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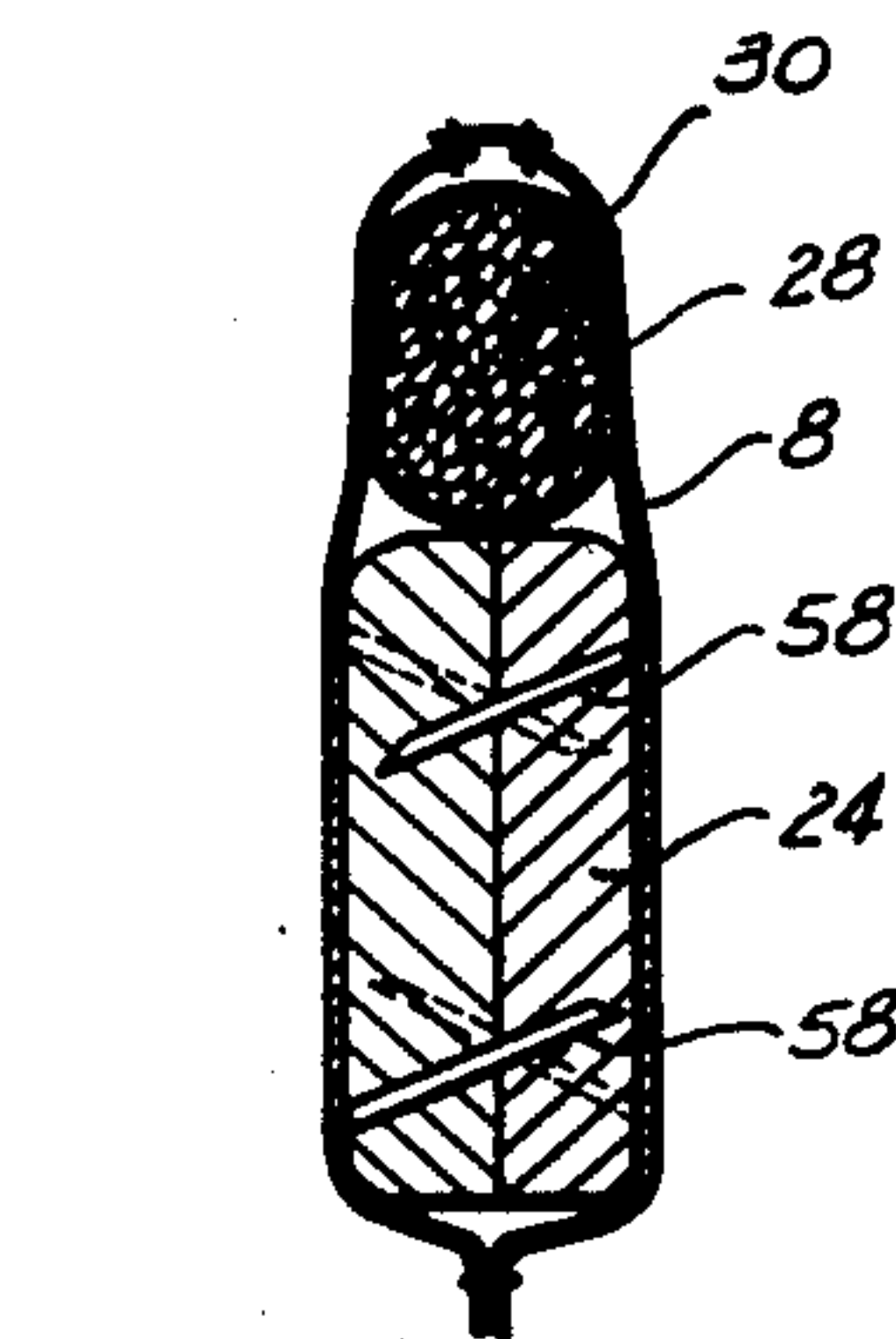
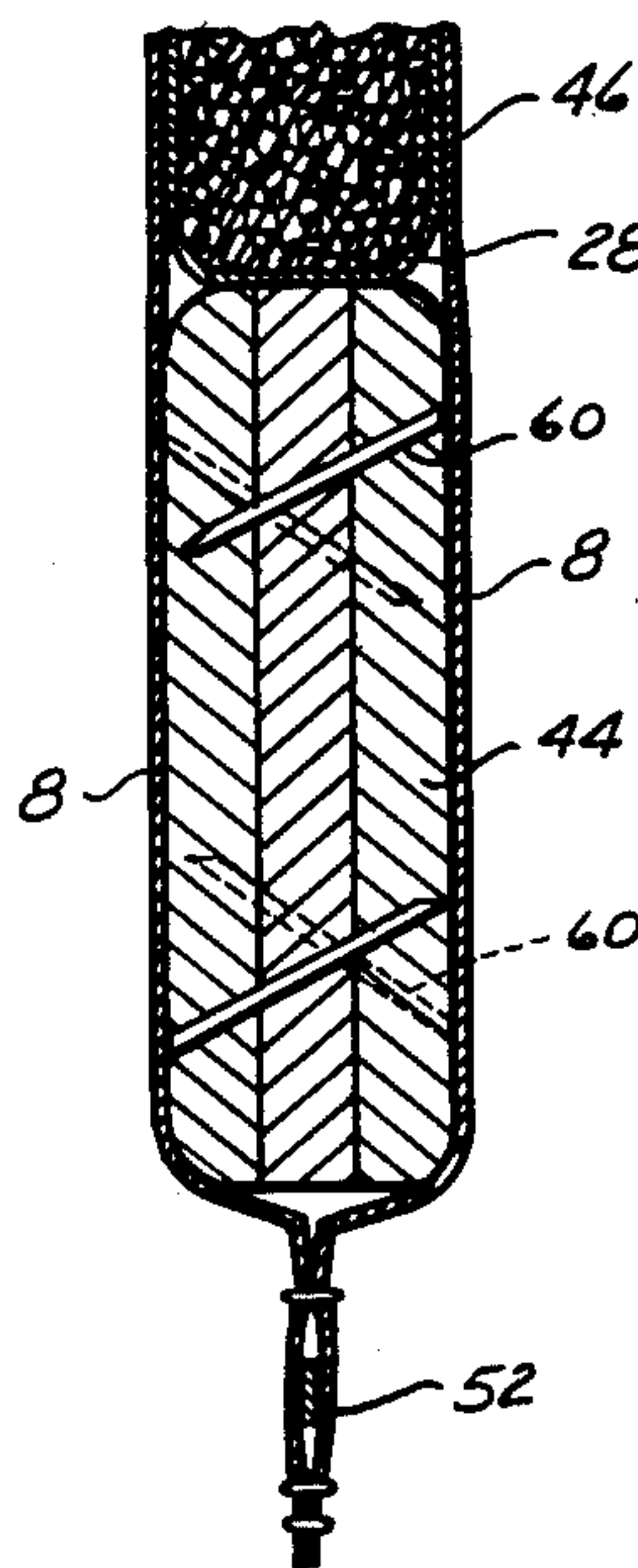
