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CRINKLED RUBBER BATHING SUIT

Filed Oct. 20, 1932

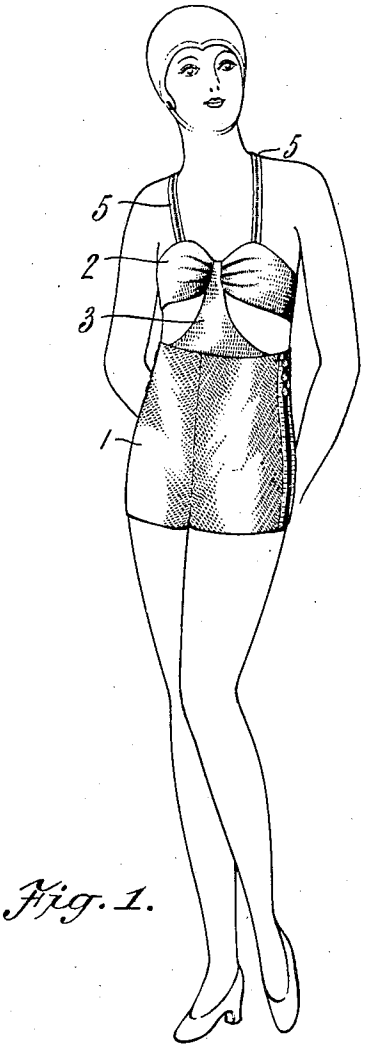


Fig. 1.

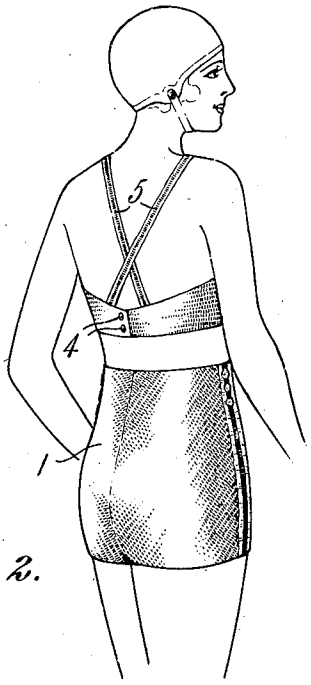


Fig. 2.

Fig. 3.

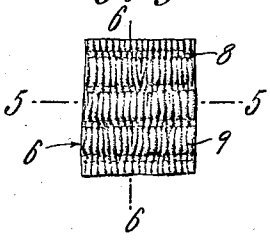


Fig. 4.

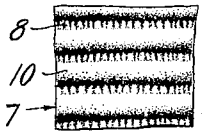


Fig. 5.

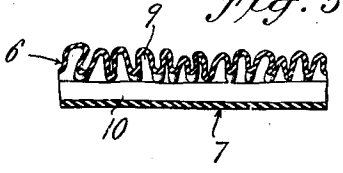
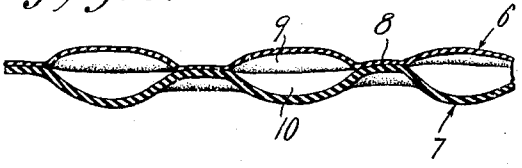


Fig. 6.



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UNITED STATES PATENT OFFICE

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CRINKLED RUBBER BATHING SUIT

Application filed October 20, 1932. Serial No. 638,663.

This invention relates to a rubber bathing suit, and more particularly to a rubber bathing suit made of a crinkled or puckered multiple ply rubber material.

The usual bathing suits of wool jersey or other knitted or woven material, are open to a number of objections. Such suits when wet become water logged and heavy and stretch out of shape so that their appearance is marred and the sagging of the material interferes with swimming. To overcome to a certain extent the objections of stretching and sagging, it is necessary to use a material which is relatively heavy and closely fabricated and to also make the suit very snug fitting. Fabric suits also do not drain and dry quickly when wet, and when a bather comes out of the water on a windy or cool day he is uncomfortable by reason of the chilly feeling caused by the absorbed water in the suit and by the evaporation of the water. For ladies' wear, the fabric suits are also lacking in that the range of colors which can be used is somewhat limited and the colors are not brilliant.

An object of our invention is to provide a crinkled or puckered rubber bathing suit.

A further object is to provide a bathing suit which does not become water logged and heavy when wet.

A further object is to provide a bathing suit which will retain its shape when wet.

A still further object is to provide a bathing suit which will dry quickly, and which will not chill the wearer after coming out of the water.

