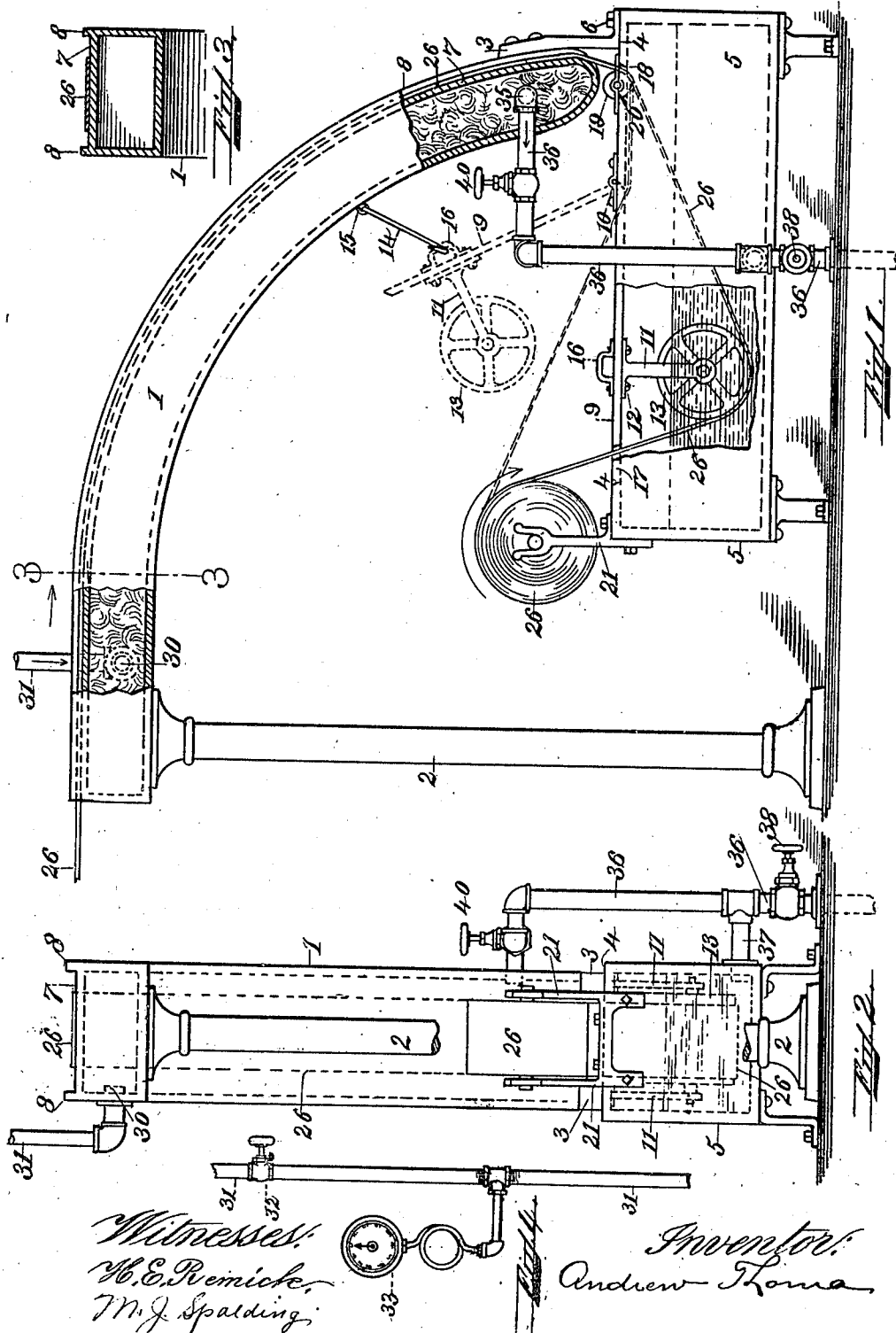


A. THOMA.
MACHINE FOR TREATING COATED FABRICS.
APPLICATION FILED JAN. 14, 1909.

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MACHINE FOR TREATING COATED FABRICS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ANDREW THOMA, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Treating Coated Fabrics, of which the following is a full, clear, and exact specification, reference being had therein to the accompanying drawings.

My invention relates to the application of coated or adhesive fabrics to leather, canvas and to various other materials and more particularly to the use of such coated fabrics in the manufacture of insoles for shoes.

