Jan. 31, 1967 R. S. SCHEURER 3,300,797

LIFE JACKET

Filed Aug. 12, 1965 2 Sheets-Sheet 1

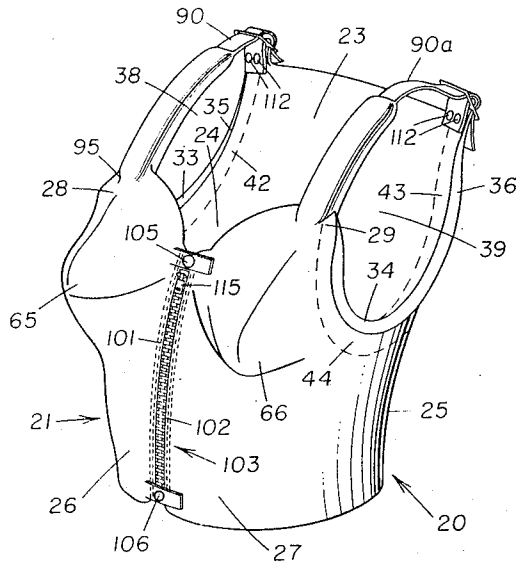


FIG. 1

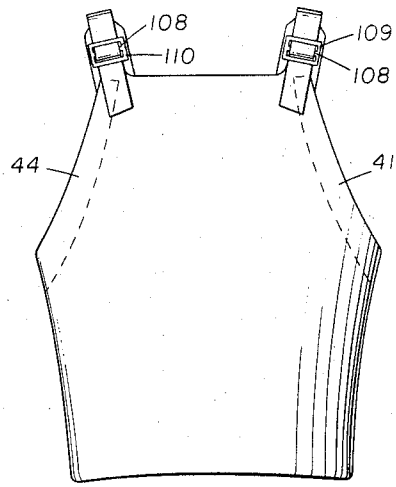


FIG. 2

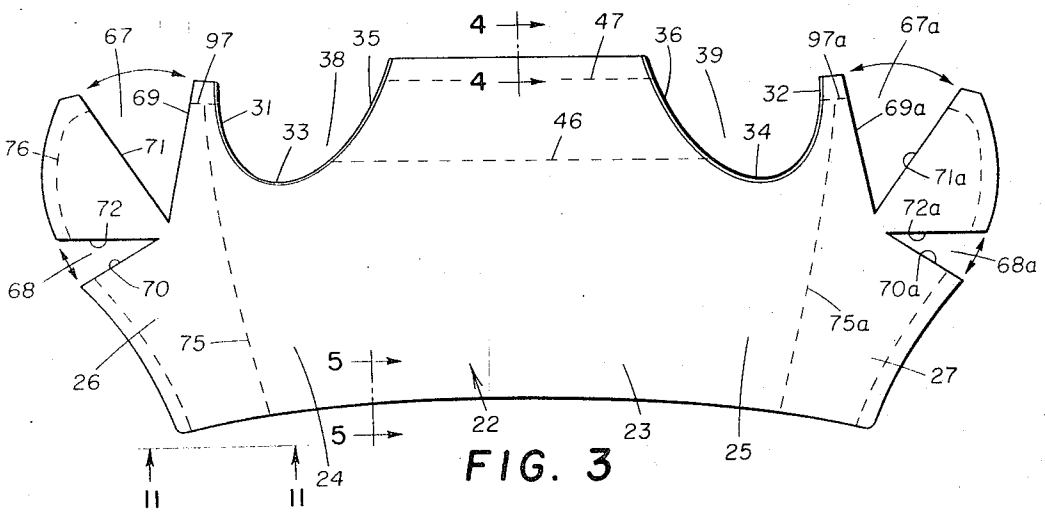


FIG. 3

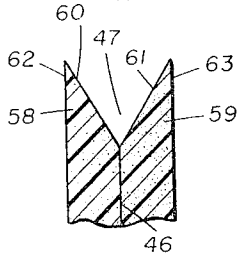


FIG. 4

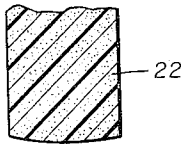


FIG. 5

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LIFE JACKET

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FIG. 6

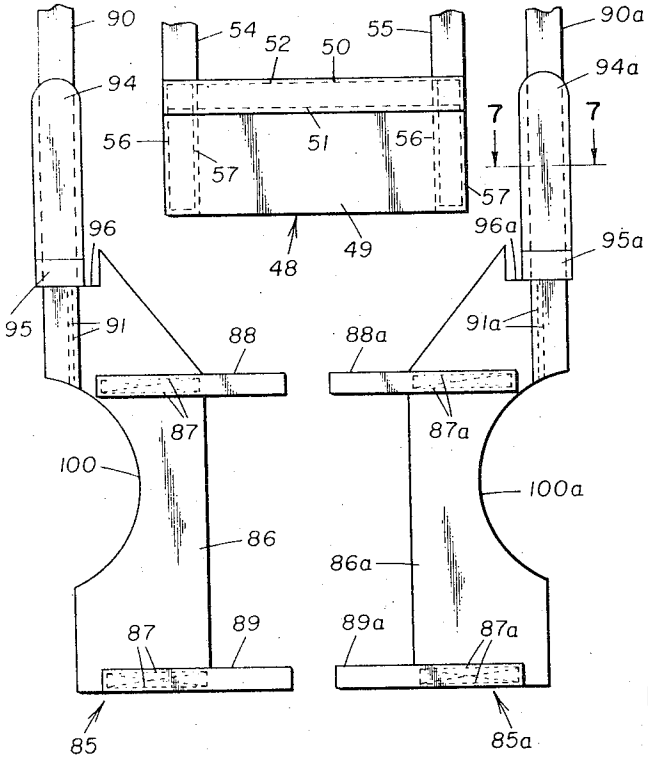


FIG. 7

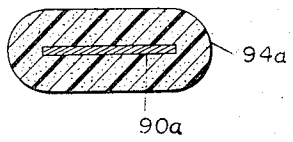
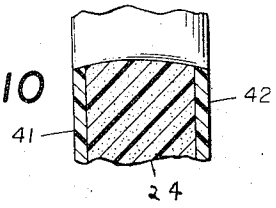


FIG. 10



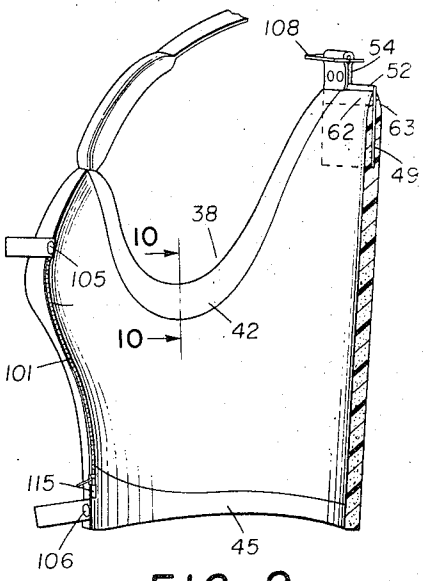


FIG. 9

FIG. 8

