

12 **EUROPEAN PATENT APPLICATION**

21 Application number: **87200972.5**

51 Int. Cl.4: **E04C 2/38**

22 Date of filing: **22.05.87**

30 Priority: **23.05.86 NL 8601322**

43 Date of publication of application:
02.12.87 Bulletin 87/49

64 Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

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54 **Sound-insulating component.**

57 Sound-insulating component consisting of a supporting panel (2) with a layer of insulating material (5) disposed thereon. Said layer of insulating material being enclosed by a peripheral rigid frame (3) which is arranged along the perimeter of the supporting panel. A strip of insulating material being disposed on the rigid frame (3) so that the overall height of the edge structure (3, 4) formed by the frame and the strip of insulating material being approximately equal to the thickness of the enclosed layer of insulating material (5).

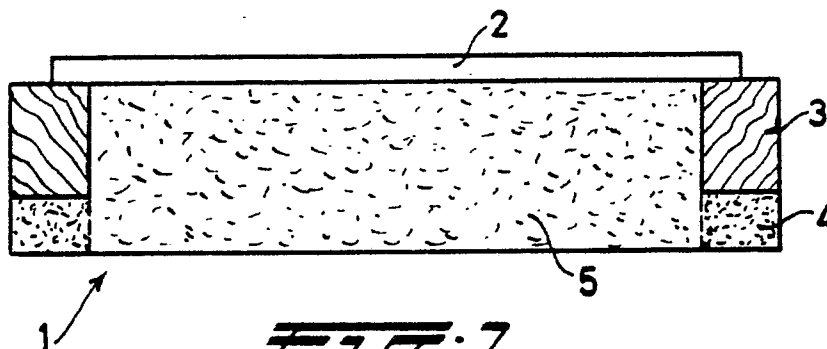


FIG: 1.

Sound-insulating component

The present invention relates to a sound-insulating component consisting of a supporting panel with a layer of insulating material disposed thereon, said layer of insulating material being enclosed by a peripheral rigid frame, which is arranged along the perimeter of the supporting panel.

Such components are known in a large number of variations and are often used, inter alia, as heat-insulating components, the insulating material consisting of polystyrene foam or glass fibre wool or the like. Although said panels have good heat-insulating properties, the sound-insulating action is in general inadequate.

An object of the present invention is to provide a sound-insulating panel which, in addition to good sound-insulating properties, is also easy to install and to handle.

This object is achieved according to the invention in that a strip of insulating material has been disposed on the rigid frame, the overall height of the edge structure formed by the frame and the strip of insulating material being approximately equal to the thickness of the enclosed layer of insulating material. The rigid frame provides the component with a certain rigidity so that the component is easy to handle and to mount, while the strip of insulating material disposed on the rigid frame prevents the rigid frame coming into contact with the wall, floor or the roof against which the components are mounted, and contact sound is therefore avoided.

Preferably, the rigid peripheral frame is manufactured from wood and the supporting panel consists of a cement-bonded fibre panel. Said combination of material makes a simple and cheap manufacture of the components possible, and also provides good sound-insulating properties.

According to the invention, the strip of insulating material disposed on the frame may have a lower compressibility than the enclosed layer of insulating material. In this manner, the rigidity of the side edges of the component is increased so that any compression of the components is avoided or reduced.

Preferably the insulating material according to the invention consists of compressed flakes of open-cell, elastic polyurethane foam of varying density with a binding agent added. Tests have shown that components can be manufactured with said insulating material which have an excellent sound-insulating action.

A suitable embodiment of the sound-insulating component according to the invention, which is particularly suitable for self-supporting structures, is characterized in that a second peripheral rigid

frame, on which a second supporting panel is mounted, is disposed on the strip of insulating material, the space enclosed between the two supporting panels and the frames being filled with insulating material. Such components are used, for example, for sloping roofs and are then mounted directly on the purlins.

The invention is explained in more detail by reference to the drawings in which:

Figure 1 shows a section of a sound-insulating component according to the invention;

Figure 2 shows a perspective view of the component from figure 1;

Figure 3 shows another embodiment of a sound-insulating component according to the invention;

Figure 4 shows a section of a roof which is manufactured from components according to Figure 3;

Figure 5 shows a section of a roof which is insulated by means of components from Figures 1 and 2;

Figure 6 is a graph which indicates the sound insulation of the roof construction according to Figure 5.

