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(54) **SYSTEM WITH A FLEXIBLE HEAT- AND SOUND-INSULATING PANEL**

SYSTEM MIT EINER FLEXIBLEN WÄRME- UND SCHALLDÄMMPLATTE

SYSTEME AVEC UN PANNEAU SOUPLE D'ISOLATION THERMIQUE ET ACOUSTIQUE

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Description

Technical Field

[0001] The invention relates to a system for heat- and sound-insulating the area between substantially parallel and interspaced beam elements in a building, eg two posts in a wall or two ridge beams of two trusses in a roof structure, with a panel being made of fibres, such as mineral wool fibres, plastic fibres or plant fibres, and provided with planar end surfaces being cut off substantially perpendicular to the "flex" direction of the panel.

[0002] It is known to insulate the area between and atop the ridge beams of two trusses in a roof structure by placing mineral wool insulation panels in two or more layers, ie one layer between the ridge beams and one or more layers atop the ridge beams and the first layer. This is not a quite satisfactory method, as several operations are involved in the placing of the panels.

[0003] It is also known to provide one of the large flat lateral faces of a mineral wool panel with score line slits such that the panel may be easily divided into smaller panels at said slits.

[0004] US 5 524 400 discloses a wall assembly of a building structure which utilizes a plurality of panels having preformed grooves interacting with generally U-shaped supports. More precisely the panels are supported by a leg of the U-shaped support being guided within a groove of a panel. A plurality of such panels may be positioned adjacent to each other and the U-shaped supports may be interconnected in a manner providing a desired degree of structure integrity. The panels are made of Styrofoam

Brief Description of the Invention

[0005] The object of the invention is to provide a system of the above type and which in a more simple manner than hitherto allows the panel to insulate atop the beam elements and in particular to insulate atop said ridge beams, while providing insulation between the beam elements.

[0006] According to the invention the length of the panel slightly exceeds the spacing between the beam elements and that its thickness exceeds one cross-sectional dimension of the beam element, eg the height of the ridge beam and that at least one end face of the panel is provided with one to five slits arranged substantially parallel to the large lateral faces of the panel and that the spacing between one of said lateral faces and the first slit in the row of slits substantially corresponds to the said one cross-sectional dimension of the beam element, eg the height of the ridge beam. As a result the portion of the panel positioned in between beam elements may be wedged therebetween ("flexed" into position), and in particular between the ridge beams and project thereabove. More specifically the portions of the panel positioned between one of the large lateral face of the panel and level

of the first slit are compressed. However, the portion of the panel positioned beyond said slit remains uncompressed and thus extends over at least one of the beam elements, in particular the ridge beams. The latter beams are thus covered by the panel material and insulated.

[0007] According to the invention an embodiment, in which the beam elements are ridge beams, is characterised in that the depth of each slit is greater than or equal to half the width of the ridge beam. As a result the panel portion opposite the ridge beams may be compressed in a comparatively easy manner. The half of the upper surface of a ridge beam may be covered by a single panel. The adjacent panel then covers the other half of the surface of the ridge beam in question.

[0008] According to the invention the thickness of the panel may range from 200 to 350 mm, which has proved particularly advantageous.

[0009] Moreover according to the invention the panel may be provided with at least one flexible zone of a length of 20-200 mm at the end face provided with the slits. It is thus ensured that at least the area adjacent the said end face is sufficient resilient (ie that the flexible zone may be compressed).

[0010] According to the invention the length of the panel may be 800-1200 mm, eg about 1000 mm, and the width may be 550-650 mm, eg about 600 mm, and the thickness may be 200-350 mm, eg about 240 mm. These dimensions have proved particularly suitable for many types of panels.

[0011] Moreover according to the invention the height of the panel portions defined by a large panel lateral face and a slit may exceed the height of a panel portion between two successive slits. This embodiment has proved particularly practical.

[0012] According to the invention the height of the panel portion between two successive slits may be constant. This has proved particularly advantageous.

[0013] Furthermore according to the invention the panel may be thus compressible (flexible) in its longitudinal direction that in its mounted state between two ridge beams as far as its upper part is concerned the panel may extend at least to a centre line on the upper face of the ridge beams. This embodiment of the panel is particularly suitable for insulating between and atop ridge beams.

