United States Patent [19]

Stoveken

[11] **3,782,745**

[45] **Jan. 1, 1974**

[54] **SNOW SURFBOARD**

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[52] **U.S. Cl.** ..... **280/18,** 280/12 H

[51] **Int. Cl.** **B62b 13/00**

[58] **Field of Search** ..... 280/12 H, 12 R, 18; 9/310 E

[56] **References Cited**

UNITED STATES PATENTS

3,378,274	4/1968	Poppen	280/18
3,580,598	5/1971	De Pauw	280/18

Primary Examiner—Leo Friaglia

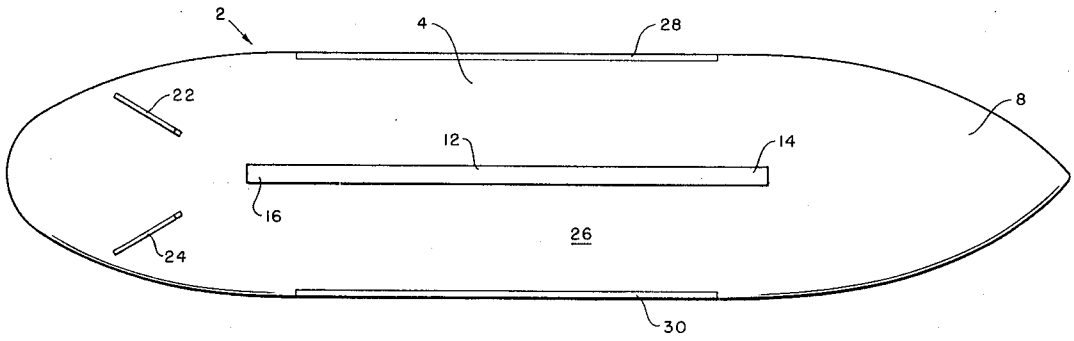
Attorney—Edward S. Irons et al.

[57] **ABSTRACT**

A snow surfboard comprising a central body section, a nose section having a gradual nose kick, a tail section having a gradual tail kick which is less than said nose kick, said central body, nose and tail sections being integrally formed, and a pair of turning skegs fixed to the lower surface of said tail section, said turning skegs being laterally spaced from the longitudinal axis of the surfboard and oriented rearwardly at an angle of from 10° to 50° to said longitudinal axis, said turning skegs extending rrom the bottom surface of said tail section a depth such that the bottom edges thereof are tangent to or just above an extension of the horizontal plane of the lower surface of the central body section.

The snow surfboard includes a shock absorbing flexible stabilizing skeg running along the longitudinal axis of the surfboard. The snow surfboard is stable and may be controlled by weight shift techniques similar to those used with water surfboards.