As is evident from Figures 1 and 2, a sound-insulating component 1 according to the invention consists of a supporting panel 2, along the perimeter of which there is disposed a peripheral wooden frame 3. A strip of insulating material 4 is disposed on said peripheral frame 3. Inside the edge structure formed by the frame 3 and the strip 4 there is disposed a layer of insulating material 5 whose thickness is virtually equal to the sum of the height of the frame 3 and the strip of insulating material 4. As can be seen in the drawing, the height of the strip of insulating material 4 is appreciably less than that of the frame 3. The strip of insulating material 4 may have a lower compressibility than the layer of insulating material 5 so that the pressure loadings are mainly absorbed by the edge structure of the components.

Figure 2 shows that the peripheral frame 3 to some extent projects outside the supporting panel so that, if several components 1 are placed next to each other, grooves are produced between the supporting panels of the components adjacent to each other in which mounting laths can be disposed as will also be described below.

Figure 3 shows another embodiment of the sound-insulating component according to the invention in which a second rigid peripheral frame 6 is disposed on the strip of insulating material 4, on which frame a second supporting panel 7 is mounted. As can be seen in Figure 3, the height of the

second frame 6 is appreciably less than that of the first frame. In the embodiment shown this height approximately corresponds to that of the strip of insulating material 4.

This type of component is suitable, in particular, for sloping roofs and can be mounted directly on the purlins. Since there is no direct contact between the supporting panels 2 and 7, a particularly good sound insulation is ensured, while the component has an adequate strength and rigidity as a result of the wooden frames 3 and 6. The insulation material used is formed by an opencell elastic polyurethane foam which consists of selected original polyurethanes of varying density from which, after flaking and adding additional substances and a binding agent, blocks are made. These are sawn into panels of the desired thickness. Depending on the desired density, the flakes are to a greater or lesser extent compressed into blocks whose density varies from 80 to 240 kg/m³.

The supporting panels consist preferably of a cement-bonded fibre panel, plasterboard, fibre-bonded plaster panel, waterproof plywood and the like.

The components constructed with a single supporting panel 2 from the Figures 1 and 2 are intended, in particular, for lining existing roofs, sidewalls or floors, the strip of insulating material 4 preventing any contact sound between the structure and the supporting panel, and the components nevertheless having an adequate strength and rigidity.

Figure 4 shows a roof structure in section which is made up of a number of components of the type shown in Figure 3 which adjoin each other.

In this embodiment, the supporting panel 2 to some extent projects at one side and overlaps the frame 3 of the next element adjoining thereto, as a result of which a good joining of the components situated adjacent to each other is obtained. The supporting panels 7 of two components adjacent to each other are at some distance from each other so that a mounting lath or batten 8 can be disposed in between. On said battens there are mounted in turn tile laths 9 which support the tiles 10, only one of which is shown in Figure 4.

Figure 5 shows a section of a roof which is insulated by means of the components shown in Figures 1 and 2. The figure shows a purlin 11 with a roof boarding 12 on which the components are disposed, the side edges of which components are adjacent to each other. Between the supporting panels 2 of two components adjacent to each other there are disposed mounting laths or battens 13 on which the tile laths 14 are mounted which support the tiles 15.

Figure 6 shows graphically the atmospheric noise insulation of the structure in Figure 5. From this graph it is clearly evident that the sound insulation in the high frequency range is much higher than the standard values laid down in NEN 1070.

In summary it may be stated that, by means of the sound-insulating component according to the invention, a good sound insulation can be obtained by lining existing roofs, walls or floors with the components shown in Figures 1 and 2 and also that good sound-insulating walls can be constructed by means of the components of the type shown in Figure 3. The components may possibly be provided with suitable decorative coverings without the quality of the sound insulation thereby being reduced. It will be clear that the invention is not limited to the embodiments shown in the drawing, but that a large number of modifications is possible within the scope of the invention. Thus, for example, a further thin layer of insulating material with a low compressibility can be provided in the case of the component shown in Figure 1, which layer covers both the edge strip and the layer of insulating material situated inside it. This embodiment provides, in particular, a good sound insulation in the lower frequency range.

