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N. REIF.

MANUFACTURE OF PLASTIC COMPOSITIONS FROM FIBROUS MATERIALS.

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Fig. 1.

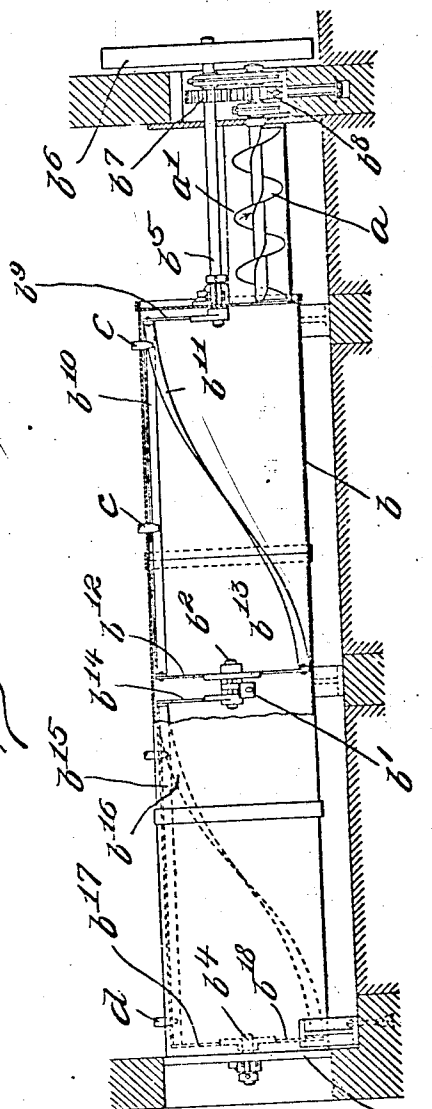
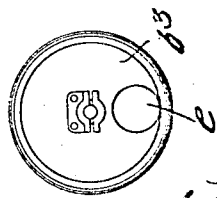


Fig. 2.



Witnesses:

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No. 895,197.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NICOLAUS REIF, subject of the Emperor of Germany, residing at Hanover, Germany, have invented certain new and useful Improvements in the Manufacture of Plastic Compositions from Fibrous Materials, of which the following is a specification.

This invention relates to the manufacture of plastic compositions of a wood-, linoleum-, india-rubber- or stone-like character from fibrous materials and oils, fats, tars and resins, which after being distributed throughout the fibrous material are sulfo-chlorinated, nitrated or oxidized and form the binding material for the fibers. The fibrous materials, for example, peat, wood, cork, paper, cellulose, refuse from textile industries, etc. are either cut into small pieces or separated into threads or fuzzed like wool, according to the purpose for which the composition is to be employed. The loose material is then saturated with basic gases, for example, with gaseous ammonia, or dusted with basic substances in a powdered form, for example, with calcium hydroxid, sodium carbonate, oxid of manganese, etc., in order to neutralize immediately the acids formed in the sulfo-chlorination or nitration of the binding material and by this means to prevent the destruction of the fibers and to prevent the binding material from being rendered brittle and dark in color by free acids. The fibrous material so treated is now moved about in a paddle-apparatus or beater and sprayed with oil, tar, fat or a mixture of these substances with resins, in such a manner that these substances, under a high pressure and in the form of a cloud-like spray are forced into the body of fibers, whereby the separate fibers or particles thereof are very uniformly covered with a microscopically thin coating of the binding material just sufficient for the connection of the fibers. At the same time or later, the binding material now on the fibrous material is sulfo-chlorinated, nitrated or oxidized, for which purpose chlorid of sulfur, nitric acid, oxygen, etc. is supplied under pressure as a cloud-like spray or vapor in quantity equivalent to the amount of binding material.

By the addition of the above-mentioned reagents, the binding material (oil, tar, etc.) on the fibers is converted into a solid material which is more or less hard and elastic and is no longer sticky but is capable of binding

when warm and resembles india-rubber or asphalt. This binding material, together with the fibrous material, forms an extremely homogeneous mass or composition that can be worked in heated rollers, tube machines (Rohrmaschinen) presses, etc. into objects of any desired kind. According to the amount of binding material or of the said reagents, a more or less wood-, linoleum-, or india-rubber-like mass or composition is obtained, which hardens during the molding or forming process. Should the objects made from the said composition require to be stone-like or fireproof, the fibrous material is dusted with suitable substances, for example, minerals, sand, sulfate of alumina, ammonium sulfate, boric acid, etc. Coloring is effected by means of mineral colors.

