

(No Model.)

F. L. BORWELL.
WATERPROOF MATERIAL.

No. 596,842.

Patented Jan. 4, 1898.

Fig. 1.

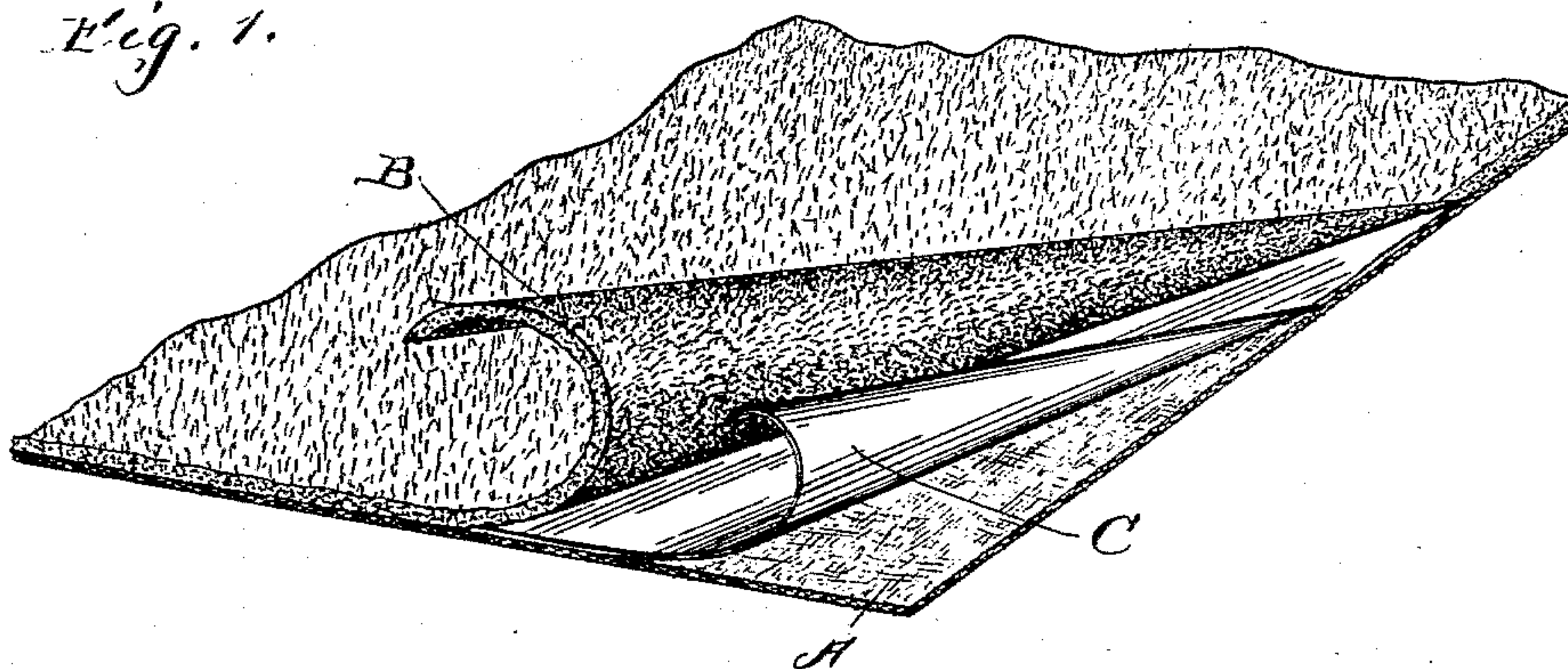


Fig. 2.

