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(71) Applicant: **Siem Verdonk R&D B.V.**
1716 KE Opmeer (NL)

(72) Inventor: **Schaap, Pieter Gerrit Jan**
1671 RV Medemblik (NL)

(74) Representative:
Land, Addick Adrianus Gosling et al
Arnold & Siedsma,
Advocaten en Octrooigemachtigden,
Sweelinckplein 1
2517 GK Den Haag (NL)

(54) Assembly and method for building a wall and/or ceiling

(57) The present invention provides a wall comprising panel parts and post parts which are attached magnetically to each other by permanent magnets (18) provided with holders, wherein mutual influencing of the magnets is prevented; profile parts arranged on the post parts by permanent magnets (18) provided with holders, wherein at least one transparent panel part is arranged in the profile parts; and door frame parts arranged on the profile parts and/or on the post parts, wherein a door is arranged hingedly on the frame parts.

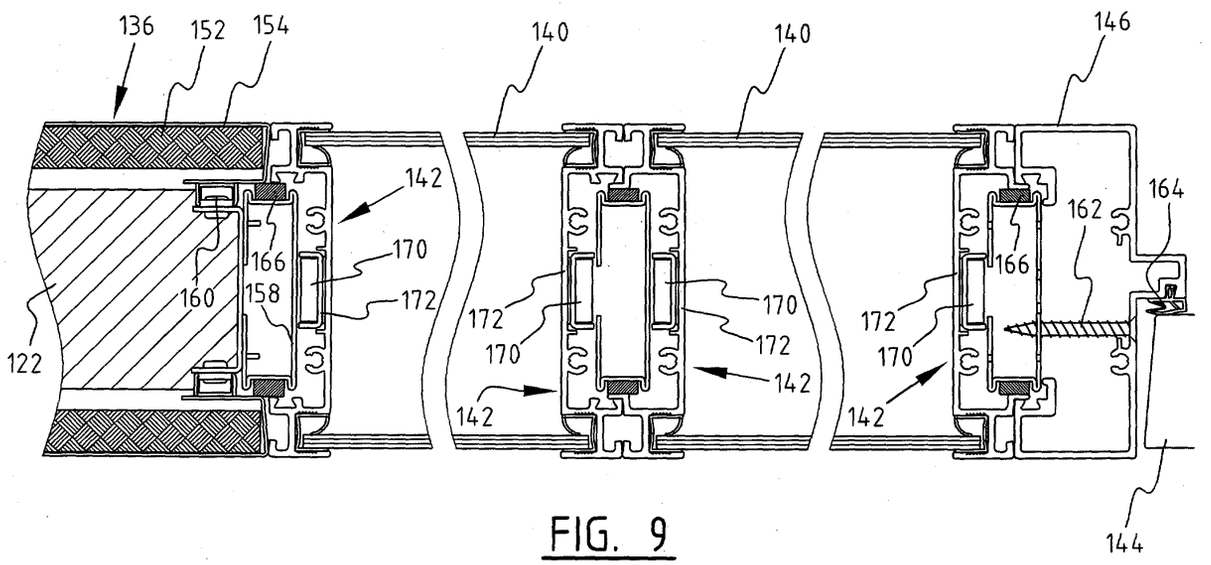

FIG. 9

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Description

[0001] Particularly in office buildings there is a great need at the present time for wall systems (and ceiling systems) which can be rapidly assembled and disassembled. It is already known that such wall systems can be assembled and disassembled particularly rapidly with snap connections. Damage to panels and posts of such a wall system can however easily occur here.

[0002] It has also already been proposed to make use of mutual magnetic fixing of panels and posts. The magnets used can, depending on metal parts on which they are arranged, transmit the magnetic action, whereby magnets strengthen or weaken each other. This can result in undesirable situations, wherein panels are for instance fitted too firmly and/or panels detach too easily.

[0003] The present invention has for its object to improve the above stated systems and, according to a first aspect, provides for this purpose an assembly for constructing a wall and/or ceiling, comprising:

panel parts of non-magnetic or non-magnetizable material provided with permanent magnets; and
post parts of magnetizable material to which the panel parts can be magnetically fixed.

[0004] According to a second aspect, the present invention provides an assembly for erecting a wall, comprising:

panel parts provided with magnetic or magnetizable portions; and
post parts to which the panel parts can be magnetically fixed on either side, wherein the magnetic field for the panel on the one side is separated as well as possible from the magnetic field for the panel on the opposite, other side.

[0005] The present invention avoids as far as possible that the permanent magnets influence each other.

[0006] In a preferred embodiment, the posts can comprise first and second upright parts which are mutually separated by means of acoustic, absorbing and/or fire-resistant material, whereby a magnetic influencing between panels on both sides is avoided, while the spaces on either side of the wall can also be readily used as office environment.

[0007] The upright parts are preferably provided with a protrusion for the magnetic or magnetizable means for correct positioning of the magnets on the one hand and the profile parts and upright parts on the other.

[0008] When the wall panels are positioned adjacently of each other, it is important that seams in the arranged wall are (almost) invisible. For this purpose the assembly according to the present invention is preferably provided with one or more positioning elements which can be fastened to the post parts.

[0009] The assembly according to the present invention is preferably further provided with aluminium profile parts to which transparent panels are fixed and to which permanent magnets or components of magnetic material can be fixed so as to attach such a profile part to for instance a door frame.

[0010] A door frame part preferably also forms part of the present invention, which door frame can likewise be mounted releasably via magnetic force.

[0011] Glass posts, angle posts and door posts can also be attached magnetically to the post parts in order to arrange glass panels or other (non-)transparent panels, to arrange a corner in the wall or arrange a door therein.

[0012] According to a third aspect, the present invention provides a wall comprising panel parts and post parts which are attached magnetically to each other by permanent magnets provided with holders, wherein mutual influencing of the magnets is prevented; profile parts arranged on the post parts by permanent magnets provided with holders, wherein at least one transparent panel part is arranged in the profile parts; and door frame parts arranged on the profile parts and/or on the post parts, wherein a door is arranged hingedly on the frame parts.

[0013] According to a final aspect, the invention provides a method for arranging a wall, making use of an assembly as described above.

[0014] Further advantages, features and details of the present invention will be elucidated on the basis of the following description of a preferred embodiment thereof, with reference to the annexed drawings, in which:

Figure 1 shows a schematic view in perspective of a first preferred embodiment of an assembly according to the present invention;
Figures 2A and 2B show respectively an exploded view and a cross-sectional view of a further part of an embodiment of the assembly according to the present invention;
Figures 3A and 3B show respectively an exploded view in perspective and a cross-sectional view of further components of the system according to the present invention;
Figure 4 shows a cross-sectional view of a detail of the preferred embodiment of an assembly according to the present invention;
Figure 5 shows a top view of a detail of a second preferred embodiment of an assembly according to the present invention;
Figure 6 is a top view of a third preferred embodiment of an assembly of posts and wall panels;
Figure 7 is a perspective view of an assembly according to the present invention;
Figure 8 is a top view of an assembly according to the present invention in a fourth preferred embodiment;
Figure 9 is a top view of an assembly according to the present invention in a fifth preferred embodi-

ment;

Figure 10 is a perspective view of an assembly according to the present invention;

Figure 11 shows a detail of the assembly of figure 10;

Figure 12 shows a detail of the assembly of figure 10;

Figure 13 is a top view of a detail of figure 10;

Figure 14 is a top view of a detail of figure 10;

Figure 15 shows a magnet holder in a preferred embodiment;

Figure 16 is a top view of the magnet holder of figure 15; and

Figure 17 is a top view of a magnet holder in a second preferred embodiment.

[0015] An assembly 10 according to the present invention comprises a number of posts 11 and wall panels 12, 13, 14, 15 etc., four of which are shown in figure 1. Panels 12-15 are provided close to edges thereof with recesses 16, 17 in which magnets 18 and 19 respectively are placed, for instance in a holder 20 so as to direct the magnetic field.

[0016] A preferred embodiment of a post 11 comprises two profile parts 21, 22 of U-shaped cross-section in magnetizable material, the edges of which are preferably bent and fixed, for instance glued, to a core of pressed rockwool. In the shown preferred embodiment the profiles are provided with schematically designated slots 24 into which protruding parts 26, 27 can be fixed so as to arrange the panels 12-15 thereagainst.

[0017] As can be seen in figure 1, the panels are positioned against protruding parts 26, 27. The projecting front side of the panels then create a (practically) invisible seam between the panels.