It has been customary, heretofore, to provide various fabrics such as canvas, sheeting and the like with adhesive coatings made of gutta-percha or gutta-percha compounds, which coatings are normally non-sticky but become sticky or tacky upon the application of heat. These coated fabrics are used to reinforce and strengthen other materials such as leather, leather board, canvas and the like; the general custom being to render the coating sticky by the application of heat and then to apply the coated fabric while the coating is in a sticky condition to the material to be reinforced. Duck or canvas provided with such coatings has been extensively used in the manufacture of insoles for shoes and especially in the manufacture of what is known as the "Gem" insole, which comprises a light, cheap leather insole reinforced with coated duck.

In making the "Gem" insole, the coated duck, in the form of strips slightly wider than the width of the insoles, is heated to render the coating tacky and adhesive, and then is applied by hand to the leather foundation of the insole, and is finally subjected to the operation of a machine known as the "Gem" machine which indents the duck over the rib on the leather insole and presses the duck firmly to the leather. Considerable difficulty has heretofore been experienced in the process, owing to the fact that when the adhesive coating cools it hardens and loses its tacky qualities, and as the process of making the insole generally consumes some time, it frequently happens that the coating cools and in consequence, the duck does not adhere perfectly to the leather foundation and the insole later falls apart. Another difficulty has been that the sticky coating

of the duck adheres to and clogs the knives or cutters of the "Gem" machine and further it has been found that the duck or canvas being dry and stiff did not conform readily to the form of the lip and would afterward tear away from it. I have found by experience, however, that if the coated duck is first wet in hot water and then subjected to a degree of heat which will soften the coating but not entirely dry the duck, that the foregoing difficulties are entirely overcome. In the first place, the coating is somewhat softened by the hot water, which softening is not due to the action of the water but to the heat. In consequence, the coating is softened to the desired extent by the application of less heat than would be necessary in case it was not first subjected to the action of hot water. Another advantage secured by the preliminary application of hot water is, paradoxical as it may appear at first glance, that the coating, after being heated and provided it is not heated to such an extent as to dry all the moisture in the fabric and coating, remains soft and retains its sticky or tacky qualities for a much longer period than when heated without moisture. This is of special advantage in the use of coated fabrics in making insoles owing to the fact that it is not always commercially convenient to submit the insole to the "Gem" machine as soon as the coated duck has been applied to the leather and therefore it is very desirable that the coating should retain its tackiness for a reasonable length of time even after it has cooled and such is the result where it has been subjected to the preliminary bath of hot water. Furthermore it is of the utmost importance that the coated fabric should be heated uniformly, and to a degree just sufficient to render the coating soft and tacky without melting it or drying the fabric. In case the coated fabric is subjected to an excessive heat, the coating is melted and runs off the fabric, and the fabric is dried. Such treatment, of course, renders the coated fabric valueless. In the event of insufficient heat being applied, the coating does not become sufficiently soft and tacky, and the fabric will not properly adhere to the reinforced material.

I am well aware that machines for treating coated fabrics have heretofore been made but all these machines have been open to the

objection that the coated fabric has not been uniformly heated. In the machines having a flat heating surface no means have been provided whereby the coated fabric is at all times retained in close contact with the heating surface as it travels through the machines and the act of drawing the fabric through such machines tends to lift it from parts of the fabric to be heated less than other parts. This same objection obtains in the case of machines employing a rotatable drum, since the weight of the coated fabric causes it to draw away from the drum and approach the source of heat when the machine is at rest and the drawing of the fabric through the machine causes it to hug the drum and recede from the source of heat, thereby subjecting different parts of the coating to different heatings.

The object of my invention is to secure an efficient and novel machine for treating coated fabric whereby the fabric is rendered pliable and easily molded and the coating is softened uniformly and in such a manner that it remains tacky even after it has cooled and will not adhere to knives, cutters or other implements.

The following is a clear description of my invention, reference being made to the accompanying drawings, in which like numbers refer to like parts throughout the several views, and in which,

Figure 1 is a side elevation of my machine having certain parts broken away to show the interior construction; Fig. 2 is a rear elevation with the standard broken away; Fig. 3 is a vertical transverse sectional view of the casing on lines 3-3 in Fig. 1; and Fig. 4 is a detail view.

In the drawings illustrating the preferred form of my invention, 1 represents a curved hollow casing or heater, which is preferably rectangular in cross section and curved longitudinally for a purpose to be hereinafter explained. The upper end of the casing 1 is supported by a standard 2 and the lower end is supported by brackets 3 secured to the top 4 of a tank 5 by bolt 6. The curved upper face 7 of the heater is provided with rims 8 which are extensions of the sides of the casing and which serve to retain the coated fabric in place as it travels over the smooth face 7 of the casing 1. The curved upper face 7 of the heater extends steeply upward from the tank 5, being curved longitudinally, as shown in Fig. 1, so that it ends in a substantially horizontal portion at its upper end, from which the fabric is drawn out upon a work table.