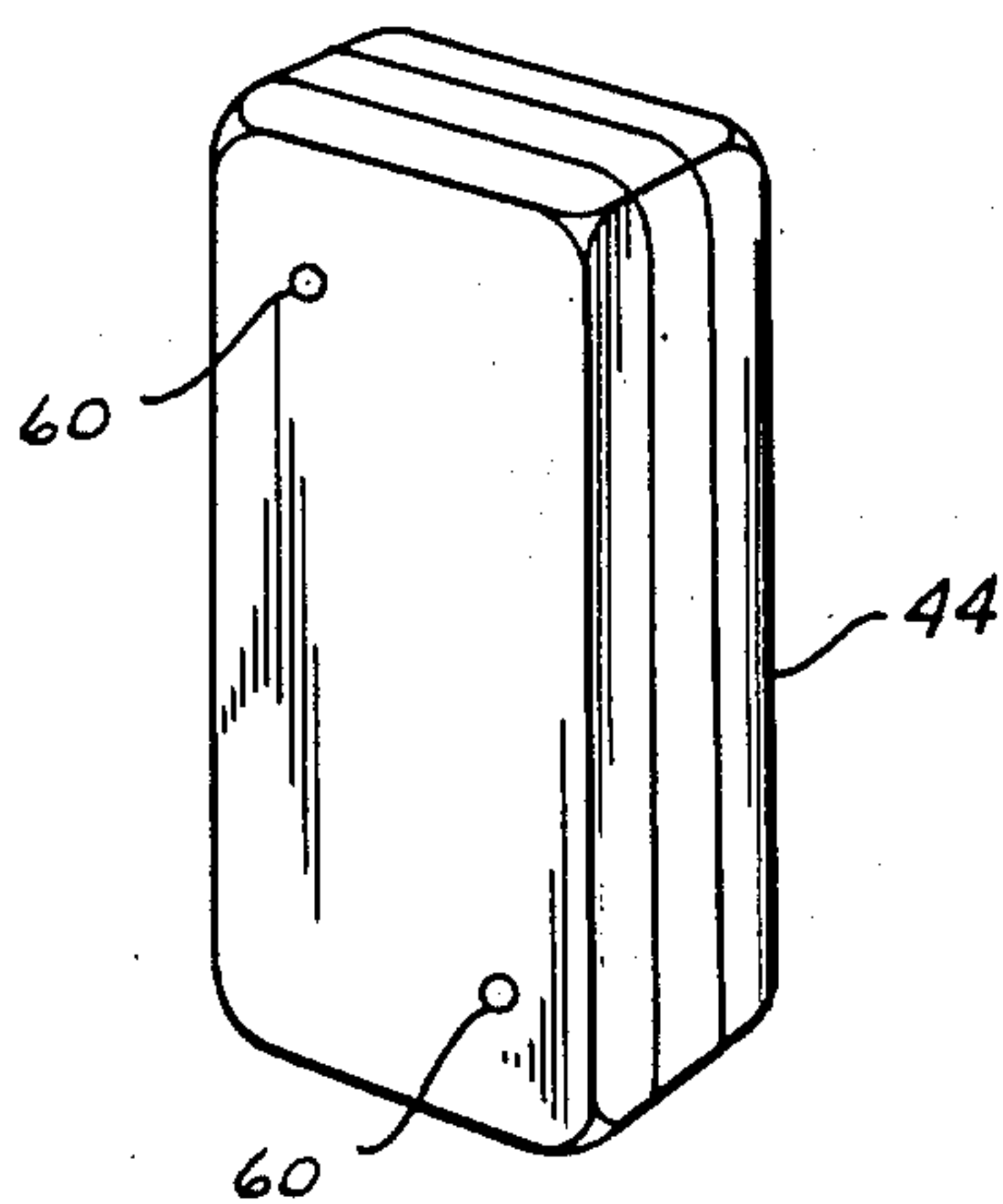
