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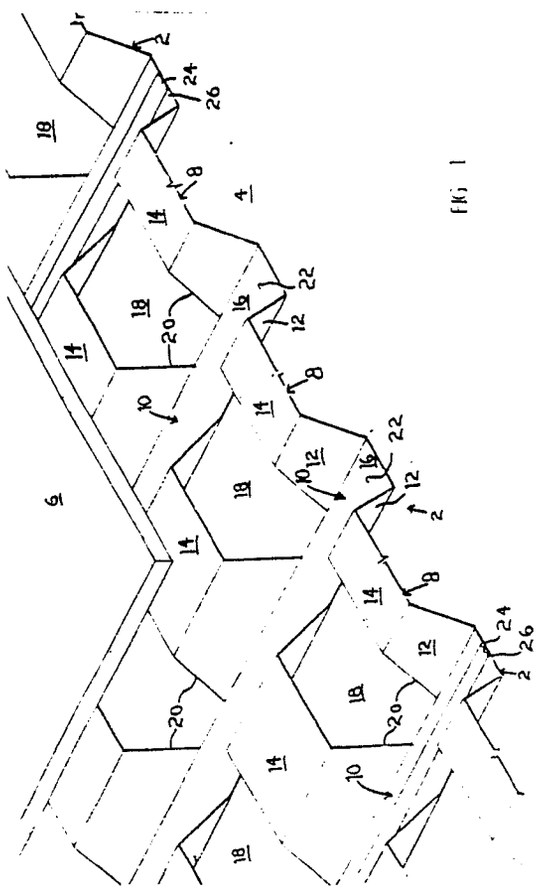
(54) A panel for floors, walls and ceilings.

(57) A panel (2) for floors, walls and ceilings, which panel (2) is provided with a plurality of alternating ridges (8) and valleys (10), the ridges (8) having flat peaks (14) which define a flat surface which is interrupted by the valleys, the valleys (10) having flat bottoms (16) which define a second flat surface which is interrupted by the ridges, each ridge being provided along its length with a plurality of spaced apart apertures (18), the apertures (18) extending over the entire height and width of the ridges so that the apertures (18) extend from the flat bottoms (16) of the valleys to the flat peaks (14) of the ridges, and the apertures being aligned in rows along the ridges.



EP 0 265 562 A1

A PANEL FOR FLOORS, WALLS AND CEILINGS

This invention relates to a panel for floors, walls and ceilings.

Panels for floors, walls and ceilings are known. Some of these known panels are provided with a plurality of corrugations Usually, the known panels are such that they are only suited for one type of use, for example, on floors or on walls or on ceilings. The known panels are such that they cannot really be regarded as multiple use panels that can equally well be used on floors, walls and ceilings.

It is an aim of the present invention to provide a panel that can be used on floors to provide raised flooring, that can be used on walls as a support for wall cladding and that can be used on ceilings as a lining, the panel remaining of basically the same construction irrespective of whether it is to be used on floors, walls or ceilings, and the panel being well suited for its multiple use.

Accordingly, this invention provides a panel for floors, walls and ceilings, which panel is provided with a plurality of alternating ridges and valleys, the ridges having flat peaks which define a first flat surface which is interrupted by the valleys, the valleys having flat bottoms which define a second flat surface which is interrupted by the ridges, each ridge being provided along its length with a plurality of spaced apart apertures, the apertures extending over the entire height and width of the ridges so that the apertures extend from the flat bottoms of the valleys to the flat peaks of the ridges, and the apertures being aligned in rows across the ridges.

When the panel is to be used for floors, the second flat surface can rest on a concrete floor and chipboard or other flooring material can be laid across the first flat surface. Mechanical and electrical services such for example as telephone lines, power lines and plumbing can be passed as desired through the tunnels formed by the ridges or along the valleys. The apertures are effective to allow the various services to branch or connect in substantially any direction with the utmost ease. The ridges and the valleys ensure that the services can be kept separate as desired.

Where the panel is to be used for walls, the ridges and the valleys can again be used for carrying services such for example as electrical services and water services. The apertures are again effective to allow the services to branch in any desired direction. Furthermore, plaster board or other desired material can very easily be fixed to the panel by fixing the plaster board or other material to the flat peaks of the ridges. Generally, this will be much faster and more convenient than first battening a wall and fixing the plaster board or other material to the battens. The plaster board or other material can be fixed to the flat peaks of the ridges using, for example, self-tapping screws.