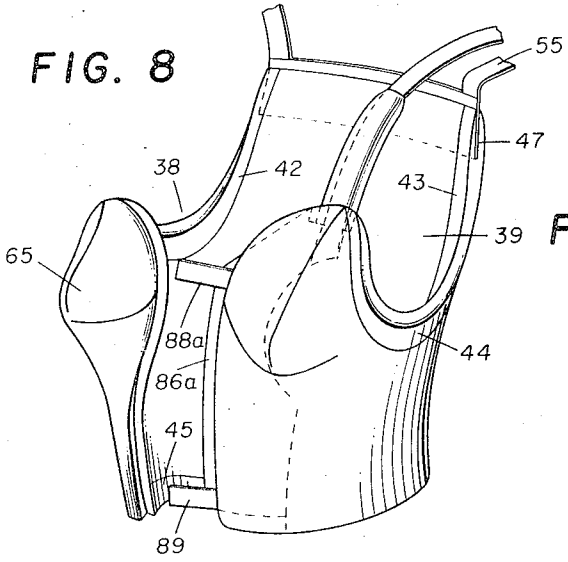
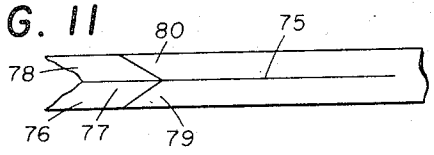


FIG. 11



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3,300,797

LIFE JACKET

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Filed Apr. 12, 1965, Ser. No. 447,417
12 Claims. (Cl. 9—342)

This invention relates to sporting equipment and more particularly to life jackets.

An object of the invention is to provide a new and improved life jacket for supporting the wearer thereof in water and for protecting the wearer from injury when the wearer strikes the water with relatively great force, as when falling while being towed at a relatively high speed on water skis over the water.

