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 [45] Patented **Dec. 15, 1970**
 [73] Assignee **American Machine & Foundry Company**
a corporation of New Jersey

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[54] MOVABLE-CARRIAGE SKI EXERCISER

6 Claims, 13 Drawing Figs.

[52] U.S. Cl. 272/57
 [51] Int. Cl. A63b 23/04
 [50] Field of Search 277/57B

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ABSTRACT: A movable carriage mounted on two curved parallel guide rails. The carriage is centered on the rails by rubber straps. Interconnected foot pads having limited freedom of rocking and pivotal movement are carried on top of the carriage to provide an edging effect while executing parallel skiing technique.

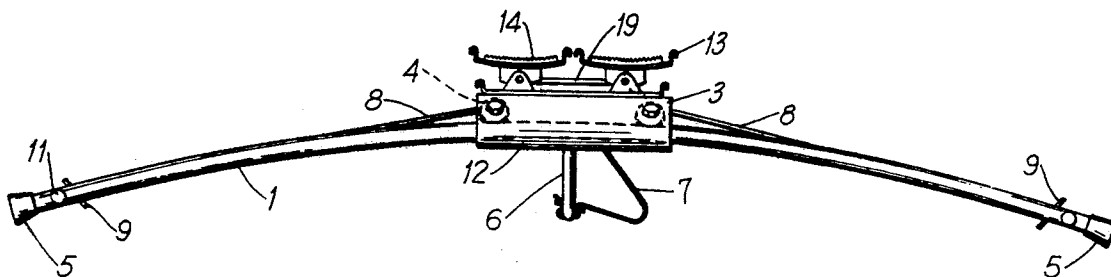


FIG. 1

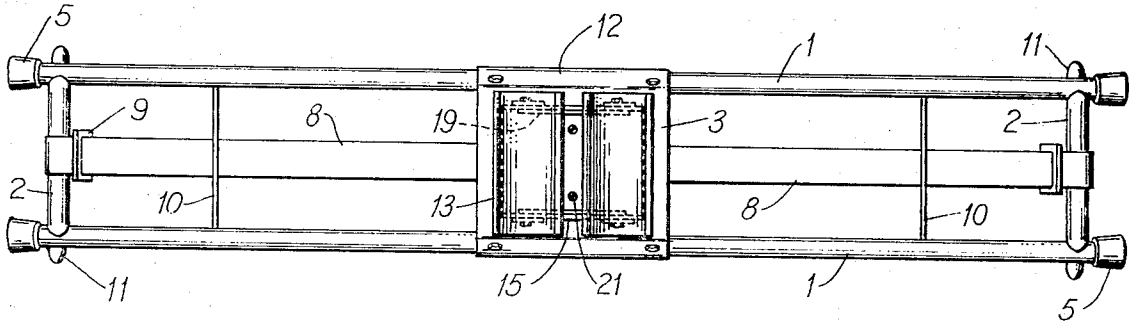


FIG. 2

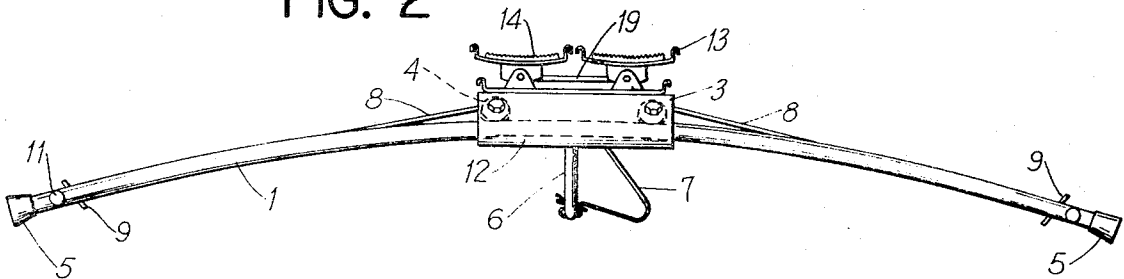
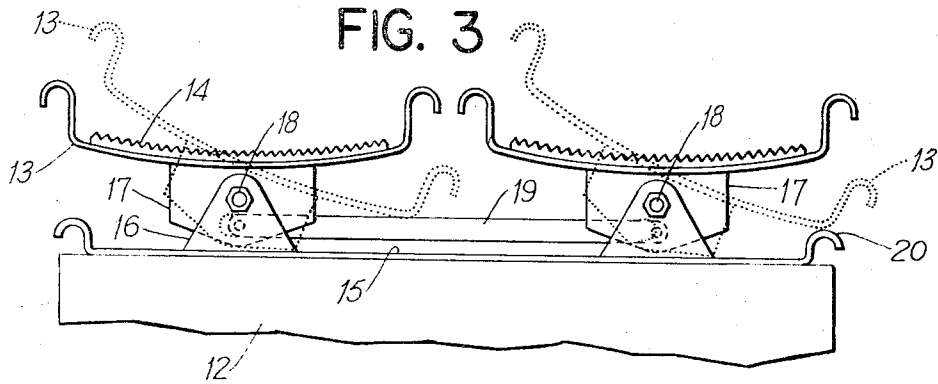


FIG. 3



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FIG. 4

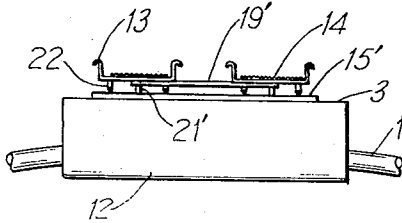


FIG. 5

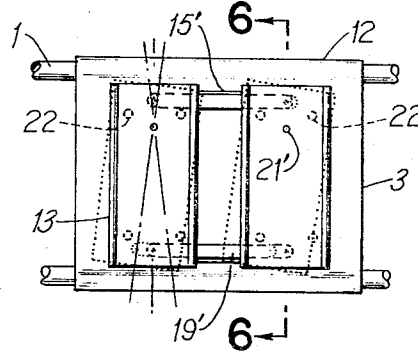


FIG. 6

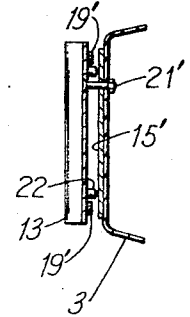


FIG. 7

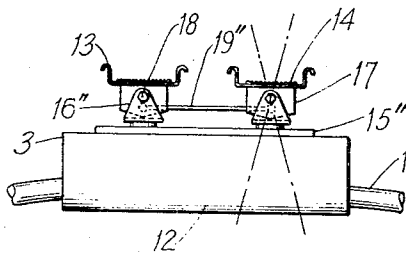


FIG. 8

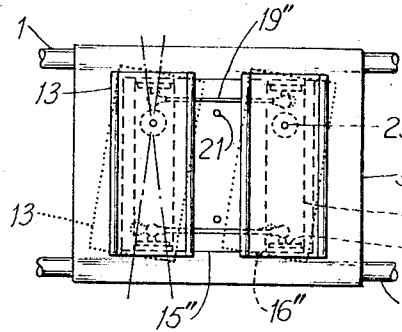


FIG. 9

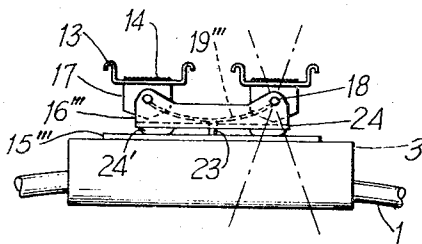
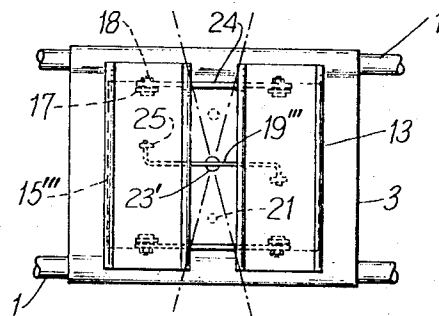


