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(11)

EP 1 245 750 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
02.10.2002 Bulletin 2002/40

(51) Int Cl.7: **E04B 2/74**

(21) Application number: **01500077.1**

(22) Date of filing: **26.03.2001**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

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(54) **Modular wall system with reusable panels**

(57) Modular construction and enclosure erection system with reusable panels, the basic panels of which have a perimetral grooving occupied by a C-section (3) arranged with the opening outwards, and can be lined on one or two faces with a decorative panel (4) which, in turn, can be veneered with ceramic pieces (5) or other materials. The joint is made secure with dihedron clamps (6) and a front section (7) that encloses the set.

The attachment means of the partitions are disks (10) with a central stub (11) which is inserted into the

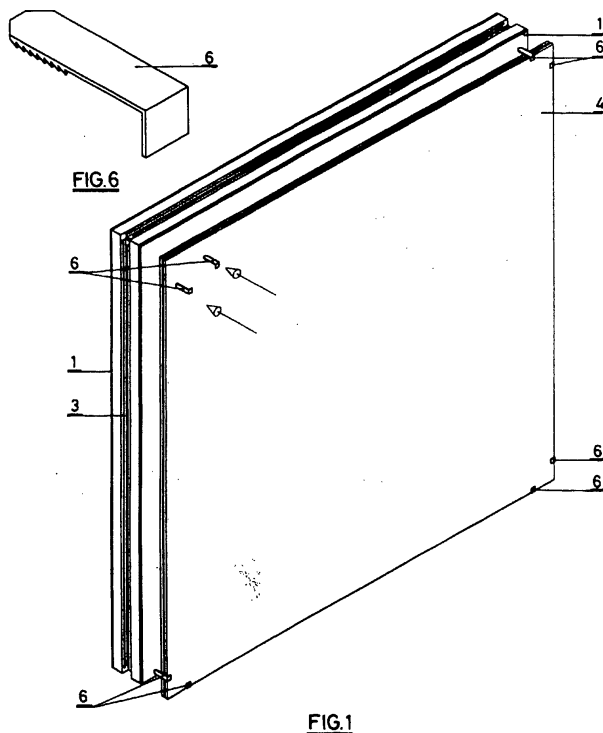
section (3).

If the paving is irregular, the partitions rest on a skirting board (14) with leveling feet (16).

The joints between panels are made with pincers (19) if they are two coplanars; with clamps (21) if they are orthogonal; or with universal joints (27) if they are four coplanars.

The edges of the partitions are lined with ornamental sections (33).

The electrical installation elements are arranged on support boards (37) with a dorsal groove (38).



EP 1 245 750 A1

Description

PURPOSE

[0001] The purpose to which the invention protected in this Patent refers is a "Modular construction and enclosure erection system with reusable panels".

[0002] These panels, which provide the system with great versatility, require that, under erection conditions of the required partitions, the decoration of the panels is not harmed by any mechanization (drills, screws, pins, etc.) so that, in the event the partitions are dismantled, they may be freely reused with no positioning limits thanks to the non-existence of traces of their previous use.

[0003] It is this essential philosophy that has had priority as regards the conception and design of the system constituting the purpose of this Patent.

HISTORY

[0004] The partitioning of diaphanous premises is a requirement for its rational use.

[0005] The immediate and most used solution consists in the construction of masonry partitions planned to cover the actual necessities of the user.

[0006] However, this option, which may be sufficiently useful during a variable period of time depending on the vitality of the user, eventually becomes obsolete and is a hindrance that obstructs and hampers the desired smooth development of the activity carried out on the premises.

[0007] When this situation is reached, the modification of the inside of the premises requires total destruction of the partitioning and its reconstruction according to the desired redistribution, all of which results in a relatively high cost, many inconveniences and transitory paralyzation of the activity during a hardly predictable period.

DESCRIPTION OF THE INVENTION

[0008] The aim of the invention constituting the purpose of this Patent consists in providing a modular system (that is, using panels of standard sizes and characteristics) that facilitate the versatility of its use, permitting easy and rapid variation of the partitioning of the premises without using aggressive tools and with a completely free and optional reuse of the new distribution of the same panels used in the first.

[0009] The partitioning panels are formed by backed rectangular boards, the basic one of which has a perimetral groove, centered on its thickness and occupied by a C-section on the four sides. This C-section has longitudinal grooves in the form of saw teeth arranged on the outside surface of its lateral faces to facilitate its adherence; and longitudinal nerves on the external face of the base arranged with the opening between branches in

the upper position.

[0010] The basic panel can be lined along one face or the two with a decorative panel which, in turn, can be or not veneered with pieces of ceramic or other materials.

[0011] In any case, the union to the basic panel of the backed decorative panels is ensured with a clamp in the form of a straight dihedron that applies its largest plane on the front of the panels, that has transversal grooves in the form of saw teeth along its lower face to prevent sliding, completing the union by means of a section applied under pressure to the set of panels along its free edge, if it has one, and that has internal longitudinal walls arranged orthogonally to the front plane of the section acting as guides and limiting the penetration of said section during its coupling.

[0012] In order to raise the dividing partitions it is necessary to have previously carried out their layout and, according to this, locate the attaching means of the partitions to the support drawing. This may be a platform (as is normally the case of fair stands, exhibitions, etc.) or else a flooring.

[0013] In the first case (platform), the attaching means are formed by disks with a central stub that is inserted into the grooving of the perimetral C-section of the basic panel and two symmetrical punch holes on one same diameter for screwing the attaching screws to the platform; whilst in the second case the disks are thicker to slightly exceed the thickness of the flooring and permit this to be extended underneath the partition.

[0014] The attaching means are aligned and distributed in an orderly manner using a straight template formed by a U-section which is placed with the opening upwards on the designed alignment and which has equidistant orifices of a suitable diameter on its transversal section to insert the attaching disks and facilitate its union screwed to the platform or the roof with due alignment and equidistance.

[0015] In the case of resting on a flooring that has level irregularities, the lineal support base of the partition is a parallelepiped skirting board on the upper face of which there is a groove with an embedded section, identical to the perimetral grooves of the basic panel, whilst its lower face receives level feet in equal and equidistant housings to maintain the verticality of the partitions, compensating the irregularities of the paving.

[0016] The orthogonal joints between every two consecutive skirting boards are made secure with rounded or squared edge plates to complete the miter joint; or else with dihedron clamps such as those of the joint between panels and are screwed if they are fronted between skirting boards.

