Aug. 11, 1942. C. L. STOKES 2,292,490

SPORT GARMENT

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Fig. 1.

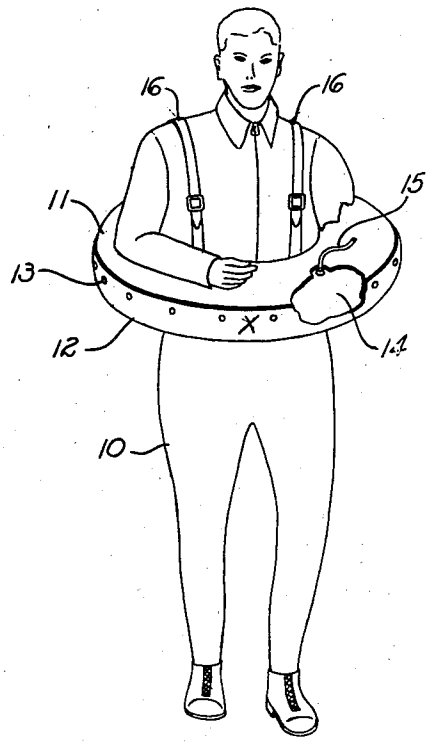


Fig. 2.

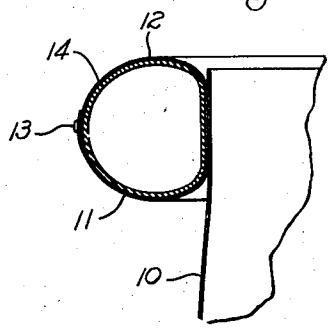


Fig. 3.

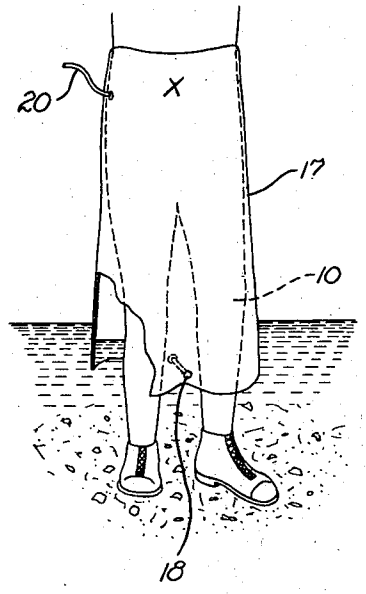
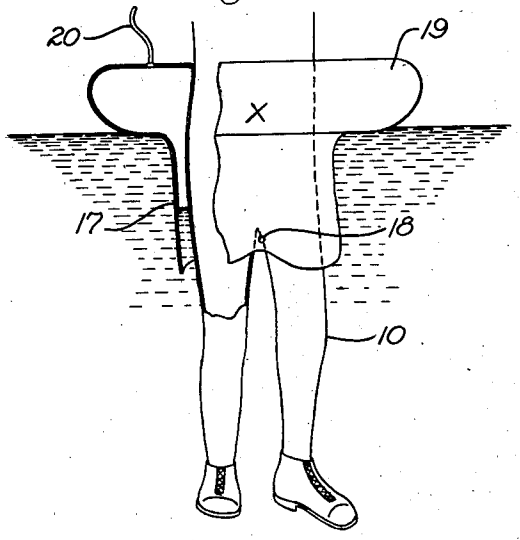


Fig. 4.



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Fig. 5.

