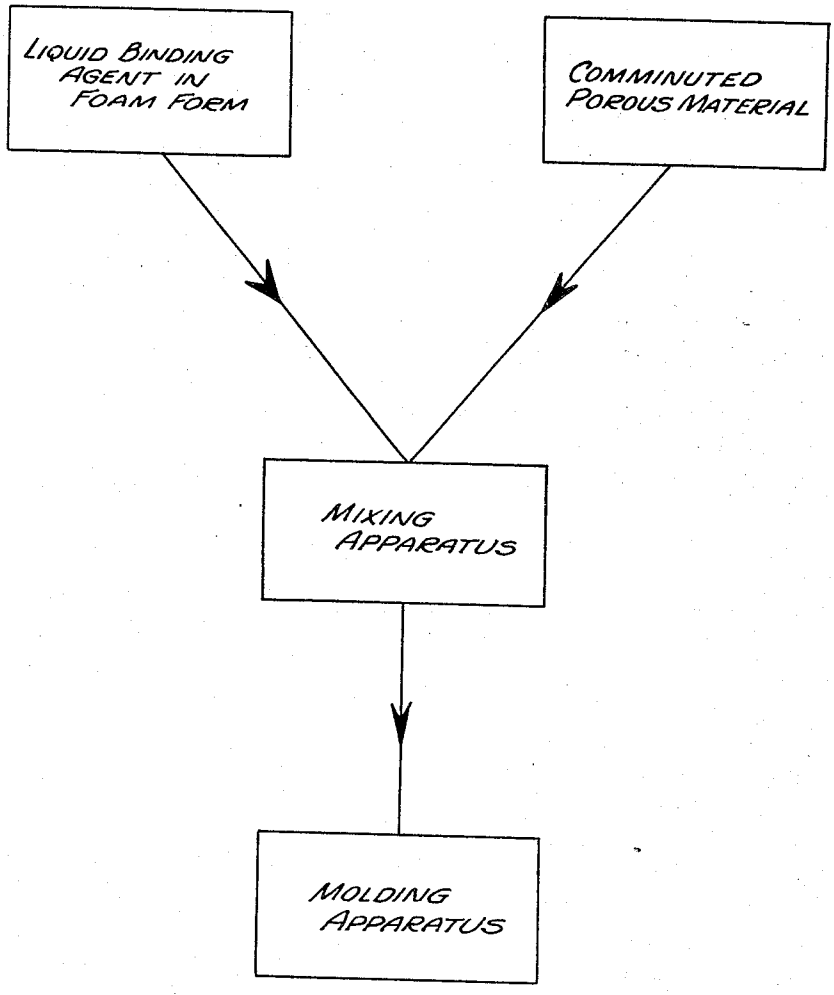
Dec. 28, 1943. A. MENGER ET AL 2,337,915

SHAPED BODY AND PROCESS OF PREPARING THE SAME

Filed Aug. 26, 1941



Inventors:
ADOLF MENGER
EUGEN BOCK

By Henry W. Coughlin
Attorney

Patented Dec. 28, 1943

2,337,915

UNITED STATES PATENT OFFICE

2,337,915

SHAPED BODY AND PROCESS OF PREPARING THE SAME

Adolf Menger and Eugen Bock, Krefeld-Uerdingen, Germany; vested in the Alien Property Custodian

Application August 26, 1941, Serial No. 408,346
In Germany April 30, 1940

10 Claims. (Cl. 18—48)

It is known that pressed plates may be prepared by mixing comminuted porous materials especially comminuted wood such as wood dust or shavings, furthermore leather, fibrous materials or the like with a liquid binding agent, if desired, while simultaneously adding a non-porous substance such as stone powder and, thereupon, pressing the mixture obtained, if desired, at a raised temperature.

This process of preparing pressed plates by using porous materials has the disadvantage that during the mixing operation a considerable portion of the liquid binding agent penetrates into the interior of the particles of the comminuted material and, consequently, cannot take part in the binding of the particles together which during pressing takes place at the surface of said particles. In order to obtain plates of satisfactory strength it is, therefore, necessary to use such large quantities of liquid binding agent that the weight of the plates is undesirably high for many purposes.

The object of this invention is a process of preparing shaped or molded articles, in particular pressed plates, which avoids the above drawbacks.