[0017] The joints between standardized panels to form the partitions must follow the general philosophy of the system so as not to harm the facing of the panels so that these can be reused. In this respect, three types of different joining elements are used according to the shape of the angle between the panels that have to be

joined:

- If two panels have to be aligned in a coplanar way, the joining elements are elastic band pincers folded in two equal halves and inversely symmetric, the free ends of which are firstly joined in a common edge and then opened to form obtuse dihedrons, inserting each branch of the pincer into each of the opposite perimetral C-sections corresponding to the two panels that have to be joined.
- If two panels are on orthogonal planes, the joining elements are elastic band clamps, folded into three branches of different length, the central one of which, of an intermediate length, has a centered orifice and two symmetrical necks next to the joining edge with the longest branch and aligned in parallel to it. The short branch is perpendicular to the central and long ones forming a dihedron of slightly less than 90° with the free ends of both end branches opening in obtuse dihedrons. In its application, the long branch is vertically inserted into the perimetral C-section of the panel in front of the facing of the other panel with the wings of said section passing through the necks of the central branch, whilst the short branch is inserted in the upper and horizontal perimetral C-section of said panel and the attachment is completed by means of a screw passing through the orifice of the central branch where it is screwed on the bottom of the horizontal perimetral section.
- If the four panels have a coplanar arrangement, the joints between the horizontal and vertical-facing perimetral sections are made by universal joints formed by two equal rectangular prismatic parts, with the pointed bases in the form of frustums. The straight section of the prismatic bodies has shape and sizes adjusted to those of the inside section of the perimetral sections which now have to be housed inside
- them, joining both parts by means of a hollow stud with an interior hexagonal section to facilitate its working with an Allen key. This can be screwed into a central orifice or an end that the two parts have in positional correspondence which then actuate, once inserted into the respective perimetral sections of the panels that have to be joined. In this regard, said sections do not reach the corners of the panels and are neared by suitably turning the joining stud.

[0018] When a partition is completed with the panels that form it, the edges occupied by the limits of the composition are apparent. Therefore, in order to improve the aspect of the partition, said edges are lined with decorative sections that finish and frame them. These decorative sections adopt the external shape of a flat frame, with longitudinal reinforcement nerves along its internal face and two longitudinal small partitions that occupy the

central zone of said face, separated at a slightly greater distance than the opening between the wings of the perimetral section, where they are inserted under pressure and embedded thanks to the section of their edges shaped as a harpoon. Two transversal nerves located at a suitable height act as penetration butts.

[0019] The electrical installation laying has been resolved without making grooves on the facing of the panels, according to the system philosophy. In this respect, each element of the installation (electricity, socket base, etc.) is arranged on a support board that has a dorsal groove to facilitate the access of the conductors to the outlet and connection orifice. These support boards are joined to the edge of the panel nearest the position designed for the element of the installation by means of elastic band clamps similar to those of the joint between orthogonal panels, folded into three branches of which the long and short ends are perpendicular to the central one and are extended towards its same face.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] To complete the description of the invention and facilitate the interpretation of its formal, structural and functional characteristics, attached are drawings in which the different schematic aspects of a preferred performance of the "Modular construction and enclosure erection system, with reusable panels" constituting the object of this Patent.

[0021] Said drawings can be grouped as a guide to the homogeneous aspects of the system to which they refer, according to the following classification:

- Structure of the panels

[0022] Figure 1 is a perspective of the composition of a panel formed by the basic and decorative ones on one face; Figure 2 is a perspective of the detail of an angle of a panel formed by the basic, decorative and veneered ones, all on one face; Figure 3 is a transversal section of a panel formed by the basic and decorative ones on one face; Figure 4 is the section formed by the basic, decorative and faced ones, on one face; and Figure 5 is the section formed by the basic, decorative and its lining, on two faces. Figure 6 is a perspective of the joining clamp.

The shape of the perimetral C-section of the basic panel is represented later on in perspective (Figure 12) and in section (Figure 13).

- Assembly of the partitions

[0023] Figure 7 shows the way of using the template to align the attachment means of the partitions; and Figure 8 an enlarged detail of the template application. Figure 9 is a transversal section of the assembly of the partition attachment means on flooring; and Figure 10 on paving.

Figure 11 shows the general assembly of the partitions on their attachment means.

[0024] In the case of assembling partitions on paving with level irregularities, the skirting board shown in Figure 14 is used, with more detail shown in Figure 15.

[0025] Figure 16 shows the housings, on the lower face of the skirting board, of the level feet elements formed by the plate (Figure 17) and the support, with the height regulating screw (Figure 18).

[0026] The orthogonal encounters between skirting boards may be at a 45°-degree angle and are resolved by rounded edge plates as shown in Figure 19, or squared, according to Figure 20; or else they can be fronted, in which case they are secured by means of dihedral clamps, as shown in Figures 21 and 22.

- Joining elements between panels

[0027] Figures 23 and 24 represent in perspective and side elevation views, respectively, the joining pinners between panels aligned in a coplanar way; and Figure 29 shows the application.

Figures 25 and 26 represent in perspective and side elevation views, respectively, the panel joining clamps the meeting of which takes place on orthogonal planes; and Figure 30 shows the application.

Figures 27 and 28 represent in perspective and side elevation views, respectively, the universal joints between four panels with coplanar arrangement; and Figure 31 shows the application in the joint of the horizontal as well as vertical-faced perimetral sections.

- Ornamental sections

[0028] Figure 32 represents in perspective the application of ornamental sections on the apparent edges of the external panels of the partition; and Figure 33 shows in detail the formal and functional characteristics of the ornamental sections in a transversal section of their arrangement when assembled.

- Electrical installation

[0029] Figure 34 represents assembly of an electrical point on its support board; and Figure 35 assembly of said board on a partition panel.

Figure 36 shows the assembly of a support board of a socket base on the partition.

DESCRIPTION OF A PREFERRED PERFORMANCE

[0030] In order to clearly show the nature and scope of the advantageous application of the "Modular construction and enclosure erection system, with reusable panels", constituting the object of the invention, the following is a description of its application and structure, making reference to the drawings which, on representing a preferred performance of the device and its com-

ponents for information purposes, must be considered in the widest sense and not limitative of the application and content of the claimed invention.

[0031] The partitioning panels are formed by backed rectangular boards, the basic one (1) of which has a perimetral groove (2), centered on its thickness and occupied by a C-section (3) on the four sides, which has longitudinal grooves in the form of saw teeth arranged on the outside surface of its lateral faces to facilitate its adherence; and longitudinal nerves on the external face of the base arranged with the opening between branches in the upper position (Figures 12 and 13). The basic panel (1) can be lined along one face or the two with a decorative panel (4) which, in turn, can be or not veneered with pieces of ceramic (5) or other materials.

[0032] Joining of the backed decorative panels (4), or where applicable, the veneered panels (5) to the basic panel (1) is ensured with a clamp (6) in the form of a straight dihedral that applies its largest plane on the front, that has transversal grooves in the form of saw teeth along its lower face to prevent sliding, completing the union by means of a section (7) applied under pressure to the set of panels along its free edge, if it has one, and that has internal longitudinal walls arranged orthogonally to the front plane of the section (7) acting as guides and limiting the penetration of said section during its coupling.

[0033] In order to align the partitions according to the previously performed layout, a straight template (8) is used formed by a U-section which is placed with the opening upwards on the designed alignment and which has equidistant orifices (9) of a suitable diameter on its transversal section to insert the attaching disks (10) with a central stub (11) which is inserted into the grooving of the perimetral section (3) of the basic panel, and two symmetric holes (12) with the same diameter for the screws (13). The thickness of the disks (10) is slightly larger than the paving to permit this to be extended underneath the partition.

