



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
01.08.2012 Bulletin 2012/31

(51) Int Cl.:
E04H 1/12 (2006.01) E04B 1/86 (2006.01)
E04B 1/82 (2006.01)

(21) Application number: **10816737.0**

(86) International application number:
PCT/ES2010/000386

(22) Date of filing: **21.09.2010**

(87) International publication number:
WO 2011/033154 (24.03.2011 Gazette 2011/12)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

(72) Inventor: **JUNGBAUER, Guillermo**
08208 Sabadell (Barcelona) (ES)

(30) Priority: **21.09.2009 ES 200930713**

(74) Representative: **Durán-Corretjer, S.L.P.**
Còrsega, 329
(Paseo de Gracia/Diagonal)
08037 Barcelona (ES)

(71) Applicant: **Enquire S.I.**
08036 Barcelona (ES)

(54) **SOUND-ATTENUATION ELEMENT**

(57) Sound-attenuation element of the type composed of a plurality of interconnected panels, characterized in that said element comprises panels in contact with

one another and that have a groove that runs around the entire perimeter of the edge thereof, battens occupying the spaces generated by the grooves corresponding to contacting edges of adjacent panels.

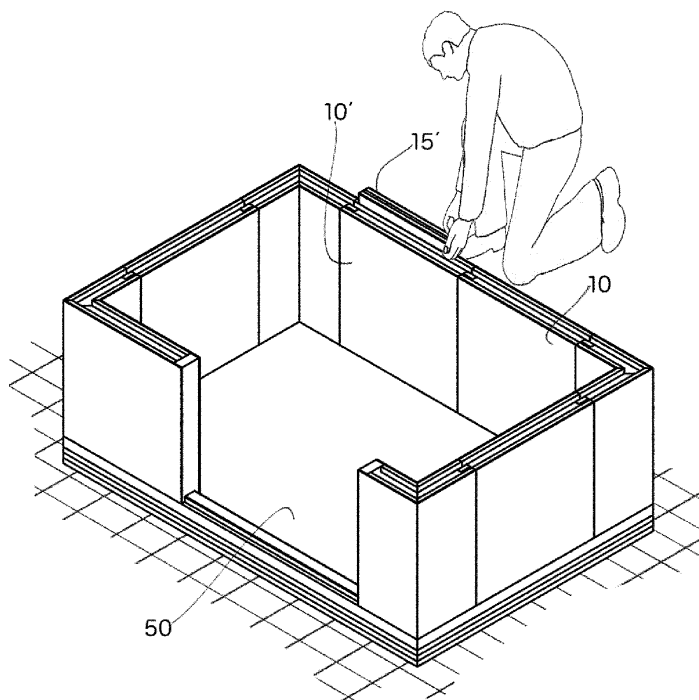


FIG.9

Description

[0001] This invention refers to a sound-attenuation element, especially a dismantlable acoustic chamber.

[0002] Chambers of this type are for example used by musicians so that they can practice in their homes without disturbing the neighbours. The chamber is erected in a room in the house and can be dismantled if it has to be moved.

[0003] The portable nature of these chambers gives rise to construction problems because in order to be able to enter houses it is necessary to be able to "dismantle" the chamber into prefabricated parts that can enter through the door or windows of a house. However decreasing the size of prefabricated parts is a problem, because in between gaps give rise to paths for sound which can reduce the sound-proofing properties of the chamber. As a consequence chambers which are currently marketed (such as, for example, that marketed by the company Studiobox GmbH) have large panels, made of a material which is delicate as to its handling. The panels of this chamber have projecting and recessed parts on their edges which are respectively inserted into recessed and projecting parts in the other panel respectively. To secure erection the panels have mechanical locking members which can be operated from the outside. As a consequence a moving operation requires qualified personnel to dismantle, move and erect the acoustic chamber. Documents US5210984 and CN201169830 also disclose acoustic chambers whose panels have complex metal structures with mechanically activated locks designed to provide an external seal for the joints between panels. Likewise the panels are of large size (the full height or width of the chamber).

[0004] One object of this invention is to provide a dismantlable acoustic chamber which overcomes the problems described above, that can be erected without the need for highly qualified personnel and is easier to transport and manufacture.

[0005] In particular this invention comprises a sound-attenuation element, preferably a dismantlable acoustic chamber of the type comprising a plurality of panels connected together, characterised in that it comprises panels in contact with each other that have a groove running along the entire perimeter of its edge, the spaces generated by the grooves corresponding to the edges of the adjacent panels in contact being occupied by battens.

[0006] The perimeteral groove and batten system of the chamber to which this invention relates makes it possible to do it without mechanical locking elements for the panels. The batten may be shared by various rows or columns of panels, which imparts dimensional stability not provided by a direct junction between panels, through pieces which are easy to handle and of reduced weight. In this case one batten occupies the space in the groove on at least four panels. On the other hand the system for the chamber that is the object of this invention permits the use of small panels, which assists erection, move-

ment and dismantling of the chamber.

[0007] Preferably the battens and panels have a manufacturing dimensional tolerance that provides pressure between the panels and battens when fitted. To ensure this pressure the battens preferably comprise at least one layer of plastics or elastomer material. Both support for the walls constructed and acoustic insulation are favoured in this way, because the batten prevents air from passing through the junctions between panels.

[0008] In a specially preferred embodiment the panels have U-shaped profiles rounded on their perimeter so that the U-shape of the profile matches the groove and the two sheets forming the inner and outer faces of the panel that give rise to the U-shaped sections mentioned and the space within the sheets which contains materials for acoustic insulation.

[0009] For a better understanding of the invention, drawings of an embodiment of this invention are provided by way of an explanatory but non-restrictive example.

Figure 1 is a perspective view of a chamber according to this invention.

