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F. ZUKAL

SWIMMING DEVICE

Filed May 27, 1926

FIG. 1.

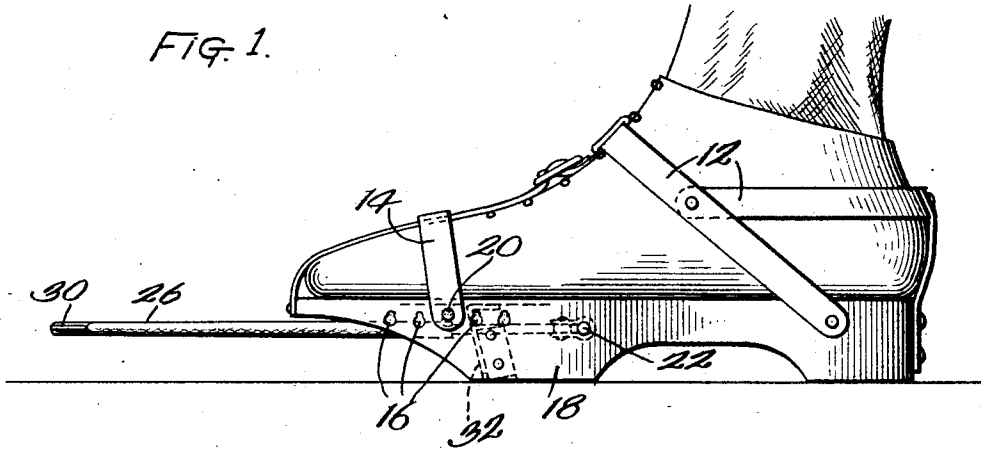


FIG. 2.

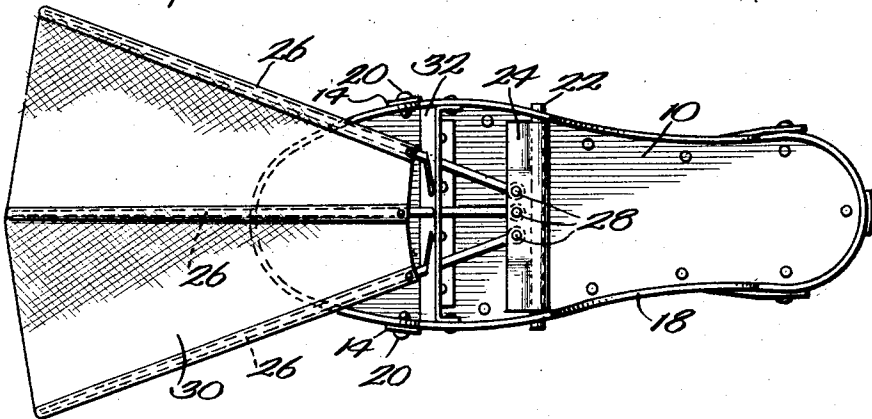


FIG. 3.

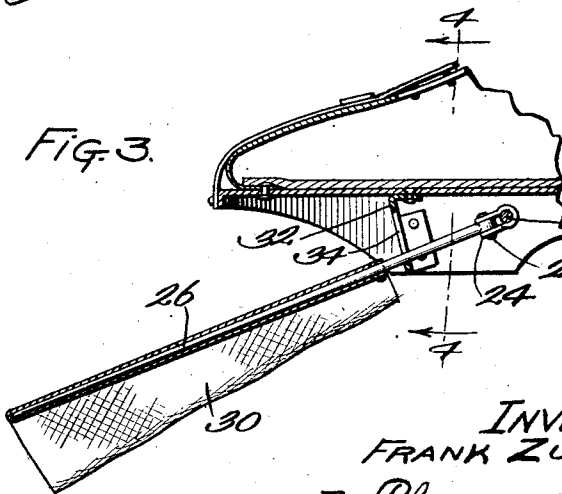
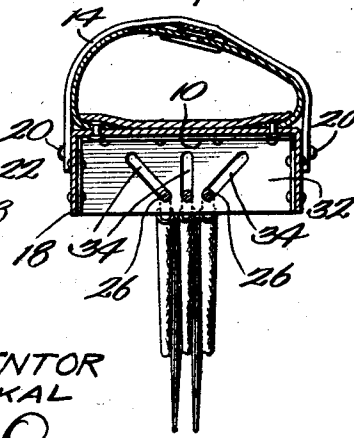


FIG. 4.



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FRANK ZUKAL, OF CHICAGO, ILLINOIS.

SWIMMING DEVICE.

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My invention relates to swimming devices or aids for swimming, and the object of the invention is to provide a simple and sure-acting device which will give the swimmer the benefit of a greater area of water against which he may push than would be available from the feet alone. I accomplish this object by the mechanism illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the device in acting position showing the same attached to the foot of the swimmer.

Figure 2 is a bottom plan view of the parts shown in Figure 1.

Figure 3 is a fragmentary view showing the device collapsed as it will be when the foot is being drawn forward through the water.

Figure 4 is a sectional view on the line 4—4 Figure 3.

Like numerals denote like parts throughout the several views.

