

# UNITED STATES PATENT OFFICE.

ALFRED EDWARD ARNOLD, OF MARRICKVILLE, NEAR SYDNEY, NEW SOUTH WALES.

## PROCESS OF MAKING ARTIFICIAL LEATHER.

SPECIFICATION forming part of Letters Patent No. 454,835, dated June 30, 1891.

Application filed March 29, 1888. Serial No. 268,838. (No specimens.)

*To all whom it may concern:*

Be it known that I, ALFRED EDWARD ARNOLD, engineer, a subject of the Queen of Great Britain, residing at Marrickville, near Sydney, in the British Colony of New South Wales, have invented certain new and useful Improvements in Processes of Making Artificial Leather; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to the manufacture of artificial leather, and has for its object the manufacture of an article superior to those heretofore made, in that it is more compact, harder, and more durable, so as to be adapted for use as brake-blocks for railway-carriages and other like purposes for which artificial leather has heretofore not been used except in a very limited way, owing to the rapid wear of the blocks.

The invention consists, essentially, in the mode or process of manufacture, as hereinafter fully set forth.

In the manufacture of my improved artificial leather I proceed as follows: I first prepare a glutinous solution of a peculiar nature that serves as a binder for the materials employed. This solution is substantially an extract of untanned hide, and its preparation is fully set forth in my application for patent, Serial No. 321,522, filed August 21, 1889, and need therefore not be particularly described here, except to say that it is peculiarly adapted for use as a binder in the manufacture of artificial leather, in that it does not tend to render the product brittle, the said product retaining a certain degree of pliability or elasticity, whereby it is eminently fitted for hard usage and less liable to wear. Having prepared the binding solution, I next take scraps of leather or hide, generally known as "waste," from boot and shoe factories, saddleries, tanneries, &c., in fact any waste unperished leather, and remove therefrom all foreign substances—such as wood, metals, dirt, &c.—that would deleteriously affect the final product either by interfering with the homogeneity thereof or otherwise tending to injuriously af-

fect said product. I next reduce the waste leather or scraps in any suitable manner by hand or machinery to shreds—that is to say, to a more or less fibrous condition. I next take the finer particles of leather resulting from the above-described operation of reducing the waste leather—namely, the more or less granular material and the dust, or I reduce waste leather or artificial-leather scraps or waste resulting from the manufacture of such to a more or less granular or pulverulent form. Having prepared the three compounds necessary to the manufacture of my improved artificial leather—namely, the binding solution, the shredded or fibrous leather, and the granular or more or less pulverulent leather—I immerse the shredded or fibrous leather in the binding solution, so as to thoroughly impregnate such leather therewith and strain off the surplus solution. The same is done with the granular or more or less pulverulent leather, which after thorough impregnation and removal of the surplus solution is dried in such manner as to keep it in its granular form. Some of the impregnated fibrous leather is now placed in a mold while moist, and some of the dry granular impregnated leather is spread over the layer of fibrous leather, so as to completely fill out all spaces or interstices. This operation is repeated until the mold is full, when pressure is applied so as to compress the material, such pressure being preferably applied from all sides of the mold at one and the same time to prevent lamination. The molded material may then be sawed or otherwise fashioned into shape or finally shaped by pressure. By applying the pressure from all sides of the mold simultaneously a thoroughly homogeneous body is obtained without lamination, the interstices between the fibrous material being filled with the granular material, the product being of a more or less fibrous nature, enhancing its properties, especially its resistance to frictional action, thus eminently fitting the article for such uses as hereinbefore stated.

The object in applying the granular impregnated leather in a dry state is to take up the moisture of the shredded leather, which I have found to be sufficient to again suffi-

ciently moisten the binding material with which the granular leather is impregnated as to bind the two firmly together, so that when the article leaves the mold it may be fashioned or shaped by means of tools while it yet retains sufficient plasticity to adapt it to receive its final form in a mold by pressure.

By the above process I obtain a composition of matter heretofore not produced, the properties of which have been fully set forth. This composition of matter I do not desire to claim herein, as it forms the subject-matter of a separate application for patent filed August 21, 1889, Serial No. 321,523.

Having described my invention, what I

claim, and desire to secure by Letters Patent, is—

In the manufacture of artificial leather, the herein-described process, which consists in impregnating leather reduced to a more or less fibrous condition with a binding solution, combining therewith while moist leather reduced to a more or less granular condition, also impregnated with a binding solution and in a dry state, and subjecting the compound to pressure, as described.

ALFRED EDWARD ARNOLD.

Witnesses:

FRED WALSH,

HENRY P. CHATER.