[0034] In the event the paving has level irregularities, the lineal support base of the partition is a parallelepiped skirting board (14) on the upper face of which there is a groove with an embedded section, identical to the perimetral grooves (3) of the basic panel (1), whilst its lower face receives level feet (16) in equal and equidistant housings (15) to maintain the verticality of the partitions. The orthogonal joints between every two consecutive skirting boards are made secure with rounded (17) or squared (18) edge plates to complete the miter joint; or else with dihedral clamps (6) such as those of the joint between panels and are screwed if they are fronted between skirting boards.

[0035] The joints between panels to form the partitions are made by three types of different elements, according to the shape of the angle between the panels that have to be joined:

If two panels have to be aligned in a coplanar way

(see Figure 29), the joining elements are elastic band pincers (19) folded in two equal halves and inversely symmetric, the free ends of which are firstly joined in a common edge (20) and then opened to form obtuse dihedrons, inserting each branch of the pincer (19) into each of the opposite perimetral C-sections (3) corresponding to the two panels that have to be joined.

If two panels are on orthogonal planes (see Figure 30), the joining elements are elastic band clamps (21), folded into three branches of different length, the central one (22) of which, of an intermediate length, has a centered orifice (23) and two symmetrical necks (24) next to the joining edge with the longest branch and aligned in parallel to it. The short branch (25) is perpendicular to the central (22) and long (26) ones forming a dihedron of slightly less than 90° with the free ends of both end branches (25-26) opening in obtuse dihedrons. In its application, the long branch (26) is vertically inserted into the perimetral C-section (3) of the panel in front of the facing of the other panel with the wings of said section (3) passing through the necks (24) of the central branch, whilst the short branch (25) is inserted in the upper and horizontal perimetral C-section of said panel and the attachment is completed by means of a screw passing through the orifice (23) of the central branch (22) where it is screwed on the bottom of the horizontal perimetral section.

[0036] If the four panels have a coplanar arrangement (see Figure 31), the joints between the horizontal and vertical-facing perimetral sections are made by universal joints (27) formed by two equal rectangular prismatic parts (28), with the pointed bases in the form of frustums. The straight section of the prismatic bodies has shape and sizes adjusted to those of the inside section of the perimetral sections (3) which now have to be housed inside them, joining both parts by means of a hollow stud (29) with an interior hexagonal section to facilitate its working with an Allen key (30). This can be screwed into a central orifice (32) or an end (32) that the two parts (28) have in positional correspondence which then actuate, once inserted into the respective perimetral sections of the panels that have to be joined. In this regard, said sections do not reach the corners of the panels and are neared by suitably turning the joining stud (29).

[0037] To improve the aspect of the partition, the edges of the panels that occupy the limits of the composition of each partition are lined with decorative sections (33) that finish and frame them. These decorative sections adopt the external shape of a flat frame, with longitudinal reinforcement nerves (34) along its internal face and two longitudinal small partitions (35) that occupy the central zone of said face, separated at a slightly greater distance than the opening between the wings of the perimetral section (3), where they are inserted under pressure

and embedded thanks to the section of their edges shaped as a harpoon. Two transversal nerves (36) located at a suitable height act as penetration butts.

[0038] Each element of the installation is arranged on a support board (37) that has a dorsal groove (38) to facilitate the access of the conductors to the outlet and connection orifice (39) of the boards (37). These support boards are joined to the edge of the panel nearest the position designed for the element of the installation by means of elastic band clamps (40) similar to those (21) of the joint between orthogonal panels, folded into three branches of which the long and short ends are perpendicular to the central one and are extended towards its same face.

Claims

1. Modular construction and enclosure erection system with reusable panels, **characterized by** the fact that the partitioning panels of standard sizes and characteristics are formed by backed rectangular boards, the basic one (1) of which has a perimetral groove (2), centered on its thickness and occupied by a C-section (3) on the four sides, which has longitudinal grooves in the form of saw teeth arranged on the outside surface of its lateral faces to facilitate its adherence; and longitudinal nerves on the external face of the base arranged with the opening between branches in the upper position (Figures 12 and 13). The basic panel (1) can be lined along one face or the two with a decorative panel (4) which, in turn, can be or not veneered with pieces of ceramic (5) or other materials. And because joining of the backed decorative panels (4), or where applicable, the veneered panels (5) to the basic panel (1) is ensured with a clamp (6) in the form of a straight dihedron that applies its largest plane on the front, that has transversal grooves in the form of saw teeth along its lower face to prevent sliding, completing the union by means of a section (7) applied under pressure to the set of panels along its free edge, if it has one, and that has internal longitudinal walls arranged orthogonally to the front plane of the section (7) acting as guides and limiting the penetration of said section during its coupling.
2. Modular construction and enclosure erection system with reusable panels, according to claim 1, **characterized by** the fact that in order to align the partitions according to the previously performed layout, a straight template (8) is used formed by a U-section which is placed with the opening upwards on the designed alignment and which has equidistant orifices (9) of a suitable diameter on its transversal section to insert the attaching disks (10) with a central stub (11) which is inserted into the grooving of the perimetral section (3) of the basic panel,

and two symmetric holes (12) with the same diameter for the screws (13). The thickness of the disks (10) is slightly larger than the paving to permit this to be extended underneath the partition. And because, in the event the paving has level irregularities, the lineal support base of the partition is a parallelepiped skirting board (14) on the upper face of which there is a groove with an embedded section, identical to the perimetral grooves (3) of the basic panel (1), whilst its lower face receives level feet (16) in equal and equidistant housings (15) to maintain the verticality of the partitions. The orthogonal joints between every two consecutive skirting boards are made secure with rounded (17) or squared (18) edge plates to complete the miter joint; or else with dihedron clamps (6) such as those of the joint between panels and are screwed if they are fronted between skirting boards.