FIG. 10



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FIG. II

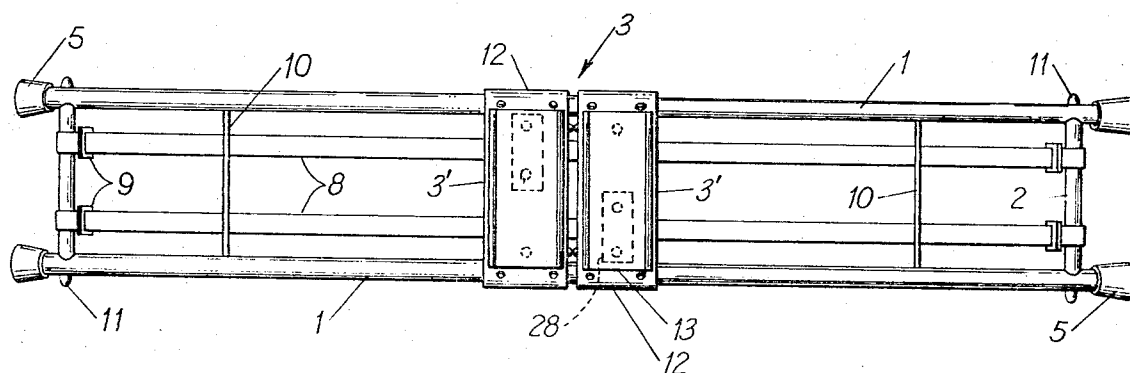


FIG. 12

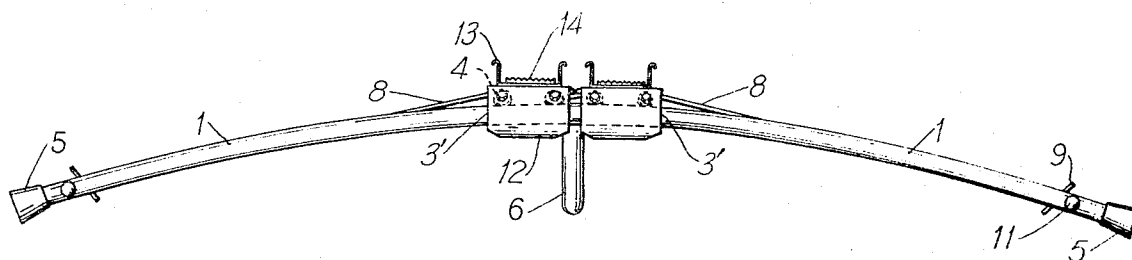
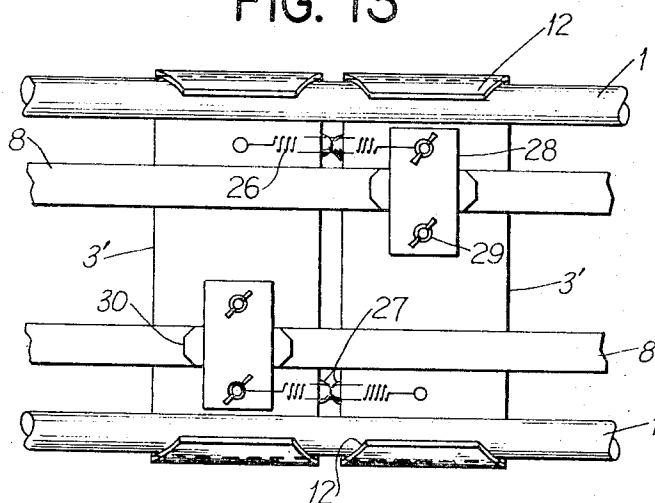


FIG. 13



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MOVABLE-CARRIAGE SKI EXERCISER

This invention relates to an improved ski exercising apparatus. More particularly, this invention is an improvement on my copending application Ser. No. 672,311 filed Oct. 2, 1967 for Ski Exercising Apparatus, which is assigned to the same assignee as the instant invention.