Another object is to provide a life jacket which is resilient to conform to the chest of the wearer and grip the chest through substantially its whole area whereby the jacket cannot move relative to the chest to impart a blow thereto when the wearer strikes the water with relatively great speed and force.

Still another object is to provide a life jacket formed of a resilient shock absorbing substance and wherein substantially all surfaces of the life jacket which contact the body of the wearer are provided by the resilient shock absorbing substance.

A further object is to provide a life jacket having a body portion formed of a flat sheet of resilient shock absorbing substance bent into an arcuate shape, with the internal cross-sectional area of the life jacket being smaller than the area of the chest of the wearer, the adjacent vertical edges of the body portion being provided with fastening means, such as the usual "zipper" fastener, whereby the body portion must be resiliently stretched about the chest of the wearer to permit the fastening means to secure its vertical edges together and thus firmly grips the chest.

A still further object is to provide a life jacket having shoulder straps connected to the body portion which limit downward movement of the jacket on the body of the wearer.

A still further object is to provide a life jacket wherein all edges of the body portion exposed to stresses and strains are provided with reinforcing means of greater strength than the shock absorbing substance to prevent tearing of the body portions.

Another object is to provide a life jacket where a reinforcing means is embedded in the body portion and extend outward therefrom along the vertical edges of the body portions to which the fastening means is secured, such reinforcing means limiting the elongation or stretch of the front sections of the body portion to maintain internal breast pockets formed in the body portion spaced laterally a predetermined distance from each other.

A still further object is to provide a life jacket wherein the reinforcing means include a back reinforcing assembly embedded in the back section of the body portion and two front reinforcing assemblies embedded in the front right and left chest sections of the body portion, the shoulder straps and fastening means of the jacket being secured to the reinforcing assemblies.

A still further object is to provide a life jacket wherein the assembly of the body portion and the reinforcing assemblies is covered with an impermeable resilient coating.

Additional objects and advantages of the invention will be readily apparent from the reading of the following description of a device constructed in accordance with the invention and reference to the accompanying drawings thereof, wherein:

FIGURE 1 is a perspective view of a life jacket embodying the invention whose body portion is shaped to conform to the upper torso of a woman;

FIGURE 2 is a back view of the life jacket illustrated in FIGURE 1;

FIGURE 3 is a plan view of a flat sheet or blank of resilient shock absorbent substance prior to its forming;

FIGURE 4 is a fragmentary sectional view taken on line 4—4 of FIGURE 3;

FIGURE 5 is a fragmentary sectional view taken on line 5—5 of FIGURE 3;

FIGURE 6 is a front view of the reinforcing assemblies of the life jacket;

FIGURE 7 is a sectional view taken on line 7—7 of FIGURE 6;

FIGURE 8 is a perspective view of the body portion with some of the reinforcing means secured thereto;

FIGURE 9 is a sectional view of the assembled life jacket with its coating omitted;

FIGURE 10 is a sectional view taken on line 10—10 of FIGURE 9, showing the reinforcing means at an arm hole of the jacket. the thickness of the reinforcing means being exaggerated; and,

FIGURE 11 is a fragmentary view taken on line 11—11 of FIGURE 3.

Referring now to the drawings, the life jacket 20 includes a body portion 21 formed of a flat sheet 22 of a resilient shock absorbing substance, such as unicellular vinyl or rubber foam which contains numerous small voids or cells which render the density of the life jacket much lower than the density of water whereby the buoyancy of the life jacket causes it to maintain the wearer thereof in an upright floating position in the water with the wearer's head held above the surface of the water.

The sheet 22, which may be of a suitable thickness, for example ¾ or 1 inch, has a back section or panel 23, side sections or panels 24 and 25, and right and left front sections or panels 26 and 27.

The front panels 26 and 27 have upper extensions 28 and 29 whose rear edges 31 and 32 together with the top edges 33 and 34 of the side section 24 and 25 and the side edges 35 and 36 of the back section define the upwardly opening right and left arm holes or slots 38 and 39 for receiving the arms of the wearer.

Arcuate or crescent shaped reinforcing strips 41 and 42 are secured as by adhesive, a bonding agent or the like to the outer and inner surfaces of the sheet 22 and extend to the outer and inner edges of the sheet defining the right arm hole 38. Similar inner and outer reinforcing strips 43 and 44 are secured to inner and outer surfaces of the sheet and extend to the inner and outer edges defining the left arm hole 39.

