

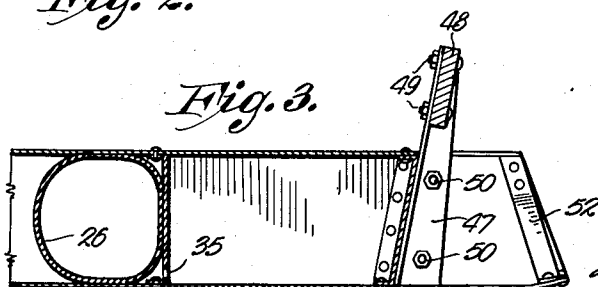
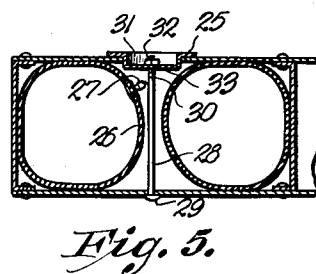
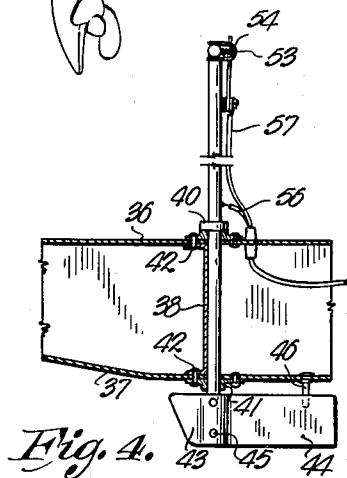
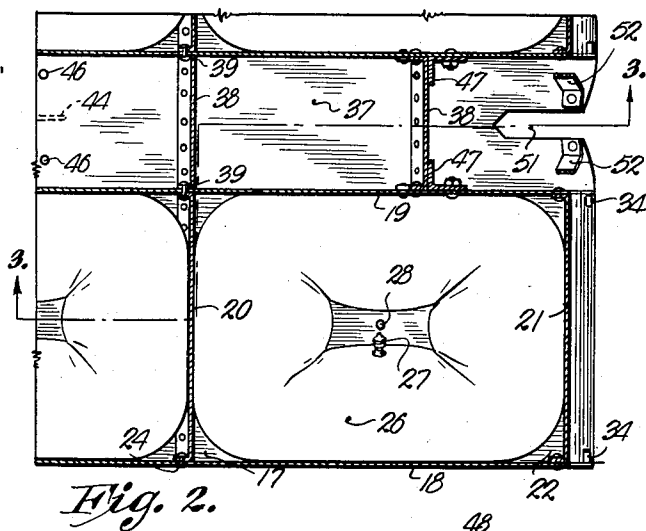
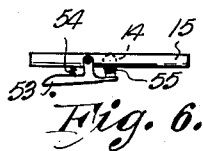
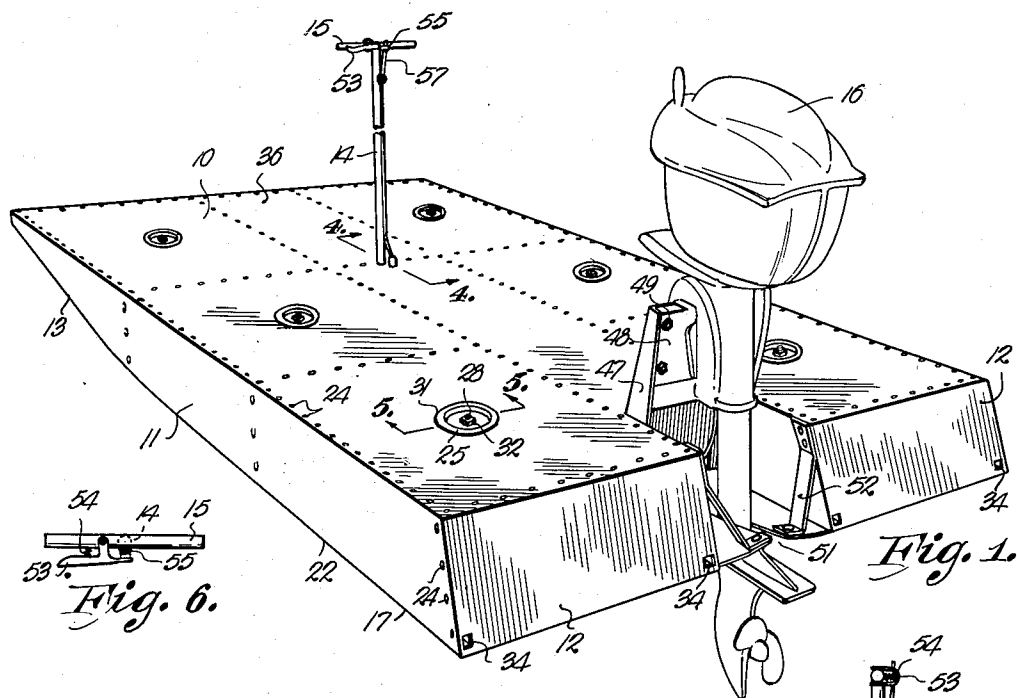
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H. H. ROBY

