June 16, 1953 F. FAHRNI 2,642,371

COMPOSITE WOODEN BOARD

Filed Jan. 31, 1950

FIG. 1.

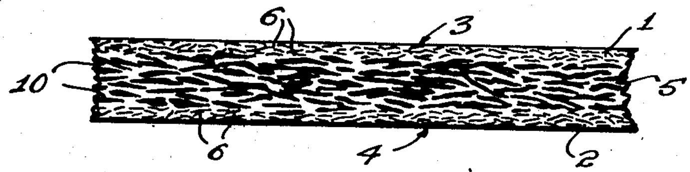

FIG. 2.

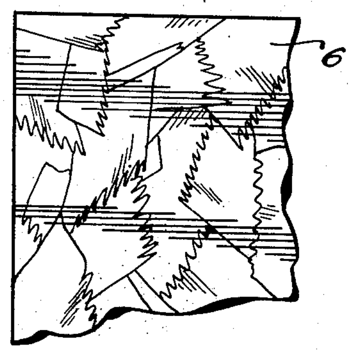

FIG. 3.

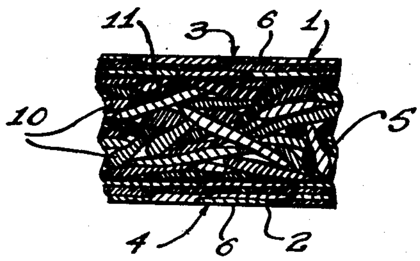

FIG. 4.

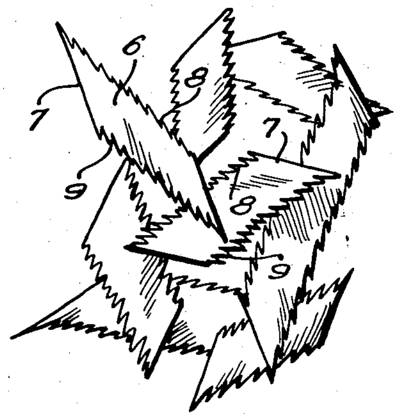

FIG. 5.

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BY
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UNITED STATES PATENT OFFICE

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COMPOSITE WOODEN BOARD

Fred Fahrni, Zurich, Switzerland

Application January 31, 1950, Serial No. 141,409
In Germany April 25, 1942

22 Claims. (Cl. 154—45.9)

1

The object of the present invention is a process for the manufacturing of compound compressed plates made of layers of pieces of wood and binding materials.

The products so far known of this type, made of wood pieces and the like mixed with a binding substance, showed great disadvantages.

When the pieces of wood were of coarser splinter shaped material, the surface is too rough and unsuitable for many uses, as for instance for flooring, cabinet-maker's work and so on.

Where a finer material is used, which necessitated a larger amount of binding substances, such plates are too expensive, all the more when coarser pieces of wood are used and reduced to a finer material, which necessitates a larger use of energy.

In addition compressed masses out of fine material alone with water contents of 8% and over, when compressed hot, presented difficulties, because the steam could not escape and steam bubbles spoiled the production.

This disadvantage can be obviated by placing a metal sieve or the like between the heated press and the mass to be compressed, which however on the other hand makes it impossible to produce plates smooth on both sides, since a sieve mark on one of the sides prevents it.

These difficulties have now been overcome by the process according to the present invention by superimposing at first a basic layer of fine, selected material, then a middle layer of coarser material, needing less binding substances, and finally a covering layer of fine, selected material the mass so obtained being then compressed in one operation.

A major advantage of this process is that due to the presence of the said middle layer, relatively coarse wood waste of any shape, colour and size without any great additional use of materials for binding may be used for making compound compressed well looking wood plates.

The plate has, nevertheless, as a result of the special basic and covering layers, a perfectly fine and equal surface, so that its uses are almost endless.

The porous structure of the coarser inner layer serves simultaneously as a channel for steam so that on both sides smooth plates are obtained.

More beautiful and smoother surfaces are obtained by keeping the outer layers damper than the inner ones during the compression, so that the general development of steam is relatively slight. Thus warping of the plates will be avoided.

