United States Patent

Horibata

[15] **3,690,265**

[45] **Sept. 12, 1972**

[54] **AQUATIC SLED AND SHOOTING APPARATUS THEREOF**

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[22] Filed: **Sept. 1, 1970**

[21] Appl. No.: **68,659**

[30] **Foreign Application Priority Data**

Sept. 3, 1969	Japan	44/69330
Sept. 8, 1969	Japan	44/70579
May 22, 1970	Japan	45/43329

[52] **U.S. Cl.** **104/70,** 188/8, 188/40, 104/73

[51] **Int. Cl.** **A63g 21/18**

[58] **Field of Search** 188/5, 8, 40, 127; 272/56.5; 104/69, 70, 134, 135, 136; 280/18, 19

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Assistant Examiner—D. W. Keen
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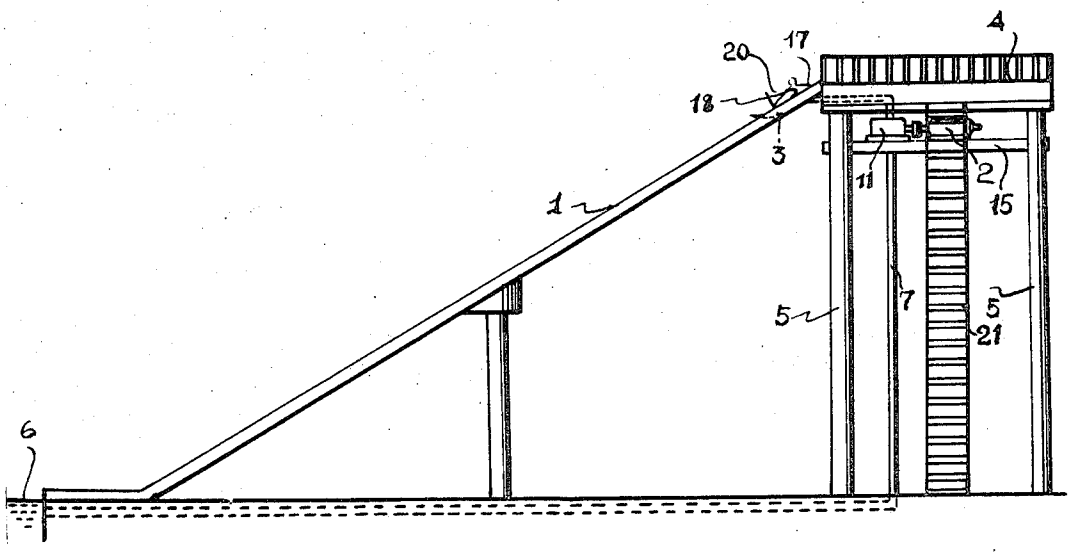
[57] **ABSTRACT**

An amusement arrangement includes an inclined slide and a fluid supply means to supply lubricating fluid upon the slide. A sled is fabricated of a lighter material than the lubricating fluid and is adapted to ride in the slide. Brake means are provided to coact between the sled and the slide to control the sliding speed of sled on the slide by selective frictional contact therewith.

