

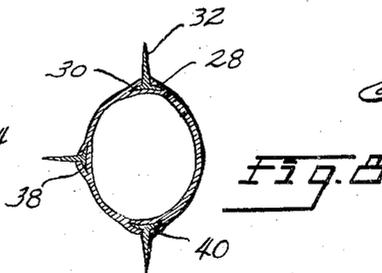
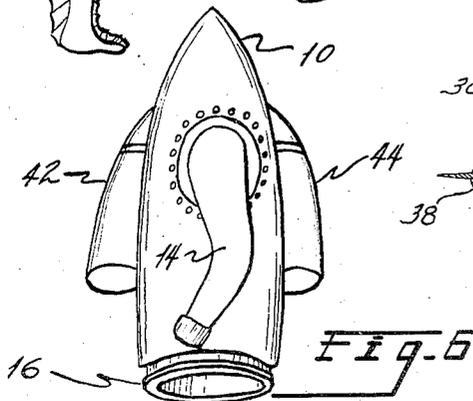
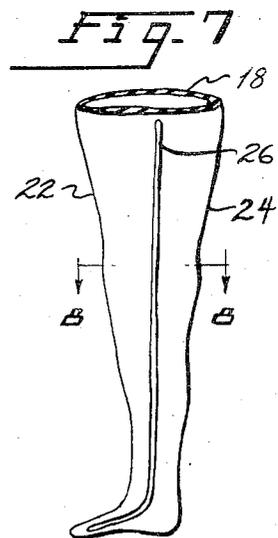
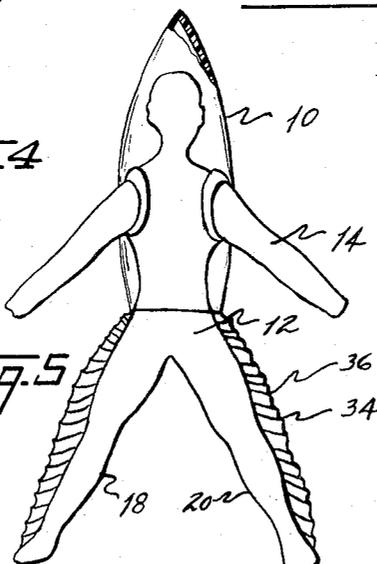
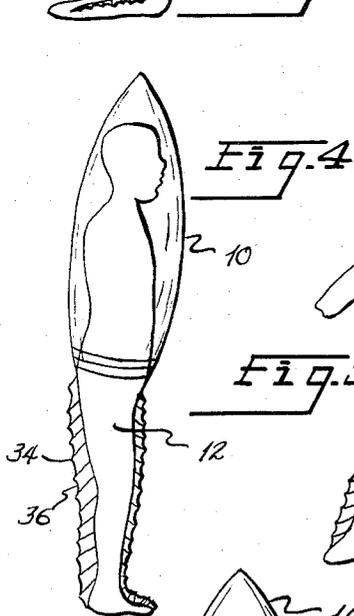
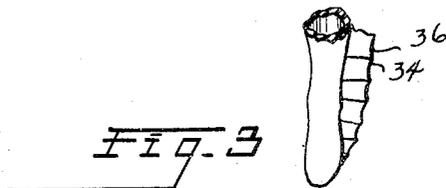
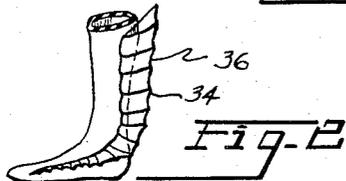
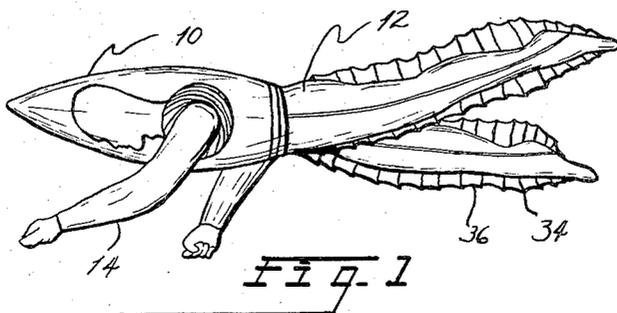
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SWIMMING AND DIVING DEVICE

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2,851,707

SWIMMING AND DIVING DEVICE

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9 Claims. (Cl. 9—21)

This invention relates to a swimming and diving device and more particularly relates to a streamlined swimming and diving suit which permits free locomotion of the arms and legs either above or below water while providing complete visibility.

