

3 Sheets--Sheet 1.

J. TREGURTHA.
Machine for Making Artificial Leather.
No. 231,692. Patented Aug. 31, 1880.

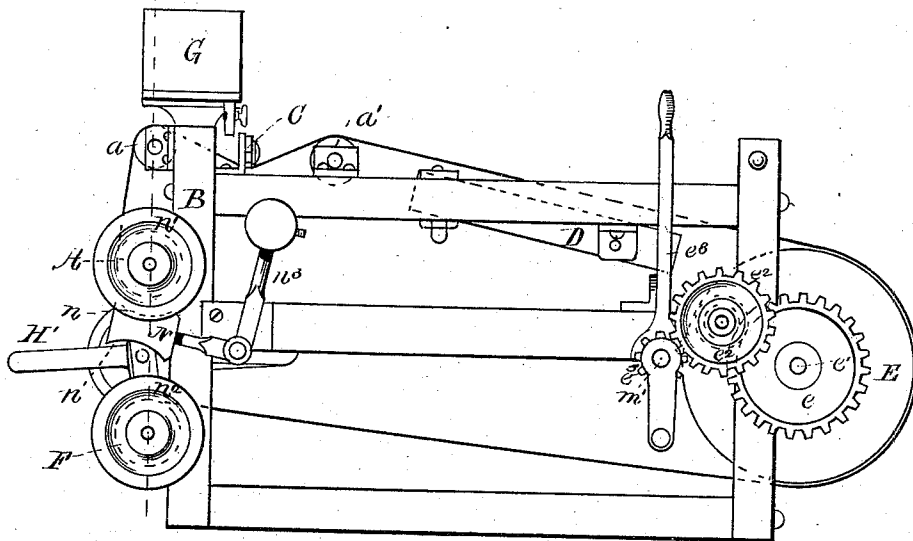


Fig. 1.

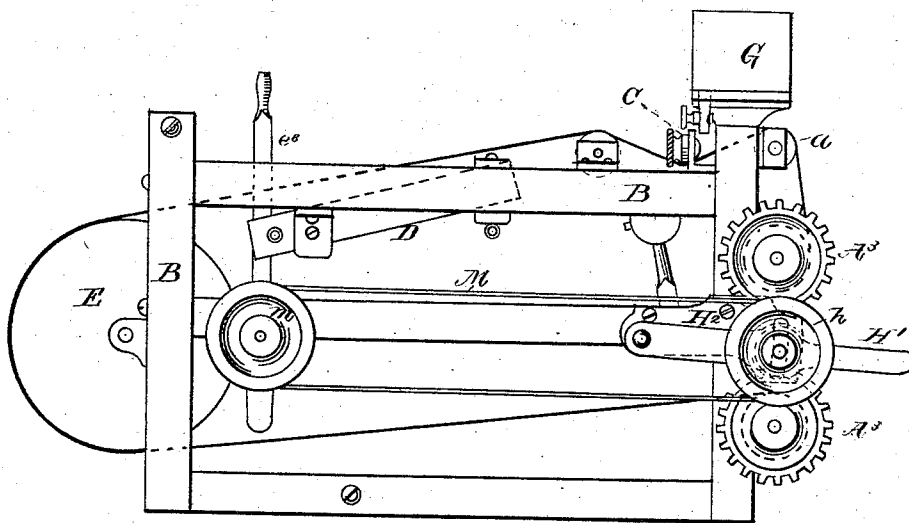
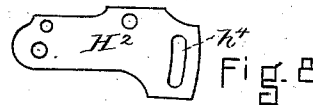


Fig. 2

WITNESSES
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James Tregurtha
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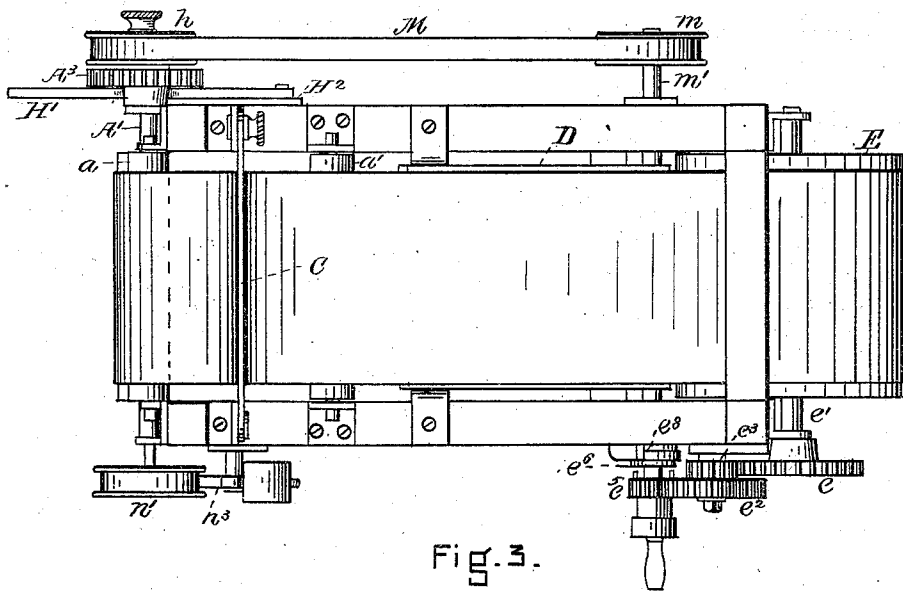


