

UNITED STATES PATENT OFFICE.

ALBERT L. CLAPP, OF BRAINTREE, MASSACHUSETTS, ASSIGNOR TO HIDE-ITE LEATHER COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

PROCESS OF MAKING LEATHER-BOARD.

981,591.

Specification of Letters Patent.

Patented Jan. 10, 1911.

No Drawing.

Application filed July 31, 1909. Serial No. 510,558.

To all whom it may concern:

Be it known that I, ALBERT L. CLAPP, a citizen of the United States, residing at Braintree, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Processes of Making Leather-Board, of which the following is a specification.

My present invention pertains to an improved process of making leather-board, and has for its main objects the production of a superior waterproof leather-board, and an improved process by which waste leather of various grades may be utilized and employed in the production of such waterproof board.

Stated broadly, the process may be said to consist in the production of a mass of finely-divided, non-fibrous particles produced from leather, which mass is employed as a filler and waterproofing agent for the stock, composed of shredded or disintegrated fibrous leather, and thoroughly intermingling with or distributing throughout the fibrous leather said mass of particles. Under certain circumstances and conditions, a suitable agent may be added to the mass of particles, or the body of fibrous stock with which the mass is intermixed, to more thoroughly waterproof the board. The particles of the non-fibrous or amorphous mass or substance are themselves water-repellent, however, and without the addition of such agent make the board waterproof to a substantial degree.

In the usual commercial process of manufacturing leather-board a considerable waste occurs in the treatment of the stock in the beater; that is, a large percentage of the stock is dissolved in the water during the process of beating and this is all lost and greatly reduces the total yield of leather-board as compared with the original amount of stock placed in the beater. Under my process this loss is supplied by what may be termed a "filler", formed from leather, and of such a nature as to render the resultant mass waterproof or substantially so, and to produce a leather-board very superior in other respects. Leather waste or scraps which, for various reasons, cannot be successfully treated in the beater may be employed to produce such waterproofing filler, thereby utilizing an otherwise waste product, while at the same time producing a board

which is of leather throughout, and likewise waterproof.

The main or underlying process is susceptible of minor changes or variations as to certain steps and differs somewhat according to the nature of the stock employed and more particularly with the stock employed in the production of a filler.

The following process has been found to produce a highly satisfactory waterproof leather-board: The first step is to start a beater load of leather scrap,—say 1500 pounds. While this is being beaten out, I prepare the material to be used as the filler and waterproofing agent in the following manner: A quantity of leather scrap, say from 300 to 500 lbs., this being equivalent to the percentage of loss in the beater engine stock, is placed in a tank equipped with a mixer and means for heating the contents of the tank. The stock in the present instance may be composed of sole leather and heel stock, and may be termed "hard scrap" to distinguish it from upper scrap which is comparatively soft, of which more will be hereinafter said.

Previous to the introduction of the charge of hard scrap into the tank, the latter will be charged with a solution consisting, preferably, of thirty-five pounds of caustic soda (sodium hydrate), fifteen pounds of caustic potash (potassium hydrate), and three hundred gallons of water. Either caustic soda or caustic potash may be used alone, without the other, but I prefer a mixture of these two materials. The solution must be sufficiently strong to completely dissolve the leather. The leather scrap and the solution are mixed in the tank and at the same time heated until completely dissolved, the stock being usually dissolved by the solution approximately from fifteen to thirty minutes. It is important that the leather be completely dissolved so as to be precipitated in a finely-divided, amorphous or non-fibrous state when the precipitating agent is added; for it is the use of this form of material produced from leather which renders the leather-board waterproof. To this body of dissolved leather is added a suitable precipitating agent, say aluminum sulfate to the amount of one hundred pounds, such quantity being sufficient to entirely precipitate all the leather dissolved by the alkaline so-

lution. The aluminum sulfate not only causes the dissolved leather to be precipitated but likewise hardens such precipitate and the degree of hardening determines, to a greater or less extent, the degree of hardness of the ultimate product or leather-board. This precipitated mass is then introduced into the beater engine, in which the charge has been reduced to the proper fibrous consistency and the whole mixed, say, for from one to two hours, or until the mass has become homogeneous throughout, when it is drawn off into the usual storage chest. From the chest it is run out over the wet machine in the regular way.