[0014] The invention also relates to a rolled blanket of heat- and sound-insulating mineral wool, the size of the blanket corresponding to a number of juxtaposed panels according to the invention. The blanket is characterised in that it is flexible in a direction perpendicular to the rolling-up direction and that the said one to five slit(s) is/are provided at least in one of the longitudinal, narrow lateral faces of the blanket. As a result large areas may be insulated in one operation.

Brief Description of the Drawings

[0015] The invention is explained in detail below with

reference to the drawings, in which

Fig. 1 is a perspective view of a first embodiment of a panel of the system according to the invention,

Fig. 2 is a diagrammatic view of a panel of the system according to the invention positioned between two beam elements such as two ridge beams,

Fig. 3 is diagrammatic view of an embodiment of a panel provided with a slit at either side, the panel being shown undeformed; ie it is compressible (flexible) over the entire length of the panel.

Fig. 4 is a diagrammatic view of an embodiment of the panel, in which the panel has a compressible zone (a flexible zone) at either of its end faces provided with slits.

Fig. 5 illustrates two successive ridge beams in two successive roof trusses in a roof structure (not shown),

Fig. 6 is a diagrammatic and perspective view of a panel with five slits,

Fig. 7 is a diagrammatic view of two posts, an insulating panel being secured therebetween,

Fig. 8 is a perspective view of a wound blanket of the panel material.

Best Mode for Carrying Out the Invention

[0016] The flexible panel 1 shown in Fig. 1 serves as heat and sound insulation of the area between the substantially parallel beam elements arranged with an interspacing x , eg two ridge beams 3', 3" of two trusses in a roof structure or two posts 13', 13" in a wall, confer also Figs. 2, 5 and 7. In Fig. 7 the panel is denoted by the reference numeral 10.

[0017] The panel 1 is made of fibres, such as mineral wool fibres (fibres of glass or stone) and has planar end faces 6, which have been cut off substantially perpendicular to the longitudinal direction (the "flex" direction) of the panel, confer the double-headed arrow A in Fig. 1. The length 1 of the panel exceeds the spacing x between the beam elements 3' and 3", confer Fig. 2. The panel may be of a thickness t exceeding one of the cross-sectional dimensions of the beam element, eg the height h of the ridge beam. It clearly appears from Fig. 2 that t exceeds h . One end face of the panel may be provided with one to five slits. Fig. 1 illustrates how the panel may be provided with one slit 5. Fig. 6 illustrates how the panel may be provided with five slits 5a-5e. The slits are placed substantially parallel to the large flat lateral face 1a. The spacing y between one of these lateral faces 1a and the first slit 5a in the row of slits corresponds substantially to

one cross-sectional dimension of the beam element, eg the height h of the ridge beam. In so far as the beam elements are ridge beams, each slit in the panel may have a depth d greater than or equal to half the width b of the ridge beam 3'.

[0018] The thickness t of the panel 1 is preferably between 200-350 mm.

[0019] At the end face 6 provided with the slits 5, the panel 1 may be provided with a flexible zone 8 of a length w of 20-200 mm, confer Fig. 4. When mentioning that the panel has at least one flexible zone, it is to emphasize that the panel material outside the flexible zone(s) may be comparatively rigid.

[0020] The length of the panel 1 may be 800-1200 mm, eg about 1000 mm, width may be 550-650 mm, eg about 600 mm, and the thickness may be 200-350 mm, eg about 240 mm.

[0021] As shown in Fig. 6, the height y of the panel parts defined by a large panel lateral face 1b and a slit 5a may exceed the height y_1 of the panel parts between two successive slits among the slits 5a-5e.

[0022] The height y_1 of the panel parts between two successive slits of the slits 5a-5d may be constant.

[0023] As shown in Figs. 2 and 5 the panel may be compressible in its longitudinal direction such that when mounted between two ridge beams 3' and 3" part of the panel may extend at least to the centre line m of the upper face of each of the ridge beams 3', 3".

[0024] A rolled blanket 15 of heat- and sound-insulating mineral wool and of a size corresponding to a number of juxtaposed flexible panels according to the invention may be formed as shown in Fig. 8. The wound blanket 15 is compressible (flexible) in a direction corresponding to the double-headed arrow B being perpendicular to the rolling-up direction. The said one to five slits is/are arranged in at least one of the narrow longitudinal lateral faces 12 of the rolled blanket. Only one slit is, however, shown in Fig. 8.