An inner bottom reinforcing strip 45 is similarly secured to the sheet 22 and extends its full length. The reinforcing strips are preferably formed of the same substance as the sheet but are solid instead of unicellular in structure so that they are stronger and offer a much greater resistance to tearing than the sheet 22 itself.

The top portion of the back panel or section 23 of the sheet 22 has a planar vertical slit 46 therein with the upper portion thereof enlarged to form a V-shaped groove 47. A back reinforcing assembly 48 is inserted in the slit 46 and includes a rectangular piece of nylon fabric 49 to whose upper portion is secured, as by two rows of stitches or seams 50 and 51, a horizontal strap 52. A pair of vertical buckle straps 54 and 55 are similarly secured to the nylon fabric and to the horizontal strap by the rows of stitches 50, 51, 56 and 57.

The back reinforcing assembly 48, after its lower portions have had a suitable adhesive or bonding agent applied thereto, is inserted into the slit 46 and the inner and outer upper edge portions 58 and 59 of the back

panel whose interior surfaces **60** and **61** respectively, define the groove **47**, are pressed inwardly to abut the outer surfaces of the horizontal strap. The outer surfaces **62** and **63** of the upper edge portions **58** and **59** of the back panel then curve convergently inwardly to the reinforcing strap **52** whose uppermost portion extends upwardly of the top edge of the back panel. The interior surfaces of the back portion defining the slit **46** and the groove **47** may also have such adhesive or bonding agent applied thereto prior to the insertion of the reinforcing assembly therein. The portions of the sheet on opposite sides of the slit are held compressed against the reinforcing assembly **48** until the adhesive or bonding agent sets.

If the lift jacket, as illustrated, is for wear by a woman, breast cups **65** and **66** are formed in the front panels **26** and **27** of the body portion **21**. The breast cup **65** is formed by cutting out V-shaped sections in the flat sheet **22** to form the V-shaped darts or slots **67** and **68** in the front panel **26** and then bringing the surfaces **69** and **70** of the sheet defining the outer sides of the slots into engagement with the edges **71** and **72** defining their inner sides and then securing these surfaces together as by an adhesive or a bonding agent. The upper portion of the front panel **26** curves outwardly to form the breast pocket as these surfaces defining the slot are thus moved into abutting relationship.

The breast cup **66** is similarly formed by providing the front panel **27** with the V-shaped slots **67***a* and **68***a*, then bringing the outer surfaces **69***a* and **70***a* into abutting relation with the surfaces **71***a* and **72***a* respectively, and then securing these surfaces to one another by an adhesive or bonding agent.

The right front panel of the sheet is provided with a vertical slit **75** whose lateral and upper portions are enlarged to form a groove **76** defined by the outwardly divergent inner surfaces **77** and **78** of the outer edge portions **79** and **80** of the sheet formed by the groove.

The right front reinforcing assembly **85** has its inner portions positioned in the slit **75** and includes a rectangular panel or piece **86** of nylon fabric to which are secured, as by rows of stitches **87**, top and bottom horizontal straps **88** and **89**, respectively.

A vertical buckle strap **90** has its lower portion secured to the panel **86** by the rows of stitches **91**. A sleeve **94** of a shock absorbent substance, which may be a vinyl or rubber foam, is telescoped over the buckle strap **90** and its lower tapered end portion **95** extends into the upper notch **96** of the panel **86**, and, when the reinforcing assembly is positioned in the slit **75**, in the upwardly facing portion **97**, FIGURE 3, of the groove **76**.

An arcuate recess **100** is provided in the inner lateral portion of the panel **86** which, when the reinforcing assembly is in the slit **75**, is in alignment with an inner portion of the breast pocket. It will be apparent that if the panel were not provided with this recess, folds would be formed therein at this location due to the outwardly convex form of the breast pocket.

The reinforcing assembly after insertion into the slit **75** is secured to the sheet **22** by an adhesive or bonding agent, with an outer vertical edge portion of the panel **86** and the outer portions of the straps extending outwardly of the edges of the sheet **22**. The outer and inner surfaces of the outer edge portions of the sheet converge outwardly due to the provision of the enlarged groove portion **76** of the slit **75**.

The left reinforcing assembly **85***a* is a mirror image of the right reinforcing assembly and the slit **75***a* of the left front panel of the sheet **22** is a mirror image of the slit **75** and, accordingly, the various components of the reinforcing assembly and of the left panel defining the slit **75***a* have been provided with the same reference numerals, to which the subscript *a* has been added, as the corresponding elements of the right reinforcing assembly and of the right front panel.

