

J. MEADE.
MACHINE FOR COATING FABRICS AND THE LIKE.
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980,315.

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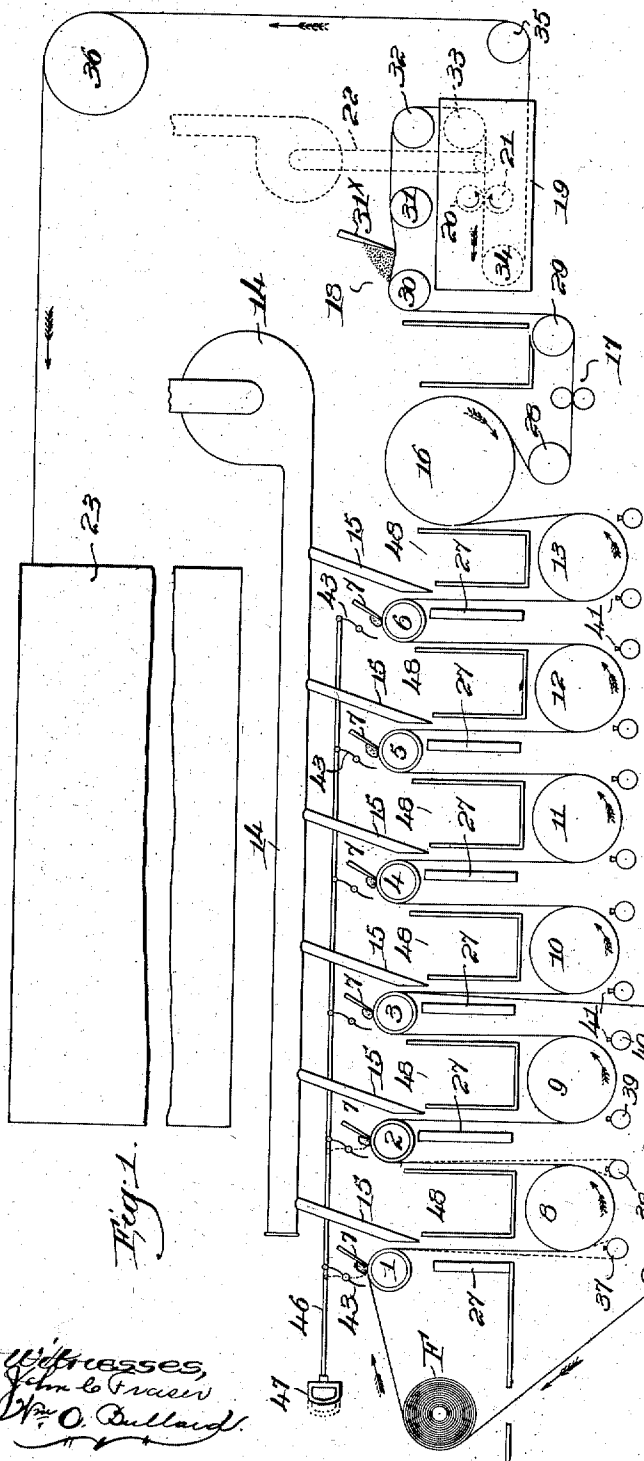


Fig. 1.

Witnesses,
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Fig. 2.

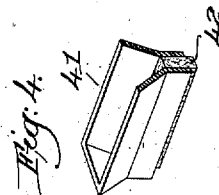
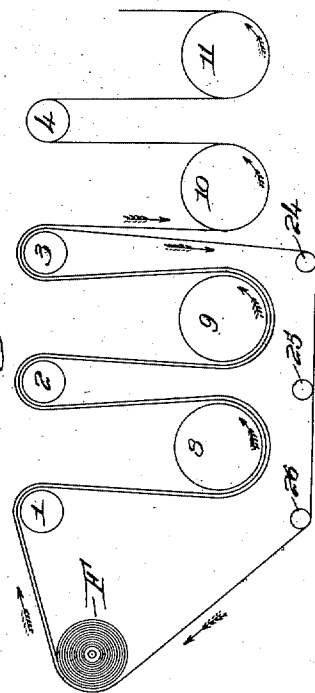
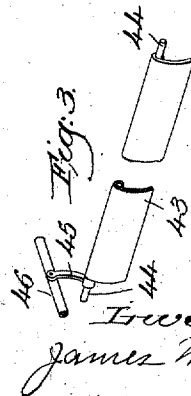


Fig. 3.



