guide rails and the heel plate may be pressed into the liner to prevent binding between the rails and the heel plate.

The aforementioned and other novel features and advantages of the present invention will become apparent in the following description, reference being had to the accompanying drawing wherein:

Fig. 1 is a side elevational view of a water ski provided with a fixed vamp and a slidable heel support;

Fig. 2 is a perspective view, partially cut-away, of a portion of the heel plate and guide rails of one embodiment of the invention;

Fig. 3 is a cross-sectional elevation taken along line 3—3 of Fig. 2;

Fig. 4 is a top plan view of the ski shown in Fig. 1;

Fig. 5 is a top plan view of a modified form of a heel plate and guide rails constructed in accordance with the invention, and

Fig. 6 is a cross-sectional elevation taken along line 6—6 of Fig. 5.

Referring now to the drawings, wherein like reference numerals are used to designate similar parts, and more particularly to Fig.s 1–4, Figs. 1 and 4 illustrate, respectively, in side elevational and top plan views, a water ski having a body denoted generally by the numeral 11, a rudder or skeg 12, a flexible vamp 13 of rubber, plastic, cloth or other suitable material, suitably secured to the upper surface of the ski as by means of hold-down strips 14 and screws 16. A pair of guide rails 17 is secured to the ski rearwardly of the vamp. As will be seen more clearly in Fig. 2, the rails 17 may be of a generally U-shaped transverse cross-section defining grooves 18 extending longitudinally of the rails and facing inwardly of the ski. A rigid heel plate 19 is provided with a curved leading or forward edge 20 to receive the heel of a wearer and has lateral edge portions thereof slidably mounted in the grooves 18 of the guide rails. A flexible heel support 21, is secured to the heel plate 19 as by means of a hold-down strip 22 and screws 23. Suitable means are provided for arresting and limiting the movement of the heel plate 19 with respect to the guide rails. For example, the heel plate may be provided along one edge thereof with a series of ratchet teeth 24 engageable with a pawl 26 pivoted to and extending through the corresponding guide rail. A stop 27 may be suitably secured, as by means of screws 28, to the ski adjacent the rearward extremity of the guide rails and engageable with the heel plate at its rearmost position to limit the travel thereof. The stop 27 advantageously may be covered with a rubber cover (not shown) to minimize noise and damage due to repeated forceful contact with the rear edge of the heel plate.

One embodiment of the invention is illustrated in Fig. 2, wherein the heel plate 19 is provided with a number of lugs 31 projecting from the lateral edges of the heel plate and adapted to be received within the grooves 18 of the guide rails 17. The lugs 31 may be four in number, one at each of the four corners of the generally rectangular heel plate. Caps 32 are provided, of a resiliently deformable material, such as natural or synthetic rubber,

plastic or the like, and have an internal slot 33 (Fig. 3) for reception therein of a lug 31. One lug 31 is illustrated uncapped in Fig. 2, the remaining three lugs having the caps 32 in position thereover. The outermost extremities of the lugs 31 may be slightly wider than the more inwardly located portions in order that the caps 32 may be held more tightly thereabout. A cap 32 is provided to encase each of the lugs 31 and preferably has the configuration illustrated in Fig. 2 wherein there is provided flat top and bottom surfaces 34 and 36 respectively and beveled front and back surfaces 37 and 38 respectively. The caps 32 are dimensioned in such a manner that they are easily slidable in grooves 18 of the guide rails 17 but do not permit undue lateral or vertical movement of the heel plate. The beveled front and back surfaces 37 and 38 are useful to sweep from the grooves accumulations of sand and other debris by directing such material inwardly of the ski and out of the grooves. Desirably, the extremities of the guide rails are beveled as at 39 thereby permitting attachment of the rails to the ski by screws 41 seated in countersunk holes in the lower legs of the rails. This construction results in an unobstructed groove 18 in which it is difficult or impossible for sand to become packed.

In operation in areas where sand or other hard particulate matter enters the grooves 18 of the guide rails and becomes entrapped between the rails and the caps 32, the advantages of the invention become apparent. Thus, the provision of the resilient caps 32 permits such entrapped particles to be pressed into the material of the caps until the caps pass over the particles. Such structures effectively eliminate the binding between guide rails and heel plate so often encountered in ski harnesses of the prior art.

A modified embodiment of the invention is illustrated in Figs. 5 and 6 wherein the grooves 18 of the guide rails 17 are covered with a liner 42 of resiliently deformable material such as that used in the construction of caps 32. The liner 42 may be secured to the surfaces of the grooves 18 by any suitable means such as vulcanization, waterproof adhesive materials, etc.

