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(54) Ventilated soundproof glass.

(57) Ventilated soundproof glass including at least two sheets of glass (1 and 4) and one sheet of plastic film (2) in between. These two sheets of glass and the sheet of plastic film have holes arranged in them. The sides of the two sheets of glass (1 and 4) adjacent to the sheet of plastic film (2) have grooves (12 and 42), by which the air can pass through the ventilated soundproof glass while the noise is substantially reduced when it is propagating through the long paths of the grooves (12 and 42) within the ventilated soundproof glass.

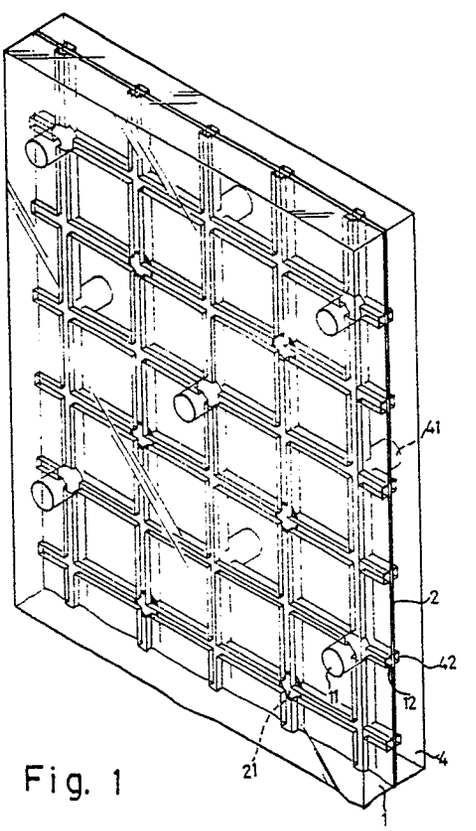

Fig. 1

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VENTILATED SOUNDPROOF GLASS

This invention relates to ventilated soundproof glass which can be used in offices, houses or any other building, providing a soundproofing effect while still maintaining ventilation.

Ordinary glass is not very effective in preventing noise or other sounds waves from propagation. It is true that there is a type of glass being made of two layers of glass with a thin film in between, which provides a much better soundproofing effect than ordinary glass. Nevertheless, when this type of glass is installed in a building, it is necessary to provide an air-conditioning system in the building because the glass is not capable of letting air go through.

In cities where noise pollution is a very serious problem, people tend to use the afore-mentioned glass in the large buildings, thus consuming more energy in ventilation due to the continual use of air-conditioning.

With the foregoing and other objects in view, this invention in one aspect resides broadly in a ventilated soundproof glass comprising: at least a first and a second sheet of glass with one sheet of plastic film there between, wherein said sheets of glass and said sheet of plastic film have a plurality of holes therein respectively; said holes of first and second sheet of glass, and said sheet of plastic film being in different horizontal and vertical positions, one side of said first sheet of glass and one side of said second sheet of glass adjacent to said sheet of plastic film having a plurality of grooves arranged thereon between said holes of said first sheet of glass and said second sheet of glass respectively.

Therefore, the present invention discloses a new type of glass which permits air to go through the glass while still preventing the sound from passing through it.

In order that this invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate typical embodiments of the present invention, and wherein:-

Fig. 1 is a perspective view of a first embodiment of ventilated soundproof glass in accordance with the present invention;

Fig. 2 is a plane view of the ventilated soundproof glass of FIG. 1;

Fig. 3 is a cross-sectional view of the ventilated soundproof glass as seen from line 3-3 of Fig. 2;

Fig. 4 is an enlarged view of a portion of FIG. 1;

Fig. 5 is an exploded view of an embodiment of the ventilated soundproof glass of FIG. 1;

Fig. 6 is an exploded view of a second embodiment of ventilated soundproof glass in accordance with the present invention; and

Fig. 7 is an exploded view of a third embodiment of ventilated soundproof glass in accordance with the present invention.

Referring to Fig. 1, an embodiment of a sheet of ventilated soundproof glass according to the present invention is shown. It can be seen that the ventilated soundproof glass consists of three parts, namely, a first sheet of glass 1, a second sheet of glass 4 and a sheet of plastic film 2 there between. The first sheet of glass 1 and second sheet of glass 4 can be made of ordinary glass or acrylic-plastics.