Fig. 3.

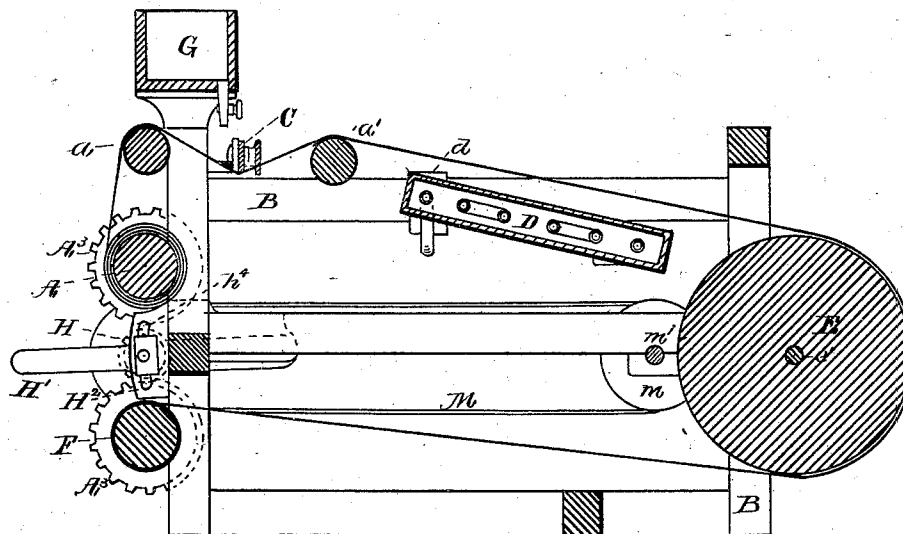


Fig. 4

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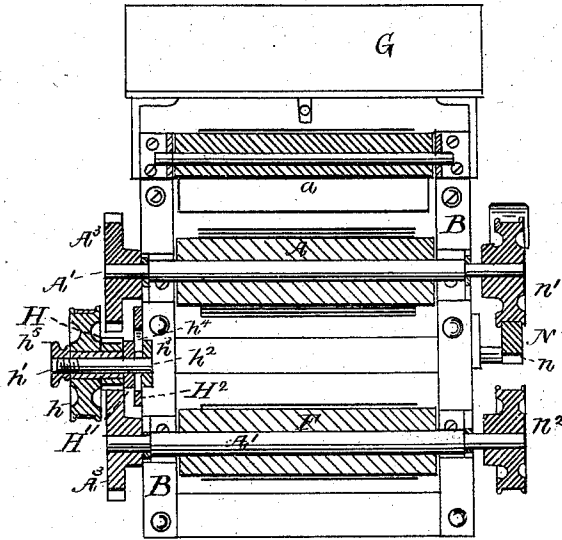


Fig. 5.

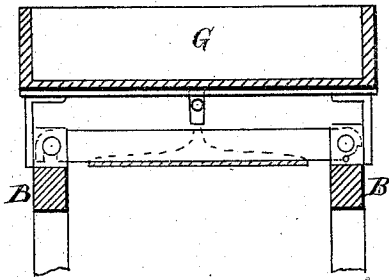


Fig. 6.

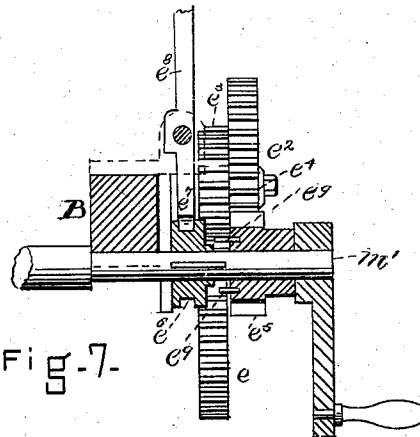


Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES TREGURTHA, OF BOSTON, ASSIGNOR TO CHASE, MERRITT & BLANCHARD, OF SAME PLACE, AND WALTER N. DOLE, OF LYNN, MASS.