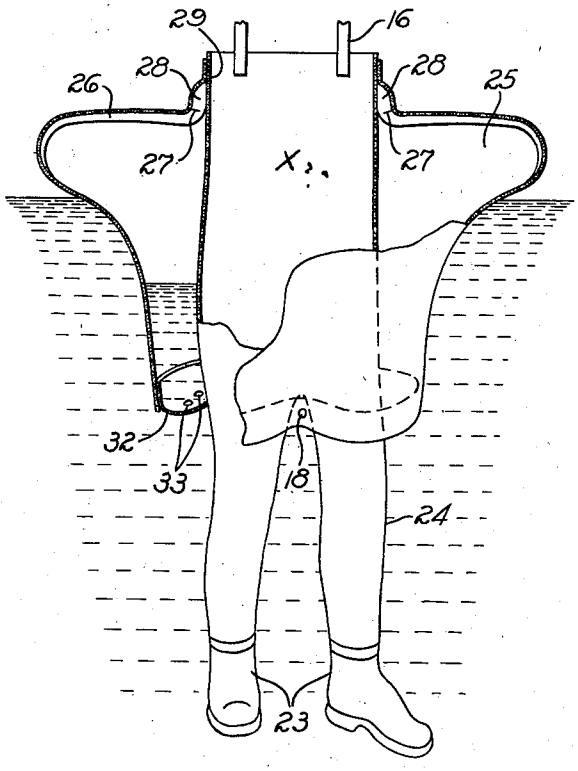


Fig. 6.

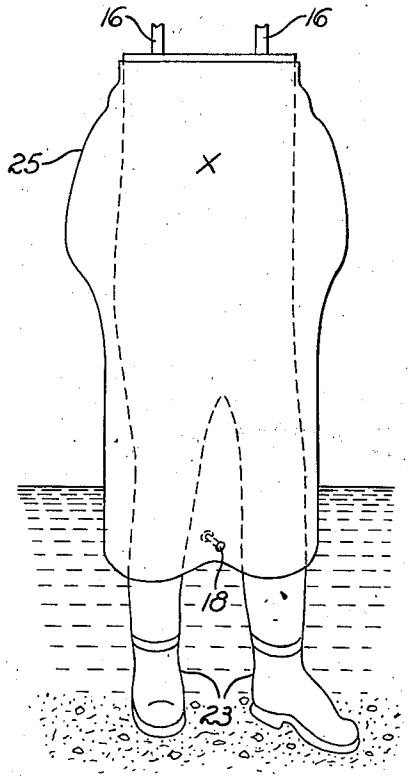


Fig. 7.

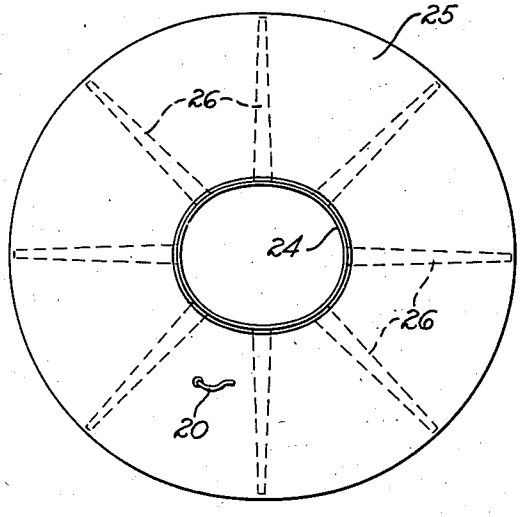
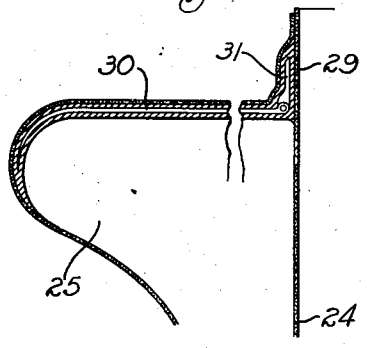


Fig. 8.



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UNITED STATES PATENT OFFICE

2,292,490

SPORT GARMENT

Charles L. Stokes, Santa Monica, Calif.

Application June 1, 1940, Serial No. 338,403

8 Claims. (Cl. 9—20)

This invention relates to waterproof garments, and has for its principal object the provision of a garment capable of supporting the wearer when partially submerged in water vertically.

The invention has particularly adaptability to garments useful for fishermen, hunters, and the like, whereby the wearer is able to put on a garment and walk straight out into water of increasing depth and thereafter to float in such water in a condition of stability. In so doing, the adaptability of the invention for life-saving purposes under any conditions will be clear.