2

It is further advantageous to add larger quantities of binding so as of substances ensuring a better appearance and resistance to outside influences to the pieces of wood destined to the outer layers than for the inner layer. Such substances consist for instance of waterproofing or additions in order to achieve a larger resistance to humidity, to harden the pieces of wood, colours of same, heightening of the powers of resistance against mildew and mold and so on. Thereby, in spite of a great reduction of production costs, the whole surface of the outer surface is particularly good and firm.

The present invention relates to wooden boards, and more particularly to composite wooden boards for building purposes, furniture and the like.

This application is a continuation-in-part of my application Serial No. 630,619, filed November 24, 1945, for "A Process for the Manufacturing of Compound Compressed Plates Made of Layers of Pieces of Wood and Binding Materials."

It is an object of the present invention to provide a wooden board consisting of an inner or core layer having good heat and sound insulating properties, and outer or texture layers having a relatively high mechanical strength.

It is another object of the present invention to provide a composite wooden board consisting of an inner or core layer having a relatively low density and outer or texture layers having a relatively high tensile strength and being substantially impervious to water.

It is a further object of the present invention to provide a composite wooden board consisting of an inner or core layer having good heat and sound insulating properties and a relatively low density and outer or texture layers having a smooth outer surface and being substantially impervious to water.

According to this invention a wooden board comprises in combination, a thin layer of superposed unoriented flat wood shavings arranged substantially parallel to the outer faces of the finished board, and an adhesive substance firmly connecting said flat wood shavings directly to one another so that the flat wood shavings firmly adhere directly to one another and provide a wooden board substantially impervious to water and having a high tensile strength.

A composite wooden board according to the invention comprises in combination, a core layer of randomly arranged wood particles providing air spaces between themselves, a binder substance firmly connecting the randomly arranged wood

particles so that the randomly arranged wood particles firmly adhere to one another and provide a porous core having good heat insulating properties, a relatively thin outer layer arranged on one face of the porous core and consisting of superposed unoriented flat wood shavings arranged substantially parallel to the outer faces of the finished board, and an adhesive substance connecting the flat wood shavings to one another and to the porous core whereby the flat wood shavings firmly adhere to one another and to the porous core so as to provide on one side of the porous core a firmly adhering surface layer being substantially impervious to water and having a high tensile strength.

A preferred embodiment of the present invention comprises in combination a central layer of randomly arranged wood particles providing air spaces between themselves, a binder substance firmly connecting the randomly arranged wood particles so that the randomly arranged wood particles firmly adhere to one another and provide a porous core having good heat insulating properties, two relatively thin outer layers arranged on opposite faces of the porous core, respectively, and consisting of superposed unoriented flat wood shavings arranged substantially parallel to the outer faces of the finished board, and an adhesive substance connecting the flat wood shavings in each of the outer layers to one another and to the porous core whereby the flat wood shavings firmly adhere directly to one another and to the porous core so as to provide on both sides of the porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

Preferably the central core layer consists of randomly arranged splinter-shaped wood particles providing air spaces between themselves whereas the two outer layers are arranged on opposite faces of the central core layer, respectively, and consist each of compressed superposed unoriented flat shaving-shaped wood particles arranged substantially parallel to the faces of the central core layer; an adhesive substance penetrates all the wood particles and firmly connects them to one another so that the same firmly adhere to one another and provide a finished composite wooden board, comprising a highly heat and sound insulating central core and firmly adhering substantially water-impervious outer layers having a high tensile strength.

In an embodiment of the present invention the splinters of which the core material consists have a length of about 5 to 50 mm., a width of about 5 to 10 mm., and a thickness not exceeding several mm. preferably of about 1 to several mm.

In an embodiment of the present invention the binder substance in the core layer amounts to a very small percentage, e. g., to about 3.5 to 4% by weight of the weight of the splinters.

In an embodiment of the present invention the binder substance in the outer layers amounts to a small percentage, e. g., to about 10 to 14% by weight of the weight of the shavings.

It should be noted that preferably the percentage of binder substance in the outer layers is substantially larger than the percentage of the binder substance in the core layer.