The operation of the modification illustrated in Figs. 5 and 6 is essentially the same as that of the embodiment illustrated in Figs. 2 and 3. The greater part of any foreign material intruding within the grooves 18 is swept out of the grooves by the action of the lugs 31 and the few remaining particles of foreign matter which are entrapped between the lugs and the resilient liner 42 are pressed into the liner thereby permitting the heel plate to pass without binding.

Manifestly, any suitable materials of construction may be utilized for the various components of the foot-supporting harness and for the ski. As illustrated in Fig. 2, the ski may be formed of a plastic or fiberglass-reinforced plastic material with a wooden core. Alternatively, the ski may be constructed entirely of wood as illustrated in Fig. 6.

Although the invention has been described and illustrated primarily as a foot-retaining harness for attachment to a water ski, it is evident that the harness could be utilized to advantage with other foot-supporting devices.

It is to be understood that the foregoing description is merely illustrative of the principles of the invention and that modifications within the capacity of one skilled in the art are to be included within the scope of the invention.

What is claimed is:

1. A foot-retaining harness for attachment to a foot-supporting base comprising a vamp fixed to the base, a heel plate, means to reciprocably slidably support said heel plate rearwardly of said vamp, and a resiliently deformable, rubber-like liner into which grains of sand and the like may be impressed, said liner being interposed between said heel plate and the heel plate-supporting means whereby binding is prevented when foreign particles are entrapped between said heel plate and said heel plate-supporting means.

2. A non-binding, foot-retaining harness for attachment to a foot-supporting base comprising a vamp fixed to an upper surface of the base, a metallic, grooved guide rail member fixed to said base rearwardly of said vamp, a metallic heel plate member having a portion thereof disposed within said groove for reciprocable sliding movement towards and away from said vamp, a resiliently deformable, rubber-like element interposed between said rail and heel plate members, said rubber-like element being fixed to one of said members and in sliding engagement with the other of said members whereby hard particles of foreign matter entrapped between said guide rail and heel plate members may be temporarily pressed into said rubber-like element by the sliding action of said heel plate to prevent binding between said rail and heel plate members, said heel plate member having beveled surfaces fixed relative thereto and integrally movable therewith, said beveled surfaces projecting into said guide rail member groove for sweeping a major portion of intruded particulate matter therefrom upon sliding movement of said heel plate member in said guide rail member.

3. In a ski, a non-binding harness comprising a vamp secured to the ski, a pair of spaced apart, grooved rails secured to the ski rearwardly of said vamp, a heel plate provided with a number of lugs projecting therefrom and slidably mounted within the grooves of said rails, and a resiliently deformable, rubber-like cap into which grains of sand and the like may be impressed, said cap being secured about each of said lugs whereby particles of foreign matter entrapped between said rails and said caps may be pressed into said caps to prevent binding between said rails and said heel plate.

4. In a ski, a non-binding harness comprising a vamp secured to an upper surface of the ski, a pair of generally U-shaped rails secured to said ski rearwardly of said vamp and having their open sides facing inwardly of said ski, a liner of resiliently deformable, rubber-like material into which grains of sand or the like may be impressed, said liner being secured to the inner surfaces of said rails, a heel plate slidably mounted on said rails and adapted, upon reciprocation with respect thereto, to sweep out of said rails a major portion of intruded particulate matter, said plate being engageable with said liner whereby remaining particles of foreign matter entrapped between said heel plate and said liner may be pressed into said liner to prevent binding between said rails and said heel plate.

5. A water ski comprising a body, a flexible vamp secured to an upper surface of said body, a pair of guide rails secured to said body rearwardly of said vamp, a heel plate slidably mounted upon said guide rails and reciprocable toward and away from said vamp, means on said plate to sweep from said rails a major portion of foreign matter intruded therein, means to arrest and to limit the movement of said heel plate, a flexible heel support secured to said heel plate, and a resiliently deformable rubber-like liner into which grains of sand and the like may be impressed, said liner being interposed between said heel plate and said guide rails whereby remaining particles of sand and other foreign matter entrapped therebetween may be temporarily pressed into said liner to prevent binding between said guide rails and said heel plate.

6. In a water ski of the type having a movable heel plate supported upon a ski body, means on said plate to remove from said plate and the plate supporting means, upon reciprocation of said plate, a major portion of particulate foreign matter intruded therebetween, and a resiliently deformable rubber-like liner into which grains of sand and the like may be impressed, said liner being interposed between said heel plate and the heel plate supporting means whereby remaining particles of foreign matter entrapped therebetween may be pressed into said liner

thereby preventing binding between said heel plate and its supporting means.

7. A device as set forth in claim 2 wherein said rubber-like element is fixed to said guide rail member and said beveled surfaces are formed on said heel plate member portion.

8. A device as set forth in claim 2 wherein said rubber-like element is fixed to said heel plate member portion

and said beveled surfaces are formed on said rubber-like element.

References Cited in the file of this patent

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2,823,397	Wagner	Feb. 18, 1958