[0025] Fig. 7 illustrates how a panel 10 may be arranged between two vertical posts 13', 13" in a wall, one portion of the panel being wedged between the posts and the remaining portion of the panel projecting beyond about half of the posts.

[0026] The invention may be modified in many ways without thereby deviating from the scope of the invention.

Claims

1. A system for heat- and sound insulating the area between beam elements, comprising

substantially parallel beam elements (3', 3"; 13', 13") arranged with an interspacing (x), eg two posts (13', 13") in a wall or two ridge beams (3', 3") of two trusses in a roof structure, and a panel (1, 10) for heat-and sound insulating the area between said substantially parallel beam

- elements (3', 3"; 13', 13"), wherein the thickness (t) of the panel exceeds one cross-sectional dimension of the beam element, eg the height (h) of the ridge beam (3', 3"): wherein at least one planar end face (6) of the panel is provided with one to five slits arranged substantially parallel to the large lateral faces (1 a) of the panel, and wherein the spacing (y) between one of said lateral faces (1b) and the first slit (5, 5a) of the one to five slits (5a-5e) substantially corresponds to the said one cross-sectional dimension of the beam element, eg the height (h) of the ridge beam (3', 3'),
characterised in
that said panel is made of fibres, such as mineral wool fibres, plastic fibres or plant fibres,
that the panel is flexible in a "flex" direction (A) being perpendicular to the longitudinal direction of the beam elements (3', 3"; 13', 13")
that the panel is provided with said planar end surfaces (6) being cut off substantially perpendicular to said "flex" direction (A) of the panel,
that the length (l) of the panel (1, 10) slightly exceeds the spacing (x) between the beam elements (3', 3"; 13', 13"), whereby the portion of a panel (1, 10) positioned in between the beam elements (3', 3" ; 13', 13") may be wedged therebetween,
 and
that the depth of each slit (5; 5a-5e) is greater than or equal to half the width (b) of the ridge beam (3', 3").
2. A system according to claim 1, **characterised in that** the thickness (t) of the panel (1,10) is 200-350 mm.
 3. A system according to claim 1 or 2, **characterised in that** the panel is provided with at least one flexible zone (8) of a length (w) of 20-200 mm at the end face (6) provided with the slit.
 4. A system according to one or more of the claims 1-3, **characterised in that** the length of the panel is 800-1200 mm, eg about 1000 mm, the width is 550-650 mm, eg about 600 mm, and the thickness is 200-350 mm, eg about 240 mm.
 5. A system according to one or more of the claims 1-4, **characterised in that** the height (y) of the panel parts defined by a large panel lateral face (1 b) and a slit (5a) exceeds the height (y1) of a panel part between two successive slits (5b, 5c).
 6. A system according to one or more of the claims 1-5, **characterised in that** the height (y1) of the panel parts between two successive slits (5a, 5b, 5c, 5d, 5e) is constant.

7. A system according to one or more of the claims 1-6, **characterised in that** it is thus compressible in its longitudinal direction that in its mounted state between two ridge beams (3', 3") it extends at least to a centre line (m) on the upper face of the ridge beams (3', 3").

Patentansprüche

1. System zur Wärme- und Schalldämmung des Bereichs zwischen Balkenelementen, das Folgendes umfasst:

im Wesentlichen parallele Balkenelemente (3', 3"; 13', 13"), die mit einem Zwischenraum (x) angeordnet sind, zum Beispiel zwei Pfosten (13', 13") in einer Wand oder zwei Firstbalken (3', 3") zweier Binder in einer Dachkonstruktion, und
 eine Platte (1, 10) zur Wärme- und Schalldämmung des Bereichs zwischen den im Wesentlichen parallelen Balkenelementen (3', 3"; 13', 13"), wobei die Dicke (t) der Platte eine Querschnittsabmessung des Balkenelement übersteigt, zum Beispiel die Höhe (h) des Firstbalkens (3', 3"); wobei
 mindestens eine planare Endfläche (6) der Platte mit einem bis fünf Schlitzten versehen ist, die im Wesentlichen parallel zu den großen seitlichen Flächen (1a) der Platte verlaufen, und wobei
 der Abstand (y) zwischen einer der seitlichen Flächen (1 b) und dem ersten Schlitz (5, 5a) des einen bis fünf Schlitzten (5a-5e) im Wesentlichen der einen Querschnittsabmessung des Balkenelement entspricht, zum Beispiel der Höhe (h) des Firstbalkens (3', 3'),