Figure 2 is another perspective view of the chamber in Figure 1 from another perspective.

Figure 3 shows a perspective view of three different panels making up the chamber of the example.

Figure 4 is a cross-section of a panel showing its inner components and the profile of its edges.

Figure 5 illustrates a perspective view of an inter-panel batten used in the chamber according to the example.

Figures 6 and 9 provide examples of a process for erecting the chamber according to the example.

Figure 10 shows the fit between the panels, with a layer of insulating wool located on the inner wall of the chamber, in cross-section.

Figure 6 is another exploded view of the assembly from a different point of view.

[0010] Figures 1 to 10 show an example of an acoustic chamber -1- according to this invention. For the purposes of clarity of explanation neither the windows nor the door have been drawn, but these can be added according to any known techniques without any problem for those skilled in the art. For example, the centre of one of the panels comprising the side walls of the chamber may be replaced by a window.

[0011] The chamber illustrated has a floor -50-, a roof -40- and side walls shaped by flat panels -10- and corner-shaped panels -20-. The side panels leave an open space -30- for entry from the exterior. The inner panels are covered with an acoustic insulating material, such as wool or foam, which is attached to the inner faces of panels -10-, -20- by any known means (e.g. joints of the Velcro or bonded type, or mechanical unions of any type, etc.).

[0012] As will be seen in the figures, panels -10-, -20- have small dimensions and are therefore quite easy to

handle. The flat panels illustrated -10-, have a quadrangular shape, but they may be of a different shape. It will also be noted that there are no operable mechanical connectors to ensure junctions between the panels on either the outer surface or the inner surface of chamber -1-.

[0013] Figures 3 to 5 illustrate the different elements making up the side walls in the example. These figures show a flat panel -10- comprising two boards -11-, -11'- having an outside finish enclosed in the manner of a frame by four pieces of solid U-shaped wood -12- which run around the perimeter of the outside of panel -10- in such a way that the U defines a groove -100- running all around the panel as shown in these figures. The laminar or board parts -11-, -11'- and the U-shaped parts -12- define a central internal space in which a material having acoustic insulation properties -13-, -13'- (foam agglomerate) is located together with a core of perforated agglomerated wood board which has the result that the panel is light in weight.

[0014] Flat panels -10- in the example may be of a generally square shape, i.e. the chamber according to this invention may use smaller panels without diminishing the sound attenuating properties of the chamber once assembled. Nevertheless the flat panels may be of other shapes such as, for example, a rectangular shape.

[0015] Parts of corner shape -20-, -20'- which may have a structure identical to that of flat panel -10-, except for the shape, are also shown.

[0016] In the case of special panels (for example connections to doors) the panels may have a special edge -21- appropriate for the purpose intended.

[0017] The set of parts is completed by a set of battens -15- which may be of variable length according to the place in chamber -1- which they occupy, but always fulfilling the requirement that when in the assembled position the battens occupy the spaces produced by the grooves -100- of adjacent panels. The battens in the example are made of wood and have an intermediate strip -16- of elastomer material to assist adjustment of the battens in the spaces produced by the grooves in the panels.

[0018] Figures 6 to 9 show a process for fitting the panels. The process of fitting is very simple and comprises first fitting a batten -15- into the grooved part -100- of a panel corresponding to the portion adjacent to the panel -10- against which it will be placed and subsequently fitting adjacent panel -10- in a process which can be done manually. In the example illustrated, battens -15- may be lateral (fitted vertically) or fitted horizontally between rows of panels. Floor -50- has a projection -51- to receive the grooves of the bases of the panels in the first row. The roof may be arranged in the same way if desired. As will be seen in the figures, battens -15- fill the gaps between panels. In order to fit correctly, a mechanical manufacturing tolerance which allows some dimensional interference between components but which does not require appreciable force to be exerted by the erector has to be chosen. Because of digitally controlled machines it is now

possible to achieve these dimensional tolerances easily by mechanisation, even for wooden materials, as in the example. Tolerances may be chosen on the basis of the ease of adjustment it is desired to provide for fitting, or on the basis of soundproofing results, the properties of the materials used, overall dimensions and corresponding standards, for example ISO 286. Inclusion of the strip of elastomer material -16- helps soundproofing even in the case where there are dimensional variations after assembly.

[0019] Once the chamber has been erected a layer of insulating wool -60- may be placed on the inner surface. The joints -61'- between the panels of insulating wool are preferably offset from the joints -61- between the panels.

[0020] Although the invention has been described in relation to examples of preferred embodiments, these must not be regarded as restricting the invention, which is defined by the broadest interpretation of the following claims.

Claims

1. A sound-attenuation element of the type comprising a plurality of panels connected together, **characterised in that** it comprises panels in contact with each other having a groove running along the whole perimeter of their edges, the spaces generated by the corresponding grooves at the edges of the adjacent panels in contact being occupied by battens.
2. An element according to claim 1, **characterised in that** the battens and the panels have a manufacturing dimensional tolerance such that a pressure is generated between the panels and the battens when fitted.
3. An element according to claim 1 or 2, **characterised in that** the battens are made of wood.
4. An element according to any one of claims 1 to 3, in which the batten has further at least one layer of elastomer material to ensure that there is a contact pressure between the batten and panel.
5. An element according to any one of claims 1 to 4, **characterised in that** the said panels lack operable mechanical locking means.
6. An element according to any one of claims 1 to 5, **characterised in that** the panels comprise U-shaped profiles running round their perimeter in such a way that the U of the profile matches the groove mentioned and two sheets forming the inner and outer faces of the panel, the U-shaped profiles and the sheets forming an inner space which contains materials for acoustic insulation.