Diving suits in use heretofore have been of two general types; the deep diving type wherein a heavy bulky suit is supplied with air from above the surface of the water and is in need of constant attention from that location and the tight fitting rubber garment utilized by skin divers to provide warmth while in the water. With the latter type suit the diver normally carries a breathing apparatus strapped to his back and wears a face mask giving limited visibility. The deep diving type suit is not intended to provide for any extensive locomotion of the diver inasmuch as he is connected to a surface station and is heavily weighted down so that he may walk upon the bottom. The tight fitting suit used by free divers basically is intended to provide warmth and serves no other function.

It is a primary object of the present invention to provide a swimming and diving suit which combines desirable features of the deep diving suit and of the tight fitting free diving suit while overcoming the disadvantages inherent in each.

It is another object of the invention to provide a swimming and diving suit which streamlines the body while permitting complete freedom of movement so that any type swimming stroke may be utilized.

It is another object of the invention to provide a swimming and diving suit of the foregoing type wherein the efficiency of propulsion through movement of the legs is greatly enhanced through the use of fins mounted on the suit in a manner to provide maximum propulsion effect for the specific type of swimming stroke being used.

It is a further object of the invention to provide such a swimming and diving suit having provision for a breathing apparatus and lighting unit without destroying the streamlined profile of the unit.

These and further objects and advantages of the invention will become apparent upon reference to the following specification and claims and appended drawings wherein:

Figure 1 is a side elevation of the swimming and diving suit of the invention in use by a swimmer showing the fins positioned for a scissors or frog kick;

Figure 2 is a side elevation of the foot of the diving suit of the invention;

Figure 3 is a front elevation of the ankle and foot of the lower portion of the suit with the fins mounted as shown in Figure 5;

Figure 4 is a side vertical section of the swim suit on a swimmer;

Figure 5 is a front vertical section of the swim suit on a swimmer;

Figure 6 is a side elevation of the upper portion of the suit provided with lighting and breathing apparatus;

Figure 7 is a side elevation of the left leg of the low-

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er portion of the suit showing the channels for receiving the fins;

Figure 8 is a vertical section taken on the line 8—8 of Figure 7.

5 The swim suit of this invention consists of an upper section 10 and lower section 12 joined together slightly below the waist of the swimmer. The upper section 10 consists of a transparent, bullet shaped cylinder which encloses the upper torso and which is provided with detachable flexible water tight sleeves 14 of rubber, plastic or other flexible water repellant substance which allows free movement of the arms. The bullet shape of the cylinder 10 provides a high degree of streamlining while the flexible arms 14 permit free movement of the arms of the swimmer and permit the handling of any tools, fishing equipment, or weapons. The swimmer is provided free movement of his head within the cylinder and thus has complete visibility. The mouth of the swimmer is unhampered with breathing apparatus. The sleeves 14 may be attached to the cylinder 10 in any suitable manner, as by simply snapping over a protruding flange where the sleeves are of elastic material. Elastic wrists are provided in the sleeves to prevent the entry of water thereinto.

25 Attached to the upper cylinder portion 10 of the suit is a lower portion 12 which is also formed of rubber, plastic or other flexible water repellant material which allows free movement of the legs. This portion of the suit is in the form of tight fitting trousers and may be attached to the upper portion of the suit in any suitable manner as by means of an elastic tight fit over a flange 16 provided at the lower edge of the cylinder 10 as shown in Figure 6. The legs 18 and 20 are each provided with three channels 22, 24 and 26 at the front and back and outer sides thereof respectively. The rubber or other material of which the legs are formed is thickened at the position of the channels, as may be seen in Figure 8, and the center portion of this thickened portion is removed to provide a space 28 for receiving a base 30 of fins 32. See Figure 8. The fins may be formed of a unitary elongated plastic element having thickened ribs 34 extending out from the base 30 at an angle of approximately 45° thereto. This rearward rake of the ribs provides maximum propulsion effect and permits the swimmer to achieve a far greater speed than is possible without the fins or with conventional "flippers" on the feet. As an alternative to this unitary construction the ribs 34 may be rod like elements embedded in the base 30 and covered by the membrane 36 which extends between the ribs.