The tank 5 which is adapted to hold water is so arranged with respect to the casing 1 (as shown in Fig. 1) that the lower end of the latter is just above the forward portion of the former. In the top 4 of the tank 5

is a door 9 hinged at 10 so that it may be raised as shown by the dotted lines in Fig. 1. Journalled in depending hangers 11 fastened to the under side of the door 9 by screws or bolts 12 is a roll 13. A hook 14 is secured to the under side of the casing 1 by an eye-bolt 15 and when the door 9 is raised it may be maintained in that position by inserting the hook 14 in a handle 16 secured to the upper side of the door 9. The top 4 of the tank 5 is provided with openings or slots 17 and 18 for the entrance and exit respectively of the coated fabric in and from the tank. In the opening or slot 18 is mounted a small roll or idler 19 in bearings 20. Upon the rear end of the tank 5 are two slotted brackets 21 adapted to hold a reel 26 of the coated fabric.

For the purpose of heating the casing 1, I provide in the upper part of said casing, an inlet 30 connected by a pipe 31 with the supply of heating medium, which is preferably steam although hot air or hot water may be used if desired. In order to control the amount of heat, the pipe 31 has a valve or throttle 32 (see Fig. 4) by which the steam pressure may be regulated and a pressure gage 33 to indicate the pressure. At the lower end of the casing 1 is an outlet 35 connected by a piping 36 to a pipe 37 which enters the tank 5 near its base. The piping 36 beyond the pipe 37 is controlled by a valve 38 and acts as a drip. A valve 40 controls the passage of steam from the outlet 35 through the pipe 36.

The operation of the machine is as follows: The tank 5 is first partially filled with water and then the steam is permitted to flow into the casing 1 through the supply pipe 31 and out through the piping 36, pipe 37, and into the tank 5, thus heating the casing 1 and the water in the tank 5. As soon as the heater and water have been raised to the desired temperature, the roll of coated fabric 26 is placed in the brackets 21, and the fabric is unrolled and carried under the roll 13 under the idler or small roll 19, through the slot 18 and over the curved face 7 of the casing with the uncoated side of the fabric contacting the heater and the coated side being exposed. It will be found more convenient when arranging the coated fabric in the machine to raise the door 9 to the position shown by the dotted lines in Fig. 1 where it may be held by the hook 14. As soon as the fabric has been properly disposed the door 9 is unhooked and lowered and the roll 13 carries the coated fabric down into the water in the tank. If, at any time, the water in the tank 5, owing to the condensation of steam rises too high, the surplus water may be drawn off through the pipe 36 by opening the valve 38. At all other times the valve 38 should be kept closed.

In using the coated fabric, the operative draws the fabric up over the curved face 7 of the heater 1 and onto a table or work bench adjacent to the machine, where it is cut off in suitable lengths and immediately applied to the material to be reinforced. This act of drawing the fabric toward the table or work bench over the fixed curved face 7 of the heater, causes the fabric to bind against the face of the heater and insures a close contact at all times between the fabric and the heating surface and thereby secures a uniform heating of the fabric so long as an even temperature is maintained in the heater. In order to secure the uniform heating of the coated fabric which is absolutely necessary to its successful use, the fabric should at all times be in close contact with the heating surface and for this reason the face 7 of the heater is curved. The substantially horizontal upper end of the curved surface 7 of the heater from which the fabric is drawn to the work table is sufficiently inclined to the vertical so that in case the fabric is cut off close to the upper end of the heating surface, the loose end of the fabric will be frictionally retained thereon and thus be kept from falling back over the steeper part of the curved surface near the tank.

The temperature of the casing 1 is kept uniform by regulating the supply of steam by means of the valve 32 and the proper temperature being once secured the steam gage 33 will show the steam pressure required and thereby enable the operative to maintain an even and uniform temperature.

After the coated fabric leaves the reel it passes through the hot water in the tank 5 and is thoroughly wet. The uncoated side of the fabric contacts the roll 13 and both sides of the fabric, while it is passing through the tank 5, are open to the action of the water. The roll 13 is made large in order to facilitate the drawing of the fabric through the machine as obviously a roll of large diameter offers less resistance to rotation than a roll of small diameter. When the coated fabric reaches the face 7 of the heater it is thoroughly wet and the coating is somewhat softened. In passing over the face 7 of the heater, however, most of the moisture is dried out leaving the fabric itself in a slightly moist pliable condition. The coating is further softened by the heat and it is in a very sticky and tacky condition by the time it reaches the hands of the operative.

