

April 26, 1960

B. E. WALTER
WATER SKI BINDINGS
Filed Feb. 7, 1958

2,933,741

Fig. 1.

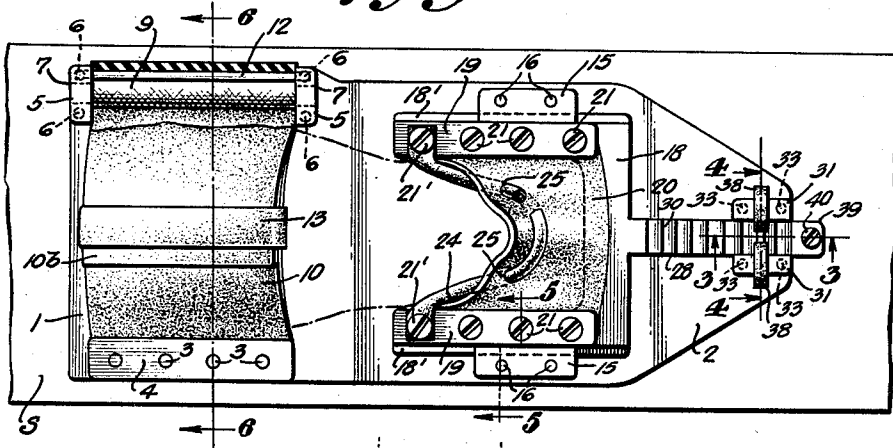


Fig. 2.

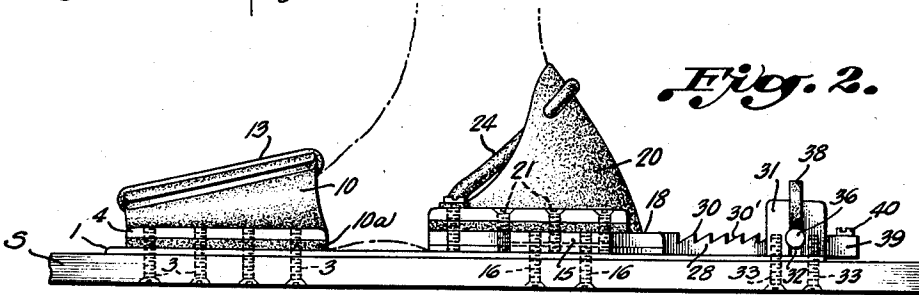


Fig. 3.

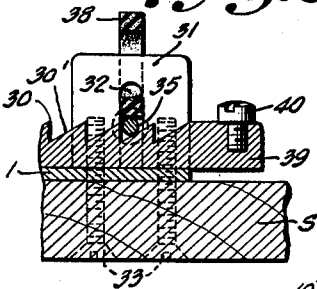


Fig. 4.

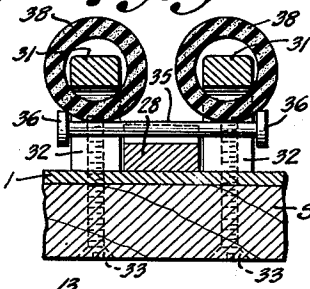


Fig. 5.

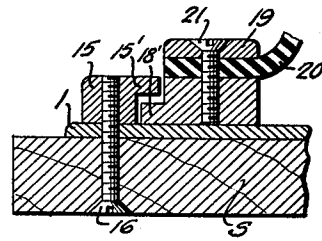
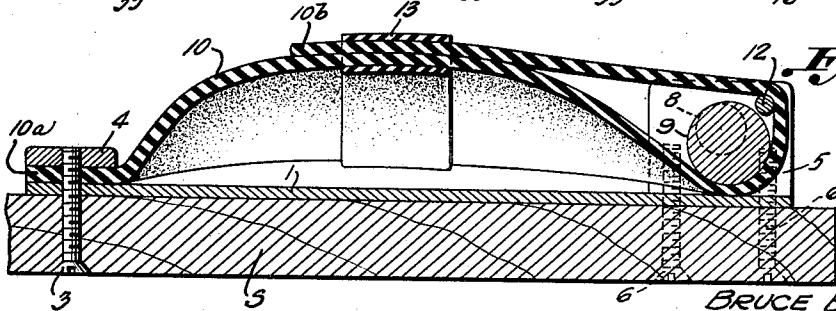


Fig. 6.



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WATER SKI BINDINGS

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Application February 7, 1958, Serial No. 713,954

10 Claims. (Cl. 9—310)

This invention relates to water ski bindings and more particularly to a ski binding which permits the adjustment of both the resilient vamp or forepart of the binding as well as the counter or heel portion of the binding.

It is the object of the present invention to provide a water ski binding which readily permits an adjustment of the counter portion with one hand to adapt the water ski to different sizes of feet of persons who may use the same and to obtain a snug and comfortable fit at the heel of the foot.