In the manufacture of the lift jacket, the reinforcing assemblies **48**, **85** and **85***a* are inserted in the slits **46**, **75** and **75***a* respectively and secured to the sheet in the manner described above and illustrated in FIGURES 8 and 9. The reinforcing strips **41**, **42**, **43** and **44** are then secured to the sheet **22** while the sheet is held in the arcuate form shown in FIGURES 8 and 9. This assembly of the reinforcing means and the sheet is then coated with a plastic substance, such as vinyl, rubber or the like, while it is held in the arcuate form illustrated in FIGURES 8 and 9 and is then held in this arcuate form until the coating sets. The coating, in conjunction with the reinforcing strips then holds the assembly in the arcuate form shown in FIGURES 8 and 9.

The coating and the reinforcing strips are also resilient and thus permit the portion of the body portion **21** below the back reinforcing assembly **48** and between the left and right reinforcing assemblies to stretch resiliently. The reinforcing assemblies are of course flexible but are not resilient, and will not stretch to any appreciable degree.

The zipper tapes **101** and **102** of the zipper fastener **103** are then secured to the portions of the panels **86** and **86***a* which extend outwardly of the adjacent vertical edges of the body portions. The complementary sections of any suitable snap fastener **105** are then secured to the top straps **88** and **88***a* in any usual well known manner and the complementary sections of a similar snap fastener **106** are secured similarly to the lower straps **89** and **89***a*. The buckle straps **54** and **55** are then looped about the middle portions **108** of the usual buckles **109** and **110** and the free ends of the buckle straps are then secured to intermediate portions thereof in any suitable manner, as by rivets **112**.

The straps **90** and **90***a* may then be inserted through the buckles **109** and **110**, respectively, to the degree necessary to position the life jacket properly about the chest of the wearer. The internal cross sectional area or space defined by the internal surface of the body portion is smaller than the chest portion of the wearer, when it is in its inherent non-stretched condition, so that the two zipper sections are spaced two to four inches apart when the jacket is placed on the wearer. The body portion is then stretched resiliently to bring the zipper sections adjacent one another and in position to be secured to one another by the zipper slide **115**. The complementary sections of the straps **105** and **106** are then connected to connect the upper and lower pairs of straps **88** and **88***a* and **89** and **89***a* together. The complementary sections of each snap connector are so disposed that when the pair of straps are connected thereto they are held under tension. It will be noted that the straps **88** and **88***a* are disposed above the top end of the zipper fastener and the straps **89** and **89***a* are disposed below the bottom end of the zipper fastener so that these straps protect the opposite ends of the zipper fastener from forces which would tend to separate the zipper fasteners at the top and bottom.

The body portion of the life jacket is now stretched resiliently about the chest of the wearer and engages it firmly so that no part of the body portion is loose and/or spaced from the chest. Any loose portion of a life jacket would tend to strike the wearer if the wearer fell with great force into the water. The breast cups of course provide internal concavities and the life jacket thus snugly protects the upper portion of the torso of the wearer.

The reinforcing assemblies which, while flexible are not resilient, now hold the breast cups and the straps **90** and **90***a* spaced properly and in proper position on the wearer, the required circumferential stretching of the body portion occuring in the portions thereof between the reinforcing assemblies **85** and **85***a* and below the back reinforcing assembly **48**.

The buckles **109** and **110** are at the back of the wearer and are not therefore likely to come in contact with the wearer. The front portions of the straps **90** and **90***a* are protected by the resilient sleeves **94** and **94***a* and will therefore not bite into the flesh of the wearer.

The internal reinforcing strips **41** and **42** and **43** and **44** extend between opposite upper ends of the back reinforcing assembly and the upper ends of the front reinforcing assemblies **85** and **85***a*, while the reinforcing strip **45** overlaps the lower ends of the front reinforcing assemblies so that the entire periphery of the sheet **22** is reinforced and protected against tearing.

Any tears to the sheet **22** are likely to start at the edges and outwardly from the internal surface thereof since when the wearer falls with great force into the water, the portions of the jacket on the side of the wearer opposite the side which strikes the water tend to move away from the wearer and fold. The inner reinforcing strips **42**, **43** and **45** are thus at the locations most likely to be subjected to severe strains and stresses. The outer straps **41** and **44** are located at the locations where the arms are most likely to rub against the body portion but could be omitted if desired.