Claims

1. A sound-insulating component consisting of a supporting panel (2) with a layer of insulating material (5) disposed thereon, said layer of insulating material being enclosed by a peripheral rigid frame (3), which is arranged along the perimeter of the supporting panel, characterized in that a strip of insulating material (4) has been disposed on the rigid frame (3), the overall height of the edge structure formed by the frame and the strip of insulating material being approximately equal to the thickness of the enclosed layer of insulating material (5).

2. A sound-insulating component according to claim 1, characterized in that the strip of insulating material disposed on the frame has a lower compressibility than the enclosed layer of insulating material.

3. A sound-insulating component according to one of the claims 1 or 2, characterized in that the height of the strip of insulating material (4) is less than half the height of the peripheral frame (3).

4. A sound-insulating component according to one of the preceding claims 1-3, characterized in that the insulating material consists of compressed flakes of opencell elastic polyurethane foam of varying density with a binding agent added.

5. A sound-insulating component according to one of the preceding claims 1-4, characterized in that the rigid peripheral frame (3) is manufactured from wood and the supporting panel (2) consists of a cement-bonded fibre panel.

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6. A sound-insulating component according to one of the preceding claims 1-5, characterized in that a second peripheral rigid frame (6), on which a second supporting panel (7) is mounted, is disposed on the strip of insulating material, the space enclosed between the supporting panels (2, 7) and the frames (3, 6) being filled with insulating material (5).

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7. A sound-insulating component according to claim 6, characterized in that the second frame is manufactured from wood.

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8. A sound-insulating component according to claim 6 or 7, characterized in that the height of the second frame (6) is approximately equal to the height of the strip of insulating material (4) situated between the two frames.

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9. A sound-insulating component according to one or more of the preceding claims 6-8, characterized in that the strip of insulating material situated between the two frames has the same compressibility as the layer of insulating material enclosed by the frames.

