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Jack

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[54] **FOOT BINDING MECHANISM**

[76] Inventor: **Charles L. Jack,** 2638 Southeast Ct., Wichita, Kans. 67216

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[52] **U.S. Cl.** ..... **9/310 AA,** 280/11.35 R

[51] **Int. Cl.** **A63c 9/24**

[58] **Field of Search** ..... 280/11.35 R, 11.35 C, 280/11.35 H, 11.35 T, 11.35 V, 11.13 R, 280/11.35 G; 9/310 AA, 310 R; 115/70; 269/201, 269/208, 215, 211

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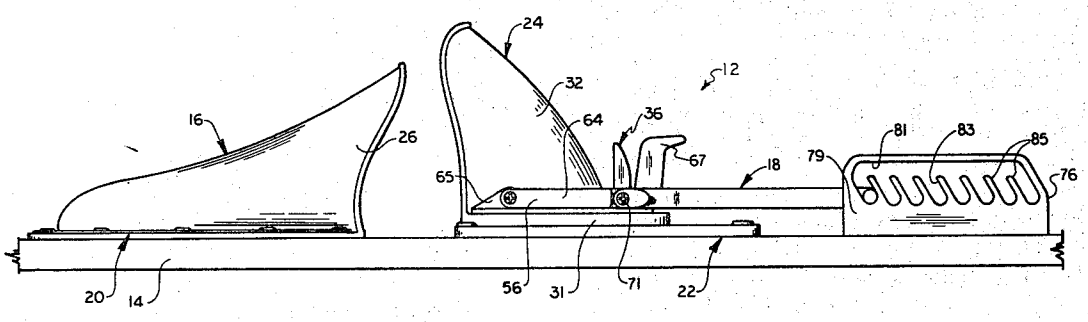
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Primary Examiner—Robert G. Sheridan
Assistant Examiner—G. L. Auton

[57] **ABSTRACT**

This invention is a foot binding mechanism to receive one's foot therein having a foot support assembly mounted on a support member and a binding assembly connected to the foot support assembly and the support member. The foot support assembly includes (1) a stationary housing assembly to support a forward portion of one's foot; (2) a movable housing assembly connectable about the heel of one's foot; and (3) the binding assembly connected to the movable housing assembly and the support member. The binding assembly includes a thrust member connected to the movable housing assembly, an anchor bar connected to the thrust member and to an anchor assembly. The anchor bar is movable in an upward direction to the unlatched condition for ease of adjustment requiring only a single hand to do so.

