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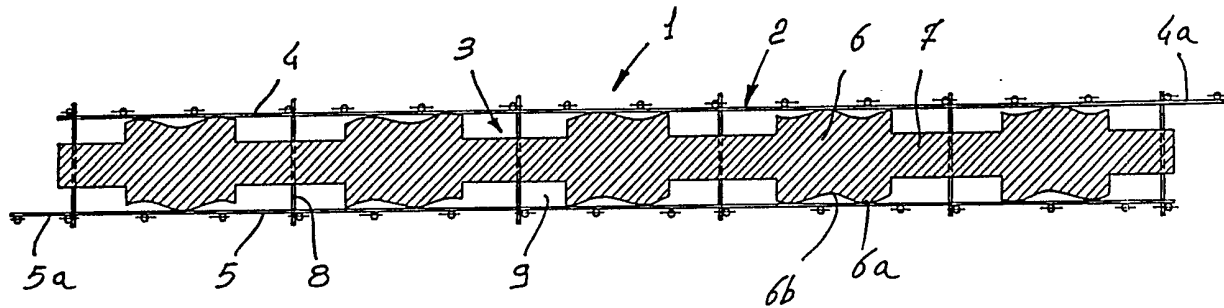
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E1D DCF2 DF116 DF193 DLEVA2 D2120 D401
D402 D414 D421 D505 D547

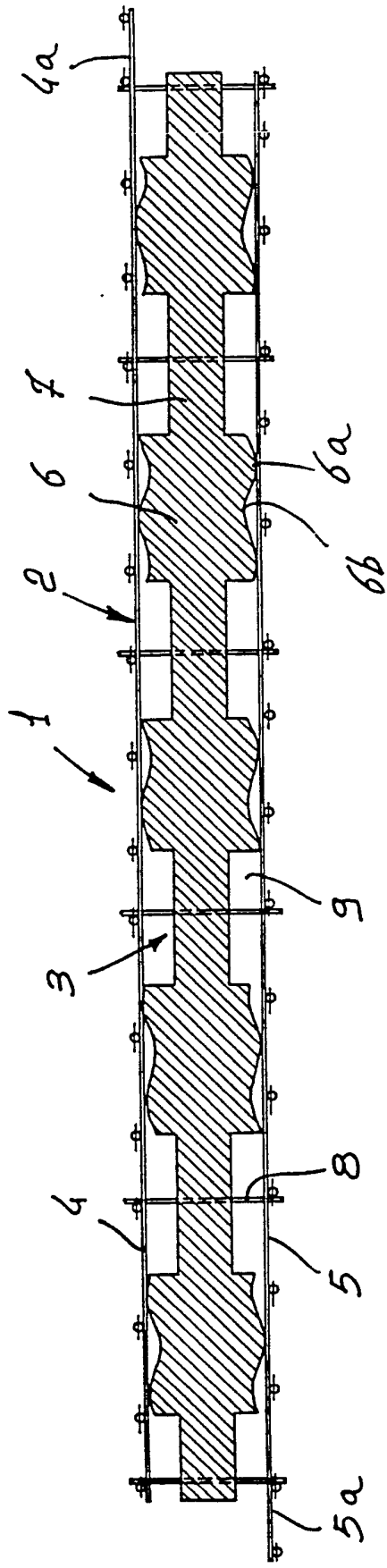
(56) Documents cited
GB 1361313 A

(58) Field of search
UK CL (Edition K) E1D DF116 DF193
INT CL⁵ E04B, E04C

(54) Thermoacoustic wall panel

(57) The panel (1) comprises an insulating layer (3) made of foamed plastic material which has a succession of corrugated portions (6) which are joined by reduced thickness portions (7). Metallic nets (4, 5) are associated with the opposite faces of the corrugated portions (6) of the insulating layer (3) and are mutually connected by transverse elements (8) which pass through the insulating layer (3). In use, concrete is applied over the nets.





WALL PANEL WITH THERMOACOUSTIC INSULATION CHARACTERISTICS

The present invention relates to a wall panel with thermoacoustic insulation characteristics.