[0018] Since profiles 21, 22 are of magnetizable material, in particular steel, the panels can easily arranged and held thereagainst by means of the permanent magnets. Since profile parts 21 and 22 are not magnetically coupled, the panels 13, 14 on one side and 12, 15 on the other are not subjected to any magnetic influence from each other. As the magnets are arranged in panels 12-15 which are for instance of wood or the like, undesirable influencing of the magnetic fields via the panel parts does not occur.

[0019] The assembly according to the present invention can be further provided with profile parts of aluminium 31, 32 (figures 2A, 2B) which are provided with profile parts 33, 34 behind which plate parts 35 of magnetizable material can be clamped and/or a permanent magnet 36 provided with two clamping arms 37, 38 respectively. As shown particularly well in figure 2B, the complementary profile parts 31, 32 can thus be attached to each other via magnet 36, wherein modifications to the profile parts, which are provided with receiving grooves 38, 39, 40, 41 respectively for receiving glass panels, can be avoided as far as possible.

[0020] In similar manner a profile 32 of extruded aluminium can be fixed to a frame profile 33, for instance for a door, wherein the steel element 35 is held fast by a magnet 44 arranged in profile pieces 45, 46 respectively on profile 43.

[0021] Post 47 (fig. 4) is provided with four protrusions 48-51 on the metal profiles 52, 53, which protrusions 48-51 are obtained by folding a metal plate. The core 54 of the post is preferably of rockwool, but may also be manufactured from glass wool, wood, flax, pressed glass and the like so as to obtain a fire-resistant wall and to limit noise nuisance between the spaces on either side of the wall as far as possible.

[0022] Using the magnets 18, 19 arranged on either side in wall panels 14, 15, the wall panels are arranged on the metal parts of post 47 without the magnets influencing each other via the panel or the profiles. An aluminium profile 31 is further fixed thereto using magnet 55. Magnet 55 is held (partly) in place by protrusions 48-51 of steel plate folded in two. Glass panels 56 are fixed in aluminium profile 31. Panels 56 can however also be of perspex, or of opaque material such as plasterboard, (veneered) MDF and the like.

[0023] In a manner not shown a so-called angle profile can likewise be fixed to post 47 in similar manner, whereby at the position of the angle profile the wall makes a bend of 15°, 30° or 45° (or 105°, 120° or 135°).

[0024] Figure 5 shows how a door frame is arranged on the end of a wall. As in figure 4, the wall comprises post parts 61, 62 between which an insulating material, such as for instance rockwool, is arranged. Post parts 61, 62 are formed from metal plates, for instance of iron, wherein protrusions 63, 64 and 65, 66 are created by bending. Wall panels 14, 15 are arranged on post parts 61, 62 by means of magnetic attraction of the magnets 18, 19 arranged, for instance by means of glueing, in recesses 16, 17 in wall panels 14, 15. The outer ends of wall panels 14, 15 roughly coincide with the outer ends of profile parts 61, 62. Door frame 43 is arranged against post parts 61, 62 by magnetic attraction of the magnet 44 (see fig. 3A). Magnet 44 is arranged clampingly in door frame 43 by means of a rotating movement. The side walls of door frame 43 roughly coincide with the surface of wall panels 14, 15 so that a continuous wall is obtained. Protrusions 65, 66 fit into door frame 43 for fixation thereof in the desired position as shown in fig. 5.

[0025] In a practical embodiment the door frame 43 is about 40 mm deep and has a width corresponding to the wall thickness.

[0026] Further preferred embodiments are described on the basis of figures 6-17. Particularly the differences from the above described embodiments will be elucidated.

[0027] Assembly 100 (fig. 6) comprises wall parts 102 and post 104. The post is constructed from a core 106 having on either side two magnetizable post parts 108, 110 which are arranged against the core with mutual spacing. The post parts comprise bent plates with bent

edges 112 with which the post parts are clamped round the core. Wall parts 102 comprise boards 114 of a suitable material such as chipboard or plaster, wherein a fixing edge 116 is arranged on the edges. Boards 114 and fixing edges 116 are covered with a relatively thin covering layer 118 of for instance metal or cardboard. On the edges of the wall panels the covering layer comprises folded-over edges 120 which, arranged against each other, provide a neat finish. An insulating layer 122 can further be arranged between the wall panels for insulation of heat or sound.

[0028] The assembly 130 as described above can be arranged between a floor 132 and a ceiling 134 of a building, for instance an office, school etc. (fig.7). A wall constructed from assembly 130 comprises wall panels 136 arranged magnetically against posts 138. The wall panels connect on either side to glass panels 140 which are arranged in glass posts 142 as described with reference to figures 2 and 3, and to doors 144 arranged in frames 146 as described with reference to figures 3A and 5.

[0029] Figure 8 shows detail VIII of figure 7, wherein wall panels 150 are constructed from plate material 152 covered with a relatively thin magnetizable layer 154 which is folded over at the edges of the plate material with folded edges 156. The folded edges are magnetically coupled to magnets 160 arranged on post parts 158. The post parts comprise bent plate metal against which metal holders 162 are arranged with screws 162. The holders consist of bent metal which encloses the magnets on three sides and is open on one side. The holder is found to direct the magnetic field and to prevent the magnetic fields of two magnets arranged on two opposite sides of a post from influencing each other. The magnets with holders are shown in detail in figure 11. Further modifications relate to frame 146 which is fastened to a post with a screw 162 and comprises rubber edge 164 against which the door 144 rests in the closed position. Rubber pieces 166 are arranged against post parts 158 to prevent vibrations.

[0030] Figure 9 shows detail IX of figure 7, wherein the transition from wall panels 136 to glass panels 140 to door 144 is shown. Arranged in each case at the transitions are post parts 158 of folded metal plate which is open on one side to prevent magnetic conduction. Glass posts 142 are arranged against post parts 158 by magnetic attraction of magnets 170 in metal holders 172. Door frame 146 is again arranged on post part 158 by screw 162.

[0031] Figure 10 shows an embodiment wherein wall panels 180 are arranged horizontally and wall panels 182 vertically between a floor 184 and a ceiling 186.

[0032] Wall panels 180 comprise covering layers 190 with folded edges 192 against which the metal holders 162 of magnets 160 are arranged with screws or rivets 194 (fig. 11).

[0033] The folded edges 192 of the wall panels have a progression with recesses 198 at corners 196 such that the folded edges fit into each other to prevent overlapping (fig. 12).

[0034] A simple embodiment comprises posts with C-shaped cores 200 of bent metal against which U-shaped parts 202, 204 are arranged on either side. Magnets 160 in holders 162 are arranged on both sides of U-shaped parts 202, 204 (fig. 13). Wall panels 136 are further embodied as described with reference to fig. 8.

[0035] For the horizontally arranged wall panels 180 it is useful to use a wider post 206 (fig. 14) having a width roughly the same as the length of magnets 160. Post 206 can be embodied in simple manner as a metal plate folded into a C-shape open on one side.

[0036] Metal holders for the magnets can be embodied in different ways. Fixing differs depending on the structure of the wall panel used. It has already been stated above that the magnet holders can be arranged against the wall panels by screwing or glueing. This is particularly favourable in the case of wall panels of chipboard. In wall panels comprising plasterboard it is more favourable to staple the magnet holders against the wall panel. In the case of wall panels comprising plaster boards reinforced with glass fibre and a cardboard covering layer, it is more favourable to provide the magnet holders 210 with protrusions 212 and to press these in the wall panel. The protrusions can be cut or pressed out of holder 210, wherein recesses 214 are created (fig. 15). Favourable patterns for protrusions 212 are shown in figures 16 and 17.

[0037] The present invention is not limited to the above described preferred embodiments thereof. The rights sought are defined by the following claims, within the scope of which many modifications can be envisaged.

Claims

1. Assembly for constructing a wall and/or a ceiling, comprising:
   - panel parts of non-magnetic or non-magnetizable material provided with permanent magnets; and
   - post parts of magnetizable material to which the panel parts can be magnetically fixed.

2. Assembly for erecting a wall, comprising:
   - panel parts provided with magnetic or magnetizable portions; and
   - post parts to which the panel parts can be magnetically fixed on either side, wherein the magnetic field for the panel on the one side is separated as well as possible from the magnetic field for the panel on the opposite, other side.

3. Assembly as claimed in claim 2, wherein the panel

parts are provided with permanent magnets.

4. Assembly as claimed in claim 1, 2 or 3, wherein the posts comprise a first metal upright part and a second metal upright part which are mutually separated by means of acoustic, absorbing and/or fire-resistant material, whereby magnetic influencing between magnets arranged opposite each other is prevented.

5. Assembly as claimed in claim 4, wherein the material is rockwool or another material such as wood, pressed glass, glass wool, flax and the like.