The principal object of the invention is accomplished by providing an inside waterproof section of a garment, which may be trousers, but the invention is not necessarily limited thereto, with which is joined in air-tight relationship a second or outer section in which air is trapped or held in such volume as to properly support the wearer in water.

In order to maintain the figure of the wearer vertically under all conditions in the water so as to prevent tipping over, the main volume of the air should be maintained not lower than the center of gravity of the body when partially submerged, preferably well above such center of gravity.

Safety is a paramount feature of the invention coupled with comfort and ease of use heretofore unknown. The combination of an inner waterproof section joined in airtight or waterproof relationship with an outer air supporting section provides such safety features inasmuch as no water can rise or be splashed between such sections when in use, thus preventing the inner section, or trousers for instance, from becoming filled with water and thus so disturbing buoyancy conditions that the user may be submerged and drowned.

This condition is exemplified in the drawings, in which:

Fig. 1 is a front view of one form of the invention;

Fig. 2 is a sectional detail of part of Fig. 1;

Fig. 3 is a front view of a second form of the invention when inoperative;

Fig. 4 is a front view of Fig. 3 when in operation.

Fig. 5 is an improved form of construction of the arrangement shown in Fig. 1;

Fig. 6 is a front view of Fig. 5 when not in use;

Fig. 7 is a top view of Fig. 5; and

Fig. 8 is an alternative construction of part of Fig. 5.

In the drawings, like numbers indicate like parts.

If it be assumed that any particular point X indicates generally the center of gravity of the body of a wearer when partially submerged, the form of Figs. 1 and 2 includes waterproof trousers 10, such as are known as "waders," the upper part of which forms a waist-line preferably approaching a line under the armpits of the wearer to which waist-line is securely fastened a casing comprising overlapping flaps 11 and 12 held together by buttons 13 and enclosing a circular rubber tube 14 which may be inflated in any suitable manner by a valved pipe 15.

The whole garment may be supported on the body of the wearer by shoulder straps 16 or in any suitable manner, so that when tube 14 is inflated the upper part thereof, when partially submerged and supporting the wearer, will form a shelf whereon the elbows and forearms of the wearer may rest without fatigue. This is due to the placement of the upper part of tube 14 at least above the center of gravity X and this structure has the dual function of assuring stability as well as supporting the elbows and forearms, which latter is especially valuable for sportsmen.

In operation, tube 14 being inflated the desired degree and the whole garment being supported by straps 16 in the proper position, the wearer will carry his rod or gun and simply walk into water of increasing depth until the buoyancy of tube 14 supports him in stable vertical position, wherein he may fish or shoot in comfort and safety. A small paddle or other means of propulsion can be carried.

If a leak should develop in tube 14, pipe 15 is preferably placed within easy reach of the wearer to at least reinflate to the point of safety. When the wearer comes out of the water he is enabled to simply approach ground where his feet can secure hold and then walk upright out of the water.

In the form shown in Figures 3 and 4, the lower portion of the body of the wearer is encased, as before, in a waterproof and airproof garment of substantially the same cut as previously described.

In the present modification, the waist-line of the inner garment 10 is securely fixed in airtight and watertight connection with one end of the airtight outer garment 17 which is shown in the form of a skirt, the front and rear of which are joined by a connector 18 placed at such point as to restrict the upward rise of skirt 17 to form

a circular air pocket 19 of sufficient capacity to support the wearer in stable vertical position in water as before.

It is clear that when the wearer of the form of Figs. 3 and 4 walks into water of increasing depth that air will be trapped between the inner and outer portions of the garment and will rise to a point where an air pocket fold 19 is formed in skirt 17 and contains air under whatever the hydrostatic pressure of immersion may be, and to this end the length, diameter, and design of skirt 17 will be made.

When the wearer walks out of the water after use, as shown in Fig. 4, the water between the two garments will assume its normal level and the air its normal pressure.