10 Claims, 12 Drawing Figures



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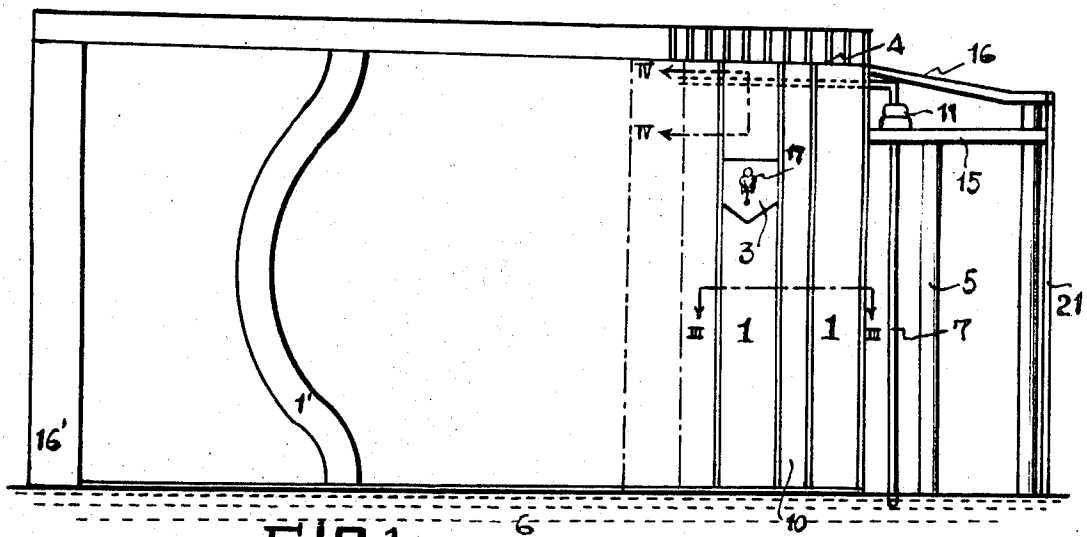


FIG. 1

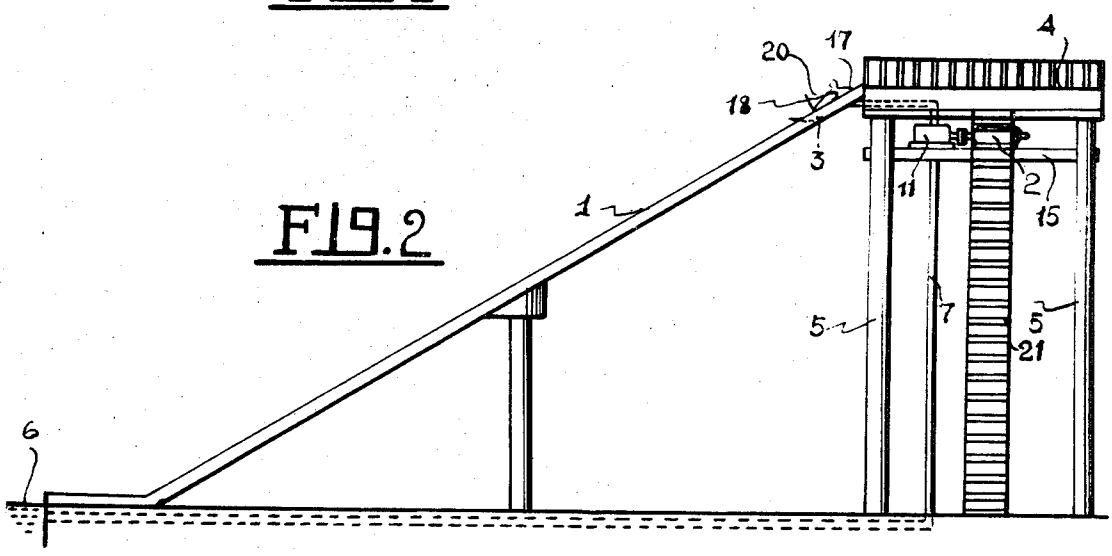
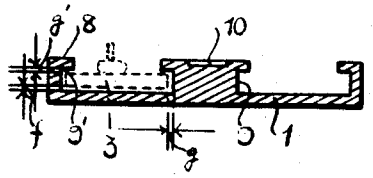