In an embodiment of the present invention the number of the super-imposed shavings is at any part of any of the outer layers at least 2 and not more than 5.

In an embodiment of the present invention the core layer is substantially thicker than any of the outer layers, i. e., has a thickness equal to several times the thickness of each of the outer layers. Each of these outer layers is relatively thin and has, e. g., a thickness of about 2 mm.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a sectional view of a composite wooden board according to the present invention;

Fig. 2 is a plan view of an outer layer of the board shown in Fig. 1;

Fig. 3 is an enlarged view of part of Fig. 1;

Fig. 4 shows some of the splinters used for the central or core material of the board shown in Fig. 1; and

Fig. 5 shows some of the shavings forming part of the outer layer of the board shown in Fig. 1.

Referring now to the drawings and first to Fig. 1, the two outer layers of finer material **1** and **2** with mirror-smooth upper surfaces **3** or **4** are immediately recognizable as also the middle layer **5** of coarser material.

The outer layers **1** and **2** of the composite wooden board are relatively thin and consist of superposed unoriented flat wood shavings **6** (Figs. 2 and 5) arranged substantially parallel to the outer faces of the finished board. An adhesive substance firmly connects the flat wood shavings directly to one another so that the flat wood shavings firmly adhere directly to one another and provide a wooden board **1** or **2** which is substantially impervious to water and has a high bending strength. At any part of the outer layer **1** or **2**, the number of the superposed shavings is at least equal to 2 and less than 5, as will be clearly seen from Figs. 1 and 3. The adhesive renders the outer surface **3** and **4** of the outer layers very smooth and like a mirror. The adhesive amounts to about 10 to 14% by weight of the weight of the shavings.

The shavings are preferably shaped substantially as parallelograms having the shorter sides **7** thereof cut along the fibers **8** of the wood as clearly seen in Fig. 5. The longer sides **9** of the shavings are indented and run at an angle to the shorter side of the parallelogram which is appreciably different from 90°, for instance equal to 30 or 45°. Fig. 2 shows the shavings **6** in a finished board where they partly overlap one another and are distributed at random with their flat sides parallel to the finished board, and to the core layer presently to be described.

The central or core layer **5** consists of randomly arranged wood particles **10** (Figs. 1, 3 and 4) which are preferably splinter-shaped so as to provide air spaces **11** between them which impart to the core layer a relatively low density and highly heat and sound insulating properties. The wood splinters **10** are firmly connected to one another by a binder substance which amounts preferably to about 3.5 to 4% by weight of the splinters. The splinters **10** have preferably a length of between 5 to 50 mm., a width of between 5 to 10 mm, and a thickness of one to several mm.

The central or core layer is porous throughout whereas the outer layers of shavings are non-porous and substantially impervious to water. Preferably the central layer has at least a thick-

ness equal to several times the thickness of each outer layer. Each of these outer layers has a thickness of about 2 mm.

The outer layers and the core layer adhere firmly to each other owing to the binder and adhesive substance and provide a finished composite wooden board comprising a highly heat and sound insulating central core 5 and firmly adhering substantially water impervious outer layers 1 and 2 having a high tensile strength.

A process for manufacturing composite wooden boards according to the present invention is disclosed in my co-pending application Serial No. 130,970, filed December 3, 1949. According to this application a relatively thin first layer of shavings to which a latent adhesive substance is admixed is spread on a carrier sheet; a relatively thick layer of ground wood particles to which a latent plastic binder is admixed is spread on the first layer of shavings and a second relatively thin layer of shavings is spread on the layer of the ground core material. The whole is subjected to a pre-pressing operation and finally pressed in a hot press whereby the layers form the composite board.

It should now be added that it is expedient that, when the outer layers are of a markedly finer material than the inner, these latter should be compressed before the finer layers are filled. By the pre-compressing of the coarser inner layers the projection of parts into the outer surface will be avoided and further the space between the single coarser pieces will be reduced, so that complete covering may be carried out with a minimum of covering material.

