

# UNITED STATES PATENT OFFICE.

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## PROCESS OF PRODUCING A MOLDED MASS.

975,691.

Specification of Letters Patent.

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No Drawing.

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*To all whom it may concern:*

Be it known that we, ADOLF HOF and ANTON PIEPER, both citizens of Germany, and residents, respectively, of Witten-on-the-Ruhr and Schmallemburg, Westphalia, Germany, have invented new and useful Improvements in Processes of Producing a Molded Mass, of which the following is a specification.

It is well known to employ bituminous substances, such as asphalt, coal tar pitch, colophony, etc., as binding agents in the manufacture of artificial paving stones, briquets and similar articles. These binding agents were completely or partly dissolved by the addition of a suitable solvent to insure their penetration into the pores of the material to be filled, and then the solvent was removed by evaporation or burning, as its presence would affect injuriously the strength and consistency of the product. This removal of the binding agent would necessarily entail a corresponding loss in the bulk of the article produced.

The present invention relates to an improved process of making molded masses by combining the particles of a suitable filling material with a binding agent which has been partly or completely dissolved by a solvent of such a character that it will become polymerized when heated to a high temperature and for a longer time while in contact with a bituminous substance. In this way such a disposition of the atoms will be obtained as will insure the most intimate relationship between the binding agent and the solvent. As solvents may be used petroleum residues and similar hydrocarbons of the methane-ethylene and acetylene series that boil at a high temperature. After the binding agent has fulfilled its function as such agent, it is subjected, within the molded mass, to a high temperature for a considerable length of time, so as to become more or less polymerized. In this way the final product will be composed of practically two ingredients only, namely, the filling material and the binding agent, without thereby entailing any loss in bulk or weight.

As the polymerization would not produce the firm product desired if the moisture contained in the molded mass would be simultaneously vaporized, it is of advantage to first free the filling material separately from its moisture by heating the same. The dried filling material is then impregnated under

the same heat with the solvent, the binding agent is added and the temperature is raised to effect the polymerization desired.

The process is carried on in the following manner: The filling material such as stones, blast furnace slag, volcanic sands, or the pulverized ore, furnace dust, etc., used in the manufacture of briquets, is so highly heated in a pre-mixer that it is thoroughly dried. Before the unmoistened particles can again take up water by contact with the air, they are impregnated with the petroleum residue, or other liquid or liquefied hydrocarbon. This solvent will thoroughly penetrate the filling material and will be distributed uniformly throughout the mass. After a complete impregnation of the filling material with the solvent has been effected, a hydrocarbon is added, and is again thoroughly mixed with the impregnated filling material. Owing to the partial solution of the binding agent by the solvent at the contact faces of the filling material, a thorough absorption of the binding agent will take place. The cover of the pre-heater is now removed and the mixture transferred directly to a retort which is then closed and where the mixture is heated to about 300° Celsius and is thoroughly stirred or kneaded under the exclusion of air. It may here be stated that the sulfur which is always present in the asphalt materially promotes the polymerization. To the finished mass, either warm or cold, is now given the proper form and consistency by a press, so that the artificial stones, bricks, briquets, tubes or vessels desired are molded. If asphalt meal is to be produced, the mass, after leaving the retort, is subjected to the action of a centrifugal machine and triturated.

Within the finished product, the asphalt will have lost its objectionable properties. Thus, its peculiar smell will entirely disappear and its tendency to become soft under increasing heat and brittle under the action of cold will be diminished. As the selection of any particular filling material is unlimited, molded masses can be produced which are entirely water and acid proof. The product is well adapted for use in chemical factories to form dressings, linings, tubes, vessels and similar articles.

We claim:

1. Process of producing a molded mass which consists in charging a filling material with a solvent adapted to be polymerized in



contact with a binding agent, adding said binding agent and heating the mass to about 300° Celsius under the exclusion of air.

2. Process of producing a molded mass, which consists in drying a filling material, adding a solvent such as petroleum residue adapted to be polymerized in contact with a hydrocarbon binding agent, adding said hydrocarbon binding agent, and then heat-

ing the mass to about 300° Celsius under 10 the exclusion of air.

Signed by us at Dusseldorf this twentieth day of June 1908.

ADOLF HOF.  
ANTON PIEPER.

Witnesses:

PETER LIEBER,  
WILHELM FLASCHE.