A valved inflation pipe 20 may be provided for air pocket 19 for safety purposes, and a tube 14 with valved stem 15, as shown in Fig. 1, may be used inside air pocket 19 of Fig. 4 for double safety effects, it being understood that the forms shown in Figs. 3 and 4 require shoulder straps or other suitable means of support (not shown), as illustrated in Fig. 1.

While the form of tube 14 and air pocket 19 is primarily circular, any other suitable form will fulfill the purposes of the invention, and in the appended claims the term "circular" is intended to cover variations in shape, such as oval, ovoid, ellipsoid, and the like.

In Fig. 5 is shown a construction adapted to take care of conditions of different buoyancy effects from that of Fig. 1.

In general, the material of which the garment of the invention is preferably made is a light rubberized fabric, such as is generally known as "balloon" fabric, which is waterproof and substantially gas proof, although the invention is not limited to the use of this fabric.

The "balloon" fabric, however, is particularly adapted for the uses of the invention by reason of its strength, lightness, and the ease of use in the invention by reason of its ready conformity to the shape of the body and also ease of manufacture by cutting from patterns, sewing, cementing and other details.

Such light fabric is shown in Figs. 1 to 4, inclusive, as being cut in the so-called English type of high waders wherein the feet and leg portions comprise solely the fabric, patterned more or less closely to the leg and foot, and in which separate laced-on shoes 21 having heavy felt or other non-slip soles 22 are used.

Such light fabric is likewise used in the forms of Figs. 5–8, inclusive, but these forms illustrate the so-called American type of high wader in which rubber boots 23 are cemented, or vulcanized, to the legs of an inner garment 24 carrying at its upper end an air pocket 25.

These American high waders are generally of a fairly loose fit, particularly in the boots, which gives greater buoyancy to the immersed wearer and it is still more necessary to have the air pocket 25 well under the armpits of the wearer due to the higher center of gravity.

On account of the low air pressure in air pocket 25 when immersed and on account of the lightness and flexibility of the waterproof fabric, it is desirable to have a quite extended bearing surface of the air pocket 25 on the water when in use, which surface may be termed "oval" herein for the purpose of illustration, and, furthermore, to have the upper surface of this oval strengthened, or stiffened, to resist bulging or distortion when the elbows of the wearer are pressed therein. To this end, there is cemented or vulcanized to the interior upper surface of air pocket 25 a plurality of radial stiffeners 26 extending from the inner garment 24 to the outer curve of air pocket 25 and designed to provide a desired curved surface to the pocket when immersed.

Such stiffeners may be of any number, even to the point of making a continuous stiffened upper surface and may be constructed of any material suited to effect the desired stiffening, non-bulging effect. Minimum weight is desirable and with that object a sufficient number of radial arms less than enough to form a continuous surface may be used, but if slight increase in weight is not objectionable to a wearer a continuous stiffened upper may well be used for full stiffening effects and for ease in manufacture.

Stiffeners 26 are preferable tapered both longitudinally and vertically in cross-section to give the desired stiffness for holding the upper surface of air pocket 25 to the required degree of bulge and may be made of any material to this end.

Preferably molded rubber, or fabric impregnated with rubber, such as similar to a tire casing, is used, but the invention is not limited thereto. It is desirable to have as little frictional effects with the stiffeners as possible when in contact with the rubberized fabric while at the same time a rubber face is desirable to be firmly joined to the rubberized fabric.

Whatever material stiffeners 26 may be made of, the position thereof desired when in use is shown generally in Fig. 5. It will there be seen that stiffeners 26 are preferably articulated, or hinged, at their junction with inner garment 24, as illustrated by a slit 27 forming butt joints 28 tending to prevent the upper surface of air pocket 25 from rising beyond the horizontal when in use while permitting the air pocket 25 to fall when not in use as shown in Fig. 6. Such butt joints 28 are preferably joined to inner garment 24 at an upper extension 29 thereof where they perform the dual function of butt joints and prevent the splashing of rough water from entering the inner garment 24. At the same time such extension 29 is not of sufficient height to prevent the upper surface of air pocket 25 from being positioned well under the armpits of the wearer, as previously described.