7. An element according to claim 6, **characterised in that** the said internal space comprises a foam agglomerate and a perforated sheet of agglomerated wood. 5
8. An element according to any one of claims 1 to 7, **characterised in that** it comprises the panels of generally square shape mentioned. 10
9. An element according to any one of claims 1 to 7, **characterised in that** it comprises the panels of generally rectangular shape mentioned. 15
10. An element according to any one of claims 1 to 9, **characterised in that** it comprises the panels of corner shape mentioned. 20
11. An element according to any one of claims 1 to 10, **characterised in that** one of the battens mentioned occupies the space in the groove of at least four panels. 25
12. An element according to any one of claims 1 to 11, **characterised in that** it is a dismantable acoustic chamber. 30
- 35
- 40
- 45
- 50
- 55

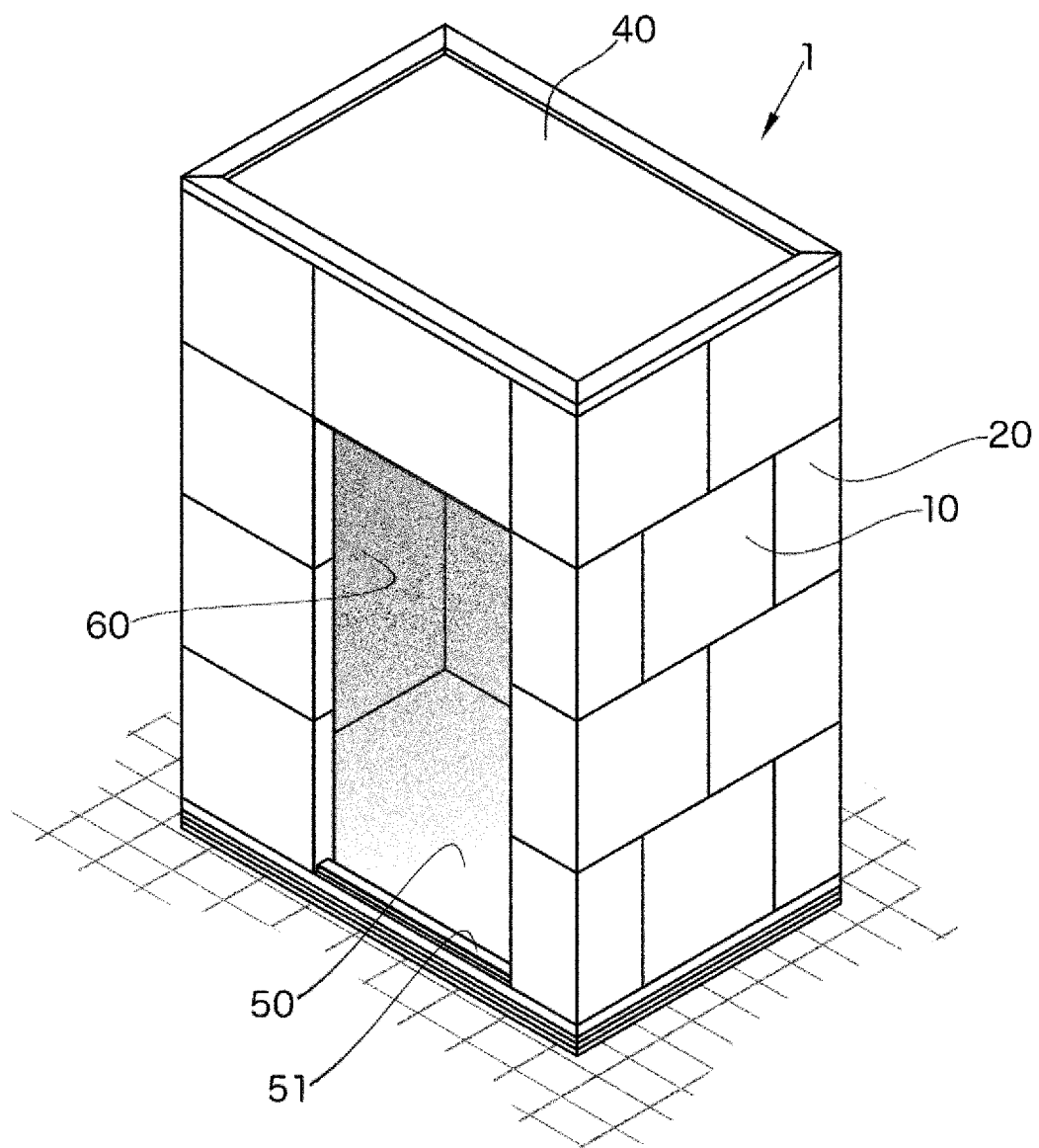


FIG.1

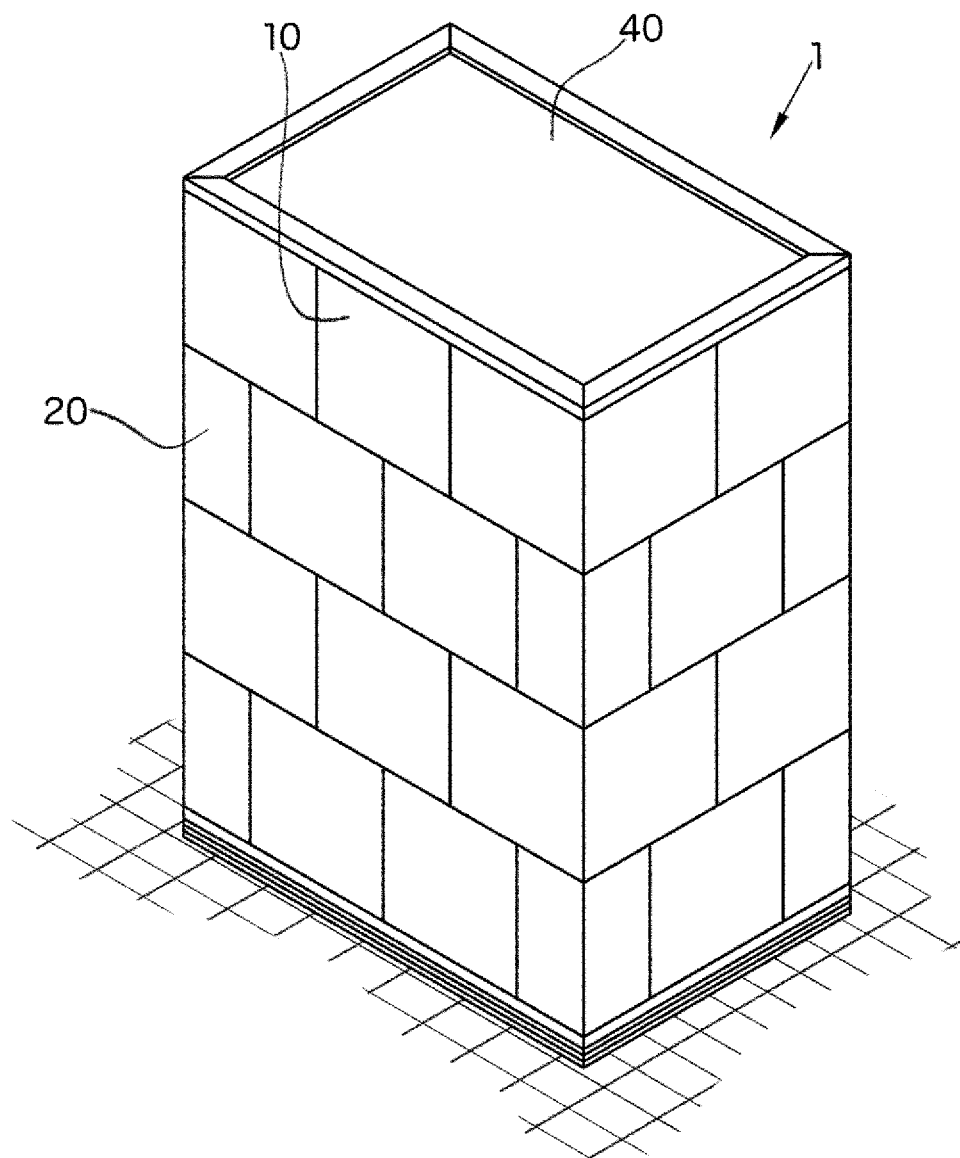


FIG.2

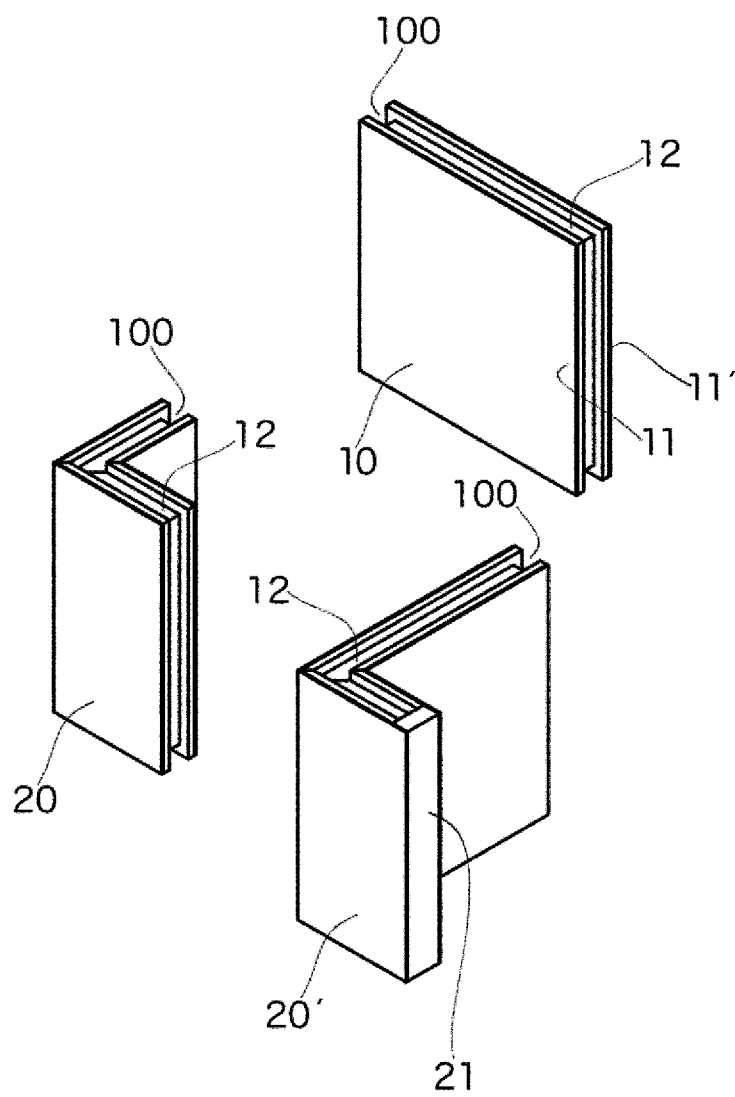


FIG.3

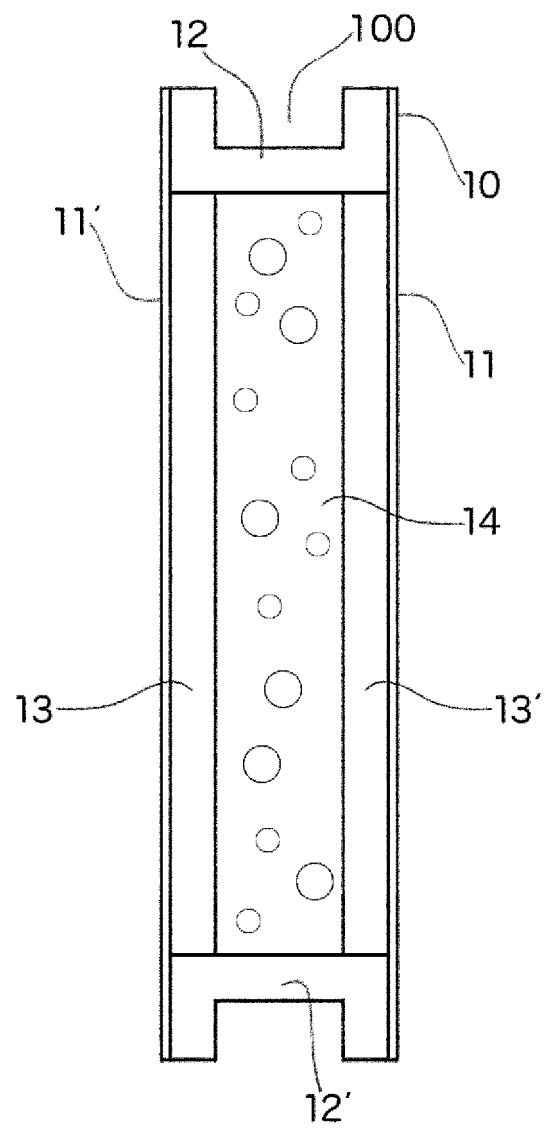


FIG.4

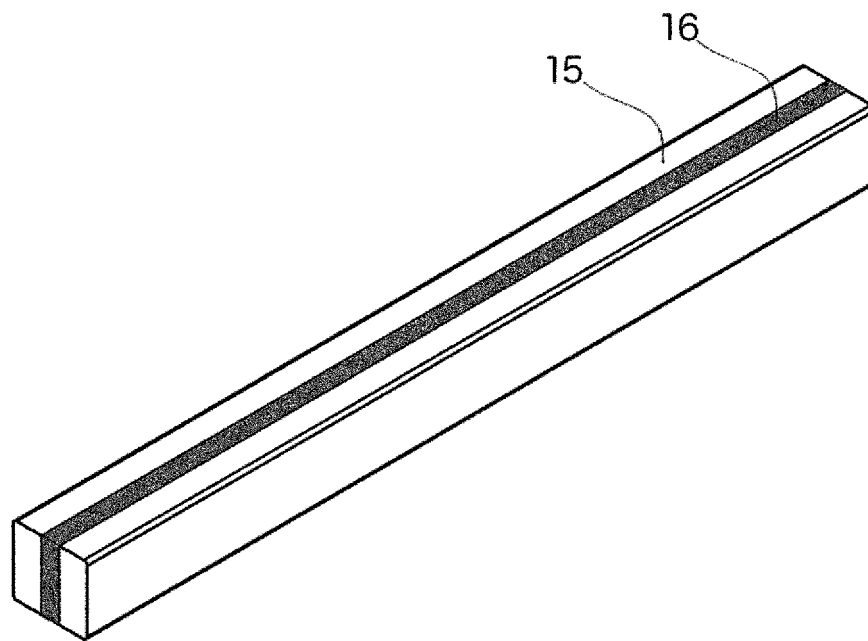


FIG.5

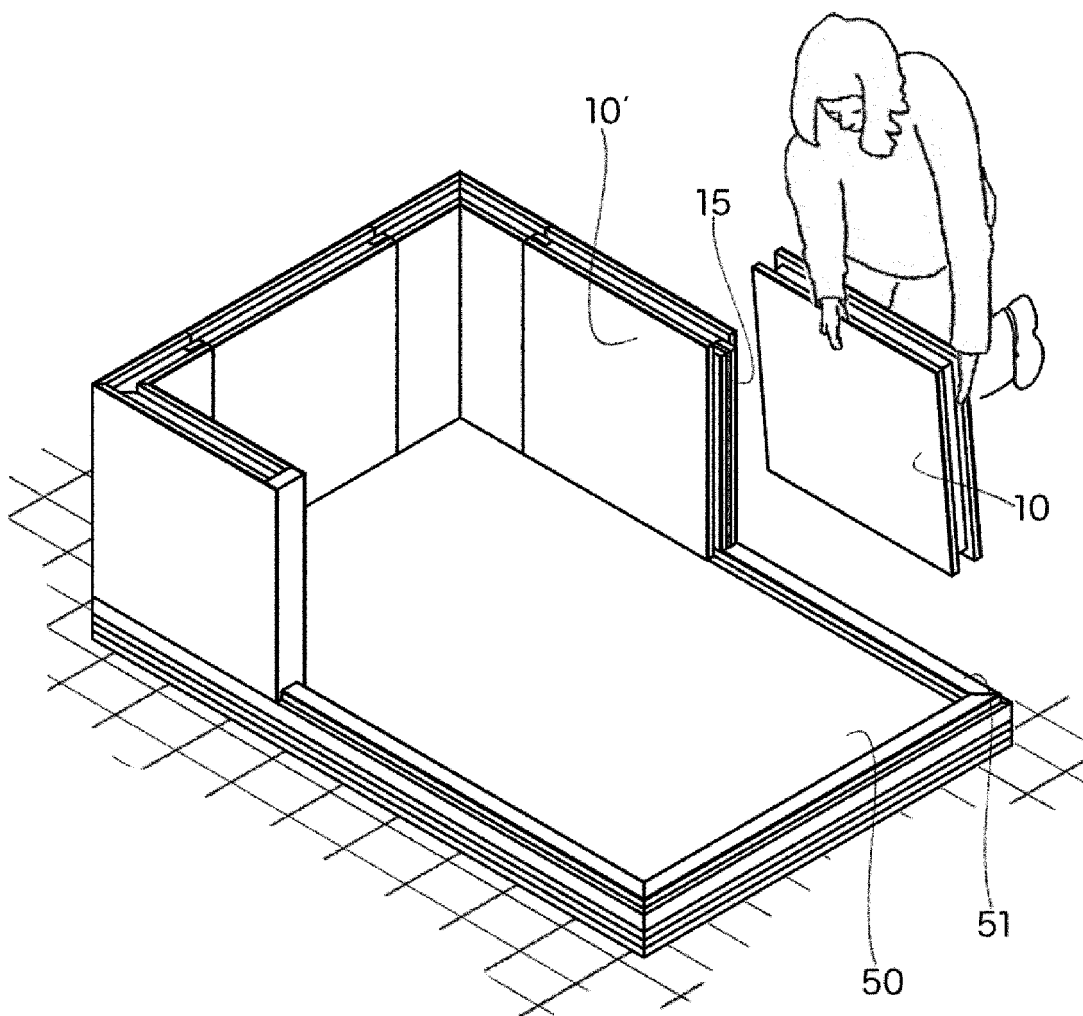


FIG.6

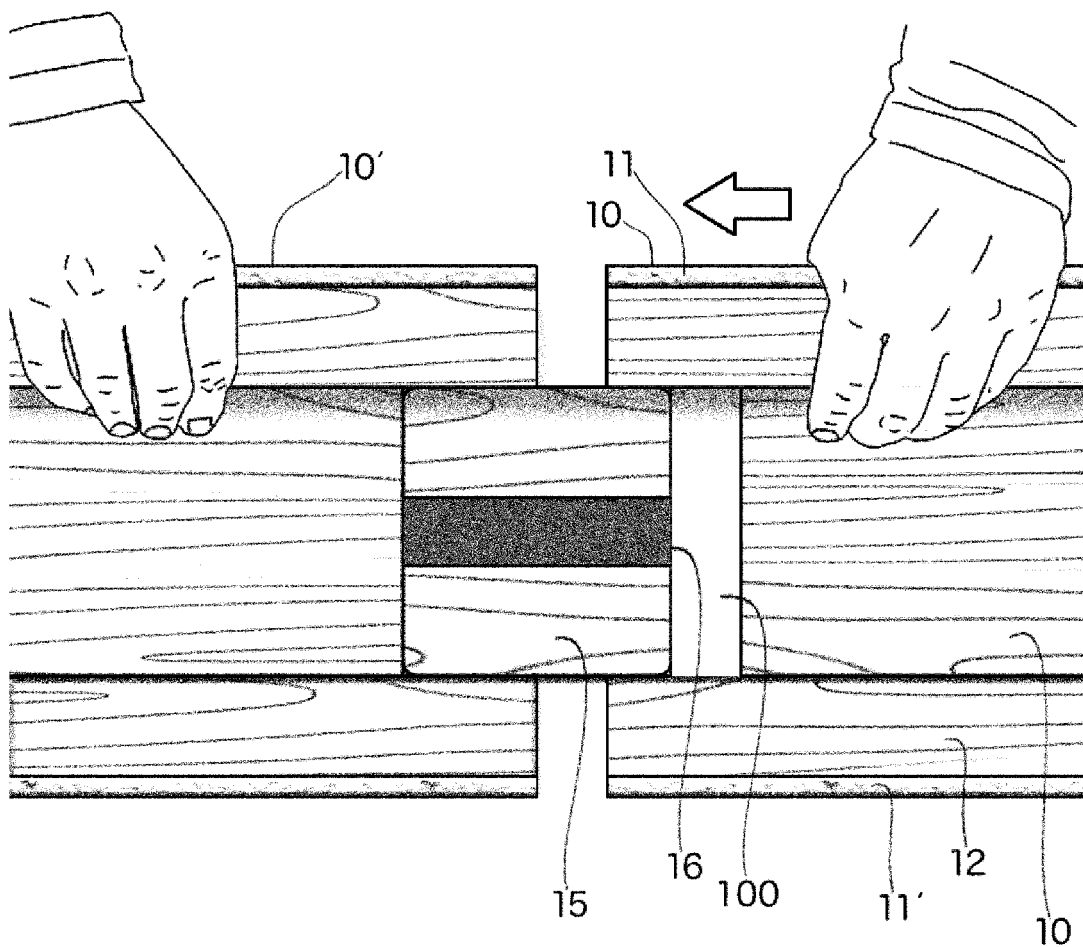


FIG.7

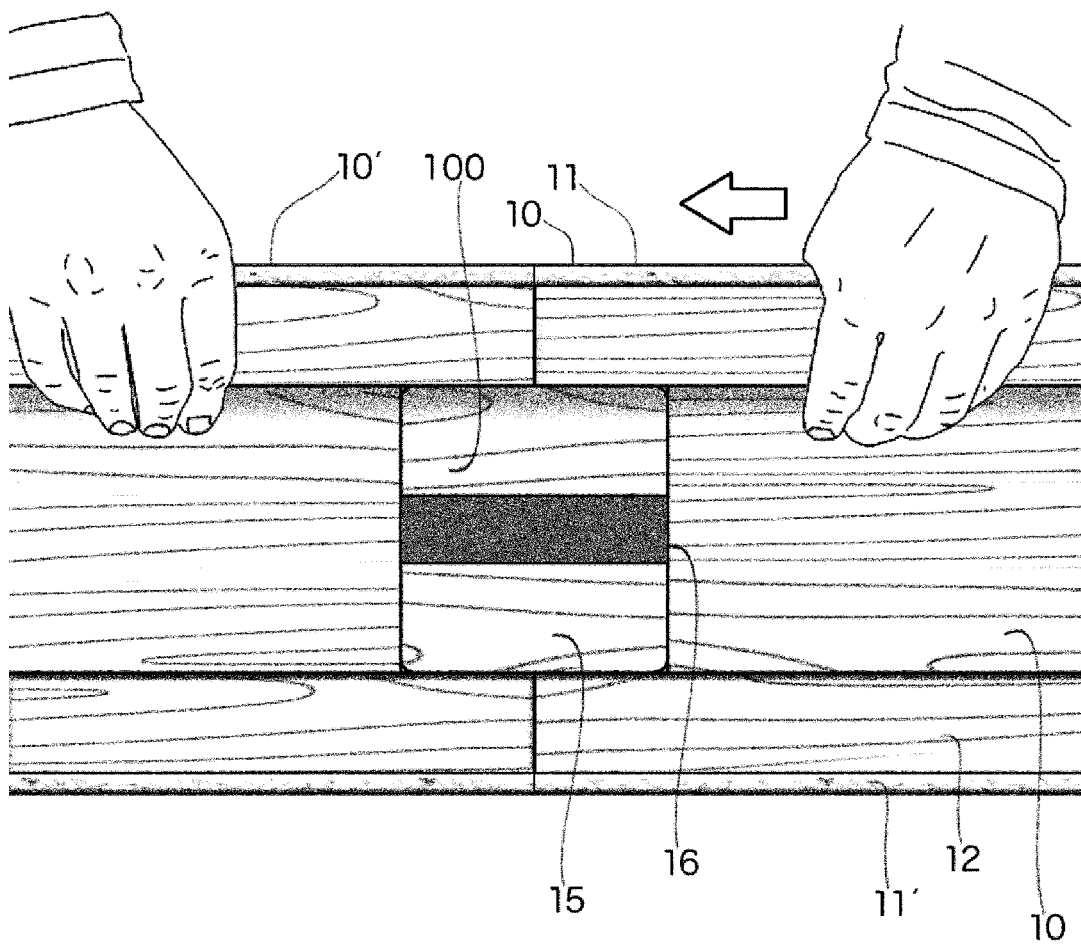