3. Modular construction and enclosure erection system with reusable panels, according to the above claims, **characterized by** the fact that the joints between panels to form the partitions are made by three types of different elements, according to the shape of the angle between the panels that have to be joined: If the two panels have to aligned in a coplanar way (see Figure 29), the joining elements are elastic band pincers (19) folded in two equal halves and inversely symmetric, the free ends of which are firstly joined in a common edge (20) and then opened to form obtuse dihedrons, inserting each branch of the pincer (19) into each of the opposite perimetral C-sections (3) corresponding to the two panels that have to be joined. If two panels are on orthogonal planes (see Figure 30), the joining elements are elastic band clamps (21), folded into three branches of different length, the central one (22) of which, of an intermediate length, has a centered orifice (23) and two symmetrical necks (24) next to the joining edge with the longest branch and aligned in parallel to it. The short branch (25) is perpendicular to the central (22) and long (26) ones forming a dihedron of slightly less than 90° with the free ends of both end branches (25-26) opening in obtuse dihedrons. In its application, the long branch (26) is vertically inserted into the perimetral C-section (3) of the panel in front of the facing of the other panel with the wings of said section (3) passing through the necks (24) of the central branch, whilst the short branch (25) is inserted in the upper and horizontal perimetral C-section of said panel and the attachment is completed by means of a screw passing through the orifice (23) of the central branch (22) where it is screwed on the bottom of the horizontal perimetral section. If the four panels have a coplanar arrangement (see Figure 31), the joints between the horizontal and vertical-facing perimetral sections are made by universal joints (27)

formed by two equal rectangular prismatic parts (28), with the pointed bases in the form of frustums. The straight section of the prismatic bodies has shape and sizes adjusted to those of the inside section of the perimetral sections (3) which now have to be housed inside them, joining both parts by means of a hollow stud (29) with an interior hexagonal section to facilitate its working with an Allen key (30). This can be screwed into a central orifice (32) or an end (32) that the two parts (28) have in positional correspondence which then actuate, once inserted into the respective perimetral sections of the panels that have to be joined. In this regard, said sections do not reach the corners of the panels and are neared by suitably turning the joining stud (29).

4. Modular construction and enclosure erection system with reusable panels, according to the above claims, **characterized by** the fact that in order to improve the aspect of the partition, the edges of the panels that occupy the limits of the composition of each partition are lined with decorative sections (33) that finish and frame them. These decorative sections adopt the external shape of a flat frame, with longitudinal reinforcement nerves (34) along its internal face and two longitudinal small partitions (35) that occupy the central zone of said face, separated at a slightly greater distance than the opening between the wings of the perimetral section (3), where they are inserted under pressure and embedded thanks to the section of their edges shaped as a harpoon. Two transversal nerves (36) located at a suitable height act as penetration butts.
5. Modular construction and enclosure erection system with reusable panels, according to the claims, **characterized by** the fact that each element of the installation is arranged on a support board (37) that has a dorsal groove (38) to facilitate the access of the conductors to the outlet and connection orifice (39) of the boards (37). These support boards are joined to the edge of the panel nearest the position designed for the element of the installation by means of elastic band clamps (40) similar to those (21) of the joint between orthogonal panels, folded into three branches of which the long and short ends are perpendicular to the central one and are extended towards its same face.