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WATER SCOOTER

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INVENTOR.
Horace H. Roby

BY

Thomas E. Seafeld
ATTORNEY.

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WATER SCOOTER

Horace H. Roby, Springfield, Mo.

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2 Claims. (Cl. 9—1)

This invention relates to a water scooter for hydroplaning over water surfaces and refers more particularly to such a water scooter made up of unsealed buoyancy cells containing buoyant float members therein.

Numerous types of floating craft are available on the market today. These include skiffs, motor boats, sealed pontoon boats, hydroplanes, surfboards and, particularly since the last war, inflatable rafts and boats of various sizes and designs.

These varieties of crafts have many relative advantages and disadvantages, depending on the particular design, and the shortcomings of one particular craft are generally made up in another which has certain weak points of its own. The present invention attempts both to present a combination of features never before found singly in any one style of craft and also to provide a number of unique advantages and features never before found in small water craft.

Some of the particular disadvantages which are to be found in the presently existing types of craft which are desired to be overcome by the present invention may be listed. Most small surface craft are relatively expensive, of relatively heavy construction and fairly large size. These characteristics result in making such craft relatively unportable and difficult to manufacture without considerable outlay of capital. Additionally, most small surface craft are relatively easy to capsize and sink, which characteristics make for a limited safety factor. Some of these latter limitations are due to the fact that only a single, generally open and unsealed float chamber is provided in the craft. Such floating craft, riding on the surface of the water, essentially unsubmerged, have a large instability factor, particularly while individuals are boarding and getting out of them. Many water units also are limited in the number of speed ranges available and generally do not provide a variety of possible speed ranges in a single structural frame. Still another difficulty with conventional float units is excessive draft in motion, particularly at high speeds. Conventional water craft are customarily sealed units of tight integral structure or fabricated of expensive deteriorable materials. Such high integrity structures and expensive materials are especially vulnerable to perforation or seam parting, etc., and generally a single breach of the water-tight integrity makes the entire vehicle useless until repair is effected.

Therefore an object of the present invention is to provide a water scooter of very small draft which may be either power driven or dragged as a surfboard.

A further object is to provide a water scooter which has potentially very high speed, is adaptable to various power units and therefore may be provided with any speed range which is desired.

A further object is to provide a water scooter which has an extraordinarily high safety factor in every type of operation, due to essentially unsinkable construction composed of multiple buoyancy cells, such construction providing unusual stability during mounting and dismounting of the scooter, and a power shut-off system operable

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to shut off the motor when the operator's grip on the steering column is relinquished.

Another object is to provide a water scooter of light unitary construction which is cheap, eminently portable, of relatively small size, simple to manufacture, and which has a high degree of shape retention despite its construction.

Still another object is to provide a water scooter composed of a plurality of unsealed buoyancy cells, each cell containing a protected, replaceable, buoyant float member, the described structure completely eliminating any problem of leakage of the scooter structure and rendering unimportant the question of water-tight integrity of the scooter hull.

Still another object is to provide a water scooter which is exceedingly simple to operate, is operable by a child with high safety, and is readily maneuverable, either by a mechanical steering system or by the shifting of the operator's weight from one side to the other of the scooter.

Other and further objects will appear in the course of the following description and claims.