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MACHINE FOR COATING FABRICS AND THE LIKE.

980,315.

Specification of Letters Patent.

Patented Jan. 3, 1911.

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To all whom it may concern:

Be it known that I, JAMES MEADE, a citizen of the United States, and residing in Stoughton, county of Norfolk, and State of Massachusetts, have invented an Improvement in Machines for Coating Fabrics and the Like, 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 apparatus for making coated goods and is more especially concerned with the applying of a plurality of coatings of rubber or similar substances to fabrics. Heretofore the process of coating fabrics has been a slow and costly one owing to various defects in the apparatus employed, but particularly to the number of times necessary to successively pass a single length or web of fabric through the same machine in order to deposit the required thickness of the coating substance thereon. After the application of each coat the fabric had to be thoroughly dried to prepare it for the next operation, each of these steps demanding a separate rolling and handling, and finally the goods were removed to other machines for the finishing deposit of starch and for curing. This method of procedure requires the manipulation of the sensitive goods a number of times, constantly exposing them to injury. A serious source of difficulty arises from the fact that after each coating the web is rolled to permit it to be arranged for a fresh start through the machine. The drying action to which it can be subjected is not sufficient to entirely set the coating substance, and it would not be feasible to starch the surfaces between the successive coats. Therefore when the goods are rolled, the coating coming in contact with the opposite face transfers thereto a certain amount of foreign matter, which is liable to injure its appearance and reduce its salability.

In the present invention, I successively coat and dry the fabric the required number of times in a single travel through my improved apparatus and then starch and finish it with but one operation, prior to rolling or handling, thereby greatly increasing the efficiency of the apparatus and the quality of the product.

My invention further comprises other features and combinations which will be hereinafter fully described and more particularly claimed.

In the accompanying drawings, Figure 1 illustrates diagrammatically one embodiment of my invention; Fig. 2 is a similar view of the supply end of the apparatus, showing the manner of leading the web over the bed-rolls in a plurality of layers; Fig. 3 is a broken perspective view of one of the members for retaining the coating substance and Fig. 4 is a similar view of a lubricating receptacle.

Similar characters of reference are applied to like elements throughout the several figures of the drawings.

The numerals 1, 2, 3, 4, 5, 6 designate a horizontal series of suitable supporting or bed-rolls, which may include any desired number, and over which passes the fabric to be treated on its way from a roll or source of supply F to a final drying or curing device 23. Above each roll, forming therewith a coating device, is situated a gage-knife or "doctor" 7 adapted to cooperate with the coating substance and to permit the application of the proper amount to the fabric. Between the bed-rolls and at some distance below are shown large rolls or drums 8, 9, 10, 11, 12, 13, of some highly polished metal, as brass or copper, adapted to be heated as desired.

In applying a semi-fluid coating substance, there is a liability of so saturating the fabric that the coating soaks through to the opposite face, thus injuring the goods and, furthermore, adhering to the rolls and interfering with the operation of the apparatus. To prevent this, before starting the web in its travel, it is preferably carried, as is most clearly illustrated in Fig. 2 of the drawings, from the supply roll F over the bed-roll 1, under the drum 8, over the roll 2, under the drum 9 and over the roll 3, hence beneath guide-rolls 24, 25, 26 and back to and over the roll F without at this time applying the coating substance. The web from this point is led again over the path just described to the bed-roll 3, from which it passes alternately under the succeeding heating drums 10, 11, 12 and 13 and over the bed-rolls 4, 5 and 6. The preliminary

lead of the web serves as an apron for the second layer and not only acts as a cushion therefor, filling the interstices of the fabric and tending to prevent the soaking through of the coating substance, but in case this saturation occurs it absorbs the substance and keeps it from the rolls. Though the number may be varied as desired, after the first few coats it is not ordinarily necessary to continue the use of this apron, since the coatings themselves prevent the seeping of the substance. In practice, a leading band of sufficient length may be attached to the web for the preliminary threading through the apparatus, thereby presenting the entire length of fabric for treatment.