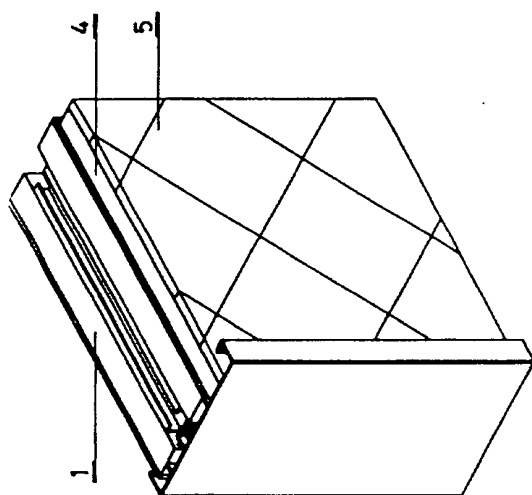


FIG. 2

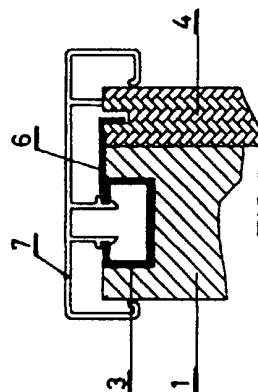


FIG. 3

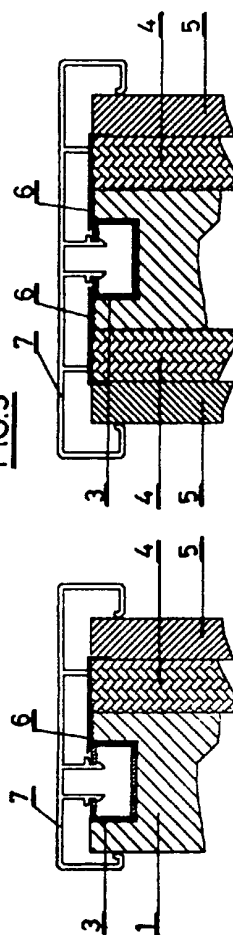


FIG. 5

FIG. 4

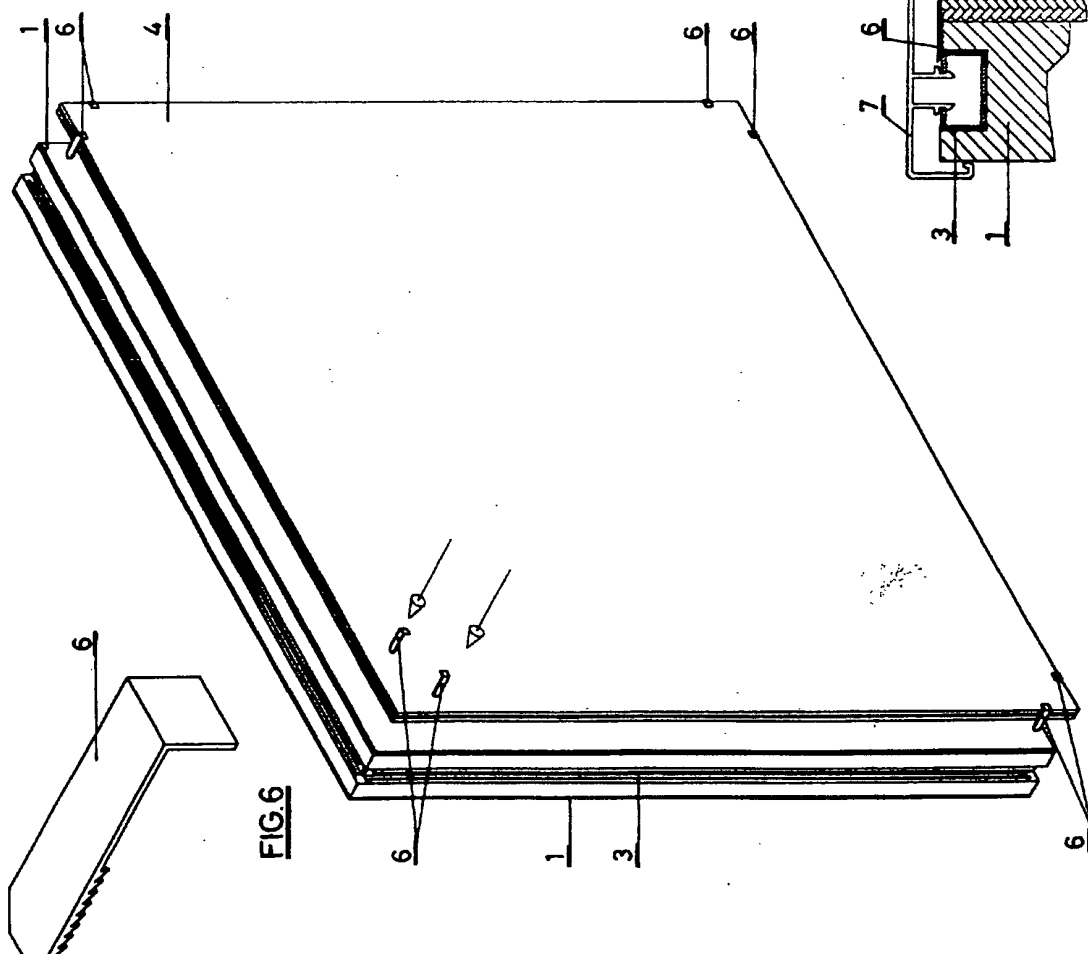
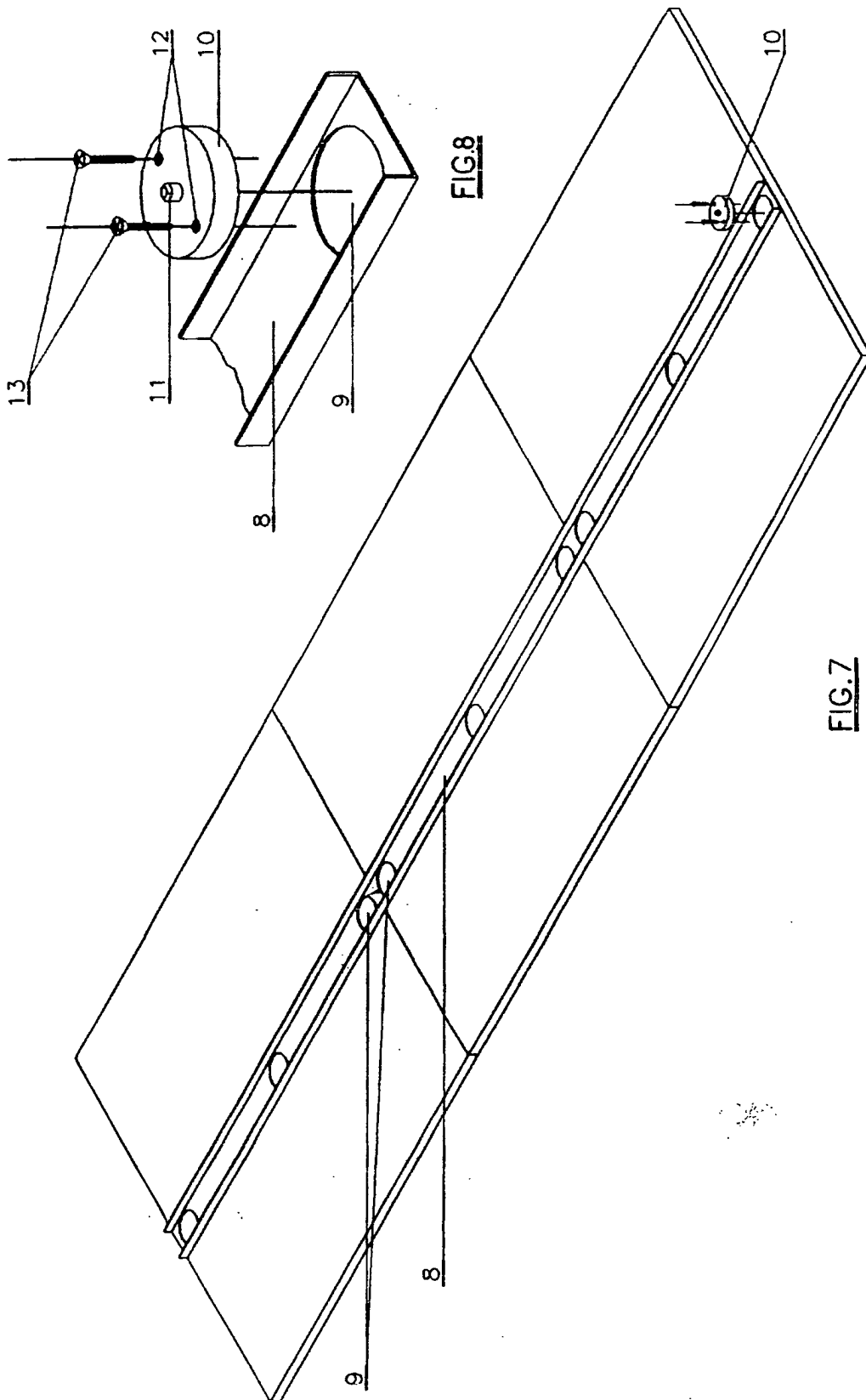


