

J. J. COSTANZO.
LIFE SAVING GARMENT FOR AVIATORS.
APPLICATION FILED DEC. 14, 1910.

1,042,327.

Patented Oct. 22, 1912.

3 SHEETS—SHEET 1.

Fig. 1

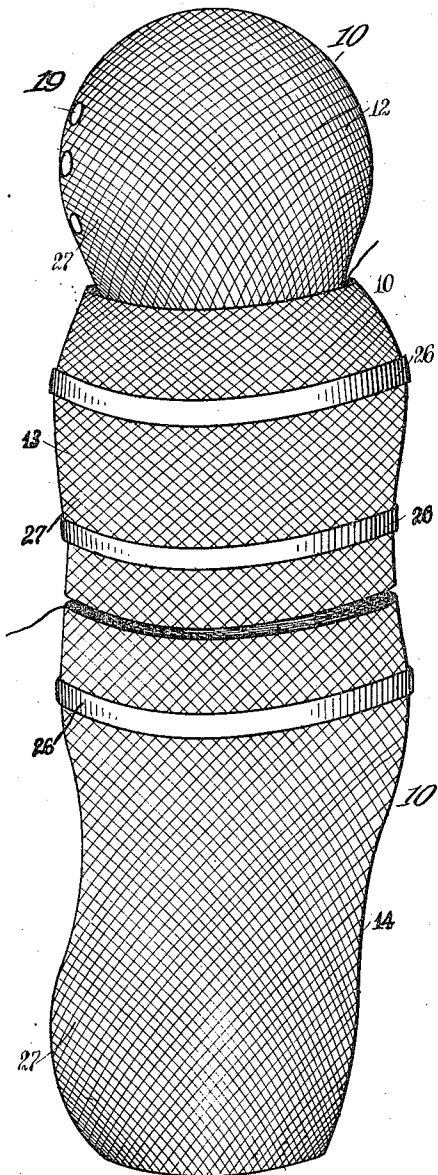
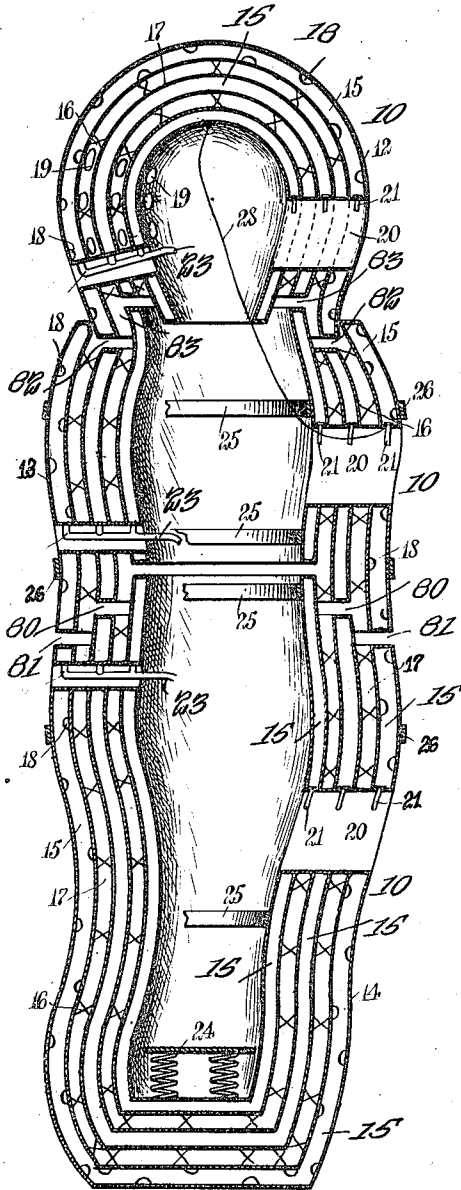


Fig. 2



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3 SHEETS—SHEET 2.

