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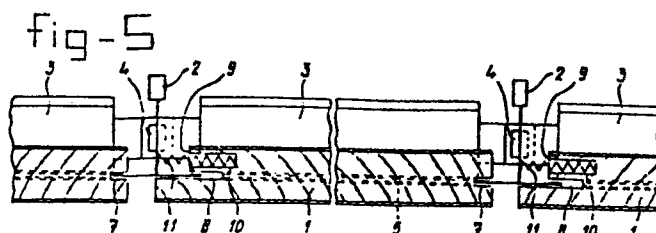
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54 Ceiling system.

57 Ceiling, comprising supporting sections running lengthwise (2) and crosswise (3) and having horizontal flanges which together form rectangular openings, in each of which is placed a rigid panel (1) with grooves (5,7,8) in the edges thereof, in which the horizontal flanges of the supporting sections (2,3) are partially accommodated, with the panels (1) being larger lengthwise and crosswise than the opening bounded by the flanges, and in which each panel (1) is provided along three edges with a groove (5,7,8), the grooves

(7,8) in two opposite edges are of unequal depth, from the panel (1) at the edge with the deeper groove (8), at the side of the panel (1) which is not visible, a part is removed, so that the deeper groove (8) over a part of its depth is open at that side, and disposed in the head end of the recessed edge are one or more compression springs (11) which rest against a vertical element of the supporting section (2) and press the bottom of the groove (7) in the opposite edge against the edge of the horizontal flange of the supporting section (2) parallel thereto.



Ceiling system

The invention relates to a ceiling system, comprising supporting sections running lengthwise and crosswise and having horizontal flanges which together form rectangular openings, in each of which is placed a rigid panel with grooves in the edges thereof, in which the horizontal flanges of the supporting sections are partially accommodated, with the panels being larger lengthwise and crosswise than the opening bounded by the flanges.

Such a system is known from British Patent Specification 1,112,185.

According to this known system, use is made of panels which in all four edges are provided with grooves which are engaged by the horizontal flanges of four supporting sections standing perpendicular to each other. Each panel is thus retained by the supporting sections.

Whenever for some reason or other a panel has to be removed, this panel is broken and replaced by a panel provided with a groove along an edge and with overlaps along three edges with snap springs along two of these edges. It is, however, also possible to construct the entire ceiling from this type of panel.

Normally the ceiling thus consists of panels which are grooved along four edges and retained by the supporting sections.

Here, the lengthwise sections are fixed, and the panels are slid one by one between the parallel lengthwise sections. A crosswise section is fitted after each panel.

If a panel has to be removed after a number of years, for example for making an electrical connection, then an undamaged panel has to be destroyed and replaced by a new panel with one groove, three overlaps and two snap springs.

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This therefore means a waste, and the new panel will practically always differ in colour and/or structure from the other panels.

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If the ceiling consists entirely of such "new" panels, then it is just as impossible to remove a panel undamaged, because the snap springs are not accessible from the bottom side.

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Furthermore, this known system is usable only in the case of panels of relatively soft material, so that points of the snap springs can easily be pressed into them.

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The object of the invention is to produce a ceiling system in which it is possible not only to fit rigid panels easily from the bottom into a system of fixed lengthwise and crosswise sections, but also to remove one or more panels undamaged at any time and refit them.

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This is achieved according to the invention in that each panel is provided along three edges with a groove, the grooves in two opposite edges are of unequal depth, from the panel at the edge with the deeper groove, at the side of the panel which is not visible, a part is removed, so that the deeper groove over a part of its depth is open at that side, and disposed in the head end of the recessed edge are one or more compression springs which rest against a vertical element of the supporting section and press the bottom of the groove in the opposite edge against the edge of the horizontal flange of the supporting section parallel thereto.

30

In this way each panel can easily be fitted from underneath in the supporting sections already fixed and standing perpendicular to each other, and can be removed again if necessary.

5 It is therefore not necessary to insert the panel into the opening, so that there need be no space above the supporting sections.

10 Narrow strips of the bottom sides of the supporting sections always remain visible between the adjacent panels. This produces narrow seams which, as far as colour is concerned, can be matched with the panels or actually can form a contrast with them.

15 The invention also relates to a panel intended for such a ceiling system, characterized in that the panel is provided along three edges with a groove, the grooves are of unequal depth in two opposite edges, from the panel at the edge with the deeper groove, at the side of the panel which is not visible, a part is removed, so that the deeper groove over a part of its depth is
20 open at that side, and disposed in the head end of the recessed edge are one or more compression springs.