6. Assembly as claimed in any of the foregoing claims, which is provided with a first profile part in which can be fixed one or more panels of transparent material such as glass, perspex and the like, or opaque material such as plasterboard, wood and the like, and which is provided with magnetic or magnetizable means for fixing thereof to a post part.

7. Assembly as claimed in any of the foregoing claims, provided with a first door frame part which can be fixed magnetically to a post part.

8. Assembly as claimed in claim 6 or 7, wherein one or more upright parts are provided with a protrusion for positioning the magnetic or magnetizable means relative to the first door frame part.

9. Assembly as claimed in one or more of the foregoing claims, wherein the first profile and/or the door frame part are of extruded aluminium and are provided with fixing protrusions for snap fastening thereto of magnets or elements of magnetizable material.

10. Assembly as claimed in one or more of the claims 1-9, provided with one or more positioning elements for positioning the panels relative to the post parts or for positioning post parts or frame parts relative to each other.

11. Assembly as claimed in any of the foregoing claims, wherein the permanent magnets are provided with holders which enclose the magnets on three sides for the purpose of directing the magnetic field and in order to prevent magnets influencing each other.

12. Assembly as claimed in claim 11, wherein the holders are provided with fixing means for fixing the holders to the panel parts and/or to the post parts, which fixing means comprise screws, rivets or protrusions.

13. Assembly as claimed in any of the foregoing claims, wherein the panel parts are provided with a covering layer which is folded at the edges of the panel parts so as to form a surface of the panel parts.

14. Assembly as claimed in claim 13, wherein at least the folded edges of the covering layer are magnetizable for magnetic fixing of the panel parts to the post parts.

15. Wall erected from an assembly as claimed in any of the claims 1-14, comprising:

- panel parts and post parts which are attached magnetically to each other by permanent magnets provided with holders, wherein mutual influencing of the magnets is prevented;
- profile parts arranged on the post parts by permanent magnets provided with holders, wherein at least one transparent panel part is arranged in the profile parts; and
- door frame parts arranged on the profile parts and/or on the post parts, wherein a door is arranged hingedly on the frame parts.

16. Method for erecting and/or removing a wall, wherein an assembly as claimed in one or more of the foregoing claims is applied.

