F. V. WEDLOCK.

HEAT INSULATING FABRIC.

APPLICATION FILED APR. 17, 1918. RENEWED DEC. 26, 1919.

1,345,046. **Patented June 29, 1920.**

Fig. 1

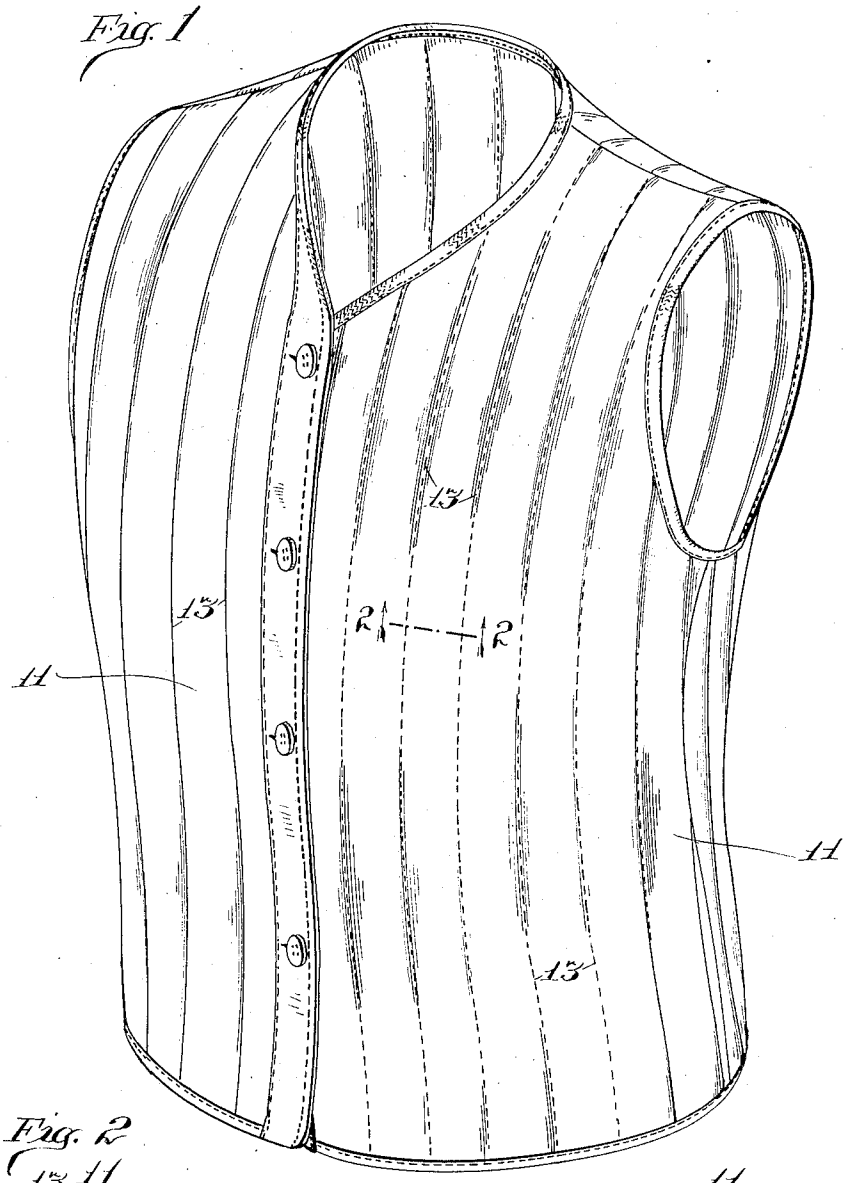
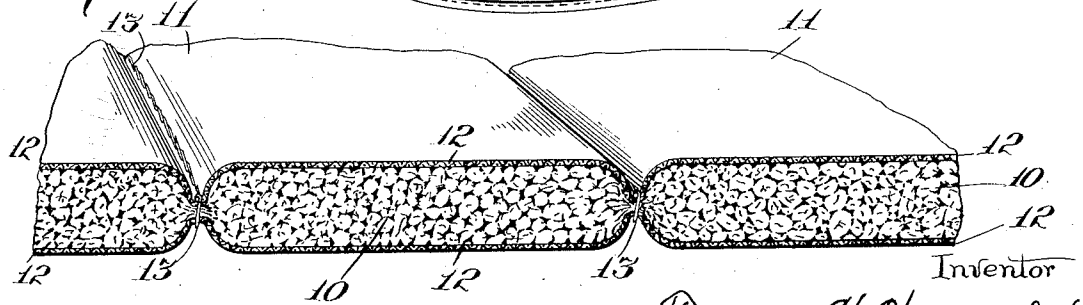


Fig. 2



Witnesses
Milton Lenoir

Inventor
Frank V. Wedlock,
by Arthur L. Sprinkle
Attorney

UNITED STATES PATENT OFFICE.