Where the panel is to be used for ceilings, it can be appropriately suspended to provide a false ceiling. In this instance, the alternating ridges and valleys provide a pleasing aesthetic effect, and this pleasing aesthetic effect is heightened by the apertures. In addition, if desired, services can be run across the panel when it is used to form a false ceiling. Furthermore, the panel facilitates air circulation above and below the panel.

Preferably, the distance between the centres of adjacent ridges is equal to the distance between the centres of adjacent apertures in the same ridge.

Preferably, the ridges have flat sides.

The apertures may increase in width from the flat bottoms of the valleys towards the flat peaks of the ridges. This tends to make the sides of the ridges nearer to being of continuous material and so increases the strength of the ridges. This can be especially advantageous when the panel is to be used for floors.

Any desired number of apertures may be provided along each ridge. Solely by way of example, it is mentioned that if the apertures are spaced apart by 10 cm (4 inches) then very considerable flexibility in routing service conduits is afforded. The size and the shape of the apertures can also be varied as desired depending upon the purpose for which the panel is to be used.

Preferably, the panel is one in which the apertures are cut from flat sheet material, and in which the apertured flat sheet material is then provided with the upstanding ridges.

The ridges and valleys may be provided in the flat sheet material using a press. The press may stamp the flat sheet material. Alternatively, the flat sheet material may be passed through rollers, or it may be made by die casting.

The panel may include a plurality of fixing holes for fixing the panel in a desired position.

Preferably, the fixing holes are provided in the flat bottoms of the valleys. When the fixing holes are so positioned, it will be apparent that the valleys cannot move laterally so that pressure on the flat peaks of the ridges cannot cause the ridges to squash by causing the bottoms of the valleys to move laterally.

The panel may include resilient mounting means for resiliently mounting the panel to facilitate the reduction of the transmission of noise and vibration to and/or from the panel in use of the panel. The resilient mounting means are particularly advantageously employed when the panel is to be used for floors.

The resilient mounting means may be rubber grommets which are press fitted into mounting holes in the panel.

The panel may include at least one aperture bridge member which fits in one of the apertures in one of the ridges.

The aperture bridge member may comprise a platform, a pair of support legs for the platform, and a pair of inclined closure members, the support legs having flanges for clipping under the flat bottoms of two adjacent valleys, and the closure members being such as to extend from the platform and to rest one against opposite edges of the ridge defining the aperture.

The panel may include at least one valley bridge member which fits in one of the valleys.

The valley bridge member may comprise a platform and a pair of support legs.

The valley bridge member may clip to lugs formed in the sides of the valley or in the base of the valley.

The panel may be made of any desired material. The particular materials chosen for the panel will often depend on the intended use of the panel, for example whether or not the panel is to be used for a floor, for a wall or for a ceiling. The panel may thus be made of a metal or a plastics material. Presently preferred metals are aluminium and galvanised steel. Presently preferred plastics materials include polyvinyl chloride. The panel, especially when it is to be made for use for ceilings, can advantageously be made of plastics material, thin gauge metals or gypsum reinforced plaster.

The valley bridge member and the aperture bridge member can be made of the same or a different material to that used for forming the rest of the panel. Generally, the aperture bridge member and the valley bridge member will be formed of a thinner material than the material employed for the rest of the panel. The valley bridge member may advantageously be formed as plastics trunking.

It will be apparent that the aperture bridge member and the valley bridge member may be used where it is desired to cross various services over each other whilst keeping the various services separate from each other. For example, it may be desired to cross a power cable over a telephone cable or an electrical supply cable over a water supply conduit, in both cases without one service being able to touch the other service.

The panels may be made in any desired sizes and the final choice of size will usually depend upon the intended use of the panel. For example, if the panel is to be used for flooring, then the panel may be made in standard chipboard sizes.

Embodiments of the invention will now be described solely by way of example and with reference to the accompanying drawings in which:

Figure 1 shows a first panel being used for flooring;

Figure 2 shows a modification of the panel shown in Figure 1;

Figure 3 shows the panel of Figure 1 and illustrates the use of aperture bridge members, valley bridge members and the directioning of services;

Figure 4 shows in greater detail the aperture bridge member shown in Figure 3; and

Figure 5 shows a second panel for a ceiling.

Referring to Figure 1, there is shown a panel 2 for a floor. More specifically, the panel 2 is for resting on a concrete or other floor 4 and supporting chipboards 6. The chipboards 6 thus form a raised floor and the panel 2 can be used to enable the easy and precise access of services to desired locations as will be described in detail hereinbelow.

The panel 2 is provided with a plurality of alternating ridges 8 and valleys 10. The valleys 10 are positioned between the ridges 8 so that the flat sloping sides 12 of the ridges 8 also form the sides of the valleys 10.