In the form illustrated the device has a sole plate 10 which is formed preferably of aluminum and is approximately of the size and outline of the foot of the wearer. It is secured to the foot by means of heel straps 12 and a toe strap 14, although these may assume various forms and positions without departing from the spirit of the invention. In order that the device may be adapted to feet of different sizes it is desirable that the toe strap 14 be attachable at different points on the sole plate, and with this in mind I have provided a number of T slots 16 in the side flange 18 of the sole plate. A headed button 20 is provided at the ends of the toe strap and by putting said buttons in different slots the strap may be adjusted forward or backward along the sole plate.

As above suggested the sole plate is provided with a marginal depending flange 18 which serves several purposes. It affords means of attachment for the straps and other parts of the mechanism. It forms a housing for the operating parts of the mechanism, and it also forms a support for holding the sole plate in elevated position and protecting the operating parts when the user is walking on land.

A shaft 22 is mounted in the side flanges approximately midway between the ends of the sole plate. It extends crosswise of the sole plate and hence lies horizontal when the

user is standing upright. Shaft 22 forms a pivot for a swivel plate 24 to which the ribs 26 are pivotally connected. They are connected near the center of the swivel plate by means of pins 28 as shown in Figure 2 and elsewhere. Extending between the ribs 26 is webbing 30 which consists of rubberized fabric or any other flexible sheet material more or less impervious to water.

A short distance in front of the shaft 22 is a cam plate 32 which is riveted or otherwise secured to the sole plate and side flanges. By preference the plate is approximately tangent to a circle centered at the shaft 22 and having a radius equal to the distance between the plate and the shaft. The plate has three slots 34, one for each of the ribs. When viewed as in Figure 4 the side slots extend obliquely downward and inward while the center slot is vertical. The sides of the outer slots form cams for producing lateral movement of the ribs when the latter travel up and down in the slots in the manner presently to be explained. The center slot forms a guide for the central rib.

In operation, when a device is attached to the foot of the wearer, and the wearer is on land as indicated in Figure 1, the flange 18 holds the sole plate and swivel plate out of contact with the ground and thus protects the operating parts. When the user is in the water, swimming, the resistance of the water on the forward motion of the foot will cause the ribs to draw together or collapse to the position indicated in Figures 3 and 4. This is due to the action of the cam plate 32, and consequently it may be said that the action is positive when the user afterwards kicks backward, as in the usual swimming stroke the resistance of the water causes the ribs and the connecting webbing 30 to expand as indicated in Figure 2. This, of course, adds a large, effective area which presses against the water, and the result is that the swimmer may make rapid progress through the water. This expanding action is also positive due to the action of the cam slots 34.

The parts move easily on account of the pivotal arrangement of the swivel plate 24 on shaft 22 and the pivotal connection of the ribs to the swivel plate. By preference the parts are all made of aluminum or other rust-resisting metal, and the consequence is

that the parts retain their original condition without deterioration due to alternate wetting and drying.

It will be evident that the construction is simple as well as positive acting, and furthermore there is nothing that can readily get out of order.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a swimming device a sole plate, means for attaching it to the foot of the wearer, ribs pivotally connected to the sole plate, flexible webbing connecting the ribs, and means for automatically collapsing and expanding the ribs when the device is moved forward and backward in the water.

2. In a swimming device a sole plate, means for attaching it to the foot of the wearer, ribs pivotally connected to the sole plate, flexible webbing connecting the ribs, and a cam plate attached to the sole plate and having oblique slots for causing the ribs to expand and collapse when moved in the slots by the resistance of the water.

3. In a swimming device, a sole plate having means for attaching it to the foot of the wearer, the sole plate having a depending marginal flange, a shaft mounted crosswise of the sole plate in the sides of the flange, ribs pivotally connected to the shaft, flexible webbing connecting the rib, and a cam plate having slots through which the ribs extend, some of the slots being oblique to thereby cause the ribs to collapse and expand when moved in the slots by the resistance of the water.

4. In a swimming device, a sole plate adapted to be secured to the foot of the wearer, a shaft rigidly connected to the sole plate transversely thereof and spaced at a slight distance below it, a swivel plate piv-

otally mounted on the shaft, ribs pivotally connected at their rear ends to the swivel plate, and at their forward ends provided with webbing, and a cam plate in advance of the swivel plate having oblique slots through which the ribs extend for controlling the action of the rib.

5. In a swimming device a sole plate, means for attaching it to the foot of the user, a marginal flange extending downward from the sole plate, a shaft extending transversely of the sole plate and supported in the sides of the flange, a swivel plate extending forward from the shaft and having a sleeve for encircling the shaft, pivot pins mounted in said sole plate, ribs connected to said pivot pins and extending forward therefrom, webbing connecting the ribs at the forward portion, and means carried by the sole plate in front of the swivel plate for causing the ribs to expand and collapse when the sole plate is moved backward and forward in the water.

6. In a swimming device a sole plate, means for attaching it to the foot of the user, a marginal flange extending downward from the sole plate, a shaft extending transversely of the sole plate and supported in the sides of the flange, ribs pivotally connected at their rear end to said shaft, and a cam plate secured to the sole plate in front of the shaft and having slots through which the ribs extend, the outer slots extending obliquely downward and inward, the marginal flange descending below the shaft and as far as the bottom of the cam plate for protecting them when the user is on land.

In witness whereof, I have hereunto subscribed my name.

FRANK ZUKAL.