FRANK V. WEDLOCK, OF CHICAGO, ILLINOIS, ASSIGNOR TO FEATHEREDGE RUBBER COMPANY, A CORPORATION OF ILLINOIS.

HEAT-INSULATING FABRIC.

1,345,046. Specification of Letters Patent. Patented June 29, 1920.

Application filed April 17, 1918, Serial No. 229,017. Renewed December 26, 1919. Serial No. 347,636.

To all whom it may concern:

Be it known that I, FRANK V. WEDLOCK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heat-Insulating Fabrics Adapted for Making Blankets and Garments, such as Sweaters and the like.

The invention relates to a specially constructed fabric of a compound or built up character adapted to have the maximum of heat insulating qualities combined with exceeding lightness and porosity, to adapt the improved heat insulating material for use especially in garments requiring unusual warmth as blankets for human beings or animals, sweaters, breast protectors, shields, coats and the like.

The improved fabric is characterized by the fact that it is largely comprised of rubber and its compounds, but differs from known fabrics which utilize in their structure considerable portions of rubber compounds, in that my improved fabric is not of a water proof or non-porous character. Heretofore compounds of rubber have been utilized in saturating or covering the fabrics for various garments and articles of wear, such as articles of foot wear, rain coats and the like, all of which have the quality of non-permeability by waters or vapors. In non-porous garments, blankets, etc., made of fabrics saturated or covered by rubber or its compounds to water proof them, while they have some value as heat insulators, by reason of their non-permeability by moisture or vapors they are found to be of small value as heat retaining articles of clothing. For example it is known that it is almost impossible to wear water proof rubber boots with any degree of comfort in extremely cold weather, and ordinary moisture and air proof rubber garments are not satisfactory heat insulating garments for the same reason, *i. e.* that they are not permeable by air and will not conduct away or absorb moisture or body vapors but condense same with chilling effect, since such condensations form with the covering a good conductor of heat, whereas air in a porous or cellular body is a good non-conductor and hence an efficient heat insulator.

It is the primary object of the present invention to produce a built up fabric containing a major portion of vulcanized rubber or its compounds with suitable flexible woven materials that will possess the qualities of lightness, softness and flexibility and at the same time possess to a maximum degree porosity and the quality of retaining within its intercellular or interstitial cavities air for the purpose of making the fabric suitable for use as garments or coverings for human beings or animals, all of which as well known require coverings of a porous nature, permitting free circulation of air therethrough for well known hygienic or sanitary reasons. It is well known that there is throughout the world a growing scarcity of wool and the satisfactory substitutes therefor, and it is a further object of the invention to produce a heat insulating fabric of rubber or its compounds and comparatively cheap woven fabrics that shall be satisfactory both in price and as a heat insulating substitute for heavy knitted, felted or woven fabrics made of wool or animal hair or fur.

Other objects of the invention are set forth in the following description which is directed to the preferred embodiment of the invention as shown in the drawings.

In the said drawings, Figure 1 is a perspective view of a garment in the form of a substitute for a knitted sweater, the same being formed of my improved heat insulating fabric. Fig. 2 is a broken perspective view partly in section showing the details of construction of my improved heat insulating fabric, the broken section being taken on line 2—2 of Fig. 1.