The need to build partitions and load-bearing walls which can ensure high thermal and acoustic insulation is known in the field of building. The use of prefabricated panels in association with conventional building methods has been proposed for this purpose. However, the panels which are currently used have limited strength characteristics and are generally complicated to install.

Said panels are furthermore sometimes used to produce formwork suitable for the building of load-bearing walls. Said formwork is constituted by a pair of panels which are arranged side by side and are associated by means of appropriate spacer elements; an interspace suitable for containing a concrete casting is defined between the panels. This however entails greater structural complexity and poses problems of bulk both for transportation and for storage.

Embodiments of the present invention may provide a panel which allows the on-site building, in a rapid and easy manner, of load-bearing walls with characteristics of considerable strength and of high thermoacoustic insulation.

A preferred embodiment of the present invention may provide a panel of the above mentioned type which is simple in concept, has a small weight and bulk, is easy to install, is versatile in use and has a relatively low cost.

There is provided, according to the invention, the present wall panel with

characteristics of thermoacoustic insulation, which is characterized in that it comprises an insulating layer made of foamed plastic material which has a succession of portions which have parallel corrugations and are joined by
5 portions with a reduced thickness, and a grid formed by a pair of metallic nets which are associated with the opposite faces of said corrugated portions of the insulating layer and are mutually connected by transverse elements which pass through said insulating layer.

10 The details of the invention will become apparent from the detailed description of a preferred embodiment of the wall panel with characteristics of thermoacoustic insulation, illustrated only by way of non-limitative example in the accompanying drawing, wherein:

15 the only figure is a horizontal sectional view of a panel according to the present invention.

With particular reference to said figure, the reference numeral 1 generally indicates the wall panel with thermoacoustic insulation characteristics.

20 The panel 1 is constituted by a metallic grid 2 which has an insulating layer 3 made of foamed material such as polystyrene. More particularly, the grid 2 comprises a pair of electrically welded metallic nets 4 and 5 with a rectangular mesh, between which the insulating layer 3 is
25 interposed.

The metallic nets 4, 5 are preferably made of hot-galvanized, cold-redrawn high strength steel wires with a low carbon content; the vertical wires are electrically welded so as to form a rectangular mesh of an asymmetric
30 type.

The insulating layer 3 is preferably made of high-density polystyrene of the virgin self-extinguishing type.

The insulating layer 3 has a succession of portions 6 which have parallel corrugations and are joined by reduced-
5 thickness portions 7. The corrugated portions 6 define an alternated succession of crests 6a and troughs 6b which extend longitudinally to said portions and are intended to be vertical in the installation position.

The metallic nets 4 and 5 are associated with the
10 insulating layer 3, tangentially in contact with the crests 6a of the opposite faces of the corrugated portions 6. In particular, the troughs 6b of each face are arranged in a median position with respect to the correspondingly parallel wires of the metallic net associated with said face.

15 Conveniently, the nets 4 and 5 have, along the opposite sides intended to be vertical, respective wings 4a and 5a which protrude with respect to the layer 3. Said wings are suitable for overlapping, upon installation, on the adjacent panels, so as to have practically no discontinuity in the
20 product thus obtained.

The metallic nets 4 and 5 are mutually connected by means of iron elements 8 which are driven transversely through the reduced-thickness portions 7 of the insulating layer 3. The iron elements 8 are equally made of galvanized
25 high strength steel wires, preferably chisel-cut so as to perforate the insulating layer 3 without breaking it; the iron elements 8 are welded to the nets 4, 5 so as to constitute a rigid coupling. The nets are mutually connected asymmetrically, so as to offset or stagger the two sides.

30 The described panel allows to easily build walls which

have high thermoacoustic insulation characteristics, which are easy to install and which can be adapted to the different construction requirements. The panels have loose reinforcements.