dadurch gekennzeichnet, dass die Platte aus Fasern besteht, wie zum Beispiel Mineralwollefasern, Kunststofffasern oder Pflanzenfasern,
 dass die Platte in einer "Biege"-Richtung (A), die senkrecht zur Längsrichtung der Balkenelemente (3', 3"; 13', 13") verläuft, flexibel ist,
 dass die planaren Endflächen (6) der Platte im Wesentlichen senkrecht zu der "Biege"-Richtung (A) der Platte abgeschnitten sind,
 dass die Länge (l) der Platte (1, 10) den Abstand (x) zwischen den Balkenelementen (3', 3"; 13', 13") geringfügig übersteigt, wobei der Abschnitt einer Platte (1, 10), der zwischen den Balkenelementen (3', 3"; 13', 13") angeordnet ist, dazwischen verkeilt sein kann, und
 dass die Tiefe jedes Schlitzes (5; 5a-5e) größer als oder halb so groß ist wie die Breite (b) des Firstbalkens (3', 3").

2. System nach Anspruch 1, **dadurch gekennzeichnet, dass** die Dicke (t) der Platte (1,10) 200-350 mm beträgt.
3. System nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Platte mit mindestens einer flexiblen Zone (8) mit einer Länge (w) von 20-200 mm an der Endfläche (6), die mit dem Schlitz versehen ist, ausgestattet ist.
4. System nach einem oder mehreren der Ansprüche 1-3, **dadurch gekennzeichnet, dass** die Länge der Platte 800-1200 mm, zum Beispiel etwa 1000 mm, beträgt, die Breite 550-650 mm, zum Beispiel etwa 600 mm, beträgt, und die Dicke 200-350 mm, zum Beispiel etwa 240 mm, beträgt.
5. System nach einem oder mehreren der Ansprüche 1-4, **dadurch gekennzeichnet, dass** die Höhe (y) der Plattenteile, die durch eine große Plattenseitenfläche (1 b) und einen Schlitz (5a) definiert werden, die Höhe (y1) eines Plattenteils zwischen zwei aufeinanderfolgenden Schlitz (5b, 5c) übersteigt.
6. System nach einem oder mehreren der Ansprüche 1-5, **dadurch gekennzeichnet, dass** die Höhe (y1) der Plattenteile zwischen zwei aufeinanderfolgenden Schlitz (5a, 5b, 5c, 5d, 5e) konstant ist.
7. System nach einem oder mehreren der Ansprüche 1-6, **dadurch gekennzeichnet, dass** es in seiner Längsrichtung so zusammengedrückt werden kann, dass es sich in seinem montierten Zustand zwischen zwei Firstbalken (3', 3'') mindestens bis zu einer Mittellinie (m) auf der Oberseite der Firstbalken (3', 3'') erstreckt.

Revendications

1. Système d'isolation thermique et acoustique de la zone située entre des éléments de poutrelles, comprenant

des éléments de poutrelles (3',3'';13',13'') essentiellement parallèles agencés avec un espacement (x) entre par exemple deux montants (13',13'') dans une paroi ou deux poutrelles de faîtage (3',3'') de deux fermes dans une structure de toit, et

un panneau (1,10) pour l'isolation thermique et acoustique de la zone située entre lesdits éléments de poutrelles essentiellement parallèles (3',3'';13',13''), dans lequel l'épaisseur (t) du panneau excède une dimension de section transversale de l'élément de poutrelle, par exemple la hauteur (h) de la poutrelle de faîtage (3',3''), dans lequel

au moins une face d'extrémité plane (6) du panneau est pourvue d'une à cinq fentes agencées substantiellement parallèlement aux faces latérales larges (1 a) du panneau, et dans lequel l'espacement (y) entre une desdites faces latérales (1 b) et la première fente (5,5a) des une à cinq fentes (5a-5e) correspond substantiellement à ladite une dimension de section transversale de l'élément de poutrelle, par exemple la hauteur (h) de la poutrelle de faîtage (3',3'),

caractérisé en ce que

ledit panneau est constitué de fibres, comme des fibres de laine minérale, des fibres plastiques ou des fibres végétales,

le panneau est flexible dans une direction de "flexion" (A) étant perpendiculaire à la direction longitudinale des éléments de poutrelle (3',3''; 13',13''),

le panneau est pourvu desdites surfaces d'extrémités planes (6) étant découpées substantiellement perpendiculairement à ladite direction de "flexion" (A) du panneau,

la longueur (l) du panneau (1,10) excède légèrement l'espacement (x) entre les éléments de poutrelle (3',3'';13',13''), moyennant quoi la portion d'un panneau (1,10) positionnée entre les éléments de poutrelles (3',3'';13',13'') peut être calée entre ceux-ci,

et

la profondeur de chaque fente (5;5a-5e) est supérieure ou égale à la moitié de la largeur (b) de la poutrelle de faîtage (3',3'').