Now, with further reference to Fig. 2, it can be seen that the first sheet of glass 1, the second sheet of glass 4 and the sheet of plastic film 2 all have a plurality of round holes arranged therein, respectively. The round holes in the first sheet of glass 1 are seen as solid circles 11 in Fig. 2, the round holes in the second sheet of glass 4 are represented by dotted circles 41, and the round circles in the sheet of plastic film 2 are represented by semi-dotted circles 21, respectively. These round holes in the three separate sheets are all in different vertical and horizontal positions. The first sheet of glass 1 has a plurality of vertical and horizontal grooves 12, being rectangular in cross-section, between the round holes at one side thereof adjacent to the sheet of plastic film 2, forming a pattern much like that of a large screen.. Each of the round holes 11, 21, 41 of the first sheet 1, the plastic film 2, and the second sheet 4, respectively, are aligned with particular intersections of the grooves 12 and 42, so as to allow for ventilation between the respective holes. The second sheet of glass 4 has also a plurality of grooves 42 at one side thereof adjacent to the sheet of plastic film 2, the grooves having exactly the same pattern as that of the first sheet of glass 1.

Now referring to Figs. 3 and 4, it can be observed that the air first goes through the round holes 11 in the first sheet of glass 1, then passes through the holes 21 in the sheet of plastic film 2 by way of the grooves 12 in the first sheet of glass 1, and then continues to proceed on through the grooves 42 in the second sheet of glass 4, and finally exits through the round holes 41 in the second sheet of glass 4. When the ventilated soundproof glass is installed in a building, the building can be ventilated through the use of the ventilated soundproof glass in a manner as described above. While the sound waves, although being able to propagate through the round holes

also, are substantially reduced due to the long paths of the grooves. The effect of the sound waves propagating therethrough is much like that of a silencer. Furthermore, the plastic film 2 also contributes to the effect of absorbing the sound.

Fig. 5 gives another clear view of the first embodiment of the ventilated soundproof glass. Figs. 6 and 7 provide second and third embodiments of the ventilated soundproof glass according to the present invention. The difference between these embodiments and the first embodiment lie in the configuration of the grooves 12 and 42 of the first sheet of glass 1 and second sheet of glass 4, respectively. Although the configuration is different, the above arguments concerning the propagation of the sound waves and noise still apply.

Likewise, the round holes 11 of the first sheet of glass 1 and the round holes 41 of the second sheet of glass 4 could alternately be other shapes other than round, and the cross-sections of the grooves of the first sheet of glass and second sheet of glass could alternately be other shapes as well as rectangular, in the embodiments.

The ventilated soundproof glass can consist of more than two sheets of glass and one sheet of plastic film. For example, it can contain three sheets of glass with a sheet of plastic film between the first sheet of glass and the second sheet of glass and another sheet of plastic film between the second sheet of glass and the third sheet of glass, thereby enhancing the soundproofing effect. The last but not the least to be pointed out is that the sheet of plastic film 2 between the first sheet of glass 1 and second sheet of glass 4 can be of any color desired, thereby reducing the light transmission and giving a more beautiful appearance.

Thus far, it is to be appreciated that the present invention is a significant improvement over the prior art, and further explanation is believed unnecessary. Since various possible embodiments might be made of the above invention without departing from the scope of the invention, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense. Thus it will be appreciated that the drawings are exemplary of preferred embodiments of the invention and that the scope of the invention is to be limited only by the scope of the appended claims.

Claims

1. Ventilated soundproof glass (a glazing panel) comprising: at least a first (1) and a second (4) sheet of glass with one sheet of plastic film (2) there between, wherein said sheets of glass and said sheet of plastic film have a plurality of holes (11, 41, 21) therein respectively; said holes of first and second sheets (1, 4) of glass, and said sheet of plastic film (2) being in different horizontal and vertical positions, the side of said first sheet (1) of glass and the side of said second sheet (4) of glass adjacent to said sheet (2) of plastic film having a plurality of grooves (12, 42) arranged thereon between said holes (11) of said first sheet of glass and said holes (41) of said second sheet of glass respectively.

2. The ventilated soundproof glass of Claim 1, wherein said holes (11, 41, 21) of said first and second sheets of glass and said sheet of plastic film are round in shape, and said grooves (12, 42) of said first sheet (1) of glass and said second sheet (4) of glass are rectangular in cross-section.

