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(54) **COMPOSITE FLOORBOARD**

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(57) **ABSTRACT**

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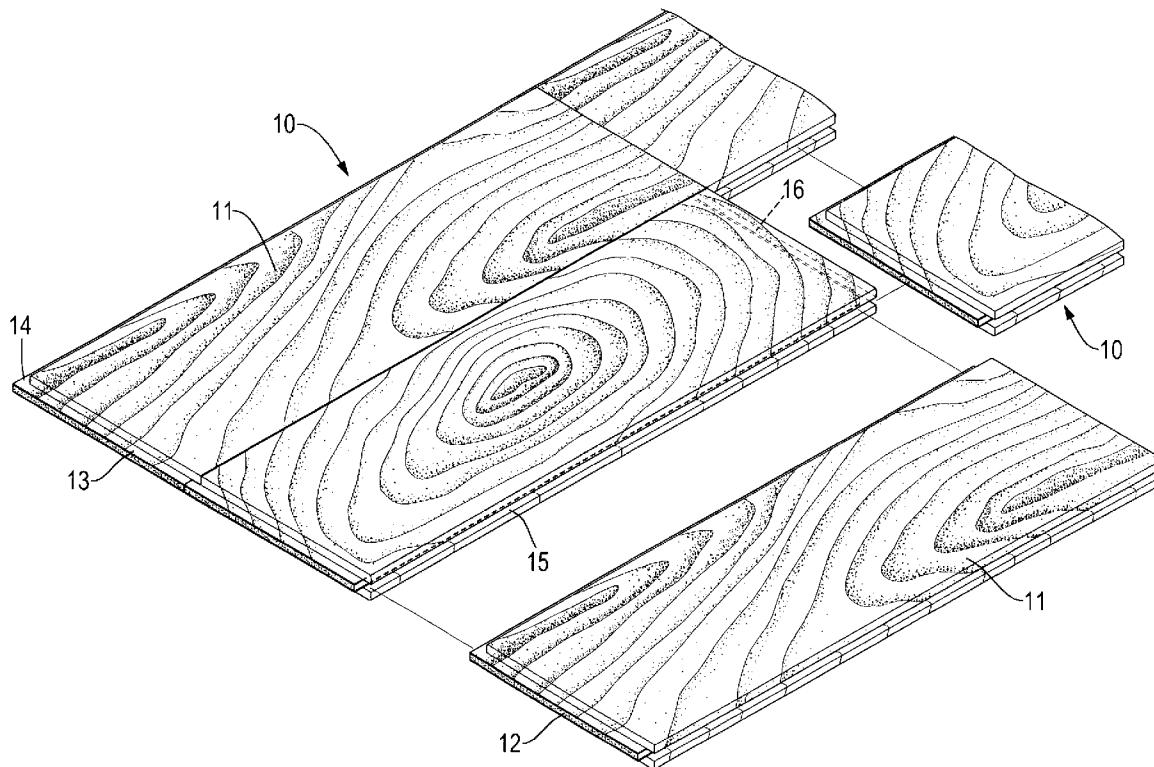
A composite floorboard is formed by two outer wooden layers and an intermediate flexible layer which has two longitudinal edges, two transverse edges. The flexible layer may be foam, sponge or any kinds of soundproof material. The composite floorboard has two surfaces, a transverse tongue, a longitudinal tongue, a longitudinal groove and a transverse groove each respectively defined in or formed on corresponding edges of the composite floorboard. Because the tongues are made by the flexible layer, the composite floorboard is easy and convenient to assemble. Because the flexible layer acts as a buffer, the composite floorboard provides a soundproofing function. The composite floorboard also requires less timber so may be lower cost to manufacture.

