United States Patent Office.

CHARLES SAFFRAY, M. D., OF NEW YORK, N. Y.

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IMPROVEMENT IN THE MANUFACTURE OF ARTIFICIAL LEATHER.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES SAFFRAY, M. D., of the city, county, and State of New York, have invented a new and improved mode or process of Manufacturing Artificial Leather, or a substitute for leather, from new or waste vegetable or animal fibres; and I do declare that the following is a full and exact description thereof:

I take any kind of new or waste vegetable or animal fibres, giving preference to the cheapest waste material, such as shoddy, wool-dust, waste cotton, hair, old rope, and material of like nature, and submit them to a cleansing process by agitating them in a slightly alkaline bath, washing in pure water, dipping in a bath rendered slightly acid by addition of sulphuric acid, and washing again. The fibres are then dried by hot air, and placed, either singly or mixed together, in a carding machine, which produces a homogeneous mixture of the materials. Then the fibres are either passed through a felting machine or simply distributed in layers of the desired thickness by any appropriate machinery. In order to prevent the deforming of these layers or felts they are placed between protectors formed of sheets of wire cloth properly fastened at both edges. The fabric thus prepared is immersed in the agglutinating solution, composed as follows: I dissolve in one of their ordinary solvents one part of galbanum or of gum ammoniac and two parts of gutta percha. This is my normal solution, and it is found to answer well for almost all purposes; but these proportions are not definite, and may be altered according to circumstances. A small proportion of India rubber or of isinglass, or both, will be found useful to render the articles more pliable. For cheap and coarse articles I add to the solution from one to ten per cent. of the weight of the gum of Canada balsam, rosin, shellac, or other similar substance, either singly or in combination. In order to give body or color to the articles, several substances may be added to the solution, such as oxide of iron, oxide of lead, powdered quartz or emery, carbonate of magnesia, lampblack, venetian red, and other similar substances or pigments. The agglutinating solution must be well stirred and kept in motion by a suitable apparatus during the immersion of the prepared fabric. In this solution, which may be slightly warmed, I immerse the prepared fabric during a quarter of an hour, taking care that during that time it is manipulated in such manner as to expel the air and produce a perfect penetration of the solution. It is then passed between wooden rollers, which press out the solution in excess, and it is carried to a vacuum room, where the solvents are evaporated in the following manner: An air-pump exhausts the air of the room, which is constantly replaced by hot air, furnished by an appropriate furnace, and the air impregnated with the solvents is forced into a condensing apparatus provided with a refrigerating worm, in which the said solvent is condensed and becomes fit to be used again, thus producing a great economy in the manufacture. When all the solvent is evaporated the fabric is carried into a hot-air room, where the glutinous substances are softened enough to adhere by pressure. The fabric is then freed from the wire-cloth protectors, and one or several layers, according to the thickness required, are made to pass between iron rollers, heated by an inside current of steam. The pressure thus produced brings the fibres in close contact by the adhesion of the very-thin film of glutinous matter which has been deposited around each of them. To prevent adhesion of the fabric to the rollers their surface is covered with a solution of molasses or soap in water. The final pressure and last finish are given by heated steel rollers, whose surface is either polished, embossed, or ornamented. In these operations presses may be substituted for rollers.

The material thus obtained is flexible, tough, impervious to water, and may be advantageously used as a cheap and efficient substitute for leather for the making of soles, belting, straps, harness, flooring, flexible tubes, and all other articles where ordinary or waterproof leather, and principally sole leather, may be applied. This artificial leather may be rendered porous by adding to the agglutinating solution from five to ten per cent. of common salt, in powder, which, being soluble in water, will be carried away, and leave small pores through the texture, if this is soaked and wrung in water. Another improvement may be added by subjecting this artificial leather to the ordinary process of vulcanization. In that case sulphur must be added to the agglutinating solution. The surface of this artificial leather may be covered by means of a thin layer of the solution, with tissue paper, silk, or other fabric. It may be, like ordinary leather, japanned, painted, bronzed, gilt, or ornamented in any other manner.

Having thus described my invention, and the process by which I manufacture artificial leather, what I claim as my invention, and desire to secure by Letters Patent, is—

The manufacture of artificial leather, with vegetable or animal fibres prepared substantially as aforesaid, and united by means of the agglutinating solution herein described, the use of wire-cloth protectors, to keep immovable the fabric during some of the processes to which it is submitted, and also the mode of saving the solvents used in the preparation of the solution.

CH. SAFFRAY.

Witnesses:

JOHN S. HOLLINGSHEAD,

WM. J. FAHERTY.