FIG. 1

FIG. 6



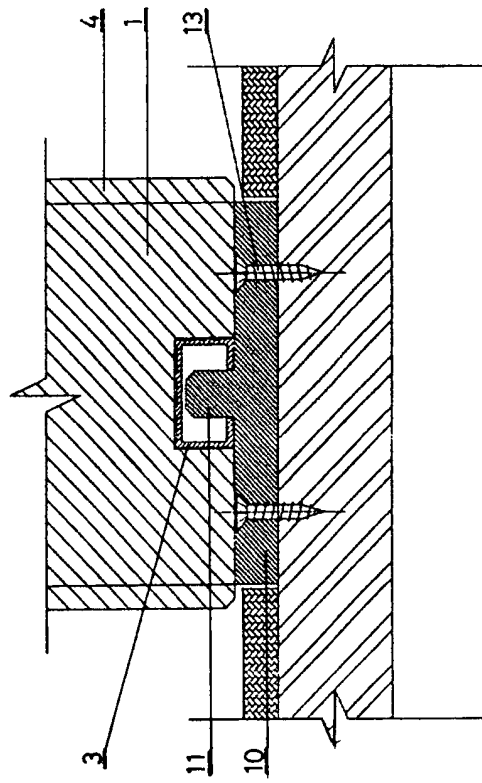


FIG. 10

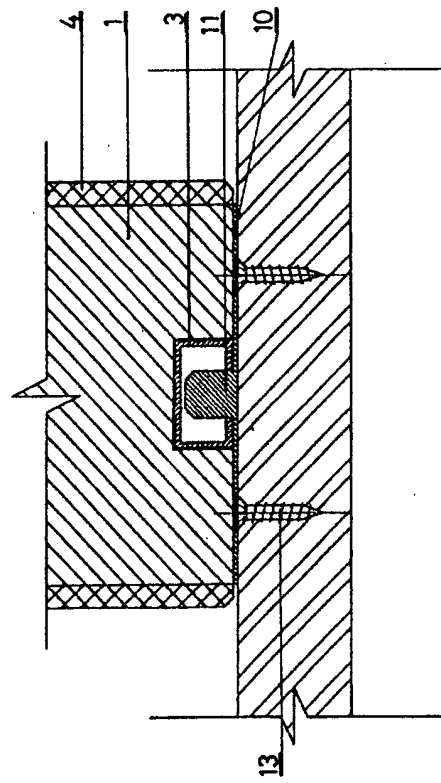
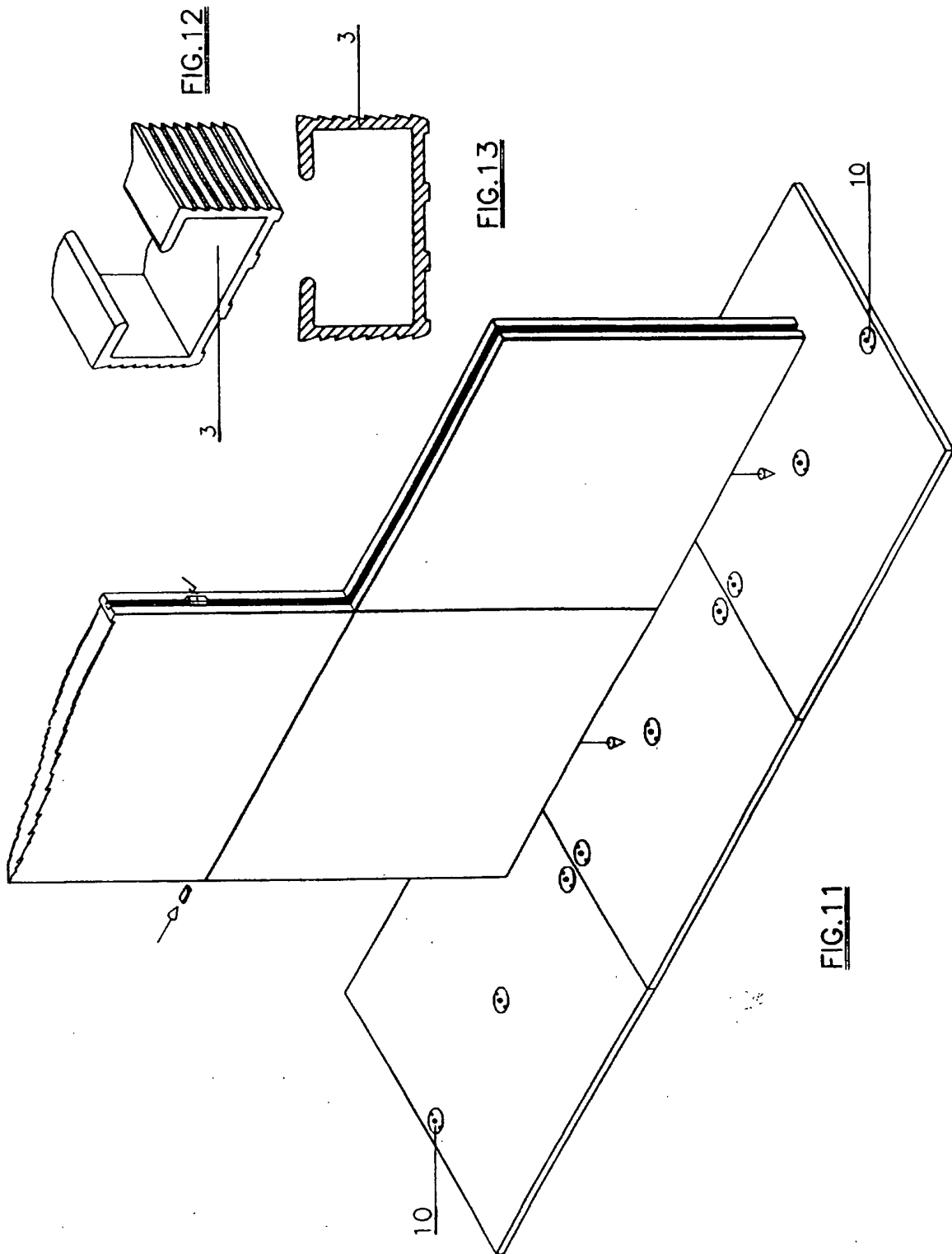