MACHINE FOR MAKING ARTIFICIAL LEATHER.

SPECIFICATION forming part of Letters Patent No. 231,692, dated August 31, 1880.

Application filed February 21, 1880.

To all whom it may concern:

Be it known that I, JAMES TREGURTHA, a subject of the Queen of Great Britain, residing in Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented an Improvement in Machines for the Manufacture of Artificial Leather, of which the following is a specification.

This invention relates to the following-described machinery for the manufacture of artificial leather or other material, in which a composition is spread automatically upon a suitable fabric.

In the manufacture of artificial leather a fibrous or cloth base closely textured is employed, and a solution of rubber and gutta-percha, or rubber alone, suitably dissolved in naphtha or any other suitable solvent and mixed with zinc-white, bone-black, or any other desirable earthy or mineral matter, colored or not, as may be desired, is spread upon the same as a surfacing.

This apparatus embraces a spreading device, means for feeding the cloth thereto and for passing it over a drying device, means for equalizing the tension upon the cloth and its rate of motion during the spreading operation, and other details in construction, which will hereinafter be more fully described.

Reference is made to the accompanying drawings, forming a part of this specification, in explaining the nature of this invention, in which—

Figure 1 is an elevation of one side of the machine. Fig. 2 is an elevation of the opposite side of the machine. Fig. 3 is a plan. Fig. 4 is a vertical section. Fig. 5 is a front view of a machine illustrating my invention. Figs. 6 and 7 are detailed views. Fig. 8 is a detached view of the slotted plate H².

The cloth to be covered with the composition is wound upon the feed-roll A, which is suitably mounted upon the frame B of the machine. From thence it is passed over the roll a, which also has bearings on the frame B, under the spreading-knife C, which is hinged to one side of the frame, and extends across the same at right angles to the line of movement of the cloth, and is fastened at the other

side of the frame by a set-screw or in any other desirable way that will permit of its being readily unfastened for the purpose hereinafter stated, and thence over the roll a' and the drying apparatus, consisting of a coil of steam or hot-air pipes, D, covered with a plate, d, for equalizing the distribution of the heat. In lieu of the steam-pipes and superposed plate, the steam-pipes alone may be employed or a suitable box having a comparatively large heating-surface, in which hot air or steam is introduced. The cloth then passes over the large tension-drum E, and from thence to the receiving-roll F, which is located immediately below the feed-roll. The tension-drum and receiving-roll have bearings in the frame B or upon any other suitable support. I have thus indicated the course which the cloth takes through the machine from the feed-roll to the receiving-roll.

The surfacing composition is fed from a reservoir, G, located above the knife, upon the cloth in sufficient quantity to entirely cover the cloth in front of it from edge to edge, and in some instances it drips over the edges of the cloth into pans placed to receive it.

The working-edge of the knife is somewhat below the upper surface of the roll a; consequently the composition by the inclination of the cloth and its movement is kept in contact with the front portion of the blade.

To provide better spreading action the cloth is then passed over the roll a', elevated somewhat above the working-surface of the blade, and is thereby kept in constant contact therewith.

The heating device dries the composition, and the drum by its large surface maintains an even degree of tension and movement in connection with a suitable braking action upon the feed-roll upon the cloth, as the frictional surface of the drum is so great that it is impossible for the receiving-roll as it grows larger with the cloth to draw the cloth over the drum at a greater rate of motion than the motion of the surface of the drum.

The tension-drum is located generally from twenty-five to forty feet from the feeding and receiving rolls, and there may be intermediate

supporting-rolls between the heating device and drum if necessary. This enables the cloth and composition to be thoroughly dried before it is wound on the receiving-roll; but as it is often desirable in manufacturing artificial leather to apply successive coats of composition I have employed mechanism for reversing the operative parts of the machine, so that the cloth after receiving a coating of the composition may be returned and rewound on the feed-roll in a position to be again fed through the machine.

In operating the receiving-roll and the feed-roll, when the latter acts as a receiving-roll to draw back the cloth after the application of one coating, I arrange upon the shafts A' A' the gear-wheels A^3 , and between the two a small gear-wheel, H , which is fastened to the pulley h , and which, with the pulley, has a bearing on the short shaft h' , projecting outwardly from the lever H' .

A short stud, h^2 , on the end of the shaft and a nut, h^3 , serve to hold the lever and shaft to the plate H^2 , the said plate being provided with a slot, h^4 , through which the screw-stud passes, and, in connection with the nut h^3 and the thumb-screw h^5 on the end of the shaft, serves to clamp the mechanism in any desired position in relation to the two gears A^3 .

