

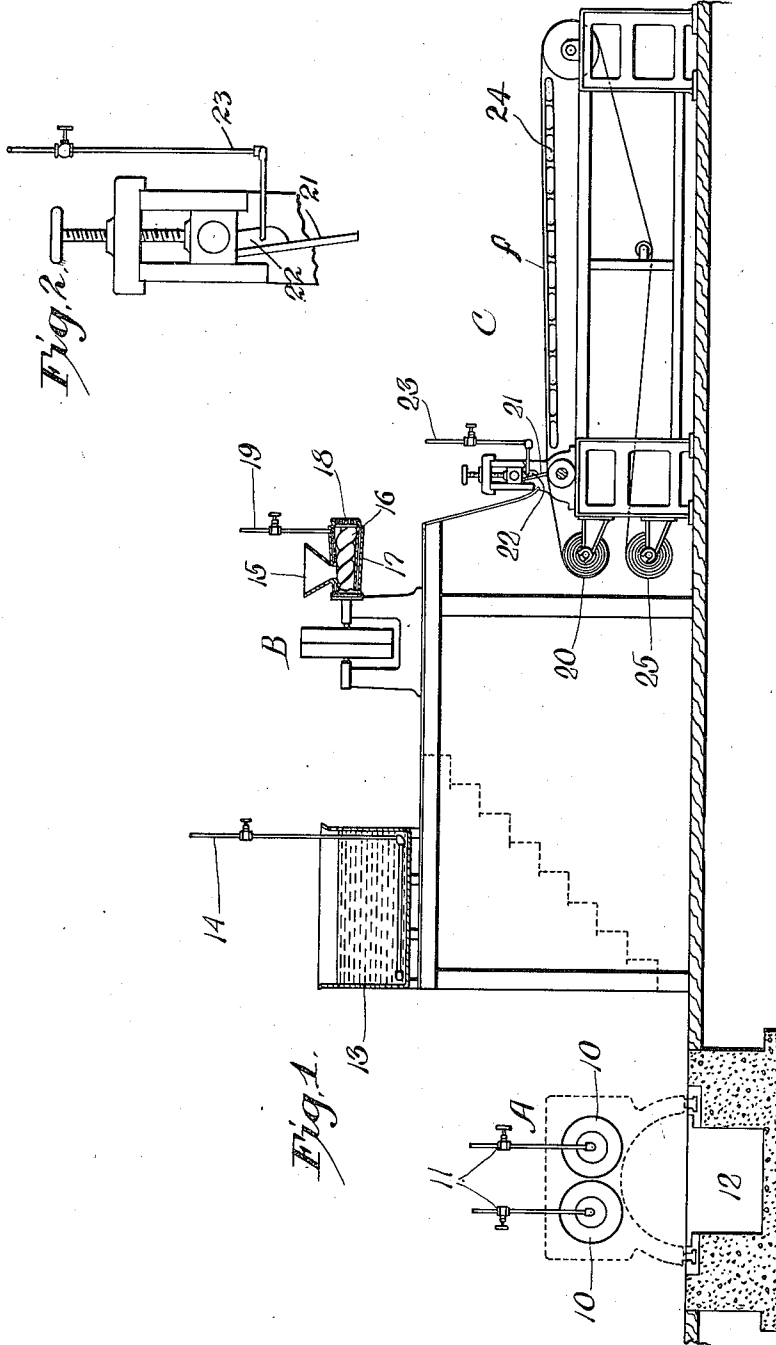
J. MEADE.

METHOD OF PREPARING ADHESIVE COATINGS AND APPLYING THEM TO FABRICS WITHOUT
THE USE OF SOLVENTS.

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1,222,967.

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UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES MEADE, a citizen of the United States, residing at Stoughton, in the county of Norfolk and State of Massachusetts, have invented a new and useful Method of Preparing Adhesive Coatings and Applying Them to Fabrics Without the Use of Solvents, of which the following is a specification.

In the preparation of adhesively coated fabrics, such as duck which with a layer of a sticky substance applied to one face is commonly used for the well known "gem" insoles for Goodyear welt shoes, the usual practice is to first treat a solid adhesive, say gutta-percha, with a solvent, as naphtha. This makes a solution of such a consistency that it may be readily distributed uniformly over the fabric by means of a spreader. This procedure, however, has several objectionable features. To get the solution into condition for spreading requires nearly twenty-four hours. The solvent is so highly volatile that it is necessary to have the solution quite thin to permit it to remain sufficiently fluid throughout the spreading operation. This causes it to run when first applied, and only a shallow coating can successfully be given the fabric. Consequently, to obtain the necessary depth of adhesive, several coatings are spread one upon another adding greatly to the time and expense of production. When the solution-coated fabric is utilized for such work as insoles, it is the usual practice to cut it, many layers at a time, with heated dies. These when they come in contact with the adhesive dry out the solvent and cause the edges of the cut insoles to stick together, often requiring that they be picked laboriously apart. There is also the general objection to the employment of volatile solvents that the fumes are liable to become ignited, as by sparks from motors driving the machinery in which the dissolved adhesive is operated upon, causing explosions and fires. By my method, I eliminate the solvent and apply to the fabric in a single brief series of operations as thick a coating as is desired, giving an inexpensive product which may conveniently be handled without danger of sticking when being cut to form.