The invention will be explained in greater detail with reference to the drawings, in which:

25 Figs. 1 and 2 are bottom views of the ceiling system according to the invention, with two different arrangements of the panels;

Fig. 3 shows a detail of Fig. 1;

30 Fig. 4 is a cross section along the line IV-IV of Fig. 3;

Fig. 5 is a cross section along the line V-V of Fig. 3.

35 In the drawings the panels are indicated by 1, the lengthwise

supporting sections by 2, and the crosswise supporting sections by 3.

5 These supporting sections 2, 3 are in the known manner an inverted T shape in cross section. The lengthwise supporting sections 2 are suspended from the fixed ceiling (not shown) by means of the free end of the middle leg.

10 The crosswise supporting sections 3 are mostly somewhat lighter and slightly lower in height and are connected by means of push-in connections 4 to the lengthwise supporting sections 2 (see Fig. 5). In the arrangement shown in Fig. 1, the lengthwise supporting sections 2 run through along the entire length of the ceiling.

15 In the arrangement of the panels 1 shown in Fig. 2, it is the sections 3 which run through, and the sections 2 are fastened between them. In this way the panels 1 can be arranged in staggered fashion.

20 Figs. 3, 4 and 5 show the system according to the invention in more detail.

25 The panel 1 is preferably 1,200 mm long and 600 mm wide. Of course, other dimensions are possible, but the module of the supporting sections 2 and 3 is generally designed for those dimensions.

30 The panels 1 can consist of a chipboard core which may or may not be fire-retardant (Class I NEN 1076). The chipboard core can be provided for purposes of decoration with a layer of veneer or hard plastic with a surface finish.

35 The panel can also be made of multi-ply which may or may not be grooved to obtain a lath effect, again provided with a surface

finish.

The panels 1 are provided along the one end edge with a groove 5. Along the other end edge there is a wide overlap 6 (see Fig. 4).

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In a practical embodiment the groove 5 is approximately 10 mm deep and the overlap 6 is about 25 mm wide.

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In both longitudinal edges the panel 1 also has grooves, in one longitudinal edge a shallower groove 7 about 5 mm deep and in the other longitudinal edge a groove 8 which is 15-20 mm deep. This groove 8 is open along part of its top side. A recessed longitudinal edge 9 is thus formed and is not visible from the bottom side of the ceiling (see Fig. 5).

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Formed in this recessed longitudinal edge 9 are two or more blind bores 10. Placed in each bore 10 is a preferably conical helical spring 11. The thicker end of this helical spring 11 is secured in the bottom of the bore 10. The spring 11 thus projects outside the bore 10 over part of its length. The panels 1 are delivered with the springs 11 fitted in them.

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For the fitting, a panel 1 is lifted upwards horizontally and shifted lengthwise a little to the right from the position shown in Fig. 4, so that the left end edge is free of the horizontal supporting flange of the left supporting section 3.

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The panel 1 can then be moved upwards slightly until the overlap 6 rests against the bottom side of the supporting flange of the right supporting section 3.

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The panel 1 is then moved in the crosswise direction, in which the supporting flange of the left supporting section 2 slides into the groove 8 in the longitudinal edge of the panel 1 and the spring 11 is compressed. The supporting flange of the right

supporting section 2 is then placed in the groove 7 and the panel is released. The springs 11 expand and press the panel 1 in Fig. 5 to the right until the bottom of the groove 7 rests against the edge of the supporting flange of the right supporting section 2 (see Fig. 5). The left visible longitudinal edge of the panel 1 then lies more or less in line with the middle leg of the left supporting section 2.

The panel 1 is finally moved a little in the lengthwise direction until the edge of the supporting flange of the left supporting section 3 rests against the bottom of the groove 5 (see Fig. 4).

All panels 1 can be fitted in this way. Removal is easily possible by carrying out the above actions in the reverse order.

All panels 1 can be placed in this way in the arrangement shown in Fig. 1 or Fig. 2.

There is a seam about 8 mm wide all the way round between the panels 1. Parts of the bottom sides of the supporting sections 2 and 3 are therefore visible. These bottom sides can be finished in a particular colour to match the panels 1.

