

UNITED STATES PATENT OFFICE.

CHARLES A. CATLIN, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO CORNELIUS S. SWEETLAND, OF SAME PLACE.

PLASTIC COMPOSITION.

SPECIFICATION forming part of Letters Patent No. 429,999, dated June 10, 1890.

Application filed February 15, 1889. Serial No. 299,999. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES A. CATLIN, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Plastic Composition, which improvement is fully set forth in the following specification.

This invention has reference to the manufacture of plastic compositions, particularly to such as are composed of a fusible material or binding agent—such as shellac, sulphur, asphaltum, and resinous matters generally—and an infusible or less fusible substance, such as asbestos fiber, paper-pulp, &c. This class includes a great variety of specific compositions used for such purposes as roofing, moldings, door-knobs, insulation of electrical conductors, battery-vessels, &c. The ordinary procedure in making such compositions has been to melt the binding agent, and while melted to stir in the fibrous, earthy, or other infusible substance, and then mold into the shape desired, sometimes with pressure. In practicing this mode of procedure it is obviously impossible to produce a uniform mixture of the several ingredients without the use of a quantity of the binding material largely in excess of the amount necessary to bind together the particles of the substance or substances with which it is mixed. Often it is desirable to avoid the use of such excess of the binding agent for economical reasons, or for the purpose of imparting to the composition in a higher degree the lasting and resisting properties of the fibrous or other material. The binding agent used is frequently highly inflammable, on which account it is desirable for many purposes to reduce the proportion used. This is accomplished by the present invention, and I have found that a composition of asbestos and a highly-inflammable resin prepared according to this invention will not maintain combustion.

Instead of combining the two substances in the manner heretofore practiced, I use the binding agent (which may be any of those commonly employed) in a finely-powdered condition, and in this state mix it thoroughly by the aid of water with the infusible or less fusible substance or substances, and after

drying compact the whole by heat and pressure. The powdered binding agent being evenly distributed through the mass and heat and pressure being then applied, a composition of uniform density, strength, and appearance is produced, in which the particles adhere tenaciously, and which is superior in many respects to a composition of the same ingredients made by ordinary processes. By thus using the binding material in a finely-divided state it is possible to reduce the amount used to approximately that actually necessary for firmly binding together the particles with which it is mixed, since in that condition it is very easily distributed throughout the mass.

It has been proposed prior to my invention to make substitutes for wood or ivory by mixing fibrous matter in a dry state with a pulverized cementing agent and then applying heat and pressure to fuse the cement and compact the mass. It is not practicable, however, to mix a fibrous material with a pulverized binding agent in a dry state. Such mixture I obtain with the aid of water or by pulping the two together. Furthermore, it is impossible to obtain a perfect felting or batting effect by pressing dry fibrous materials into molds, whereas by pulping the fibrous material according to my invention the desired felting of the fibers can be realized, and the material may, in pressing out the excess of moisture, be pressed into a form approximating that ultimately desired.

Many of the resins and tars cannot be powdered in a dry condition, and when, for instance, coal-tar pitch is used it must be ground in cold water. In this case it is not necessary to dry it out again before mixing; but it may in this condition be mixed with fibrous or other material. The pulpy mass can be formed into sheets or into approximately the shapes desired, and the larger part of the water removed by pressure, care being taken not to force out the cementing-powder with the water. The mass is then dried in any suitable way, as by exposure to the atmosphere for a sufficient length of time, when heat is applied sufficient to soften the cementing-gum to a proper degree, and then the

mass compacted by means of rolls or dies or pressed into shape in molds.

In some cases the cementing substance in pulverulent form may be deposited on the fibrous or other material by precipitation. For example, I take asbestos and mix it with a solution of rosin soap, to which may be added marble-dust or any mineral addition, then add a calcium salt (chloride, for example) in solution, and the result is a precipitation of calcium rosin soap upon and throughout the mass of fiber and other material used. This method of applying the fusible binding agent in a pulverulent form produces an excellent result, the material being thoroughly and uniformly distributed. The process is completed by pressing out the water, drying, heating, and compressing, as above described. It will be understood, of course, that other resins and soaps may be used in like manner.

The present invention is particularly useful in preparing compositions in which asbestos fiber constitutes the main ingredient. In preparing compositions with this and other materials I employ, say, thirty-three per cent. of the binding agent, though good results may be obtained with a smaller proportion of the binding agent, particularly where rosin and coal-tar pitch are used. When asphaltum is used for this purpose, it is found that the result is a practically incombustible substance which it is almost impossible to burn by holding it directly in the flame. This latter composition is particularly useful for the construction of battery-cells, and is also a valuable insulating material, as are many other analogous compositions prepared by the same process. Such compositions are unaffected by moisture and climatic changes, and are sufficiently rigid for such purposes as outside boarding-shingles, ceilings, &c. The readiness with which they may be molded, filed, sawed, cut, sandpapered, and nailed makes them useful for various building and other purposes.

Picture-frames or moldings can be readily prepared from the compositions specified, and for such uses the absence of tendency to warp, shrink, or swell as a consequence of moisture or climatic changes is a very desirable property.

In the process of heating the mass while pressing the particles of the several substances together, as specified, it is believed

that chemical changes occur, whereby both a more perfect union of the ingredients and also a reduction in a considerable measure of the inflammability of the finished material are effected. For example, when rosin and quicklime are both used, the heating and pressure produce a more or less perfect combination of the two.

I claim as my invention and desire to secure by Letters Patent—

1. The process herein described for the manufacture of compositions of matter, said process consisting in combining a fibrous material with a cementing agent in a pulverulent state by mixing said substances together with water, and after a thorough mixture has been obtained removing the surplus moisture, fusing the cementing agent, and compacting by pressure, substantially as set forth.

2. The described process of making compositions of matter of a non-fusible substance and a fusible binding agent, said process consisting in pulping the two substances together, the binding material being in a finely-divided state, removing the superfluous moisture, and heating and compressing, as set forth.

3. The process herein described for the manufacture of compositions of matter, which process consists in pulping a fibrous material with a binding agent in a pulverulent condition, pressing to remove the surplus moisture, and at the same time bring the mass to approximately the form desired, and finally uniting the substances by heat and pressure, as set forth.

4. The described process of making compositions of matter containing a fusible binding agent (such as coal-tar pitch, or like material) and an infusible substance, (such as asbestos,) said process consisting in reducing the binding agent to a pulverulent condition by grinding in cold water, mixing the infusible substance therewith, pressing to remove the surplus moisture, and finally uniting the two by heat and pressure, as set forth.

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

CHAS. A. CATLIN.

Witnesses:

GEO. E. LEONARD,
E. T. HERRICK.