FIG. 2

FIG. 3



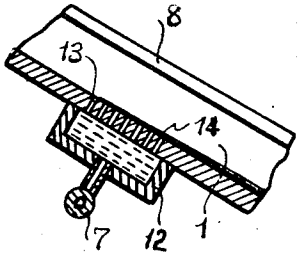


FIG. 4

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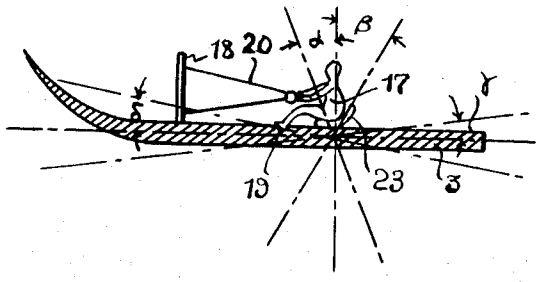
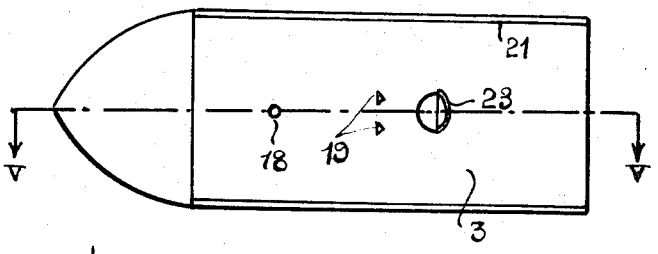


FIG.5

FIG.6



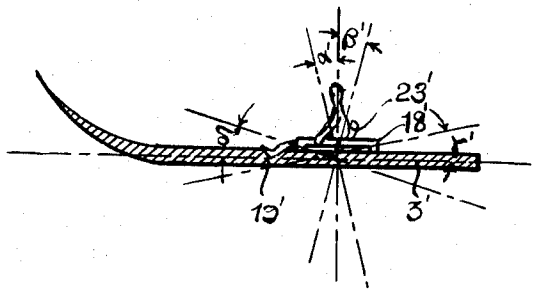
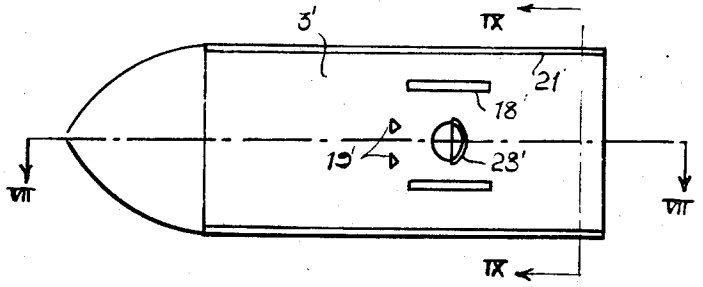


FIG.7

FIG.8



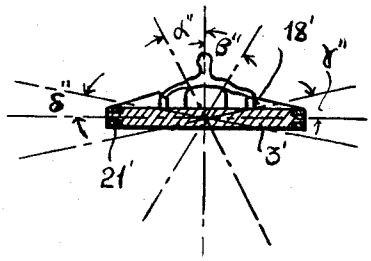


FIG.9

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FIG.10

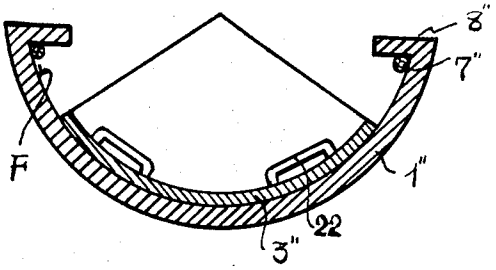


FIG.11

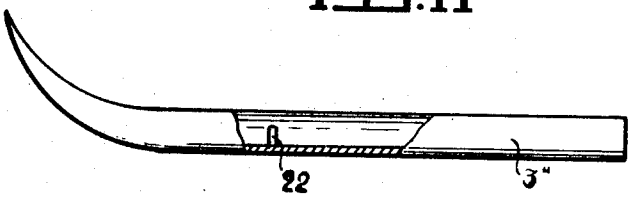
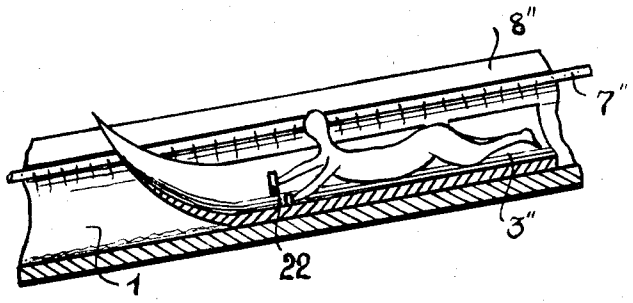