It is another object of the invention to provide a ski binding which permits an adjustable clamping of the forepart or vamp of the binding, to adapt the same to different sizes and shapes of the feet of persons using the skis, which adjustment may remain fixed while the same person uses the skis, but which nevertheless may be readily modified to vary the adjustment. At the same time, the adjustment of the vamp portion of the binding permits a rapid disengagement thereof in response to excessive forces imposed thereupon, occasioned by spills or other unusual circumstances.

It is a further object of the invention to provide a ski binding affording a snug fit at the upper portion of the counter in order to afford the wearer maximum comfort while permitting manipulative control of the skis in the desired manner with maximum safety.

It is another object of the invention to provide a ski binding consisting of few parts of rugged construction which are reliable in operation and of low cost in order to enhance the appeal of water skiing as a healthy and safe aquatic sport.

The invention proceeds upon the principle of providing a ski binding which may be mounted upon a unitary plate which is adapted to be affixed to the top surface of a water ski with a few simple fastening operations. This supporting plate carries on its forepart a wide band of flexible material which may be readily adjusted to the specific size and contours of the instep of the wearer's foot, which adjustment may remain fixed while the same person uses the ski. This adjustment may be easily modified by a simple manipulation of an eccentric clasp and furthermore, the grip for the flexible band is quickly released upon the incidence of excessive forces imposed thereon, such as may be occasioned by spills or the striking of foreign objects in the course of use of the ski.

The counter or heel portion of the ski binding is also adjustable relative to the vamp portion by the provision of a slidable U-shaped plate or yoke having a rearwardly extending projection fitted with ratchet teeth on the upper face thereof with which cooperates a locking roller extending transversely to these teeth. The roller permits movement of the yoke and counter forwardly in order to bring the counter into snug engagement with the heel and is self-locking by means of the roller which is forced into engagement in the spaces between the teeth and which blocks the yoke against retrograde movement until the roller is disengaged manually. The roller and ratchet mechanism is reliable in operation in consequence of resilient spring

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means acting to maintain the roller in operative contact with the ratchet teeth despite sharp and erratic movements which may be imposed upon the ski.

The counter portion of the ski binding also includes a resilient band engageable with the upper portion of the counter and cooperating with the upper part of the heel to maintain the counter in snug engagement with the foot of the wearer.

All the parts of the vamp and counter portions of the binding are formed of material which is resistant to moisture and is capable of giving a long useful life.

Other objects and purposes will appear from the detailed description of the invention following hereinafter, taken in conjunction with the accompanying drawing, wherein:

Fig. 1 is a plan view of the improved ski binding in accordance with the invention, with certain portions broken away to clarify the illustration;

Fig. 2 is a front elevation of Fig. 1;

Fig. 3 is a longitudinal sectional view along line 3—3 of Fig. 1;

Fig. 4 is a transverse sectional view along line 4—4 of Fig. 1;

Fig. 5 is a vertical sectional view along line 5—5 of Fig. 1; and

Fig. 6 is a transverse sectional view along line 6—6 of Fig. 1.

As shown in the drawing, the ski S, which may be formed of wood and finished in any desired manner, is adapted to have mounted on the top face thereof the metallic plate 1 formed of stainless steel, aluminum or any other metal, by means of fastening bolts extending from the underside of the ski. The rear portion 2 of the mounting plate is narrowed, as shown in Fig. 1, and all the operating parts of the ski binding are affixed to this mounting plate in order to easily adapt the unit either to new skis or to existing ones.

Instead of forming the resilient vamp portion as a fixed hood, as practiced most generally heretofore, the vamp is formed as a resilient strap 10 of gum rubber or other flexible material having its edge 10a clamped between the edge of plate 1 and an overlying bar 4 by means of bolts 3 extending from the underside of the ski S and penetrating through openings in the plate 1, flexible binding strap 10 and into the threaded openings in clamping bar 4.

Bearing blocks 5 are mounted on the opposite side of the plate 1 by means of bolts 6 extending from the underside of the ski through openings in the plate 1 and engaging threaded bores in bearing blocks 5. These bearing blocks are provided with cylindrical bearings 7 for the cylindrical trunnions 8 having an eccentric clamping cylinder 9 therebetween, which preferably is knurled in order to enhance the frictional binding between it and the upper surface of the flexible strap 10 as indicated in Fig. 6. A cylindrical stop pin 12 extends between the bearing blocks 5 and serves to limit the throw of the eccentric clamp 9 in a counterclockwise direction to an amount adequate to pass the strap 10 without travelling any great extent beyond that distance. Thus, when the free end 10b of the strap 10 is threaded between the upper surface of the plate 10 and the eccentric clamp 9, the same may be tightened as desired for the comfort of the user, and upon release of the strap the eccentric 9 will swing a short distance in a clockwise direction to clamp the strap at that point. The free end of the strap is carried back, as shown in Fig. 6, around the stop pin 12 and is engaged within retaining loop 13 to maintain the free end 10b of the strap from flapping.