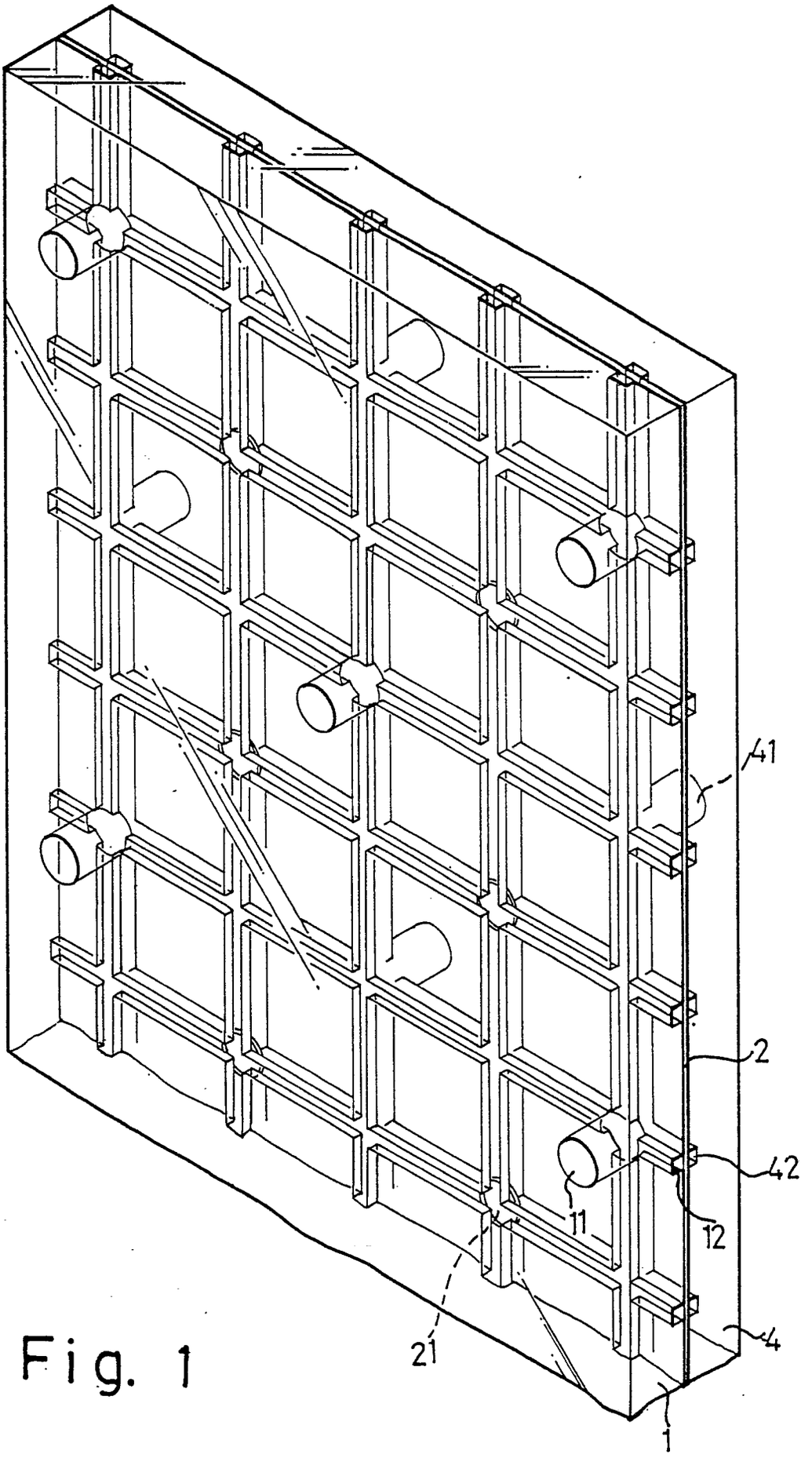

Fig. 1

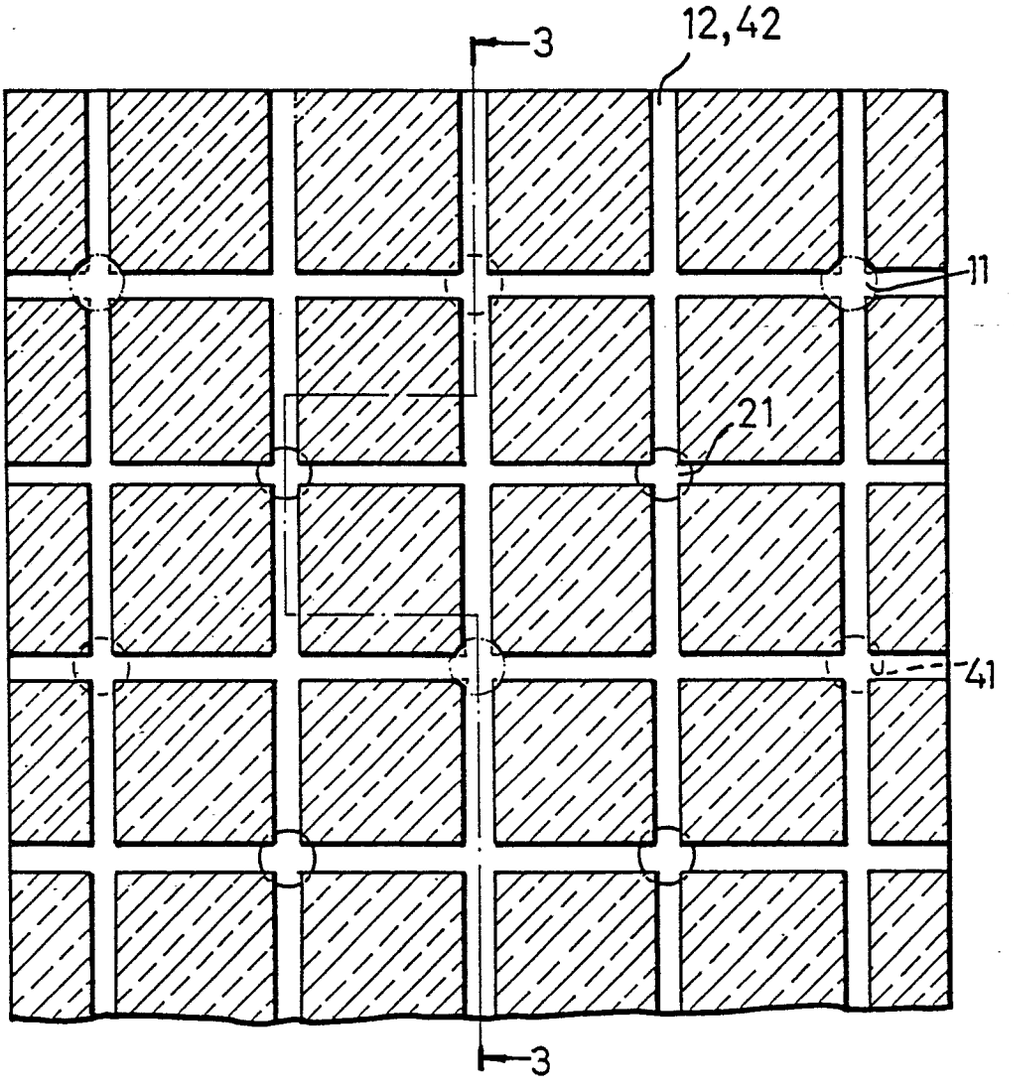

Fig. 2

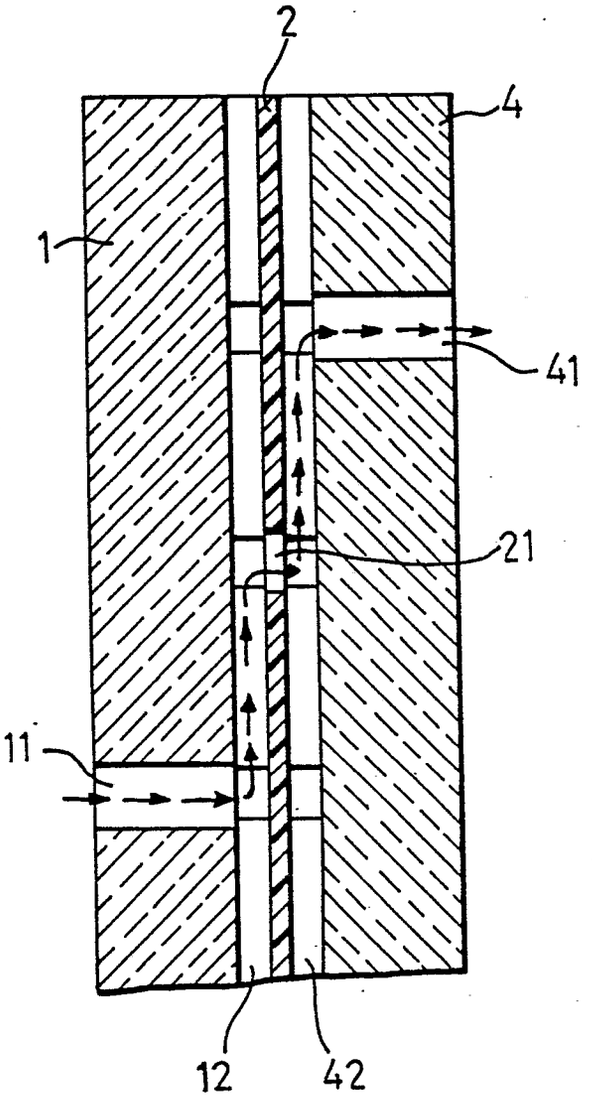

Fig. 3

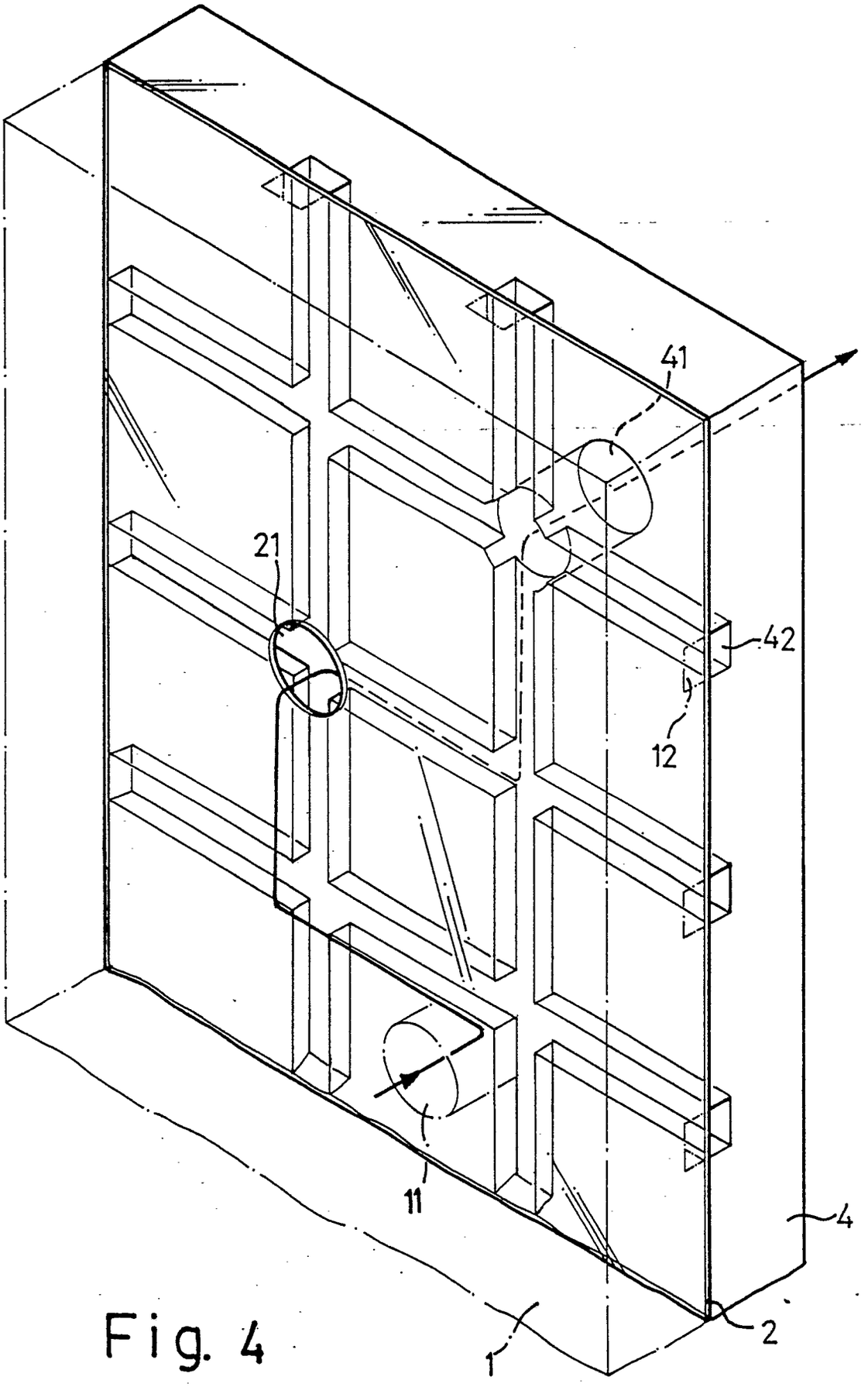