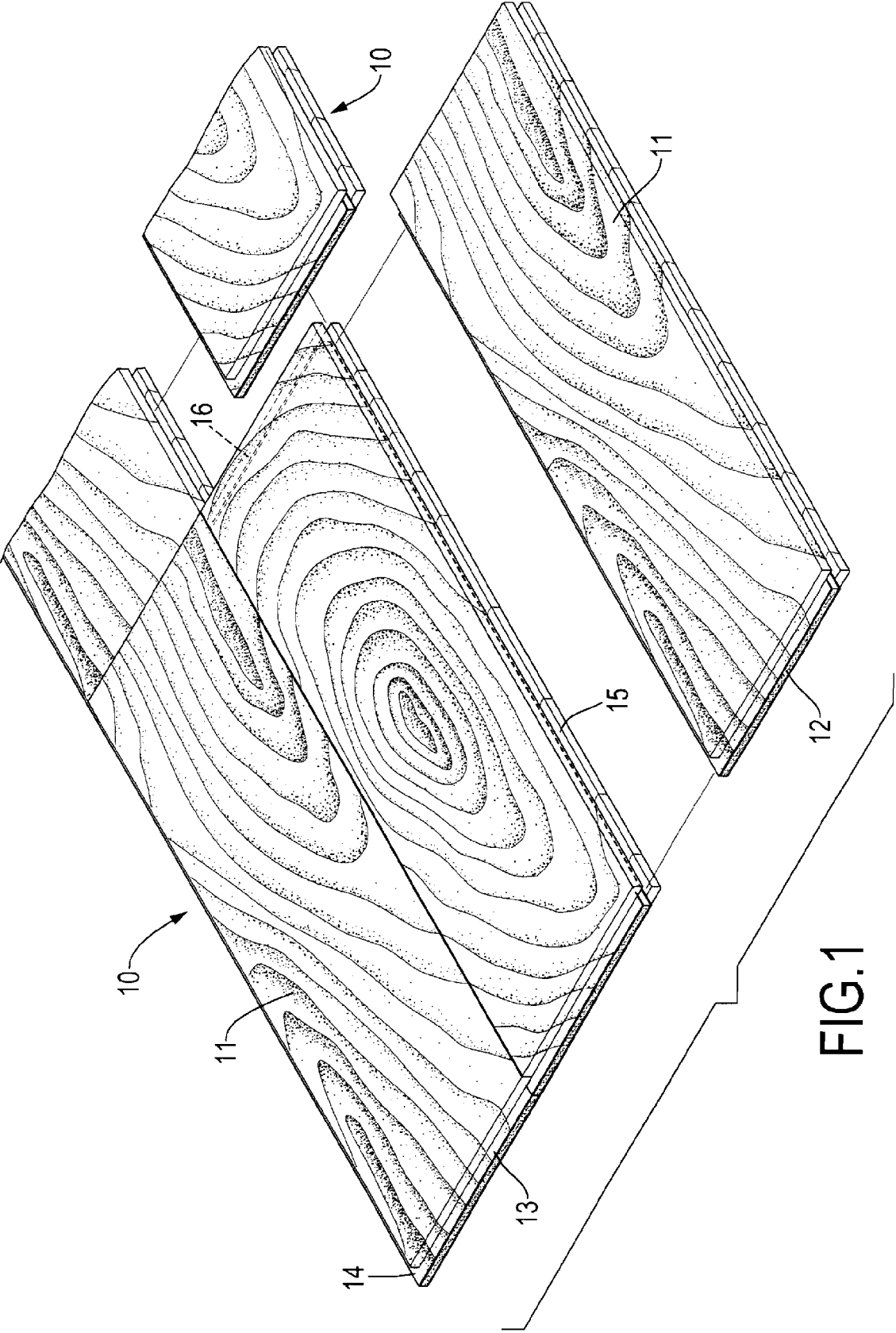
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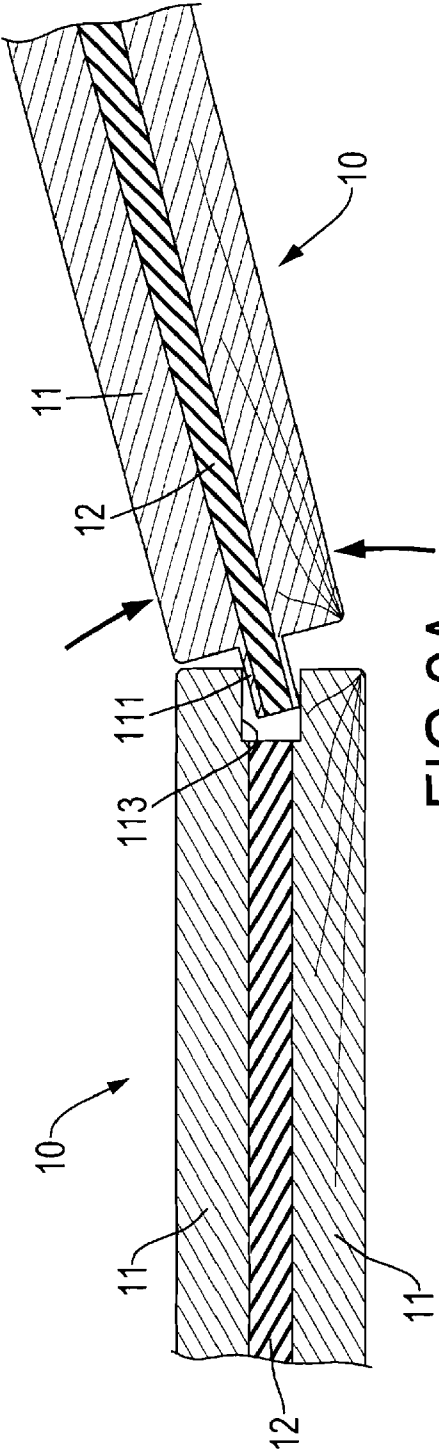


