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W. E. UNITED STATES PATENT OFFICE.

PHILIP H. HOLMES, OF GARDINER, MAINE.

PROCESS OF MANUFACTURING ARTICLES FROM FIBROUS MATERIALS.

SPECIFICATION forming part of Letters Patent No. 577,135, dated February 16, 1897.

Application filed May 29, 1894. Serial No. 512,910. (Specimens.)

To all whom it may concern:

Be it known that I, PHILIP H. HOLMES, a resident of Gardiner, in the county of Kennebec and State of Maine, have invented certain new and useful Improvements in Processes of Manufacturing Articles from Fibrous Material; and I do hereby declare the following to be 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.

My invention relates to an improved process for manufacturing articles from fibrous material, the object being to produce articles from a material that will be elastic, strong, tough, and waterproof.

With this object in view my invention consists in certain steps in the process of manufacture, as will be hereinafter set forth, and pointed out in the claims.

I take fiber of any kind, for instance, as wood, straw, or other fiber, or a mixture of suitable fiber and cork-dust or other suitable material to give body to the mixture, and place such stock in a beating-engine of any preferred construction, then mix oil, rubber, and paraffin-wax together in about equal quantities, although the proportions of these materials may be varied more or less, according to the particular purpose for which the composition is to be used. The oil employed may be linseed, cotton-seed, nut, or other vegetable oil. The rubber is preferably used in a liquid form, and it may be made liquid by the use of several things, as, for instance, by the use of naphtha. After these ingredients shall have been thoroughly mixed with the aid of heat I add soap in sufficient quantity to produce an emulsion that will readily mix with water. I also add to the mixture both glue and rosin or other suitable sizing. This can be changed according to the stock to be made. For instance, if the stock is to be used for the manufacture of traveling-cases I do not put in as much sizing and waterproofing material as for shoe-stock. The mixture is then poured into the beating-engine with the stock (fibrous pulp) and the engine operated for a sufficient length of time to cause the stock to become thoroughly impregnated with the mixture, which operation is facilitated by

heating the mixture while it is being subjected to the action of the beating-engine. When the materials have been thoroughly mixed with the wood fiber, I drive the materials referred to, which have become mixed with the water contained in the fiber pulp, as well as with the pulp itself, out of the water and into the fiber. This I accomplish by adding to the mixture in the engine and which has been thoroughly beaten, as described, a suitable quantity of alum, the quantity being determined by watching the mixture, and when such a quantity of alum has been added as will result in making the water perfectly clear, or substantially so, the rubber, oil, and other ingredients of the mixture will have all been driven into the fiber. The object of adding the alum is to clarify the water and also to drive from the water all materials, such as rubber and oil, into the fiber, so that when the fiber is run into sheets it will contain all this waterproofing material. Without this astringent the waterproofing material would pass out with the water and be lost, and the object would not be accomplished. This step in the process is important not only from an economical standpoint, all of the ingredients of the mixture being thereby saved and utilized, but it also is important in insuring uniformity in the product, because just the required proportion of ingredients is put into the mixture, and when the treatment is completed the fiber will contain the exact proportions of ingredients required for the production of the desired result. The pulp thus prepared is then removed from the engine and may be molded into articles or material of any desired shape, form, or size, or formed into sheets by the ordinary machinery used in the manufacture of paper or board, and from these sheets soles for boots and shoes may be cut.

In view of the fact that the material is elastic, tough, and waterproof it is specially adapted to the manufacture of substitutes for cork soles or for the inner soles which are placed between layers of leather of a boot or shoe sole, or for the removable inner soles.

Articles may be molded from the pulp, as, for instance, rollers, handles, stoppers, and an endless variety of similar articles may be

readily manufactured from the improved material.

It would of course be impossible to enumerate the various articles for which my improved fibrous material is adapted, and hence I would have it understood that I do not in any wise restrict myself to any particular use of the material. In this connection I will also state that the process may be varied somewhat without departing from my invention. In the manufacture of some articles requiring special characteristics some of the steps or ingredients specified might be omitted or varied, or additional steps or ingredients employed in the treatment and manufacture of the stock from which such articles are made. Hence I do not restrict myself or limit my invention to the precise method or the particular materials hereinbefore specified.

Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described process consisting in mixing with fibrous pulp, oil, rubber and wax, then adding material to produce an emulsion, adding alum, and forming the pulp into any desired shape.

2. The herein-described process consisting in mixing with fibrous pulp, oil, rubber and wax, then adding soap to produce an emulsion, and then adding sizing and alum, and finally forming the pulp into any desired shape.

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

PHILIP H. HOLMES.

Witnesses:

J. FRED. KELLEY,
R. S. FERGUSON.