It is a simple matter for the adjustment of the vamp portion to be varied by disengaging the strap 10b from the loop 13 and pulling thereon to disengage the knurled

eccentric from its clamping action and to readjust the strap in any other loosened or tightened position.

While the eccentric clamp is effective in maintaining the strap in any adjusted position, it is also capable of swinging in a clockwise direction upon the incidence of an excessive force on the strap in order to permit the strap to be released from its clamping action and to enable a rapid disengagement of the foot from the vamp portion. Such excessive force may arise when the skier takes a spill or strikes an obstacle in the water.

The counter portion of the ski binding consists essentially of a flexible strap 20 of gum rubber, leather or other suitable material, which is adapted to be clamped on to the opposite sides 18' of a U-shaped yoke 18, which is reciprocable towards and away from the vamp portion of the ski binding to enable the adjustment of the two portions for different sizes.

As shown in Figs. 1 and 5, a pair of guide tracks 15 are mounted on opposite sides of the plate 1 by means of threaded bolts 16 extending upwardly through the plate 1 and into threaded engagement with bores in the guide tracks 15. Shoulders 15' extend inwardly of the guide tracks 15 in overlying relation with footed flanges 18' on the sides of the yoke 18 with sufficient clearance therebetween to permit the restricted rectilinear movement of the yoke 18 between the guide tracks 15 and the surface of the plate 1 (Fig. 5).

The counter portion 20 is clamped on to the sides of the yoke 18 by means of rectangular clamping bars 19 through which extend fastening bolts 21 through the edges of the counter 20 and into the threaded bores at the sides 18' of the yoke.

In order to enhance the gripping effect of the flexible counter 20 on the heel of the foot, a flexible band or hose 24 may be threaded through openings 25 on the opposite sides of the top of the counter and fastened to the foremost part of the clamp for the counter by the engagement of fastening bolts 21' with the ends of this reinforcing band or flexible rope, as clearly shown in Figs. 1 and 2.

In order to permit a rapid adjustment of the counter portion relative to the vamp portion, which may be executed with one hand, the yoke 18 is provided with a projection 28 extending rearwardly therefrom along the longitudinal axis thereof. A plurality of ratchet teeth are provided in the upper face of this projection with spaces 30' therebetween, with the slopes of the ratchet teeth on the forepart thereof.

Bearing blocks or yokes 31 are mounted upon the opposite sides of the projection 28 for guiding the latter therebetween, and are affixed to the end 2 of the mounting plate by means of bolts 33 extending upwardly through the body of the ski S and apertures through the plate 1 into threaded bores on the bearing blocks or yokes 31. These blocks may be of rectangular cross-section, as shown in Fig. 4, and are formed with a passage 32 between the opposed legs thereof for the purpose of accommodating a locking roller 35 therein. The locking roller 35 is provided with enlarged heads 35' at opposite ends thereof to confine the movement of the roller 35 within the aligned slots 32, and resilient rings 38 of sponge rubber are threaded in the openings 32 (Figs. 3 and 4) in order to press the roller 35 in a downward direction for the purpose of assuring cooperative action of the roller 35 with the teeth 30 of the ratchet bar 28.

Figs. 1 and 2 show the accommodation of the counter to a small foot, which requires the manual lifting of the pin 35 from the seat 30' in which it is engaged against the resilient force exerted by the sponge rubber rings 38 which would free the yoke 18 for movement in a rearward direction of the ski, or to the right as shown in Figs. 1 to 3. Thereafter, the counter can be advanced to the heel of the user without hindrance by the roller 35 which will merely ride over the inclined faces of the

ratchet teeth 30 until the desired distance has been traversed. At that point the roller 35 is seated behind a vertical face of one of the ratchet teeth and motion of the yoke to the right is impossible without a manual lifting of the roller. Thus, the counter cannot shift in position unintentionally during operation of the skis without a manual lifting of the roller 35 as may be required by a resetting of the counter for use of the skis by different persons. The provision of the resilient rings 38 to maintain the roller in seated position despite sharp inclinations or other rapid movements of the ski, affords a desired factor of safety in a sport which presents some hazard when the counter is shifted unintentionally to release the foot of the wearer from the ski.

While the rear wall of the yoke 18 affords a stop for the movement of the counter in a rearward direction, a stop 39, provided with a screw 40 thereon, serves to limit the movement of the yoke 18 in a forward direction.

As is readily obvious, the mounting plate 1 is affixed to the top surface of the skis by means of the fastening bolts 3, 6, 16 and 33 which engage the plate at several distributed points thereof, and which additionally serve to fasten to the top of the mounting plate the essential elements of the binding assembly.