The ridges 8 have flat peaks 14 which define a first flat surface which is interrupted by the valleys 10. The valleys 10 have flat bottoms 16 which define a second flat surface which is interrupted by the ridges 8.

Each ridge 8 is provided along its length with a plurality of spaced apart apertures 18. As shown, the apertures extend over the entire height and width of the ridges 8 so that the apertures 18 extend from the flat bottoms 16 of the valleys 10 to the flat peaks 14 of the ridges 8. As can be seen, the apertures 18 are all aligned in rows across the ridges 8. Also as can be seen, the distance between the centres of adjacent ridges 8 is equal to the distance between the centres of adjacent apertures 18 in the same ridge 8. It can also be seen that the apertures 18 increase in width from the flat bottoms 16 of the valleys 10 towards the flat peaks 14 of the ridges 8. This means that the valleys 10 have sloping edges 20 and the sloping edges 20 ensure that quite a lot of the sides 12 remain and this may be effective to give the ridges 8 good overall strength.

The chipboard 6 can be secured by any appropriate means such for example as self-tapping screws to the flat peaks 14 of the ridges 8. The panel 2 can itself be secured by means of fixing

holes 22 to the floor 4, using for example screws or pins. One edge of each panel 2 is provided with a raised lip 24 and this raised lip 24 fits over the opposite edge 26 of an adjacent panel so that the panels 2 can interlock with each other in a satisfactory manner.

Referring now to Figure 2, similar parts as in Figure I have been given the same reference numerals and their precise construction and operation will not again be given. In Figure 2, it will be seen that the flat bottoms I6 of the valleys I0 are provided with resilient mounting means in the form of rubber grommets 28. The grommets 28 enable the panel 2 to be resiliently mounted on the floor 4 and the grommets 28 are effective to facilitate the reduction of the transmission of noise and vibration to and/or from the panel 2 in use. Similarly, the flat peaks I4 of the ridges 8 are also provided with resilient mounting means in the form of rubber grommets 30 and the grommets 30 enable the chipboards 6 to be resiliently mounted on the panel 2, again to facilitate the reduction of the transmission of noise and vibration to and/or from the panel 2 in use.

Referring now to Figure 3, similar parts as in Figure I have been given the same reference numerals and their precise construction and operation will not again be given. Figure 3 shows power cables 32 and telephone wires 34 running through the panel 2. More specifically, the telephone wires 34 are shown running in a tunnel 36 formed by the associated ridge 8. Two of the power cables 32 are shown running through another tunnel 36 of another ridge 8, whilst the third power cable 32 is shown running along a valley I0.

A valley bridge member 38 is used as shown in the valley I0 to enable one of the power cables 32 in the tunnel 36 to turn right through an aperture I8 and to pass over the power cable 32 in the valley I0 whilst remaining totally separate from the power cable 32 in the valley I0. As can be seen from Figure 3, the channel bridge member comprises a platform 40 and a pair of support legs 42. Lugs (not shown) may be formed in the sides I2 or in the flat bottoms I6 so that the valley bridge member 38 can clip in position. The valley bridge member 38 can be made of any desired metal or plastics material and it may be similar to trunking.

Figure 3 also shows the use of an aperture bridge member 44 which allows one of the power cables 32 to pass through a series of the apertures I8 and to pass over the telephone wires 34 whilst remaining totally separate from the telephone wires 34.

The aperture bridge member 34 is shown in detail in Figure 4. In Figure 4, it will be seen that the aperture bridge member 44 comprises a platform 46, a pair of support legs 48 for the platform 46 and a pair of inclined closure members 50. The support legs 48 have flanges 52 for fitting under the flat bottoms I6 of two adjacent valleys I0. The closure members 50 are such as to extend from the platform 46 to rest one against opposite edges 54,56 of the ridge 8 defining the aperture I8.

Referring now to Figure 5, there is shown a panel 2 for a ceiling. For simplicity and ease of illustration, similar parts as in Figure I have been given the same reference numeral. The panel 2 shown in Figure 5 may be regarded as the panel 2 shown in Figure I but turned upside down. In Figure 5, the flat edge 26 of the panel 2 rests on one arm 58 of a beam 60. As shown, the beam 60 is of inverted T-shape. A centre leg portion 62 of the beam 60 is provided with a hole 64 which receives a wire 66 as shown. The wire 66 thus supports the beam 60 at a desired height and the beam 60 supports the panel 2. Obviously, to provide an entire false ceiling, several beams 60 will be required. In use as a ceiling panel, the apertures I8 give a pleasing aesthetic effect and good air circulation. In addition, the tunnels 36 formed by the ridges 8 (which form valleys when viewed from above) can be used to run services such for example as electric light cables. The apertures I8 can also be very effective to allow light to shine through them from sources of illumination positioned above the panel 2.