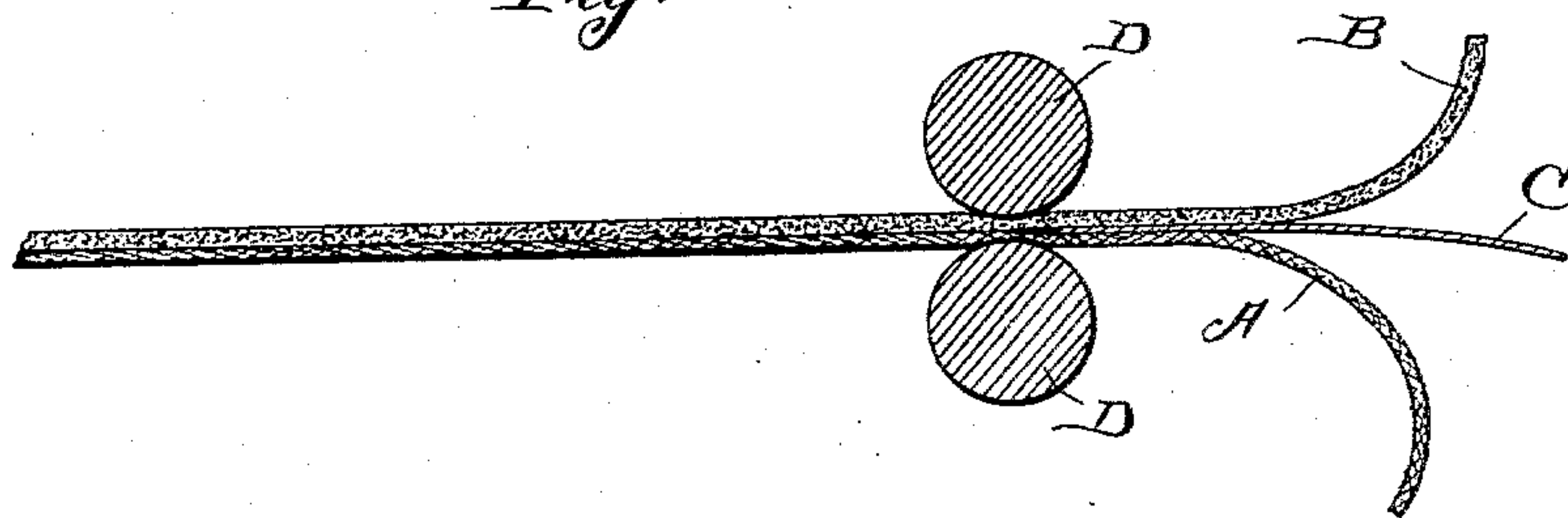
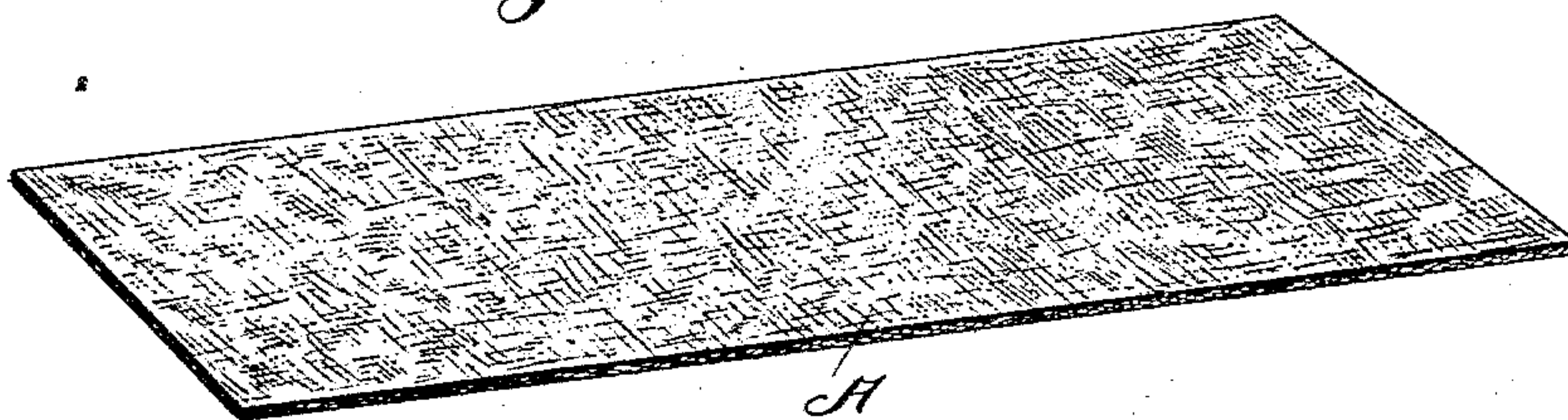


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK L. BORWELL, OF CHICAGO, ILLINOIS.

WATERPROOF MATERIAL.

SPECIFICATION forming part of Letters Patent No. 596,842, dated January 4, 1898.

Application filed June 22, 1896. Serial No. 596,533. (No specimens.)

To all whom it may concern:

Be it known that I, FRANK L. BORWELL, of Chicago, in the State of Illinois, have invented certain new and useful Improvements in Waterproof Material, of which the following is a specification.

This invention relates to waterproof material for garments or coverings.

The object is to produce a waterproof material which shall be comparatively soft and pliant and at once warm, of superior strength, and withal of comparative cheapness.

Heretofore waterproof material has been formed of two layers of closely-woven fabric of the same or of different kinds, with an interposed layer of gutta-percha or india-rubber, the whole being cemented together by heating the gutta-percha or rubber or vulcanizing the same while interposed; but the article consisting of these closely-woven fabrics with the interposed gutta-percha or rubber is stiff and harsh and, while serving well as a mere rain-proof material, is wanting in warmth and comfort and the ease to a wearer of pliability and in cold weather, with rubber, becomes almost as unbending as a sheet of metal, and is then liable to cracking or ready perforation, all with discomfort to the user.