The supporting sections 2, 3 are in practice 22 or 24 mm wide. The ceiling system according to the invention can be used with both types of supporting section.

The ceiling system according to the invention was developed particularly for the renovation of ceilings, thus ceilings which are already provided with an arrangement of supporting sections. Here, the panels to be replaced rest freely on the top sides of the supporting flanges of the supporting panels. The system is, however, very suitable for entirely new ceilings.

Of course, half panels can also be fitted. The other half can

then be, for example, a lighting panel.

The above-mentioned dimensions serve only as an example.

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The panels 1 can be designed and finished in all kinds of ways. The invention is particularly suitable for wood panels, but can be used for all rigid panels.

C L A I M S

1. Ceiling system, comprising supporting sections running lengthwise and crosswise and having horizontal flanges which together form rectangular openings, in each of which is placed a rigid panel with grooves in the edges thereof, in which the horizontal flanges of the supporting sections are partially accommodated, with the panels being larger lengthwise and crosswise than the opening bounded by the flanges, characterized in that each panel is provided along three edges with a groove, the grooves in two opposite edges are of unequal depth, from the panel at the edge with the deeper groove, at the side of the panel which is not visible, a part is removed, so that the deeper groove over a part of its depth is open at that side, and disposed in the head end of the recessed edge are one or more compression springs which rest against a vertical element of the supporting section and press the bottom of the groove in the opposite edge against the edge of the horizontal flange of the supporting section parallel thereto.

2. Panel intended for the ceiling system according to Claim 1, characterized in that each panel is provided along three edges with a groove, the grooves in two opposite edges are of unequal depth, from the panel at the edge with the deeper groove, at the side of the panel which is not visible, a part is removed, so that the deeper groove over a part of its depth is open at that side, and disposed in the head end of the recessed edge are one or more compression springs.

3. Panel according to Claim 2, characterized in that the panel consists of chipboard core which may or may not be fire-retardant and is provided with one or more decorative surface coatings and finishes.

4. Panel according to Claim 2, characterized in that the panel consists of multi-ply which may or may not be grooved on one side to form a lath pattern, and provided with a surface finish.