The panels 2 can be made from any desired materials. Usually, when the panel 2 is to be used for a floor as shown in Figures I to 4, then the panel 2 will be made of a metal such for example as aluminium or galvanised steel. When the panel 2 is to be used as a ceiling panel as shown in Figure 5, then, if it is made of a metal, it can be made of a light gauge metal so that the panel 2 is not too heavy. Alternatively, the panel 2 can advantageously be made by forming a plastics material or by using gypsum reinforced plaster. When the panel 2 is to be used to support wall cladding (not shown) then it can again be made of any desired material although the strength required of the panel 2 will not be that required of the panel 2 when it is to be used for flooring and so the panel 2 when used with wall cladding will usually be made of light gauge metal or the above mentioned other materials for the ceiling panel.

It is to be appreciated that the embodiments of the invention described above with reference to the drawings have been given by way of example only and that modifications may be effected. Thus, for example, the frequency, size and shape of the apertures I8 may be varied. Also, the precise cross sectional shape of the ridges 8 may be varied as may the precise cross sectional shape of the valleys I0. If desired, the grommets 30 in the flat peaks I4 of the ridges 8 may be omitted.

Claims

I. A panel for floors, walls and ceilings, which panel is provided with a plurality of alternating ridges and valleys, the ridges having flat peaks which define a first flat surface which is interrupted by the valleys, the valleys having flat bottoms which define a second flat surface which is interrupted by the ridges, each ridge being provided along its length with a plurality of spaced apart apertures, the apertures extending over the entire height and width of the ridges so that the apertures extend from the flat bottoms of the valleys to the flat peaks of the ridges. and the apertures being aligned in rows across the ridges.

2. A panel according to claim I in which the distance between the centres of adjacent ridges is equal to the distance between the centres of adjacent apertures in the same ridge.

3. A panel according to claim I or claim 2 in which the ridges have flat sides.

4. A panel according to any one of the preceding claims in which the apertures increase in width from the flat bottoms of the valleys towards the flat peaks of the ridges.

5. A panel according to any one of the preceding claims and including a plurality of fixing holes for fixing the panel in a desired position.

6. A panel according to any one of the preceding claims and including resilient mounting means for resiliently mounting the panel to facilitate the reduction of the transmission of noise and vibration to and/or from the panel in use of the panel.

7. A panel according to any one of the preceding claims and including at least one aperture bridge member which fits in one of the apertures in one of the ridges.

8. A panel according to claim 7 in which the aperture bridge member comprises a platform, a pair of support legs for the platform, and a pair of inclined closure members, the support legs having flanges for clipping under the flat bottoms of two adjacent valleys, and the closure members being such as to extend from the platform and to rest one against opposite edges of the ridge defining the aperture.

9. A panel according to any one of the preceding claims and including at least one valley bridge member which fits in one of the valleys.

I0. A panel according to claim 9 in which the valley bridge member comprises a platform and a pair of support legs.