FIG.12



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AQUATIC SLED AND SHOOTING APPARATUS THEREOF

This invention relates to acquatic amusement devices and in particular to improved water sleds or skooters moved by gravity on inclined slides.

In the prior art, an arrangement has been proposed for amusement at pool-side, sea-side or lakeside whereby a slider slides on a violent water stream in slides by sitting directly in the stream. In such arrangement, however, the slider cannot control his speed, which would be considerable, during the sliding operation because he rides directly upon the thin stream film of water on the slide. Such film is necessary not only to provide the sliding speed but also to provide protection for the slider from injury by isolating him from frictional contact with the slide surface.

However, an unexpected accident can injure the slider, especially at the high speed terminal of the slide, as caused by some slight imperfect or uneven surface on the slide or by a slight disturbance or unbalance of the slider's attitude.

Accordingly, a primary object of the present invention is to provide a novel water sled having a controllable sliding speed to eliminate jeopardy to the slider.

Another object is to provide a water sled which is able to achieve a high sliding speed.

Another object is to provide an improved water sled which is lighter than the water it displaces so that it floats as the slider rides on the water surface in the pool adjacent the slide.

Another object is to provide a deformable and elastic water sled to control the sliding speed in coaction with the displacement of the center of gravity of the slider.

Another object is to provide a water sled having a long life.

The invention will be more fully understood by reference to the following detailed description which is accompanied by drawings in which:

FIG. 1 is a front view of water sled according to the present invention;

FIG. 2 is a side view of the water sled shown in FIG. 1;

FIG. 3 is a sectional front view taken along line III—III in FIG. 1;

FIG. 4 is a sectional side view taken along line IV—IV in FIG. 1 showing the lubricating fluid supply means for the slider surface;

FIG. 5 is a sectional side view taken along line V—V in FIG. 6 showing an embodyment of the sliding sled of the present invention;

FIG. 6 is a plan view of the sled shown in FIG. 5;

FIG. 7 is a sectional side view taken along line VII—VII in FIG. 8 showing the other embodyment of the sliding sled of the present invention;

FIG. 8 is a plan view of the sled shown in FIG. 7;

FIG. 9 is a sectional front view taken along line IX—IX in FIG. 8;

FIG. 10 is a sectional front view of another embodyment of the slide and sled in accordance with the present invention;

FIG. 11 is a partial sectional side view of the sled for sliding on the slide shown in FIG. 10;

FIG. 12 is a sectional partial side view of a slider upon the sled of FIG. 11 showing his sliding attitude and the water supply system for the slide surface.

Referring more particularly to the drawings, it will be seen that the water sled in accordance with the present invention comprises a number of the straight or curved slides 1, 1′ or combinations thereof, a water fluid supply source 2, and a sled 3 which is discharged on a water pool 6 after sliding on the slide.

Slide 1, 1′ is attached at a side of a platform 4 supported by poles 5, the slide being made of hard material, for example, wood, light metal, synthetic material, etc. attached between the platform 4 and pool 6 at a suitable inclination, the inclination being changeable or selected in accordance with the sliding technique of the slider.

As seen in FIG. 3, the slides 1 has inwardly turned lips 8 at the top portion of each of the sides thereof to prevent the sled 3 from jumping out of slide during its downward motion, the lips also acting as frictional control means for the speed of sled 3 by being contactable with metal longitudinal edges 21 on the sled 3 as described hereinafter with reference to FIGS. 6 and 8.