The invention consists in the waterproof material substantially as hereinafter described and claimed.

In the accompanying drawings, forming part of this specification, and in which like letters of reference indicate corresponding parts, Figure 1 is a view in perspective, showing a fragment of my waterproof material with the inner or fluffy side exposed to view, the layers at one corner being separated to illustrate their relation. Fig. 2 is a view in section, showing the relation of the parts in the operation of being united; and Fig. 3 is a view in perspective, showing the finished article, the outer side being exposed to view.

Great difficulty has heretofore been experienced in producing a waterproof material suitable for wear and outdoor use which would combine, with its quality of shedding water, the advantages of softness and pliability with warmth and conformation to movements of the body. When two closely-woven fabrics are united by an interposed layer of india-

rubber or its equivalent, the softening or vulcanizing of the rubber to cause the two fabrics to adhere seems to run the rubber into the interstices of the closely-woven fabrics in such manner as, while practically making them one material, to render them stiff and harsh, this characteristic being particularly noticeable in cold weather, a material made of the fabric described being not only non-pliant, and thus very cumbersome, but lacking in warmth. Where two closely-woven textile fabrics are united in the manner described, the juxtaposition of the longitudinal strands with each other and of the cross-strands with each other would by itself alone serve to make a material composed of the two fabrics just twice as stiff as a piece of single fabric even without the interposed rubber, while the rubber then surrounding and uniting strands in juxtaposition into one causes additional stiffness. Even where the strands of one of the textile fabrics would register with interstices in another of the same kind the stiffness would be equally increased by the close agglutination of the strands of the two fabrics into a continuous sheet or mass, the same or different fabrics being of substantially the same closeness of texture. Besides closely-woven fabric is generally more expensive than a fabric that is loosely woven, and it is a desideratum to make garments that shall not only be waterproof, pliant, and warm, as heretofore set forth, but which shall also be cheap for the use of truckmen, car-drivers, sailors, general laborers, and such, and that can be worn as an outer garment at times other than when it is raining—that is to say, which will present a general outer garment.

To make my material, I may take any suitable comparatively thin fabric for an outer layer and any suitable soft and fluffy fabric for an inner layer or lining and, having interposed between these layers a sheet of pure gutta-percha, unite them, as illustrated in the accompanying drawings; but I prefer to take for the outer layer cotton duck and for the inner layer or lining cotton or woolen shoddy, a fibrous material obtained by tearing into fibers refuse woolen goods, &c., this material being soft, flexible, and warm, and at once very cheap. The term "shoddy" is intended

to include the sweepings or waste from cotton or woolen mills or any light textile refuse fibrous material, and may be applied to the duck either in mass or in the form of loosely-
5 woven weak blanketing or blanket, commonly known in the trade as a "lining," and having no utility except for use in conjunction with a cloth covering. Heretofore such blanketing has been exclusively used with
10 duck and oil-cloth for teamsters' storm-coats, horse-blankets, or lap-robies of a low grade, the layers being united in the garment by sewing the patterns together, and the greater portion of the cost of producing such articles
15 consists in the labor required in cutting and placing together the patterns preparatory to sewing them. When so made up, the lining is supported principally at the seams and is liable to sag or part between the seams; but
20 when united as I propose the fabric can be cut and handled as one piece and the lining is supported at all points of its area, so that it cannot sag or part between seams and the durability or wear of the lining is greatly increased, enabling a better garment of the
25 class to be made for less cost than heretofore.

Referring to the drawings, A designates the thin outer layer of cotton duck, B the
30 thick inner layer or lining of woolen or cotton shoddy, and C the layer of pure gutta-

percha. The parts thus arranged are united by the application of heat at a temperature of about 100° to 130° Fahrenheit and by pressure, which causes the duck and shoddy to
35 be united by the gutta-percha. The heat and pressure may be applied by means of the rollers D D, heated to the requisite temperature. The article thus formed is impervious to rain and is flexible, soft, and spongy, the
40 gutta-percha not adding stiffness to the duck and the shoddy lining being easily compressible in handling or folding, so that such article, though waterproof, has the capability of being folded, cut, sewed, handled, and worn
45 to the same extent as any single layer of non-waterproof cotton or woolen goods of like material and similar thickness or weight and does not have the appearance of being waterproof and may be worn reversed. 50

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A waterproof material composed of an outer layer of duck, an inner layer of shoddy lining, and an interposed layer of adhesive substance, such as gutta-percha, substantially
55 as and for the purpose described.

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Witnesses:

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