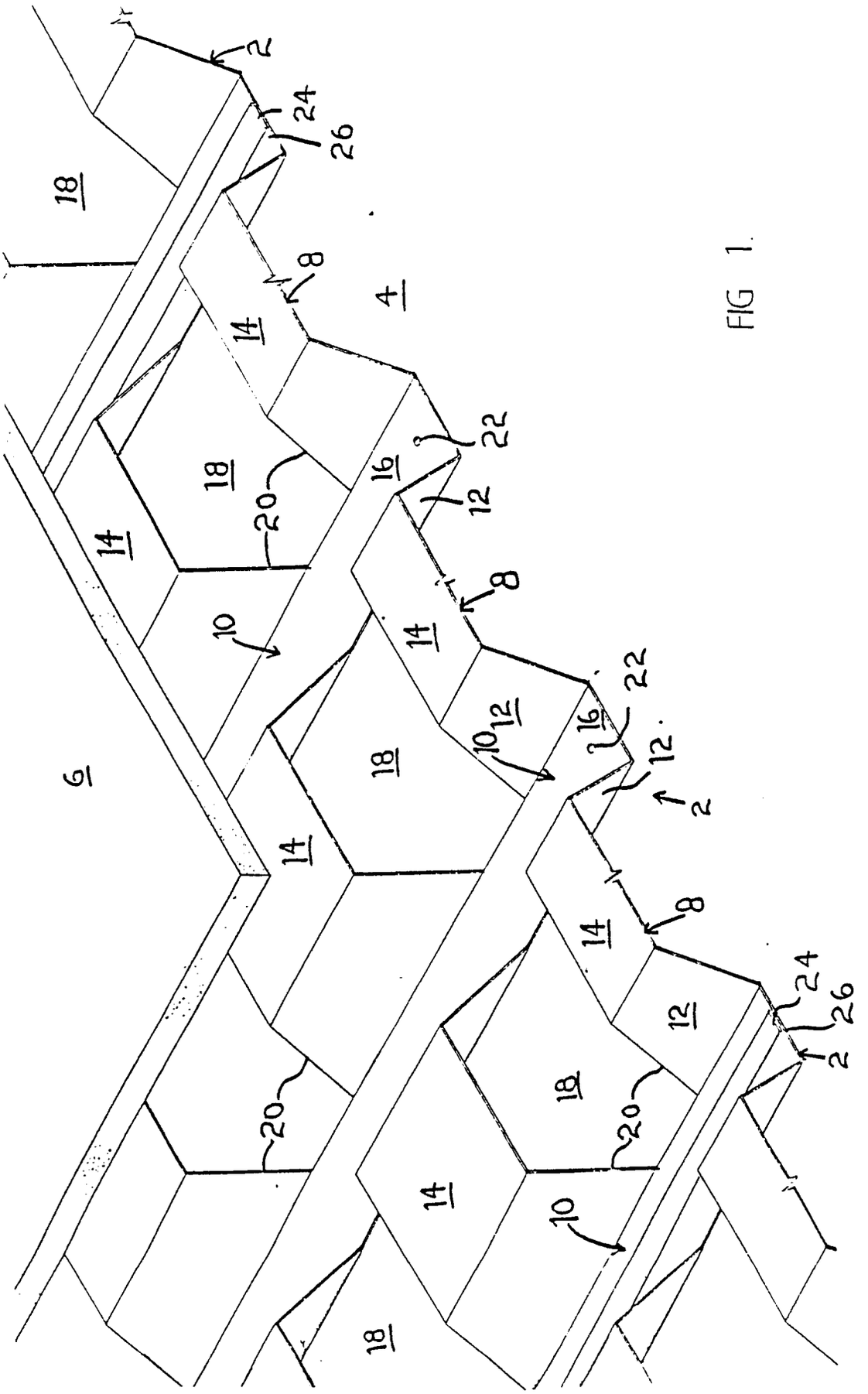

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FIG 1.

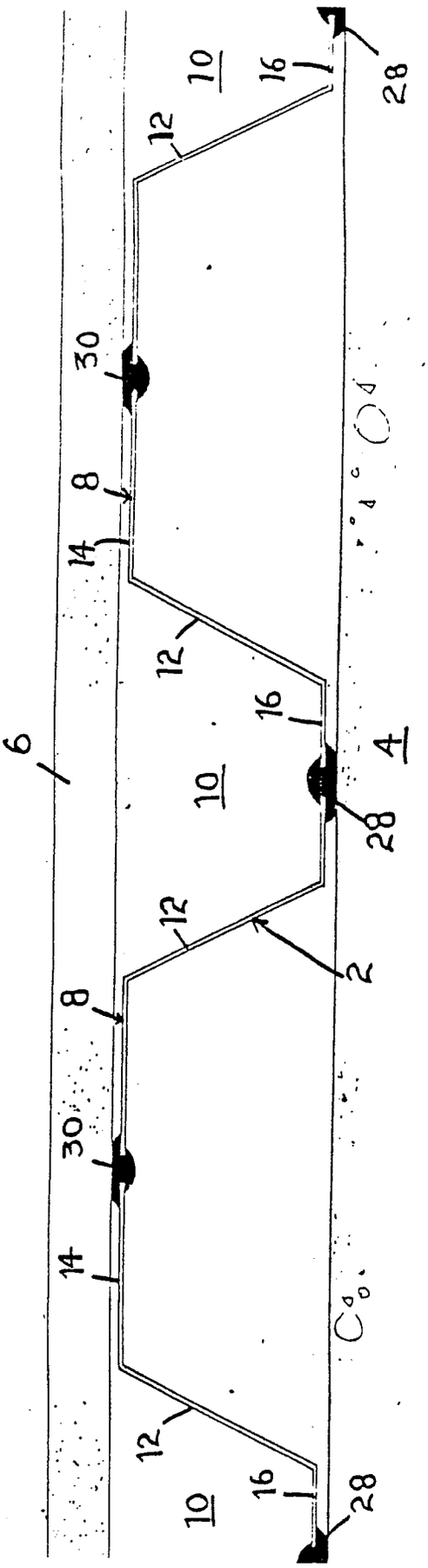

FIG 2.