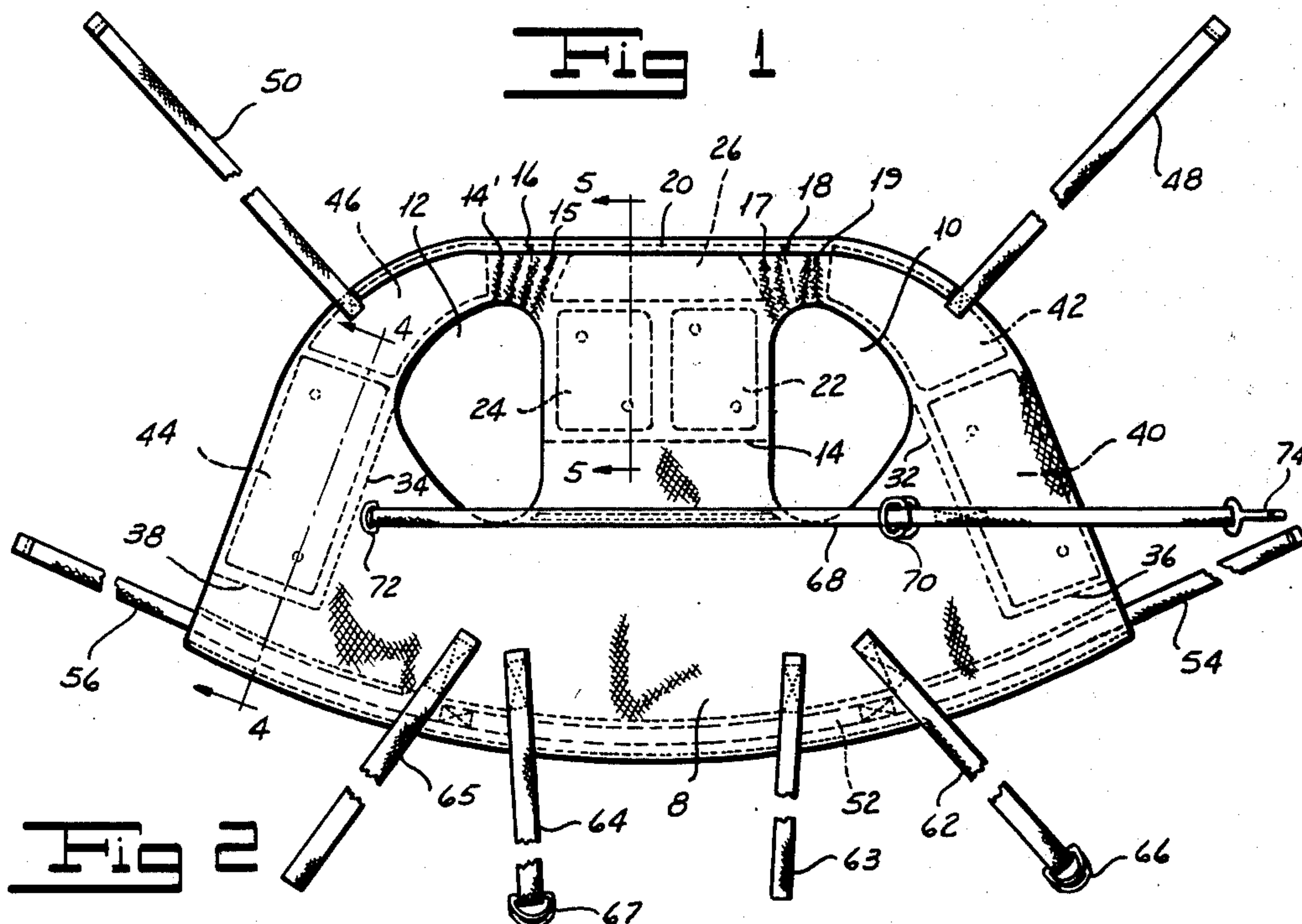
L. P. FRIEDER ET AL

