

Dec. 31, 1940.

S. KIENITZ

2,226,564

LIFE PRESERVER

Filed Oct. 8, 1937

3 Sheets-Sheet 1

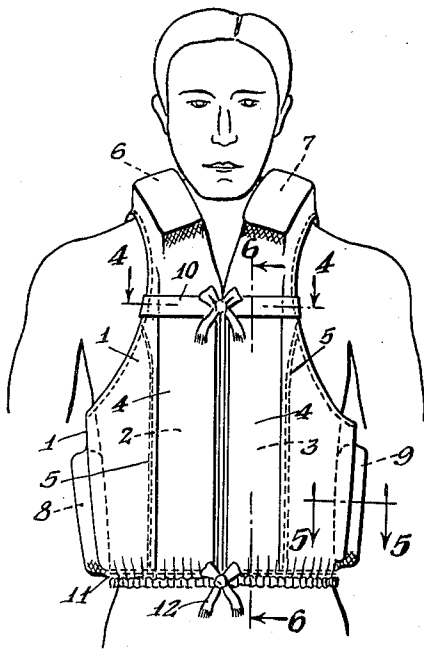


Fig. 1

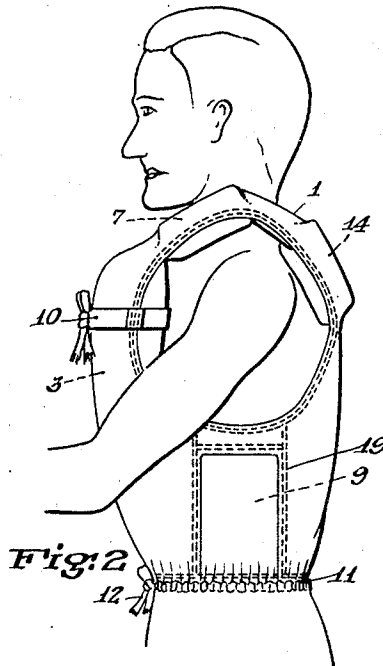


Fig. 2

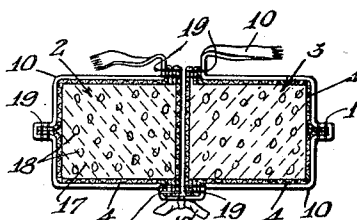


Fig. 4

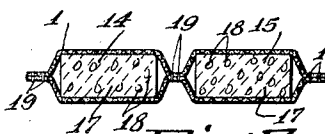


Fig. 7

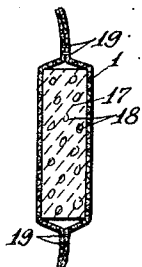


Fig. 5

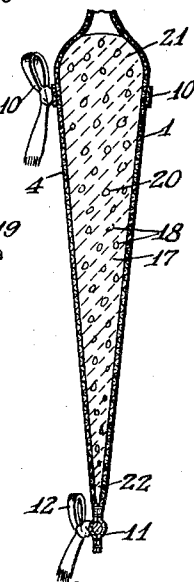


Fig. 6

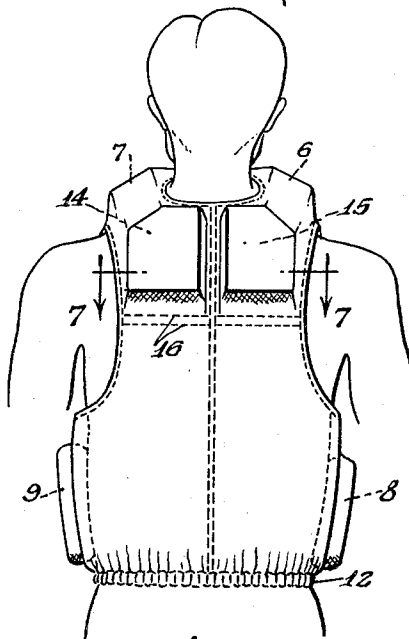


Fig. 3

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Dec. 31, 1940.