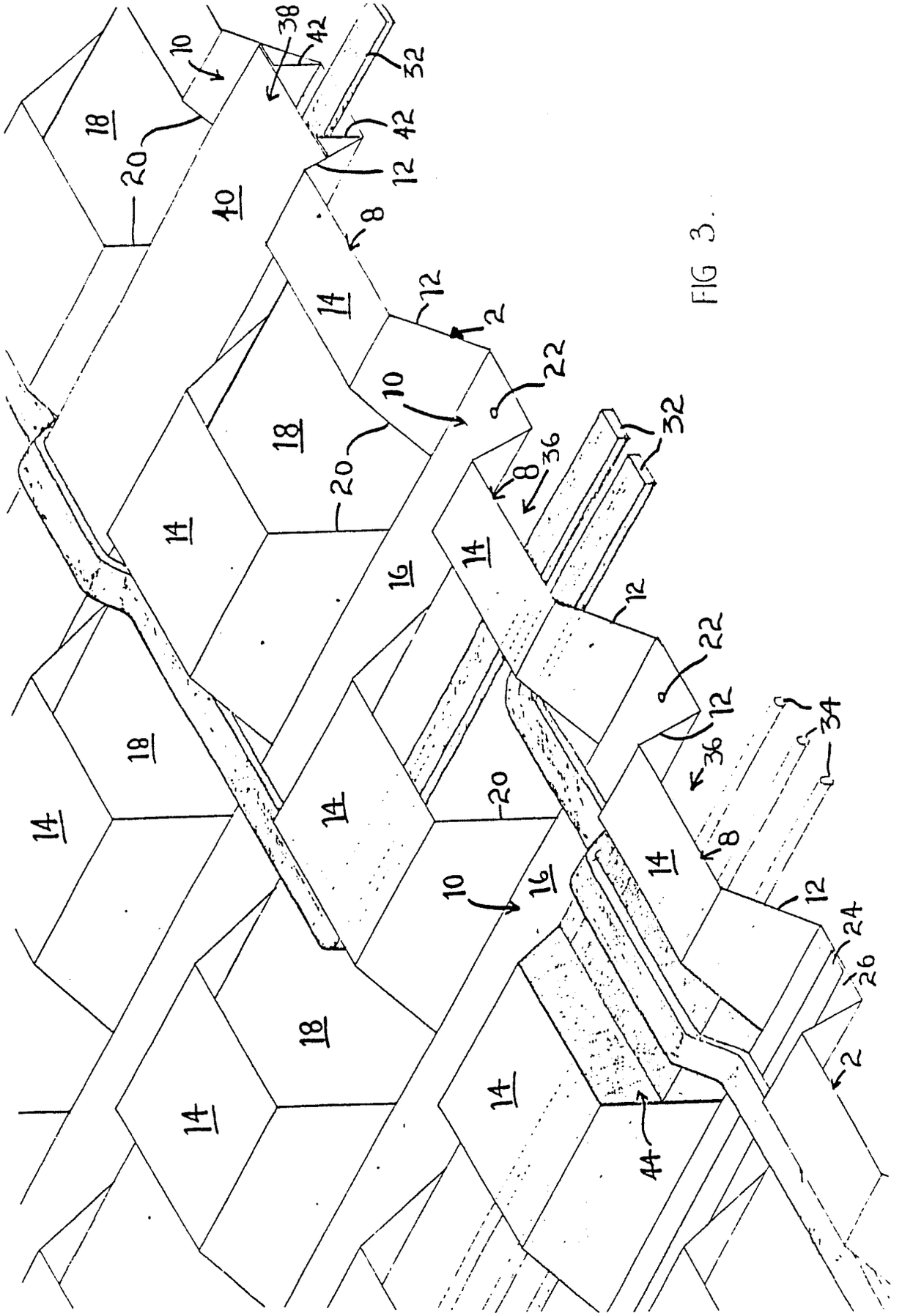

FIG 3.