In the accompanying drawings which form a part of the specification and are to read in conjunction therewith, there is shown an embodiment of the invention by a sequence of figures in which like reference numerals indicate like parts in the various views.

Fig. 1 is a perspective view of a preferred form of water scooter embodying the invention.

Fig. 2 is a top sectional view of a portion of the water scooter shown in Fig. 1.

Fig. 3 is a view taken along the lines 3—3 of Fig. 2 in the direction of the arrows.

Fig. 4 is a cross-sectional view taken along the lines 4—4 of Fig. 1 in direction of the arrows.

Fig. 5 is a cross-sectional view taken along the lines 5—5 of Fig. 1 in the direction of the arrows.

Fig. 6 is a view of handgrip of the power shut-off system.

General introduction

The invention comprises a water scooter which may be power driven or towed (as a surfboard) composed of one or more buoyancy cells of a new and unusual sort. The characteristics of the buoyancy cell will be first generally described singly and then in the various preferred combinations. The preferred form of water scooter will then be described in detail, with reference to Figs. 1—6.

The fundamental construction unit in the inventive water scooter is a buoyancy cell comprising an unsealed surface enclosing a volume, said volume containing a buoyant float member. The buoyancy cell preferably comprises a plurality of interconnected unsealed surfaces of any desired shape, such as a disc, an oval, etc. The buoyancy cell illustrated in the figures is a rectangular compartment, made up of a plurality of faces riveted together. The float member preferably fills the enclosed volume and is removable therefrom. The float member 26 may be of any desired material and design. Thus, it may be flexible, sealed and inflatable, as an ordinary inner tube or it may be of a relatively inflexible flotation material, a celled buoyant water resistant substance, an example of which would be a product sold under the name "Sterofoam" a slab like material manufactured by the Dow Chemical Company of Midland, Michigan. One or more drainage holes are provided in the lower side walls of the cell to permit drainage of any contained fluids from the cell when it is put in motion. A brace member is customarily provided between the two opposite faces of largest area of the cell to provide stability of shape when the float member is resilient and flexible. Preferably the float, usually an inner tube, surrounds

the brace member. A power source may be attached to one of the sides of the cell to drive it through the water, or it may be dragged through the water by another boat. The direction of motion of the cell is opposite the side which has the drainage holes therein. A steering means may also be attached to the buoyancy cell to guide it as it is dragged or driven. An upwardly inclined bottom surface at the forward end of the scooter is often provided to permit hydroplaning at higher velocities.

The previously described buoyancy cell may be combined in pluralities of two or more single cells to form a float platform also to be dragged or self powered. The cells, if directly connected, have interpenetrating holes between themselves and in the backside of the rear cell for water drainage when the platform is put in motion. The volumes and size of the float members contained by the volumes are adjustable to the shape of the float platform desired. It is also contemplated to provide a channel between float platforms made up of two or multiples of two buoyancy cells to provide more efficient and adaptable mountings for steering means and power sources. It is contemplated that such a channel should be composed of cells similar to those previously described, but without float members therein.

Preferred form

Referring to the drawings, in Figs. 1 through 6 is shown a water scooter comprising a preferred form of structure embodying the invention having a plurality of buoyancy cells with enclosed float members therein, a channel composed of unsealed buoyancy cells without float members dividing the buoyancy cells into two groups, a steering mechanism and a power source, both mounted in the channel area. It will be clear from an examination of the preferred form that it is made up essentially of a plurality of the basic inventive units or buoyancy cells.

Fig. 1 shows a perspective view of the preferred form completely assembled. The water scooter has a top deck 10, side walls 11, rear walls 12, and upwardly inclined front underside 13. Perpendicular steering post 14 having cross bar handles 15 extends upwardly through top deck 10. Power source 16 (a conventional outboard motor) is mounted at the rear portion of the hull.

