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SHAPED BODIES AND PROCESS OF PREPARING THE SAME

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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 already 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 process which during the pressing takes place at the surface of the 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 for many purposes undesirably high.

The object of this invention is a process of preparing shaped bodies, in particular pressed plates, which avoids the above drawbacks. According to this new process 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 with the comminuted material; the surface of the particles is coated rather with a layer of foam which lasts well and is hardly absorbed so that practically almost the entire binding agent is available for binding the particles of material when the masses are pressed together. Consequently this process requires quantities of binding agent which are much inferior to those used in the processes hitherto known and shaped bodies of much less weight are obtained.

In order to obtain shaped bodies of satisfactory strength it is necessary, according to the process of the present invention, to effect the pressing process at such temperatures and under such pressures that the foam structure of the binding agent is destroyed to a considerable extent. These conditions will easily be ascertained for each particular case by a simple test. The foam may be prepared according to any known manner by finely dispersing gases, especially air, in the liquid or dissolved glueing 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 glueing agent itself, for instance, by addition of carbonates or bicarbonates from which carbonic acid is then split off by heating or by adding an acid.

For the process of the present invention there are suitable binding agents of all kinds, especially synthetic binding agents, such as, for instance, those built up on the basis of condensation products from urea and aldehyde or from phenol and aldehyde, furthermore, natural binding agents such as glue from hides, bone glue, dextrin or the like.

According to the process of the present invention there may be obtained besides pressed plates, for instance, 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.

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