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LAMINATED PRODUCTS

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My present invention has to do with the preparation of sheets composed of fibrous material and a condensation product.

More specifically my present invention concerns itself with the preparation of sheets or a series of sheets comprising separate laminated layers, each lamination consisting of artificially prepared staple fibres impregnated with a phenolic condensation product.

Although the present invention is described with especial reference to a phenolic formaldehyde or other phenolic condensation product it is to be understood that other condensation products which will give the same results are to be included in the term "phenolic condensation products" as used throughout this specification and the appended claims.

Hitherto it has been the practice to prepare a series of laminated plates which are superimposed to form blocks of materials for use in the manufacture of molded articles. These have been prepared through the use of cotton batting (see U. S. Patent #1,318,743) or of woven sheets comprised either of ordinary cloth or of artificial fibre. These sheets have hitherto been saturated with diluted solutions of Bakelite and subjected to a first drying without however completing the hardening thereof. The webs thus prepared were cut into blocks or plates of the desired size. In the prior art such plates were superimposed one above the other and subjected for some time to hot pressing in order that they may combine one with the other. For example, a pressure of from 500–1000 kg. per square cm. and a temperature of, for example, 150° C were employed. The resulting product is what might be termed a fused plate or block which may be further worked up by sawing, lathing, planing, milling, boring and polishing.

One objection to the process outlined above is that considerable quantities of the fabric are utilized in the preparation of such products. For example a composition of 40% fabric and 60% Bakelite is common. For this reason this procedure has been expensive because it was necessary first to spin the fibres into yarn and then prepare the fabric from this yarn.

Wishing to eliminate the costs enumerated above and still produce a satisfactory product I have conceived the following invention.

Essentially I utilize what I may term sheet-like distributed textile fibres. The loose fibre masses, according to my present invention, are worked up into a sheet-like card web on a carding machine and these card webs are directly impregnated with a sufficient quantity of a phenolic condensation product. I have found it preferable to free this card web from excessive solvents immediately by heating in a continuous operation. This product is then dried so that it may easily be handled, but it is not completely hardened.

These sheets thus preliminarily prepared are then placed one above the other in any desired shape, size or form, and pressed in order to complete the hardening.

The temperatures and pressures of the prior art may be employed in the final production of my laminated sheets.

It will thus be seen that by using staple fibres just as they are produced in the form of a thin matting I may secure results which have hitherto been possible only when the fibres were first spun and then woven into a fabric. Thus I have eliminated two expensive steps from this process, yet the end product is equal in strength and appearance to those produced in the prior art. The impregnation may be accomplished through the use of fine sprays arranged so as to contact the moving web either from above or from above and below. These sprays must be of such consistency that they do not seriously impair the continuity of the web thus being impregnated. For the support of the web during impregnation a porous or foraminous belt-like arrangement may be employed so that the Bakelite solution may drain off below and then be recovered and reused.

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