While the life jacket **20** illustrated and described is for wear by a woman, it will be apparent that a jacket for wear by men may be formed in exactly the same manner and with the same reinforcing means, the breast cups being of course unnecessary, the sheet **22** is not provided with the slots **67**, **68**, **67***a* and **68***a*.

It will now be apparent that a new and improved life jacket has been illustrated and described which firmly engages about the chest of the wearer and is resiliently stretched thereabout.

It will also be apparent that the jacket is formed of a sheet of low density resilient substance provided with flexible non-resilient reinforcing means across the full length of the front portion thereof and across the upper portion of the back portion thereof so that stretching of the jacket can occur only along the side portions and along the back portion thereof below the back reinforcing means.

It will further be seen that the internal surfaces of the jacket along the periphery thereof and between the front and back reinforcing assemblies have resilient reinforcing means secured thereto whereby substantially the entire periphery of the jacket is reinforced.

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

1. A life jacket including: a substantially rectangular body of resilient low density substance, said body being arcuate and having a back panel, a pair of side panels extending forwardly from opposite sides of said back panel and a pair of front panels spaced forwardly of said back panel and extending inwardly toward each other from forward sides of said side panels; a back reinforcing assembly including a rectangular flexible non-resilient panel embedded in the upper portion of said back panel and having an upper edge portion extending above the upper edge of said back panel; a pair of front reinforcing assemblies secured to said front panels, each of said front reinforcing assemblies including a substantially rectangular flexible non-resilient panel embedded in its associated front panel, said panels of said front reinforcing assemblies having outer portions extending outwardly from said front panels of said body toward each other; fastening means secured to said outer portions for securing said panels to one another; and a pair of shoulder strap means secured to said front and rear reinforcing assemblies for limiting downward movement of said body on the chest of a wearer.

2. The life jacket of claim **1**; and auxiliary fastening means secured to said panels of said front reinforcing assemblies for securing said assemblies to one another above and below said fastening means.

3. The life jacket of claim **2**; and reinforcing means secured to internal surfaces of said body between said reinforcing back and front reinforcing assemblies to reinforce peripheral edge portions of said body between said panels of said reinforcing assemblies.

4. The life jacket of claim **1**; and reinforcing means secured to internal surfaces of said body between said reinforcing back and front reinforcing assemblies to reinforce peripheral edge portions of said body between said panels of said reinforcing assemblies.

5. The life jacket of claim **1** wherein said fastening means comprises a zipper fastener extending substantially the full length of said panels of said front reinforcing assemblies.

6. The life jacket of claim **1** wherein said each of said front panels is provided with an internal grasp concavity at the upper portion thereof.

7. The life jacket of claim **1**; and resilient reinforcing strips secured to internal surfaces of said body between said back and front reinforcing assemblies reinforcing peripheral edge portions of said body between said panels of said reinforcing assemblies.

8. The life jacket of claim **7**; and resilient reinforcing strips secured to external surfaces of said body between said back and front reinforcing assemblies reinforcing upper peripheral edge portions of said body between said panels of said reinforcing assemblies.

9. A life jacket including: a substantially rectangular body of resilient low density substance adapted to be resiliently stretched about the chest of a wearer, said body having a back panel, a pair of side panels extending from opposite sides of said back panels, and a pair of front panels extending from said side panels; a back reinforcing assembly including a rectangular flexible non-resilient panel embedded in the upper portion of said back panel; a pair of front reinforcing assemblies secured to said front panels, each of said front reinforcing assemblies including a substantially rectangular flexible non-resilient panel embedded in its associated front panel, said panels of said front reinforcing assemblies having outer portions extending outwardly of said front panels; fastening means secured to said outer portions for securing said panels of said front reinforcing assemblies to one another; and a pair of shoulder strap means secured to said front and rear reinforcing assemblies for limiting downward movement of said body on the chest of a wearer.

10. The life jacket of claim **9**, and resilient reinforcing means secured to said body and extending between said front assemblies and said back reinforcing assembly to reinforce upper peripheral edge portions of said body between said panels of said front assemblies and said back reinforcing assembly; and resilient reinforcing means secured to said body and extending between said panels of said front reinforcing assemblies to reinforce lower peripheral edge portions of said body between said panels of said front reinforcing assemblies.

11. The life jacket of claim **10**, wherein said fastening means comprises a zipper fastener extending substantially the full length of said panels of said front reinforcing assemblies.

12. The life jacket of claim **11**, wherein each of said front panels is provided with an internal concavity at the upper portion thereof.

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