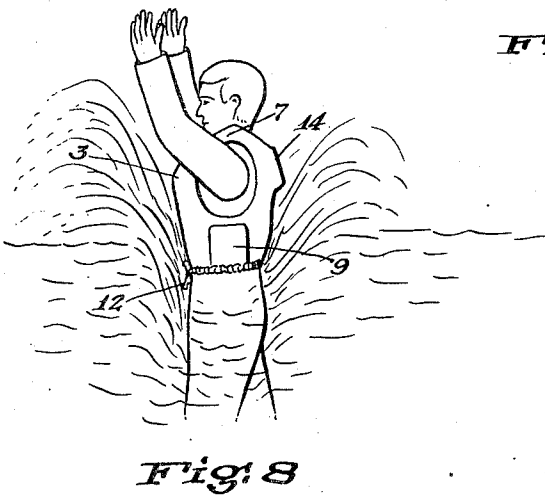
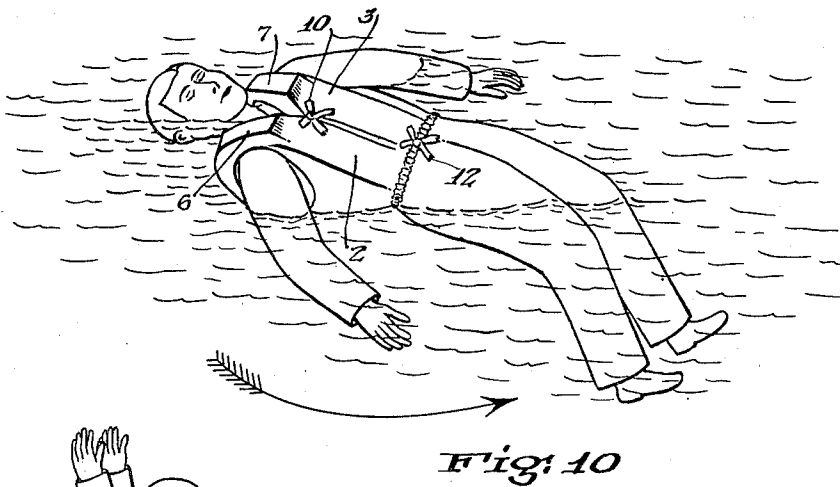
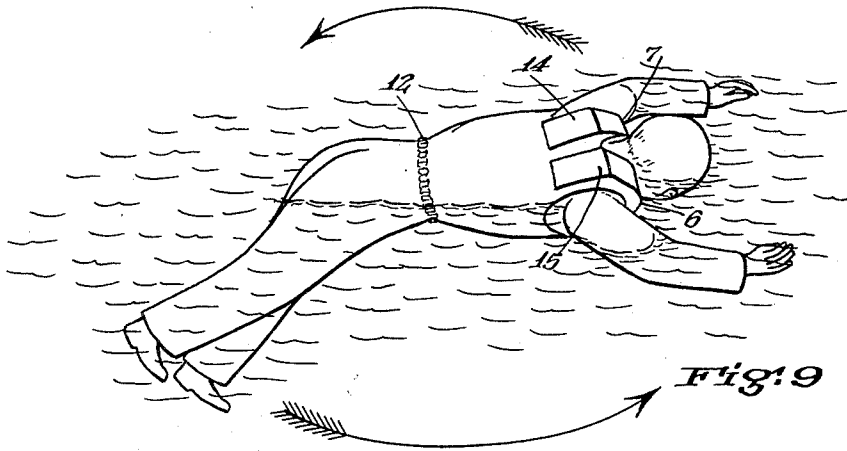
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2,226,564

LIFE PRESERVER

Filed Oct. 8, 1937

3 Sheets-Sheet 2



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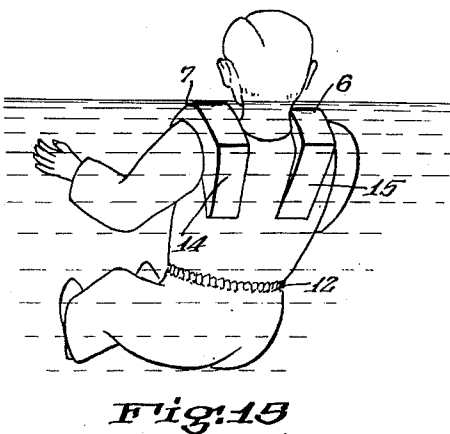
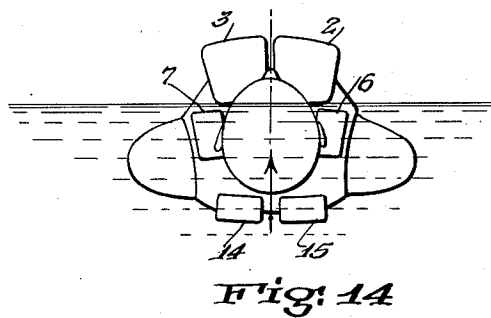
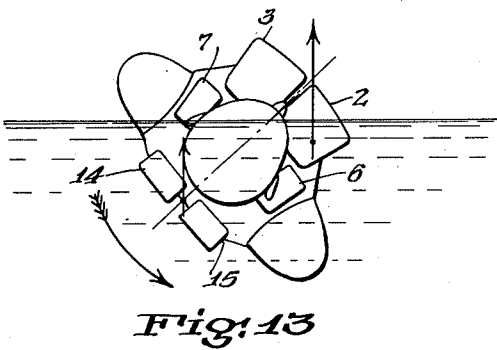
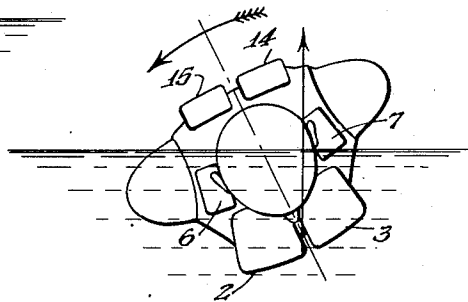
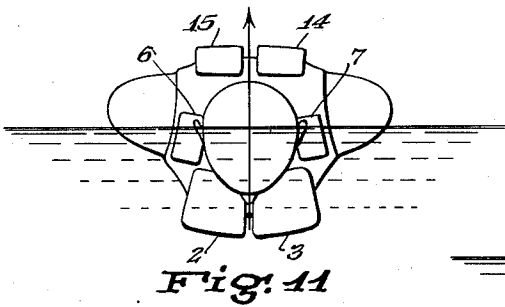
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LIFE PRESERVER