In Figure 1 of the accompanying drawing an organization is illustrated by which my improved method may be carried out, while

Fig. 2 is an enlarged view of a portion thereof.

As an adhesive solid I may employ gutta-percha, pontianac, balata, and various other gums or resins which possess the property of becoming plastic and adhesive under the influence of heat. It is to be understood that when hereinafter gums or gummy solids are referred to, it is intended to embrace all suitable inspissated vegetable juices, and the like. With this solid, to permit it to be brought to the proper state of plasticity and to be highly adhesive when heated and again cooled, I mix with it a sufficient amount, say 10%, of a wax, or wax-like substance, which may be mineral, animal or vegetable. Of these I prefer paraffin, beeswax or carnauba. The term "wax-like substance" is to be considered to comprehend all waxes and substances which resemble them in character.

The correct proportions of the gums and waxes are first reduced to a proper state of division and mixed in a preliminary way by being ground together in a mill indicated at A. This mill may consist of a pair of differentially driven rolls 10, 10, preferably hollow and heated by steam-pipes 11 to a temperature at which both the gum and wax are somewhat softened. The temperature at which the substances named become plastic is from 170° to 180° Fahrenheit. From the receptacle 12 of the mill the mixture, now in the condition of a thick paste or dough, is transferred to a tank 13 containing a liquid, preferably water, heated by a steam-pipe 14 to a temperature of about 200° F. While the mass is still more softened thereby, it remains in a condition in which it may be handled. From the tank the coating mixture is placed as required in the hopper 15 of a mixer B, where it is advanced by a worm 16 rotatable in a jacketed casing 17 through perforations in a plate 18. Steam is supplied to the jacket by a pipe 19 at about 210° F. By this apparatus the adhesive is thoroughly tempered and softened to the consistency at which it may be most effectively spread. From the outlet of the mixer the now semi-fluid substance may be directed upon the web of fabric, traveling from the supply-roll 20 through a spreader C, at the rear of the gage-knife 21. This knife has a hollow support 22 to which is connected a steam-pipe 23. Steam enters

this chamber at a temperature of from approximately 212° to 215° F., maintaining the coating in the properly plastic condition until it is fully spread. In its movement
5 through the machine it is then dried in the customary manner by steam-pipes 24 and received as the completed goods upon a winding roll 25. During no step in the process does the adhesive come under the influence of a degree of heat great enough to so
10 harden it that it loses its flexibility, this being approximately 220° F.

By this method I obtain, with little expenditure of time, a mixture which at all
15 steps is in the best condition to receive the treatment which is being given, which will be free from stickiness until heated for a purpose of final utilization, and which when thus heated and applied will be highly
20 adhesive.

I claim:

1. The method of applying adhesive coatings to fabrics which consists in mixing a gummy solid and a wax-like solid at a temperature at which the solids become plastic,
25 and spreading the mixture upon the fabric under the influence of a higher temperature.

2. The method of applying adhesive coatings to fabrics which consists in grinding together and mixing a gum and a wax at a temperature at least that at which the mixture becomes plastic, tempering this mixture
30 at a higher temperature, and spreading the mixture upon the fabric under the influence of a still higher temperature.

3. The method of applying adhesive coat-

ings to fabrics which consists in grinding together and mixing a gum and a wax at a temperature of approximately 170° F., tempering this mixture at approximately 210°
40 F., and spreading the mixture upon the fabric under the influence of a temperature of approximately from 212° to 215° F.

4. The method of preparing adhesive coatings which consists in grinding together and
45 mixing a gum and a wax at a temperature at least that at which the mixture becomes plastic, immersing the mixture in a liquid heated to a higher temperature, and tempering the mixture.
50

5. The method of preparing adhesive coatings which consists in grinding together and mixing a gum and a wax at a temperature at least that at which the mixture becomes plastic, immersing the mixture in a liquid
55 heated to a higher temperature, and tempering the mixture at a still higher temperature.

6. The method of applying adhesive coatings to fabrics which consists in grinding together and mixing a gum and a wax at a
60 temperature of approximately 170° F., immersing the mixture in a liquid heated approximately to 200° F., tempering the mixture at a temperature of approximately 210°
65 F., and spreading the mixture upon the fabric under the influence of a temperature of from 212° to 215° F.

Signed at Stoughton, in the county of Norfolk and State of Massachusetts, this 13th day of March, 1916.

JAMES MEADE.