Beneath the bed-rolls and between them and the heating drums are vertical heating or drying chambers 27, while above the bed-rolls and extending longitudinally of the apparatus is a blast-conduit 14 provided with downwardly projecting outlets 15, so situated as to direct the heated air against the coated fabric as it leaves the coating devices upon the opposite side from the heating chambers. Together these devices prepare the goods for the next coating.

From the last coating device and its succeeding heating drum 13, the fabric passes about a heating drum 16 of relatively large circumference, with which it has a considerable arc of contact, and receives its final drying as the part of its finishing treatment. Upon leaving the drum 16 the fabric is directed horizontally by guide-rolls 28, 29 between calender rolls 17, which prepare it to better receive starch. From this step the goods travel horizontally over rolls 30, 31 and 32 with the coated side upmost, and starch being placed upon it at 18 in front of a suitable gage-knife 31* is distributed over the surface. To remove the surplus starch, the web next enters a casing 19, passing over guide-rolls 33, 34. Here members 20 and 21 rotate at opposite side of the goods in the direction indicated by the arrows and brush off all the excess, which may be carried away by an exhaust pipe 22. By guide-rolls 35, 36 the web is now directed to the curing device 23. Wherever it is necessary, for the purpose of securing the advance of the web at an equal tension, the rotatable elements of the apparatus are driven at uniform peripheral speeds in the direction of the arrows.

In coating fabrics with certain substances, these may not dry with sufficient rapidity to permit of the coated surface contacting with the drums or layer of fabric about them. For such conditions, there may be provided below and at each side of the drums 8, 9, 10, 11, 12 and 13 a guide-roll or idler, as 37, 38, 39, 40, the surface of which is kept covered

with some such lubricant as palm-oil. This may be effected by means of a suitable receptacle 41 (see particularly Fig. 4), in the form of a trough with a longitudinal opening in the bottom, in which is inserted a piece 42 of felt or other absorbent material protruding below the receptacle into contact with its roll. As said roll revolves the felt conducts the lubricant to it, preventing the adhesion of the coating substance and keeping it clean. From the bed-roll 1 the freshly coated fabric may be led, as indicated by dotted lines in Fig. 1, beneath the idler 37, then over the drum 8 and beneath the idler 38. The non-coated side of the fabric is thus brought into contact with the heated surfaces, the coated side coöperating with the lubricated surface. The same course may be followed at all the drums.

It is sometimes necessary to stop the operation of the apparatus, and to this end provision is made to retain the coating compound in position in front of the gage-knife and to prevent it from flowing over and streaking the fabric. In front of each knife is mounted upon trunnions 44 a curved retaining member or blade 43, shown in detail in Fig. 3. Arms 45 extend upwardly from the blades and are pivoted to a common operating member or rod 46, provided at one end with a handle 47. Before stopping the apparatus the operator will, by means of the handle, pull the rod 46 causing the plates to simultaneously assume the position shown in dotted lines in Fig. 1, thereby confining the coating substance between the curved blade and gage-knife.

To enable the operator to readily supply the knives with the coating substance as needed and to allow inspection of the fabric as it passes through the apparatus, passageways 48 are located above the heating drums and between the substantially vertical runs of fabric passing therefrom over the bed-rolls. The sides or walls of the passageways act as shields to protect the fabric from injury, and serve to direct against and retain in proximity to these portions of the fabric the heated air supplied by the various devices.