To attain suitable lubrication during the downward slide of the water sled, suitable horizontal gaps g are provided between both vertical walls of sled 3 and the juxtapositioned internal vertical side surfaces 9 of slide 1.

Also suitable vertical gaps g' are provided between the top surfaces of sled 3 and the underside of lips 8 to control the lateral spreading of a lubricating fluid film f supplied through apertures 13 (FIG. 4) from a small tube 7 along the path of movement of the sled whereby the internal surfaces 9, 9′ are wetted with distributed fluid for the desired high degree of lubrication. Very importantly the spread fluid is prevented from overflowing onto climbing way 10 because of the lip 8.

In a known manner the slide is supplied with lubricating fluid to produce the fluid film 14 by tube 7 from pool 6 by suction pump 11 associated with motor 2 mounted on base 15 directly below the ascending plate 16.

The lubricating supply means provides fluid to a duct 12 along slides 1 respectively as shown in FIG. 4, the fluid duct 12 discharging the fluid through apertures 13 to produce the uniform fluid film on slide 1.

In operation, the sled 3 is firstly moored at the top of slide 1 and then released by the slider from a suitable mooring means (not shown) on platform 4.

The discharged sled 3 accelerates on slide 1 with increasing speed and increasing kinetic energy.

The attitude or pitch or angle of attack, of sled 3, at the end of slide 1, may be selectively changed to increase the distance to be traveled on water surface 6.

The floating sled 3 on water surface 6 after recovery is replaced on platform 4 by an escalator 16′ by a suitable power source (not shown).

Such sliding sled 1 may be made of the lighter material than the lubricating fluid, for example, wood, plywood, or foam plastic so as to support and float the slider on water surface during or after the sliding on to the pool.

The foam plastic construction, however, is preferably for the sled material because it also has elasticity and can be deformed at will by the slider by adding some force on a seat and a control bar on the sled 3.

In FIG. 5, there is shown an embodyment of sled 3 in accordance with the present invention having a control bar 18 and a control rope 20. Such sled 3 is angularly displaced, upwardly or downwardly, by α degrees and α degrees respectively by forward or backward body movement of the slider 17. Thereby the sliding speed is controlled by adjusting the frictional contact between light metal edge 21 attached to the slide 3 and the underside surface of lip 8.

It is also preferable that the sled's bow is properly bent back, as shown in FIG. 8, to decrease the water resistance after the sled discharges on the pool 6.

Another embodyment of the sled in accordance with the present invention is shown in FIG. 7, the sled 3' having a pair of hold-on bars 18' straddling the slider seat 23'.

The angular displacement of the sled by the slider for control of the sliding speed is caused by body movement in the manner described with reference to FIG. 5.

For example, an angular displacement β '' or α ' is obtained respectively by an upward or downward force by the slider on hold-on bars 18'. Additionally the slider can selectively change the rolling angle of the sled by selectively leaning on either the left or right hold-on bar 18 '.

The sled 3' as shown in FIG. 7, may preferably be used for curved slide 1' in FIG. 1 due to the added "roll" control features of the sled in FIG. 8.

So as to increase the braking action, sled 3 or 3' respectively has recesses 19 or 19' for receiving the heel of the slider's foot to increase or decrease the force to be applied on the control bar 18 (or 18') for changing the angle of pitch of the sled 3 by leg movement of the slider.

Another embodyment of the sled in accordance with the present invention is shown in FIGS. 10 and 11 as a canoe type sled having an open stern which permits quick emptying of any water within the canoe body after it is retrieved from the pool. Such sled 3'' has a curvature on its bottom surface which corresponds to a curved slide surface 1''. With such construction, the lubricating fluid supply tubes 7'' may be disposed along substantially the entire slide length underneath lips 8'' of slide 1' so as to obtain the uniform distribution of lubricating fluid for the overall slide surface. Sled 3'' may also have all the features of the embodyment shown in FIG. 5 to 7, but it is preferable to employ control bars 22, which may be folding, for receiving the hands of the slider as shown in FIG. 12 so as not to interfere with lips 8'' and fluid line 7''.