Filed Oct. 8, 1937

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,226,564

LIFE PRESERVER

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Application October 8, 1937, Serial No. 167,926

7 Claims. (Cl. 9—20)

My invention relates to a life preserver jacket and more specifically relates to a life preserver jacket of closed cell gas expanded rubber of such construction as to safely carry a wearer in a more or less upright position in the water and protect him against drowning and the buffeting action of the waves.

In the past, life preservers have been made of three primary materials, cork, kapok and balsa wood. The report of the Committee on Commerce relating to the "Investigations of the Steamships *'Morro Castle'* and *'Mohawk'* disasters" and the adequacy of methods and practices for the safety of life at sea, after a long and exhaustive analysis of the various materials and structures of life preservers have recommended, and laws have been passed to enforce such recommendations, that life preservers may be made only of solid cork or closed cell gas expanded rubber and not of cork shavings, granulated cork, kapok or any other loose granulated material.

Therefore, for practical purposes, solid cork is the most commonly used life preserver material and the prior art relating to this material will be dealt with in great detail although the other materials of the prior art will be discussed.

The solid block cork necessitated by these regulations is expensive and difficult to obtain in such form since most cork can be cheaply manufactured into desired shapes only by the use of mixes comprising particles of cork and binder. Cork is a relatively light material having a weight on the order of 12 lbs. per cu. ft. It is hydrostatic by nature and acts to take up and discharge water according to the moisture conditions of the atmosphere in which it is placed. This taking up of water wets the canvas or duck fabric in which it is enclosed in jacket form and in the course of a comparatively short time causes such rotting of the fabric that, upon being subjected to the violent action attendant upon its emergency use, such fabric can easily be torn or ripped rendering the preserver useless. The average useful life of a canvas covered cork preserver is approximately two years.

Cork, because of this hydrostatic pumping of water, not only loses buoyancy when picking up water but also greatly increases in weight. The only way to discover the buoyancy of a cork life preserver jacket that has been in service is by actual tests in water. The life preserver jacket of my invention can be tested by visual inspection. If by any chance, through some misstep in the process of manufacture, improper gas retention resulted so that the buoyancy of the material

would be impaired, a mere glance would reveal a collapse of the surface of the material because of this loss of gas. Thus, mere visual inspection is sufficient to determine the efficiency of the jacket of my invention. This is of great importance since it is by no means expedient to test life preserver jackets by means of a water test when they are stored away on board a ship.

An important disadvantage of cork relates to its rigidity. In many marine disasters that have occurred recently bodies were found in the water with broken necks. It is believed that such injury occurred when passengers wearing cork life preservers jumped off the decks at a considerable distance from the water. In certain instances, upon striking the water, the heads of the wearers were shown in such violent contact with the rigid cork of the preserver that a broken neck resulted. The combination of the rigidity of the cork in life preservers together with the high distances from deck to water under which condition such cork preservers must be used has presented a serious hazard in modern life saving problems.

Another disadvantage attendant upon the use of cork as a buoyant material for life preservers lies in the fact that the material can be obtained only from a very few restricted sources. Cork, for all practical purposes, comes only from Spain, Portugal and the North Coast of Africa. In times of war such as the Spanish Civil War now in progress, the sources of cork are dangerously impaired and in the case of life preservers, which are vital to marine safety, such shortage of buoyant material presents a serious situation.

The present invention overcomes these disadvantages by utilizing a soft, flexible buoyant material comprising closed cell gas expanded rubber so constructed in life preserver jacket form as to render impossible dangerous impact between preserver and body or head of the wearer.