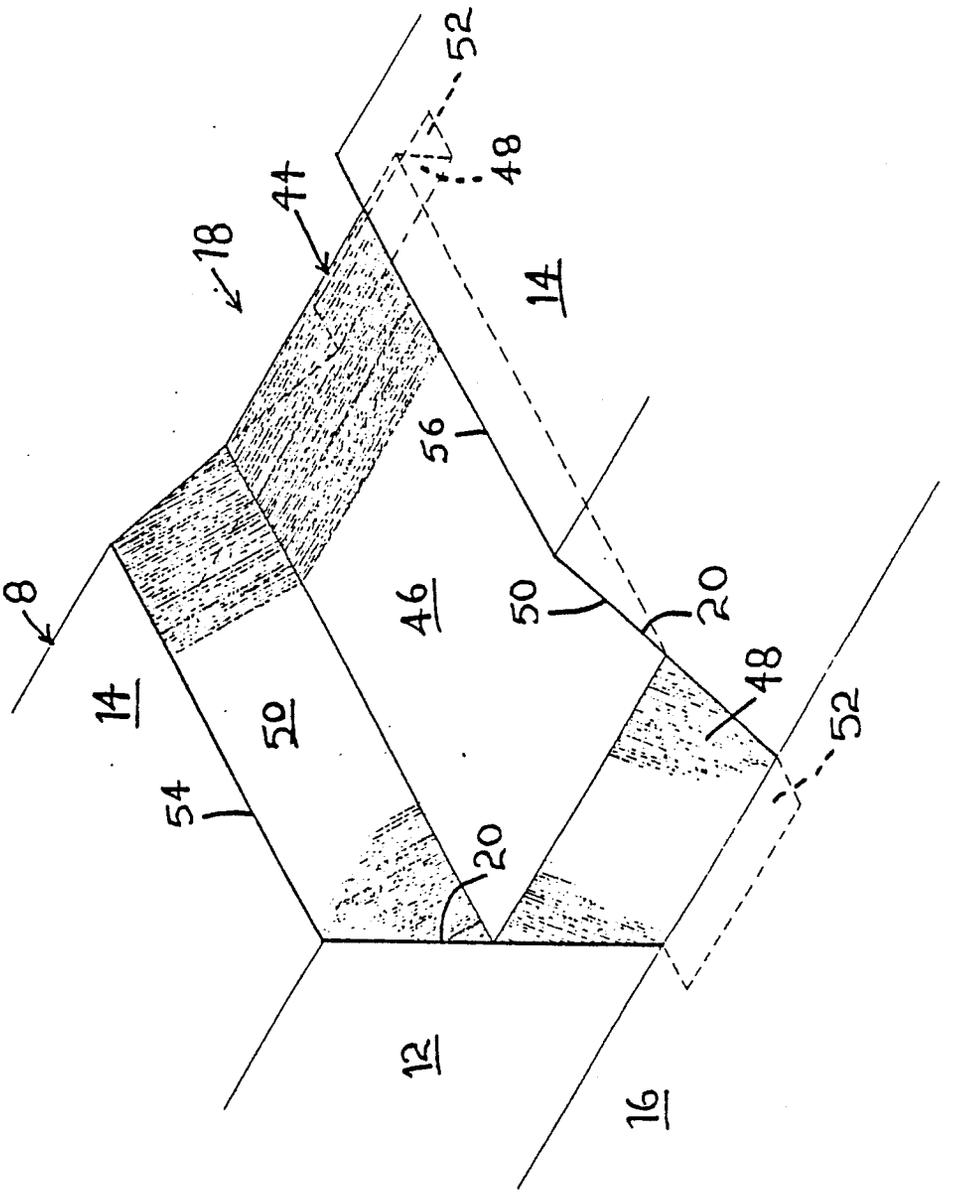

FIG 4.