6 Claims, 5 Drawing Figures



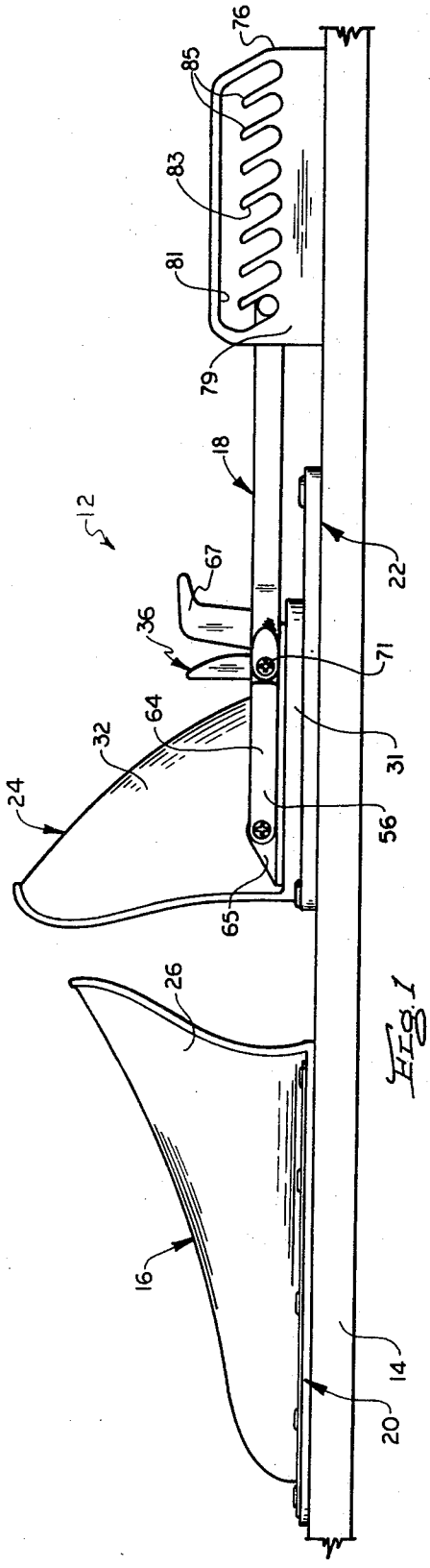

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Fig. 1

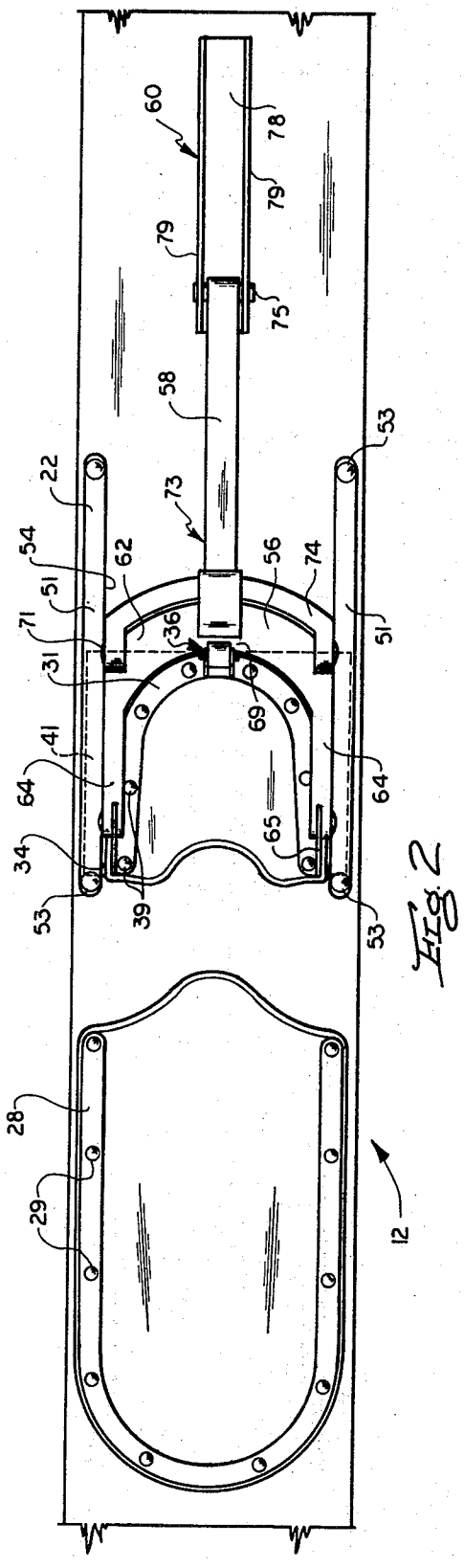

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Fig. 2

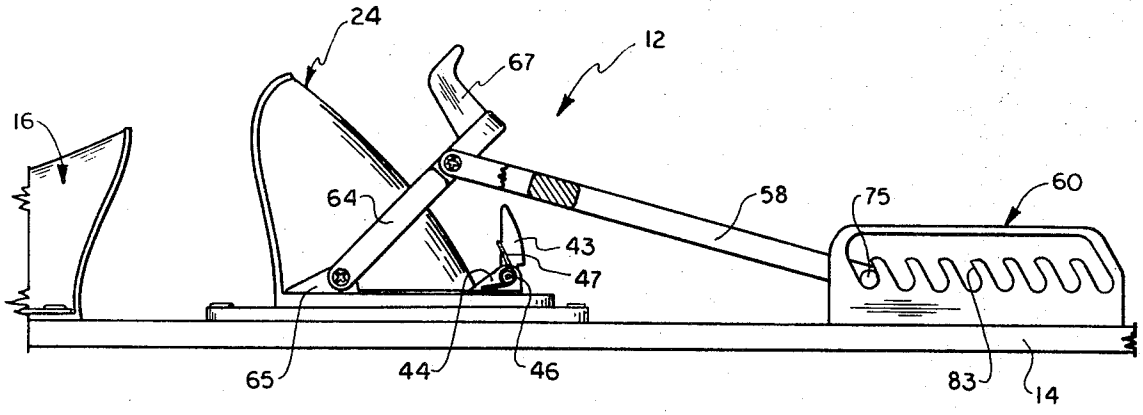


Fig. 3

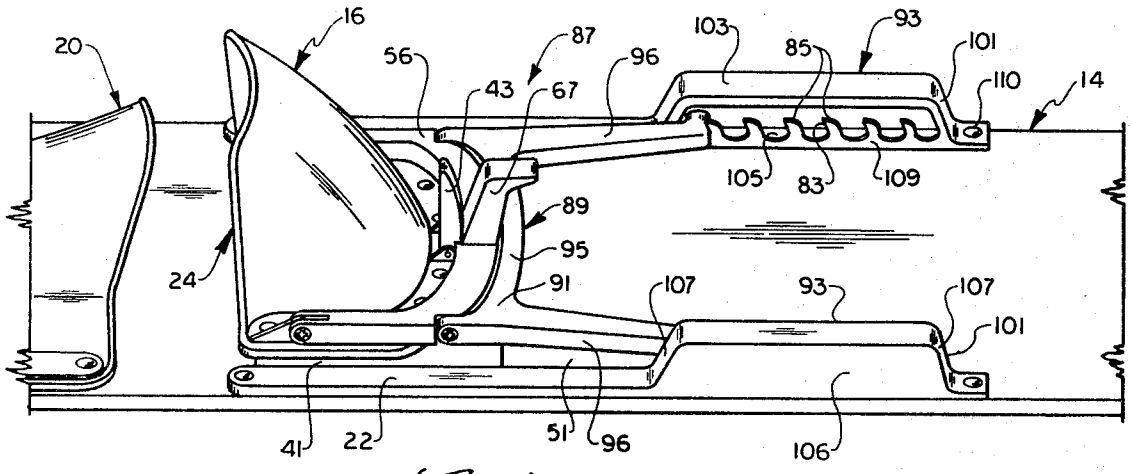


Fig. 4

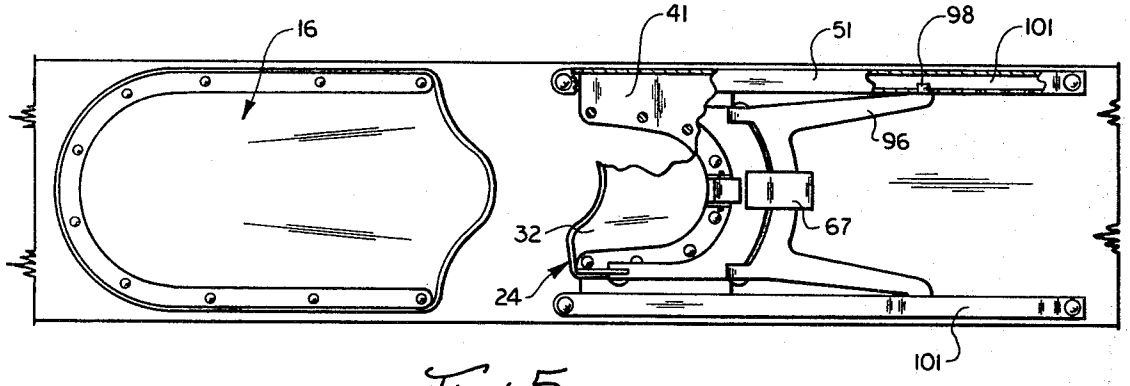


Fig. 5

FOOT BINDING MECHANISM

PRIOR ART

In the prior art, there are numerous binding structures which are utilized for holding snow ski boots or one's foot on water skis but they are complicated in usage requiring both hands for attachment and adjustment thereof. The prior art devices fail to disclose a binding structure which is readily movable from the latched to unlatched conditions requiring only one hand to do so and, therefore, the prior art devices are especially difficult to use when one is floating in the water and attempting to mount water skis. Aadditionally, the prior art binding structures are generally complicated in structure, hard to use, un-reliable in operation, cannot be easily placed in a repeat adjusted condition, and are normally unattractive in appearance.

SUMMARY OF THE INVENTION

In one preferred embodiment of this invention, a foot binding mechanism is provided which is easily attachable to a support structure such as a water or snow ski and adapted to receive and anchor one's foot therein. The foot binding mechanism includes a foot support means secured to the support member and a binding means mounted between a portion of the foot support means and the support member. The foot support means includes a stationary housing assembly secured to the support member adapted to receive the forward portion of a foot therein; a movable housing assembly secured to the support member adapted to receive a person's heel portion therein; and a connector housing secured to the support member adapted to receive the