FIG. 2A

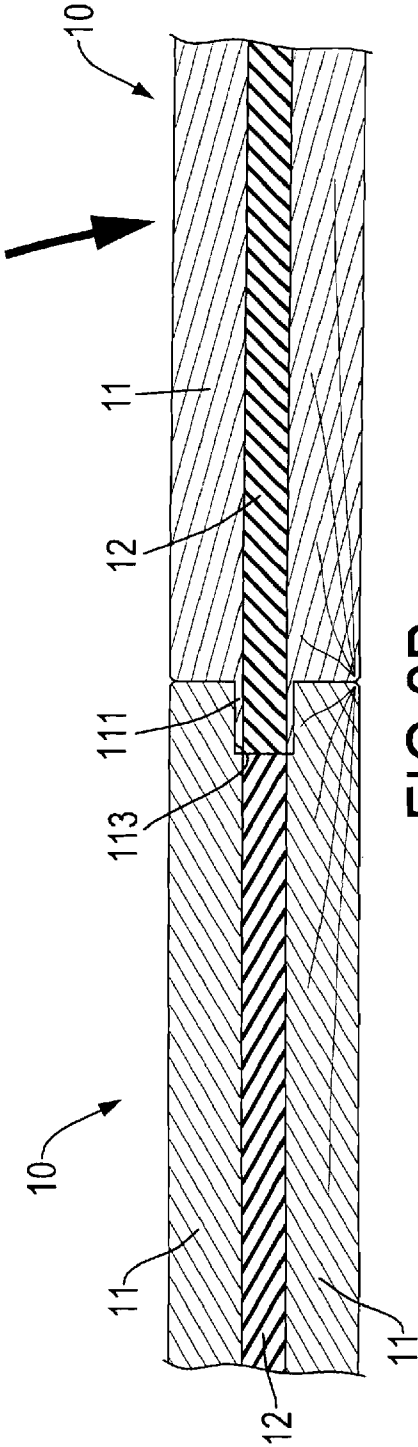


FIG. 2B

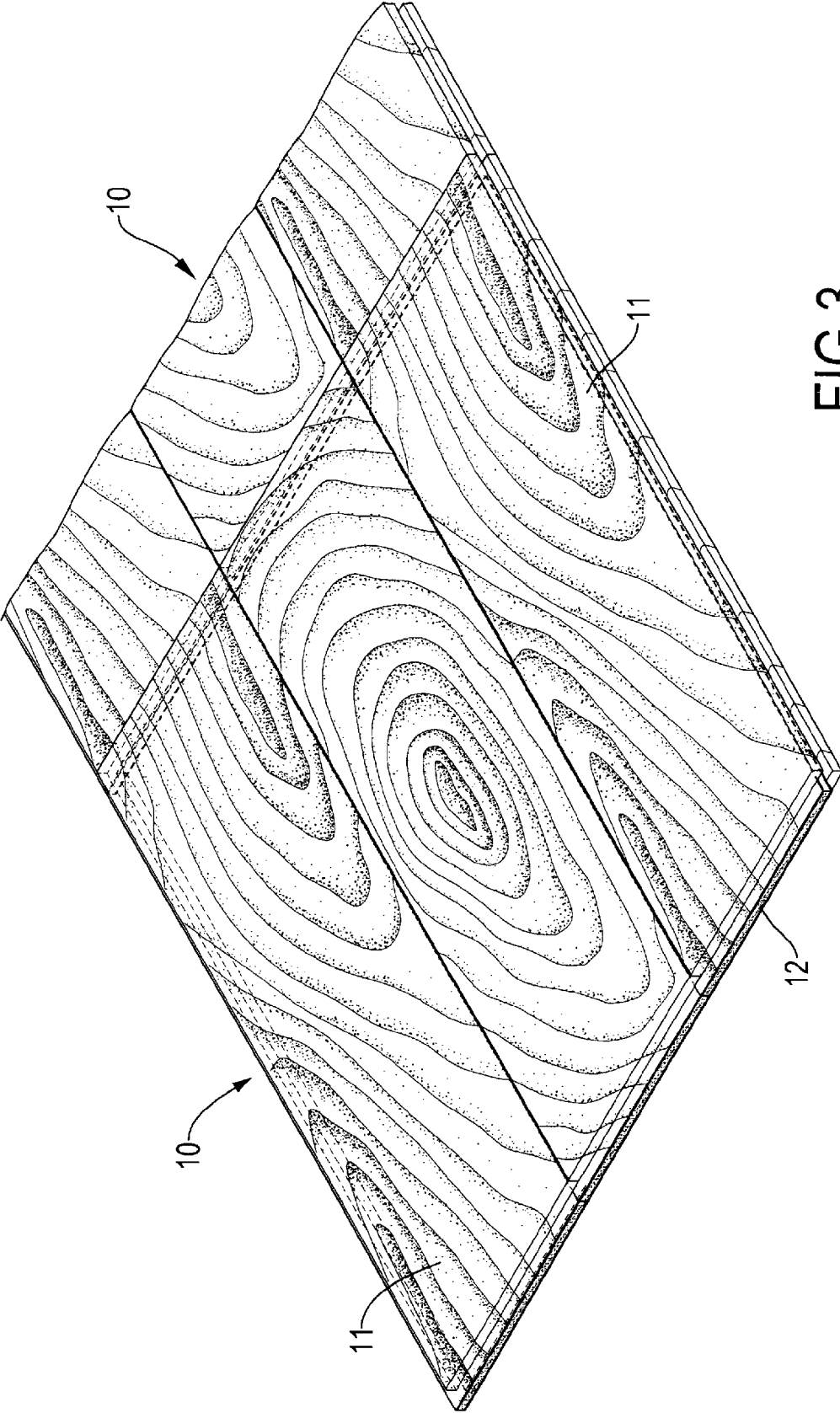


FIG.3

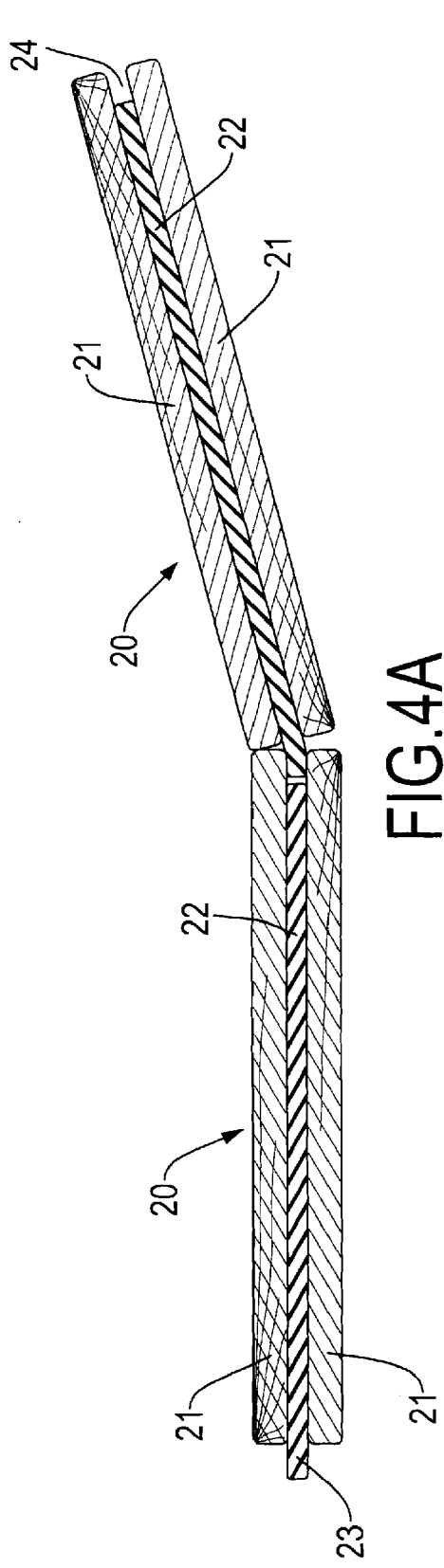


FIG. 4A

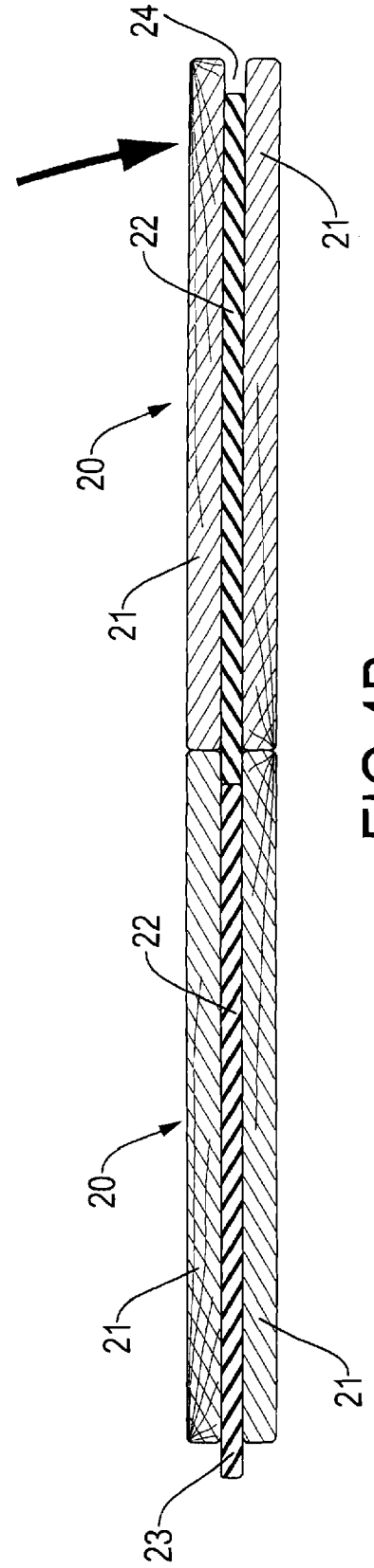


FIG. 4B

COMPOSITE FLOORBOARD

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a composite floorboard, more particular to a composite floorboard that has integrated soundproofing and uses less wood.

[0003] 2. Description of the Related Art

[0004] Composite floorboards are frequently used in living areas, such as living rooms and bedrooms and are preferred over stone or linoleum since. Its wood surface is more pleasant to touch and adds a natural feeling to rooms.