Kapok, which has been used in the past as a life preserver material, has such serious disadvantages attendant upon its use that its use is now prohibited in accordance with the law by the marine inspection authorities.

Life preserver jackets are stored away in closed spaces with little accessibility to air. Spontaneous combustion in the kapok has been suspected of causing many dangerous fires on ship board. A more dangerous feature, however, of kapok lies in its packing tendency. It has been found that, after periods of disuse, the kapok has settled down in the extremities of the compartments in which it is packed in the life preserver. This settling, as around the lower extremity, makes the middle

the most buoyant section and throws the wearer's stomach up and his head under the water. Even a partial settling in the middle causes this dangerous shifting of buoyancy which seriously impedes necessary activity of the wearer in the water. Kapok depends for its buoyant properties upon the proper separation of its fibres. There is no way to test its floatability except by actually testing it in the water. This is not always convenient in inspection of a large number of life preservers.

After a kapok jacket has been used it must be dried out very carefully in an airy atmosphere and the kapok must be carefully prevented from matting during this drying process. Matting of the kapok completely destroys its buoyant properties since it is the inclusion of the air between the fibers of the kapok on which such buoyancy depends. If, for example, the kapok on the front portion of the jacket should mat and the kapok in the rear remain buoyant, upon use, the wearer's face would be forced down into the water. Further, any irregular matting of the buoyant kapok would cause serious difficulties in positioning the wearer in the water. Similarly to cork, the only way to test the effectiveness of a kapok life preserver jacket is by actual testing in water. As pointed out above, this is a difficult procedure on ship.

Balsa wood has also been used in the past to a slight extent for life preservers, but it is highly inflammable, expensive and has many other disadvantages that make its use impractical.

Balsa wood takes up moisture faster than cork. This tends to decrease its buoyancy. Further, it can be easily splintered because of its low structural strength.

It has been proposed to make a buoyant life preserver from expanded rubber or rubber froth. Such construction is shown by Denton, 1,931,406. The expanded rubber life jacket described therein, however, was of rigid construction and presented the difficulties of the rigid cork described above. It is a primary concept of my invention that the buoyant material should be soft and flexible in nature. Further, the specific features of construction of my jacket which present new and unexpected results to be described later are entirely lacking in Denton's life jacket.

The life preserver of my invention comprises closed cell gas expanded rubber constructed in a certain form which gives many new and unexpected results long desired but hitherto not obtained in this art. The closed cell gas expanded rubber has many important properties. The first of these is its permanent floatability. The material consists of soft rubber containing a multiplicity of small closed cells of an inert gas. It weighs about 8 lbs. per cu. ft., being much lighter than cork. The material is resistant to rot of any kind and under normal circumstances of use cannot lose its buoyant properties. It is not hydrostatic in any degree since its cells are sealed one from the other and non-communicating being separated by rubber membranes.

The material can be molded or formed as by cutting to any desired shape which, as will be pointed out later, is an important feature in my particular construction. Its flexibility and softness are of particular importance, as pointed out above, with regard to the danger of impact hitherto characteristic of rigid cork.

Careful laboratory tests have shown that upon submersion in water, the closed cell gas expanded

rubber of my invention has a water absorption of only .6 by weight over a period of several days.

A primary feature of my construction lies in the use of two large wedge shaped members of closed cell gas expanded rubber which are positioned in the front of the jacket with the large bulky section of the wedges at the top and extending down to a thin taper at the bottom. These wedge shaped members have a triple function. First, they maintain the wearer's body in a more or less upright position with head out of the water. Second, they offer a physical shield protection to the head and throat of the wearer both at the time of the impact with the water upon occasion of jumping from the deck into the water and also against the action of the waves while the wearer is in the water. Third, they prevent the entrance of water at the waist between the life preserver jacket and the wearer's body such as would cause a separation of the jacket from the wearer.

Referring now more specifically to these above mentioned features, I wish to call special attention to the wedge shaped front construction of my life preserver jacket. These wedge shaped members of solid closed cell gas expanded rubber retain perfectly a desired position of the wearer's body in the water. The concentration of the bulk of this buoyant material high upon the wearer's chest has a tendency to throw his head and shoulders out of the water and his feet somewhat below the surface thereof. The concentration of the buoyant material in the center of the chest further acts so as not to impede any swimming or arm motion of the wearer while affording the buoyant protection.

In connection with the wedge shaped members, I can use two auxiliary pads of closed cell gas expanded rubber located above the wedge shaped members. These afford a further shield against the physical impact of the water, in conjunction with the wedge shaped members.