movable housing assembly therein for longitudinal movement. The binding means includes a main thrust member secured to the movable housing assembly; an anchor bar connected to the thrust member on one end thereof; and an anchor assembly secured to the support member and adjustably connected to the opposite end of the anchor bar. The thrust member includes a main thrust body pivotally connected to the movable housing assembly having thereon a lift knob to move from unlatched to latched conditions. The anchor bar includes one end pivotally connected to the thrust member and the other end provided with laterally extended connector shafts which are mountable within the anchor assembly. The anchor assembly is provided with a pair of upright parallel sidewalls having a plurality of forwardly extending slots therein to receive respective ones of the connector shafts in an adjusted position. The movable housing assembly is moved longitudinally within guide tracks of the connector housing on movement of the anchor bar. On placement of the anchor bar in particular ones of the opposed slots in the anchor assembly, such operates to hold in an adjusted position and provides numerous positions for foot size variations.

In another preferred embodiment, a foot binding mechanism is provided having a foot support means connected to support member such as a water or snow ski member and having a binding means mounted between the support member and the foot support means. The foot support means is substantially identical to that in the first embodiment having a stationary housing assembly, a movable housing assembly, and a connector housing. The main difference in this embodiment is the binding means which includes a thrust member, an anchor bar, and a anchor assembly. The anchor bar is provided with a main body portion having a pair of spaced connector legs having outer connector shafts which are mountable within respective portions