4 Claims, 5 Drawing Figures



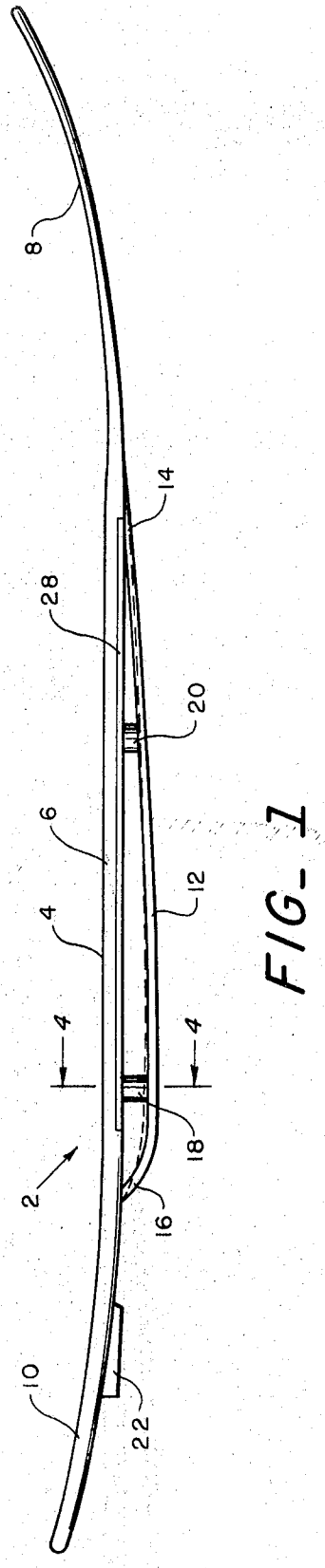


FIG_1

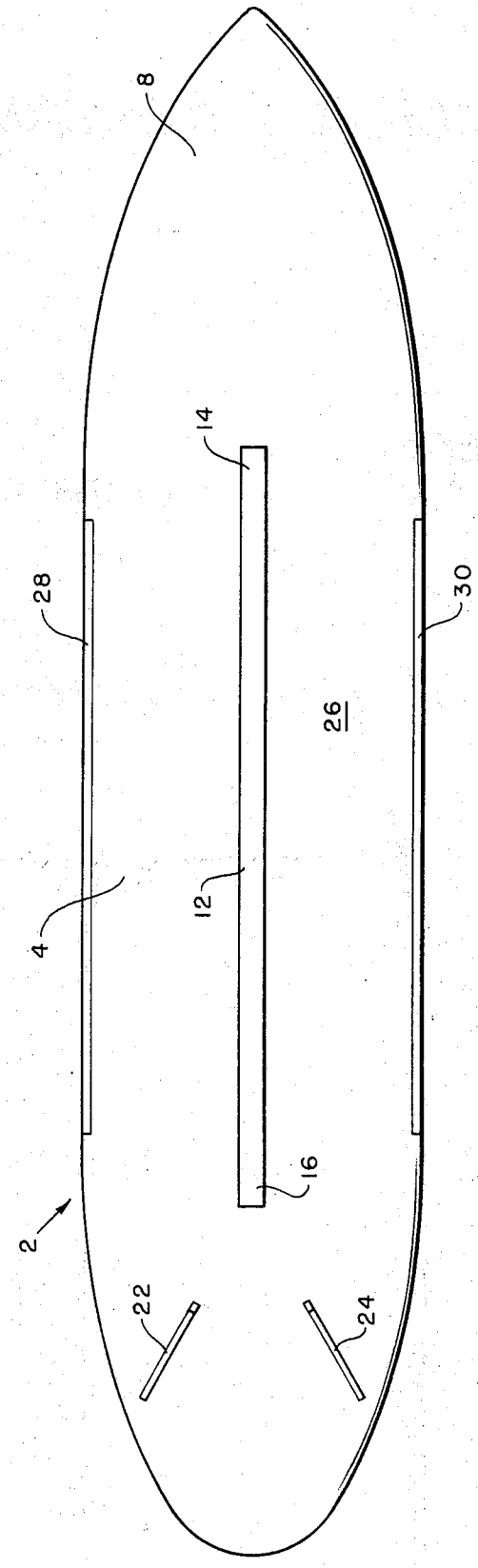


FIG_2

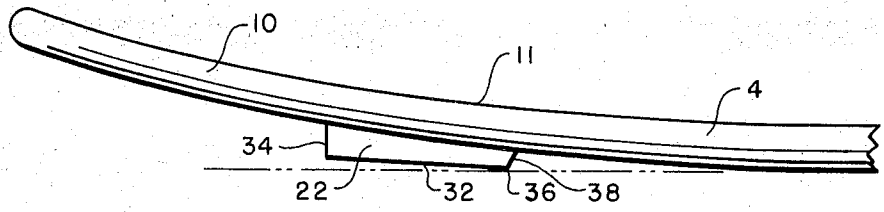


FIG_ 3

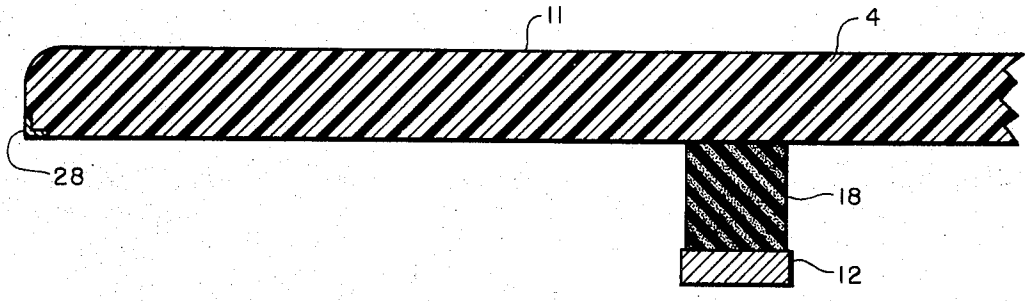


FIG_ 4

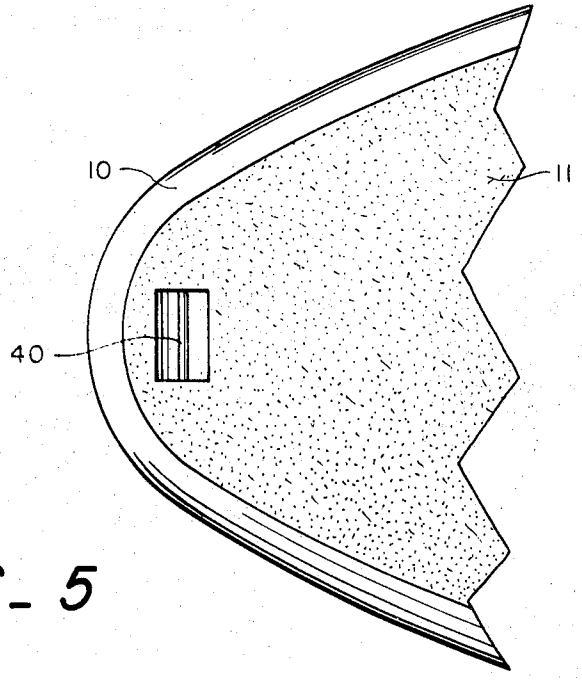


FIG_ 5

SNOW SURFBOARD

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention is concerned with a device for coasting over a snow surface and more particularly to what has come to be known as a snow surfing board. In some instances, the type of device to which this invention is directed is called a "mono-ski;" however, this is somewhat of a misnomer since in the present invention the feet of the user are not secured to the top surface of the device as in the case of a mono-ski.

It is well known that in the past few years the sports of both surfboarding and skiing have gained immense popularity. Currently with the development of the increased interest in these sports, the equipment, i.e., the surfboards and skis, utilized in the sports have developed extensively in design and in the types of materials and construction utilized in these structures. Within the past few years particularly, largely to meet the desires of persons who are surfing enthusiasts but who are often unable to participate extensively in the sport during the winter months, attempts have been made at designing what has been termed snow surfboards in which the feet are not permanently attached to the ski, or toboggans designed to be utilized by a single person standing on the top surface.

2. Prior Art

In general, the devices developed so far have had little resemblance to the characteristics of a surfboard in the way they can be maneuvered or in the methods utilized to control them. Devices developed thus far have generally been designed like a mono-ski with a lanyard attached to the leading edge, and the steering has been effected largely by a tilting of the structure from side to side from one side edge to another with the turning being effected by the curving motion of a typical ski or, according to some designers, by pulling up the front point and pivotting on the heel of the ski structure. Other approaches have utilized steering ribs at the edge of a toboggan-like structure.

