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D. W. PALMER ET AL
SKI TRAINER

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2 Sheets-Sheet 1

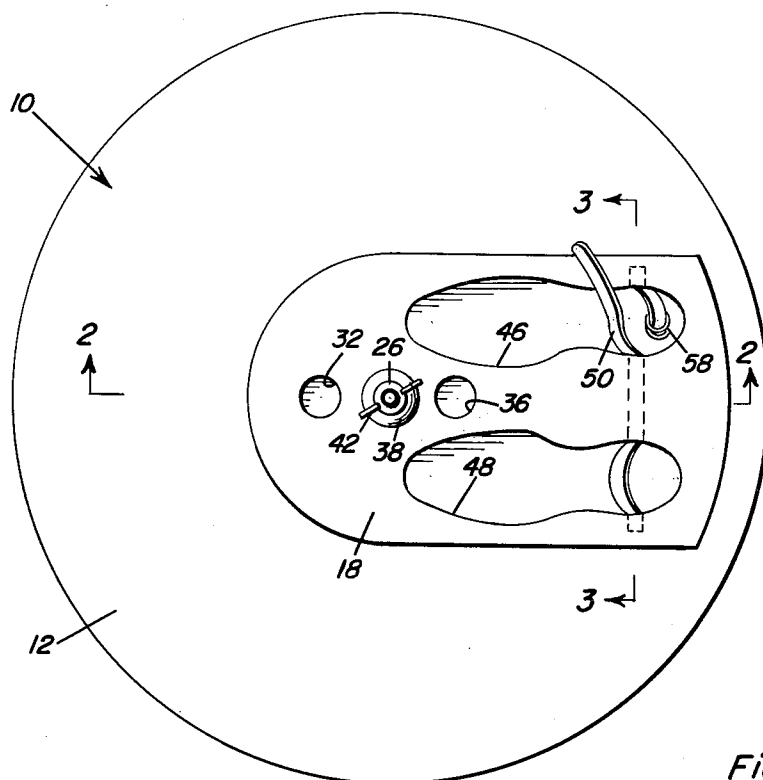


Fig. 1

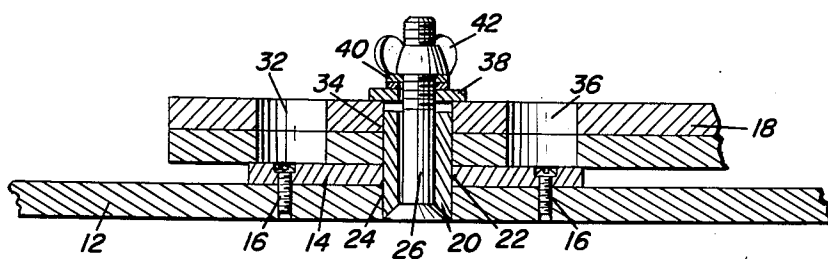


Fig. 2

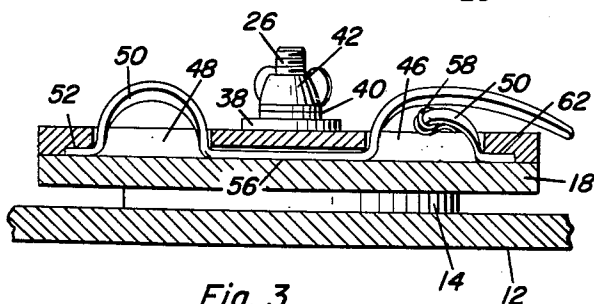


Fig. 3

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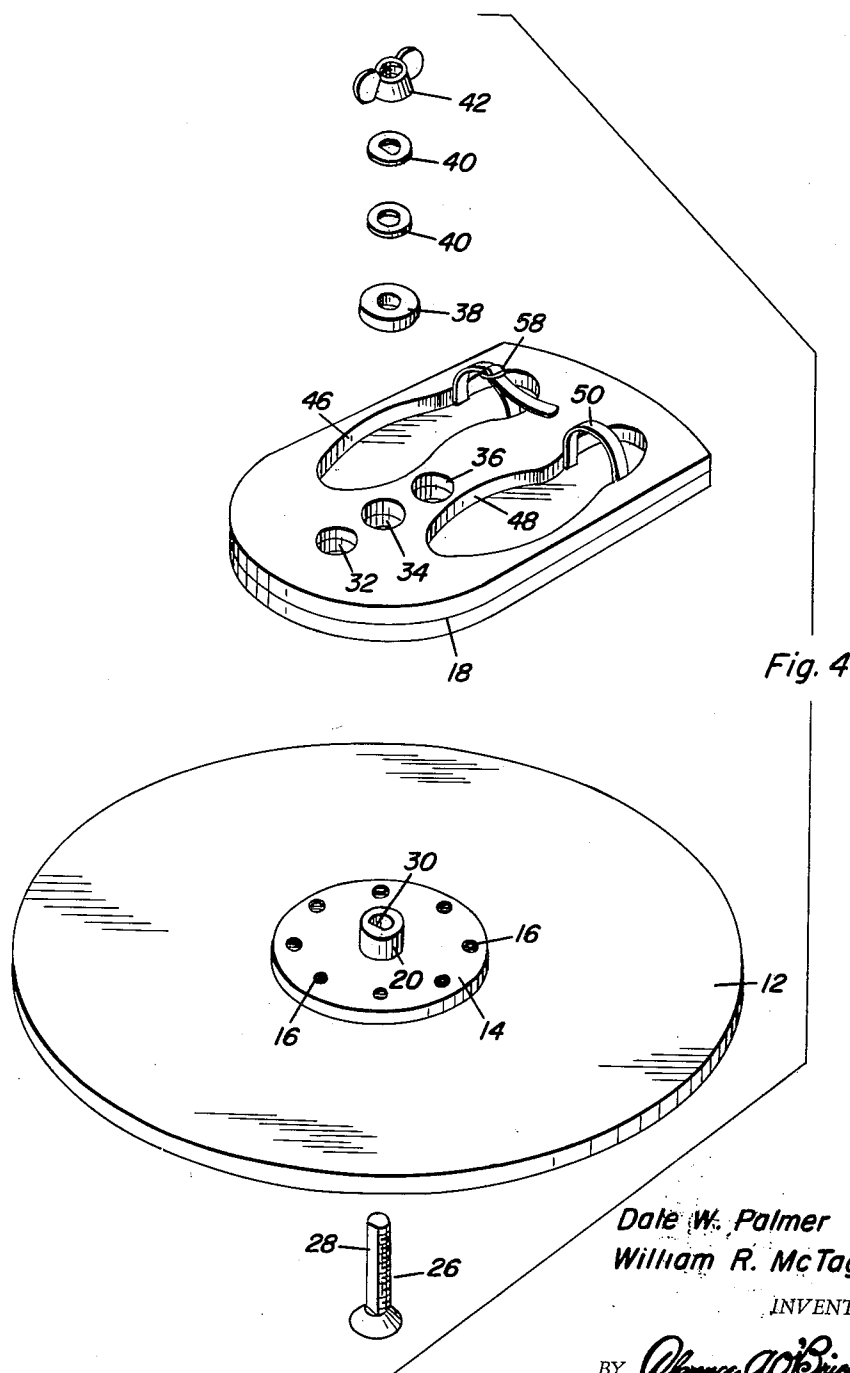
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3,021,137 SKI TRAINER

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This invention relates to training devices and more particularly to a device to function as a game and also a practice instrumentality for skiing.

An object of the invention is to provide a mechanically simple combined game and training device for skiing wherein snow and skiing conditions are simulated enabling a skier to obtain essentially the same feel as experienced on skis in different snow conditions.

A further object of this ski training invention is to provide a ski training device which embodies a concept of skiing which is believed to be unique. The inventors believe that skiing is actually performed in two separate planes in the snow. One plane is a lower, rearward plane which is the plane assumed by straight forward running while the skier is in a semi-relaxed, semi-upright stance. A second plane is a higher, more forward, less frictionally resistant plane which is assumed by the skier while turning. This second, turning plane, is attained by first crouching and then lifting rapidly upwardly and forwardly raising the heels of the skis and in effect lifting the entire ski to a higher less resistant body of snow. A combined lifting motion, coupled with a twisting motion of the body permits the turn.

This ski training invention embodies this new concept of skiing, which may be termed "the double plane theory," by furnishing one larger running base and also a higher, smaller, less frictionally resistant turning base, the turning base being located forwardly of the running base. The positioning of the turning board simulating skis over the respective running and turning bases closely duplicates actual skiing and snow conditions.

Each plane is so positioned and combined with the entire invention that it permits application of a constant frictional resistance against turning thus simulating actual snow conditions. No other prior art or skiing instruction technique known to the inventors anticipates or contemplates the "double plane theory" of skiing embodied in this invention. Further, no known device embodies this concept in theory or practical application permitting low unit cost, foolproof operation and with no maintenance requirement.