It is an object of this invention to provide an improved ski exercising apparatus which will more nearly simulate true Wedeln or parallel skiing technique.

It is a further object of this invention to provide an improved ski exercising apparatus which will make it possible for the user thereof to simulate "edging" when performing ski exercises on the device.

It is a further object of this invention to achieve the above stated advantages in a low cost, uncomplicated, and readily assembled attachment for a ski exercising apparatus which is currently available on the the market.

The ski exercising apparatus disclosed in my copending application is currently available on the market. It comprises a pair of parallel spaced guide rails and a carriage mounted thereon for shuttling from left to right while exercising with the device. The guide rails are curved downwardly from their central portion towards their opposite ends. In using the device the person stands with his full weight on the carriage and by shifting the body weight left to right the carriage is caused to shuttle alternately in a left to right direction. The sideways movement of the carriage is restrained by resilient means such as a rubber strap extending from the carriage to opposite ends of the guide rails.

Briefly, in the instant invention a pair of movable foot pads are provided on the carriage of the above described type of ski exercising apparatus so that "edging" is simulated when executing the parallel skiing technique on the device. In the preferred form of the invention the movable foot pads comprise part of an accessory which can be readily assembled to existing ski exercising apparatus.

The features of the invention which are believed to be novel are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a top plan view of a preferred form of the invention;

FIG. 2 is a front elevation view of the device shown in FIG. 1;

FIG. 3 is an enlarged view of the central portion of FIG. 2;

FIG. 4 is a front elevation view of another form of the invention;

FIG. 5 is a top plan view of the device illustrated in FIG. 4;

FIG. 6 is a sectional view taken along the section line 6-6 of FIG. 5;

FIG. 7 is a front elevation view of a third form of the invention;

FIG. 8 is a top plan view of the device illustrated in FIG. 7;

FIG. 9 is a front elevation view of a fourth form of the invention;

FIG. 10 is a top plan view of the device illustrated in FIG. 9;

FIG. 11 is a top plan view of a fifth form of the invention;

FIG. 12 is a front elevation view of the device illustrated in FIG. 11; and

FIG. 13 is a bottom plan view of the central portion of FIG. 12 to enlarged scale.

Referring now particularly first to FIGS. 1-3, illustrated therein is a ski exercising device comprising a pair of parallel spaced curved guide rails 1 which are curved from their elevated central portion in a downward direction towards their opposite ends. Opposite spaced ends of the guide rails 1 are spanned by brace members 2. Mounted on the guide rail is a generally flat carriage 3. The carriage 3 is provided with rollers or wheels 4 so that the carriage can be shuttled alternately left to right along the guide rails. Opposite ends of the rails are

capped with rubber cups 5 or the like so that the structure can be supported on the floor without scratching the floor or sliding thereabout. The central portion of the structure is supported by a center support 6. A safety strap 7 constructed from resilient material such as rubber interconnects the carriage 3 and the center support 6. A rubber strap 8 extends from the carriage 3 to opposite ends of the guide rails and is connected to the braces 2 by adjustable buckles 9.

The parts so far described comprise the basic ski exercising unit disclosed in my copending patent application. Briefly, a user of the device stands with his full weight on the carriage 3 and by alternately shifting his weight from right to left the carriage is caused to shuttle alternately from right to left against the restraints provided by the rubber strap 8. The strap 7 is a safety measure to prevent the carriage from flying off in a right or left hand direction should the portion of strap 8 on the opposite side rupture.

In the instant invention two guide belt rods 10 are provided at a location about midway between the carriage 3 and opposite ends of the guide track, assuming the carriage is at its central neutral or at rest position. The rods 10 span the rails 1 and overlie the belt 8. Rods 10 prevent the belt from flapping or whipping into a position between the rails 1 and the rollers 4 where they would be damaged or cause the carriage to jam. In the instant invention end stops 11 are provided at the opposite ends of the rails 1. The front and rear portions of the carriage 3 are provided with downwardly overhanging portions 12 which partially embrace the rails 1 so as to retain the carriage 3 captured on the rails. The end stops 11 are intended to engage or abut the overhanging portions 12 should the carriage 3 travel to its extreme end of right or left hand movement.