FIG.8

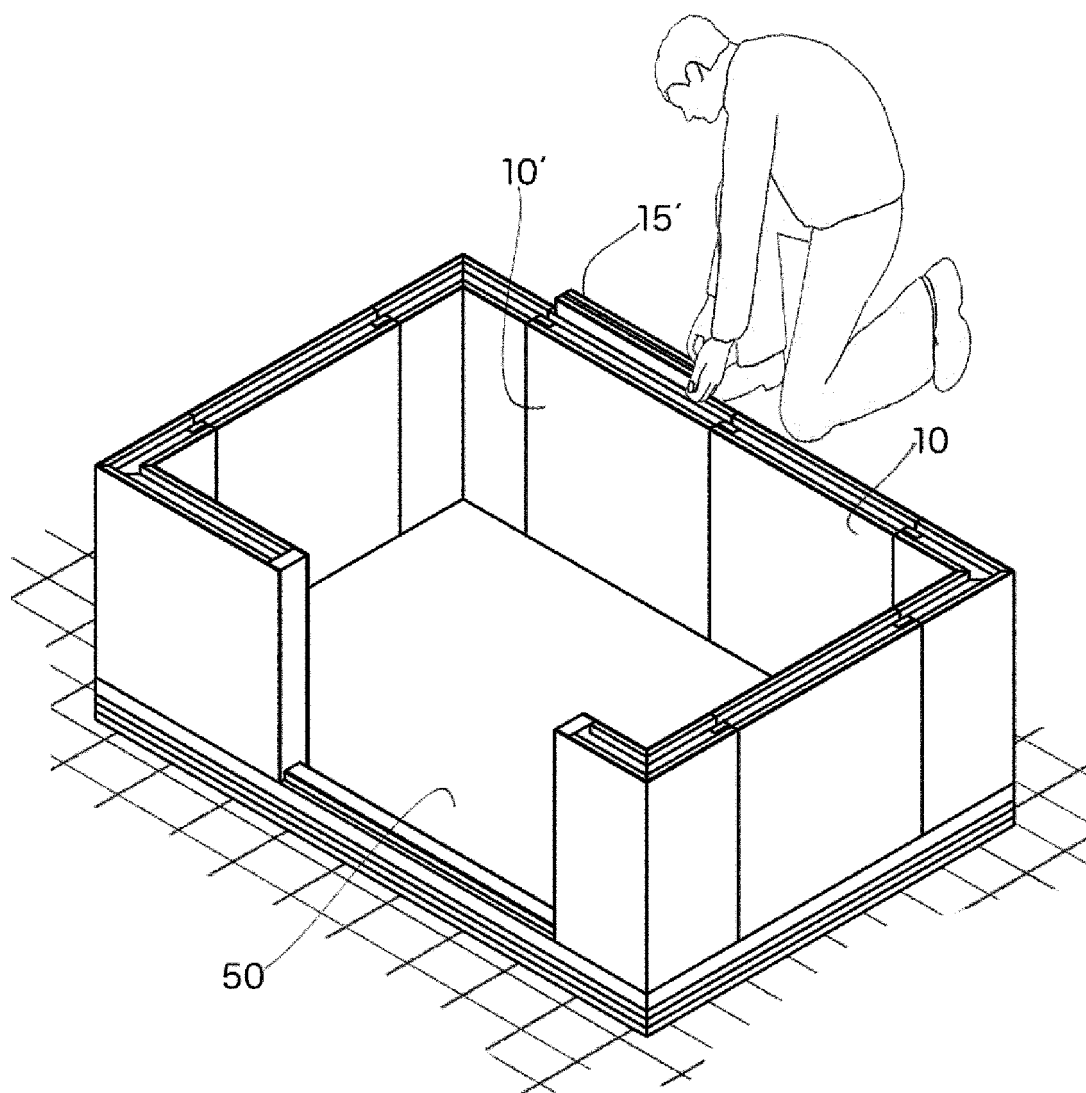


FIG.9

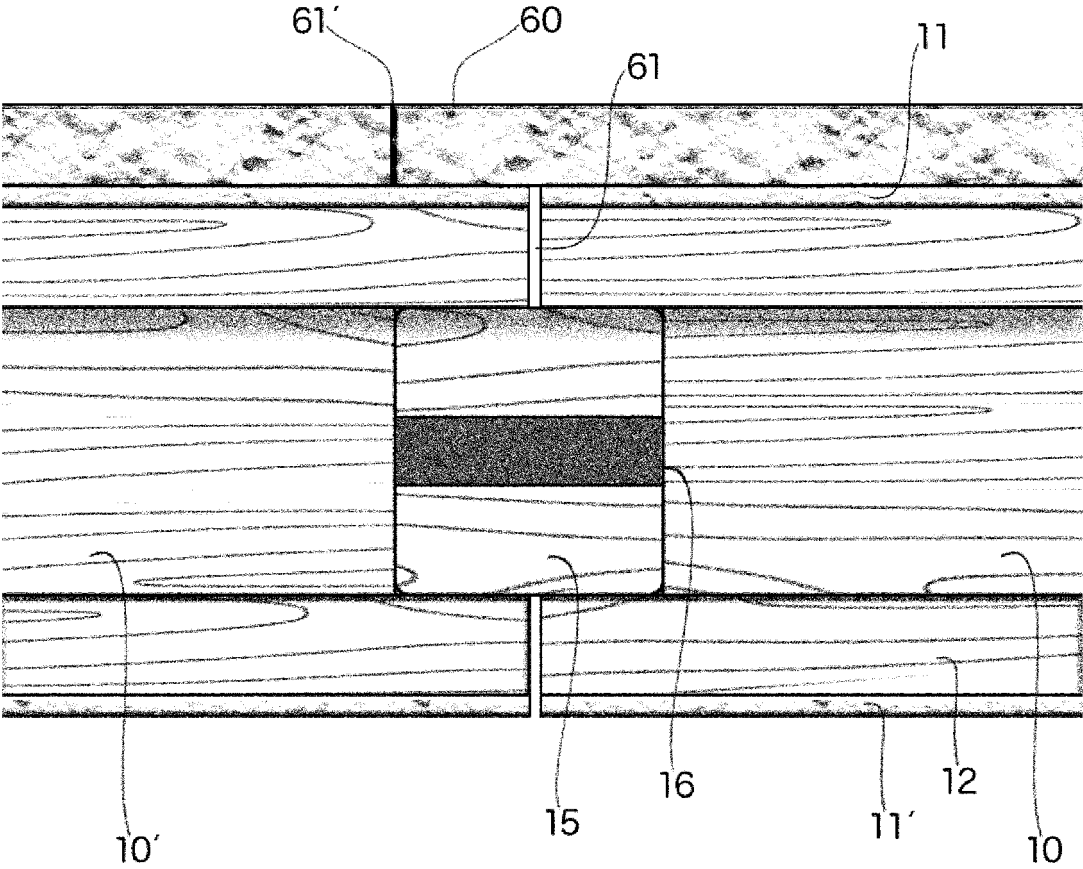


FIG.10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2010/000386

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E04H, E04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES, STRIP, GROOVE, ACOUSTIC, SOUND, CHAMBER, ROOM, MUSICAL, INSTRUMENT,

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0369595 A1 (PRECEY ANTONY DAVID) 23/05/1990, column 2, line 4 - column 4, line 31; figures.	1,10,12
A		3,6,7,11
X	BE 876257 A2 (DIJK BV GEBR VAN) 16/11/1979, abstract; figures.	1,4,12
Y		6,8,9
A		7,8,9,12