Fig. 3

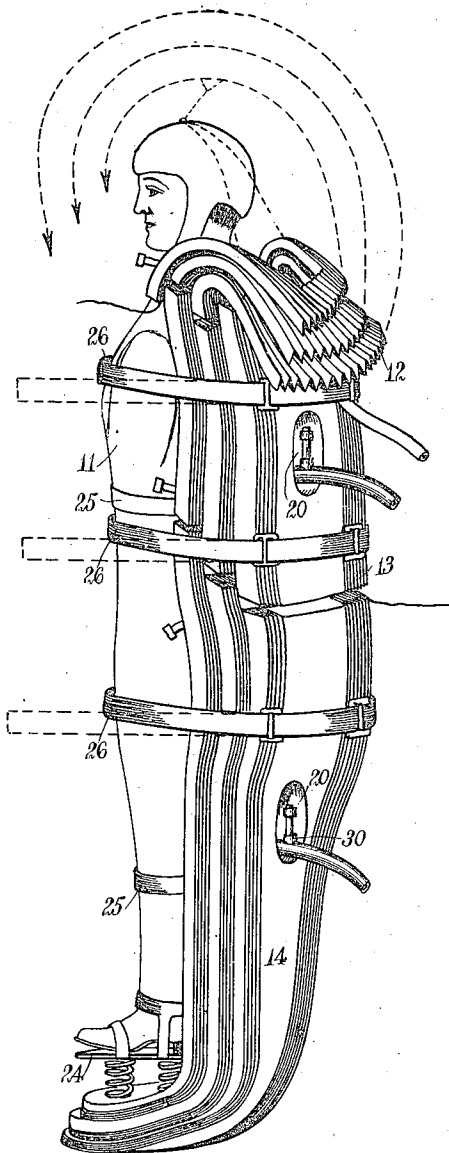


Fig. 4

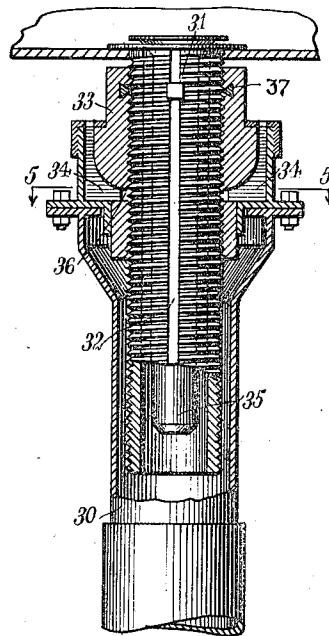
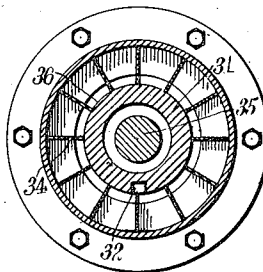


Fig. 5



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3 SHEETS-SHEET 3.

Fig. 7.

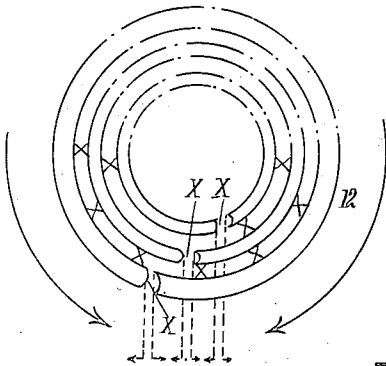


Fig. 8.

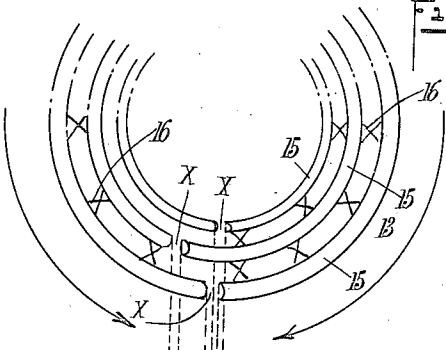


Fig. 9.