2. Système selon la revendication 1, **caractérisé en ce que** l'épaisseur (t) du panneau (1,10) est 200-350 mm.
3. Système selon la revendication 1 ou 2, **caractérisé en ce que** le panneau est pourvu d'au moins une zone flexible (8) d'une longueur (w) de 20-200 mm au niveau de la face d'extrémité (6) pourvue de la fente.
4. Système selon une ou plusieurs des revendications 1 à 3, **caractérisé en ce que** la longueur du panneau est 800-1200 mm, par exemple environ 1000 mm, la largeur est 550-650 mm, par exemple environ 600 mm et l'épaisseur est 200-350 mm, par exemple environ 240 mm.
5. Système selon une ou plusieurs des revendications 1 à 4, **caractérisé en ce que** la hauteur (y) des parties de panneau définies par une large face latérale de panneau (1 b) et une fente (5a) excède la hauteur (y1) d'une partie de panneau entre deux fentes successives (5b,5c).

6. Système selon une ou plusieurs des revendications 1 à 5, **caractérisé en ce que** la hauteur (y1) des parties de panneau entre deux fentes successives (5a,5b,5c,5d,5e) est constante.

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7. Système selon une ou plusieurs des revendications 1 à 6, **caractérisé en ce que** il est ainsi compressible dans sa direction longitudinale que dans son état monté entre deux poutrelles de faîtage (3',3'') il s'étend au moins vers une ligne centrale (m) sur la face supérieure des poutrelles de faîtage (3',3'').