As a further guard against the entrance of water between the life preserver jacket and the wearer's body, I provide, in a tunnel enclosure below the wedge shaped members, a draw string or tape which extends all the way around the wearer's body. A simple drawing and tying of this draw string securely fits the preserver around the wearer's waist and acts to prevent the entrance of water beneath the jacket.

One important advantage of the life jacket construction of my invention with which this draw string has special reference lies in the fact that it is adapted to fit snugly on persons of entirely different build. In tests, the jacket has been placed on a short man weighing about 240 lbs. and on a tall thin man weighing about 125 lbs. In both cases the fit, because of the draw string and central, chest placed wedge shaped construction of the buoyant material, was entirely satisfactory.

About the upper portion of each wedge shaped member and extending all the way around said members are securing tapes. These tapes instead of being secured to the end of the jacket completely embrace the buoyant material so that it is almost impossible to rip them off during the emergency use in which they are handled. Above the wedge shaped sections and aligned therewith are small pads of closed cell gas expanded rubber which have two functions. First they protect the wearer's throat and chin against the buffeting of the waves and lessen the initial impact with the water. Second, they add to the buoyant properties of the jacket, helping to center the wearer's weight around the chest and shoulder

area. In the back of the preserver and adapted to be positioned across the shoulder blades are two pads of closed cell gas expanded rubber. These maintain the buoyant properties of the jacket with respect to the chest area of the wearer. If desired, pads of the same material can be located at the sides of the jacket to add to its buoyancy.

It is to be noted that my jacket is exceedingly simple both to put on and to secure in place. Its obviously simple construction permits of only one manner of use so that no confusion is possible. It is secured in the natural places in front, that is across the chest, and around the waist by simple tie strings whose use could not be confused and which are so positioned that there is little likelihood of tearing.

My construction is not to be confused with the fabric tube filled with kapok which is to be found in certain life preservers of the prior art. Not only was there no provision for buoyancy with respect to more or less upright position of the wearer, but the special features of wedge shaped members set forth above were entirely lacking.

The life preservers which were adapted to support the wearer with face up in the water specifically relied upon placing of a large amount of buoyant material up and down the front of the jacket. Not only would these jackets tend to throw the wearer's head back level with the water but they also had the effect of turning the wearer over very rapidly in the water. That is, when the wearer of the jacket entered the water the large amount of buoyant material in the front of the jacket tended to spin him rapidly around into final position. This rapid spinning is obviously undesirable for many reasons. The life preserver jacket of my invention takes approximately four seconds to turn the wearer over in the water and this turning over results in the wearer's head and neck being entirely out of the water and his entire body ending up in a more or less sitting position with relative freedom of movement. The buoyancy elements in my jacket are largely centered about the shoulders and top of the chest to effect this desirable final positioning of the wearer.

A further important distinction of my preserver lies in the simple and precise fitting of the wedge shaped members against each other when secured, to afford a solid uniform surface. Hitherto it has been impossible to obtain a life preserver jacket adapted to turn and hold the wearer in a more or less upright position without providing a large volume of buoyant material. This large volume of material provided a bulky preserver that seriously impeded any swimming action on the part of the wearer and tended to throw the wearer's stomach out of the water. Further, no preserver in the prior art had the careful control of the particular upright position desired and obtained by the life preserver set forth herein.

Another important feature of the construction of my life preserver jacket lies in the fact that the buoyant pads are centered in place and because of their molded construction and integral nature, they can in no way shift so as to cause an undesirable buoyancy displacement. This is in marked contrast to the loose buoyant material such as kapok hitherto used in the art. It is another important feature of my construction that there is no inside or outside to the jacket. The construction is reversible and as long as the wedge shaped pads are in front it does not matter whether the jacket is put on properly or inside out.

An object of my invention is to provide a novel life preserver jacket of closed cell gas expanded rubber material.

Another object of my invention is to provide a novel life preserver jacket of soft and flexible material of permanent form.

Another object of my invention is to provide a novel life preserver jacket with front wedge shaped construction to turn and maintain the wearer leaning slightly backward in a nearly upright position in the water.

A further object of my invention is to provide a novel life preserver jacket to protect the wearer against the physical action attendant upon impact with water on the initial jump and subsequent wave action.

Still a further object of my invention is to provide a novel life preserver jacket comprising wedge shaped members with tapered edge downward to prevent a penetration of water between the life preserver and the wearer such as would cause separation of the jacket from the body of the wearer.

Another object of my invention is to provide a novel life preserver jacket with a draw string below the buoyancy elements of the jacket.

Another object of my invention is to provide a life preserver jacket of closed cell gas expanded rubber which can be stored simply and in a small space, the regularity of the shape of the life preserver making it accessible in time of need.

A further object of my invention is to provide a fastening for a life preserver jacket that embraces completely the buoyancy elements to provide the most secure fitting and eliminate possibility of separation by tearing.