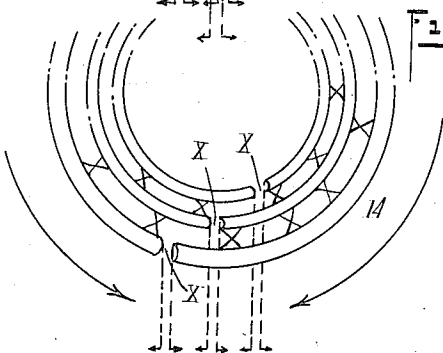
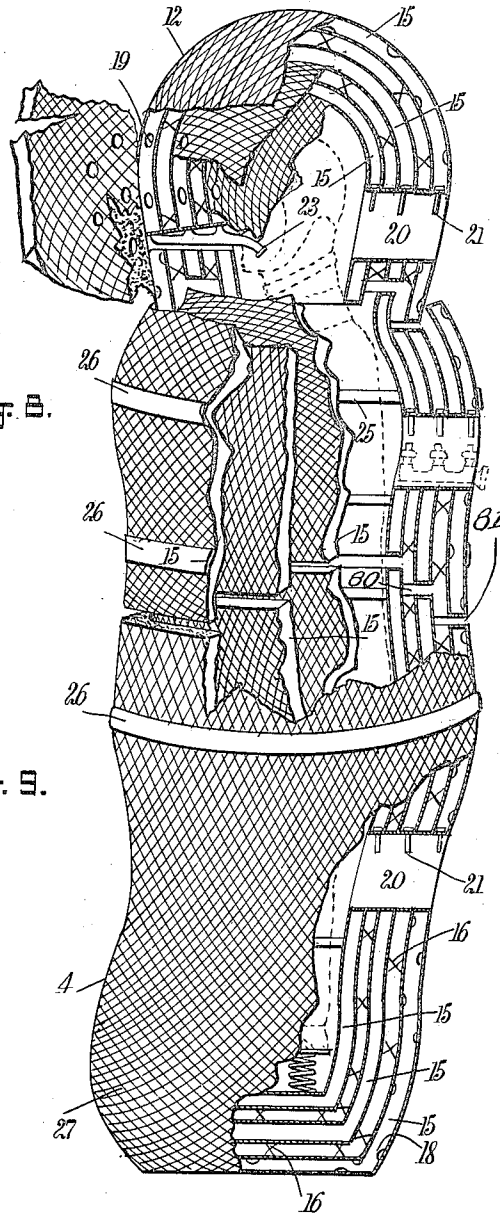


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH J. COSTANZO, OF ALEXANDRIA, EGYPT.

LIFE-SAVING GARMENT FOR AVIATORS.

1,042,327.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed December 14, 1910. Serial No. 597,213.

To all whom it may concern:

Be it known that I, JOSEPH J. COSTANZO, a subject of Italy, and a resident of Alexandria, Egypt, have invented a new and Improved Life-Saving Garment for Aviators, of which the following is a full, clear, and exact description.

The invention relates to life preservers, and has for an object to provide a garment adapted for aviators, to prevent injury or death to the aviator when he or she is dropped with or from an aerial craft. For the purpose mentioned use is made of an inflatable casing, preferably made of connected sections of rubber or any other convenient inflatable substance with suitable air-receiving apertures therein and means whereby the shock of a fall or blow will be substantially absorbed by the casing and its parts and not communicated to the aviator within the casing.

In the use of aerial-craft, such as aeroplanes and the like, aviators are oftentimes seriously injured and sometimes killed by being thrown from or with the aerial craft, and it is for this reason that I have provided a life-saving garment to be worn by aviators, and adapted to effectually prevent them from being incapacitated in the manner heretofore mentioned.

My device furthermore efficiently performs the functions of a life buoy, and should an aviator properly equipped with my garment be precipitated into a body of water, the garment will prevent the aviator from being drowned.

