TWO-LAYER FLOORBOARD

The invention relates to the production of construction materials. The invention gives the possibility of producing two-layer floorboards of unlimited and easily changeable length, and also use raw materials almost fully. The two-layer floorboard includes a glued together upper layer (1) made of rectangular elements of solid wood lamella (3), which are connected along the line (4), which is perpendicular to side edges (7) of the floorboard, and lower layer (2) made of wood board elements (5), which are connected along a line (6) which forms a 30-80° angle (8) with side edges (7) of the floorboard.
Description

[0001] The invention relates to the production of construction materials, specifically two-layer floorboards with an upper layer made of solid wood lamellae.

[0002] The two-layer floorboards in which the upper layer is a single-piece solid wood lamella, and the lower layer is a wood board are commonly used. The length of such floorboards usually does not exceed 3 metres. Furthermore, a disadvantage of such floorboards is high costs of raw materials. When two-layer floorboards of specific length are to be produced and their length does not match the available length of lower layer boards, a material for the lower layer must be specifically produced with a length matching the length of the lamella used for the upper layer. If the raw material for the lower layer is shorter than the length of lamella of the upper layer, unreasonable cut-offs of the lamella are formed. Gluing the lower layer to the upper layer causes considerable deformations due to different properties of these layers.

[0003] Two-layer floorboards produced by SIA “Amber Wood” are known [http://www.amberwood.lv/index.php?id=58]. The upper layer of these known two-layer floorboards is a single-piece solid wood (for example, oak or ash) lamella. The lower layer is a wood board, specifically, birch plywood. A distinctive feature of these two-layer floorboards is that the lower layer is fragmented (i.e. made of several rectangular elements with a connection line perpendicular to side edges of two-layer floorboards). A fragmented birch veneer lower layer ensures high dimensional stability when the board’s temperature and moisture change, as well as facilitating the laying of floorboards on an uneven foundation.

[0004] However, off-cuts of raw materials, especially of the solid wood lamella, are formed in the production of these known two-layer floorboards. Furthermore, these have a technologically limited length of two-layer floorboards, which depends on the available length of raw materials for both layers (both technologically and in terms of costs).

[0005] The technical task solved by the present invention is the possibility to produce two-layer floorboards of unlimited and easily changeable length in the production process, at the same time increasing the length of both the lower layer and the upper layer without losing the strength of the floorboard, and using raw materials almost fully.

[0006] In a two-layer floorboard disclosed herein, the upper layer is made of solid wood lamellae, and the lower layer is made of at least two wood board elements, the upper layer and the lower layer are glued together and side edges of the two-layer floorboard have locking means. The upper layer is made of two or more rectangular elements of solid wood lamella, while the wood board elements forming the lower layer are connected along a line which forms a 30-80° angle with side edges of the floorboard.

[0007] In narrower, shorter and thinner two-layer floor-boards, the wood board elements forming the lower layer are connected along a line forming a wide angle, up to 80°, with side edges of the floorboard. For example, an angle near 80° may be used for floorboards of the following dimensions: 80-130mm wide, 10-12mm in thickness, and up to 1,5m long. In an embodiment, the wood board elements forming the lower layer of wider, longer and thicker two-layer floorboards are connected along a line forming a 30-50° angle with side edges of the floorboard.

[0008] For example, an angle near 30°- 45° may be used for floorboards of the following dimensions: 300mm wide or more, 16mm in thickness, and 6m long or more.

[0009] When producing the two-layer floorboards disclosed herein, in the process of gluing both layers together, elements of the upper layer and elements of the lower layer are connected together at their ends. Joining of these two layers allows product of almost unlimited length to be obtained, which can be cut to the necessary size, thus obtaining boards of any length. For example, the known two-layer floorboard structures, which were used earlier, allowed production of floorboards with a length of up to 3 metres. The present invention gives the possibility to produce, for example, 6 metre and if necessary, longer boards without losing mechanical properties of the product at the location of the joint. The location described herein of the connection of the lower layer elements is not a limitation. The connection can be located anywhere. Therefore, a blank for two-layer floorboards of an unlimited length can be produced, which is then cut to necessary length. As a result there are almost no off-cuts (losses) of materials.

[0010] If the lower layer is made of more than two wood board elements, the interconnection lines between adjacent elements are usually parallel.

[0011] The wood board elements constituting the lower layer are mainly made of wood board selected from the group of: plywood, particle board, oriented strand board, medium-density fibreboard, and blockboard.

