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A method for the manufacture of fibreboards.

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The invention relates to a method for the manufacture of fibreboards from a paper material ground to a fleece, coated with a thermoplastic and where the thermoplastic constitutes the bonding agent in the fibreboard.

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A METHOD FOR THE MANUFACTURE OF FIBREBOARDS

The present invention relates to a method for the manufacture of fibreboards by distributing between two plates a paper material ground to a fleece and subsequently subjecting the same to pressure and heat.

Different types of fibre or particle boards have a wide field of application within the building industry and the manufacture of furniture. These boards may be of different quality and nature depending on the field of application. More strongly compressed boards are used, for example, as a substitute for the more expensive timber in furniture framework and fittings. More loosely compressed fibreboards may be used as partly insulating layers in walls, floors and roofs.

The method of manufacturing fibreboards or particle boards is generally known, and for this purpose wood particles of different qualities and coarsenesses are used, and in this way boards of different properties are obtained. Common to all the boards which are known is that a bonding agent of some kind has to be blended into the fleece material. As this bonding agent usually is in the form of a powder or grain the mixing can bring about problems as the fleece material quite often has a different grain size. Moreover, when coarser particles are used these should not be subjected to the mechanical effects which a mixing process involves, as the particles are brittle and break readily.

Conventional manufacture of particle boards also means that a wood has to be used as a raw material which on the one hand is expensive and, on the other hand, can be used for different purposes.

Particle boards in accordance with known manufacturing processes, once they are made into boards, cannot be converted, since the bonding agent cannot be reheated and act again as a bonding agent.

It is an object of the present invention to provide a method for the manufacture of a fibreboard where the bonding agent is included in the fibre fleece.

It is a further object of the present invention to make it possible to manufacture cheaper fibreboards.

It is a further object of the present invention to make it possible in a simple manner to provide fibreboards with a particular three-dimensional shape desired.

These and other objects have been achieved in accordance with the invention in that the method described in the introduction has been given the characteristics that the paper material is coated at

least one one side with a thermoplastic which on treatment with heat and pressure is made to melt and in that way bonds together the paper fleece.

The paper material ground to a fleece is spread out between two plates whereafter it is subjected to pressure and heat. The paper material should be coated at least on one side with a thermoplastic which, when the material has been ground to a fleece, will be uniformly distributed in the fleece mass.

A paper material of the abovementioned type is found to be obtainable at a low price in the packaging industry which manufactures non-returnable packages for liquids from paper coated with thermoplastics. In the said industry a certain wastage always exists on changing of the material rolls, edge shearing, faulty printing or the like. This waste material is of little use in other fields and commands therefore a considerably lower price than does wood as a raw material for the conventional manufacture of particle board.

When the spread out fibre mass is heated to a temperature above the melting point of the thermoplastic, that is to say at least 105°C, the plastic which adheres firmly to the paper particles melts. In practice a temperature of at least 170°C is required as transfer losses occur. If at same time the spread out fibre mass is subjected to a compressive stress, a fibreboard is obtained where the paper fleece is held together by the molten thermoplastic. The pressure which is to be applied is adapted to the type of board which one wishes to manufacture. To obtain a strongly compressed fibreboard which is substantially homogeneous and where virtually all the air is pressed out, a pressure of approx. 700 kN/m² should be applied for approx. 1 min per mm finished board. Such a fibreboard with a substantially smooth surface may be used to great advantage as a substitute for timber or particle boards in furniture making and in the manufacture of fittings. Through the addition of colour to the fibre mass it is also possible to obtain fibreboards for a more decorative use.

If profiled press plates are used, boards of the homogeneous types described above may also be manufactured, which may be given a desired three-dimensional shape already during manufacture.

It is also possible to reheat these fibreboards with thermoplastic as a bonding agent manufactured in accordance with the invention and afterwards under pressure and in moulds impart to them a desired three-dimensional shape.

In the manufacture of porous fibreboards a homogeneous paper layer, coated at least on one side with thermoplastic, is introduced between

each pressure plate and the fibre mass. This thermoplastic surface is located nearest the fibre mass and during heat treatment this surface layer also melts and bonds together the paper fleece with the outer homogeneous paper layer. To obtain a more porous board a pressure treatment at an appreciably lower pressure is required than for a corresponding homogeneous board. A pressure of approx. 20 kN/m² is required. The temperature is to be approx. 200° C. A higher temperature is required due to the fact that the air caught between the fibres causes a greater loss of temperature, when the fibre material is pressed.

The time duration of pressure application is dependent of the thickness of the fibre material to be pressed and the grade of porosity wanted.

The fibre mass then still contains a quantity of air, so that this type of board can have wide uses in the building industry as a partly insulating building material, especially in countries with a shortage of timber.

As is evident from the foregoing description a method is achieved by the present invention for the manufacture in a simpler and substantially cheaper manner of fibreboards for various fields of application.

Claims

1. A method for the manufacture of fibreboards by distributing between two plates a paper material ground to a fleece and subsequently subjecting the same to pressure and heat, **characterized in that** the paper material is coated at least on one side with a thermoplastic which on treatment with heat and pressure is made to melt and in that way bonds together the paper fleece.
2. A method for the manufacture of fibreboards in accordance with claim 1, **characterized in that** the heat and pressure treatment is adapted so that the paper fleece is baked together to a substantially homogeneous board.
3. A method for the manufacture of fibreboards in accordance with claim 2, **characterized in that** the manufacture takes place at a temperature of 170° C and a pressure of approx. 700 kN/m².
4. A method for the manufacture of fibreboards in accordance with claim 2, **characterized in that** with the help of profiled press plates a desired three-dimensional shape is imparted to the fibreboard during manufacture.
5. A method for the manufacture of fibreboards in accordance with claim 2, **characterized in that** a desired three-dimensional shape can be imparted to the finished fibreboard on renewed heating and pressure treatment.
6. A method for the manufacture of fibreboards in accordance with claim 1, **characterized in that**

between each press plate and the fibre fleece a homogeneous layer of paper material, coated at least on one side with a thermoplastic, is introduced.

7. A method for the manufacture of fibreboards in accordance with claim 4, **characterized in that** the heat and pressure treatment is interrupted before the fibreboard becomes homogeneous with the intention of obtaining a more porous material with air enclosed between the paper fleece.



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	DE-B-1 151 374 (HABRA-WERK, WILHELM F. OTT) *Whole document* ---	1-7	B 27 N 3/02
X	DE-A-2 258 169 (FA. ADOLF SIEBERT) * Whole document* -----	1-7	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			B 27 N B 29 J C 04 B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
STOCKHOLM		15-11-1989	JENSEN O.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	