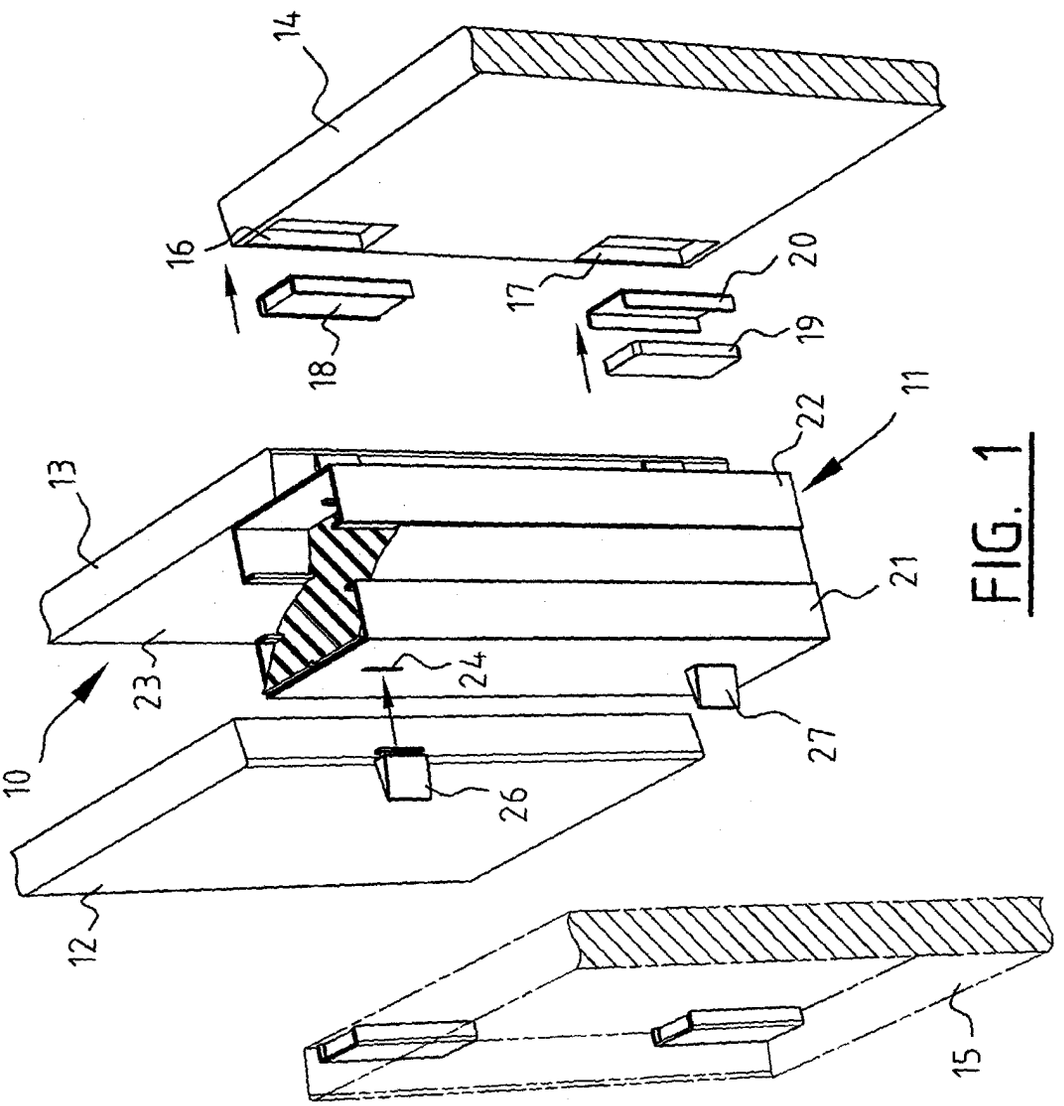


FIG. 1

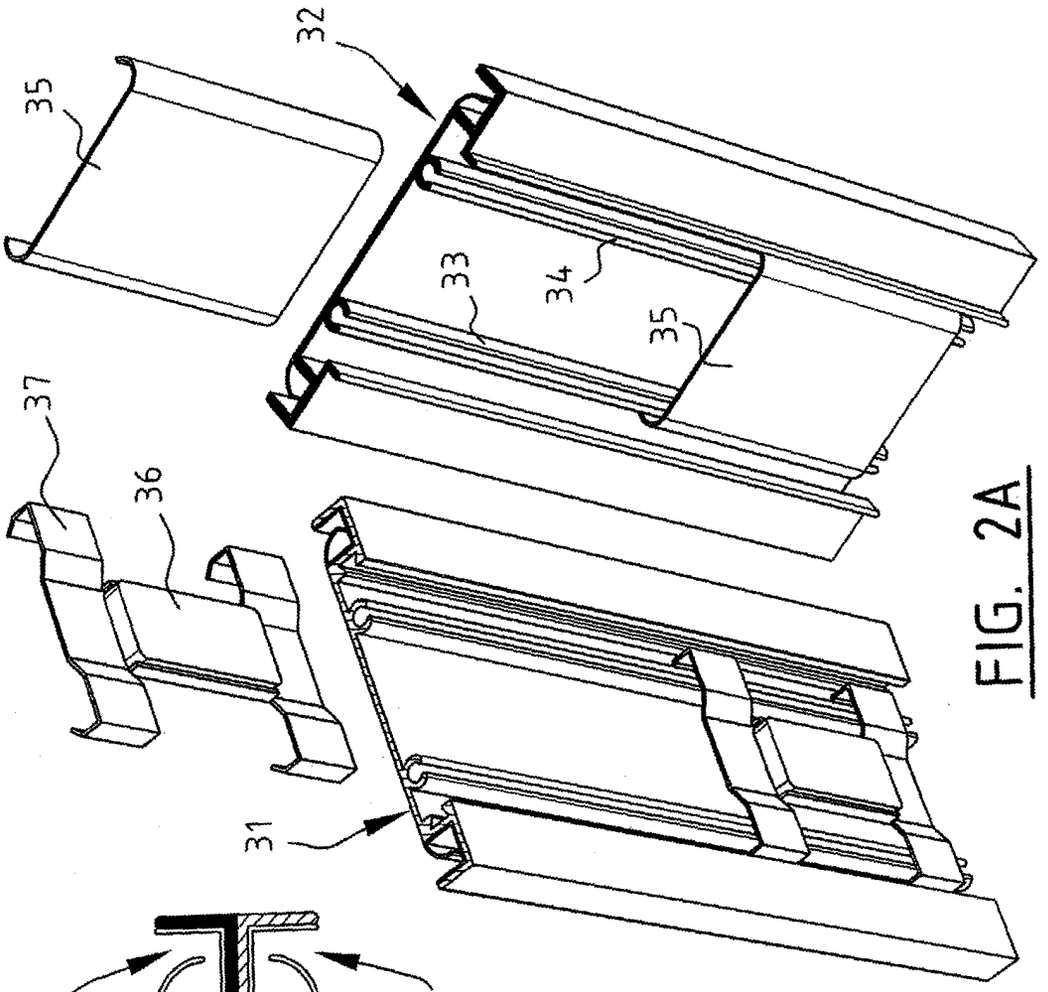


FIG. 2A

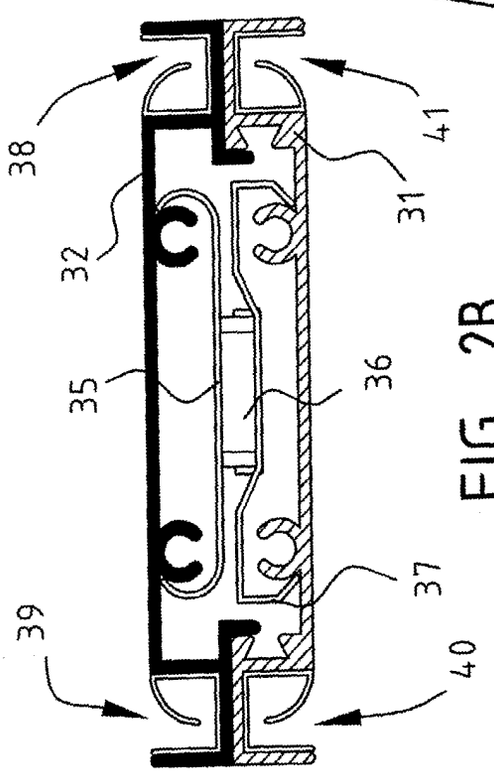


FIG. 2B