FIG. 9



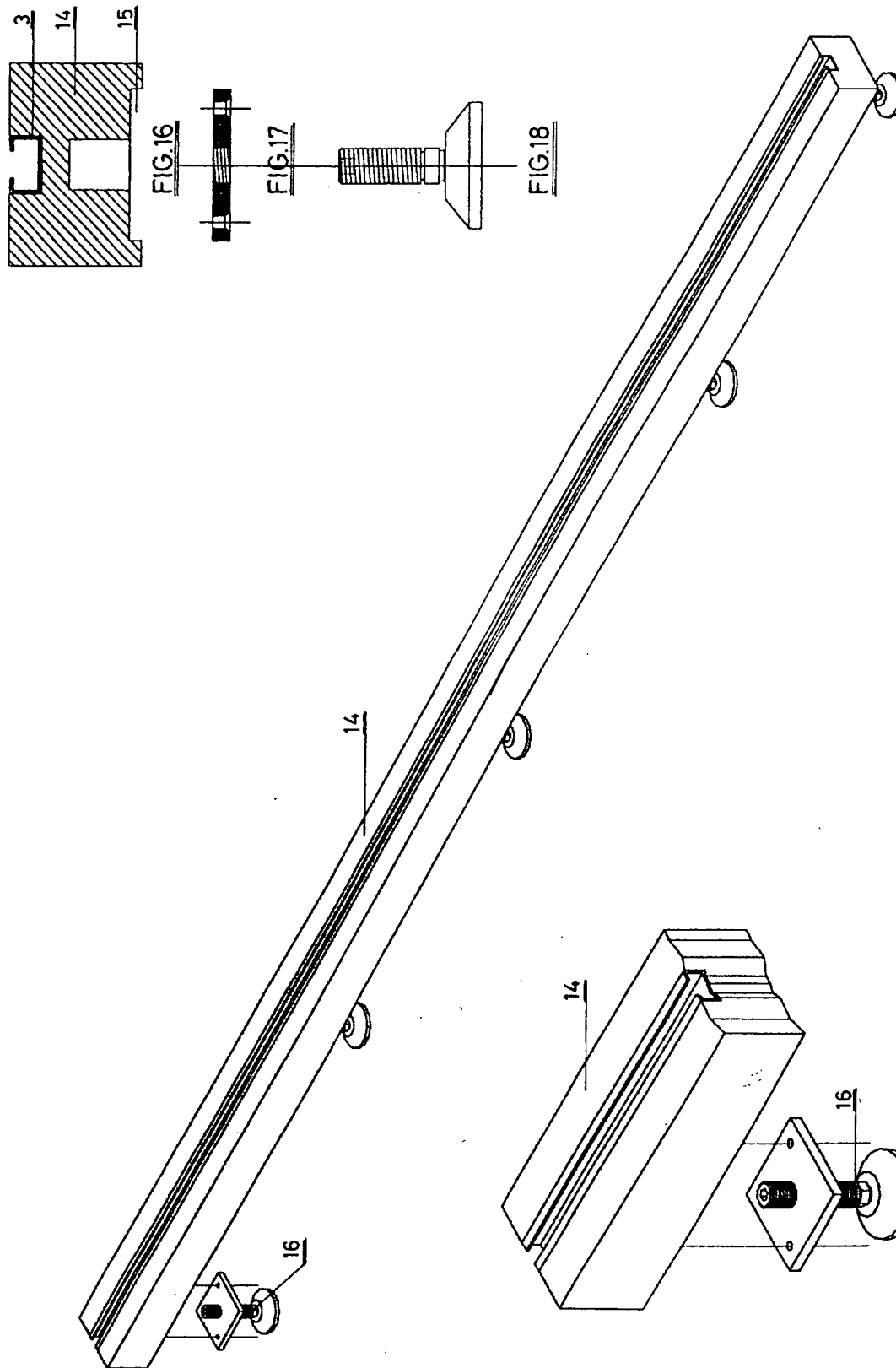
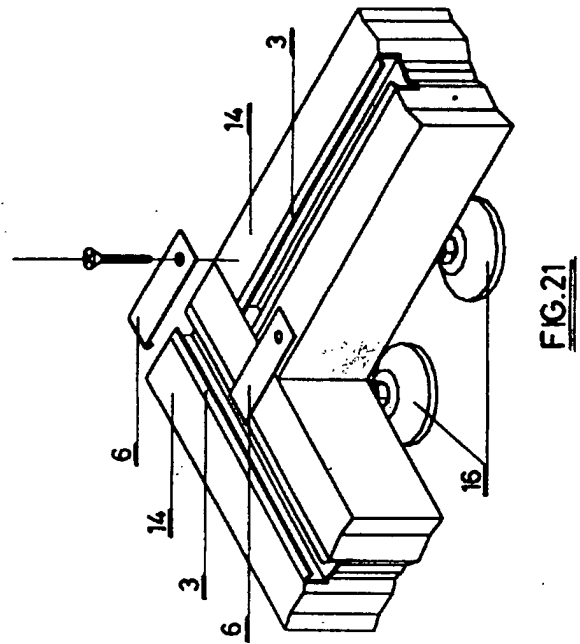
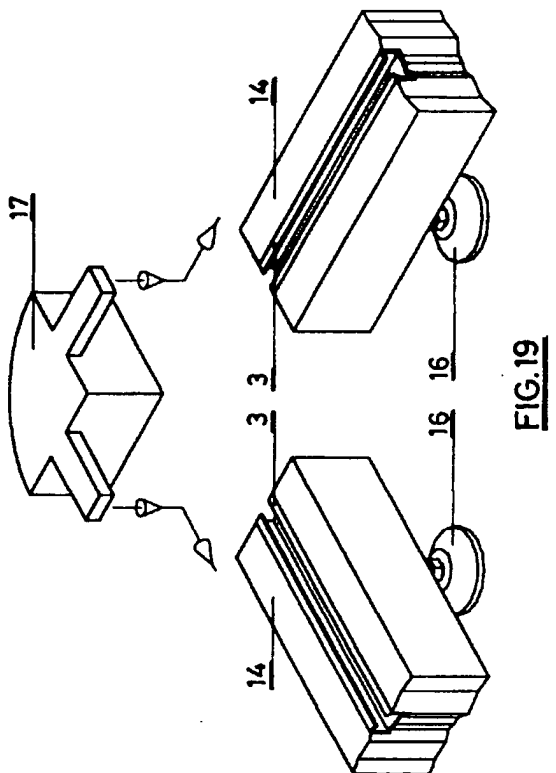
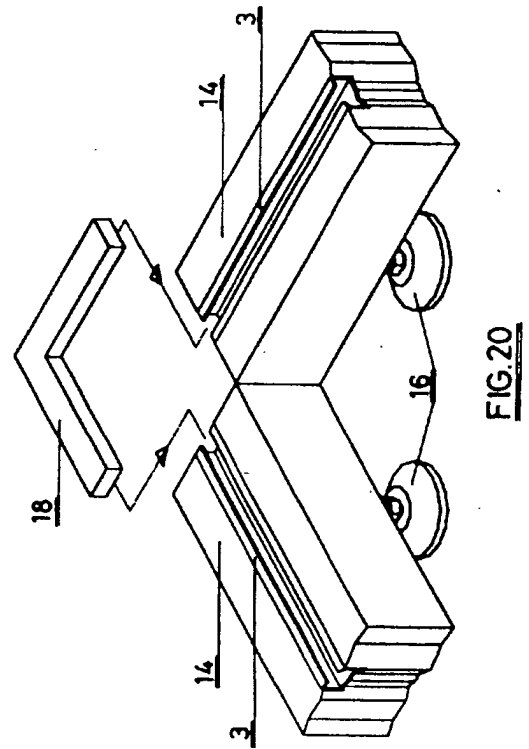
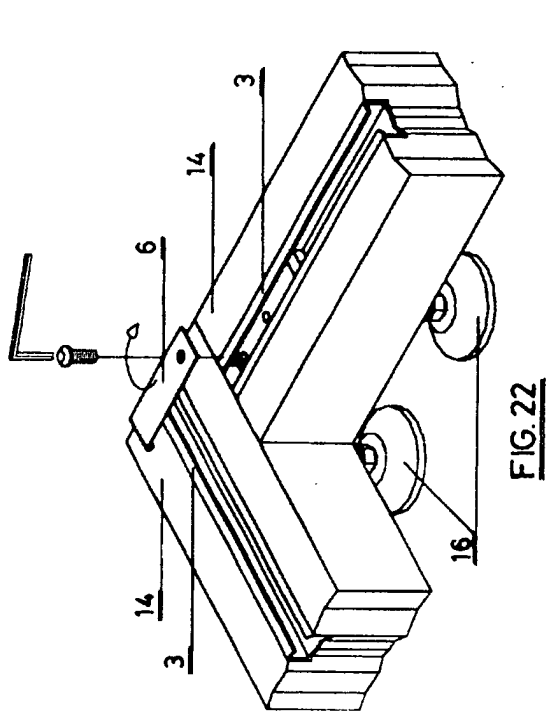


