

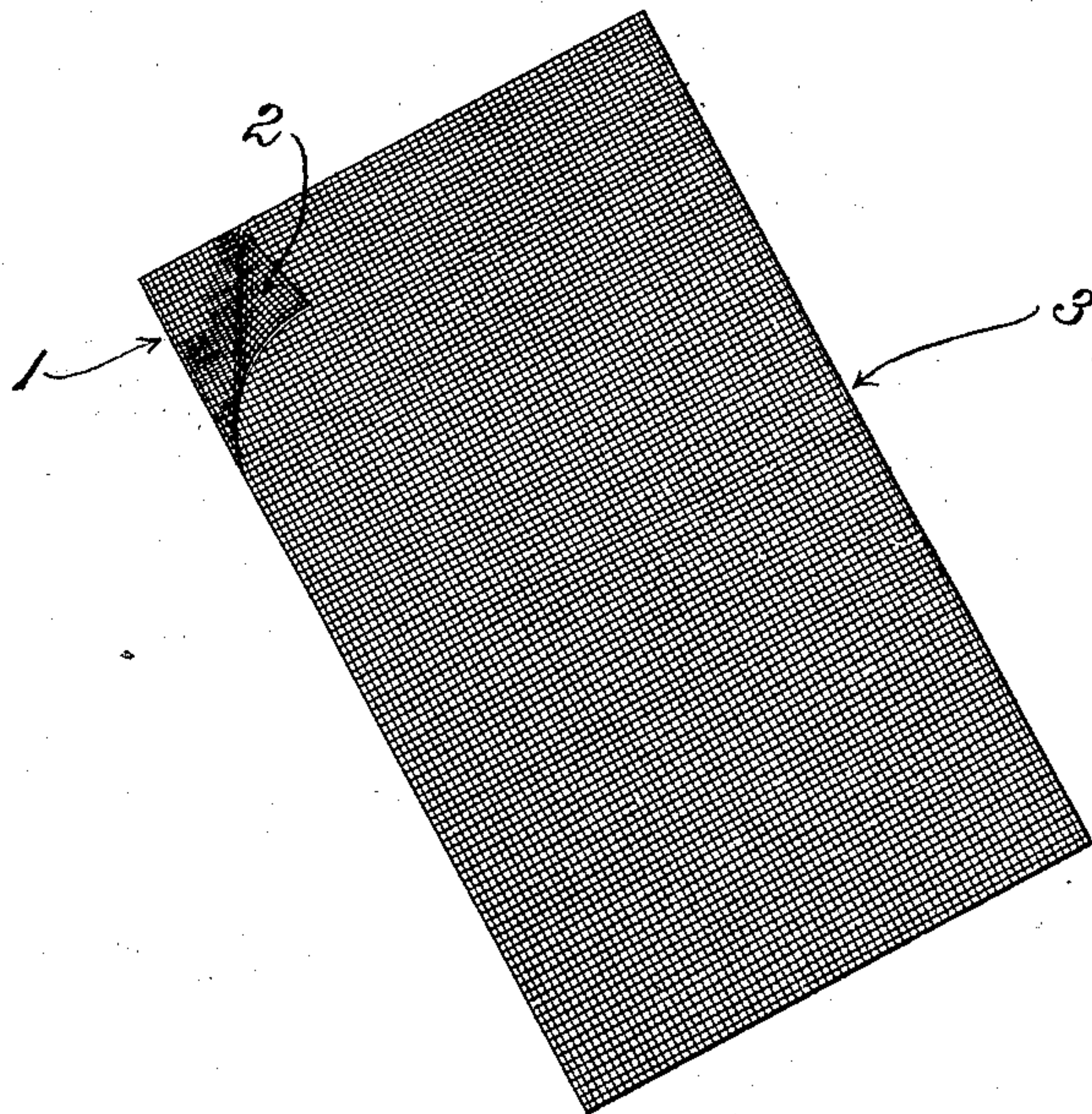
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Patented Jan. 15, 1901.

C. H. CROWELL.
COMPOUND STIFFENING FABRIC.

(Application filed Mar. 20, 1899.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

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COMPOUND STIFFENING FABRIC.

SPECIFICATION forming part of Letters Patent No. 665,996, dated January 15, 1901.

Application filed March 20, 1899. Serial No. 709,731. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES H. CROWELL, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Compound Stiffening Fabrics, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention consists in an improved compound fabric composed of two or more webs or plies of cloth united together and possessing properties which fit it for a variety of uses, but more especially as a stiffening or in
15 places where its elastic springiness comes into play.