In the basic ski exercising unit so far described as the user stands on the carriage and shuttles left to right he is executing a Wedeln or parallel skiing technique movement. In the instant invention an attachment having movable foot pads is provided for the carriage 3 to make it possible to simulate "edging" while executing the parallel skiing technique movement.

The movable foot pad attachment will now be described with particular reference to FIG. 3. The attachment comprises a pair of generally elongated, parallel, and spaced foot rests or pads 13. The foot pads 13 are intended to receive solely the feet of the ski exercise device user. The upper surfaces of the foot pads 13 are provided with a rubber layer 14 or similar antiskid type material. The pads 13 are pivotally mounted on a generally flat base plate 15. The base plate 15 has a pair of upstanding tongues or ears 16 integrally formed thereon. The pads 13 have similar tongues or ears formed adjacent opposite ends thereof but turned in a downward direction. The ears 16 and 17 are pivotally connected together by suitable means 18. Thus, the pads 13 are free to rock in a clockwise and counterclockwise direction along axes 18 which extend parallel to each other and parallel to the upper flat surface of carriage 3 in front to back direction.

The freedom of movement provided for the foot pads is limited. That is to say, the direction and amount of movement of the foot pads 14 is restrained or curtailed. The movement limiting means on the foot pads 13 comprises a pair of links 19 which are pivotally connected at their opposite ends to the foot pad ears 17. Thus the links 19 constrain both foot pads 13 to move in unison relative to each other and also in the same direction with respect to the carriage 3. This is illustrated by the dotted outline for the foot pads shown in FIG. 3. The dotted outline of the foot pads is the position they assume when the carriage 3 is at the left hand end of the rail 1. The opposite sides of the base member 15 have curved lips 20 formed thereon which are raised slightly from the main plane of base plate 15. These lips 20 abut opposite sides of the foot pads 13 on their undersurface to limit clockwise and counterclockwise rocking movement of the pads 13, in the manner shown in dotted outline in FIG. 3.

The just described form of the invention is the preferred one inasmuch as it is low cost, uncomplicated, and readily fabricated. It is in the form of an attachment which is readily adapted to existing ski exercising device units. It is attached to the flat carriage 3 merely by simple removable fastening means 21, see FIG. 1, which may comprise a pair of bolts extending into aligned apertures formed in the base plate 15 and the carriage 3.

The second form of the invention will now be described by reference to FIGS. 4—6. In this and all subsequent forms of the invention parts which are similar to those already described in FIGS. 1—3 will be assigned similar reference numerals and will not be described again.

In the form of the invention of FIGS. 4—6 the foot pads 13 are movably mounted on a base plate 15' which in turn is mounted on the carriage 3. The pads 13 are constrained to move in unison with respect to each other and in the same direction with respect to the carriage 3. This is accomplished by connecting the pads 13 together by links 19' which are pivotally connected at their opposite ends to the respective front and rear portions of the pads 13. However, in this form of the invention instead of pivoting about axes which are parallel to the carriage 3, the pads 13 pivot or swing about axes 21' which are perpendicular to the carriage 3. The pivot axes 21' are provided by bolts which are fastened to the underside of the foot pads 13 and extend therefrom into aligned apertures formed in the base plate 15' and carriage 3. In other words, the bolts 21' also comprise means for removably fastening the foot pad accessory to the carriage 3. A plurality of ball bearing assemblies 22 or the like are mounted on the underside of the foot pad 13 for rolling on the base plate 15' to assist in swinging movement of the foot pads 13 in a smooth manner. Opposite swinging movement of the foot pads 13 is limited when the links 19' about the ball bearing assemblies 22.