[0005] Conventional composite floorboards use tongue and groove connections, wherein bilateral edges of each floorboard are protrudent as a tongue, or recessed as a groove. The tongue of the composite floorboard is inserted into a groove of an adjacent composite floorboard. Since the tongue and the groove are formed directly from the solid wood, therefore, it is less flexible and requires more effort to install.

[0006] Further, conventional composite floorboard has poor sound insulation. Therefore, a soundproof material, such as acoustic matting is set under the composite floorboard which further increases the complexity. Furthermore, in regions of high temperature and humidity, the composite floorboards may move, curve or twist after being laid. Importantly, the composite floorboards are solidly formed from wood, meaning manufacturing costs of composite floorboards is high.

[0007] To overcome the shortcomings, the present invention provides a composite floorboard to mitigate the aforementioned problems.

SUMMARY OF THE INVENTION

[0008] The primary objective of the present invention is to provide a composite floorboard having integrated soundproofing and uses less wood.

[0009] The composite floorboard in accordance with the present invention comprises two longitudinal edges, two transverse edges, a flexible layer and two wooden layers. The flexible layer may be foam, sponge or any soundproofing material and has two surfaces, a transverse tongue, a longitudinal tongue, a longitudinal groove and a transverse groove each respectively defined in or formed on corresponding edges of the composite floorboard. The wooden layers are respectively mounted on the surfaces of the flexible layer. Because the tongues are made by the flexible layer, the composite floorboard is easy and convenient to assemble. Because, the flexible layer acts as a cushion, the composite floorboard provides a soundproofing function. The composite floorboard also uses less wood so may be lower cost to manufacture.

[0010] Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is an exploded perspective view of composite floorboards of a first embodiment of the present invention;

[0012] FIGS. 2A and 2B are operational cross sectional views of the composite floorboard of FIG. 1 being combined;

[0013] FIG. 3 is a perspective view of the composite floorboards of FIG. 1, shown mounted together; and

[0014] FIGS. 4A and 4B are cross sectional views of a second embodiment of a composite floorboard of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0015] With reference to FIGS. 1, 2A and 2B, a preferred embodiment of the present invention of a composite floorboard (10) is substantially quadrangular, may be rectangular or square and has two longitudinal edges, two transverse edges, a flexible layer (12) and two wooden layers (11).

[0016] The composite floorboard (10) has two surfaces, a transverse tongue (13), a longitudinal tongue (14), a longitudinal groove (15) and a transverse groove (16). The transverse tongue (13) and longitudinal tongue (14) respectively protrude from one of the longitudinal and transverse edges of the composite floorboard (10). The longitudinal groove (15) and the transverse groove (16) are respectively defined at the other longitudinal and transverse edges of the composite floorboard (10).

[0017] Each tongue (13, 14) protrudes a distance from the respective edge and fits in a corresponding groove (15, 16) of another composite floorboard (10). Each groove (15, 16) has a depth equal to the distance of the tongues (13, 14).

[0018] The wooden layers (11) are respectively mounted on the surfaces of the flexible layer (12). Each wooden layer (11) has two longitudinal edges, two transverse edges, a longitudinal strut (111), a transverse strut, a longitudinal step (113) and a transverse step. The struts (111) are respectively formed on and protrude from the longitudinal and transverse edges of the wooden layers (11) corresponding to the tongues (13, 14) of the flexible layer (12) and may be between 0.5 to 1 mm thick. The steps (113) are respectively defined in the longitudinal and transverse edges of the wooden layer (11) corresponding to and aligning with the grooves (15, 16) and may be about 0.5 mm to 1 mm deep.