The accompanying drawing is intended to serve to illustrate the compound character of the fabric, it presenting a view of a fabric
20 composed of two webs or plies joined or united together, portions of the said webs or plies being represented as diverging from each other in order the more clearly to suggest the general structure of the fabric.

25 In the said drawing, 1 and 2 designate two webs or cloths of rather fine and light texture. 3 designates the compound fabric containing the said webs or cloths united together. I have shown two webs or cloths joined or united to-
30 gether; but any desired number greater than two may be employed, according as it is desired the thickness and other properties of the compound fabric shall vary in order to fit the same for different uses and purposes. It will
35 be understood, therefore, that my improved compound fabric comprises a plurality of plies, each ply having as its base a woven web or cloth of fairly fine and light texture. Each web or cloth is separately treated and pre-
40 pared before being united with the others. I treat the same to give body and substance thereto, without, however, giving any material increase of thickness. Thus I apply to each web or cloth separately a composition
45 which fills up the interstices thereof. This composition is in the nature of a waterproof size. Various kinds of waterproof sizes or finishing compounds are well-known in the art and choice may be made of such as are
50 adapted to the subsequent uses of my fabric. It is not necessary that the webs or cloths

should be completely waterproof, and hence in making choice of ingredients and applying the waterproofing size or filling I take care that there shall be left in the webs or cloths 55 a slight degree of permeability or absorptiveness for water. Before the waterproofing size or filling becomes dry or set I subject the sized or filled webs or cloths to heavy compression, thereby forcing the size or filling thoroughly 60 into the interstices and among the fibers of the webs or cloths, expelling the excess and condensing and compacting the webs or cloths. This treatment renders the webs or cloths thin, dense, smooth, and firm, as well 65 as more or less stiff and also partially waterproof. I now unite two or more of the prepared webs together by the aid of a glue composition containing by preference animal glue and some substance, such as glucose, ca- 70 pable of serving in a well-known manner for promoting the absorptive powers of the glue composition for water. The glucose or other known equivalent therefor is commonly termed a "softener" and operates by increas- 75 ing the power of the glue composition to take up moisture, so that when subjected to the action of moisture the said composition softens promptly and also without requiring to be treated with such an excess of water or to 80 such a long soaking as to dissolve away the glue.

The compound fabric which is produced by the foregoing process, it comprising a plu- 85 rality of sheets of prepared and partially-waterproofed cloth united together by a glue composition, possesses a high degree of elasticity combined with stiffness. It is very springy. At the same time it will bend at a very sharp angle upon itself without either 90 permanently creasing or breaking. It is moderately absorptive of water and is capable upon the application of moisture of being rendered highly pliable. The glue composition is exceedingly tenacious, and on account 95 of the presence of the softener therein the said composition will soften without dissolving. Hence the plies will not separate under the application of moisture to render the compound fabric pliable, and while the said 100 fabric is in a moist and pliable condition it is capable of being molded into any desired

shape. I dry the same upon the mold, and as it dries it retains the shape given thereto in the molding, resuming once more all its original hardness, stiffness, elasticity, and other properties. It is much thinner in proportion than any other stiffening fabric with which I am acquainted.

One use in particular for which my fabric is especially fitted and designed is in the manufacture of tip and counter stiffeners for boots and shoes. It is capable of being molded to any shape of toe or heel stiffener that is required. Its stiffness, elasticity, and freedom from tendency to crack or break when bent under pressure and the readiness with which it returns into shape after being relieved from pressure, combined with its thinness, render it especially valuable and serviceable in the manufacture of stiffeners for box-toes for fine footwear. It can be made of any thickness to suit the needs in connection with counter-stiffeners by putting together the required number of webs or plies in the process of being produced.

I claim as my invention—

1. As an article of manufacture, the partially-absorbent compound stiffening fabric

herein described, adapted to soften under the application of moisture and to be molded into the required shape while thus softened, consisting of a plurality of plies united by an absorbent adhesive, and having each ply thereof constituted of a thin web of cloth charged with partially-waterproof size and in a compressed and condensed state, substantially as set forth.

2. The process of manufacturing compound stiffening fabric which consists in separately treating thin webs of cloth with a partially-waterproof size, then subjecting the respective webs of cloth to pressure, thereby compressing and condensing the same, and then uniting a plurality of the thus-prepared webs of cloth together by means of a glue composition containing a softener to promote subsequent absorption of water, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES H. CROWELL.

Witnesses:

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