The hull of the scooter in the preferred form comprises two sets of buoyancy cells, each set made up of three individual compartments. The two sets of compartments are separated by a central channel. In Fig. 2 a top sectional view of the left rear compartment of the scooter in Fig. 1 is shown. Buoyancy cell 17 has outer side wall 18, inner side wall 19, front wall 20, rear wall 21, bottom wall 22, and top wall 23. The walls described are shown as metal sheets riveted or bolted together in unsealed fashion to form the buoyancy cell or compartment. The cell is not sealed and is accessible by water at its seams. It would not float alone. While in the preferred form of scooter the walls are shown as essentially continuous thin metal sheets, it is of course understood that if a single buoyancy cell were to be employed the walls would probably be separate individual interconnected sheets. Any suitable material may be employed for the walls, it being understood that it is necessary that the substance be able to withstand water corrosion and prolonged submersion therein. Aluminum is a preferred material. Rivets 24 are shown joining the wall sections. When the float member is resilient and flexible, opening 25 is positioned in top wall 23. All buoyancy cells which are to contain inflatable float members have such a top opening. Preferably positioned within each buoyancy cell 17 having opening 25 is a resilient, sealed, air- and water-tight inflatable float 26. Float 26 provides the buoyancy necessary to prevent the cells 17 from sinking. Any desired float object of suitable nature may be employed, but one of the simplest and most readily available float objects is a common

inner tube having valve 27 as shown in Fig. 2. The walls of the buoyancy cell protect the float from external contacts which might tend to distort or tear its surface. The basic criteria of the float object is that it be able to withstand prolonged submersion in water without losing its air-tight integrity and buoyancy quality. Again, when the float member is resilient and flexible, a brace member 28 is commonly employed between top and bottom walls 23 and 22 respectively. In its preferred form as shown in Fig. 5, brace 28 comprises a bolt having a head 29 extending upward through the center of the buoyancy cell into opening 25. Brace 28 has threaded portion 30. Nut 32 engages threaded portion 30. Cap 31 has hole 33 therein to receive brace 28. It is not necessary that cap 31 form a water-tight seal with opening 25. In the preferred form of buoyancy cell 17 float member 26 completely fills and abuts the inner walls of the cell volume. Additionally, the float member preferably surrounds brace 28, which aids in spacing the float member. As is seen in Fig. 5 and Fig. 2, a conventional inner tube may be so positioned within the buoyancy cell as to completely fill it, surround the brace post, and have valve 27 readily available for input or release of the air pressure.

When a relatively inflexible float member 26 is employed, opening 25 and brace 28 are omitted. One side of the buoyancy cell is removable to permit removal of the float 26 although often this is unnecessary during the life of the craft.

It is contemplated that the float members 26 be installed in the buoyancy cells for relatively long periods of time without deterioration, and such has proved the case in actual operation. Thus, a float member may be inserted in a buoyancy cell at the beginning of a summer and remain in place without damage or deterioration with constant use of the water scooter until the end of the summer, when it may be deflated and removed. Positioned next the lower edge of rear wall 21 are perforations or holes 34. These holes serve as outlets for any fluid which may collect within the buoyancy cell 17 when it is at rest in the water. This may be a fairly sizable quantity as no effort whatsoever is made to effect a complete water-tight seal at the junctures of the walls defining the cell. When the cell is at rest, then, a very appreciable quantity of water collects within each buoyancy cell. The holes 34 are always positioned in the wall or at a point opposite to the projected direction of motion. Thus, when the buoyancy cell or cells gets under way, the water tends to surge to the rear and flow from the holes 34. Once velocity is built up and as the fluid departs from the cell, the cell tends to rise in the water and, if the front underside of the cell is upwardly inclined, will begin to hydroplane, thereby trajectorying the water to the rear and out of the holes 34. When a plurality of buoyancy cells is provided in line as in the preferred form of water scooter, a series of connecting openings 35 are provided in the front walls of each cell which is preceded in the direction of motion by another cell. Such openings may be seen in Fig. 3. The process of water discharge from a multiple cell scooter unit is the same as previously described as for a single cell unit. It should be noted that the leading edge of any scooter unit does not have any holes therein as this would, of course, completely defeat the water purging process. It should be emphasized that this process is not theoretical but actual and has been achieved in a number of working models of various structural forms, some of which are now in commercial production. The essential features of the water discharge openings are first, discharge openings in the rear of the hull, second, interconnecting discharge openings in partitions between buoyancy cells in line, and, finally, no openings in the leading face of the scooter unit. The holes, of course, must be in the lower rear portions of the compartment walls to permit relatively complete drainage.