Still a further object of my invention is to provide a novel reversible life preserver jacket which is of such construction that it can be put on in but one obvious and correct manner.

Another object of my invention is to provide a novel life preserver jacket with buoyancy elements positioned at the back and sides to provide a certain desirable balance for the wearer in the water.

Figure 1 represents a front perspective showing the jacket of my invention properly in place on the wearer. The dotted lines indicate the internal construction thereof.

Figure 2 is a side view showing the jacket in perspective.

Figure 3 is a back view showing the jacket on the wearer.

Figure 4 is a cross-section taken along the lines 4-4 of Figure 1 and shows the construction of the wedge shaped elements.

Figure 5 is a cross-sectional view taken along the line 5-5 of Figure 1. It shows the side pad.

Figure 6 is a cross-section taken along the line 6-6 of Figure 1 and shows a cross-section of the wedge shaped members with special reference to the wedge shape.

Figure 7 is a plan cross-section taken along the line 7-7 of Figure 3.

Figure 8 shows the wearer of this life preserver jacket landing in the water from a distance.

Figure 9 shows the life preserver jacket on the wearer who has fallen face down into the water.

Figure 10 shows the wearer of such a life preserver jacket now carried over on his back with his head and shoulders out of the water because of the placing of the buoyant members of the life preserver jacket.

Figures 11, 12, 13, 14 and 15, are side views showing the turning action of the buoyant life preserver jacket in reversing the wearer who is

lying face down in the water over on to his face and finally with his head out of the water and his feet and lower part of his body downwardly in a more or less sitting position.

- 5 Referring now more specifically to the drawings, in Figure 1 the life preserver jacket of my invention is shown on the wearer. In the canvas jacket 1 is secured the wedge shaped members 2 and 3 sewed in the fabric 4 by the stitching 5. It is to be noted that these long wedge shaped members run vertically along the body of the wearer and are centrally positioned therein, with the bulk of the material placed high in the jacket. The pads 6 and 7 may be formed integrally with the wedges or preferably in the form of separate pads and secured adjacent to the wedges in proper position in the fabric. Attention is directed to the physical protection offered to the throat and chin of the wearer by these front members.

- At the sides of the jacket are located buoyancy pads 8 and 9 which afford additional buoyancy and have a balancing effect with respect to the remainder of the jacket. Securing the jacket on the wearer and maintaining the wedge shaped members properly in place is tie string 10 which extends completely around the two wedge members 2 and 3 so that it is practically impossible not to obtain proper fastening and securing of these wedge members in emergency use. Around the lower portion of the jacket and formed integrally therewith is a fabric 11 which extends around the waist of the wearer and in which is positioned a draw string 12.

- The draw string 12 is fastened in the back of the tunnel and cannot be pulled out. This is important to maintain the draw string always in proper position and eliminate possibility of its loss.

- In Figure 2, the pad 14 is shown positioned high up upon the back of the jacket to afford the proper balanced buoyancy to the wearer.

- The back view of Figure 3 shows the pads 14 and 15 which provide buoyant features. A securing stitching 16 assists in securing the pads 14 and 15 in their proper positions.

- In the cross-sectional view of Figure 4 are shown the wedge members 2 and 3 which are made up of closed cell gas expanded rubber 17 containing homogeneously throughout, cells of inert gas 18. This closed cell gas expanded rubber is enclosed within the canvas 1 which is secured by the stitching 19. Around the wedge members is the securing tape 10.

- In Figure 5 is shown a similar construction in which the closed cell gas expanded rubber 17 is secured within the canvas jacket 1 by the stitching 19.

- In Figure 6 the novel wedge shaped members are clearly indicated. The expanded rubber element 20 is shaped so that the top of the element is in the form of a bulky blunt end 21 and the bottom tapers to a thin edge 22. This wedge shaped element is secured in the canvas 1 and provided with hereinbefore mentioned fastening means 10 and 12.

- In Figure 7 are shown the rear pads 14 and 15 consisting of closed cell gas expanded rubber 17 secured within the canvas 1 by stitching 19.

- Taking the Drawings 8, 9, and 10 in their proper sequence, we find a man wearing the life preserver jacket of my invention entering the water from a distance. The importance of the draw string 12 which is at the lowest part of the life preserver jacket, and the tapered buoyancy ele-

ments is clearly shown. When tied about the waist of the wearer, water is prevented from entering between the life preserver jacket and the wearer's body. In the past, the force of a jump of this nature has often been sufficient to separate an ordinary life jacket from the wearer.