The necessity of the use of a lanyard attached to the front of the board in many of the previous structures to facilitate the turning by pulling the forward portion up from the snow and forcing the heel downwardly has meant that the control of such snow surfing boards has been effected by motions and techniques very much different from the weightshifts and balance normally utilized in conventional water surfing boards. Because of the inability to use conventional surfboarding techniques or at least similar techniques for control of snow surfboards, these boards have not been adapted by all those who might otherwise find an interest in the sport. The devices available at the present time aside from imposing the limitation that different control techniques from water surfing be utilized have also lacked the capability of responding positively to refined control movements and been relatively unstable.

Besides requiring different control techniques than conventional surfboards, the snow boards up to the present have found limited use at high speeds and over any snow surface which was other than very smooth and soft because the bumps and shocks resulting from travelling over an uneven or somewhat bumpy surface were transmitted completely to the "surfer" because of the lack of any substantial shock absorbing qualities in the board. This is especially critical when one remembers that the feet of the snow surfer are not secured to the board as in the case of a skier.

Examples of simple ski boards which cannot be controlled in a refined manner are disclosed in U. S. Pat. No. 3,374,003 Fulsom which discloses a ski board which aside from an upwardly curved toe portion is comprised substantially of a rigid elongated planar body having two longitudinally extending runners spaced inwardly from the longitudinal edges of the bottom surface. Such boards were designed mainly for children and are not designed for sophisticated maneuvering or high-speed utilization by adults or more skilled participants. Any shocks from bumps in uneven surfaces are transmitted directly to the user and thus maintaining balance is extremely difficult. Furthermore, turning can only be accomplished in the same manner as conventional skis.

In U. S. Pat. No. 3,378,274 Poppen, there is disclosed what is called a surf-type snow ski of the same basic design as in Fulsom above; however, in this case the heel of the body has a slight upward curve to it and the bottom surface has either a plurality of longitudinal grooves or ridges or a combination thereof to aid in stabilization. A lanyard is attached to the upper side of the toe of the ski to aid in maintaining the balance of the user and for pulling the front portion of the ski up out of the snow to aid in turning. The patentee indicates that the turning is effected by pivotting the board about the heel although it would appear that actual carving the turn in the snow as in conventional ski turns is actually what would take place. A non-skid upper surface is provided and the ski is covered with a conforming layer of water-proof durable resin. The corners or edges are protected by a metal edge as in a conventional ski. In effect, the structure of this patent is primarily a conventional ski without bindings provided with a lanyard for holding on to and being slightly wider than a normal ski in order to accomodate the two feet of the user.

U. S. Pat. No. 3,580,598 dePauw discloses a toboggan having a corrugated bottom surface with the corrugations running longitudinally to achieve a stabilizing effect. Steering ribs which run longitudinally to the body of the toboggan are spaced slightly inwardly from each longitudinal edge of the toboggan and converge slightly inwardly towards the rear of the toboggan. The rear of the toboggan body is curved upwardly slightly so that the rear portions of the steering ribs are generally out of contact with snow during a straight run and the corrugations alone serve to stabilize the direction. Turning is effected primarily by tilting from side to side as in a conventional toboggan although an improvement in control over a conventional toboggan is obtained.

SUMMARY OF THE INVENTION

The present invention provides an improved snow board of greatly increased stability and controllability over previous snow boards. The snow board of the present invention can be controlled by the user in a manner very similar to a water surfboard, that is, by simple weight shifts so that the feel of the board is quite similar to that of an ordinary surfboard. The snow board of the present invention permits the user to ride on the snow board without any permanent attachment of his feet to the board or any handles or ropes being held.