of the anchor assembly. The anchor assembly is provided with a pair of upright housing assemblies in spaced parallel relationship connected to the connector housing. Each housing assembly includes a plurality of forwardly extending connector slots adapted to receive the connector shaft of the respective connector legs therein. This second embodiment operates substantially identical to that of the first embodiment except having the parallel connector legs and separate connector housings to provide for a more rigid latching of the foot binding mechanism.

One object of this invention is to provide a foot binding mechanism which can be readily attached to a support ski of various types having a foot support means and a binding means, the binding means is operable in an easy manner to be moved to an adjusted position and to the latched and un-latched conditions requiring only one hand to do so.

One further object of this invention is to provide a foot binding mechanism which can be used to hold any foot structure in a rigid manner.

Still, another object of this invention is to provide a foot binding mechanism having an interconnected foot support means and a binding means which, on movement from the latched to the un-latched condition, provides for a substantial longitudinal movement of a portion of the foot support means for ease of inserting and removing a foot structure.

Still, a further object of this invention is to provide a foot binding mechanism having a binding means, an anchor bar, and an anchor assembly connected to a foot support means whereby the foot binding mechanism is readily operable to hold the foot support means in the adjusted condition regardless of the force applied thereto.

Still, another object of this invention is to provide a foot binding mechanism which is easy to use, attractive in appearance, economical to manufacture, substantially maintenance free, and safe in operation.