When a relatively inflexible float member 26 is em-

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ployed, it is customary to employ only a single buoyancy chamber no matter the length of the section as there is no problem of inner tube failure. In such case only a single set of discharge openings 34 are employed.

Fig. 1 shows a water scooter having an upwardly inclined front underside, which is a preferred form when a craft is desired which will readily hydroplane and have a relatively high rate of speed. It should be understood, however, that such structure should not be construed as limiting, and any number of forms may be employed using the basic buoyancy cell structural unit. Thus, a simple rounded end, flat bottom hull has proved very satisfactory for certain relatively low speed models of a different type. In such a design, employing a simple rounded prow, the shapes and volumes of the buoyancy cells are essentially equivalent and equivalent sized float members are employed in each cell. In a structure as is shown in Fig. 1, if desired, the volume of the front buoyancy cell may be less than that of the cells following and a smaller float member employed, or, the same volume may be employed and an equivalent float member therein with the float member somewhat flattened at its front end. As the float members are resilient, such distortions of shape are readily obtainable without loss of safety. When a group of buoyancy cells is employed in line, continuous metal sheets may be employed for the side, top and bottom walls and sheet partitions riveted thereto, thus providing a unitary construction.

When a scooter is made up of two, or multiples of two, buoyancy cells, a channel connection between the cells or groups of cells may be employed as is shown in the preferred form, as illustrated in Fig. 1. Such a channel joins the side walls of the cell with top and bottom partitions 36 and 37 respectively. The front end of the channel is conventionally closed over in the same manner as the adjacent buoyancy cells; thus, in the preferred form in Fig. 1, the bottom wall at the front of the channel is stepped and the front wall edge is of the same width as the front walls of the buoyancy cells. Customarily, also, the channel has partitions 38 continuing adjacent cross partitions in the buoyancy cells for strength and rigidity. Thus the channel is composed of one or more cells, usually of lesser volume than the buoyancy cells 17 and not containing float members. It should be noted, however, that the partitions 38 have rear wall holes 39 similar in position, structure, and function to the rear wall holes of the buoyancy cells. Thus, the motion of the scooter through the water also purges the channel cells of fluid as it does the buoyancy cells. The main purpose of the connecting channel is to provide an advantageous mount for the steering and power assemblies. It should be noted, however, that the channel structure is not required to be able to mount either steering or power means on a single or a group of conventional buoyancy cells as described.

Referring now to the steering assembly as illustrated in the preferred structure, as previously noted, steering post 14 protrudes upwardly from deck 10. Referring to Fig. 4, it will be seen that post 14 extends through the channel cell next the front partition 38 through the bottom wall of the cell. Post 14 is gripped above deck 10 by collar 40 which serves as a thrust bearing and holds the steering post from slipping downwardly. A second collar 41 fixes the lower end of the post in the bottom wall of the channel. Collars 40 and 41 are held in place by bolts or rivets 42 and no attempt is made to produce a sealed water-tight connection with either the collars or the bolts. Fixed to the lower end of post 14 is rudder 43 having blade 44 and attached to post 14 by bolts 45. Shafts 46 in Fig. 4 serve to limit the rudder travel in each direction.

At the rear of the channel is provided a mount for the power source 16. The rear partition 38 of the last channel cell is set forwardly on the bottom floor of the channel and reinforced by upwardly extending frames 47

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having crosspiece 48 bolted thereto by bolts 49. Frames 47 are bolted to the buoyancy cell side walls by bolts 50. Groove 51, to receive the drive shaft of the power source, is cut in the bottom floor of the channel. Support flanges 52 join the upturned edges of the rear of the groove and the wall of the buoyancy cell. Frames 47 are made of such strength and groove 51 of such size as to receive a variety of power plants which will give any desired range of speed for the craft. Thus, for children, a low power motor may be employed.