The third form of the invention will now be described by referring to FIGS. 7 and 8. This form of the invention combines both types of foot pad movement provided by the first and second forms of the invention. The base plate 14'' is removably fastened to the carriage 3 by bolts 21. The ears 16'' comprise end portions of a generally U-shaped member 16'. The members 16' are pivoted to the plate 15'' on axes 23 which extend perpendicular to the upper flat surface of carriage 3. Accordingly, the members 16' can swing or rotate in a manner similar to the foot pads of FIGS. 4—6. Opposite ends of the foot pads 13 have downwardly extending ears 17 formed thereon. These ears 17 are pivotally connected to the ears 16'' on axes 18 so that the foot pads 13 can rock similar to those of FIGS. 1 and 3. Thus there are two kinds of movement provided in this third form of the invention. The two foot pads are constrained to move in unison by virtue of ball type connecting links 19''. The balls at the ends of the links 19'' are socket swivel connected to the underside of the foot pads 13 in a manner which will be obvious to those skilled in the art so that the foot pads 13 can experience rocking and swinging movement simultaneously in unison with respect to each other and also with respect to the carriage 3 in the same direction. Although this form of the invention may more nearly simulate true ski movement techniques it will be obvious to those skilled in the art that it is more costly and complicated than the first form of the invention and, therefore, may not be preferred by manufacturers over the first form of the invention.

The fourth form of the invention shown in FIGS. 9 and 10 is similar to the third form of the invention but has certain economies and simplicities thereover. In this form of the invention the foot pads 13 rock about axes 18 which are parallel to the carriage in a front and back direction. However, instead of the foot pads 13 swinging about individual axes which are perpendicular to the carriage, the whole assembly swings about a single axis 23' which is perpendicular to the carriage.

The device comprises a base plate 15''' which is removably connected to the carriage by means such as bolts 21 extending through plate 15''' and the carriage. A flat pan shaped

member 24 is positioned on the base member 15'''. Member 24 has pivot ears 16''' formed in its four corners. The ears 17 of the foot pads 13 are pivoted on the ears 16''' on 15'''. 18. The swing axis 23' is provided by a bolt 23' fixed to the center of pan 24 and passing therefrom into aligned apertures formed in the base plate 15''' and the carriage 3. Since the foot pads 13 do not swing in parallelogram type fashion as in the third form of the invention of a single swing axis 23' is sufficient, and it is unnecessary to utilize the ball ended type connecting links 19'' of the third form of the invention. Instead, in this fourth form of the invention the foot pad interconnecting means may comprise merely a single rod or heavy wire form bent into a generally Z-shape with its opposite ends pivotally connected to the underside of the foot pads 13 at punchouts 25 formed therein in a manner which will be obvious to those skilled in the art. The underside of the pan 24 can be provided with integral rounded protrudances 24' to facilitate smooth swinging of the pan 24 on the base member 15'''.

In actual embodiments of the invention I have found that an angle of 20° right and 20° left for rocking the foot pads about horizontal axes provide satisfactory results. In addition, for purposes of swinging the foot pads about a vertical axis or axes a total swing angle of about

