



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
09.06.2004 Bulletin 2004/24

(51) Int Cl.7: **E04F 15/20**

(21) Application number: **03257699.3**

(22) Date of filing: **08.12.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(72) Inventor: **Bignell, David Anthony**
Lower Cambourne
Cambridgeshire CB3 6DD (GB)

(74) Representative: **Murnane, Graham John et al**
Murgitroyd & Company,
165-169 Scotland Street
Glasgow G5 8PL (GB)

(30) Priority: **06.12.2002 GB 0228466**

(71) Applicant: **Icopal Limited**
Manchester M32 0YL (GB)

(54) **Flooring components**

(57) The invention relates to flooring components (10) having vibration damping and acoustic insulating properties. The flooring components (10) comprise an upper deck layer (12) of particle chipboard material, a lower resilient layer (14) of rubber material and, interposed between the upper and lower layers, a layer of foam material (16). The layer of foam material comprises a mixture of open and closed cell foam particles. The

lower resilient layer (14) and the foam layer (16) extend over, and are bonded to, substantially the entire under-surface of the upper deck layer (12) thereby providing a continuous barrier to unwanted sound transmission and/or reverberations. A flooring assembly (20) is also described which comprises a plurality of flooring components (10) joined together via tongue and groove joints (18) and laid over a floor supporting structure (22).

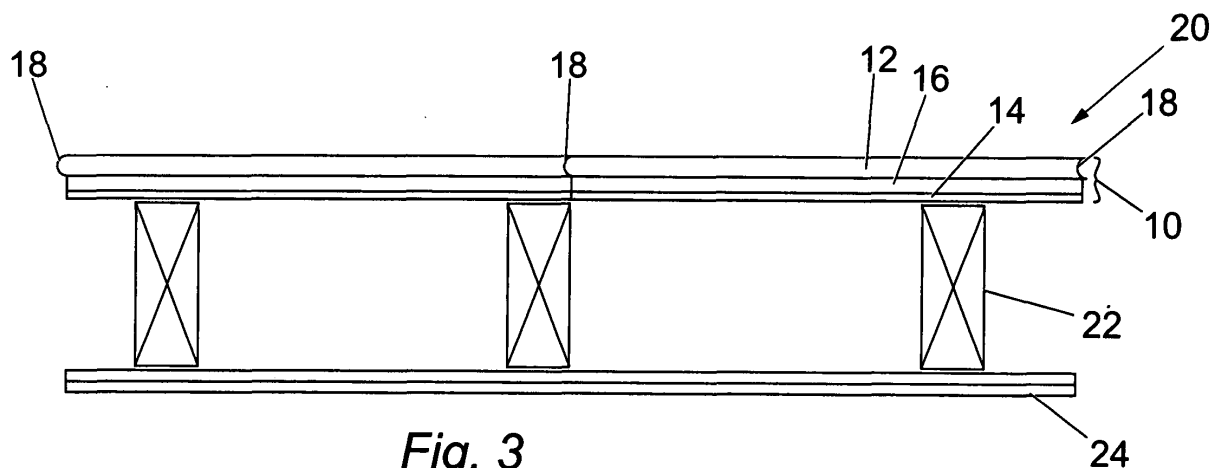


Fig. 3

Description

[0001] The present invention relates to flooring components, and in particular to flooring components having vibration damping and acoustic insulating properties.

[0002] It is known to refurbish an existing floor laid on a plurality of timber joists with a view to improving the sound insulation properties of the floor. Typically, this has been achieved by overlaying a new floor deck on top of existing joists, there being a plurality of foam strips positioned between the new floor deck and the joists.

[0003] Such foam strips comprise layers of open and closed cell foam. The open-cell foam layer acts to attenuate impact sounds such as those caused by shock loads on the floor and the closed-cell foam layer acts to attenuate airborne sounds. Other known strips are formed in a single layer where the open and closed cell foam particles are mixed together in a random fashion.

[0004] Although the aforementioned foam strips successfully attenuate both impact and airborne sounds, they only do so at the contact point of the joists and floor deck. Therefore, the absence of any insulating material in the spaces between adjacent joists continues to allow the transmission and/or reverberation of unwanted sound.

[0005] According to a first aspect of the present invention there is provided a flooring component comprising an upper deck layer, a lower resilient layer and a layer of foam material interposed between the upper and lower layers.

[0006] Preferably, the layer of foam material is adhered to the lower surface of the upper deck layer and the upper surface of the lower resilient layer respectively.

[0007] Preferably, the upper deck layer is made of particle chipboard material.

[0008] Preferably, the lower layer of resilient material is made from rubber.

[0009] Preferably, the layer of foam material is reconstituted foam comprising a mixture of open and closed cell foam particles.

[0010] Preferably, the upper deck layer has a thickness in the range 22mm to 38mm.

[0011] Preferably, the lower resilient layer has a thickness in the range 3mm to 7mm.

[0012] Preferably, the foam layer has a thickness in the range 8mm to 15mm.

[0013] Preferably, the edges of the upper deck layers are provided with tongue and groove joints.