Attached to steering post 14 and handle 15 is a kill switch having grip 53, spring return 54, and contact 55. Figs. 4 and 6 show the details of the kill switch assembly, with ground wire 56 and connecting wire 57 attached to contact 55. Ground wire 56 is attached to post 14, which is a conductor. The kill switch is the reverse of an ordinary contact switch, thus, when grip 53 is pressed and contact 55 open, the electrical system of the power source can operate. However, when grip 53 is released and contact 55 closed, the power source electrical system is short circuited and the power cut off. Thus, the operator must maintain his hold on the steering post handle 15 to keep the motor functioning, and should any accident cause him to lose his grip on the handle the motor will immediately be shut off. This is an additional safety factor.

Operation

The operation of all types of craft constructed of the basic buoyancy cell unit is similar and may be simply described. It should be noted that craft of this structure may be either towed or power driven as desired, thus combining the features of either a surfboard or a power boat and offering certain features and safety factors furnished by neither of the latter. When the craft is at rest in the water, the buoyancy cells and channel cells, if any, partially fill with water due to the unsealed character of the seams of the cells. It should be noted, that while no great attempt is made at sealing the cells, the cell seams are joined in such a manner as to minimize flow resistance, especially on the bottom side. The presence of the quantity of water in the buoyancy cell thus makes for an exceedingly stable mounting platform for getting on or off the surface of the scooter. The presence of this water also assures a relatively slow start and attainment of speed, thereby offering stability during acceleration. The water swiftly drains out as the craft gains speed and especially as the front end rises when the scooter begins to hydroplane. As long as any forward motion is maintained by the scooter, the buoyancy cells remain essentially free of water as any fluid which enters swiftly drains out the drainage holes. Very high speeds are attainable with this craft depending upon the type of power unit employed, but in commercial models speeds of 35 to 40 miles per hour have been attained. The very small draft makes possible both a high safety factor and high speed. When the craft comes to a halt in the water after the power has been shut off, the buoyancy cells and channel cells quickly fill up again through the unsealed seams and once again a stable raft-like float is provided for convenient mounting or dismounting. When the craft is beached, the fluid in the cells will quickly drain out through the seams and rear holes. The kill switch, as previously described, prevents accidents should the operator lose control of the steering handle. The surface of the deck around the steering post may be roughened, if desired, to further secure footing, or mats of various sorts may be attached to the deck. However, to date, these devices have not proved necessary as, due to the high riding of the deck above water in the hydroplaning action, there has been no problem of deck washing.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth together with other advantages

which are obvious and which are inherent to the structure.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a water vehicle adapted to be propelled through the water in a selected direction, a hollow body having a top surface, a bottom surface and circumferential side walls forming a float platform having a forward end and a trailing end, the bottom surface at the forward end being upwardly inclined, as least one portion of said body adjacent the bottom surface open to receive water, a buoyant float member in said body having an external volume less than the internal volume of said body whereby water will accumulate in said body when said vehicle is stationary, and at least one drain aperture formed closely adjacent the bottom surface additional to and differing from said first open body portion in the trailing end of said body through which the accumulated water in said body is returned to the exterior thereof when said vehicle is set in motion.

2. In a water vehicle adapted to be propelled through the water in a selected direction, the combination of a hollow body having a top surface, a bottom surface and circumferential side walls and a plurality of compartments formed therein and having a forward end and a trailing

end, the bottom surface at the forward end being upwardly inclined, at least one portion of each of said compartments adjacent the bottom surface open to receive water, buoyant float members disposed in said compartments each having an external volume less than the internal volume of its respective compartment whereby water will accumulate in said compartments when said vehicle is stationary, said compartments being provided with at least one intercommunicating aperture formed closely adjacent the bottom surface to permit passage of the water in said compartments toward the trailing end of said body while said vehicle is in motion, and the trailing compartment being provided with at least one drain aperture formed closely adjacent the bottom surface in the trailing end of said body additional to and differing from said first open body portion to return said water to the exterior of said body when in motion.

References Cited in the file of this patent

UNITED STATES PATENTS

577,061	Palmer	Feb. 16, 1897
1,272,412	Flynn	July 16, 1918
1,927,124	Jones	Sept. 19, 1933
2,494,316	Sanderson	Jan. 10, 1950
2,593,806	Steele	Apr. 22, 1952

FOREIGN PATENTS

4,364	Great Britain	of 1888
242,187	Great Britain	Nov. 5, 1925
526,997	Great Britain	Sept. 30, 1940
880,565	Germany	June 22, 1953