According to the process of the present invention, which is illustrated by the flow sheet in the accompanying drawing, the liquid binding agent is mixed in the form of foam with the porous material and the mixture is then pressed. It is surprising that the structure of the foam is not destroyed during the mixing thereof with the comminuted material. On the contrary, the surface of the particles is coated with a layer of foam which is relatively stable and is absorbed but little by the particles so that practically almost the entire binding agent is available for binding the particles of material when the masses are pressed together. Consequently the present process requires much smaller quantities of binding agent than used in the processes hitherto known while, at the same time, shaped or molded articles much lighter in weight may be obtained.

In order to obtain shaped or molded articles of satisfactory strength it is necessary, according to the process of the present invention, to shape the particles by pressure at such temperatures and under such pressures that the foam structure of the binding agent is destroyed to a considerable extent. These conditions may be readily ascertained for each particular case by a simple test.

The foam may be prepared according in a known manner by finely dispersing gases, especially air, in the liquid or dissolved gluing substance. It is advantageous to add foam-forming or foam-promoting agents such as, for instance, albuminous substances, saponins or the like or other natural or artificial organic compounds of high molecular weight. The gas may also be produced in known manner, in the solution of the gluing agent itself, for instance, by addition of carbonates or bicarbonates from which carbonic acid is split off by heating or by adding an acid.

For the process of the present invention there may be used any of the binding agents usual in the art and, especially synthetic binding agents, such as, for instance, those having as their base urea-aldehyde or phenol-aldehyde condensation products. Natural binding agents may be used such as glue from hides, bone glue, dextrin or the like.

According to the process of the present invention there may be obtained, for example, in addition to pressed plates, blocks, beams of any cross section, for instance, masts, T-girders or the like, chair legs, lamp stands, doorknobs, containers and casings or the like.

The following examples serve to illustrate the invention but they are not intended to limit it thereto; the parts are by weight.

Example 1

2,5 parts of butylnaphthalene sulfonic acid, 1 part of ammonium chloride, 5 parts of urea and 25 parts of an ammoniacal solution of casein of 5% strength are added to 100 parts of an aqueous solution of 65% strength of a condensation product from urea and formaldehyde. Into this mixture air is introduced in a finely divided state by means of a rapidly agitated stirring device until the volume of the glue-batch has trebled.

50 parts of this foamy glue mixture are well mixed with 1000 parts of wood shavings. The material thus obtained is brought into a press or a press mould and pressed for 12 hours at 20° C. whereby a pressed plate of remarkable strength is obtained.

Example 2

100 parts of a foamy glue mixture according to Example 1 are well mixed with 1000 parts of comminuted wood waste obtained in the manufacture of ply wood. The material thus obtained is brought into a press or a press mould and pressed for 12 hours at 20° C. the structure of the foam being destroyed by the action of the pressure and the subsequent binding operation. In this way a beam of remarkable strength is obtained.

We claim:

1. A process of preparing molded articles which comprises mixing a liquid binding agent in the form of foam with comminuted porous material and subjecting the mixture to a pressure sufficient to form the article and substantially completely destroy the foam structure of the binding agent.

2. A process of preparing molded articles which comprises mixing a liquid binding agent in the form of foam, the base of which is a synthetic resin, with comminuted porous material and subjecting the mixture to a pressure sufficient to form the article and substantially completely destroy the foam structure of the binding agent.

3. A process of preparing molded articles which comprises mixing a liquid binding agent in the form of foam, the base of which is a urea-aldehyde condensation product, with comminuted porous material and subjecting the mixture to a pressure sufficient to form the article and substantially completely destroy the foam structure of the binding agent.

4. A process of preparing molded articles which comprises mixing a liquid binding agent in the form of foam, the base of which is a urea-formaldehyde condensation product, with comminuted porous material and subjecting the mixture to a pressure sufficient to form the article and substantially completely destroy the foam structure of the binding agent.

5. A process of preparing molded articles which comprises mixing a liquid binding agent in the form of foam, the base of which is a urea-formaldehyde condensation product, with comminuted wood and subjecting the mixture to a pressure sufficient to form the article and substantially completely destroy the foam structure of the binding agent.

6. A molded article obtained in accordance with the process of claim 1.

7. A molded article obtained in accordance with the process of claim 2.

8. A molded article obtained in accordance with the process of claim 3.

9. A molded article obtained in accordance with the process of claim 4.

10. A molded article obtained in accordance with the process of claim 5.

ADOLF MENGER.
EUGEN BOCK.