Fig. 4

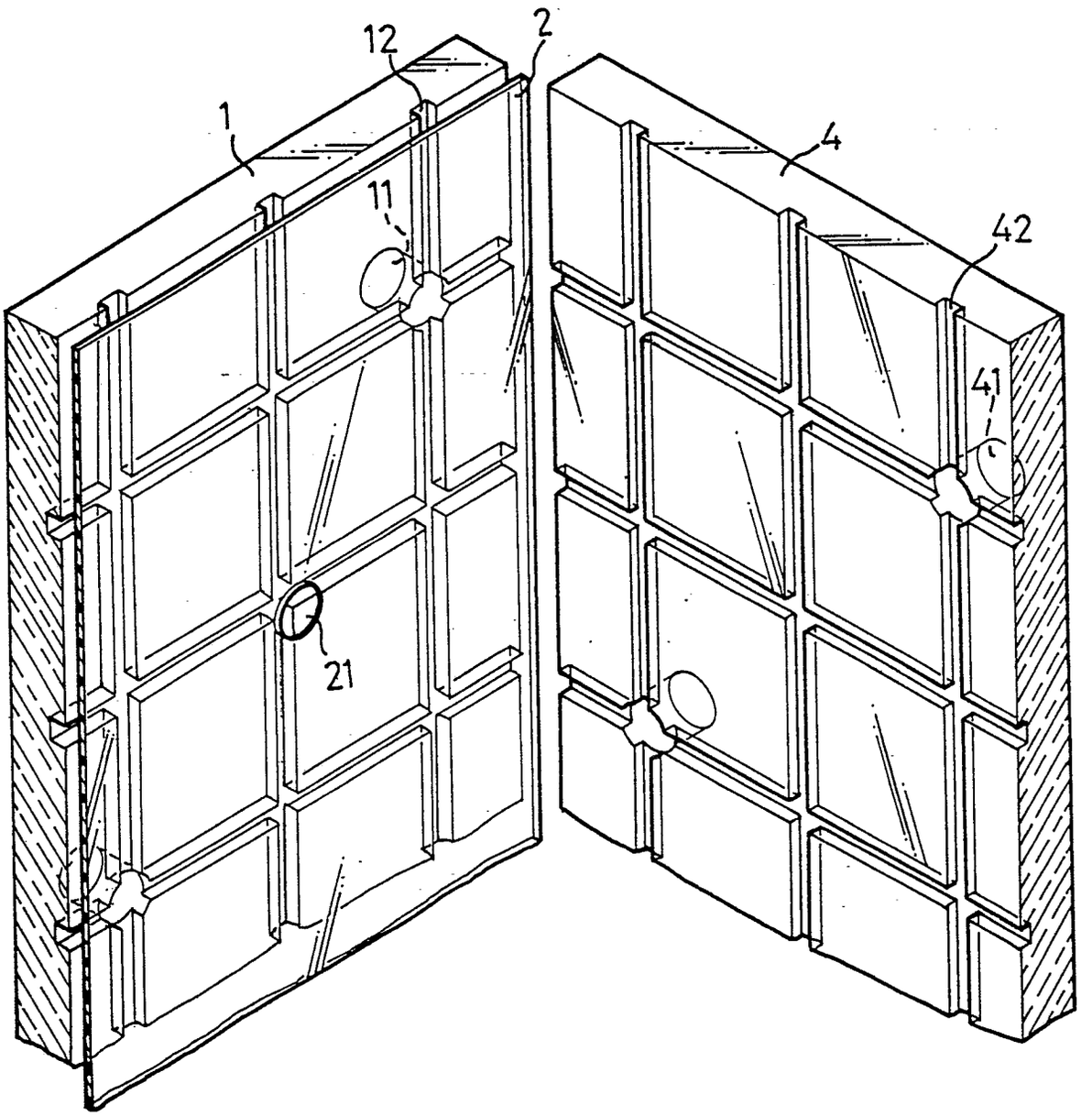

Fig. 5

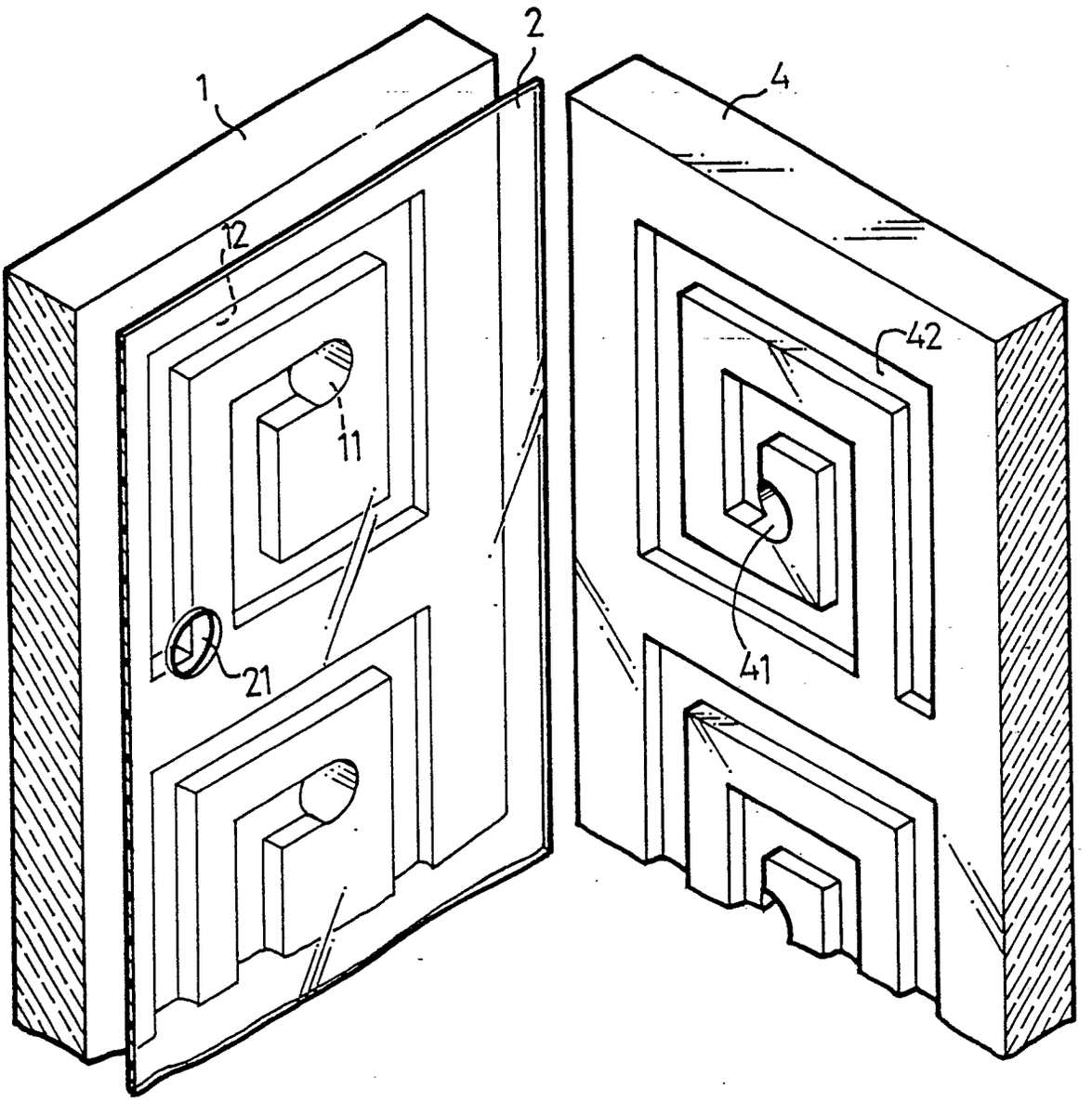

Fig. 6

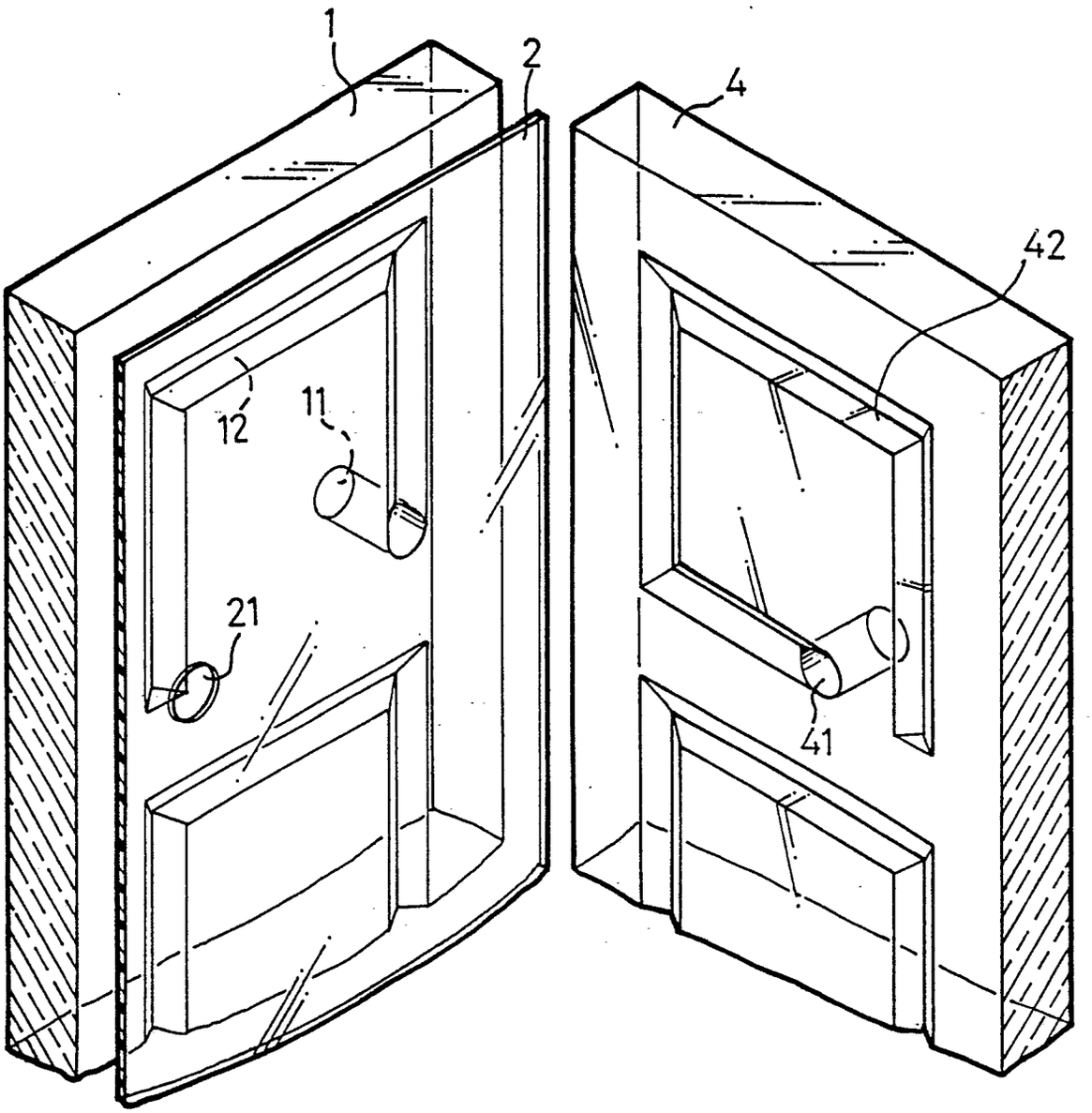

Fig. 7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 30 8705

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.3)
A	US-A-2 225 809 (CRITTALL MAN. CO.) * Page 1, column 1, lines 1-24; page 2, column 1, lines 3-11; figure 6 *	1	E 06 B 3/66 E 06 B 7/02
A	US-A-2 870 700 (F.P. HARRINGTON) * Column 1, lines 15-26; column 2, lines 18-34; figures 1,3 *	1,2	
A	DE-A-2 753 127 (T.L. WEINLICH) * Page 5, lines 9-13; page 9, lines 8-15 *	1	
A	DE-A-2 725 679 (K. SAUER) * Page 3; figures 1,2 *	1	
E	US-A-4 787 296 (T.H. HUANG) * Column 1, line 52 - column 4, line 10; figures 1-7 *	1,2	

TECHNICAL FIELDS SEARCHED (Int. Cl.3)

E 06 B
F 24 F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19-05-1989	VERVEER D.

CATEGORY OF CITED DOCUMENTS

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