It is a further concept of this invention that actual skiing is performed at a relatively constant pre-set coefficient of friction. The degree thereof being determined by snow conditions, heavy or light. This frictional resistance is constantly present regardless of whether the skier is running straight forward or attempting to turn. By rendering the upper surface of the lower running base flat and also rendering the upper turning base flat and also equal in width to the turning board (skis) two important objects are accomplished.

The first is to permit the use of a braking device which will establish a fixed coefficient of friction across a large area of the turning base which will remain constant even though the skier has lifted himself up from the running

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base onto the turning base. Thus the continual resistance of the snow is simulated in all attitudes of the skier.

The second of the objects is to compel the skier to maintain his skis flat to the respective bases for it is the belief of the inventors that tipping or edging skis individually is a natural but undesirable reaction of every beginning skier which should be corrected as far as possible. A combined flat upper surface of both running base and turning base is accordingly a further important element of this invention as it compels and teaches flat skiing of both skis in all attitudes of the skier.

A further object of this ski training invention is to embody a braking device which when combined with the running base and turning base will simulate actual snow conditions. It is deemed an important feature of the braking mechanism that it operate effectively and uniformly whether the skier is on the running base or the turning base. Further, that it operate effectively and uniformly regardless of what position transversely the turning board (skis) is located on the bases. A further important feature of this braking device is ease of adjustment to enable the skier to readily adapt the ski trainer to simulate varying snow conditions ranging from light snow to heavy snow and without use of tools or even getting off the ski trainer.

Another object of the invention is to provide a novel fastening device to hold the operator's feet on the turning board. It is simple and inexpensive with no bindings, special boot or other paraphernalia required. One simple adjustment for the operator's feet is required to secure both feet in place simultaneously. Double straps and buckles are eliminated by running a single strap from the left side over the left foot instep, down under a recess in the turning board that represents the skis, across the right foot to a simple D-ring type of buckle and under the right side of the foot where it is again fastened to the top of the turning board.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a top view of the ski training device.

FIGURE 2 is a sectional view taken on line 2-2 of FIGURE 1.

FIGURE 3 is a sectional view taken approximately on the line 3-3 of FIGURE 1.

FIGURE 4 is an exploded perspective view showing all parts of the ski training device.

In the accompanying drawings ski training device or ski trainer 10 is illustrated to show one typical embodiment of the invention. The ski trainer is constructed of a running base 12 which is preferably circular and of sufficient diameter to remain fixed in place on a floor surface. For instance, the base 12 may be made approximately two and one-half feet in diameter. Turning base 14 is secured to the top surface of base 12 at the center thereof so that it is immovable with respect to the base. Screws 16 or other fasteners may be used for this purpose. The top surface of the turning base is smooth and flat to support the flexible laminated turning board 18 which simulates skis. Upstanding hollow spindle 20 is fastened in aligned openings 22 and 24 of the turning base and

running base respectively, and a spindle bolt 26 is fastened in place within the hollow spindle 22. The spindle bolt 26 has a flat side 28 fitting flush against a flat side 30 (FIGURE 4) in hollow spindle 20 so that the bolt 26 cannot turn. The turning board 18 has three centers established by three apertures 32, 34 and 36, a selected one of which is adapted to receive the spindle and spindle bolt.

Fiber washer 38 or a washer made of other substance suitable for the purpose, is disposed on the top surface of ski board 18 and is backed by one or more washers 40. Spindle bolt 26 extends through the aligned apertures of washers 40 and 38 and has the wing nut 42 threaded thereon and bearing against the washers 40. The wing nut may be tightened or made loose to simulate snow conditions that is, heavy and light, by generating more frictional resistance to turning of the board 18 by clamping fiber washer 38 onto the top surface of the turning board 18 with greater or lesser force.

Turning board 18 was said to be laminated to facilitate manufacture. The upper part of turning board 18 has two upwardly opening recesses 46 and 48 in the general outline or configuration of shoes and they are adapted to receive the shoes of the user. Mechanically simplified means for tightening the shoes of the user in recesses 46 and 48 are connected with turning board 18. These means consist of flexible strap 50 having one end set in the recess 52 that opens laterally into recess 48. The strap is curved up to fit over the instep of the foot occupying recess 48 and then is extended through a transverse passage 54 which registers with both recesses 48 and 46. The strap 50 is looped upwardly over the instep of the other foot in recess 46 and is buckled by buckle 58 to a short part 51 of strap 50 whose end is anchored in recess 62. Recess 62 opens laterally into recess 46, and the portions of strap 50 which are in recesses 52 and 62 may be glued and/or fastened in place. It is evident that both feet are simultaneously clamped in place within recesses 46 and 48 by merely one tightening and fastening connection.