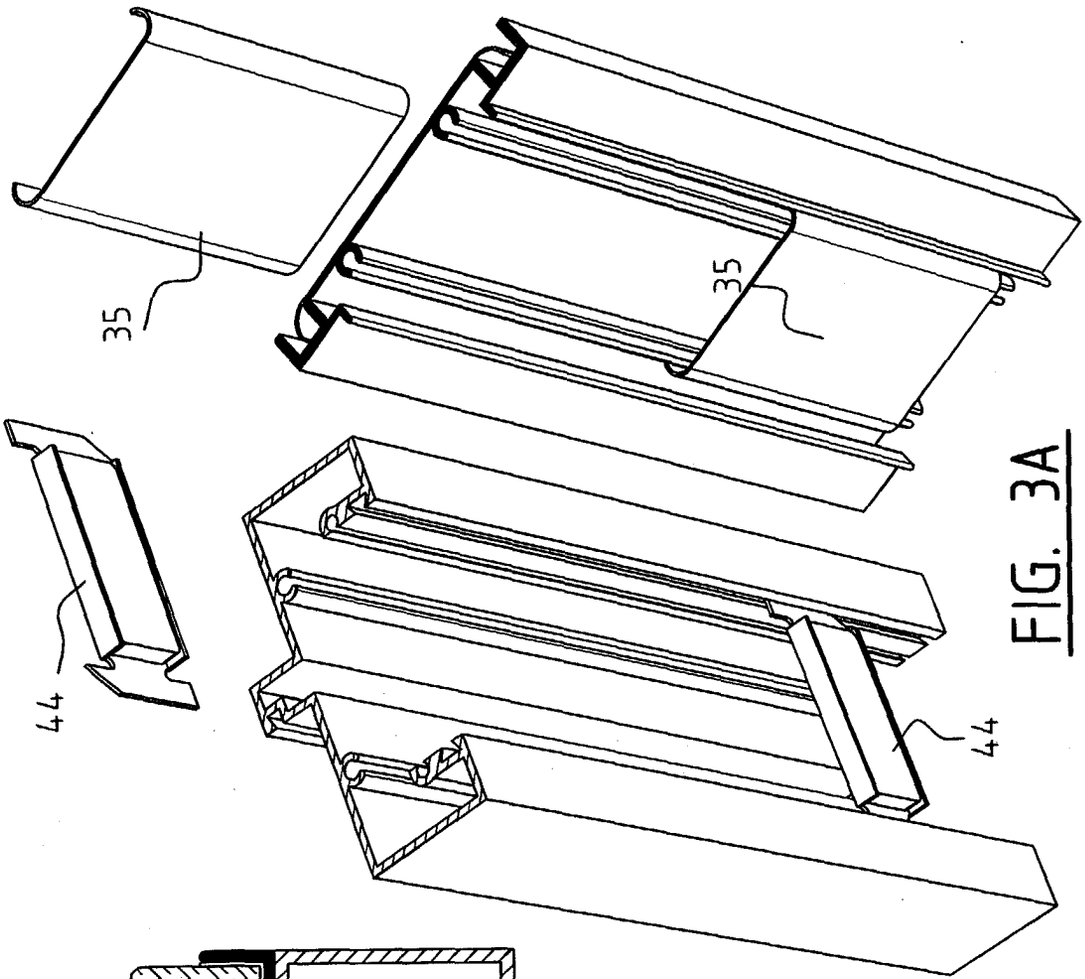


FIG. 3A

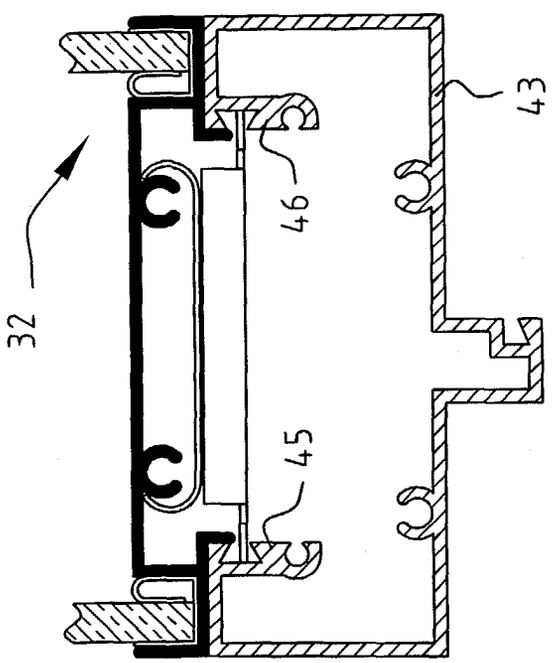


FIG. 3B

FIG. 4

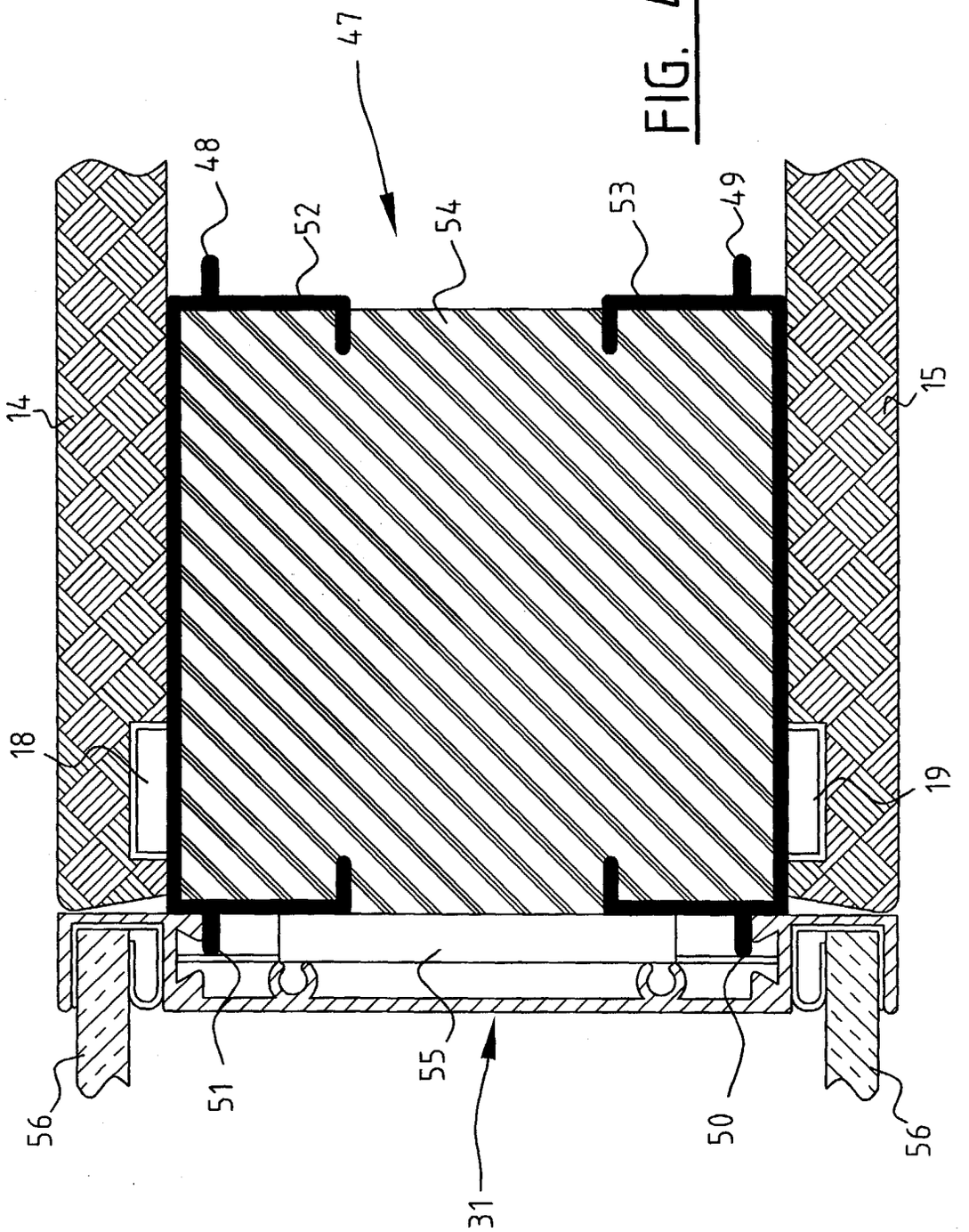
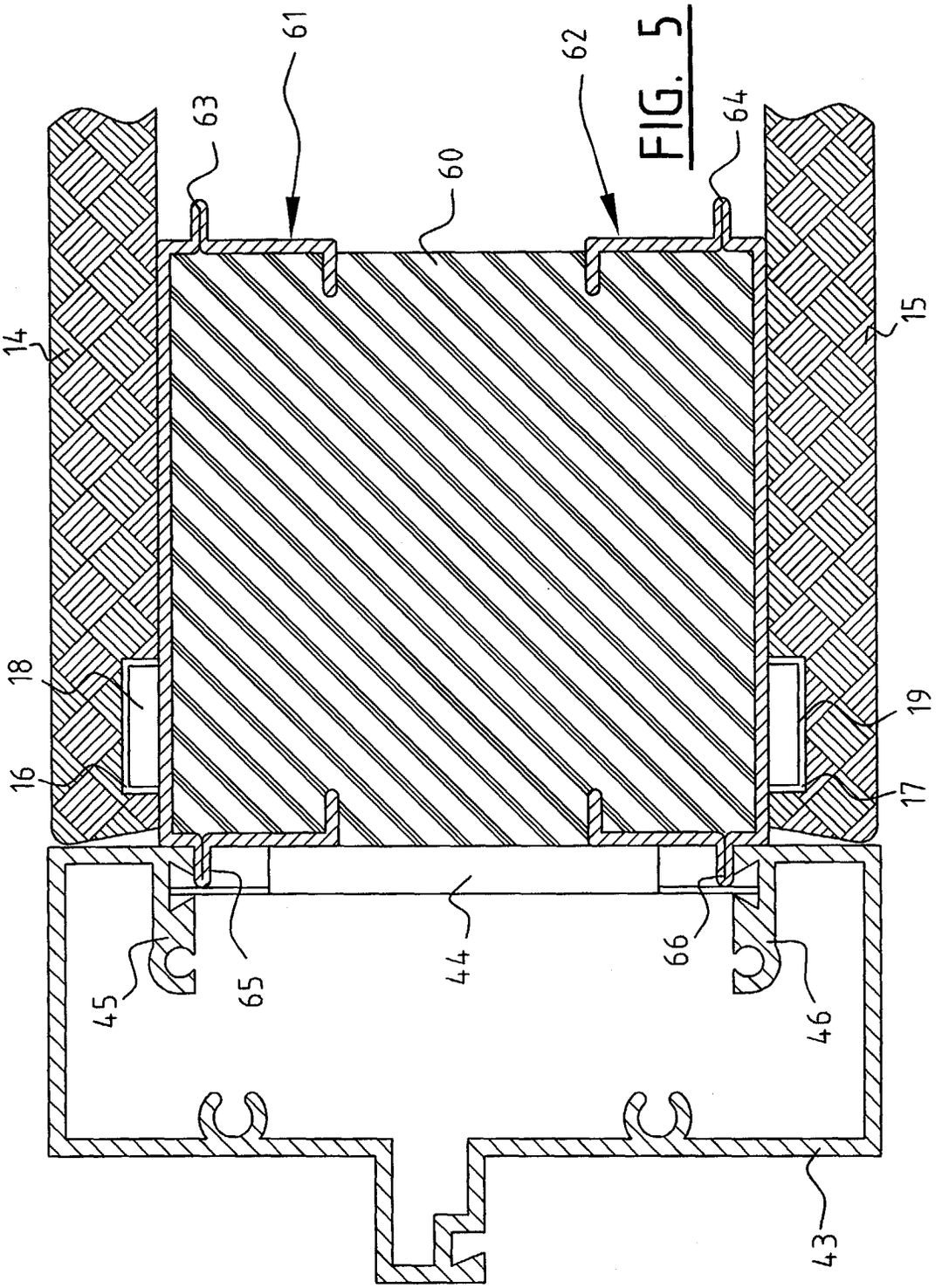