[0014] According to a second aspect of the present invention there is provided a flooring assembly comprising a plurality of the flooring components as described in the previous paragraph, wherein the flooring components are laid in side-by-side abutting relationship such that the edges of the upper deck layers are joined at their co-operating tongue and groove joints.

[0015] Preferably, the upper deck layers are bonded together at their tongue and groove joints without any

mechanical fixings.

[0016] Preferably, the floor components are laid directly onto a floor supporting structure.

[0017] Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a cross-sectional view of a floor component;

Fig. 2 is a perspective view of a floor component; and

Fig. 3 is a cross-sectional view of a flooring construction in use.

[0018] Figs. 1 and 2 show a floor component 10 having an upper floor deck layer 12 of chipboard material of thickness 22mm to 38mm, a lower layer 14 of rubber material of thickness 3mm to 7mm and, interposed between the upper and lower layers 12, 14, a layer 16 of reconstituted foam material of thickness 8mm to 15mm. The layer of reconstituted foam material 16 is bonded by adhesive to both the upper deck layer 12 and the lower resilient layer 14 of rubber respectively. The upper floor deck layer 12 is provided with tongue and groove joints 18 respectively on its opposite edges.

[0019] The layer 16 of reconstituted foam material comprises a mixture of open and closed cell foam particles and is bonded to the lower surface of the upper floor deck layer and the upper surface of the lower layer of rubber respectively.

[0020] In one example, the lower layer 16 of rubber material has a density of 600 kg m⁻³ and has a thickness of 4.75 mm. It will be appreciated however, that the properties (i.e. material, thickness and density) of the resilient lower layer will be chosen depending upon the nature of the anticipated loads and acoustic noise levels to be attenuated.

[0021] Fig. 3 shows a floor assembly 20 employing the flooring components shown in Figs. 1 and 2. The floor assembly 20 is laid directly onto floor joists 22 which may also support a suspended ceiling 24.

[0022] In use, floor components 10 are supported on a plurality of floor joists 22 in side-by-side abutting relationship such that they are joined at their corresponding tongue and groove joints 18. The floor components 10 are bonded with adhesive at their tongue and groove joints 18 and are free from any mechanical fixings.

[0023] Vibrations and impact loads to the floor deck 12 and the consequent acoustic noise produced by those vibrations and shocks are attenuated by both the rubber and foam layers 14, 16. The function of the foam layer 16 is to attenuate both impact and airborne noise whilst the lower layer of rubber 14 also provides a degree of resilience for impact loads and acts to spread such loads over the more fragile foam layer 16.

[0024] Advantageously, the lower rubber layer 14 and the foam layer 16 both extend over substantially the en-

tire surface area of the lower surface of the upper deck layer 12. Accordingly, a continuous barrier to unwanted sound transmission and/or reverberation is provided.

[0025] It will be appreciated by those skilled in the art that the flooring components 10 and flooring assembly 20 of the present invention constitute an improvement over the prior art. For example, the fact that the layers of sound insulating material 14, 16 extend over substantially the entire surface area of the upper deck layer 12 and not only between the upper deck layer 12 and the supporting floor joists 22 means that overall sound insulation is improved.

[0026] Various modifications and improvements may be made without departing from the scope of the present invention. For example, the thickness, density and choice of materials for the various layers 12, 14, 16 of the floor components 10 may be selected depending upon the nature and extent of the anticipated loads and the nature and extent of acoustic noise levels to be attenuated.

Claims

1. A flooring component (10) comprising an upper deck layer (12), a lower resilient layer (14) and a layer of foam material (16) interposed between the upper and lower layers (12, 14). 25
2. A flooring component (10) according to claim 1, wherein the layer of foam material (16) is adhered to the lower surface of the upper deck layer (12) and the upper surface of the lower resilient layer (14) respectively. 30
3. A flooring component (10) according to claim 1 or 2 wherein, the upper deck layer (12) is made of particle chipboard material. 35
4. A flooring component (10) according to any preceding claim, wherein the lower layer of resilient material (14) is made of rubber. 40
5. A flooring component (10) according to any preceding claim, wherein the layer of foam material (16) is reconstituted foam comprising a mixture of open and closed cell foam particles. 45
6. A flooring component (10) according to any preceding claim, wherein the upper deck layer (12) has a thickness in the range 22mm to 38mm. 50
7. A flooring component (10) according to any preceding claim, wherein the lower resilient layer (14) has a thickness in the range 3mm to 7mm. 55
8. A flooring component (10) according to any preceding claim, wherein the foam layer (16) has a thick-

ness in the range 8mm to 15mm.

9. A flooring component (10) according to any preceding claim, wherein the edges of the upper deck layers (12) are provided with tongue and groove joints (18).
10. A flooring assembly (20) comprising a plurality of the flooring components (10) according to claim 9, wherein the flooring components (10) are laid in side-by-side abutting relationship such that the edges of the upper deck layers (12) are joined at their co-operating tongue and groove joints (18).
11. A flooring assembly (20) according to claim 10, wherein the upper deck layers (12) are bonded together at their tongue and groove joints (18) without any mechanical fixings.
12. A flooring assembly (20) according to claim 10 or 11, wherein the floor components (10) are laid directly onto a floor supporting structure (22).