fig-1

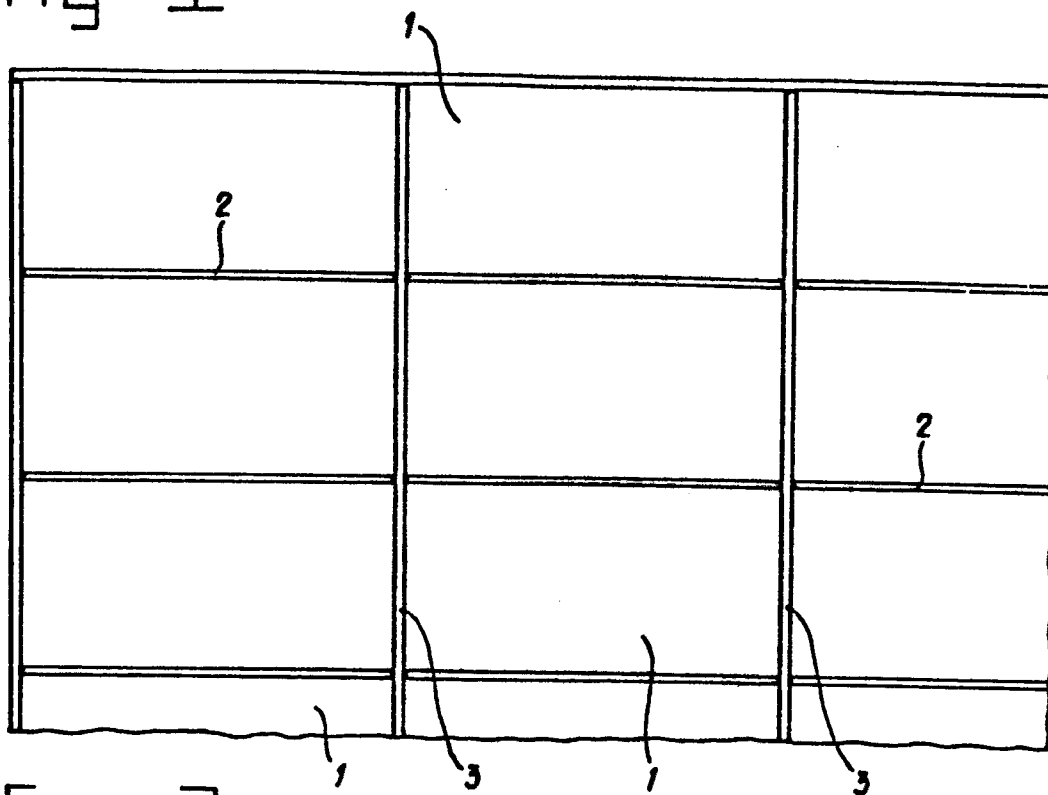


fig-2

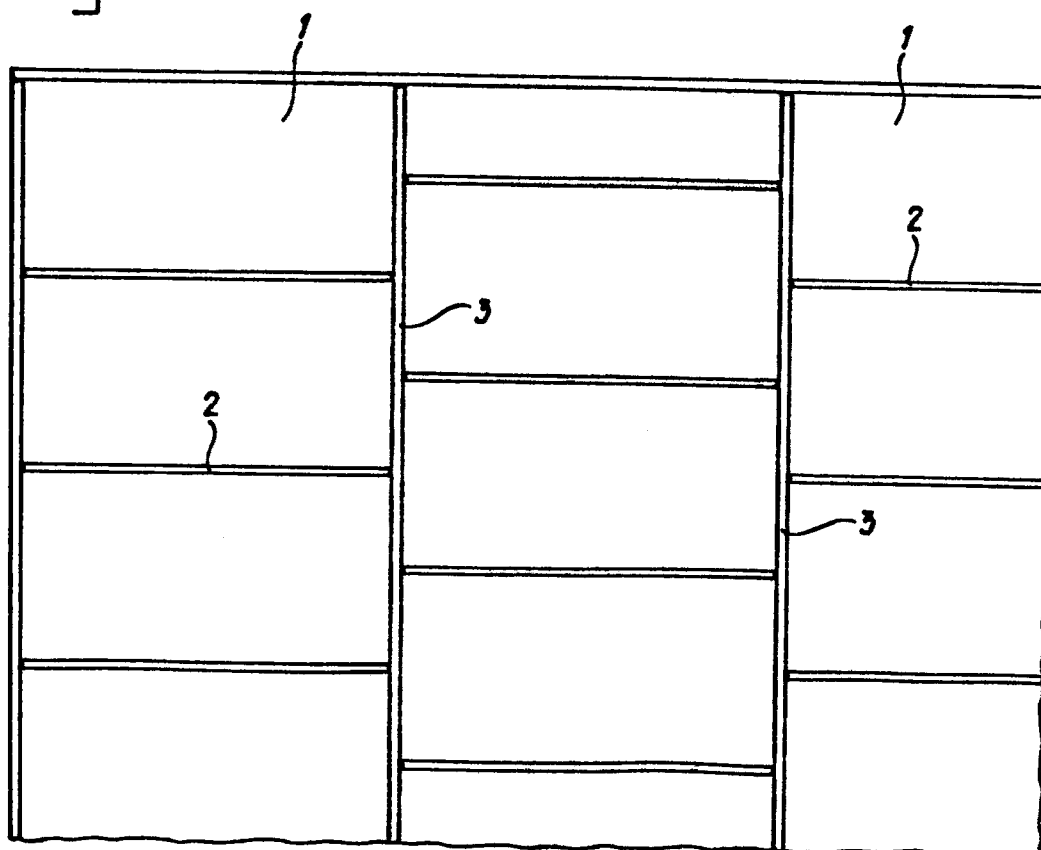


fig-3

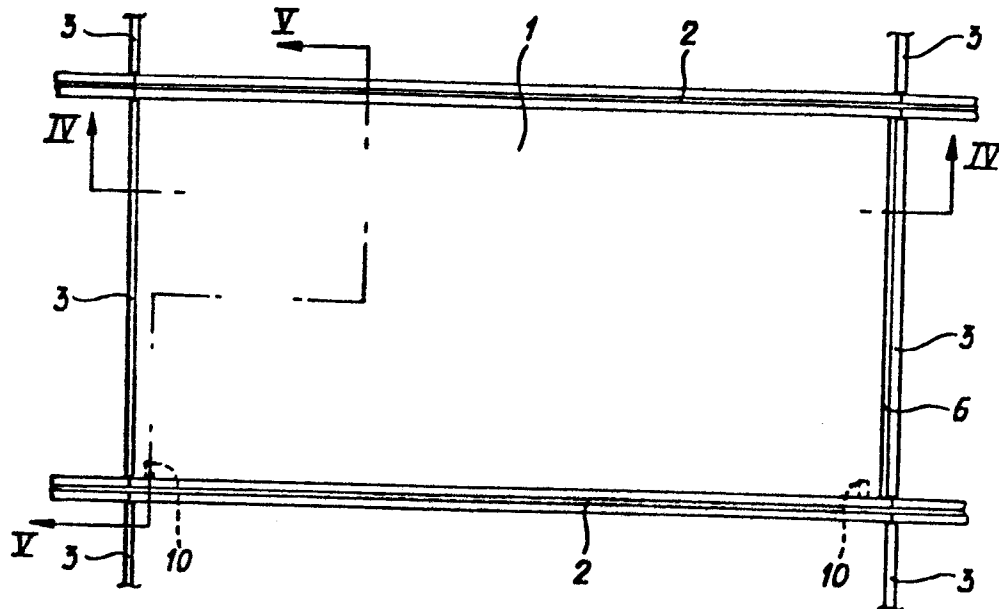


fig-4

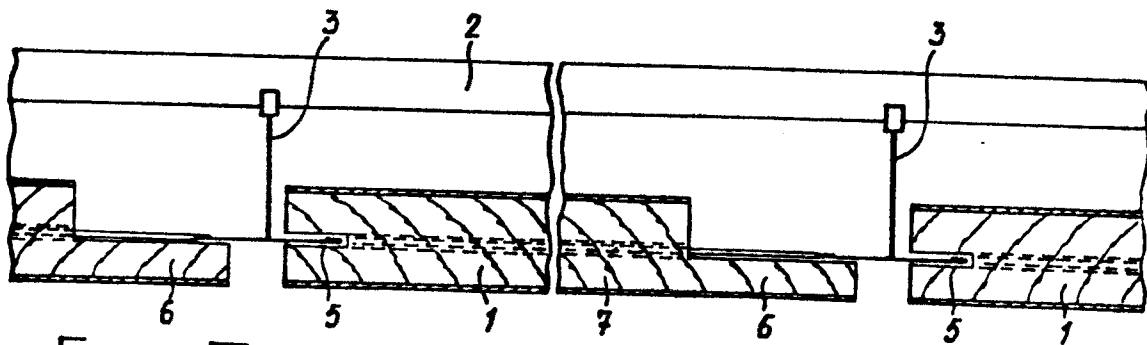
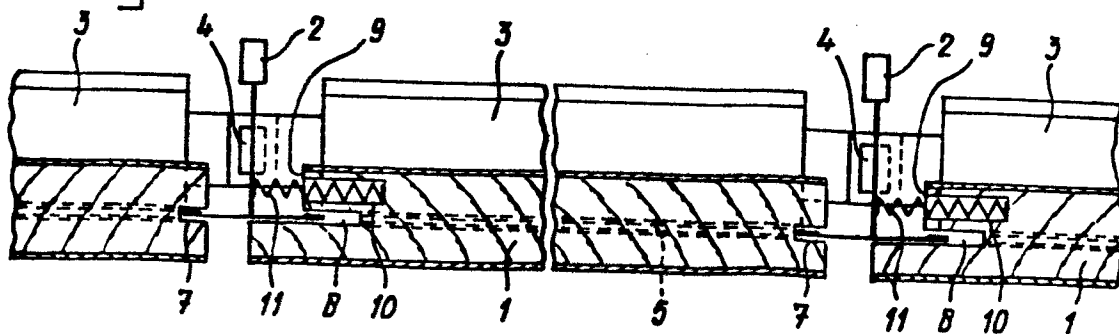


fig-5





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	US-A-3 488 908 (JAHN) * Column 3, lines 53-75; column 4, lines 1-10; figures 1,3-5 *	1,2	E 04 B 5/57 E 04 B 5/54
A	US-A-2 139 641 (NEUMEISTER) * Page 2, column 1, lines 72-75; column 2, lines 1-36; figures 1-4 *	1,2	
A	DE-A-2 553 797 (SCHÄFER) * Page 11, paragraphs 2,3; page 12, paragraph 1; figures 1,2,4,5 *	1,2	
A	BE-A- 643 170 (HOFFMAN)		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			E 04 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17-10-1986	Examiner HENDRICKX X.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			