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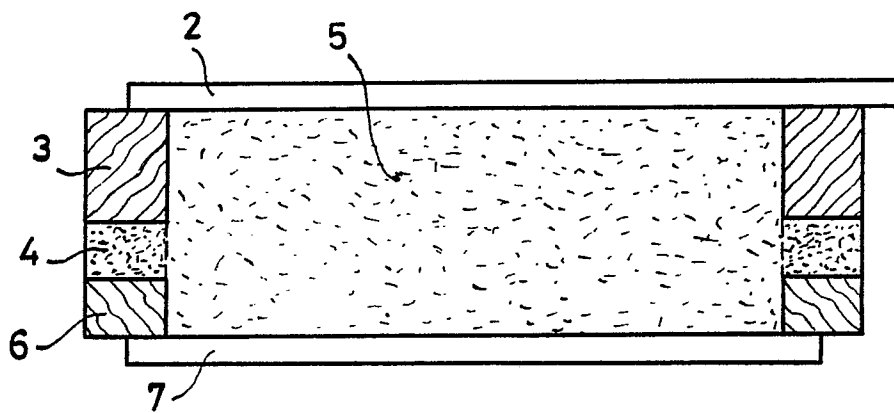
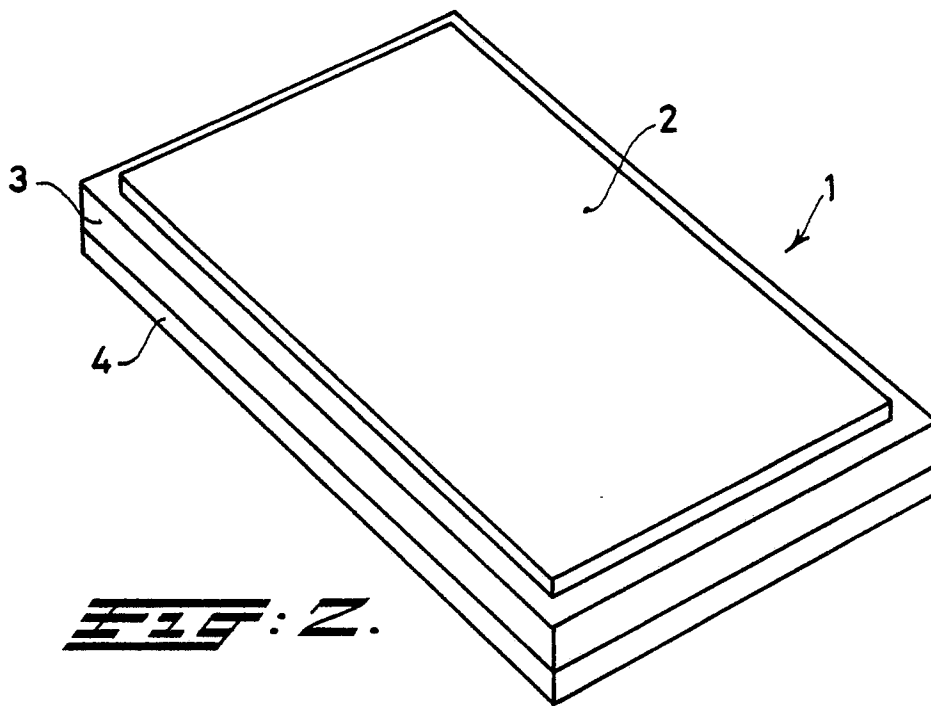
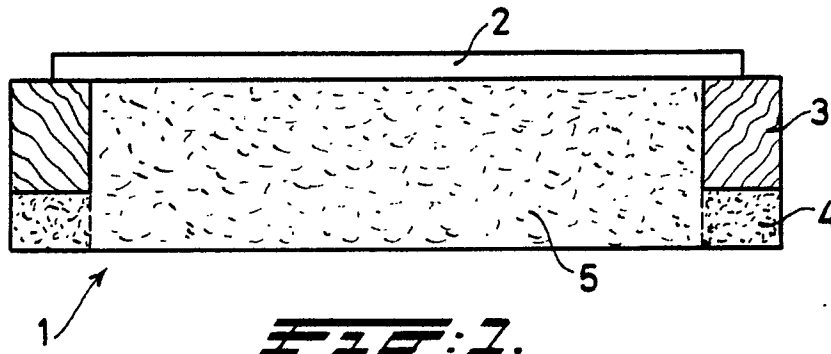
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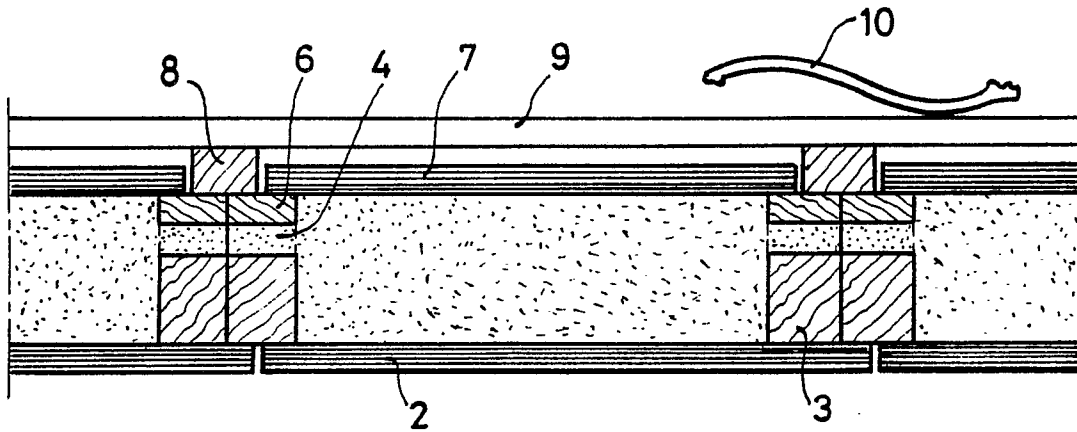


FIG. 4.