In some cases, especially where hard scrap is used in the production of the filler, bichromate of potash, or other agent producing an insoluble chromate, may be used to render the leather-board more thoroughly waterproof. When employed, about ten per cent. by weight of the leather entering into the solution is used, which is added to the precipitate before introduction into the beater engine; or, it may be added to the mass in the beater engine before or at the same time that the precipitate is introduced therein. The use of such an agent is not essential to the production of a commercial, substantially waterproof leather board, but it is of advantage in certain cases, being particularly so when hard scrap is used for the filler instead of upper leather scrap. Owing to the fact that hard scrap comes in a cleaner condition and much freer from foreign matter than the upper scrap, the use of hard scrap is, perhaps, to be preferred. The generic invention, however, covers the use of either class of scrap, with or without the chromate as a waterproofing agent. In fact, the invention has opened up a field of use for the waste upper scrap and hard scrap, neither of which can be successfully employed as the body stock, since they cannot be reduced in the beater engine to the proper fibrous consistency.

The leather-board produced by the process above outlined is found to be waterproof, firm and pliable, and contains, together with the leather fibers, all the precipitated leather used as a filler, and produced either from the hard scrap or upper waste. The stock when being formed into the board does not adhere to the felt, and runs smoothly, picking up very rapidly on the wet machine.

While I prefer to obtain the fine particles of amorphous or non-fibrous substance by precipitation from a solution as above described, it is to be understood that this may be done in other ways. For example, I may reduce the leather scrap used for the filler to a non-fibrous state by the action of live steam, then dry the mass, and grind it to a powder, which powder is added to the material in the beater engine.

No claim is made herein to the generic process, consisting essentially of the production of a filler and the addition of such filler to a mass of fibrous leather, nor to the process of producing a waterproof filler or waterproof, colloidal filler adapted to be distributed throughout the mass of fibrous leather, as such generic invention forms the subject-matter of my copending application Serial No. 597,071, filed on or about the 13th day of December, 1910, the present case being limited to the production of the filler from leather.

Having thus described my invention, what I claim is:

1. The process of manufacturing stock for leather-board, which consists in distributing a filler, comprising a mass of finely-divided non-fibrous particles produced from leather, through a mass of fibrous leather.

2. The process of manufacturing stock for leather-board, which consists in producing from leather a filler, comprising a mass of finely-divided non-fibrous and substantially waterproof particles, and mixing such mass with a mass of fibrous leather.

3. The process of manufacturing stock for leather-board, which consists in intermixing a filler, comprising a mass of finely-divided non-fibrous particles produced from leather with a mass of fibrous leather with the addition of a waterproofing reagent.

4. The process of manufacturing leather-board stock, which consists in dissolving a quantity of leather in an alkaline solution; precipitating the same; and thereafter mixing the precipitate thus formed with a body of fibrous leather.

5. The process of manufacturing leather-board stock, which consists in dissolving a quantity of leather in an alkaline solution; precipitating the same; adding a waterproofing reagent to the precipitate; and mixing the precipitate thus treated with a mass of disintegrated fibrous leather.

6. The process of manufacturing leather-board stock, which consists in dissolving a quantity of leather in an alkaline solution composed of caustic soda and caustic potash; precipitating the leather thus dissolved; and intermixing the precipitate thus formed with a mass of disintegrated fibrous leather.

7. The process of manufacturing leather-board stock, which consists in dissolving a quantity of leather in an alkaline solution composed of a mixture of caustic soda and caustic potash; precipitating the leather thus dissolved; adding a waterproofing reagent to the precipitate; and intermixing the precipitate thus treated with a mass of disintegrated fibrous leather.

8. The process of manufacturing leather-board stock, which consists in dissolving a quantity of leather in an alkaline solution composed of a mixture of caustic soda and

caustic potash; adding a salt of aluminum to precipitate the leather thus dissolved; adding to said precipitate a salt of chromium; and intermixing the substance thus
5 produced with a mass of disintegrated fibrous leather.

9. As a new article of manufacture, leather-board composed of a body of fibrous leather rendered substantially waterproof by
10 the presence throughout the body of a finely-divided non-fibrous substance produced from leather.

10. As a new article of manufacture, leather-board, comprising a body of fibrous
15 leather having intimately intermixed therewith a non-fibrous substance, produced from leather, in a finely-divided state, said board being characterized by being substantially waterproof, firm and pliable.

11. As a new article of manufacture, 20 substantially waterproof leather-board, comprising a body of fibrous leather having intimately intermixed therewith a filler composed of a non-fibrous precipitate produced
25 from leather.

12. As a new article of manufacture, waterproof leather-board, comprising a body of fibrous leather having intimately intermixed therewith a filler comprising a water-
30 proof precipitate produced from leather.

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

ALBERT L. CLAPP.

Witnesses:

WILLIAM K. RICHARDSON,
HARRISON F. LYMAN.