The fifth form of the invention will now be described by reference to FIGS. 11—13. In this form of the invention the carriage means 3 actually comprises two separate carriages 3', each of which has a foot pad 13 mounted thereon, but which however, are interconnected by springs 26. The springs 26 urge the two parts of the split carriage 3 towards each other. Bumpers 27 formed on the inner sides of the carriage parts 3' dampen their coming together. Separate rubber straps 8 are provided for each of the carriage parts 3' to restrain their movement away from the illustrate central neutral position. When a person using the device shifts his weight from right to left both carriage parts 3' will move in unison to right or left. This is because they are connected together by the springs 26. However, the foot pads 13 are not totally restrained from moving with respect to each other as the carriage 3 shuttles back and forth along the rails 1. This is because the contracting force of springs 26 can be overcome by the forces exerted on the two carriage parts 3', it being understood that a separate foot is placed on each foot pad 13 and if the feet are urged apart as the carriage is being shuttled back and forth the two carriage parts can be separated. In this last form of the invention the overhanging front and rear portions of the carriage which partially embraces the guide rails 1 for purposes of holding the carriage 3 captive on the rails is clearly illustrated in the bottom view of FIG. 13. A separate one of the straps 8 is connected to a separate one of the carriage parts 3' by clamping means comprising a plate 28 and bolt and wingnut means 29. The plate 28 is clamped against the underside of the foot carriage part 3' with one rubber strap or belt 8 therebetween. A rubber or the like pad 30 is interposed between the belts 8 and the clamping plates 28 for purposes of reducing wear on the belts 8. Inasmuch as there are two belts 8 and the interconnecting springs 26 it is unnecessary in this form of the invention to use the safety strap 7 of FIG. 2, it being understood that it is highly unlikely that both rubber belts of FIG. 11 would simultaneously rupture.

While there have been shown and described several embodiments of the invention, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention, and therefore, it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. A ski exerciser device comprising a pair of spaced parallel guide rails, said rails being downwardly curved from their center towards their opposite ends, a brace member spanning said spaced rails at each end thereof, generally flat carriage means on said rails which is adapted to support the full weight of a user of said device in standing position thereon, roller

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means beneath said carriage means at the front and back thereof for causing said carriage means to shuttle to the right and left in response to said user shifting his weight to the right and left, rubber strap means extending from said carriage means to each of said brace members to restrain movement of said carriage means from its center position, and a pair of spaced foot pads on said carriage means which are adapted to receive solely the feet of said user, and means adapting said foot pads for limited movement with respect to each other as said carriage means is shuttled to the right and left along said rails, wherein said carriage means has front and rear overhanging portions partially embracing said rails to retain said carriage means captive on said rails, stop means formed on each end of said rails, said stop means being adapted to abut said overhanging portions, and a guide rod spanning said rails on each side of said device about midway between said center and the opposite ends of said rails to prevent said rubber strap means from entering between said roller means and guide rails as said carriage means shuttles along said rails, said rubber strap means extending beneath said guide rods.

2. In a device as in claim 1, each of said foot pads being pivotally mounted on said carriage means, and means interconnecting said foot pads for causing them to move in unison and in the same direction with respect to said carriage means.

3. In a device as in claim 2, each of said foot pads being pivotally mounted on said carriage means for rocking movement about axes which extend parallel to said carriage means in a front to back direction.

4. In a device as in claim 2, each of said foot pads being pivotally mounted on said carriage means for swinging movement about an axis which extends perpendicular to said carriage means.

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5. In a device as in claim 2, each of said foot pads being pivotally mounted on said carriage means for rocking movement about axes which extend parallel to said carriage means in a front to back direction and for swinging movement about an axis which extends perpendicular to said carriage means.

6. An attachment for a ski exercise device comprising a generally flat carriage which is shuttled right to left along guide track means, said attachment comprising a pair of spaced parallel movable foot pads, a base member, means mounting said foot pads on said base member for movement with respect to each other and said carriage, means interconnecting said foot pads for restraining them to move in unison in the same direction with respect to said carriage, and means for removably attaching said attachment to said carriage, wherein said foot pads are pivotally mounted on said base member for rocking movement about axes which extend parallel to said carriage in a front to back direction, and stop means formed along opposite sides of said base member for engaging opposite sides of said foot pads to limit said rocking movement, said base member comprising a generally flat plate, said attaching means comprising aligned holes in said plate and carriage and removable fastening means insertable therein, said plate having two pairs of spaced upright tongues formed thereon, said foot pads being elongated and having downwardly projecting tongues formed at opposite ends thereof, said foot pad tongues being pivotally connected to said plate tongues, said interconnecting means comprising a pair of links pivotally connected at their opposite ends to the foot pad tongues, and the upper surface of foot pads having foot antiskid means formed thereon.

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