The general operation of the apparatus need be but briefly outlined. The attendant, moving freely among the devices by means of the passageways, starts the leading band from the end of the web of fabric to be treated at the supporting roll F in the proper path about the bed-rolls, heating drums and guide-rolls of the coating section and then on through the finishing section, the course chosen in the former being such as to produce the best results for the material used, and being governed by the considerations previously outlined. Heat is

then supplied to the various devices and the coating substance placed in coöperation with the gage-knives, and the travel of the web begins. By each knife a coating of the proper thickness is applied, the under or leading layer of the fabric at the necessary points guarding against undue penetration. Between the coating devices the goods, without interruption in their travel and without contact of one side with the other or with a surface to which they are liable to adhere, and with entire freedom from handling, are so dried with a minimum expenditure of heat that at the next coating device they are ready for another application. All the coatings having been applied, and still without ceasing its travel and without manipulation, the goods are subjected to a final drying and calendered and starched so that they are finished, save for the curing and any special treatment which it may be desired to introduce. Until the excursion of the entire web has been completed no attendance is necessary, except for inspection of the goods and for supplying the coating substance and starch as that upon the gage-knives becomes exhausted. If, for any reason, it is desired to stop the apparatus, no damage will be done to the fabric by an uneven coating because of a back flow from the gage-knives, since the attendant will, by means of the operating member 46, simultaneously confine the coating substance at all the devices between the gage-knives and retaining members.

I claim:

1. An apparatus for making coated goods comprising a coating section having a plurality of devices adapted to apply successive coatings to the same side of a fabric, a finishing section having means for preparing the coated fabric for rolling and handling, and means for passing the fabric through the coating section from one coating device to another and from the coating section directly to the finishing section.

2. An apparatus for making coated goods comprising a coating section having a plurality of devices adapted to apply successive coatings to the same side of a fabric, means between the coating devices to prepare the fabric for the action of the next coating device, a finishing section having means for preparing the coated fabric for rolling and handling, and means for passing the fabric through the coating section from one coating device to another and from the coating section directly to the finishing section.

3. An apparatus for making coated goods comprising a coating section having a plurality of devices adapted to apply successive coatings to the same side of a fabric, a

finishing section having a calendering device and a starching device, and means for passing the fabric through the coating section from one coating device to another and from the coating section directly to the finishing section.

4. An apparatus for making coated goods comprising a series of bed-rolls, a gage-knife coöperating with each bed-roll, heating drums situated between the bed-rolls, calender-rolls to which the fabric to be coated passes from the last bed-roll, and a starching device receiving the fabric from the calender-rolls.

5. An apparatus for making coated goods comprising a series of bed-rolls, a gage-knife coöperating with each bed-roll, heating drums situated between the bed-rolls, calender-rolls to which the fabric to be coated passes from the last bed-roll, a starching device receiving the fabric from the calender-rolls, and heating drums between the last bed-roll and the calender-rolls presenting a greater contact surface to the fabric than do those between the bed-rolls.

6. The combination with a fabric-support, of means for leading a fabric in a web over the support, means for guiding the web back over the support and above the first lead of fabric thereon, and coating means coöperating with the support.

7. The combination with a series of fabric-supports, of means for passing a web of fabric over a support in a plurality of layers, means for passing the fabric over another of the supports in a less number of layers, and coating means coöperating with the supports above the fabric.

8. In a fabric-coating apparatus, a source of fabric-supply, a bed-roll to which the fabric is led from the supply, a guide-roll directing the fabric over the source of supply and back to the bed-roll, and means for applying a coating to the fabric in its second passage over the bed-roll.

9. A fabric-coating device, a heating drum about which the fabric passes from the coating device, intermediate means with which the coated fabric contacts for reversing the side presented to the heating drum, and lubricating means coöperating with the portion of said reversing means contacting with the coated side of the fabric.

10. The combination with fabric-coating means and heating means, of an intermediate guide-roll, a receptacle for a lubricant adjacent to the guide-roll, and absorbent material extending from the receptacle into contact with the guide-roll.

11. In a coating apparatus comprising a plurality of devices for successively applying a coating substance to a fabric, and movable means simultaneously operable to hold

the coating substance in place upon the fabric at all the devices.

12. A fabric-coating apparatus comprising a plurality of bed-rolls, coöperating
5 knives for applying a coating substance to the fabric, a retaining member movable above each bed-roll, and an operating member common to all the retaining members.

In testimony whereof, I have signed my name to this specification, in the presence of 10 two subscribing witnesses.

JAMES MEADE.

Witnesses:

PATRICK H. MAHONEY,
CORNELIUS HEALY, Jr.