In constructing my improved heat insulating fabric I employ sheets of rubber compound that are impregnated with a gas forming material and vulcanized under pressure, and after vulcanization these are mechanically treated in order to render the same uniformly porous throughout and capable of taking moisture or vapors into the interstices or pores thereof and permit-

ting of free circulation of air therethrough. A compound suitable for making a rubber sponge material when treated to a vulcanizing heat under sufficient pressure as steam pressure, to prevent breaking down of cells during vulcanization and afterwards thoroughly breaking down the cell walls by exploding them by passing them between closely confined rollers or otherwise crushing the cells, or by puncturing or thoroughly slitting them by any suitable means as described in U. S. Patent 1,045,234, November 26, 1912 to Willis and Felix, makes the most desirable material when formed or cut in strips or slabs of suitable thickness, preferably from one quarter to three quarters of an inch in thickness as indicated by the reference character 10 in Fig. 2. Over each of the exposed flat surfaces of this porous material I place a covering of woven fibrous material as indicated at 11, 12 (Fig. 2), capable of absorbing vapors and moisture into its fibrous structure, after which fastening means is employed to permanently secure the composite materials into a unitary sheet or structure. I prefer to use stitching 13 in parallel rows, the stitching extending through the fabric between the sheets 11 and 12 and piercing and compressing the porous rubber sponge material, thus thoroughly anchoring it in the product without interfering with the porous or absorptive qualities of any of the materials entering into the composite fabric. The parallel rows of stitching 13 extending between the outer layers of woven fabric and piercing and anchoring the sheets of porous rubber sponge material are shown in Fig. 1 and the preferred manner of applying the stitching is shown in greater detail in Fig. 2.

I claim:

1. As an article of manufacture a heat insulating fabric consisting of a body portion of a perforated material of an elastic nature, the said material also being incapable of absorbing liquids or moisture except within and through the said perforations thereof, and a strengthening material of a woven fibrous texture over the exposed surfaces of the said elastic material, the said fibrous covering material being capable of absorbing liquids or moisture.

2. As an article of manufacture a heat insulating fabric consisting of a body portion of a perforated vulcanized rubber compound, the said material being incapable of absorbing liquids or moisture except within and through the said perforations thereof, and a strengthening material of a woven fibrous texture over the exposed surface of the said elastic material, the said fibrous covering material being capable of absorbing liquids or moisture.

3. As an article of manufacture a heat insulating fabric consisting of a body portion of a thoroughly perforated vulcanized rubber incapable of absorbing liquids or moisture except within and through the said perforations thereof, a strengthening material of a fibrous texture over the exposed surfaces of the said perforated vulcanized rubber, the said fibrous covering material being capable of absorbing liquids or moisture, and means comprising separated parallel rows of stitching passing through the said fabric from side to side thereof and binding the woven strengthening material over the exposed surfaces of the said body portion of perforated vulcanized rubber.

4. As an article of manufacture a heat insulating fabric consisting of a body portion of a vulcanized rubber compound of a cellular structure having the walls of the said cells thereof mechanically broken down or ruptured uniformly throughout the structure, the said cell walls of the structure being relatively fragile and highly elastic, and a strengthening material of a woven fibrous texture over the exposed surfaces of the said elastic material, the said fibrous covering material being capable of absorbing liquids or moisture, and being attached to the surfaces of the said perforated elastic material by separated parallel rows of stitching passing through the fabric from each covering to the covering on the opposite exposed surface, the said stitching being adapted to draw the sheets of woven covering material on the respective surfaces of the fabric substantially together, thereby compressing the perforated rubber body portion along the said parallel lines of stitching and dividing the said fabric into a plurality of laterally closed compartments each completely filled by the said elastic perforated rubber body portion.

5. As an article of manufacture, a sweater adapted to cover the chest and trunk portions of the body of a person and comprising a body portion consisting of a vulcanized rubber compound formed uniformly throughout of a plurality of relatively thin walled contiguous cells, said cells being uniformly broken down or ruptured after vulcanization thereby rendering the said rubber material of a porous character, coverings of a woven fibrous material lining both the interior and exterior portions of the said body portions of the sweater, and means for securing the said coverings of woven material to the surfaces of the said body portion.

6. As an article of manufacture, a garment comprising a plurality of superimposed sheets of woven fabric of a fibrous nature having the power of absorbing into the fibrous structure thereof liquids and moisture, said superimposed sheets of woven material being joined together by rows of stitching thereby dividing the space be-

tween the said sheets of woven material into a plurality of laterally closed compartments, and portions of rubber sponge material within the said compartments being retained in position between the said sheets of woven material by the said stitching, the said rubber sponge material being formed of perforated vulcanized rubber in the form of a highly flexible, thin walled, cellular structure and having the walls of said cells ruptured throughout the rubber sponge material.

In testimony whereof I have signed my name to this specification on this 12th day of April, A. D. 1918.

FRANK V. WEDLOCK.