Reference is to be had to the accompanying drawings constituting a part of this specification, in which similar characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a side elevation of my device in closed or operative position; Fig. 2 is a longitudinal sectional view of my device in closed position and disclosing the interior construction thereof; Fig. 3 is a perspective view of the garment in open position and secured to an aviator; Fig. 4 is a longitudinal sectional view of the inflating valve; Fig. 5 is a sectional plan view, taken on the line 5—5 in Fig. 4; Fig. 6 is a view similar to Fig. 1, a portion of the structure being broken away in order to show the relation of the parts; Fig. 7 is a diagrammatic view setting forth the relative positions of the ends of the head member 12 when the de-

vice is in inflated position; Fig. 8 is a similar view of the intermediate member 13; and Fig. 9 is a similar view of the foot member 14.

Referring more particularly to the various views, I employ a plurality of inflatable, connectible members 10, adapted to inclose a body 11, the said members 10 individually consisting of a head member 12, an intermediate member 13 and a foot member 14. Each of the members 12, 13 and 14 is constructed of independent superimposed inflatable chambers 15, the outer walls of which are connected by cords 16, a space 17 containing the cords being provided between each chamber. Resilient buttons 18 are formed on the inner sides of the chambers 15 and further tend to absorb any shock inflicted on the members of my device.

The head member 12 is provided with openings 19 for the admission of air for breathing purposes, and in each of the members 12, 13 and 14 are recesses 20, from which suitable air terminals 21 depend, for connection with a cut-off valve, to supply air to the various chambers 15 in the members 12, 13 and 14. Exhaust pipes 23 are disposed in the members 12, 13 and 14 for exhausting the air from the chambers 15, and the said exhaust pipes can be conveniently fitted with controlling valves, for controlling the amount of air to be exhausted from the chambers 15. The pipes 23 of the three mentioned chambers for the evacuation of air, can be conveniently connected to a tri-conduit valve arranged to exhaust the air from the chambers at the proper moment and consequently if, for any reason, one of the chambers should become deranged the remaining two chambers will continue to hold their air pressure. A spring-mounted base 24 is secured in the foot member 14, and constitutes a platform for the aviator to stand on.

A plurality of belts 25 is provided in the interior of each of the members 12, 13 and 14, for securing the said members to the body of the aviator, and belts 26 are secured to the outside of the members 12, 13 and 14, to relatively hold the said members in proper position around the aviator. To more securely retain the shape of the members 12, 13 and 14, each of the said members is provided with a netting 27 encircling the member exteriorly thereof.

To assist the aviator in properly position-

ing the head member 12 when the same is being inflated, a cord 28 is secured to the member 13 and the member 12, and by operating the mentioned cord the head member can be easily adjusted, to properly fit over the head of the aviator.

It has previously been stated that the garment herein described and claimed is made up in three sections which comprise the head member, the intermediate member and the foot member; each of these members is independent of the others in construction and in use, the three of them however, being so positioned on the body that a garment which completely surrounds the body is provided. Referring particularly to Figs. 2 and 6, it will be noted that openings 80, 81 are illustrated adjacent the lower end of the intermediate member and the upper end of the foot member; it is to be further noted that these openings lie in different planes, whereby the ends of the members overlap for a certain extent. Between the lower end of the head member and the upper end of the intermediate member are openings 82, 83, lying in different planes, the openings being adjacent the meeting ends of the members and illustrating the relation in which they are positioned, the independence of the members being maintained, while they cooperate to the extent of affording a complete outer covering for the body.

Each of the members is made of flexible material so that when the chambers therein are deflated the member will occupy a small space; when air is forced into the chambers the member will expand, the construction being such that when inflated, the members assume the several forms shown in the drawings. Referring particularly to Figs. 7, 8 and 9, the relation of the meeting ends of each of the walls which incloses the chambers in the different members, is set forth; it is to be noted that the walls of the different chamber are so designed that in no case do the different openings *a* between the meeting ends of the walls of any chamber lie in the same plane as the space between the meeting ends of the wall of another chamber, thereby providing for overlapping of the walls of the several chambers, whereby compactness is assured and resilience provided. Of course, this particular arrangement of the walls of the chambers is not essential, as any other construction which arrives at the same result, that is, to provide the body with an inclosing series of air chambers, meets the spirit of the invention.