[0012] In the simplest case, the wood board elements forming the lower layer, which are interconnected along an oblique end line, can be connected using a straight joint (i.e. the joint plane is perpendicular to the upper surface of the floorboard).

[0013] In other configurations, the wood board elements forming the lower layer, which are interconnected along an oblique end line, can be connected using one of the following joints:

- Scarf joint;
- Double scarf joint;
- Tongue and groove joint (for example, finger joint, profiled straight tongue and groove, profiled tapered tongue and groove, profiled round tongue and groove joint);
- Shiplap joint or an angled shiplap joint;

[0014] The thickness of solid wood lamella elements forming the upper layer is usually 1 to 8 millimetres. The
thickness of wood board elements forming the lower layer is 5 to 30 millimetres. Preferably, the lower layer is at least twice as thick as the upper layer.

[0015] The solid wood lamella elements forming the upper layer can be glued in the place of their interconnection.

[0016] The present invention is illustrated by way of example only, by drawings showing:

Fig. 1 - part of a two-layer floorboard (lower view);
Fig. 2 - part of a two-layer floorboard (in section);
Fig. 3 - a two-layer floorboard with three elements of the lower layer (lower view);
Fig. 4 to Fig. 11 - part of a two-layer floorboard (in section), where the elements forming the lower layer are connected along an angled end line:

Fig. 4 - using a scarf joint;
Fig. 5 - using a double scarf joint;
Fig. 6 - using a finger joint;
Fig. 7 - using a profiled straight tongue and groove joint;
Fig. 8 - using a profiled tapered tongue and groove joint;
Fig. 9 - using a profiled round tongue and groove joint;
Fig. 10 - using a shiplap joint;
Fig. 11 - using an angled shiplap joint.

[0017] A two-layer floorboard (Fig. 1, 2) comprises an upper layer (1) and a lower layer (2), which are glued together. The upper layer (1) is made of two or more rectangular elements of solid wood lamella (3) of the same thickness and width, which are interconnected using a straight joint along the line (4) where the two lamellae (3) abut, which line (4) is perpendicular to side edges (7) of the floorboard.

[0018] Solid wood lamella can be made of oak, ash or some other valuable wood species. The most common are lamellae with a thickness of 3 to 5 millimetres, but when there are special requirements for the properties of the floorboards, lamella thickness can range from 1 to 8 millimetres.

[0019] The present two-layer floorboard may be produced with a width of 10 to 30 cm.

[0020] The lower layer (2) is made of two or more wood board elements (5) of the same thickness and width. Depending on the mechanical properties required for a specific floorboard, the lower layer (2) may be made of one of plywood, particle board, oriented strand board, medium-density fibreboard, and blockboard.

[0021] The thickness of the wood board elements (5) forming the lower layer (2) is usually, but not necessarily, 5 to 30 millimetres. As above, in this example, the thickness of solid wood lamella elements (3) forming the upper layer (1) is 1 to 8 millimetres. The lower layer (2) is preferably at least twice as thick as the upper layer (1).

[0022] Thicker upper and lower layer materials are used in the production of longer and wider two-layer floorboards, to ensure sufficient mechanical properties of two-layer floorboards.

[0023] The wood board elements (5) forming the lower layer (2) are connected along a line (6), which forms a 30-80° angle (8) with the side edges (7) of the floorboard.

[0024] In some embodiments, the wood board elements forming the lower layer (2) of two-layer floorboards are connected along a line which forms a wide angle, up to 80°, with side edges of the floorboard.

[0025] Longer, wider and thicker two-layer floorboards are heavier than shorter, narrower and thinner two-layer floorboards. Therefore any joint place in the board is exposed to an increased mechanical load. To make the joint of wood board elements (5) forming the lower layer (2) of two-layer floorboards capable of taking additional load, it can be formed with a smaller (30-50°) joint angle (8).

[0026] In the two-layer floorboard shown on Fig. 1 the wood board elements (5) forming the lower layer (2) are interconnected with each other along an oblique end line (6) using a straight joint (i.e. the joint plane is perpendicular to the upper surface of the floorboard). In this case, where the connection of the elements (5) is simple, it may be preferable to glue them together.

[0027] The side edges (7) of two-layer floorboards are equipped with locking means (9) for locking with another, adjacent, two-layer floorboard. For example, traditional types of connection of floorboards may use tongue and groove pins.

[0028] In the two-layer floorboard shown in Fig. 3, the lower layer (2) is made of more than two wood board elements (5). The interconnection lines (6) are parallel. That is, the line (6) joining the first and second wood board elements (5) is parallel to the line joining the second and third wood board elements (5). The ends of the two-layer floorboard may be fitted with locking means (9). For example, this may be the same type of connection as that of the side edge (7) of the two-layer floorboards.