A still further object is to provide a rubber bathing suit which can be easily donned by reason of its non-frictional surface.

Another object is to provide a bathing suit which can be made in a variety of brilliant colors, with a matching cap and shoes.

Still another object is to provide a bathing suit which will occupy a minimum space when not in use.

Still another object is to provide a rubber bathing suit which is very flexible, and which is more elastic than plain sheet rubber of corresponding gauge so that while being snug fitting it will stretch easily and will not bind.

For a detailed description of the nature and objects of the invention reference is made to the accompanying specification and drawing, in which latter:

Figure 1 is a front view of a suit made according to the invention;

Figure 2 is a rear view of the same;

Figure 3 is an enlarged top plan view of one form of crinkled rubber material which may be used;

Figure 4 is an enlarged bottom plan view of the material;

Figure 5 is a cross section on a still larger scale on the line 5—5 of Fig. 3; and

Figure 6 is a large scale cross section on the line 6—6 of Fig. 3.

Referring to the drawing, in which is shown one form of a ladies' bathing suit, the numeral 1 refers to the trunks or pants and 2 to the brassière, which is connected to the trunk portion by the intermediate portion 3. The brassière may be joined at the back in any suitable manner, as by the snap fasteners 4, and it is held in position by shoulder straps 5 which may cross at the back as shown in Fig. 2. These straps 5 may be made of all rubber or of rubberized fabric. Any other desired style of suit may be made, such as an entire shirt and trunks, and these may be integral or separable.

In Figs. 3 to 6 there is shown one form of crinkled or puckered rubber which may be used, but the invention is not limited to the form shown as many modifications of the material are suitable for the purpose. In the form shown, the crinkled rubber is made of two plies, a top ply 6 and a bottom ply 7. These plies are united along spaced lines or narrow areas 8, and between said narrow joined areas, the top ply is formed with short transverse puckers 9, a series of such puckers being disposed between each pair of adjacent narrow joined areas 8. At the same time, the bottom ply 7 is formed into longitudinal continuous puckers 10, each of which extends between a pair of adjacent joined areas 8, each longitudinal pucker 10 being disposed directly beneath

a longitudinal series of transverse top puckers 9. It will be noted by inspection of Figs. 3 to 6 that while the series of short puckers 9 are more or less regularly arranged in rows, the individual puckers 9 are irregular and differ from one another in shape, height, width and length. Hence, the air spaces formed within individual puckers and between the inner and outer rubber sheets are irregular in shape and size.

The material is preferably made by passing two superposed sheets of unvulcanized rubber between a pair of even speed pressure rolls, one of the rolls being provided with series of circumferential projecting ribs which coact with the other smooth roll to adhesively join the two sheets along narrow areas or lines. Other forms of projections on the roll may be used, the shape, size and location of the joined areas of the rubber sheets depending upon the character and shape of the projections. One of the sheets is fed in between the rolls under tension, and after the two sheets have been joined along the lines 8 by the pressure of the ribs at the bite of the rolls, the tension on the stretched sheet is released, thereby causing it to contract. As the stretched sheet contracts, it causes the adhesively joined unstretched sheet to pucker or crinkle as shown in Fig. 3, while at the same time the stretched sheet is formed with longitudinal puckers as shown in Fig. 4. Either the stretched or the unstretched sheet may be in contact with the roll having the projections. It is not essential, in the making of the material, that the sheets be wholly unvulcanized, as one or both may be cured to a slight extent, but the cure should not be sufficient to so completely destroy the adhesiveness of the rubber stocks that they will not adhere when passed between the crinkling rolls. Also, when using one or more partly vulcanized sheets, it is preferred that the sheet which is to be stretched shall be vulcanized to a greater extent than the unstretched sheet. Nor is it essential that only two sheets be used, as instead three sheets may be used, in which case the intermediate sheet will be the one to be stretched, as it is passed between the crinkling rolls. Either surface of the material may be used as the outside. Processes are also in use for making a single ply crinkled rubber sheet, and if desired such material may also be used in making the suit.

By varying the thickness and composition of the rubber stocks, their state of vulcanization, the design, size and spacing of the projections on the crinkling roll, the degree of stretch, and other variables, it is possible to produce a large variety of crinkled patterns.

The composite crinkled rubber sheet after issuing from the rolls may then be made up into bathing suits by cutting out the parts and adhesively joining them by pressure and vulcanizing, or instead the crinkled sheet material may first be vulcanized and the parts then cut out and joined by cement.