In the use of my described life-saving garment, when the aviator enters his aerial craft, the life garment is spread out so that the aviator can dispose himself with the various parts of the life garment partially infolding him, suitable connections with an air supply having previously been made, as

will readily be seen in Fig. 3. When the aviator wishes to inclose himself in the life garment, the air connections are operated to supply air to the life preserver, and the members 12, 13 and 14, as they fill with air, will quickly infold the aviator. Thus, when the aviator, clad in a life garment such as described, falls to the ground, the shock of the fall will be substantially absorbed by the inflated suit and the aviator will be uninjured. Should the aviator fall into water, the buoyancy of the life garment will prevent the aviator from sinking, and by exhausting the air from the member 14 by means of the exhausting pipes 23, the aviator inclosed in the life garment will assume an upright position, thus substantially keeping the aviator's head above the surface of the water.

In Figs. 4 and 5 I disclose a form of cut-off valve particularly adapted for use with my life garment when the mentioned garment is to be inflated. The valve consists of a pipe 30, constituting the end of an air supply pipe for connection with an air tank, and mounted in the said pipe is a threaded sleeve 31, provided with a channel 32. A nut 33, having secured thereto a plurality of inclined blades 34, is mounted to turn on the sleeve 31, and a stop valve 35 is mounted in the said sleeve. Encircling the sleeve 31, adjacent the blades 34, is an air channel 36, and when the air from the air tank passes through the pipe 30, a current of air moves along the channel 32 into the channel 36, from which it passes between the inclined blades 34. As the air passes between these blades it strikes the inclined portions of each blade, thus tending to turn the blades, and the resultant action is to turn the nut 33 to which the blades are secured, thus moving the nut and the pipe end 30 downwardly on the sleeves 31. When the pipe end becomes entirely disengaged from the sleeve 31, the air supply having ceased to flow into the life garment, a back pressure will result, due to the air in the garment, and this pressure will actuate the stop valve 35, to effectually prevent any air from leaving the life garment through the ends or terminals 21. A block 37 is mounted to move along the channel 32 as the nut 33 moves thereon, thus preventing any air from passing the block 37 in the channel 32. Channels 38 are provided intermediate the blades 34, for the exhaustion of air when the valve is operated and by arranging the air channels adjacent the blades a proportional exhaust of air from the valve is secured.

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

1. A structure of the class described comprising a plurality of inflatable chambers

concentrically arranged and which constitute body members, and means for connecting the said chambers together.

2. A structure of the class described comprising a plurality of inflatable concentric chambers constituting body members, means for connecting the chambers together, and shock-absorbing cushions in one of the chambers.

3. A structure of the class described comprising a number of concentric inflatable members adapted to be positioned around the body, the said members collectively forming a covering for the body, each of the members comprising a plurality of inflatable chambers, and means for holding the chambers in each member together.

4. A structure of the class described comprising a number of concentrically arranged and inflatable members adapted to collectively inclose the body, each member being made up of a number of separate chambers, each of the chambers being adapted to be inflated, means between the side walls of the chambers for holding them in spaced relation one to the other, cushioning means within one of the members, and means for engagement with the body, whereby all of the members may be retained in position on the body.

5. A structure of the class described comprising a plurality of circularly arranged independent and inflatable chambers, means between the side walls of the chambers for holding the different chambers together, the side wall of one of the chambers forming an inclosure adapted to receive the body, whereby the body is surrounded by a resilient structure, and means for retaining the chambers in position on the body.

6. A structure of the class described comprising a plurality of concentrically arranged members cooperating to form an inclosure to receive the body, each of the members being made up of a plurality of inflatable chambers, means within the inclosure for engagement with the body, whereby all of the members are held in position thereon.

7. A structure of the class described comprising concentrically arranged body members made up of inflatable chambers, together with means for maintaining the body members in spaced relation.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH J. COSTANZO.

Witnesses:

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J. BAROZZI.