2,629,116

LIFE JACKET

Filed April 29, 1949

2 SHEETS—SHEET 1



INVENTORS
LEONARD P. FRIEDER
THOMAS H. GARBER
EDGAR G. BAKER

Henry L. Shaver
ATTORNEY

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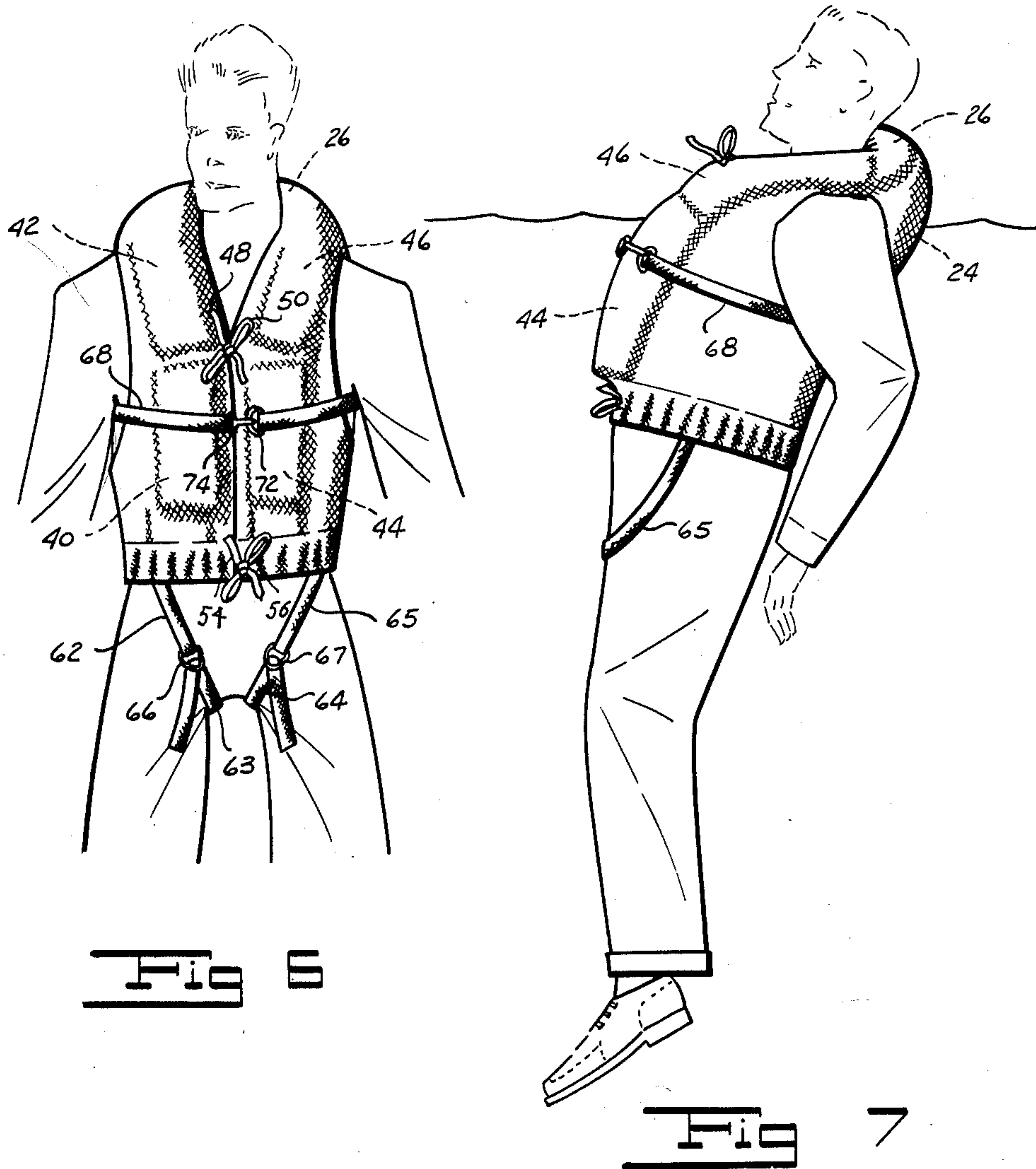
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2 SHEETS—SHEET 2



INVENTORS
LEONARD P. FRIEDER
THOMAS H. GARBER
EDGAR G. BAKER
Henry L. Shewier
ATTORNEY

UNITED STATES PATENT OFFICE

2,629,116

LIFE JACKET

Leonard P. Frieder, Great Neck, N. Y., Thomas H. Garber, Silver Spring, Md., and Edgar G. Baker, Carbondale, Pa., assignors, by mesne assignments, to Reconstruction Finance Corporation, Philadelphia, Pa., a corporation of the United States

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3 Claims. (Cl. 9—20)

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Our invention relates to life jackets and more particularly to an improved life jacket in which the buoyant material is composed entirely of cork and which is adapted to support a wearer in a position with his head and face out of the water for extended periods of time with safety and comfort.

It has long been known that cork is the best buoyant material for use in life jackets. It is low in cost, possesses a long life, requires no special care in storage and will not waterlog through extended periods of use. Cork life jackets, for example, will retain positive buoyancy sufficient to perform their function after more than thirty days' immersion in water. Cork life preservers of the prior art are uncomfortable. The wearer's skin has been chafed by the uneven edges of the cork blocks producing painful injuries after extended exposure in salt water. It has frequently been necessary for wearers of life jackets to jump from the deck of a vessel to be abandoned and it has been found with the conventional life jacket that the cork blocks would break the wearer's jaw and teeth incident to the impact with the water. Frequently the wearers are unconscious and the cork life jackets of the prior art have had insufficient righting moment to turn an adult wearer to the right backward upright position in the water, with the result that wearers have drowned even though wearing life jackets.