DESCRIPTION OF THE DRAWINGS

Various other objects, advantages, and features of the invention will become apparent to those skilled in the art from the following discussion, taken in conjunciton with the accompanying drawings, in which:

FIG. 1 is a fragmentary side elevational view of a support ski member having a foot binding mechanism of this invention attached thereto;

FIG. 2 is a view similar to FIG. 1 showing a top plan view of the foot binding mechanism of this invention;

FIG. 3 is a fragmentary side elevational view similar to FIG. 1 except showing the foot binding mechanism of this invention in the unlatched condition;

FIG. 4 is a fragmentary perspective view of a support ski member illustrating a second embodiment of the foot binding mechanism of this invention connected thereto; and

FIG. 5 is a fragmentary top plan view of the second embodiment of the foot binding mechanism of this invention having portions thereof broken away for clarity.

DESCRIPTION OF PREFERRED EMBODIMENTS

The following is a discussion and description of preferred specific embodiments of the new foot binding mechanism of this invention, such being made with reference to the drawings, whereupon the same reference numerals are used to indicate the same or similar parts and/or structure. It is to be understood that such discussion and description is not to unduly limit the scope of the invention.

In one preferred embodiment of this invention as shown in FIGS. **1** and **2**, a foot binding mechanism, indicated generally at **12**, is shown as mounted on an elongated flat support member **14** which is normally a snow or water ski member. The foot binding mechanism **12** is utilized to retain one's foot thereon whether bare as for water skiing or may be adapted to anchor a ski boot thereon for snow skiing. However, the foot binding mechanism **12** described herein is utilized to anchor one's foot to a water ski member.

The foot binding mechanism **12** includes a foot support means **16** connected to the support member **14** and a binding means **18** mounted between the support member **14** and the foot support means **16.** The foot support means **16** includes a stationary housing assembly **20** secured to the support member **14**; a connector housing **22** secured to the support member **14**; and a movable housing assembly **24.**

The stationary housing assembly **20** includes a foot support boot **26** secured by an anchor member **28** mounted by screw members **29** to the support member **14.** More particularly, the anchor member **28** is of a generally u-shape so as to enclose the forward peripheral portion of one's foot. The foot support boot **26** is constructed of a resilient rubber material.

The movable housing assembly **24** includes a main u-shaped connector element **31** to receive and anchor a heel support boot **32** against a guide plate **34** and a latch assembly **36.** The connector element **31** is provided with a plurality of spaced holes to receive respective screw members **39** connected to the guide plate **34.** The guide plate **34** has opposed, outer guide sections **41** to be mounted within the connector housing **22** for sliding movement to be explained. The latch assembly **36** is mounted on a central, rearward portion of the connector element **31** and includes a latch member **43** pivotally connected to a support lug **44** by a pin member **46.** The latch assembly **36** further includes a spring member **47** mounted about the pin member **46** to bias the latch member **43** in a rearward, latched condition as viewed in FIG. **3.**

The connector housing **22** is provided with a pair of parallel, opposed guide tracks **51,** each secured as by connector members **53** to the support member **14.** Each guide track **51** includes a longitudinal guide slot **54** therein to receive a respective guide section **41** of the guide plate **34** therein for longitudinal movement in a manner to be explained. It is noted that the combination of the stationary housing assembly **20** and the movable housing assembly **24** resembles a conventionally available foot support structure found on water ski structures. However, the novelty lies more specifically in the binding means **18** of this invention.