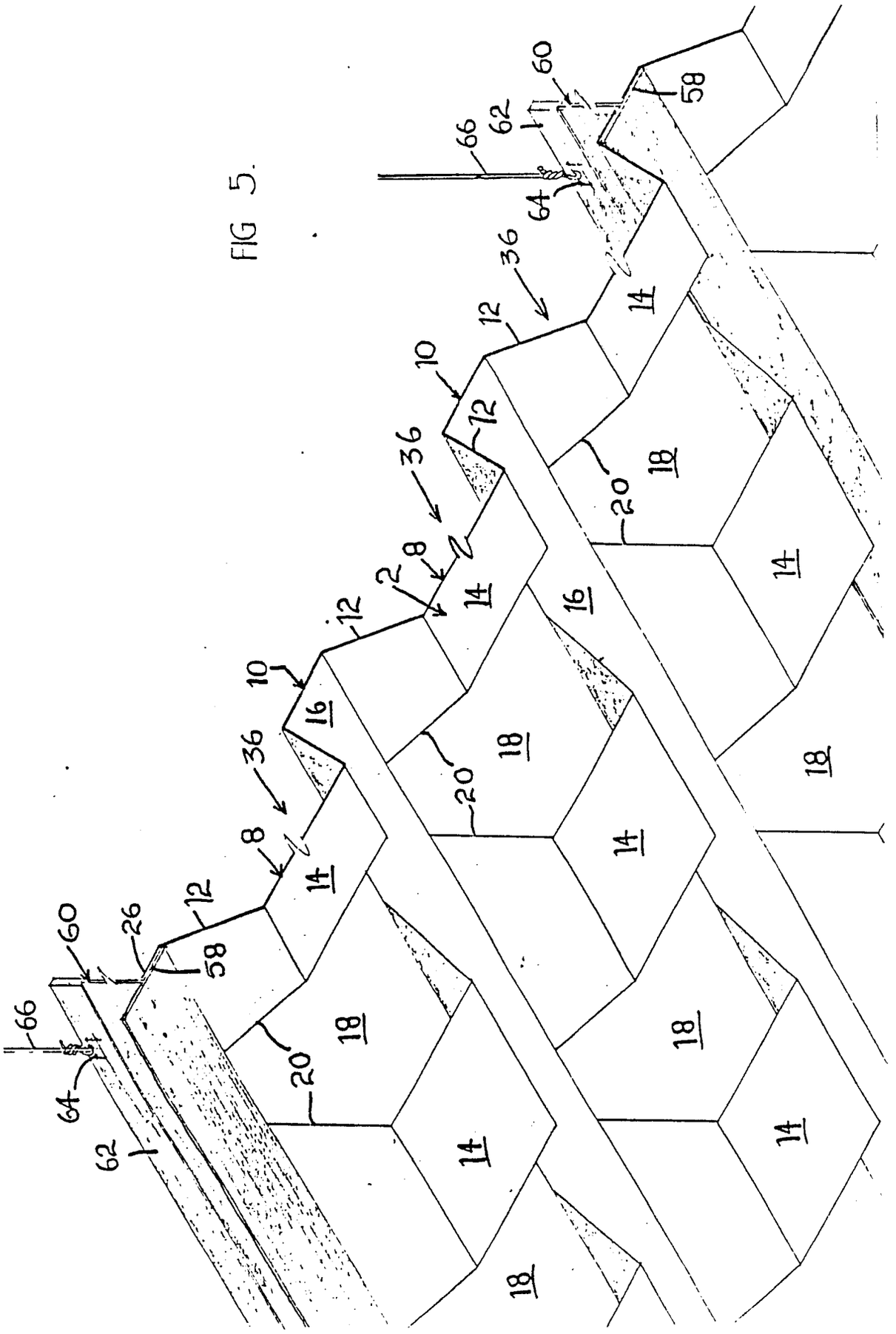

FIG 5.

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Application number

EP 86 30 8394

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 4)
Y	DE-A-1 683 278 (MENGERINGHAUSEN) * Page 10, line 4 - page 18, line 5; figures 1-10 *	1	E 04 F 15/024 E 04 F 13/08 E 04 C 2/32 E 04 B 5/54
Y	US-A-3 591 351 (ULLMAN) * Column 1, line 67 - column 2, line 25; column 4, line 7 - column 8, line 11; figures 1-28 *	1	
A		2-4	
A	FR-A-1 307 701 (BLAKE) * Page 2, left-hand column, line 9 - page 3, left-hand column, line 48; figures 1-9 *	1-3	
A	FR-A-1 278 924 (ADIE) * Page 2, left-hand column, line 51 - page 6, right-hand column, line 44; figures 1-12 *	1,2,5	TECHNICAL FIELDS SEARCHED (Int Cl 4) E 04 F E 04 C E 04 B
A	FR-A-2 171 620 (CHAMAYOU) * Page 7, lines 12-31; figures 9,10 *	1,3,4	
A	US-A-3 733 766 (LECLERCQ) * Column 2, line 16 - column 4, line 56; figures 1-9 *	1,3,6	

-/-

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18-06-1987	AYITER J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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D : document cited in the application
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EUROPEAN SEARCH REPORT

Application number

EP 86 30 8394

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 4)
A	GB-A-2 172 912 (DEREK) * Page 1, line 128 - page 2, line 118; figures 1-12 *	1,7,8	
A	EP-A-0 094 780 (ROBERTSON) * Page 5, line 18 - page 11, line 19; figures 1-6 *	1,9,10	
			TECHNICAL FIELDS SEARCHED (Int Cl 4)

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L : document cited for other reasons

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