The expanded rubber elements 3 and 7 afford a physical protection to the wearer's throat and chin upon striking the water, the jacket being streamlined to throw the water away from these places. This is of great importance when the wearer is forced to jump an appreciable distance, as from the deck of a ship. Upon entering the water we will assume, as shown in Figure 9, that he lands over upon his face. Oftentimes the force of a fall from a tremendous distance, a mental shock or exposure is enough to render the wearer unconscious. It is then imperative that he be automatically turned over by the jacket so that he rides in the water with his head up so that his breathing will not be interfered with. In the life preserver jacket of my invention the bulky wedge shaped members 2 and 3 automatically act to slowly turn the wearer over on his back as shown in Figure 10 where his breathing is assured.

Figures 11 to 15 should be taken in sequence and similarly show the action of the life preserver jacket of my invention in turning over a wearer, who is positioned face down in the water, on to his back.

The final position of the wearer is shown in Figure 15 in which his head is out of the water and he has assumed a sitting position. This allows freedom of movement for swimming and at the same time assures proper breathing.

I shall now describe a specific manner in which I make the life preserver jacket of my invention. The most important elements are of closed cell gas expanded buoyant material. These are made as follows:

I take a mix of the following:

	Parts by weight
Smoked sheets of rubber.....	100
Zinc.....	4
Whiting.....	50
Sulphur.....	3
Phenylbetanaphtha-amine.....	1
Paraffin wax.....	3
Diphenylguanidine.....	0.5

The smoked rubber is thoroughly masticated upon rolls. To this is added the reclaimed rubber. Immediately thereafter there is incorporated the zinc oxide, whiting, paraffin wax, phenylbetanaphtha-amine and diphenylguanidine. Immediately after blending these above ingredients, sulphur is added to the rubber mix.

These materials are thoroughly incorporated in the rubber on the rolls and the rubber is then allowed to rest in a cool dark place for a period of about 24 hours.

This serves to allow the molecular structure of the rubber to restore itself to its normal position. The violent working of the rubber on the rolls appears to disarrange the spiral or extended molecular structure of the rubber and affect certain of its desirable properties.

It has been found that superior results and improved properties in the final structure are obtained by the use of this rest period.

After the modifiers have been incorporated in the rubber mix and the rubber has been thoroughly rested, it is shaped on a suitable forming machine such as an extruder or calender. The so-

shaped rubber is then placed into a gassing chamber or autoclave and subjected to a gas pressure of nitrogen at a pressure of about 300 lbs. per sq. in.

5 After the rubber mix has been thoroughly impregnated with this gas, the gas pressure is released and the mix is taken out and placed in suitable molds. There it is subjected to a vulcanizing heat which acts to completely expand
10 the gas enclosed in the rubber and consequently the rubber structure itself, and also to vulcanize the rubber to a final cure.

The rubber dough can be given a preliminary vulcanization or partial cure before gassing, or concurrently with the gassing. This is in order
15 that the rubber structure itself will be sufficiently set to prevent the escape of the enclosed gas.

Alternative methods of forming closed cell gas expanded rubber such as internal development
20 of gas may be employed, any suitable method of forming closed cell gas expanded rubber being within the purview of my invention. It is of utmost importance, however, that closed cell gas expanded rubber be obtained and not an open
25 celled sponge rubber.

The wedge members 2 and 3 described hereinbefore can be molded precisely to shape or cut from blocks or sheets. Similarly with the small
30 pad-like block members which add to the buoyancy of the jacket. The so shaped buoyancy members of closed cell gas expanded rubber are then securely stitched within the canvas or duck jacket as indicated in the drawings. It will be
35 noted from the drawings that the life preserver jacket of my invention has regular shape and, when stored away, can be so positioned as to utilize but a minimum of space. This is of importance since space is of value aboard ship and
40 also because the regularity with which it can be stored affords easy access in time of need. The tie and draw strings can be positioned within the jacket so that no confusion and entanglement is possible.

The simplicity of this life preserver jacket
45 makes its use obvious even to a bewildered user during an emergency since it corresponds to almost any coat or jacket arrangement such as a wearer is accustomed to. The securing strings and tapes are positioned directly in front of
50 wearer's body in a perfectly normal position so that their use is obvious. The manner in which they are to be tied precludes the possibility of improper securing.