While I have described my invention as embodied in a specific form and as operating in a specific manner for purpose of illustration, it should be understood that I do not limit my invention thereto, since various modifications will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

I claim:

1. A water ski binding comprising a flexible resilient vamp portion and a flexible resilient counter portion, a plate supporting said counter portion adapted to be mounted on a ski for slidable movement thereon longitudinally thereof, a projection extending rearwardly of said plate provided with ratchet teeth on the upper face thereof, a roller extending transversely above and across said projection to permit forward movement of said slidable plate towards said vamp portion while blocking retrograde movement thereof, and means for mounting said roller on said ski.

2. A water ski binding comprising a flexible resilient counter portion and a flexible resilient vamp portion composed of a wide band of flexible material adapted to have one edge thereof affixed to the top of a ski adjacent one side thereof, and a releasable eccentric clamp adjacent to the opposite edge of the top of said ski and in direct contact with said band of flexible material for adjustably clamping the free end of said wide band in conformity with the instep of the user, said clamp being releasable upon the incidence of excessive force on said band to permit disengagement of the band therefrom.

3. A water ski binding comprising a flexible resilient vamp portion and a flexible resilient counter portion, said flexible resilient vamp portion including a wide band of flexible material adapted to have one edge thereof affixed to the top of a ski adjacent to one side thereof, an eccentric clamp adjacent to the opposite edge of the top of said ski and in direct contact with said band of flexible material for adjustably clamping the free end of said wide band in conformity with the instep of the wearer, said clamp being releasable upon the incidence of excessive force on said band to permit disengagement of the wearer's foot therefrom, a plate supporting said counter portion slidably mounted on said ski longitudinally thereof, a projection extending rearwardly of said plate provided with ratchet teeth on the upper face thereof, a roller extending transversely above and across said projection to permit forward movement of said slidable plate towards said vamp portion while blocking retrograde movement thereof, and means for mounting said roller on said ski.

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4. A water ski binding comprising a flexible resilient vamp portion and a flexible resilient counter portion, a U-shaped plate supporting said counter portion on the opposite sides of said plate, means for mounting said plate onto the top of a ski for slidable movement thereon longitudinally thereof, a projection extending rearwardly of said plate provided with ratchet teeth on the upper face thereof, a pair of slotted guide blocks on the opposite sides of said projection for limiting the reciprocable movement thereof, and a roller extending transversely above and across said projection and movable within the slots in said guide blocks to permit forward movement of said slidable plate towards said vamp portion while blocking retrograde movement thereof.

5. A ski binding as set forth in claim 4 wherein resilient means is provided on said guide blocks for yieldingly pressing said roller into engagement with said ratchet teeth.

6. A ski binding as set forth in claim 5 wherein said resilient means comprises resilient annular rings in engagement with the guide blocks and having a portion thereof disposed in the upper ends of the guide slots therein.

7. A water ski binding comprising a flexible resilient vamp portion and a flexible resilient counter portion, a plate supporting said counter portion adapted to be mounted on a ski for slidable movement thereon longitudinally thereof, means for clamping the opposite sides of said counter to the top of said slidable plate, a resilient band threaded through the upper portion of the counter with the ends thereof clamped to the forepart of the counter, a projection extending rearwardly of said plate provided with ratchet teeth on the upper face thereof, a roller extending transversely above and across said projection to permit forward movement of said slidable plate towards said vamp portion while blocking retrograde movement thereof, and means for mounting said roller on said ski.

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8. A water ski binding comprising a flexible resilient counter portion and a flexible resilient vamp portion composed of a wide band of flexible material adapted to have one edge thereof affixed to the top of a ski adjacent to one side thereof, and a releasable rotary eccentric clamp adjacent to the opposite edge of the top of said ski for adjustably clamping the free end of said wide band in conformity with the instep of the user, means for limiting the rotary movement of said clamp in one direction and said clamp being capable of rotation in the reverse direction to release said band therefrom upon the exertion of excessive force on said band.

9. A ski binding as set forth in claim 8 wherein said band is surrounded by a flexible retaining loop to receive the free end of said band beyond its points of engagement with said eccentric clamp.

10. A water ski binding comprising a flexible resilient counter portion and a flexible resilient vamp portion composed of a wide band of flexible material adapted to have one edge thereof affixed to the top of a ski adjacent to one side thereof, a pair of aligned bearing blocks affixed to the opposite edge of the top of said ski adjacent to the opposite edge thereof, a releasable rotary clamp mounted between said bearing blocks having an eccentric portion for adjustably clamping the free end of said wide band in conformity with the instep of the user, said clamp being releasable upon the incidence of excessive force on said band to permit disengagement of the band therefrom, and a unitary metallic plate on the top of said ski for mounting said counter and vamp portions onto said ski.

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