[0019] The flexible layer (12) is mounted between the wood layers (11). The flexible layer (12) may be foam, sponge, cork, rubber or any kinds of conventional soundproof materials. The dimension of the flexible layer (12) is smaller than the wood layer (11) and has a first longitudinal edge, a second longitudinal edge, a first transverse edge and a second transverse edge. When the flexible layer (12) is mounted between the wood layers (11), the first longitudinal edge and the transverse edge of flexible layer (12) are respectively aligned with the struts (111) of the wood layers (11) and forms the tongues (13, 14) of the composite floorboard (10). The second longitudinal edge and the second transverse edge of the flexible layer (12) are respectively aligned with the steps (113). Further with reference to FIG. 3, when assembling the composite floorboard (10) of the present invention, the tongues (13, 14) are inserted into the grooves (15, 16) of the adjacent composite floorboard (10). Since the tongues (13, 14) are formed by the flexible layer (12) and maybe by the struts (111), the struts (111) and tongues (13, 14) are flexible and are easily inserted into the grooves (15, 16) in the composite floorboard (10).

[0020] With reference to FIG. 4, a composite floorboard (20) of another preferred embodiment of the present invention, the composite floorboard (20) has two wood layers (21) and a flexible layer (22). The wood layer (21) has a first longitudinal edge, a second longitudinal edge, a first transverse edge and a second transverse edge. The surface dimension of the flexible layer (22) is approximately equal to that of the wood layers (21). The flexible layer (22) is mounted between the wood layers (21) and has a first longitudinal

edge, a second longitudinal edge, a first transverse edge, and a second transverse edge. The first longitudinal edge and the first transverse edge of the flexible layer (22) extend out of the first longitudinal edge and the first transverse edge of the wood layer (21) and form the tongues (23) of the composite floorboard (20). Because the flexible layer (22) extends out the first longitudinal edge and the first transverse edge of the wood layers (21), the grooves (24) will be formed at the second longitudinal edge and the second transverse edge of the composite floorboard (20).

[0021] The present invention provides a composite floorboard with the flexible layer mounted between two wooden layers. This flexible layer provides a cushion function of the composite floorboard when in use and is also convenient for assembling the composite floorboard. The flexible layer also provides an optional moisture-proof function, so that the humid air will be stopped and will not make the composite floorboard out of shape. With the flexible layer made by foam, sponge or any kind of soundproof materials, the composite floorboard provides a soundproof function and does not require laying of an acoustic matting, therefore simplifying and reducing end-user installation costs thereof. Also, the composite floorboard is made using two wooden layers and a flexible layer, so requires less wood. Therefore, production costs of the composite floorboard may be reduced.

[0022] Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and features of the invention, the disclosure is illustrative only. Changes may be made in the details, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A composite floorboard comprising two wooden layers and a flexible layer, wherein the flexible layer is mounted between the two wooden layers.

2. The composite floorboard as claimed in claim 1, wherein each of the two wooden layers and the flexible layer has two longitudinal edges and two transverse edges.

3. The composite floorboard as claimed in claim 1, wherein the composite floorboard comprises two longitudinal edges; two transverse edges;

a transverse tongue protruding a distance from one of the transverse edges of the composite floorboard; a longitudinal tongue protruding a distance from one of the longitudinal edges of the composite floorboard; a longitudinal groove being defined in the composite floorboard at the other longitudinal edge and having a depth equal to the distance of the longitudinal tongue; and a transverse groove being defined in the composite floorboard at the other transverse edge and having a depth equal to the distance of the transverse tongue.

4. The composite floorboard as claimed in claim 1, wherein each wooden layer further comprises

a longitudinal strut and a transverse strut respectively formed on and protruding from the longitudinal and transverse edges of the wooden layer those correspond to the tongues of the composite floorboard; and

a longitudinal step and a transverse step being respectively defined in the longitudinal and transverse edges of the wooden layer those correspond to and align with the grooves of the composite floorboard.

5. The composite floorboard as claimed in claim 4, wherein the struts are 0.5 mm to 1.0 millimeter (mm) in thickness; and

the steps are 0.5 mm to 1.0 mm in depth.

6. The composite floorboard as claimed in claim 1, wherein the flexible layer is a foam layer.

7. The composite floorboard as claimed in claim 1, wherein the flexible layer is a cork layer.

8. The composite floorboard as claimed in claim 1, wherein the flexible layer is a rubber layer.

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