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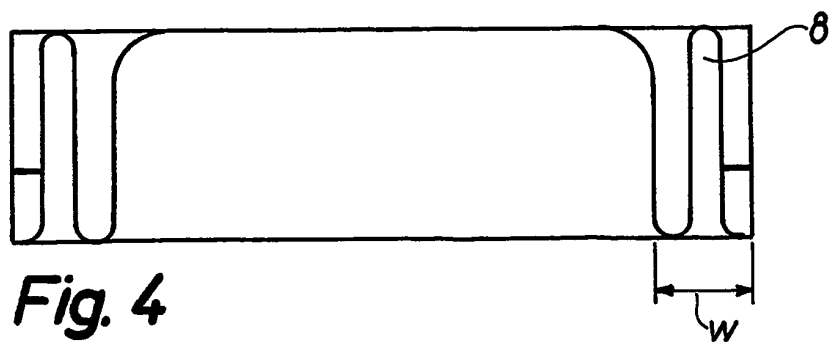
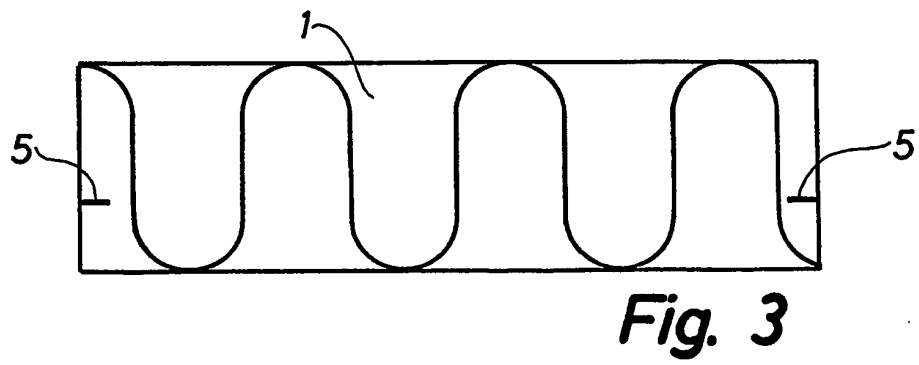
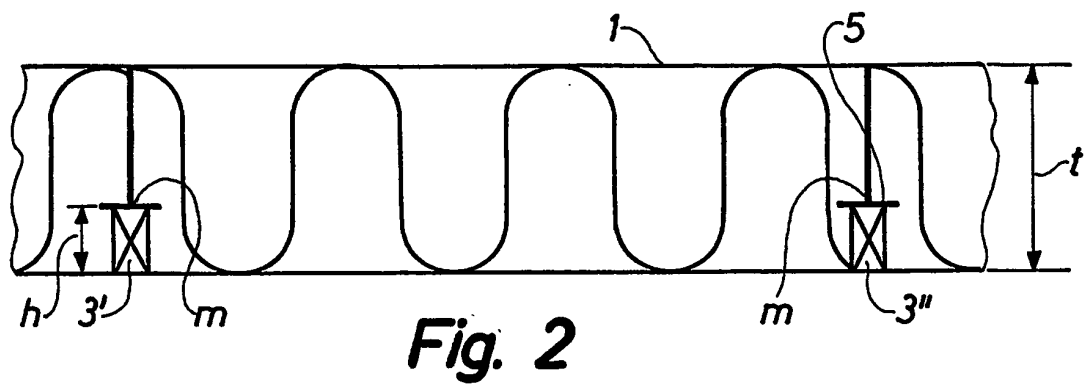
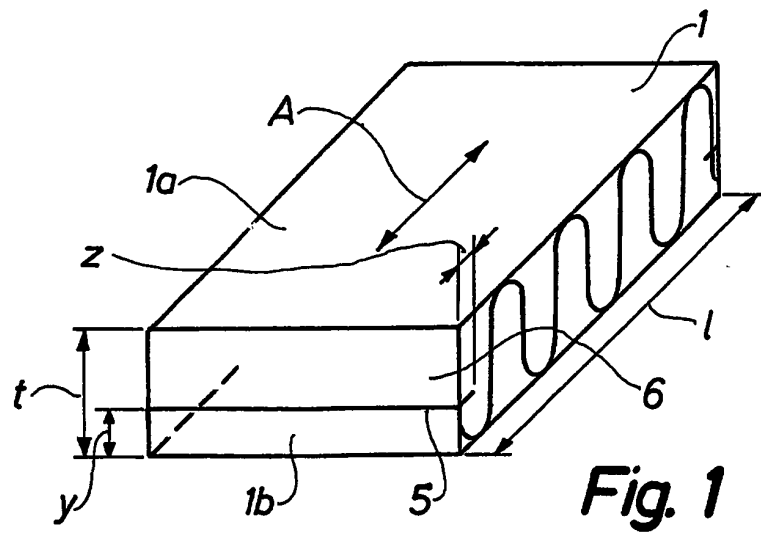
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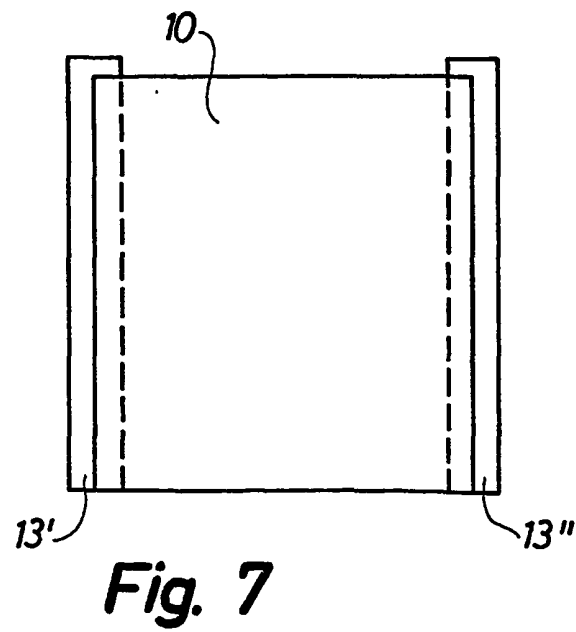