In case it is desired to stop using the machine for a short time, my construction permits the process of treating the coated fabric to be suspended without wasting the fabric. After the fabric has passed through the hot water in the tank and the coating thereby softened, it obviously cannot be re-

wound on the reel without sticking together and if it is permitted to remain long in the hot water and in contact with the heater while the machine is at rest, the coating will be injured. Whenever the machine is stopped for any appreciable time, the roll 13 may be withdrawn from the water by raising the door 9 and securing it on the hook 14 and the coated fabric may be drawn up and out of the water and that portion of it lying on the face of the heater may be lifted off and thrown over any suitable support. When the machine is again started, the door 9 is unhooked and dropped and the fabric replaced on the face of the heater. If meanwhile the fabric has dried it may be dipped in the tank and then drawn over the face of the heater. This renders any change in the heating means connected with the machine unnecessary and saves time and material.

In treating the coated fabric, it will be noticed that the appearance of the coating changes as it becomes softened by heat and thereby the proper time to discontinue the heating process is indicated. Furthermore the condition of the coating may be tested by touching the tip of the finger to it while it is on the heater. For these reasons, the face 7 of the heater is uncovered and as the fabric passes over the face, the coating is exposed to view and may be examined or touched at any time for the purpose of ascertaining its condition. It will be found that this construction also greatly aids in securing the proper amount of heat; since it enables one to ascertain immediately from the condition of the coating whether too much or too little heat is being applied and then to remedy it.

What is claimed is:

1. In a machine for treating coated fabric, the combination of a moistening tank, a hinged cover therefor, a depending roll mounted on said cover for guiding the coated fabric through the water in said tank and means for heating said fabric after it emerges from said tank to partially dry the moisture and to soften said coating.

2. In a machine for treating coated fabric, the combination of a moistening tank, a roll which immerses the coated fabric in the water contained in the moistening tank as it passes around said roll, a hollow casing above and extending over said tank having an upper longitudinally curved surface extending upwardly from the tank for supporting said fabric as it passes over said curved surface and adapted to deliver the fabric directly to a work table, and means for heating the hollow casing.

3. In a machine for treating fabric coated on one side with an adhesive compound, the combination of a moistening tank, a hollow casing having an upper longitudi-

nally curved surface for supporting the fabric as it passes over said curved surface, means for heating said hollow casing, and means including guide rolls bearing against the uncoated side only of the fabric for guiding the fabric through the moistening tank and delivering the fabric to the curved surface with its uncoated side against said surface.

4. In a machine for treating fabric coated on one side with an adhesive compound, the combination of a moistening tank, means for supporting a supply roll of the coated fabric, a hollow casing above the tank having an upper longitudinally curved surface for supporting the fabric as it passes over said curved surface, means for heating said hollow casing, and means including rolls bearing against the uncoated side only of the fabric for guiding the fabric from the supply roll, immersing the fabric in the moistening tank and delivering the fabric from the moistening tank to the curved surface with the uncoated side of the fabric against said surface.

5. In a machine for treating coated fabric, the combination of a moistening tank, a hollow casing above the tank having an upper longitudinally curved surface extending upwardly from the tank and ending in a substantially horizontal portion from which the fabric is adapted to be drawn out upon a work table and upon which the loose end of the fabric may lie and be thus kept from falling back over the lower inclined portion of the curved surface, means for heating the hollow casing, and means for immersing the fabric in the moistening tank and for guiding the fabric to the curved surface.

6. In a machine for treating coated fabric, the combination of a moistening tank, a hollow casing above the tank, having an upper longitudinally curved surface extending upwardly from the tank and ending in a portion sufficiently inclined to the vertical so that the loose end of the fabric may be frictionally retained thereon and be thus kept from falling back from the curved surface, said curved surface being exposed so that the fabric may be lifted therefrom and laid back while the machine is not in use, and means for heating the hollow casing.

7. In a machine for treating coated fabric, the combination of a moistening tank, a hollow casing above the tank having an upper longitudinally curved surface extending upwardly from the tank and ending in a portion sufficiently inclined to the vertical so that the loose end of the fabric may be frictionally retained thereon and be thus kept from falling back from the curved surface, said curved surface being exposed so that the fabric may be lifted therefrom and laid back while the machine is not in use, means for holding the hollow casing, a roll for immersing the fabric in the moistening tank, and means for lifting said immersing roll from the tank while the machine is not in use.

In witness whereof, I have hereunto set my hand, in the presence of two subscribing witnesses, this the 12th day of January, 1909.

ANDREW THOMA.

Witnesses:

E. L. AYLING,
M. E. UNDERWOOD.