Following are some examples of execution of the process according to the present invention:

Example 1

Waste from veneering, ends, and furniture factories are so worked in a splitting machine that pieces result between 5 and 50 mm. long, about 5 to 10 mm. wide and from one to several millimeters thick. Other shorter and thicker little pieces occurring do not matter. This material is, possibly previously waterproofed with 2.5% paraffine, dried to a humidity content of 5% and with a 3.5% of a binding substance, for instance a condensate of ureaformaldehyde obtained in powder form according to an already known process with the suitable catalysis, which rapidly dissolves the binding substance in question in the heat and then mixed with water.

For the covering layers the material is dust-free, clean white soft wood, planing shavings or other thin and flat kinds of shavings, which are mixed with 14% of binding substances and finally kept to a humidity contents of 18% by sprinkling with water.

In a mobile form so many thin layers are formed through the to and fro movement, that these are, when finally compressed, 2 mm. thick. On this basic layer are again spread so many single layers of as much previously selected coarser material as to produce when compressed, a thickness of 21 mm.

These two layers can in some cases be pre-compressed and thereover single layers of glued flat shavings of the same mixture will be filled in up to 2 mm., in order to produce the covering layer.

The whole mixture will now be rapidly pre-compressed so that it becomes sufficiently coherent and provided with a covering sheet of metal, be compressed without frame in, for instance, a press heated to 120° C. with 10 kg. pressure per square cm.

The product obtained is a beatutiful, firm and on both sides very smooth plate with a pale, veneer-like surface, which is very suitable for furniture or cabinet-making, for doors as for walls and ceiling coverings. The covering layers may also be stained, and polished and thus substiuted for expensive veneering.

Example 2

Uneven waste, such as sawmill waste, splinters, trunk disks, etc., are broken into coarser, splinter shaped parts and dried to about 4%. 800 parts of weight of this material are mixed, according to the already known process, with 32 parts of weight of a binding substance, fed uniformly into a form as described under (1) and pre-compressed.

Uneven waste of hard wood is split on a suitable machine into thin, flat, planing shavings shaped pieces of wood, which are then further reduced to scale shaped bits. After drying out to 10% humidity contents 150 parts of weight as well as 50 parts of weight finer hard wood saw shavings are mixed with 20 parts of weight of a waterproof binding substance and 20 parts of weight of water. 10 parts of weight of hard wax powder are then added. The mass thus mixed is uniformly distributed over the above described pre-compressed coarse layer and also submitted to a pre-compression in the frame. The main compression without frame follows in the press heated about 150° C. at a pressure of 25 kgs. per square cm.

The result is a plate of a beautiful, smooth and hard surface layer, specially suitable for flooring. To obviate the danger of slipping, quartz powder, plaster or the like, may be added to the covering mass before or during the mixing with the binding substance.

In all cases the compression amalgamates the layers of the sheet into one body.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of wooden boards differing from the types described above.

While I have illustrated and described the invention as embodied in a composite wooden board, I do not intend to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of my invention.

Without further analysis, the foregoing will so fully reveal the gist of my invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What I claim as new and desire to secure by Letters Patent is:

1. A composite wooden board comprising in comprising in combination a core layer of randomly arranged wood particles providing air spaces between themselves; a binder substance firmly connecting said randomly arranged wood particles without filling said air spaces so that said randomly arranged wood particles firmly adhere to one another and provide a porous core having good heat insulating properties; an outer

layer arranged on one face of said porous core and having a thickness which is small as compared to the thickness of said core, said outer layer consisting of superposed unoriented flat wood shavings; and an adhesive substance connecting said flat wood shavings directly to one another and to said porous core whereby said flat wood shavings firmly adhere to one another and to said porous core so as to provide on one side of said porous core a firmly adhering surface layer being substantially impervious to water and having a high tensile strength.

2. A composite wooden board comprising in combination a central layer of randomly arranged wood particles providing air spaces between themselves; a binder substance firmly connecting said randomly arranged wood particles without filling said air spaces so that said randomly arranged wood particles firmly adhere to one another and provide a porous core having good heat insulating properties; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings arranged substantially parallel to the outer faces of the finished board; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

3. A composite wooden board comprising in combination a central core layer of randomly arranged splinter-shaped wood particles providing air spaces between themselves; two outer layers arranged on opposite faces of said central core layer, respectively, and consisting of compressed superposed unoriented flat shaving-shaped wood particles; and an adhesive substance firmly connecting said flat shaving-shaped wood particles of said outer layers directly to one another and said splinter-shaped wood particles of said core layer to one another without filling said air spaces between the same so that the layers firmly adhere to one another and provide a finished composite wooden board comprising a highly heat and sound insulating central core and firmly adhering substantially water impervious outer layers having a high tensile strength.