FIG. 5



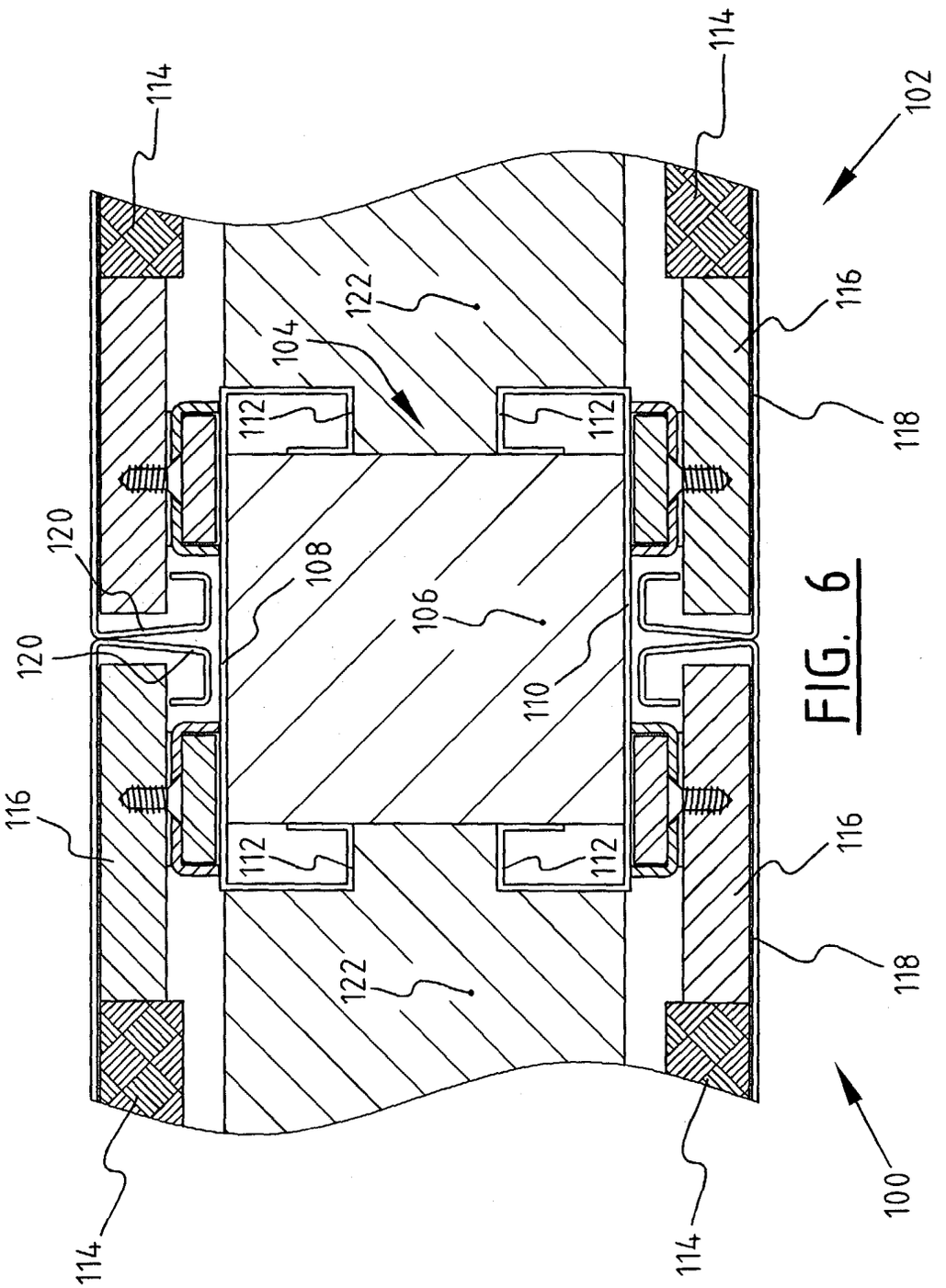

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FIG. 6

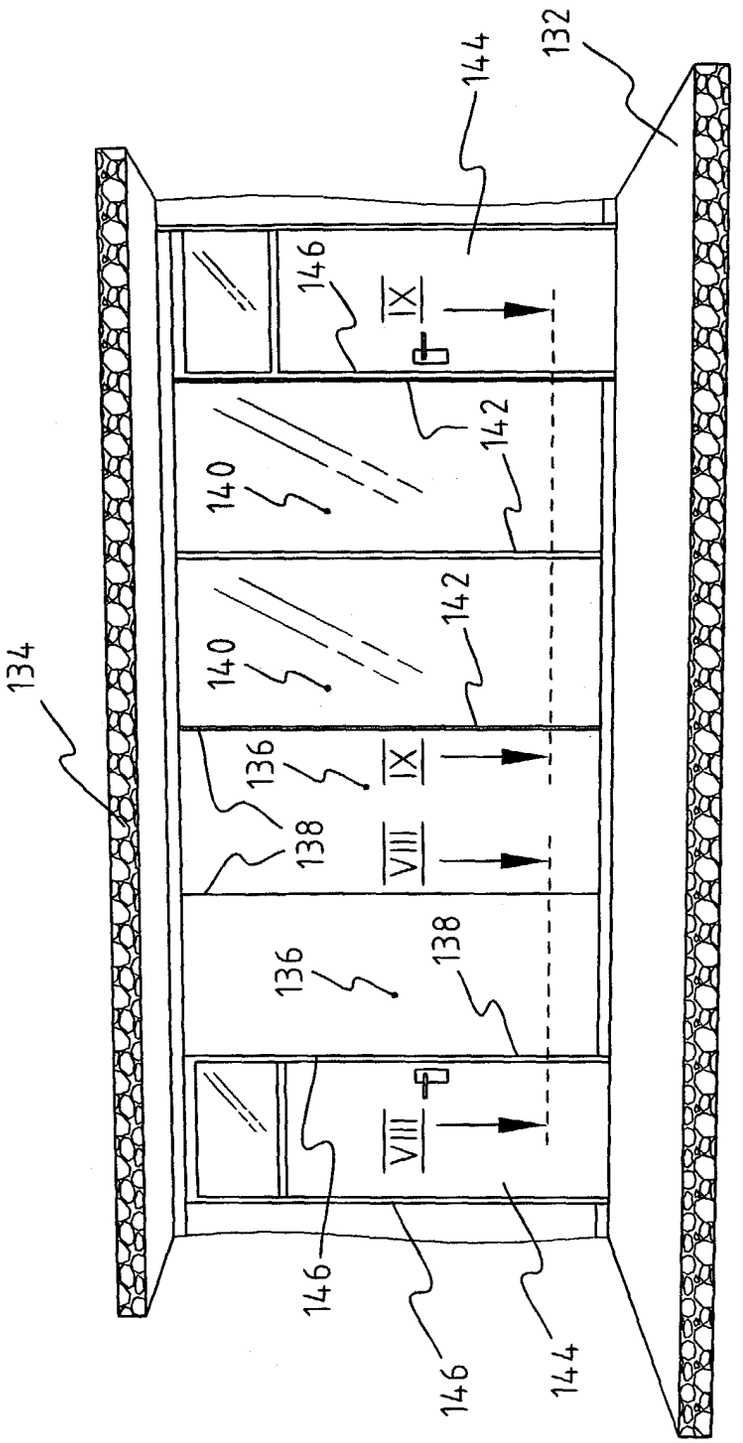
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FIG. 7

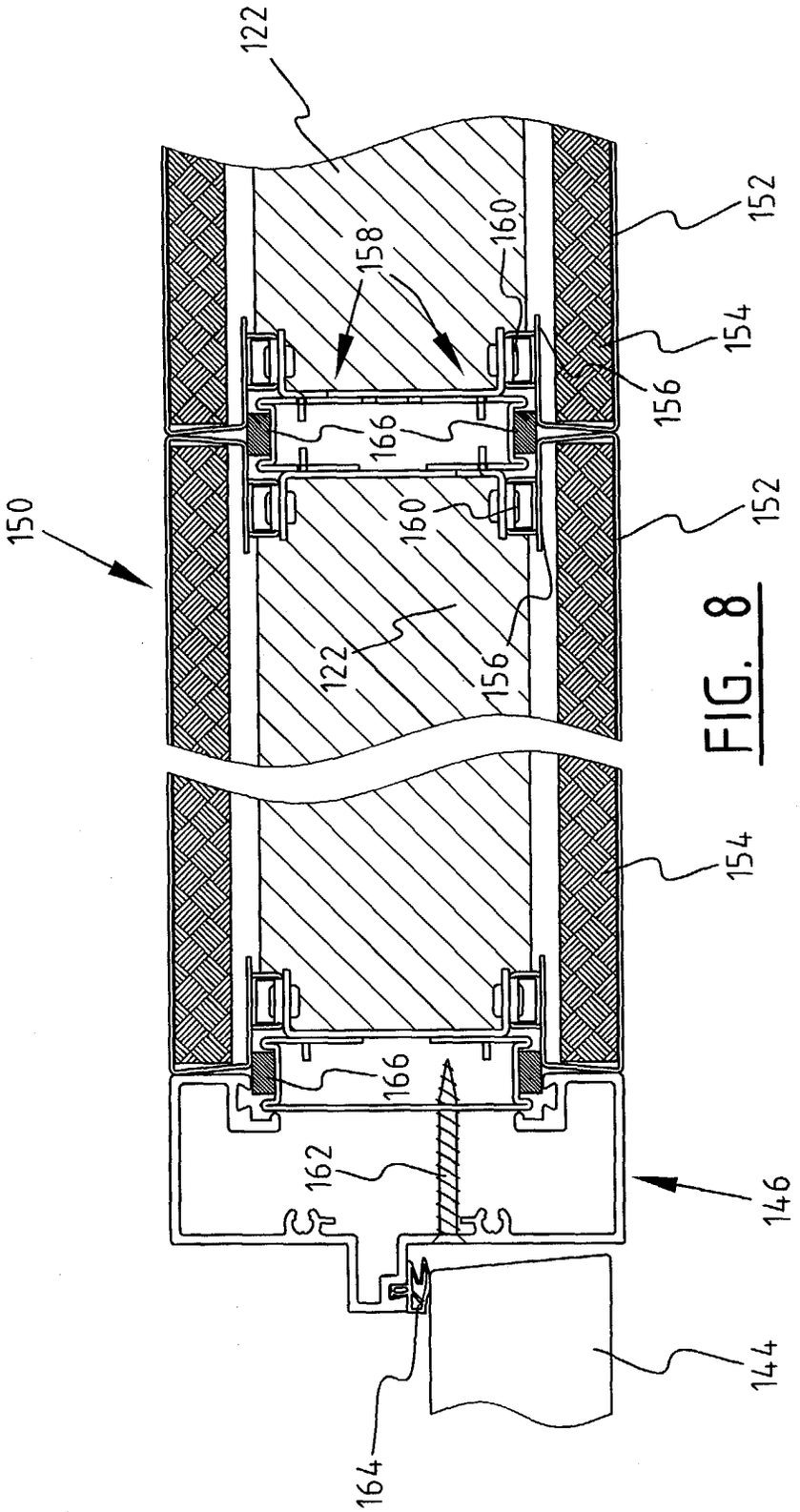
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FIG. 8