According to the present invention, a snow surfboard is provided having a shock absorbing stabilizing skeg running down the longitudinal center of the board extending below the bottom planing surface of the board and blending into the planing surface of the board at the approximate points at which the main or planing section of the board joins the nose and tail sections of the board. The aft portion of the stabilizing skeg provides a pivot about which the board may be tilted to raise the nose. Extending from the lower surface of the tail section of the snow surfboard of the present invention are two turning skegs directed outwardly from the longitudinal axis of the board at an angle up to approximately 10° to 50°, but preferably from 25° to 35°, and most preferably from 30° to 35°, and extending from the bottom surface of the tail section of the board to a depth such that the bottom surfaces of the turning skegs are approximately level or slightly above the planing surface of the board. Thus, in normal running, the turning skegs are just out of contact with the snow or barely skim the top surface of the snow. The bottom edge of each skeg has a slight lift from front to back so that the first snow contact is with the front end portion and gradually increases to greater contact with the snow as the tail is pushed downwardly by the user shifting his weight towards the rear of the board.

The turning of the board is accomplished by a weight shift to the rear on one side which starts the turn by action of the carefully designed turning skegs which initiate the turn and then by the normal rocker of the board. The rudder effect of the turning skeg also operates with the pivotting action of the board about the rear of the stabilizing skeg and the carving of the turn resulting from the rocker effect of the board similar to an ordinary ski to result in a very smooth, rapidly initiated, highly controlled turn. The snow board of the present invention is thus provided with control means which permit the user to control the motion of the board with weight shifts in a manner similar to water surfing. The user is able to ride the board lying down, standing, kneeling or sitting without any means other than balance for keeping in contact with the board. No hand-held bars or ropes are necessary.

BRIEF DESCRIPTION OF THE DRAWING

Referring to the accompanying drawing which forms a part of the specification:

FIG. **1** is a side elevational view of the snow board according to the present invention;

FIG. **2** is a bottom plan view of the snow surfboard shown in FIG. **1**;

FIG. **3** is an enlarged side view of the rear tail portion of the board shown in FIG. **1** showing the shape and position of a turning skeg in greater detail;

FIG. **4** is a partial sectional view taken along line **4**—**4** of FIG. **1**; and

FIG. **5** is a partial top view of the snow surfboard of FIG. **1** showing the top surface of the tail portion in greater detail.

DETAILED DESCRIPTION OF A SPECIFIC EMBODIMENT

Referring to the accompanying drawing in greater detail, the snow board is indicated generally at **2**, comprising a board **4** having central body section **6** and nose section **8** which curves or kicks upward above the surface of the snow in order to keep the board planing above the snow. The nose kick also serves to initiate turns and the carving action of the board through the snow in the normal way that a ski is carved through snow in a turn. If extended use of the board in deep snow is contempalted, a somewhat higher nose kick may be employed than that shown. The main body **6** of the board **4** flows into a tail portion **10** which has a tail lift, that is, the portion **10** extends above the plane of the main section **6** of the board and of the snow.

Located along the longitudinal axis of the board underneath the central portion **6** is a flexible stabilizing skeg **12** which lfows smoothly into the lower surface of the board **4** at the point **14** at which the central body section **6** transitions to the nose portion **8.**

The rear end of the skeg **12** is attached to the board **4** at the approximate point **16** where the central portion **6** of the board **4** transitions to the tail section **10.** The rear of the skeg **12** merges with the board **4** at point **16** at a somewhat greater angle than the nose portion **8.**

As shown in the drawing, the skeg **12** extends below the bottom surface **26** of the main portion **6** of the board **4** until a maximum depth is reached just forward of the point **16.**

Between the bottom surface of the board **4** and the skeg **12,** there are provided two or more shock absorbing pillars **18** and **20** which are comprised of material such as silicone rubber in order to absorb shocks transmitted to the skeg **12** from irregular running surfaces. The skeg **12** extends below the bottom surface **26** of the board **4** from about 1 to about 3 inches, with a depth of 1-¼ to 1-½ inches generally being preferred. One shock absorbing pillar should be positioned between skeg **12** and bottom **26** at the point of maximum depth of the skeg.