In the use of such sled for sliding down on the straight or curved slide 1 or 1', the slider rides on it in a prone position or a stooped position so as to prevent injury by the frictional contact with the elongated lips 8'' of the slide 1 or 1'.

The slide 1'' of FIG. 10 has a larger contact surface with sled 3'' than the slide 1 as shown in FIG. 1 to 4. Also the sled and slider has a substantially lower center of gravity due to the slider's position as described hereinbefore whereby the slider has improved sliding balance.

Another advantage of FIGS. 11 and 12 is that the lips 8'' can project inwardly more than lips 8 of FIG. 3. Accordingly, the sled can be more securely prevent from jumping out of the slide when the slider adds a zigzag yawing movement to the sled. Such zigzagging not only adds to the pleasure of the slider but also provides a braking action on side edges of the sled due to the frictional contact with the lip interface.

The sleds described hereinabove can control the sliding distance after landing on pool surface by changing the angle of attack of the sled by modifying the force on the control bars as desired, whereby the effective glide length on the pool surface can be shortened or lengthened as desired.

In the specification and drawings attached hereto, there is shown one-directional slide or slides but the slide or slides may be bidirectional or radially arranged about platform 4. Also the slides may be constructed so that their inclinations vary throughout their lengths.

The present invention need not be limited to the embodyments described hereinabove. For some application, it may prove more desirable to use other known materials and to vary the construction by the application of known engineering principles.

Accordingly, the embodyments set forth hereinbefore are examplary and would, with ordinary skill in the art, be modified to meet requirements at hand. requirements

What I claim is:

1. An amusement arrangement comprising an inclined slide, a fluid supply means to supply lubricating fluid upon said slide, a sled fabricated of a lighter material than said lubricating fluid and adapted to ride in said slide, and brake means coacting between said sled and said slide to control the sliding speed of said sled on said slide by selective rolling motion of said sled and wherein said slide has inwardly projecting edges to prevent said sled from jumping out of said slide and said brake means includes the underside of said edges and juxtapositioned surfaces on said sled which are placed in selective mutual frictional contact by selective rolling motion of the sled.

2. Amusement arrangement as recited in claim 1 wherein said sled has a seat, recess means for receiving the slider's heels and control bar means for permitting the slider to make rolling body movements.

3. Amusement arrangement according to claim 2 wherein said control bar means includes a pair of side folding hand-holding bars.

4. Amusement arrangement as recited in claim 2 wherein said sled is flexible so that a backward pull upon said control bar will cause selective engagement of the front portion of said sled with the underside of said projecting edges of said slide.

5. Amusement arrangement as recited in claim 1 wherein the sled is constructed of a foam material.

6. Amusement arrangement as recited in claim 1 wherein the slide and sled have the same selected sectional curvature and that the lubricating means includes fluid discharge tubes on both sides of said slide throughout its length.

7. Amusement arrangement as recited in claim 6 wherein the sled has a hollowed out body, the stern portion thereof is open.

8. Amusement arrangement as recited in claim 1 wherein said sled is selectively dimensioned so that its two outer vertical edges are selectively spaced from the juxtapositioned vertical walls of said slide to maintain a vertical lubricating film between said sled and said slide whereby to increase the speed of said sled.

9. Amusement arrangement as recited in claim 8 wherein said inwardly projecting edges of said slide are selectively dimensioned so that they are selectively spaced from the top surface of said sled to maintain a horizontal liquid film therebetween whereby to effect a cooling of the braking surfaces between said sled and said slide after rolling motions of said sled.

10. Amusement arrangement as recited in claim 1 wherein said fluid supply means directs lubrication fluid along and above said sled when said sled is disposed upon said slide whereby to increase the speed of said sled and to effect cooling of the braking surfaces between said sled and said slide after rolling motions of said sled.

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