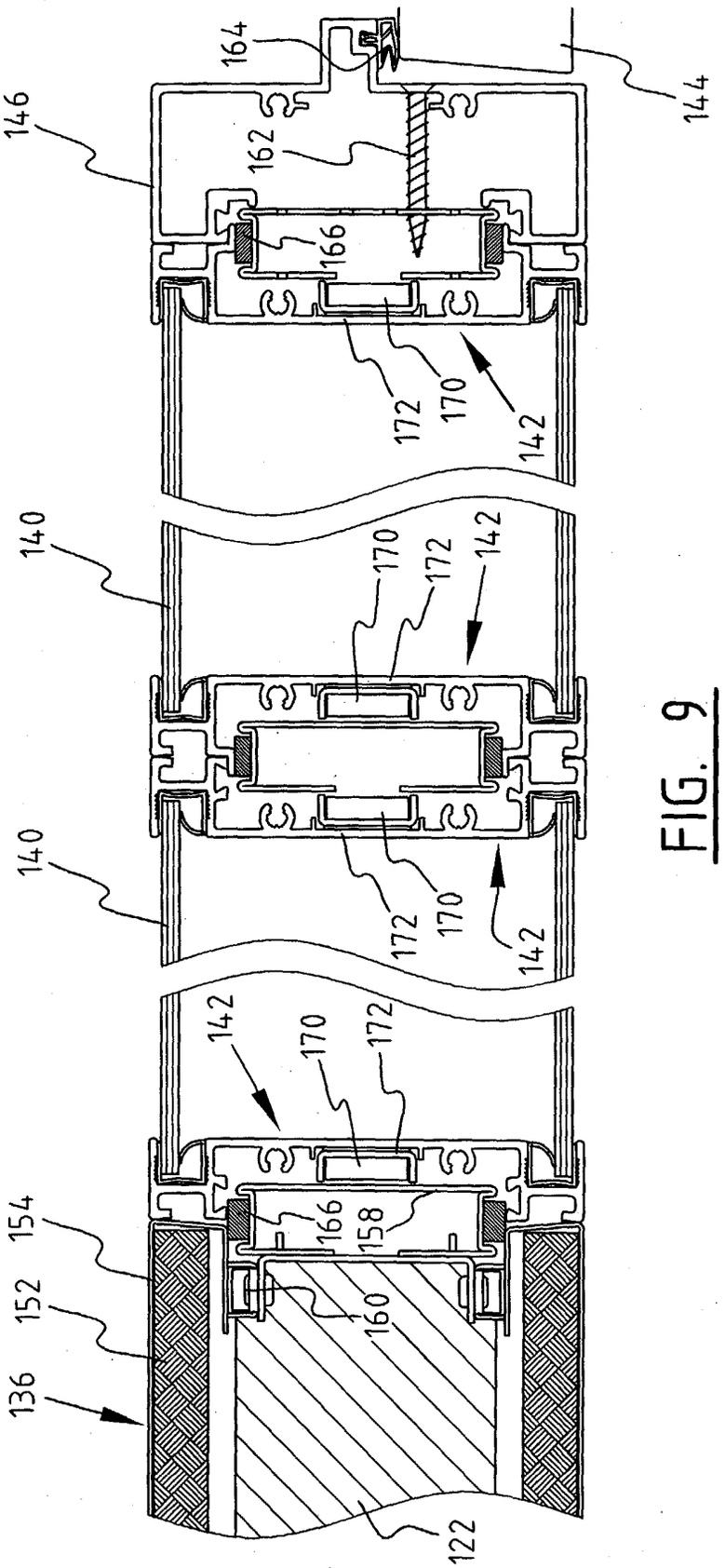
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FIG. 9