On the underside of the tail portion **10,** the board **4** is provided with a pair of turning skegs **22** and **24** respectively set at an angle to the longitudinal axis of the board as shown in FIG. **2.** As shown more clearly in FIG. **3,** the skegs **22** and **24** are positioned on the underside of the tail portion **10** so that the lowermost point of each turning skeg is approximately level with the horizontal plane of the bottom surface **26** of the board **4** indicated by the dashed line or slightly above the plane so that the turning skegs are either just out of contact with the snow surface during normal running or just barely skimming the snow surface.

Referring to FIG. **3,** it is seen that the steering skeg **22** has a front bottom corner **36** which is the lowermost point of the turning skeg and is the portion of the skeg **22** ordinarily just skimming the surface of the snow during normal straight running conditions. The front edge **38** of the skeg is tapered upwardly and forwardly as shown. The bottom edge **32** of the skeg can be oriented parallel to the surface of the snow but preferably is tapered upward thus slightly extending at a slight angle upward and away from the running snow surface. The rear edge **34** of the skeg **22** extends vertically upward to the lower surface of the tail portion **10** or may be tapered slightly to the rear.

Steering skegs **22** and **24** are set in the tail section **10** at an angle from 10 to a maximum of 50° to the longitudinal axis of the board. It is understood that in general the greater the angle, the more turning effect will be achieved, and the lesser the angle, the less will be the turning effect. I have found that for most applications an angle of approximately 25° to 35° to the longitudinal axis of the board is preferred, with an angle of 30° to

35° being most preferred to yield a combination of ease of control, maximum speed in turns, and refinement of control.

The bottom edges of the central portion **6** of the board **4** are provided with metal inserts **28** and **30** in order to provide body and to protect the edges.

The top surface **11** of the board is provided with a non-slip finish indicated by FIG. **5.** Located in a recess in the aft portion of the upper surface **11** of the board **4** is a ring **40** or other suitable means for attachment of a conventional runaway strap so that if the user should tumble, the board will not freely run away constituting a safety hazard to other participants in the area.

The board of the present invention can be constructed of any of the usual materials employed in constructing skis. Thus, in a less expensive model, a wood core may be utilized, and either steel or aluminum stabilizing and turning skegs employed. Polyethylene laminate on the lower running surface of the board may be used. In more refined models, a high density foam such as polyurethane may be used as a core material or glass fiber and the like may be used. Epoxy and fiberglass laminate constructions are also envisioned.

In the preferred form, the metal skegs are embedded in the material of the body **4** during the molding of the body.

By way of illustration only, the dimensions of a typical board such as described above are approximately 4-½ feet in length, 1 foot wide, the central portion **6** of the body being approximately 2 to 2-½ feet long.

In general, the normally planing surface of the board should have a surface area of about 1 square foot for each 50 pounds of weight of the contemplated user.

The turning skegs are one-fourth inch wide by 5 inches in length of aluminum and extend approximately one-half inch below the surface of the tail portion of their maximum depth. The nose kick or the distance the nose rises above the horizontal bottom surface of the board is about 4 inches in the embodiment illustrated. The stabilizing skeg extends about 1-1/8 inches below the bottom surface of the board. As shown by the dashed line in FIG. **1,** the shock absorber pillars of silicone rubber have resiliency so as to allow the stabilizing skeg to flex as it passes over uneven surfaces as indicated by the dotted line in FIG. **1.** The skegs are embedded in the body **4** and thus secured thereto during the molding of the board.

The stabilizing skeg **12** of the snow board **4** of the present invention tends to maintain the longitudinal axis of the board parallel to the axis of travel and absorbs shocks from uneven surfaces. The user in travelling down a hill without turning locates his weight centrally on the board. The turning action is positively controlled by merely shifting back slightly on the board, shifting one's weight to one side so that one of the turning skegs starts to contact the surface. Since the front corner and front edge of the skeg are just outside of contact of the snow, a slight shift in weight brings the corner **36** and front portion of the lower surface **32** into contact with the snow and starts initiating the turning action because of the rudder effect of the turning skeg. The turning force applied can readily be increased by shifting the weight further backward and to the side, the turning being positively initiated by the turning skeg and developing rapidly with the slightest shift in weight. The tilt of the board causes the board to also carve the turn in a similar manner to that of a ski due to the rocker or curvature of the board which depends, as in the case of the skis, upon the degree of flex built into the board.