Because of the disadvantages of cork life jackets, use has been made of kapok, a fiber indigenous to the Philippine Islands, containing minute cells and possessing considerable buoyancy. Kapok life jackets, however, become waterlogged fairly rapidly and lose their buoyancy after six or eight hours of immersion in water. Then too, special care must be taken in storing kapok life jackets to prevent a breakdown of the buoyant fibers or mildew, with the ensuing loss in buoyancy. Furthermore, a kapok life jacket can not be reused after it becomes waterlogged, after long submersion. Then too, the kapok fibers are much more readily combustible than blocks of cork so that they present a greater fire hazard.

Balsa wood has more buoyancy than cork and is another buoyant material which is useful in life preservers. Balsa is a wood and will become waterlogged sooner than cork since it possesses the capillarity of a wood. The cell structure of cork is peculiar and each cell is in contact with fourteen neighboring cells, and does not possess

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capillarity which accounts for its property of not absorbing moisture. For the purposes of this invention we can consider that balsa wood and cork are substantial equivalents.

One object of our invention is to provide a life jacket having buoyant masses of cork so placed as to provide a righting moment which will support the wearer in a substantially upright slightly backwardly inclined position in the water irrespective of whether the wearer is conscious and irrespective of the physical makeup of the wearer.

Another object of our invention is to provide a life jacket in which cork is the buoyant medium having a collar in which the buoyant material comprises cork fragments adapted to act as a cushion, and to provide a modicum of comfort to the wearer and to provide support for the wearer's head.

Another object of our invention is to provide a life jacket which will be comfortable to the wearer while performing shipboard duties or when wearing the jacket during a possible emergency, in which the buoyant material comprises cork.

Another object of our invention is to provide a life jacket of the reversible type having cork as the buoyant medium and adjustable for adults weighing between one hundred and three hundred pounds and varying in height from four feet to six and one half feet, and which will have the desired righting moment to support the wearer in the substantially upright slightly backwardly inclined position.

Another object of our invention is to provide a life jacket having readily adjustable leg straps and belt and including means for lifting an unconscious wearer out of the water.

Other and further objects of our invention will appear from the following description:

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith, and in which like reference numerals are used to indicate like parts in the various views,

Figure 1 is a rear elevation of a life jacket showing one embodiment of our invention stretched out on a plane surface.

Figure 2 is a perspective view showing a cork buoyancy block used in our life jacket.

Figure 3 is a perspective view of a packet of cork fragments used in our life jacket collar.

Figure 4 is a sectional view drawn on an enlarged scale taken along line 4—4 of Figure 1.

Figure 5 is a sectional view drawn on an enlarged scale taken along line 5—5 of Figure 1.

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Figure 6 is a perspective view showing the life jacket worn by a wearer.

Figure 7 is a perspective view showing our life jacket in use and illustrating the substantially upright slightly backwardly inclined position into which our life jacket constrains a wearer to float.

In general, our invention contemplates the provision of a jacket comprising a vest made of two thicknesses of cloth sewn to provide three pockets, one in the rear of the vest and two along the front of the vest. In the rear pocket we dispose a pair of cork blocks and a packet of cork fragments above the cork blocks. In each of the front pockets we dispose a cork block and a packet of cork fragments. The cork fragments are positioned above the cork blocks such that when the jacket is worn the three packets of cork fragments will form a collar cushioning the neck and head of the wearer at the back and along the sides. Neck tie tapes and waist tie tapes are provided adjacent the upper portion and lower portion of the sides of the vest. A pair of crotch straps is provided adjacent the bottom side of the jacket on each side of the center thereof. A lifting strap surrounds the lift jacket below the armpits. This helps secure the jacket to the wearer and is adapted to act as a lifting strap for hoisting unconscious wearers from the water. The lifting strap is positioned to extend through the armholes so that the jacket may be worn inside out, that is, so that the jacket will be reversible.

The fabric of the jacket is pre-shrunk and may be formed of rip-stop material, that is, material having predetermined threads of the warp and woof of larger gauge to prevent a rip from traveling. If desired, the jacket may be dyed a bright color such as Indian orange and may be treated with mildew inhibitors, such as dihydroxy-diphenylmethane. Similarly, the fabric may, if desired, be dyed with a fluorescent material so that wearers can be located with ease at night with the use of an activating light.