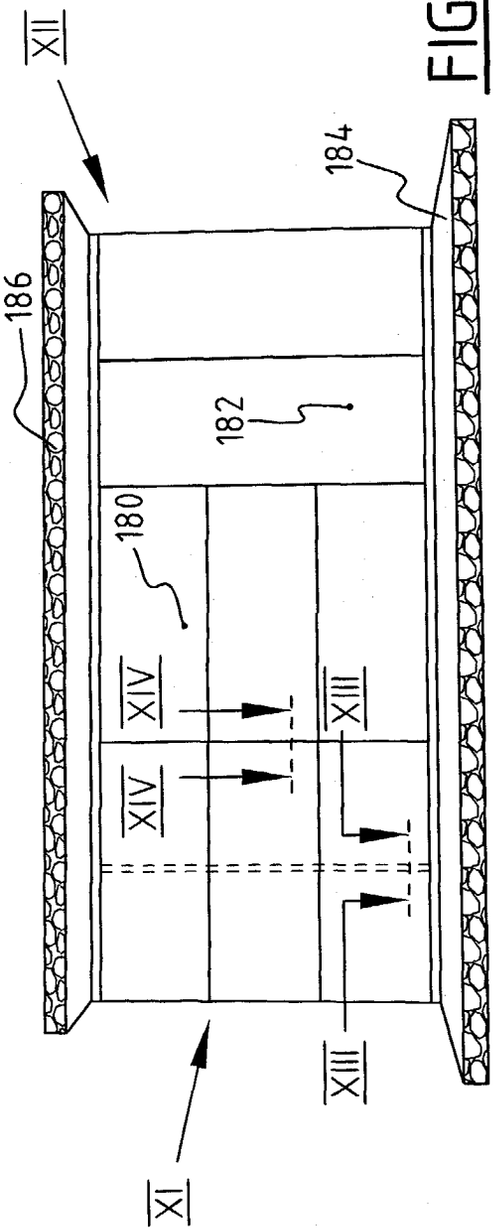

FIG. 10

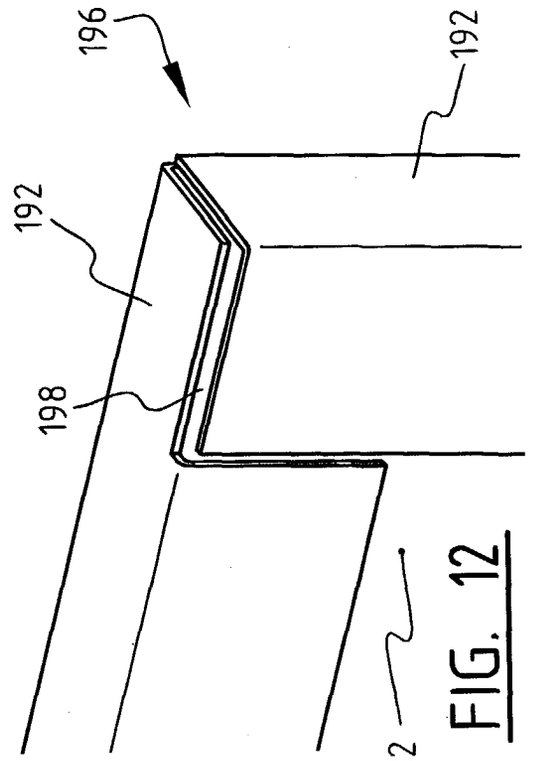

FIG. 12

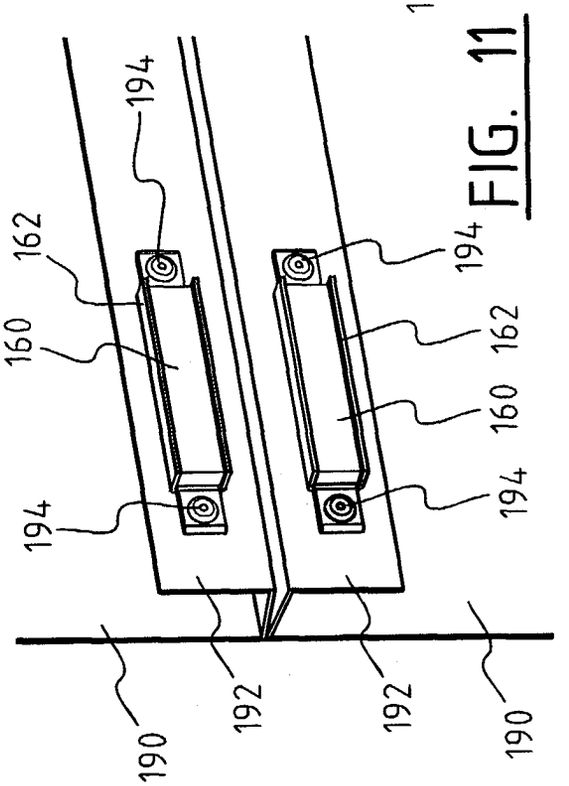

FIG. 11

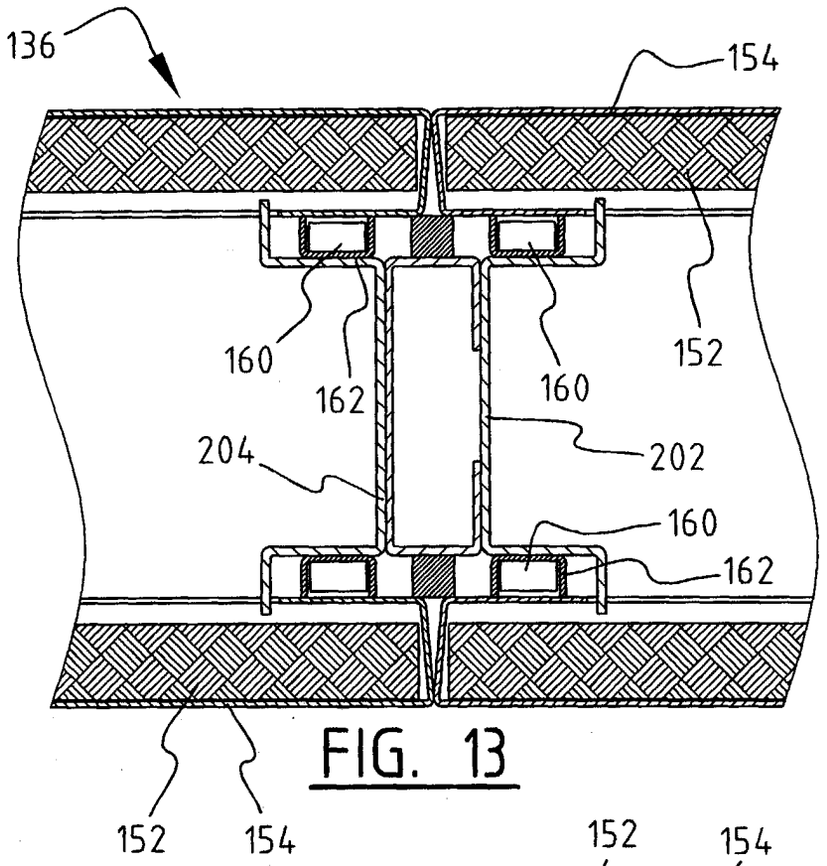
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FIG. 13

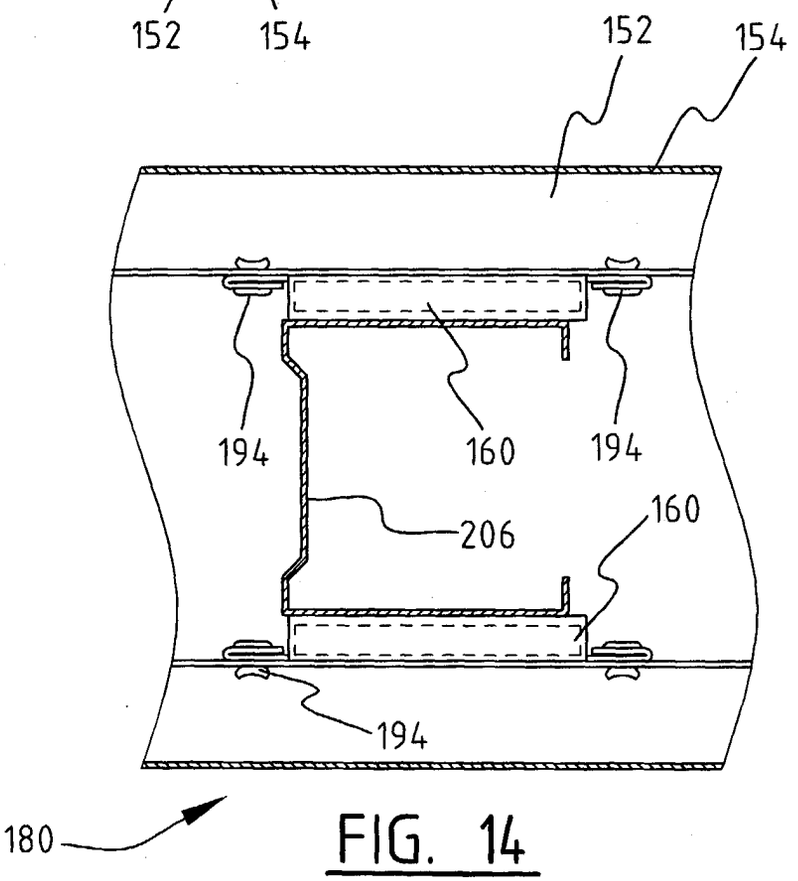
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FIG. 14

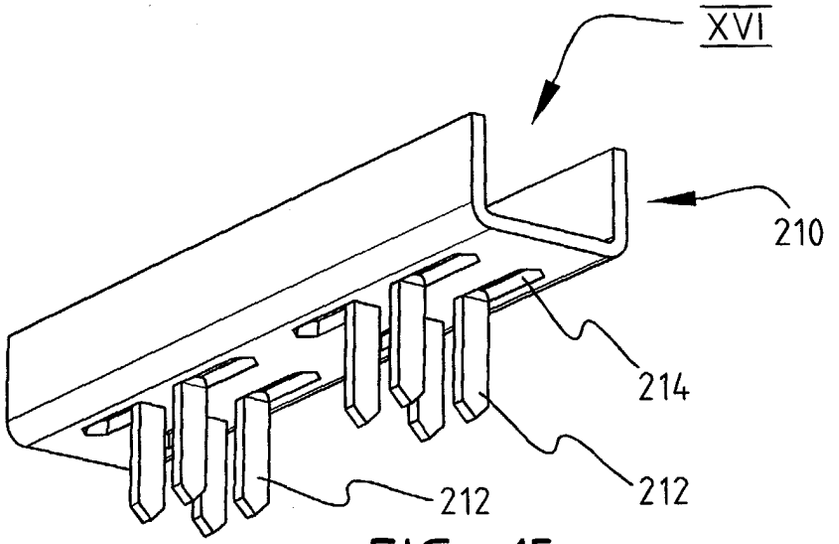

FIG. 15

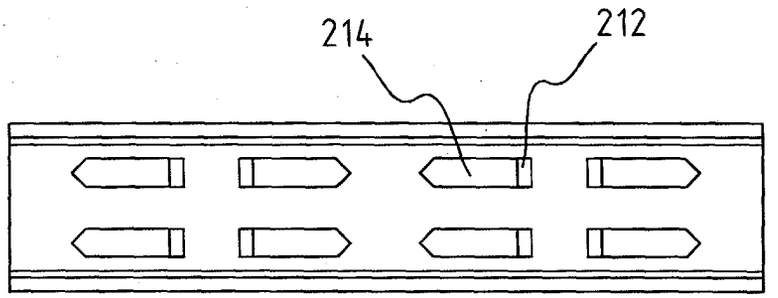

FIG. 16

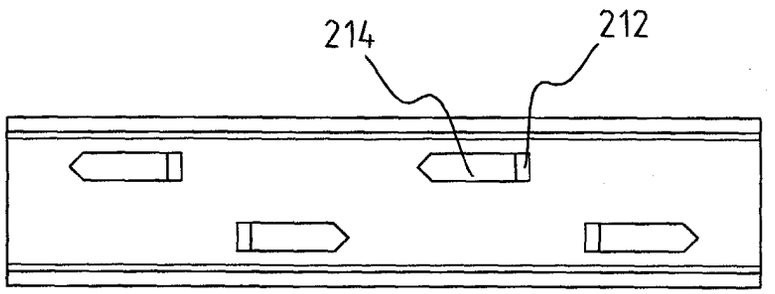

FIG. 17

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 07 6098

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.7)
X	FR 1 314 564 A (ALEXANDRE PIERRE HUBERT) 11 January 1963 (1963-01-11) * page 1, left-hand column, line 1 - line 8 * * page 2, left-hand column, line 9 - right-hand column, line 31 * * page 4, left-hand column, line 4 - line 6; figures 1-4 *	1-7,10, 11	E04B2/74
X A	US 3 837 132 A (WELLER K) 24 September 1974 (1974-09-24) * column 5, line 33 - column 8, line 31; figures 10,11,14,15 *	1,6,10, 11 2,4,5	
X	US 3 982 370 A (BUFFINGTON DONALD R) 28 September 1976 (1976-09-28) * column 2, line 65 - column 3, line 23; figures 1-7 *	1,7-9	
X	DE 16 09 467 A (REHDER GERHARD) 30 July 1970 (1970-07-30) * page 3, line 4 - line 18; figure 1 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	EP 0 931 887 A (VERWOL PROJEKTAFBOUW B V) 28 July 1999 (1999-07-28) * paragraph '0009! - paragraph '0010!; claim 1; figure 1 *	2,4,5	E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 July 2004	Zuurveld, G

CATEGORY OF CITED DOCUMENTS

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Y : particularly relevant if combined with another document of the same category
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P : intermediate document

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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

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 07 6098

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