While any suitable method of vulcanization may be employed, it has been found that the sulphur chloride cure is particularly applicable, because it permits the use of rubber compounds containing brilliant organic colors which would be injured by the usual heat vulcanization. It further readily permits the use of varying slight degrees of vulcanization of the sheet rubber stocks in cases where it is desired to use partially vulcanized rubber sheets in making the crinkled material.

However, if desired, the vulcanization may be accomplished by the use of a low temperature accelerator, and in particular the method disclosed in patent to Cadwell No. 1,777,960 may be used. By this method the rubber stocks may be compounded with a portion of a powerful vulcanizing combination, and the balance of the vulcanizing combination may be introduced into the finished crinkled stock or the finished bathing suit by diffusion and the rubber cured at low temperature.

By our invention it will be seen that a bathing suit may be provided which has many advantages over the fabric suits now in use. Due to the fact that the material is rubber, it does not become water logged and heavy when wet, and upon coming out of the water the water retained on the suit quickly drains off so that the suit will dry rapidly. Since the rubber does not absorb the water, as does a fabric suit, it retains its shape when wet, so that the suit is always of good appearance and when wet cannot drag in swimming, as will a misfitting and stretched fabric suit. By reason of the puckered or roughened interior surface, the suit does not have the frictional drag of a smooth sheet of rubber and can therefore be put on with very little effort. Moreover, by reason of the internal puckers, the material tends to form air-pockets between itself and the skin of the wearer, and additional air pockets are formed between the superposed sheets of the crinkled material, so that by reason of this air insulation the suit does not feel as cold as a fabric suit to the wearer when coming out of the water in a cool air. The rubber compositions used in making the bathing suit can be supplied in a variety of fadeless brilliant colors which cannot be equalled in any fabric suit, and in addition a rubber bathing cap and rubber bathing shoes can be made to match the suit. The material, by reason of its crinkled outward appearance, does not resemble rubber but instead resembles an ornamental fabric,

and, due to the puckers, the material is more elastic than sheet rubber of corresponding gauge so that it will stretch easily and will not bind while at the same time being snug fitting. Further, after use the suit can be quickly dried and occupies very little space when not in use.

While a detailed description of a specific embodiment of the invention has been given, it will be obvious that it is capable of wide variation and it is not desired to limit the invention otherwise than as set forth in the appended claims.

Having thus described our invention, what we claim and desire to protect by Letters Patent:

1. A rubber bathing garment including a torso covering part and having outwardly directed closely spaced small puckers disposed over substantially its entire outer surface and forming air pockets beneath said surface.

2. A bathing garment including a torso covering part and comprising superposed integrally united thin, flexible plies of rubber with interposed small closely spaced and communicating air spaces disposed over substantially its entire area.

3. A bathing garment including a torso covering part and comprising superposed integrally united plies of rubber, opposed surfaces of which garment are puckered away from each other.

4. A bathing garment including a torso covering part and comprising superposed integrally united plies of rubber, the inner surface of the garment being formed with closely spaced substantially continuous projecting ribs, and the outer surface being formed with small closely spaced puckers.

5. A bathing garment including a torso covering part and comprising superposed integrally united plies of rubber, the inner surface of the garment being formed with closely spaced substantially continuous hollow ribs, and the outer surface being formed with small closely spaced puckers, the interiors of which communicate with the interiors of said ribs.

6. A rubber bathing garment including a torso covering part and having substantially its entire outer and inner surfaces roughened.

7. A rubber bathing garment including a torso covering part and having substantially its entire outer surface provided with closely spaced low projections of irregular outline forming pockets beneath its outer surface.

8. A rubber bathing garment including a torso covering part and comprising superposed plies of thin sheet rubber, substantially the entire inner and outer surfaces of the garment being provided with puckers and recesses.

9. A rubber bathing garment including a torso covering part and comprising superposed and united plies of thin sheet rubber, substantially the entire outer surface of the garment being provided with closely spaced, small, low projections of irregular outline, and the inner surface of the garment being also provided with low projections.

10. A bathing garment including a torso covering part and comprising superposed plies of thin sheet rubber integrally connected at spaced small areas, and puckers formed over substantially the entire unconnected areas on both surfaces of the suit, the puckers on one surface extending longitudinally at an angle to the puckers on the opposite surface.

Signed at Providence, county of Providence, State of Rhode Island, this 10 day of October, 1932.

JAMES J. GALLIGAN.

Signed at Providence, county of Providence, State of Rhode Island, this 10 day of October, 1932.

WILLIAM J. ROBINSON.