The pulley h is driven by the belt M , pulley m , and shaft m' .

When it is desired to convert the feed-roll into a receiving-roll for rewinding the fabric, the thumb-screw is loosened and the pinion disengaged from the gear-wheel and engaged with the gear on the shaft of the feed-wheel.

The mechanism for creating a drag on the feed-roll and on the receiving-roll alternately consists of the brake-shoe N , having two working-surfaces, n , one of which is adapted to engage with the periphery of the friction-wheel n' on the feed-roll shaft A , and the other of which is adapted to engage with the periphery of the friction-wheel n^2 on the receiving-roll shaft, and the same is secured upon a weighted arm, n^3 , in such a way that it may alternately engage with either of said wheels, as desired. Of course, any other desirable mechanism for creating a drag on the feed-roll when it operates as such, or upon the receiving-roll when the cloth is unwound therefrom by the feed-roll, may be employed.

The drum E is connected with the driving-shaft m' by means of the gear-wheel e on its shaft e' , the intermediate gear, e^2 e^3 , on the short shaft e^4 , and the pinion e^5 on the shaft, which has provision for revolving freely thereon.

A clutch, e^6 , pivoted to the yoke e^7 , and operated by the lever e^8 , slides on a fast feather on the shaft, and engages with the pins e^9 on the face of the pinion; and when it is desired that the drum be positively revolved the clutch is made to engage with pins on the pinion.

It will be observed that the mechanism herein described is very valuable in applying suc-

cessive coatings of a composition, particularly when they are quite thin, as the fabric is passed twice over the drying devices—once as the composition is being applied, and once upon the rewinding of the fabric on the feed-roll preparatory to again feeding it through the machine.

It will further be observed that the device for equalizing the tension upon the cloth is very simple and very efficient, as the frictional surface of the drum is so large that the strain of the receiving-roll is not sufficient to make the cloth slip thereon.

The brake is used as a retarding mechanism in the sense that it prevents the free revolution of either the feed or receiving rolls upon their respective shafts, and acts as a drag for creating a tension in connection with either of the rolls which is acting as a receiving-roll and the drum.

Any suitable mechanism may be used for revolving the drum in lieu of that herein described, and any known means may be employed in disconnecting the actuating mechanism of the drum from its operating devices in lieu of the clutch herein described.

It can readily be seen that in the winding and unwinding of the cloth in its traverse to and fro in this machine under tension, and subjected to the scraping and rubbing action of the knife and rollers a a' , there will be a tendency to stretch the cloth, and as the pores are filled by the surfacing compound while the longitudinal fibers are under tension, naturally the extension of the cloth will become permanent. As matter of fact, a considerable percentage more yards of surfaced cloth are delivered by this machine than are fed to it to be surfaced.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of the feed-roll A , provided with the brake to retard the same, the spreading mechanism, substantially as hereinbefore described, the equalizing-drum E , and the receiving-roll F , all arranged as described, to deliver the cloth from the feed-roll to the spreading device, and thence in a direct line to the equalizing-drum, and thence in a direct line to the receiving-roll, substantially as hereinbefore described.

2. The combination, in a machine for the manufacture of artificial leather, of the feed-roll A , supporting-rolls a a' , the spreading-knife arranged between the two supporting-rolls a a' , as described, and the equalizing-drum E , and receiving-roll F , all arranged to operate substantially as described.

3. The combination of the roll A , the spreading mechanism, the heating mechanism, arranged between said spreading mechanism and the equalizing-drum E , and the receiving-roll F , substantially as described.

4. The combination, in a machine for manufacturing artificial leather, of the feed-roll

A, the drum E, the receiving-roll F, and shifting brake mechanism, adapted to be alternately applied to either roll A or F, according as the cloth is wound thereon or unwound therefrom, substantially as described.

5 5. The combination, in a machine for the manufacture of artificial leather, of the feed-roll A, the drum E, the receiving-roll F, with the shifting roll-driving mechanism described, adapted to be alternately engaged with either
10 of the rolls A or F, according as the cloth is to be wound by the receiving or feed roll, substantially as described.

6. In a machine for coating cloth, the com-

15 bination of a delivery-roll, with a detachable driving mechanism for actuating said roll positively and a brake for retarding said roll, a receiving-roll with a detachable driving mechanism and a brake for retarding said roll, an intermediate drum provided with detachable
20 mechanism suitable for positively driving said drum in the direction of the delivery of the cloth while under the coating operation, substantially as described.

JAMES TREGURTHA.

Witnesses:

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