The rocker of the board ultimately determines the radius of a pure carved turn, that is, the radius of a turn in which the track does not change width as in the case of a perfectly carved turn in skiing. The rocker of the board will change as more load is applied to the running surface. A high-speed board is designed with greater length and more stiffness so as to have less rocker than a low speed more highly maneuverable board. The board, once the limit of the rocker has been reached, will still turn but less efficiently and eventually will spin out.

The tail is in effect the lever arm that pivots the board about the rear of the stabilizing skeg and the area of the running surface at the juncture of the planing surface and tail. The more tail lift, the greater is the degree that the board will nose up and sideways as a turn is initiated.

As indicated, the importance of the turning skeg is that it rapidly initiates smooth turns and gets the turn started with minimum shift in weight of the user. The effect of the turning skeg is somewhat similar to a rudder, that is, the more surface that is presented to the running snow, the greater the turning moment that is generated. The amount of surface is, of course, determined by the angle that the skeg is set to the center line, the depth of the skeg, and its angle from the lower tail surface. As indicated, the turning skeg in normal running is just out of contact with the snow and, as the weight is initially shifted backwards and to the side, the forward portion of the turning skeg which has the least surface area is first presented to the snow, and as the weight shift continues, an increase in area of the skeg is presented to the snow as the rear portion is extended further into the running snow.

While in the present embodiment, the turning skegs are shown as fixed, both in horizontal angle and angle to the longitudinal axis of the snow board, it should be understood that the turning skegs could be mounted in an adjustable manner on the board so that the angle to the longitudinal axis of the board could be varied and the depth which the skegs extend from the lower surface of the tail and the angle or degree of lift of the skegs could also be made adjustable.

Furthermore, it should also be understood that both the stabilizing skeg and the turning skegs, while in the present embodiment are illustrated as separate pieces secured to the body of the snow boards, it is possible that the skegs could be integrally molded or otherwise constructed as an integral structure with the body of the snow board.

While the invention has been explained by a detailed description of certain specific embodiments, it is understood that various modifications and substitutions can be made in any of them within the scope of the appended claims which are intended also to include equivalents of such embodiments.

What is claimed is:

1. A snow surfboard comprising a central body section, a nose section having a gradual nose kick, a tail section having a gradual tail kick which is less than said nose kick, said central body, nose, and tail sections being integrally formed, and a pair of turning skegs fixed to the lower surface of said tail section, said turning skegs being symmetrically laterally spaced on oppo-

site sides of the longitudinal axis of the surfboard and oriented to diverge rearwardly at an angle of from 10° to 50° to said longitudinal axis, said turning skegs extending from the bottom surface of said tail section a depth such that the bottom edges thereof are tengent to or just above an extension of the horizontal plane of the lower surface of the central body section, a shock absorbing flexible stabilizing skeg running along the longitudinal axis of the surfboard from approximately the point at which the central body section merges with the nose section to a point at which the central body section merges with the tail section, said stabilizing skeg blending smoothly into the lower planing surface of the board at the juncture of the nose section and central body section so as to facilitate the smooth flow of snow.

2. A snow surfboard as claimed in claim **1** wherein said stabilizing skeg comprises a flexible metal strip spaced in its intermediate regions from the bottom surface of said board, and wherein pillars of a resilient material are included between the bottom surface of said board and said stabilizing skeg in its intermediate section.

3. A snow surfboard as claimed in claim **2** wherein said turning skegs are oriented at an angle of from 30° to 35° from the longitudinal axis of said board.

4. A snow surfboard as claimed in claim **3** wherein the depth of said turning skegs increases from front to rear.

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