[0029] It is permissible that the connection line (4) of elements (3) of the upper layer (1) crosses the connection line (6) of elements (5) of the lower layer (2).

[0030] In other versions of configuration of the invention, the wood board elements (5) forming the lower layer (2) of two-layer floorboards are interconnected along an oblique end line (6) using more complicated joints (see e.g. Fig. 4-11). In such cases, the wood board elements (5) do not need to be glue together, because these types of joints ensure sufficiently secure fixation of elements (5) of the lower layer (2).

[0031] In the process of production of the present two-layer floorboards, the lower layer and the upper layer forming the two-layer floorboard are extended at the same time. That is, the production process can include a continuously-operating gluing line that gluers upper and lower layer pieces together, producing a continuous length of two-layer floorboard. Lengths of floorboard may
be cut to any desired length as they are extended out from the gluing line. Thus, a two-layer floorboard may be cut off from the gluing line that has an arbitrary number of upper layer lamellae and lower-layer wood board elements.

[0032] Connection places of the elements (3, 5) of both layers are made in such a way that the two-layer floorboard has sufficient strength also along the connection lines, even where the lines of the upper and lower layers cross. The present invention provides the possibility of using raw materials in full, because no unused cut-offs are formed. It is possible to produce two-layer floorboards of almost unlimited length (even 6 metres and more), as well as to easily change the length of two-layer floorboards being produced, for example, to produce a small batch of boards with a length necessary for the floor in a specific room, thus reducing also off-cuts of finished floorboards.

Claims

1. A two-layer floorboard comprising an upper layer (1) and a lower layer (2); wherein the upper layer (1) is made of solid wood lamellae, and the lower layer (2) is made of at least two wood board elements (5); wherein the upper layer (1) and the lower layer (2) are glued together; and side edges of the two-layer floorboard have locking means (9); and characterised in that the upper layer (1) is made of two or more rectangular elements of solid wood lamella (3); and the wood board elements (5) forming the lower layer are connected along a line (6) which forms a 30-80° angle (8) with the side edges (7) of the floorboard.

2. The two-layer floorboard as claimed in claim 1, wherein the wood board elements (5) forming the lower layer (2) are connected along a line (6) which forms a 30-50° angle (8) with the side edges (7) of the floorboard.

3. The floorboard as claimed in claim 1, wherein the lower layer (2) is made of more than two wood board elements (5) and wherein each of the interconnection lines (6) between adjacent wood board elements are parallel with one another.

4. The floorboard as claimed in any preceding claim, wherein the wood board elements (5) constituting the lower layer (2) are made of wood board selected from the group of: plywood, particle board, oriented strand board, medium-density fibreboard, and blockboard.

5. The floorboard as claimed in any preceding claim, wherein the wood board elements (5) forming the lower layer (2) are interconnected along an oblique end line (6) using an angled joint.

6. The floorboard as claimed in one of claims 1-4, wherein the wood board elements (5) forming the lower layer (2) are interconnected along an oblique end line (6) using a dovetail joint.

7. The floorboard as claimed in one of claims 1-4, wherein the wood board elements forming the lower layer are interconnected along an oblique end line using a dowel joint.

8. The floorboard as claimed in one of claims 1-4, wherein the wood board elements (5) forming the lower layer (2) are interconnected along an oblique end line (6) using a bridle joint or an angled bridle joint.

9. The floorboard as claimed in any preceding claim, wherein the thickness of wood board elements (5) forming the lower layer (2) is from 1 to 8 millimetres, the thickness of solid wood lamella elements (2) forming the upper layer (1) is 5 to 30 millimetres, and the lower layer (2) is at least twice as thick as the upper layer (1).

10. The floorboard as claimed in any preceding claim, wherein the wood board elements (5) forming the lower layer (2) are glued together at their interconnection place.
Fig. 10

Fig. 11
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<td>WO 03/097963 A1 (HAMBERGER INDUSTRIEWERKE GMBH [DE]; HIPPER AUGUST [DE]) 27 November 2003 (2003-11-27) * claim 1; figures 1b, 2, 6 * * page 6, line 9 - line 16 * * page 6, line 22 - line 36 * * page 9, line 19 * -----</td>
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The present search report has been drawn up for all claims

Place of search: Munich
Date of completion of the search: 24 October 2018
Examiner: Estorgues, Marlène

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