

UNITED STATES PATENT OFFICE.

EPHRAIM CUSHMAN AND JOHN R. CUSHMAN, OF AMHERST, MASS.

IMPROVEMENT IN THE MANUFACTURE OF LEATHER-PAPER STOCK.

Specification forming part of Letters Patent No. 29,672, dated August 21, 1860.

To all whom it may concern:

Be it known that we, EPHRAIM CUSHMAN and JOHN R. CUSHMAN, of Amherst, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Artificial Leather, of which the following is a full, clear, and exact description.

Our invention has for its object to manufacture artificial leather out of scraps and waste clippings of leather, and to employ for this purpose machinery heretofore used in the manufacture of paper.

In the attempts made to manufacture artificial leather upon "cylinder paper-machines" it has been found difficult to raise the material from the vat upon the cylinder, the stock slipping back from its surface instead of forming a continuous sheet upon it. We have also discovered that the leather pulp, when prepared simply by grinding, soon destroys the felt upon which the sheet of leather is taken off the cylinder. Both of these difficulties we have succeeded, in a great measure, in removing by cleansing the stock of certain impurities which are introduced by the leather scraps employed. These impurities consist chiefly of the oil used in the manufacture of the leather, which is often accompanied by soap used in dressing certain kinds of skins. To remove these impurities we beat up the stock in an ordinary paper-mill engine and raise the temperature of the contents of the engine by the introduction of hot water or steam, so as to set free the grease, which rises to the top of the mass and is permitted to pass off by the screen or washer.

That others skilled in the art may understand and use our invention, we will proceed to describe the manner in which we have carried it out.

We take tanners' skivings, or scraps from boot and shoe manufactories, or both combined, and place them in the ordinary paper-mill engine, where the stock is beaten and reduced in a manner similar to that adopted for paper-stock, and as the process proceeds we introduce into the engine a current of hot water or steam, (preference being given to the latter,) so as to raise the temperature of the mass sufficiently high to set free the grease. For this purpose we have found a temperature of 150° Fahrenheit to answer, though it is manifest

that a considerable variation from this exact temperature may be made, both above and below. As the beating of the stock proceeds the grease and other impurities set free by the heat rise to the surface of the mass and pass away with the water drawn off by the revolving screen or washer, or are skimmed off from the surface in the form of scum as it rises. This washing or cleansing of the stock occupies from a half to three-quarters of an hour, or thereabout.

For the purpose of still further increasing the tenacity of the artificial leather, we sometimes add to the stock (while in the engine) a portion—say from fifteen to twenty-five per cent.—of some fibrous material—such as jute, hemp, or manila waste—which gives to it a greater tenacity and enables the manufactured article better to withstand bending or torsion than when composed exclusively of the beaten leather scraps. We do not, however, consider this addition of fibrous materials to the leather refuse as essential to our process, but only as giving to the article produced a greater tenacity when required for certain uses. When the pulp has been sufficiently reduced in the engine it is carried to the cylinder paper-machine, where it goes through essentially the process employed in the manufacture of paper-board.

The article thus produced has this advantage, among others, that it may be made of any desired thickness or hardness suited for the work for which it is intended, while the ordinary leather varies so much in both these respects that a considerable amount of it is wasted, particularly in cutting out such articles as boots and shoes.

The above artificial leather may be finished with a soft surface, or by calendering, according to the uses to which it is to be applied.

What we claim as our invention, and desire to secure by Letters Patent, is—

As an improvement in the preparation of stock for making artificial leather, heating the stock while it is in the beating-engine and removing the impurities as they rise, as set forth, for the purpose specified.

EPHRAIM CUSHMAN.
JOHN R. CUSHMAN.

In presence of—

EPHRAIM CUSHMAN, Jr.,
M. B. CUSHMAN.