It is of course to be realized that the free end of the turning board 18 bends down to frictionally engage the portions of the running base 12 disposed therebelow due to its flexibility when an operator is supported by the turning board with his feet in the recesses 46 and 48. Therefore, although the friction between the turning board 18 and the turning base 14 is constant and may be adjusted as desired when an operator is not supported by the turning board 18, the weight of an operator on the turning board 18 increases the friction between the latter and the periphery of the turning base 14 as well as providing additional friction between the free end of the turning board 18 and the running base 12, the latter friction being also adjustable by relocating the spindle in another of the apertures 32, 34 and 36 thereby increasing or decreasing the effective length of the lever arm comprising the length of the turning board from its free end to its axis of rotation.

In operation the operator stands in the foot recesses of the simulated skis 18, and places the strap across the insteps of his feet and tightens the strap as described previously. The operator then in a simultaneous motion rises rapidly upwardly and forwardly and swings his body to his left for a right turn and to his right for a left turn. The free end of the turning board 18, will rise up from the running base 12 to rest completely or virtually completely on the turning base 14 and slide on the turning base over the running base coming to a smooth stop when the skier's weight is allowed to settle back down on the running base 12 in a properly executed turn exactly as under actual skiing conditions. The skier must both exert a twisting motion and also a forward lifting motion against the straps across his instep in order to raise the turning board 18 up off (or virtually off) the lower running base 12 onto the higher and smaller turning base 14

to allow the turn. The device simulates actual snow and skiing conditions almost precisely. Tightening of the wing nut 42 increases the friction duplicating heavier snow conditions. Moving the skis back that is, selecting aperture 32 as the pivot axis, provides additional friction on the heel of the ski requiring additional lifting and turning force for proper operation. The preferred materials of construction are wood principally although this is subject to variations. By having the balance of the individual using the training device established by location of the recesses 46 and 48 slightly to the rear of the selected turning axis of the turning board 18 or approximately to the rear, the desired frictional changes between turning surfaces of board 18 and turning disk 14 are obtained as the turning board is used in the manner described above.

In addition to teaching proper turning the ski trainer also teaches the skier important balance and closed ski technique. Further, use of the ski trainer is an excellent way to obtain physical conditioning especially for skiers and this applies not only to snow skiing but also water skiing.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A ski trainer comprising a horizontal running base having a flat upper peripheral surface and adapted to be located on a supporting surface, a circular turning base having a flat upper surface on said running base and fixed with respect to said running base, an elongated flexible and substantially horizontally disposed turning board simulating skis, said turning board having means in one end for establishing feet positions and for securing the feet of an operator therein and a flat under surface on the other end disposed in surface to surface contacting frictional engagement with the upper surface of said turning base, means on the other end of said board rotatably journaling the latter about an axis extending perpendicular to and through the center of said turning base, said journaling means including means for adjusting friction generated between the confronting upper and lower surfaces of said turning base and turning board respectively, said turning board being flexible and when an operator is supported by said one end of said turning board, having the lower surface of said one end in frictional engagement with the upper peripheral portion of said running base.

2. The combination of claim 1 wherein said journaling means includes means for adjustably positioning the axis of rotation of said turning board longitudinally thereof.

3. The combination of claim 1 wherein said turning board is a unitary structure and positions the feet of the operator closely together and on the one unitary board to compel the operator to practice close ski technique and to acquire balance and practice with both feet joined as a unit rather than as separate individual units.

4. The combination of claim 1 wherein said means for simultaneously fastening the feet of the operator includes a single strap which is anchored at one end and which has a portion which loops over the instep of one foot, said turning board having a passage through which an intermediate part of strap is passed and said strap also looped over the other foot instep, said foot position establishing means including a pair of upwardly opening recesses, said strap having one end fastened at one side of one of said recesses, said passage located between said recesses, and the other end of said strap fastened to said turning board at the remote side of the other of said recesses.

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5. The combination of claim 4 wherein said strap is made in two pieces with a buckle connection therebetween so that it may be tightened.

6. The combination of claim 1 wherein said pivotal securing means includes at least two apertures in said other end of said turning board spaced longitudinally therealong providing selected locations on said turning board for the pivot axis of the turning board, a spindle assembly projecting upwardly from said turning base and received in a selected one of said apertures.

7. The combination of claim 1 wherein said means for simultaneously fastening the feet of the operator includes a single strap which is anchored at one end and which has a portion which loops over the instep of one foot,

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said turning board having a passage through which an intermediate part of strap is passed, and said strap also looped over the other foot instep.

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