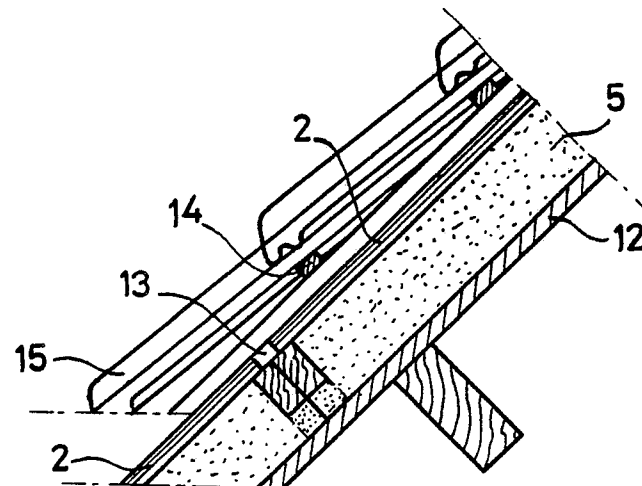
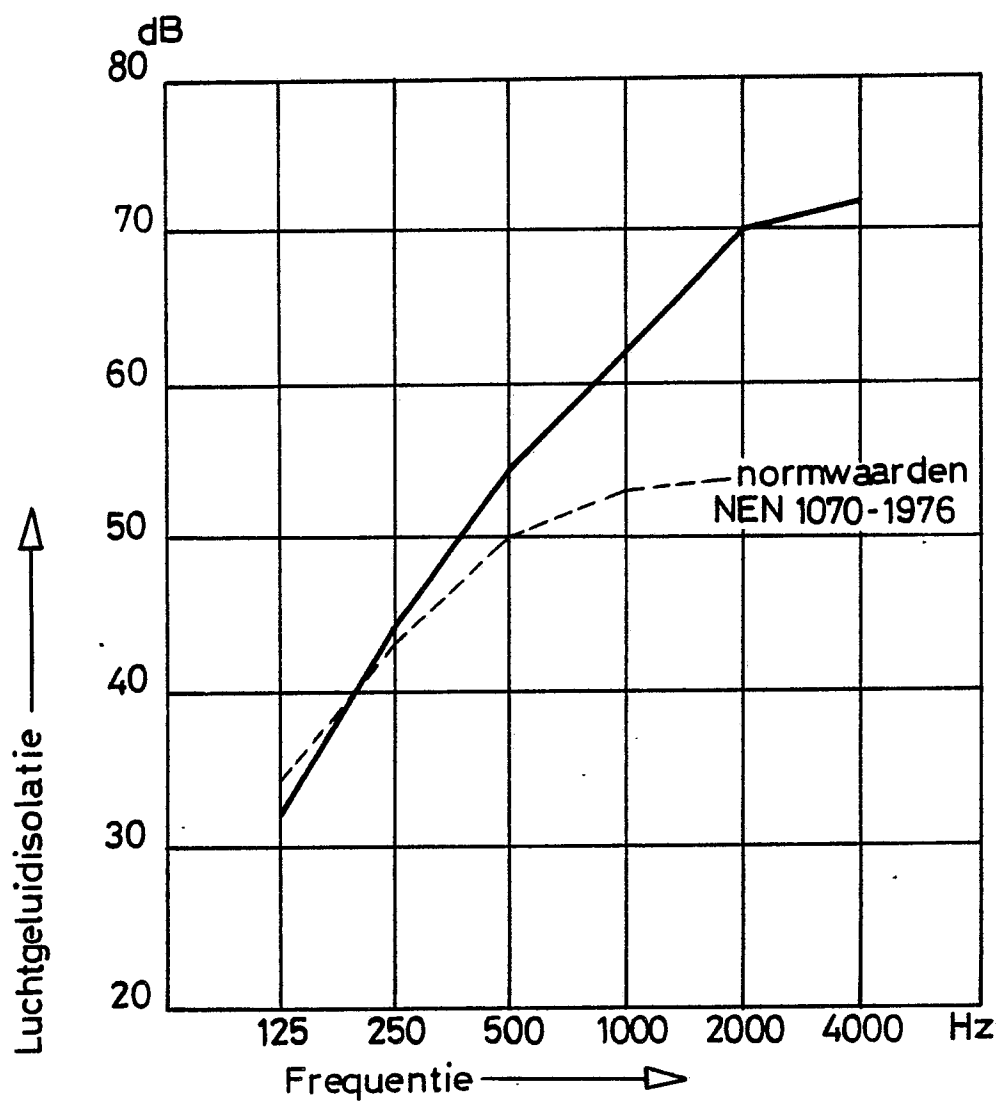


FIG. 5.

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