The binding means **18** includes a main thrust member **56** pivotally connected to the movable housing assembly **24**; an anchor bar **58** pivotally connected to the thrust member **56**; and an anchor assembly **60** connected to the support member **14** and operable to adjustably receive one end of the anchor bar **58** therein. The thrust member **56** is of a generally u-shape having a main body **62** with forwardly extended leg sections **64.** The forward most portions of the leg sections **64** are pivotally connected to upright connector tabs **65** integral with the connector element **31** of the movable housing assembly **24.** A central portion of the thrust main body **62** is provided with upwardly extended lift knob **67** to be utilized in moving to latched and unlatched conditions as will be explained. Adjacent and forwardly of the lift knob **67** is a latch portion **69** to receive the latch member **43** thereagainst when in the latched condition as shown in FIG. **1.** Outer portions of the main body **62** are each provided with an opening to receive screw members **71** for pivotal connection to the anchor bar **58.**

The anchor bar **58** is provided with a body section **73** having a forward u-shaped support section **74** with integral outer arm sections **76** pivotally connected by the screw members **71** to the main body **62.** The rearward end of the body section **73** is provided with a laterally extended connector shaft **75** to be received in the anchor assembly **60.**

The anchor assembly **60** is provided with a main body **76** having a bottom wall **78** secured to the support member **14** and having a pair of parallel, opposed upright sidewalls **79** integral with the bottom wall **78.** Each sidewall **79** is provided with a cut-out section **81** which includes a plurality of connector or guide slots **83** separated by forwardly extended separator or finger elements **85.** Pairs of opposed guide slots **83** are operable to selectively receive the connector shaft **75** of the anchor bar **58** therewithin in a desired adjusted position as will be explained.

In a second preferred embodiment of this invention, as shown in FIGS. **4** and **5**, a foot binding mechanism **87** is attached to the support member **14.** The foot binding mechanism **87** includes the foot support means **16** and a binding means **89** connected to the support member **14** and the foot support means **16.** The foot support means **16** is substantially identical to that previously described having the stationary housing assembly **20** secured to the support member **14**; the movable housing assembly **24** connected to the connector housing **22** which, in turn, is secured to the support member **14.**

The binding means **89** of this embodiment is provided with the previously described main thrust member **56** and having an anchor bar **91** secured to an anchor assembly **93.** The anchor bar **91** is provided with a main body or yoke section **95** having integral, spaced connector legs **96,** each of which are mountable in the anchor assembly **93.** The connector legs **96** are each provided at the outer most ends with an outwardly extended connector shaft **98** to be mountable within the anchor assembly **93.**

The anchor assembly **93** is provided with two anchor sections **101,** each extended rearwardly and integral with respective one's of the guide tracks **51** of the connector housing **22** of th foot support means **16.**

More particularly, each anchor section **101** is provided with a main body **103** having a bottom wall **105,** an outer wall **106,** endwalls **107,** and an inner sidewall **109** which is provided with a plurality of connector or guide slots **83** therein. It is seen that each anchor section **101** is secured as by screw members **110** to the

support member **14**. The connector slots **83** are separated by forwardly extended separator or finger elements **85**.

OPERATION OF THE INVENTION

In the use and operation of the foot binding mechanism **12** of this invention, it is seen that the latch member **43** can be pivoted to the unlatched condition and the lift knob **67** moved upwardly to the unlatched condition as shown in FIG. **3**. In this condition, one can insert a foot within the foot support boot **26** to enclose same. Of course, the anchor bar **58** can be moved longitudinally within the anchor assembly **60** to place the connector shafts **75** in the desired cooperating pair of the connector or guide slots **83** depending on adjustment required. On placing the anchor bar **58** in the desired adjusted condition, it is obvious that the lift knob **67** can be moved downwardly to move the movable housing assembly **24** forwardly until the thrust member **56** and anchor bar **58** are extended generally in the same plane to the latched condition of FIG. **1**. Of course, the latch member **43** is engagable with the latch portion **69** of the main body **62** to hold in this latched condition.

On movement to the unlatched condition, one needs to grasp the lift knob **67** and, with one's thumb, pivot the latch member **43** in a counter-clockwise direction as viewed in FIG. **1**. The lift knob **67** can then move vertically to the unlatched condition of FIG. **3** requiring only one hand to achieve same.