The alternate structure of Fig. 8 acts similarly to that of Fig. 5, but may include articulated metal arms 30 and 31 encased in rubber, which latter is cemented to the inner surface of air pocket 25.

As an additional safety factor, the lower end of air pocket 25 may terminate in a flexible annular flap adapted to contact inner garment 24 and containing one or more air holes 33 near its inner periphery. Holes 33 are for the ready entrance and exit of air and water, and flap 32 tends to prevent the loss of air when, for any reason, the wearer gets into a more or less horizontal position.

In any of the structures described, it must be emphasized that some means, such as the connector 18, should be employed to assure but a limited rise of the lower edge of air pocket 25. This provides against escape of the trapped air when, for any reason, the body of the wearer tends to approach the horizontal.

Further, the combination described and claimed must not be confused with garments used for bathing which have air supports. The use of the invention is predicated upon its avail-

ability for use in water of any temperature due to the structure maintaining the body of the wearer dry. Such structure not only performs this function but, in preventing the ingress of water to the inner garment, the same is maintained in stabilized condition so that water logging, which may cause the death of the wearer by capsizing and drowning, is prevented.

At the same time, the provision of an annular air pocket enlarged as provided herein is readily adaptable to swimming suits as an attachment for safety effects and such attachment primarily provides for the skirt forming the air pocket 25 to be cut with the upper portion flaring outwardly and downwardly to join with lower portion flaring outwardly and upwardly. This design gives ample room for any sized annular chamber desired according to the weight of the wearer and also permits the insertion of an additional safety factor in the form of a separate air tube, as shown in Fig. 2 and previously described.

This application is a continuation-in-part of my co-pending application Serial No. 289,248, filed August 9, 1939.

I claim as my invention:

1. An attachment for high waders comprising: a waterproof sheet of material of generally cylindrical shape adapted to form an airtight chamber with a lower opening when fixed around the upper end of said waders and immersed; said sheet having an upper outwardly and downwardly flaring section joined to a lower outwardly and upwardly flaring section and being thus adapted to be distorted at its upper end into an enlarged annular chamber by entrapped air, and means at the lower end of said sheet to restrict the entry and exit of air.

2. The combination with a pair of high waders of a generally cylindrical swirt enclosing the same and being securely fixed in airtight relation at the upper end of said waders, means to restrict the upward rise of said skirt when immersed, and an inflatable tube within the upper portion of said skirt.

3. The combination with a pair of high waders of a generally cylindrical skirt enclosing the same and being securely fixed in airtight relation at the upper end of said waders, means to restrict the upward rise of said skirt when immersed, and an inflatable tube within the upper portion of said skirt; said tube being inflatable through said skirt.

4. A sport garment of air-tight fabric comprising a skirt having its wearer-encircling upper margin located below the armpits and above the waistline of the wearer, its free lower margin being of a perimeter very roughly half of the hip circumference, whereby when the wearer wades into progressively deeper water the hip portion will bell outwardly due to the entrapped air and the lower margin will rise without expanding in peripheral length, and means limiting the rise of the lower margin of the skirt, thus minimizing loss of the entrapped air and consequent decreased buoyancy.

5. The device of claim 4 in which the diameter of the skirt from its upper margin downwardly increases at such rate as to form a substantially horizontal shelf when inflated.

6. The device of claim 4 in which the diameter of the skirt from its upper margin downwardly increases at such rate as to form a substantially horizontal shelf when inflated and means to stiffen said shelf.

7. The device of claim 4 in which the diameter of the skirt from its upper margin downwardly increases at such rate as to form a substantially horizontal shelf when inflated and means to stiffen said horizontal shelf and to curve the skirt inwardly below the shelf and toward the lower margin.

8. A sport garment for fishermen, hunters, and the like, comprising a pair of high waders having secured thereto near their upper margin a skirt of airtight material decreasing in horizontal circular measurement both toward its top and toward its bottom from a point appreciably nearer the connection between the skirt and the waders than to the bottom of the skirt when hanging loosely, and means limiting the rise of the lower margin of the skirt.

CHARLES L. STOKES.