Y	GB 1132774 A (DEUTSCHE BAUAKADEMIE) 06/11/1968, the whole document.	6,8,9
A		7
A	DE 29904630 U1 (REITH MANFRED ING) 02/06/1999, abstract; figures.	1,6,9,11,12

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance.	
"E" earlier document but published on or after the international filing date	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"O" document referring to an oral disclosure use, exhibition, or other means.	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
21/01/2011Date of mailing of the international search report
(22/02/2011)

Name and mailing address of the ISA/

OFICINA ESPAÑOLA DE PATENTES Y MARCAS
Paseo de la Castellana, 75 - 28071 Madrid (España)
Facsimile No.: 91 349 53 04Authorized officer
M. Hernández Agusti

Telephone No. 91 3495553

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2010/000386

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 19700632 A1 (MOSER KARL) 16/07/1998, abstract; figures.	1,3

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

EP 2 481 868 A1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2010/000386

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
EP0369595 A	23.05.1990	GB2224761 AB EP19890310323	16.05.1990 09.10.1989
-----	-----	-----	-----
BE876257 A	16.11.1979	NL7805268 A	20.11.1979
-----	-----	-----	-----
GB1132774 A	06.11.1968	NONE	
-----	-----	-----	-----
DE29904630 U	02.06.1999	EP0942108 AB EP19990890087 AT407902 B AT97698 A AT247206 T	15.09.1999 10.03.1999 25.07.2001 15.11.2000 15.08.2003
-----	-----	-----	-----
DE19700632 A	16.07.1998	EP0890681 A EP19970119547	13.01.1999 07.11.1997
-----	-----	-----	-----

Form PCT/ISA/210 (patent family annex) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2010/000386

CLASSIFICATION OF SUBJECT MATTER

E04H1/12 (01.01.2006)

E04B1/86 (01.01.2006)

E04B1/82 (01.01.2006)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5210984 A [0003]
- CN 201169830 [0003]