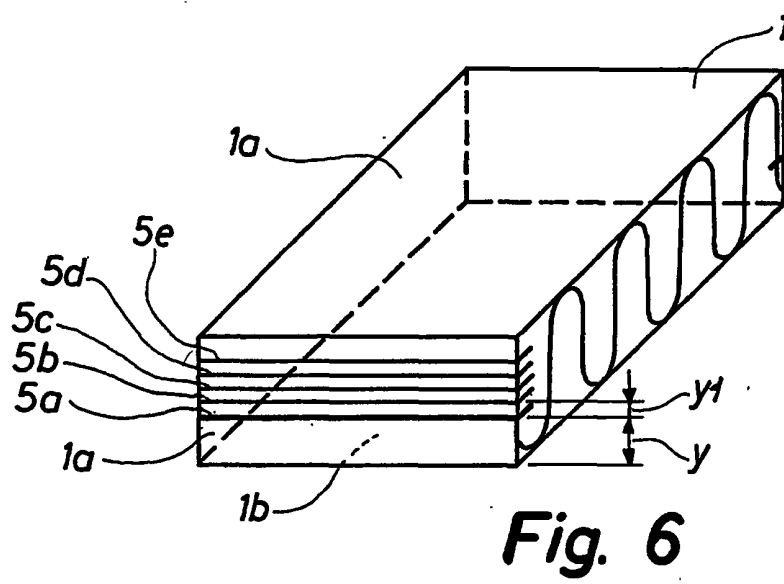
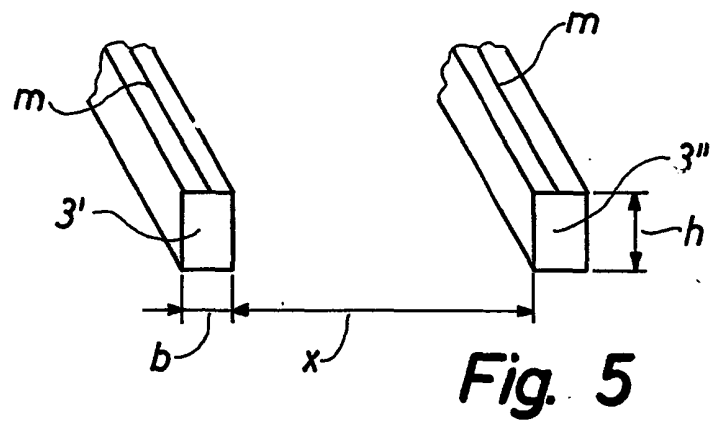
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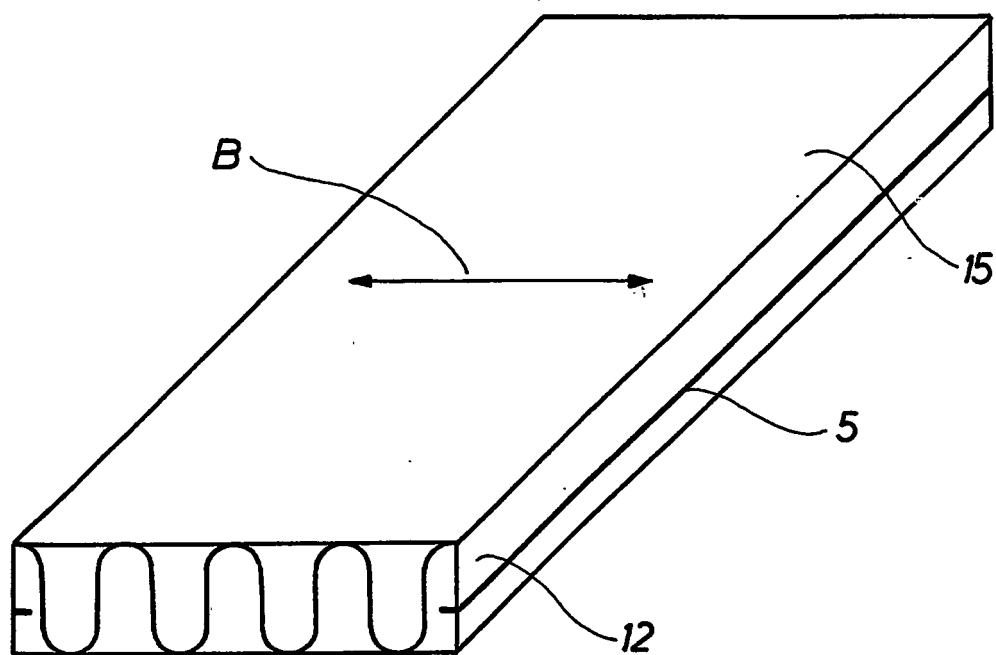


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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