More particularly referring now to the drawings, the jacket proper comprises two thicknesses of fabric 8 which may be of any desirable material such as cotton drill, cotton twill, rayon drill, rayon twill, nylon drill, nylon twill, or the like. The fabric may be woven in a rip-stop construction if desired. A pair of armholes 10 and 12 are provided. The section between the armholes is sewn along seams 16 and 18 and along an upper seam 20 to provide a pocket. In this pocket we dispose a pair of cork blocks 22 and 24, and above them a packet of cork fragments 26. The packet comprises a fabric cover 28 housing cork fragments 30. The cork fragments comprising packet 26 are approximately two and one half ounces in weight and are composed of fragments of cork varying in size from one quarter inch to one inch in approximate diameter. We have found that fragments of cork smaller than one quarter inch have insufficient buoyancy characteristics while fragments which are larger than one inch have insufficient mobility in the packets and produce discomfort to the wearer and lose their desired cushioning effect. On each side of the central packet we provide marginal pockets formed by seams 18 and 16 and by seams 32 and 34 extending parallel to the respective edges of the jacket and by bottom seams 36 and 38. It will be observed that the lateral pockets are substantially continuous with the upper portion of the central back

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pocket. In the right hand front pocket, as viewed in Figure 1, we dispose a cork block 40 and above it a packet of cork fragments 42 generally shaped to the configuration of the upper portion of the pocket. In the left hand front pocket we dispose a cork block 44 and above it a packet 46 containing cork fragments similar to packet 42. The cork fragments vary in size from one quarter inch to one inch in approximate diameter and each of the packets comprises about five ounces of cork fragments. To the upper right hand side of the jacket we secure a tying strap or tape 48 made of suitable material. A similar strap 50 is secured to the left hand upper side of the jacket. A bottom tape or strap 52 is sewn along the bottom of the jacket adjacent its lower edge and has a right hand portion 54 and a left hand portion 56 which may be tied together. On either side of seam 18 we provide areas 17 and 19 providing pleats or fullness adapted to permit the back block 22 to adjust itself. Similarly, at each side of seam 16 we provide an area 14' and an area 15 forming a pleat or fullness adapted to permit block 24 to adjust itself. These adjustments make for comfort. The blocks 22 and 24 are composed of two laminations of cork secured by dowel pins 58 disposed angularly to each other and driven in from the sides, as can readily be seen by reference to Figure 5. No glue or adhesive is used in the block since this is apt to deteriorate it by age or immersion in water. The front blocks 40 and 44 are composed of three laminations or sheets of cork secured by dowel pins 60 as can readily be seen by reference to Figure 4. The corners of the cork blocks are rounded to insure that no sharp areas are presented which may initiate a rip or tear in the fabric. Each of the front blocks weighs twenty-six and one quarter ounces and each of the rear blocks weighs nine and three quarter ounces. The total weight of the cork blocks, therefore, is four pounds and eight ounces, and all of the cork blocks displace five hundred twenty cubic inches. Each one of the rear blocks displaces seventy cubic inches and each one of the front blocks displaces one hundred ninety cubic inches. It will be seen that the arrangement is such that the buoyancy of the two front cork blocks is approximately seventy-three percent and the buoyancy of the two rear cork blocks is about twenty-seven percent of the total buoyancy. All of the buoyancy is available to support the wearer. Since the center of buoyancy of the system is above the center of gravity of the wearer which in a human being is located in a transverse plane adjacent the hips, we have a metacentric height furnishing a righting moment tending to float the wearer in a generally upright position. Since the buoyancy in the front of the jacket is greater than the buoyancy in the back of the jacket the upright position is inclined to the rear. Furthermore the positioning of the greater buoyancy mass at the front of the jacket produces a righting moment rotating the wearer to float face upwardly. The packets of cork fragments disposed around the collar act not only as a cushion but support the head of the wearer and give additional buoyancy around the head area tending to lift the wearer out of the water in a position for easy breathing.