5 In particular, it is possible to use the panel 1 as a base element of a "sandwich" obtained by applying on the opposite faces a layer of structural concrete-type roughcast with synthetic fibers, provided with appropriate strength characteristics. The roughcast can be applied by spraying,
10 by means of an appropriate nozzle. The metallic nets 4 and 5, by virtue of the shaping of the insulating layer 3, are incorporated in the layer of roughcast.

 The presence of the metallic overlap provided by the wings 4a, 5a in the coupling plane of the panels determines
15 a continuity which hinders the forming of fissures at this critical region.

 The reduced-thickness portions 7 furthermore define, between the adjacent corrugated portions 6, respective compartments 9 suitable for being filled with a concrete
20 casting for the execution of corresponding pillars. The concrete casting can be integrated, if necessary, by bar reinforcements.

 The panels 1 in summary allow to provide vertical elements with structural load-bearing characteristics which
25 are suitable for the building of walls of buildings. The "sandwich" can furthermore be used as a curtain wall or as internal partitioning element, to complete a building built with conventional methods.

 The vertical elements have high characteristics of
30 rigidity, monolithicity and light weight and can be adapted

to any constructive form. They furthermore have a very small bulk, since they are constituted by a single panel without interspaces.

The fact should furthermore be stressed that the panels
5 can be executed horizontally with the same machine.

In the practical execution of the invention, the materials employed, as well as the shape and dimensions, can be any according to the requirements.

CLAIMS

1 1. Wall panel with thermoacoustic insulation
2 characteristics, characterized in that it comprises an
3 insulating layer made of foamed plastic material, having a
4 succession of portions which have parallel corrugations and
5 are joined by portions of reduced thickness, and a grid
6 constituted by a pair of metallic nets which are associated
7 with the opposite faces of said corrugated portions of the
8 insulating layer and are mutually connected by transverse
9 elements which pass through said insulating layer.

1 2. Panel according to claim 1, characterized in that
2 said corrugated portions define an alternated succession of
3 crests and troughs which extend longitudinally to said
4 portions and are intended to be vertical in the installation
5 position, the troughs of each face being arranged in a
6 median position with respect to the correspondingly parallel
7 rods of the metallic net associated with said face.

1 3. Panel according to claim 1, characterized in that it
2 provides the spray-application, on the opposite faces, of a
3 layer of structural concrete-type roughcast with appropriate
4 strength characteristics in which said metallic nets are
5 intended to be embedded.

1 4. Panel according to claim 1, characterized in that
2 said reduced-thickness portions define, between the adjacent
3 corrugated portions, respective compartments suitable for
4 being filled with a concrete casting for the execution of
5 corresponding pillars.

1 5. Panel according to claim 1, characterized in that
2 said transverse elements pass through said reduced-thickness

3 portions of the insulating layer.

1 6. Panel according to claim 1, characterized in that
2 said metallic nets have, along the opposite sides intended
3 to be vertical, respective wings which protrude with respect
4 to said insulating layer, said wings being suitable for
5 overlapping, upon installation, on the adjacent panels, so
6 as to have practically no discontinuity in the product thus
7 executed.

1 7. Panel according to claim 1, characterized in that
2 said metallic nets are constituted by hot-galvanized, cold-
3 redrawn high strength steel wires with a low carbon content
4 and are electrically welded so as to form a rectangular mesh
5 of an asymmetrical type.

1 8. Panel according to claim 1, characterized in that
2 said transverse elements are constituted by galvanized high
3 strength steel wires which are chisel-cut so as to perforate
4 said insulating layer without breaking it.

1 9. Panel according to claim 1, characterized in that
2 said metallic nets are mutually connected asymmetrically, so
3 as to offset or stagger the two sides.

1 10. Wall panel with thermoacoustic insulation
2 characteristics according to what can be deduced from the
3 description and from the drawing.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number 9114425.3

Relevant Technical fields

(i) UK CI (Edition K) E1D (DF116, DF193)

(ii) Int CI (Edition 5) E04B, E04C

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

M A REEVE

Date of Search

20.8.91

Documents considered relevant following a search in respect of claims 1-10

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	GB 1361313 (WEISMANN) see particularly figure 5	1

SF2(p)

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).