In the second preferred embodiment, being the foot binding mechanism **87** of this invention, it is seen in the operation that is is substantially identical of the first embodiment as far as latching and unlatching except the anchor bar **91** has the parallel connector legs **96** mountable within the connector or guide slots **83** to anchor against lateral movement. The foot binding mechanism can be readily adjusted as to foot size with the connector shafts **98** in selected connector slots **83** of the anchor assembly **93**. Also, movement to the latched and unlatched conditions is identical to that previously described in the first embodiment.

In the second embodiment being the foot binding mechanism **87** as shown in FIGS. **4** and **5**, it is noted that such provides for an open space between the anchor sections **101** so that one can utilize with a single ski as the foot not within the foot support means **16** can be placed between the anchor sections **101**. Additionally, in this embodiment, it is seen that the use of the spaced connector legs **96** provides for more rigid connection and would not permit any possible lateral twisting movement of the movable housing assembly **24** when in the latched condition.

While the invention has been described in conjunction with preferred specific embodiments thereof, it will be understood that this description is intended to illustrate and not to limit the scope of the invention, which is defined by the following claims.

I claim:

1. A foot binding mechanism adapted to receive one's foot therein, comprising:

a. a foot support means attached to a main support member having a stationary housing assembly and a movable housing assembly;

b. said movable housing assembly connected by a connector housing to said support member;

c. a binding means connected to said movable housing assembly and said support member;

d. said binding means includes a thrust member connected to said movable housing assembly, an anchor bar connected to said thrust member, and an anchor assembly connected to said anchor bar;

e. said anchor bar movable longitudinally within said anchor assembly to adjusted positions and freely movable in an upward manner to the unlatched condition for substantial longitudinal movement of said movable housing assembly and, subsequently, movable downwardly to the latched condition in contact with said anchor assembly;

f. said anchor assembly having a plurality of guide slots therewithin to selectively receive said anchor bar therewithin in an adjusted condition whereby said anchor bar is movable within said guide slots so as to be movable to various adjusted position, and said guide slots restrict rearward movement of said anchor bar and permit upward and lateral movement thereof to another adjusted position.

2. A foot binding mechanism as described in claim **1**, wherein:

a. said stationary housing assembly having a connector member securing a foot support boot against said support member;

b. said thrust member having a main thrust body pivotally connected to said movable housing and pivotally connected to said anchor bar and movable about a pivot point from latched to unlatched conditions, and

c. said anchor assembly having a pair of spaced sidewalls having a plurality of said guide slots therewithin to selectively receive said anchor bar therewithin in an adjusted condition whereby said anchor bar is movable within said sidewalls and outwardly of said guide slots so as to be movable to various adjusted position.

3. A foot binding mechanism as described in claim **1**, wherein:

a. said anchor assembly having a pair of spaced sidewalls having the plurality of said guide slots therewithin to selectively receive said anchor bar therewithin in an adjusted condition whereby said anchor bar is movable within said sidewalls and said guide slots so as to be movable to various adjusted positions, and

b. said guide slots having forwardly extended finger elements to restrict rearward movement of said anchor bar and permit upward and lateral movement thereof to another adjusted position.

4. A foot binding mechanism as described in claim **3**, wherein:

a. said anchor assembly provided with a pair of spaced anchor sections each to receive a portion of said anchor bar therein; and

b. said anchor bar having a pair of parallel connector legs, each having an outwardly extended connector shafts to mount in respective one's said guide slots to hold in the adjusted conditions.

5. A foot binding mechanism as described in claim **4**, wherein:

a. said movable housing assembly having a connector element securing a heel support boot against said support member;

b. said connector element haivng guide plates movable within said connector housing for longitudinal movement;

c. said connector element having a latch assembly engageable with said thrust member to anchor and hold said anchor bar in the latched condition.

6. A foot binding mechanism as describe in claim **4,** wherein:

a. said connector legs mounted on opposed edges of said support member to present a support area therebetween;

b. said thrust member and anchor bar extended in a common horizontal plane in the latched condition to prevent movement of said movable housing assembly, and

c. said connector legs mounted within said guide slots and held against rearward movement by said finger elements.

* * * * *