4. A composite wooden board comprising in combination a central core layer of randomly arranged splinter-shaped wood particles providing air spaces between themselves; two outer layers arranged on opposite faces of said central core layer, respectively, and consisting of compressed superposed unoriented flat shaving-shaped wood particles arranged substantially parallel to the faces of said central core layer; and an adhesive substance penetrating said flat shaving-shaped wood particles of said outer layers directly to one another and firmly connecting said splinter-shaped wood particles of said core layer to one another without filling said air spaces between the same so that the layers firmly adhere to one another and provide a finished composite wooden board comprising a highly heat and sound insulating central core and firmly adhering substantially water impervious outer layers having a high tensile strength.

5. A composite wooden board comprising in combination, a layer of randomly arranged wood splinters providing air spaces between themselves; a binder substance firmly connecting said randomly arranged wood splinters without filling said air spaces so that said randomly arranged wood splinters firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; an outer layer arranged on one face of said porous core and having a thickness which is small as compared to the thickness of said core, said outer layer consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram; and an adhesive substance connecting said flat wood shavings directly to one another and to said porous core whereby said flat wood shavings firmly adhere to one another and to said porous core so as to provide on one side of said porous core a firmly adhering surface layer being substantially impervious to water and having a high tensile strength.

6. A composite wooden board comprising in combination, a layer of randomly arranged wood splinters providing air spaces between themselves, said splinters having a length of about 5 to 50 mm. and a thickness of between one and several mm.; a binder substance firmly connecting said randomly arranged wood splinters without filling said air spaces so that said randomly arranged wood splinters firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; an outer layer arranged on one face of said porous core and having a thickness which is small as compared to the thickness of said core, said outer layer consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram, said shavings being arranged substantially parallel to the outer faces of the finished board and partly overlapping one another; and an adhesive substance connecting said flat wood shavings directly to one another and to said porous core whereby said flat wood shavings firmly adhere to one another and to said porous core so as to provide on one side of said porous core a firmly adhering surface layer being substantially impervious to water and having a high tensile strength.

7. A composite wooden board comprising in combination, a layer of randomly arranged wood splinters providing air spaces between themselves; a binder substance firmly connecting said randomly arranged wood splinters without filling said air spaces so that said randomly arranged wood splinters firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; an outer layer arranged on one face of said porous core and having a thickness which is small as compared to the thickness of said core, said outer layer consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram, said shavings being arranged substantially parallel to the outer faces of the finished board and partly overlapping one another, the number of said superposed shavings being at any part of said outer layer at least 2 and not more than 5; and an adhesive substance connecting said flat wood shavings directly to one another and to said porous core whereby said flat wood shavings firmly adhere to one another and to said porous core so as to provide on one side of said porous core a firmly adhering surface layer being substantially impervious to water and having a high tensile strength.

8. A composite wooden board comprising in combination, a layer of randomly arranged wood splinters providing air spaces between themselves, said splinters having a length of about 5 to 50 mm. and a thickness of between one and several mm.; a binder substance firmly connecting said randomly arranged wood splinters without filling said air spaces so that said randomly arranged wood splinters firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; an outer layer arranged on one face of said porous core and having a thickness which is small as compared to the thickness of said core, said outer layer consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram, said shavings being arranged substantially parallel to the outer faces of the finished board and partly overlapping one another, the number of said superposed shavings being at any part of said outer layer at least 2 and not more than 5; and an adhesive substance connecting said flat wood shavings directly to one another and to said porous core, said binder substance amounting to about 3.5 to 4% by weight of said splinters and said adhesive substance amounting to about 10 to 14% by weight of said shavings, whereby said flat wood shavings firmly adhere to one another and to said porous core so as to provide on one side of said porous core a firmly adhering surface layer being substantially impervious to water and having a high tensile strength.