The cork blocks and the packets of cork fragments produce a positive buoyancy, after allowance for the weight of the cork, the fabric and the straps, of about eighteen pounds. This posi-

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tive buoyancy is ample to support an adult weighing as much as three hundred pounds.

A pair of crotch straps 62 and 63 and 64 and 65 are provided. The front crotch strap 62 on the right hand side of the jacket is provided with double D-rings 66 adapted to co-act with the strap end 63. The rear crotch strap 64 of the left hand side of the jacket is provided with double D-rings 67 adapted to co-act with the strap 65. By reversing the D-rings the chances of confusing the crotch straps is lessened. The straps may be formed of a herring-bone cotton tape or the like. A lifting strap 68 is sewed to the body of the jacket adjacent the armholes 10 and 12 so that it may be fastened around the jacket exteriorly thereof irrespective whether the jacket is reversed or not. It is made of three-inch webbing and is provided with a hook-on ring 70. A single D-ring 72 and a snap hook 74 are used to secure the lifting strap around the jacket. Means may be provided for adjusting its length.

Referring now to Figure 6 we see the jacket on a wearer with the cork blocks 40 and 44 in front. The collar is formed of the packets of cork 46, 42 and 26. The tie straps 48 and 50 are tied at the front portion of the jacket while the tapes 54 and 56 are tied at the lower portion of the jacket. The snap hook 74 at one end of the lifting strap 68 is secured to the single D-ring 72. The crotch straps are secured by means of the D-rings 66 and 67.

Referring now to Figure 7, a wearer of the jacket is shown supported adjacent the surface of the water in the upright slightly backwardly inclined position which is desired.

It will be seen that we have accomplished the objects of our invention. We have provided a life jacket having buoyant masses of cork or balsa wood placed so to provide a righting moment which will support the wearer in a substantially upright slightly backwardly inclined position in the water irrespective of whether the wearer is conscious and without regard to the physical makeup of the wearer. Our life jacket uses cork or balsa wood as a buoyant medium and has a collar in which the cork or balsa wood fragments are adapted to act as a cushion, and to provide a modicum of comfort to the wearer, and to support the wearer's head in the water. We have provided a life jacket which will be comfortable to the wearer while performing ship-board duties or when wearing the jacket prior to immersion during a possible emergency, in which the buoyant material comprises cork. We have provided a life jacket of the reversible type having cork as a buoyant medium which is adjustable for adults between one hundred and three hundred pounds in weight and varying in height from four feet to six and one-half feet, which will have the desired righting moment to support the wearer in the desired substantially upright slightly backwardly inclined position. We have provided a life jacket which will support a wearer through extended periods of immersion and yet has the requisite degree of comfort.

If desired, the packets of cork fragments may

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be divided into a number of compartments by flexible partitions of threads, cloth, or the like, in such a manner as not to destroy the mobility of the cork fragments. In this manner, if one of the compartments becomes ruptured by tearing, only the cork fragments in one compartment will be lost, and there is sufficient buoyancy in the cork blocks to sustain a person wearing a jacket without the cork fragments, as pointed out above.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of our claims. It is further obvious that various changes may be made in details within the scope of our claims without departing from the spirit of our invention. It is, therefore, to be understood that our invention is not to be limited to the specific details shown and described.

Having thus described our invention, what we claim is:

1. A life jacket including in combination a fabric vest formed with a pair of armholes, three cork masses, means securing one of said cork masses to the vest back between the armholes, means securing another of said cork masses to the right front of the vest, means securing the third of said cork masses to the left front of the vest, the center of buoyancy of the back cork mass being positioned above the center of buoyancy of the front cork masses, the aggregate buoyancy of the front cork masses being greater than the buoyancy of the back cork mass, said vest being formed along its upper portion to provide a collar, and cork fragments positioned within the collar, said cork fragments having an approximate diameter of between one-quarter inch and one inch.

2. A life jacket as in claim 1, in which said cork fragments are positioned in envelopes, within the collar.

3. A life jacket as in claim 2, in which the fabric of the jacket in the back thereof above the armholes and intermediate adjacent envelopes is provided with a fullness adapted to relieve the pressure of the rear cork mass against the body of a wearer.

LEONARD P. FRIEDER.
THOMAS H. GARBER.
EDGAR G. BAKER.

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