The large wedge shaped members composed of
55 closed cell gas expanded rubber are positioned within the canvas or duck jacket with the bulky edge up and the tapering edge downward. They are so placed as to be positioned directly in front of the wearer and in side to side relationship as indicated in Figure 1. Either integrally with
60 these wedge shaped members or preferably in the form of separate pads are two buoyant pad members of the same expanded rubber material positioned above the wedge shaped member and so
65 placed as to be on either side of the wearer's neck and chin. High upon the back of the preserver are placed two other pads of gas expanded rubber to provide proper buoyancy features. Suitable stitching in the canvas runs around all
70 of these members to hold them properly in place. If desired, additional side pads positioned below the arm pit of the wearer can be inserted in the jacket. These pads can be used but are not necessary for complete safety. Around the bottom
75 of the life preserver jacket formed integrally with

the jacket is a tunnel of fabric in which is disposed a draw string. This draw string thus is positioned to securely hold the bottom of the jacket close to the wearer's waist and prevent
vertical movement of the jacket. The upper part
5 of the life preserver jacket is secured in proper position on the wearer's body by means of a tie string which goes completely around the upper part of the wedge shaped members and holds them closely together. There is little likelihood
10 that the tie string can be ripped from the jacket because it is engaged completely with the cloth thereof by suitable stitching and extends to completely surround the expanded rubber elements in secured contact therewith.
15

It is within the purview of my invention to vary the position of the various buoyancy elements in any way that may be found desirable for the results indicated.

I claim:

1. A life jacket comprising a fabric jacket and two soft and flexible elements of closed cell gas expanded rubber having a wedge shaped cross-section contained therein, said wedge shaped elements being disposed in the front of the jacket
25 with the large blunt end up and the tapered thinner end down, and a tape encompassing said two elements for securing them together and simultaneously closing the jacket.

2. A life jacket comprising a fabric jacket, soft and flexible closed cell gas expanded rubber in solid form contained therein, said soft and flexible closed cell gas expanded rubber being in the form of buoyancy elements, said buoyancy elements comprising two elements having a wedge
35 shaped cross-section disposed in the front of the jacket with the large blunt end up and the tapered thinner end down and preformed balancing auxiliary pads of soft and flexible closed cell gas expanded rubber buoyancy elements in the back
40 of the jacket, a tunnel around the waist of the jacket, a draw string in said tunnel, said draw string being secured in said tunnel, securing tapes extending around said wedge shaped buoyancy elements to completely encompass the same.
45

3. A life jacket comprising a fabric jacket, soft and flexible closed cell gas expanded rubber in solid form contained therein, said soft and flexible closed cell gas expanded rubber being in the form of buoyancy elements, said buoyancy elements comprising two elements having a wedge shaped
50 cross-section disposed in the front of the jacket with the large blunt end up and the tapered thinner end down and preformed balancing auxiliary pads of soft and flexible closed cell gas expanded rubber buoyancy elements in the back of the jacket, a tunnel around the waist of the jacket, a draw string in said tunnel, said draw string being secured in said tunnel, securing tapes extending around said wedge shaped buoyancy
60 elements to completely encompass the same, said jacket being reversible so that it can be utilized with safety with proper results on either side.

4. A life jacket comprising a fabric jacket, soft and flexible closed cell gas expanded rubber buoyancy elements having a wedge shaped cross-section being disposed in the front of the jacket, auxiliary pads of soft and flexible closed cell gas expanded rubber, located on said jacket at the neck portion thereof, said auxiliary pads protruding up from the jacket to add buoyancy around the wearer's upper trunk and to protect the wearer's neck and face from the impact of the water.

5. A life jacket comprising a fabric jacket, soft

and flexible closed cell gas expanded rubber in solid form contained therein, said soft and flexible closed cell gas expanded rubber being in the form of buoyancy elements, said buoyancy elements comprising two elements having a wedge shaped cross section disposed in the front of the jacket with the large blunt end up and the tapered thinner end down and preformed balancing auxiliary pads of soft and flexible closed cell gas expanded rubber buoyancy elements in the back of the jacket, and means for securing said various buoyancy elements to the body.

6. A life jacket comprising a fabric jacket, soft and flexible closed cell gas expanded rubber in solid form contained therein, said soft and flexible closed cell gas expanded rubber being in the form of buoyancy elements, said buoyancy elements comprising two elements having a wedge shaped cross section disposed in the front of the jacket with the large blunt end up and the tapered thinner end down, and preformed balancing auxiliary pads of soft and flexible closed cell gas

expanded rubber buoyancy elements in the back of the jacket, and means for securing said various buoyancy elements to the body comprising a securing means about the waist portion.

7. A life jacket comprising a fabric jacket, soft and flexible closed cell gas expanded rubber in solid form contained therein, said soft and flexible closed cell gas expanded rubber being in the form of buoyancy elements, said buoyancy elements comprising two elements having a wedge shaped cross section disposed in the front of the jacket with the large blunt end up and the tapered thinner end down, and preformed balancing auxiliary pads of soft and flexible closed cell gas expanded rubber buoyancy elements in the back of the jacket, and means for securing said various buoyancy elements to the body comprising a securing means about the waist portion, and a securing tape about said first mentioned buoyancy elements.

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