9. A composite wooden board, comprising in combination, a central layer of randomly arranged splinter-shaped wood particles of random length providing air spaces between themselves; a binder substance firmly connecting said randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

10. A composite wooden board, comprising in combination, a central layer of randomly arranged splinter-shaped wood particles having a length of about 5 to 50 mm. and a thickness of between one and several mm. and providing air spaces between themselves; a binder substance firmly connecting said randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

11. A composite wooden board, comprising in combination, a central layer of randomly arranged splinter-shaped wood particles of random length providing air spaces between themselves; a binder substance firmly connecting said randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram, said shavings being arranged substantially parallel to the outer faces of the finished board and partly overlapping one another, the number of said superposed shavings being at any part of said outer layer at least 2 and not more than 5; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

12. A composite wooden board, comprising in combination, a center layer of randomly arranged splinter-shaped wood particles of random length providing air spaces between themselves; a binder substance firmly connecting said randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core, said binder substance amounting to between 3.5 and 4% by weight of said splinter-shaped wood particles and said adhesive substance amounting to between 10 and 14% by weight of said shavings, whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

13. A composite wooden board, comprising in combination, a central layer of randomly arranged splinter-shaped wood particles of random length providing air spaces between themselves; a binder substance firmly connecting said

randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram having the shorter sides thereof cut along the fibre of the wood; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

14. A composite wooden board, comprising in combination, a central layer of randomly arranged splinter-shaped wood particles of random length providing air spaces between themselves; a binder substance firmly connecting said randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram having the shorter sides thereof cut along the fibre of the wood, the longer sides thereof being indented and running at an acute angle to said shorter sides, said shavings being arranged substantially parallel to the outer faces of the finished board and partly overlapping one another; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

15. A composite wooden board, comprising in combination a central layer of randomly arranged splinter-shaped wood particles having a length of about 5 to 50 mm. and a thickness of between one and several mm., and providing air spaces between themselves; a binder substance firmly connecting said randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram, said shavings being arranged substantially parallel to the outer faces of the finished board and partly overlapping one another, the number of said superposed shavings being at any part of said outer layer at least two and not more than five; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core, said binder substance amounting to 3.5 to 4% by weight of said splinter-shaped wood particles and said adhesive substance amounting to 10 to 14% by weight of said shavings, whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

16. A composite wooden board, comprising in combination a central layer of randomly arranged splinter-shaped wood particles having a length of about 5 to 50 mm. and a thickness of between one and several mm., and providing air spaces between themselves; a binder substance firmly connecting said randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers each relatively thinner than said porous core arranged on opposite faces thereof, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram having the shorter sides thereof cut along the fibre of the wood, said shaving being arranged substantially parallel to the outer faces of the finished board and partly overlapping one another, the number of said superposed shavings being at any part of said outer layer at least two and not more than five; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core, said binder substance amounting to approximately 3.5 to 4% by weight of said splinter-shaped wood particles and said adhesive substance amounting to approximately 10 to 14% by weight of said shavings, whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

17. A composite wooden board, comprising in combination a central layer of randomly arranged splinter-shaped wood particles having a length of about 5 to 50 mm. and a thickness of between one and several mm., and providing air spaces between themselves; a binder substance firmly connecting said randomly arranged splinter-shaped wood particles without filling said air spaces so that said randomly arranged splinter-shaped wood particles firmly adhere to one another and provide a porous core having good heat insulating properties and a low density; two outer layers arranged on opposite faces of said porous core, respectively, and having thicknesses, respectively, which are small as compared to the thickness of said core, said outer layers each consisting of superposed unoriented flat wood shavings each being shaped substantially as a parallelogram having the shorter sides thereof cut along the fibre of the wood, the longer sides thereof being indented and running at an acute angle to said shorter sides, said shavings being arranged substantially parallel

to the outer faces of the finished board and partly overlapping one another, the number of said superposed shavings being at any part of said outer layer at least two and not more than five; and an adhesive substance connecting said flat wood shavings in each of said outer layers directly to one another and to said porous core, said binder substance amounting to 3.5 to 4% by weight of said splinter-shaped wood particles and said adhesive substance amounting to 10 to 14% by weight of said shavings, whereby said flat wood shavings firmly adhere directly to one another and to said porous core so as to provide on both sides of said porous core firmly adhering surface layers being substantially impervious to water and having a high tensile strength.