50 The provision of the three channels 22, 24 and 26 permits the swimmer to mount the fins in the position which will provide maximum propulsion for the particular stroke which the swimmer desires to use. Thus for a crawl or flutter kick the fins are mounted in the side channels 38 of each leg as shown in Figure 5, while for a frog kick the fins are mounted in the upper and lower channels 30 and 40 as shown in Figures 1 and 4. Various combinations are possible and the individual swimmer soon learns the most efficient combination for his stroke. The flexibility of the fins provides complete freedom of ambulation both in and out of the water despite the fact that the ribs 34 are rigidly mounted in the base 30. That is to say, movement of the legs is made possible by the flexibility of the webs 36 between the ribs while the ribs provide the necessary rigidity for swimming. Because of the large propulsive effect that can be achieved through the use of the legs alone the swimmer is permitted to lock his arms against the sides of the cylinder to achieve an even greater streamlined effect where desired.

Referring to Figure 6 the cylinder 10 may be provided

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with artificial light, breathing apparatus, propulsion units, firing mechanism, radio, telephone or the like apparatus in a pair of streamlined enclosures 42 and 44 attached to the top and bottom of the cylinder respectively. These units are detachable so that the swimmer may dispense with their use for shorter diving periods where desired.

It will be apparent from the foregoing that I have provided a novel swimming suit which combines the advantages of a deep diving suit of the helmet variety with the freedom of movement and complete detachment from the surface possible with tight fitting suits. Complete visibility is provided and a high efficiency propulsion is made possible through the use of detachable fins which may be assembled onto the suit in a manner which will permit the swimmer to attain maximum propulsion with any of a number of different types of swimming strokes. Provision is made for breathing and propulsion units and for artificial light. The unit is particularly well adapted to use by sportsmen and is also well adapted to use for military purposes such as removing underwater obstacles. Radio or telephone equipment can be provided so as to effect communication with the surface.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A swimming suit comprising a transparent bullet shaped upper section having flexible water tight sleeves attached thereto, a flexible lower section comprising a torso portion joined to said upper section and having flexible legs attached thereto, channels extending along the outer sides of said legs substantially the full length thereof and further channels extending along the front and back of said legs substantially the full length thereof, and flexible fins removably mounted in at least two of said channels.

2. A swimming suit as set out in claim 1 wherein said

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fins comprise an elongated base having ribs projecting therefrom and having webs joining said ribs.

3. A swimming suit as set out in claim 2 wherein said ribs extend away from said base at an acute angle.

4. A swimming suit as set out in claim 3 wherein said angle is substantially 45 degrees.

5. A swimming suit comprising a transparent generally bullet-shaped upper section having flexible water-tight sleeves removably attached thereto, a flexible lower section removably attached to said upper section by means of a water-tight connection, said lower section comprising a torso portion attached to said upper section and a pair of flexible legs attached to said torso portion, mounting means formed on each said flexible leg and extending substantially the full length of said leg, and flexible fins removably secured to said mounting means and extending substantially the full length of said legs.

6. A swimming suit as set forth in claim 5 wherein said mounting means comprises channels extending along the outer sides of each said leg, and said fins have a widened base removably positioned in said channels and rib portions extending outwardly from said base.

7. A swimming suit as set forth in claim 5 wherein said mounting means comprises channels extending along the front and back of each said leg along substantially the full length thereof, and said fins comprise a widened base removably positioned in said channels with rib portions extending outwardly therefrom.

8. A swimming suit as set out in claim 5 including a streamlined container attached to the back of said upper portion.

9. A swim suit as set out in claim 8 including an additional streamlined container attached to the front of said upper portion.

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