

APPARATUS FOR TREATING ADHESIVE COATED FABRIC.

986,032.

Fig. 1.

Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TREATING ADHESIVE-COATED FABRIC.

986,032.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed May 26, 1910. Serial No. 563,471.

To all whom it may concern:

Be it known that I, ANDREW THOMA, a citizen of the United States, and resident of Cambridge, county of Middlesex, and State of Massachusetts, have invented an Improvement in Apparatus for Treating Adhesive-Coated Fabric, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to an apparatus for treating adhesive coated fabric.

The apparatus is particularly designed for use in connection with the manufacture of fabric reinforced leather inner soles, such as the "Gem" inner sole. As is well known, in the manufacture of such articles it is now common to employ fabrics such as duck or canvas coated on one side with an adhesive coating which, in its normal or cold state, can be readily handled without inconvenience, but when properly treated by methods including the use of heat becomes very tacky or sticky so that it can be placed upon the leather of the inner sole, or other substance, and will thereupon adhere thereto with great tenacity.

The present invention involves a new form of apparatus for treating or conditioning such adhesive coated fabric without the use of water and by means of steam alone, so that the fabric is given exactly the right condition for adhering to an irregular surface, such as that of the inner sole.

In order to secure the best results it is necessary that not only the adhesive coating shall be placed in such a tacky or sticky condition as readily and permanently to adhere to the base of the inner sole, or other article, but that the fabric itself should be in such a condition that it can be molded readily to conform to an irregular surface, such as the lip of the inner sole. When the adhesive coated fabric is treated by the use of water the sizing or starch is largely or entirely washed out of the fabric, thus removing the body or substance of the fabric which it is desired to have in the completed article. It is also necessary that the inner sole shall be thoroughly dried before being used or the cloth will be mildewed or rotted. Such drying requires not only time but a considerable amount of space. When the adhesive coated fabric is treated by the use of dry

heat alone the fabric does not always have that degree of pliability which is desirable.

In the present invention the fabric is conditioned or treated by passing superheated steam against the fabric upon the uncoated side. The apparatus involves a closed chamber through which the fabric is passed with its uncoated side running against a perforated wall of the chamber. Steam passes through the perforations and through the fabric and is first superheated in a suitable manner. The result is that the adhesive coating is thoroughly softened up or conditioned beginning next to the fabric itself and extending to the surface of the coating. These coatings are usually formed of cheaper and, consequently, less tacky substances next to the fabric, while the substances or layers at the surface are more readily rendered tacky.

By the use of this apparatus the coating where it permeates the fibers and interstices of the fabric is thoroughly softened and the entire mass of the coating is softened by the steam so that the maximum degree of adhesiveness is secured. The starch or sizing is not removed from the fabric, but the fabric is rendered pliable by the softening up of the coating embedded therein and of the sizing, so that the fabric become very flexible.

The nature of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

The drawings show a preferred form of apparatus embodying the invention.

In the drawings, Figure 1, is a side elevation, partially in vertical cross section, of an apparatus embodying the invention; Fig. 2 is a transverse section taken on the line $x-x$, Fig. 1.

It is unnecessary to describe in detail the adhesive coated fabric to be treated, because that is well known, and the composition of the coating varies more or less as to its ingredients, although having the same general characteristics; viz., that when cold it is capable of being easily handled and when heated it becomes tacky or sticky. Moreover, as already noted, the coating is usually formed of successive layers, those nearer the fabric being of a cheaper and less tacky quality, while the top layer is usually largely composed of gutta percha, which is ren-

dered extremely tacky or sticky upon the application of heat.

The apparatus is supported in any suitable way as by standards 1, 2, so as to bring its exit end adjacent to the work-table 3, and it is preferably inclined as shown so as to allow the condensation to be drained off by gravity.

The main features of the apparatus are comprised in an elongated, rectangular casing, preferably comprising three chambers, 4, 5, and 6, each extending longitudinally of the casing and being arranged one above the other.

The lower chamber 4 is entirely closed, and a pipe 7 connects the chamber 4 with a suitable supply of live steam. At the lower end of the chamber an exhaust pipe 8 is provided but is normally kept closed by means of the valve 9. The chamber 5 is also closed but its upper wall, or the wall separating it from the chamber 6, is perforated through the larger portion of its area, as illustrated. This intermediate wall 10 is formed of some slow conductor of heat and for that purpose the article known on the market as asbestos wool is preferably employed. The upper chamber 6 is also closed but is provided at each end with slits or openings for the entrance and emergence of the strip of fabric 11, and is also provided at the top with the hinged cover 12.