18. A composite wooden board comprising in combination a central core layer of randomly arranged splinter-shaped wood particles providing air spaces between themselves; two outer layers arranged on opposite faces of said central core layer, respectively, and consisting of compressed superposed flat unoriented wood shavings; and an adhesive substance penetrating said wood shavings of said outer layers directly to one another and firmly connecting said splinter-shaped wood particles of said core layer to one another without filling said air spaces between the same so that the layers firmly adhere to one another and provide a finished composite wooden board comprising a highly heat and sound insulating central core and firmly adhering substantially water impervious outer layers having a high tensile strength, said outer layers of shavings having each a thickness of about 2 mm. and said central core layer having a thickness equal to several times the thickness of each core layer.

19. A composite wooden board comprising in combination a central core layer of randomly arranged splinter-shaped wood particles providing air spaces between themselves; two outer layers arranged on opposite faces of said central core layer, respectively, and consisting of compressed superposed unoriented flat wood shavings each being shaped substantially as a parallelogram having the shorter sides thereof cut along the fibre of the wood, the longer sides thereof being indented, said shavings being arranged substantially parallel to the faces of said central core layer; and an adhesive substance penetrating said flat wood shavings of said outer layers directly to one another and firmly connecting said splinter-shaped wood particles of said core layer to one another without filling said air spaces between the same so that the layers firmly adhere to one another and provide a finished composite wooden board comprising a highly heat and sound insulating central core and firmly adhering substantially water impervious outer layers having a high tensile strength.

20. A composite wooden board comprising in combination a central core layer of randomly arranged splinter-shaped wood particles providing air spaces between themselves; two outer layers arranged on opposite faces of said central core layer, respectively, and consisting of compressed superposed unoriented flat wood shavings each being shaped substantially as a parallelogram having the shorter sides thereof cut along the fibre of the wood, the longer sides thereof being indented, said shavings being arranged substantially parallel to the faces of said central core layer; and an adhesive substance penetrating said flat wood shavings of said outer layers directly to one another and firmly connecting said splinter-shaped wood particles of said core layer to one another without filling said air spaces between the same so that the layers firmly adhere to one another and provide a finished composite wooden board comprising a highly heat and sound insulating central core and firmly adhering substantially water impervious outer layers having a high tensile strength, said central core layer having a thickness which is several times the thickness of each said outer layer.

21. A composite wooden board comprising in combination a core layer of randomly arranged wood particles; a binder substance firmly connecting said randomly arranged wood particles so that said wood particles firmly adhere to one another and provide a porous core having good heat insulating properties; an outer layer arranged on one face of said core and having a thickness which is small as compared to the thickness of said heat-insulating porous core, said outer layer consisting of superposed unoriented flat wood shavings arranged substantially parallel to the outer face of the finished board; and an adhesive substance connecting said flat wood shavings directly to one another and to said core whereby said flat wood shavings firmly adhere to one another and to said porous core so as to provide on at least one side of said core a firmly adhering surface layer being substantially impervious to water and having a high tensile strength.

22. A composite wooden board comprising in combination a core layer of randomly arranged splinted-shaped wood particles providing air spaces between themselves, a binder substance firmly connecting said randomly arranged wood particles without filling said air spaces so that said randomly arranged wood particles firmly adhere to one another and provide a porous core having good heat insulating properties; an outer layer arranged on one face of said heat insulating porous core and having a thickness which is small as compared to the thickness of said core, said outer layer comprising superposed unoriented flat wood shavings arranged substantially parallel to the outer faces of the finished board; and an adhesive substance connecting said flat wood shavings to one another and to said porous core whereby said flat wood shavings firmly adhere to one another and to said porous core so as to provide on one side of said porous core a firmly adhering surface layer being substantially impervious to water.

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