The drawings illustrate one form of an apparatus in which the method can be carried out.

Figure 1 is a longitudinal sectional view, and Fig. 2 an end view.

Like reference characters upon the drawings denote corresponding parts, and, referring to the drawings, *b* denotes a cylinder with which communicates a conduit *a* having arranged therein spiral conveyer *a'* for feeding the material to be treated to the cylinder *b*. Within the latter is secured a support *b'* constituting a bearing for the shaft *b¹*. Journaled in the outlet end *b²* of the cylinder *b* is a stub shaft *b⁴*. Journaled in the inlet end of the cylinder is the inner end of an operating shaft *b⁵*, the latter rotated through the medium of a pulley *b⁶* carried thereby and connected with a prime mover not shown. The shaft *b⁵* carries a gear *b⁷* which meshes with a gear *b⁸* fixed upon the shaft of the conveyer *a'*. By such construction it is evident that when motion is imparted to the operating shaft *b⁵* the conveyer *a'* will be driven. Upon the inner end of the shaft *b⁵* is a carrying arm *b⁹* to which is connected one end of the agitating blades *b¹⁰*, *b¹¹*. The other end of the agitating blade *b¹⁰* is fixed to an arm *b¹²* and the other end of the blade *b¹¹* is fixed to an arm *b¹³*. These arms *b¹²* and *b¹³* are fixed to one end of the shaft *b²*. The latter also carries an arm *b¹⁴* to which is connected one end of the agitating blades *b¹⁵* and *b¹⁶*. The other end of the blade *b¹⁵* is attached to an arm *b¹⁷* and the other end of the blade *b¹⁶* is attached to an arm *b¹⁸*. The arms *b¹⁷* and *b¹⁸* are fixed to the bearing stub *b⁴*.

From the foregoing arrangement of agit-

ing blades it is evident that when the shaft *b*⁵ is rotated motion will be imparted to the blades thereby agitating the material within the cylinder *b*. Communicating with the cylinder *b* is a plurality of nozzles *c* for the introduction of oil, tar or the like and the cylinder *b* has also communicating therewith a nozzle *d* for the introduction of chlorid of sulfur or the equivalent. An outlet *e* is formed in the end *f* of the cylinder *b*.

What I claim is:—

1. A method of manufacturing a plastic composition comprising the treating of fiber with a protective material, then adding a vulcanizable material thereto, and then vulcanizing the mixture.

2. A method of manufacturing a plastic composition comprising the treating of fiber with a material adapted to neutralize any acids formed during the process of vulcanizing, then adding a vulcanizable binder and a vulcanizer.

3. A method of manufacturing a plastic composition comprising the treating of fiber with a basic material, adding a vulcanizable binder, and vulcanizing with an acid vulcanizer.

4. A method of manufacturing a plastic composition comprising the treating of fiber with a neutralizing agent, adding vulcanizable binder thereto, and then vulcanizing with sulfur chlorid.

5. A method of manufacturing a plastic composition comprising the treating of fiber with ammonia, adding a vulcanizable binder, and then vulcanizing with sulfur chlorid.

6. A method of manufacturing a plastic composition comprising the treating of fiber with a basic material, then adding a bituminous binder, and then vulcanizing with an acid vulcanizer.

7. A method of manufacturing a plastic material comprising the treating of fiber with ammonia, then adding a bituminous binder, and then vulcanizing with sulfur chlorid.

8. A method of manufacturing a plastic composition comprising the treating of fiber with a protective material, spraying thereon a vulcanizable binder, and then vulcanizing the mixture.

9. A method of manufacturing a plastic composition comprising the treating of fiber with a protective material, then spraying a vulcanizable binder thereon, and then spraying a vulcanizer upon the mixture.

10. The herein described composition of matter consisting of fiber, and a vulcanizable binder vulcanized together and free from substances deleterious to the fiber.

11. The herein-described composition of matter consisting of fiber and a bituminous binder vulcanized together and free from substances deleterious to the fiber.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

NICOLAUS REIF.

Witnesses:

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