The chamber 5 is provided with a steam spray pipe. Two of such pipes are herein shown at 13 and 14 running longitudinally of the chamber and provided with perforations 15 opening close to the wall 16 intermediate the chambers 4 and 5. The pipes 13 and 14 are connected together by the pipe 160, which pipe is connected to the chamber 4.

The casing, except for the intermediate partition 10, is preferably made of iron and may be cast in the form shown. At its lower or rear end it is provided with a drip pan 17 and this drip pan is connected by the pipe 18 to the lower end of the exhaust pipe 9. Any condensation occurring in the upper chamber 6 will drain into this drip pan.

The roll of fabric 19 is suitably supported beneath the casing and the strip of fabric 11 extends up therefrom around a suitable tension device 20, then enters the chamber 6 at its lower end and passes through the chamber with the uncoated side resting upon the perforated plate 10 and emerges at the upper end of the chamber onto the work table. The fabric 11 in its travel through the chamber extends over and covers the perforations. The live steam entering the chamber 4 heats that chamber and the walls 16. The steam passing from the chamber 4 through the pipe 160, and being conveyed out through the openings 15, is

already at a high temperature, but being directed down against the plate 16 is still further heated so that it rises in the form of superheated steam through the perforations of the plate 10 and comes against the uncoated side of the fabric. The perforated portion of the wall or plate 16 being entirely covered by the coated fabric, the fabric forms as it were a blanket over the perforations preventing the free escape of the superheated steam into the uppermost chamber, holding the steam back to thus add to its superheating, and insuring the treatment or conditioning of the fabric from the uncoated to coated side.

The steam is kept at such a temperature that very little vapor arises from the machine, thus no annoyance is caused to the operatives and no material amount of moisture is discharged into the air, or condensed outside of the machine.

A comparatively small amount of steam is sufficient and is found thoroughly to condition the fabric. The asbestos plate dots not heat up in the way that an iron plate or conductor of heat would, and prevents any burning or overheating of the fabric.

The machine is ready for use within a few seconds after the turning on of the steam, and is in full efficiency within two or three minutes thereafter. This affords a great saving of time and enables the machine to be started at any time when it is desired to carry on the work. The fabric if left remaining in the chamber 6 is not injured but is kept in the proper condition ready for use the moment it is pulled out of the chamber onto the work table. This eliminates any waste of the fabric.

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

1. An apparatus for treating adhesive coated fabric comprising a casing presenting three superimposed chambers, the partition between the upper two chambers being perforated, means for supplying live steam under pressure to the lowermost chamber, and means for supplying steam to the middle chamber whereby the steam supplied to the middle chamber is superheated and passes in superheated form through the perforations into the uppermost chamber.

2. An apparatus for treating adhesive coated fabric comprising a casing presenting three superimposed chambers, means for supplying live steam to the lowermost chamber, a steam spray pipe located in the intermediate chamber and connected to the lowermost chamber, a perforated wall separating the intermediate and uppermost chambers whereby when the strip of fabric is passed through the uppermost chamber with its uncoated side covering the said perforations

the fabric will be conditioned from the uncoated to the coated side by superheated steam directed against the uncoated side.

3. An apparatus for treating adhesive coated fabric comprising a casing presenting a chamber apertured at opposite ends for the entrance and emergence of the fabric to be treated, a second chamber beneath the said first chamber and separated therefrom by a perforated wall, means for admitting steam to said second chamber, and means for superheating the steam admitted

into said second chamber, whereby the superheated steam will rise through the said perforations and against the uncoated side of the fabric passing thereover.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ANDREW THOMA.

Witnesses:

NATHAN HEARD,
FREDERICK S. GREENLEAF.

Correction in Letters Patent No. 986,032.

It is hereby certified that in Letters Patent No. 986,032, granted March 7, 1911, upon the application of Andrew Thoma, of Cambridge, Massachusetts, for an improvement in "Apparatus for Treating Adhesive-Coated Fabric," an error appears in the printed specification requiring correction as follows: Page 2, line 27, the word "wool" should read *wood*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of July, A. D., 1911.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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