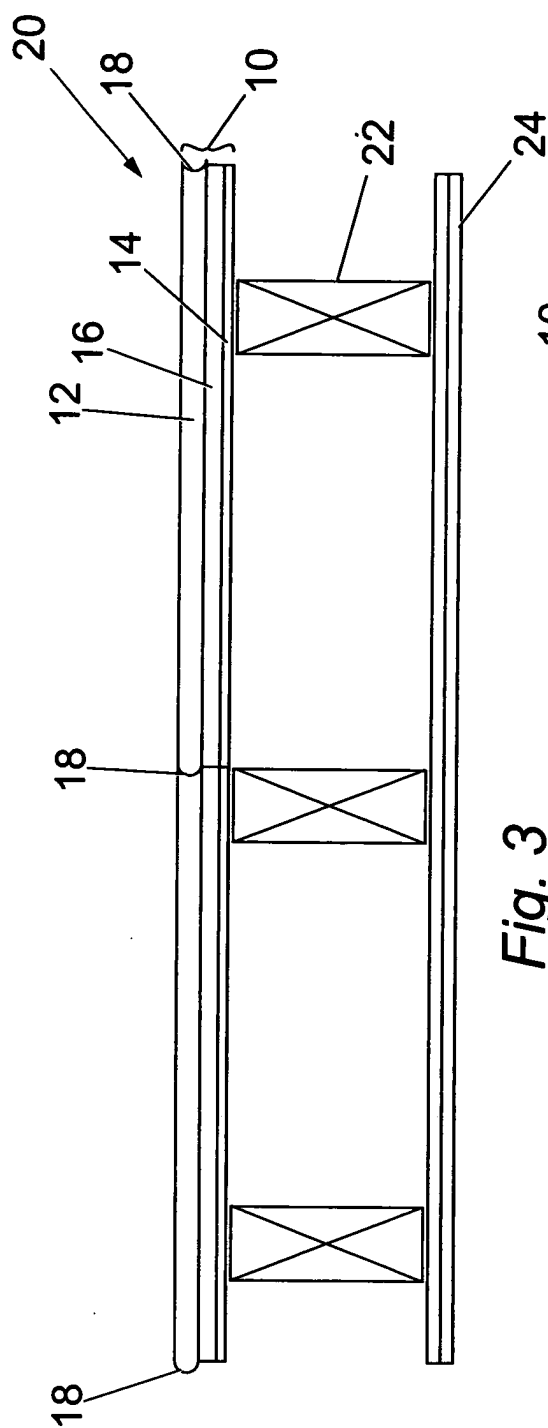


Fig. 3

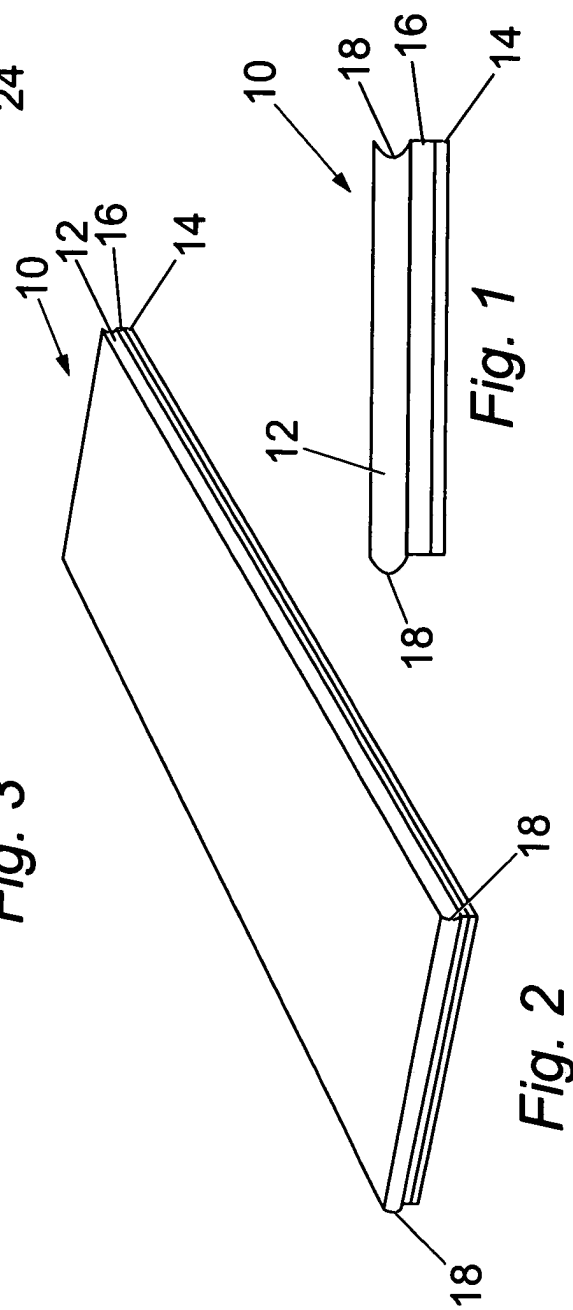


Fig. 1

Fig. 2