FIG.14

FIG.15



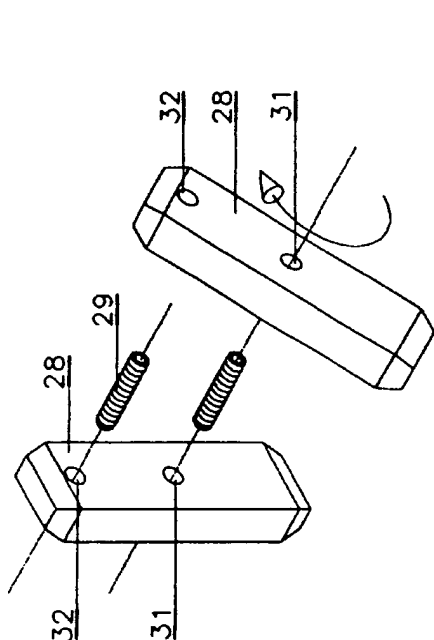


FIG. 27

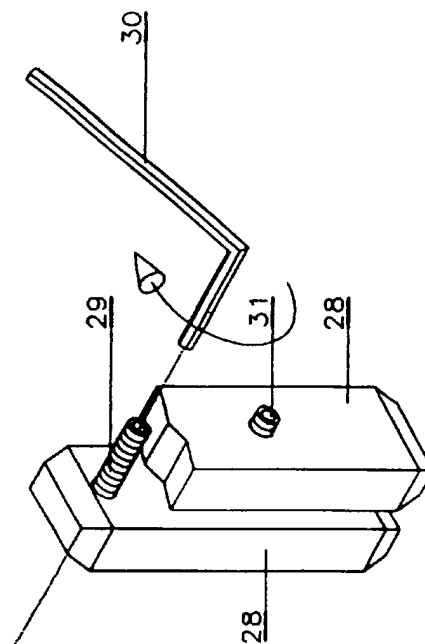


FIG. 28

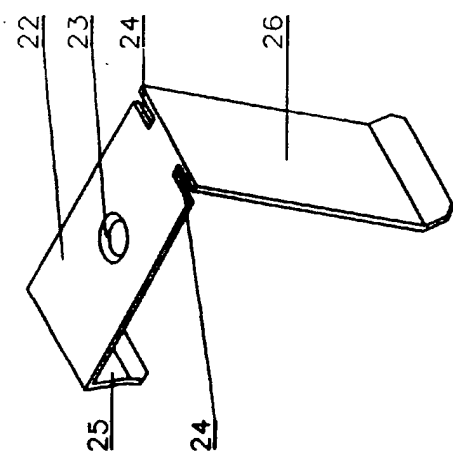


FIG. 25

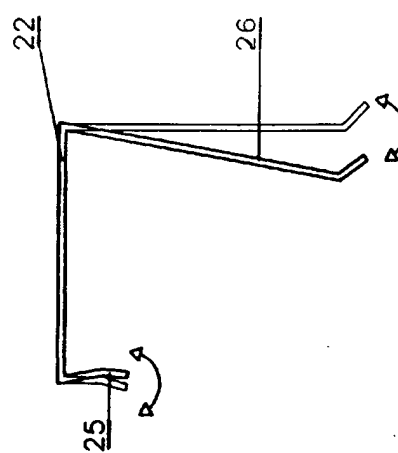


FIG. 26

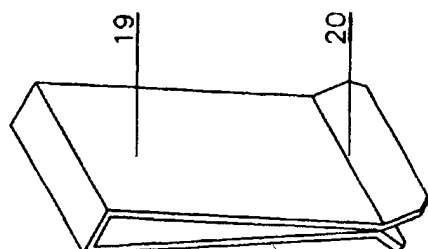


FIG. 23

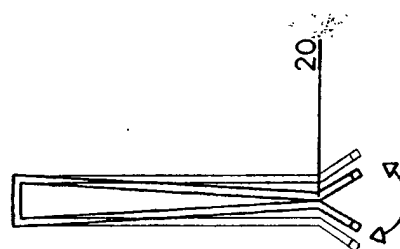
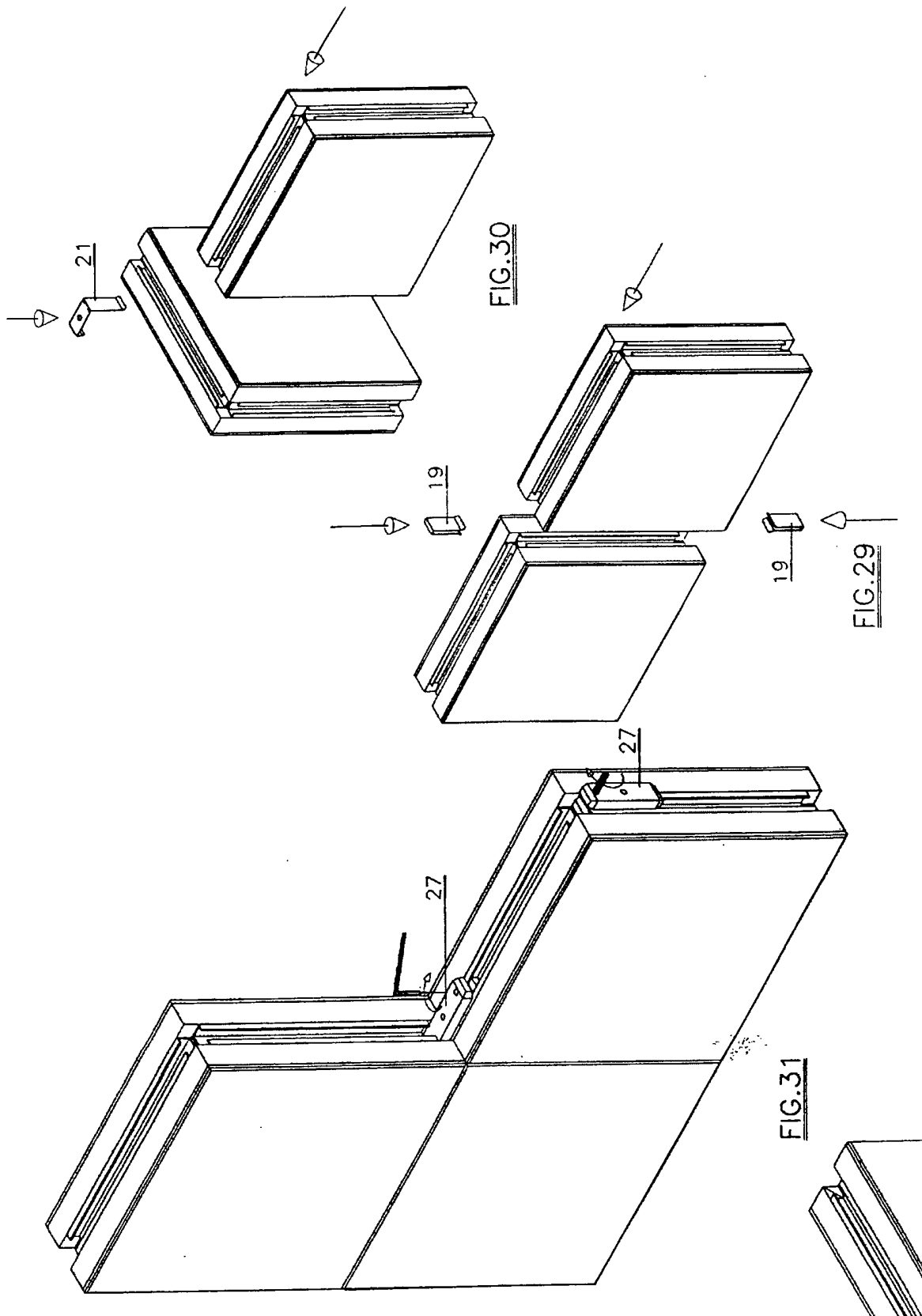


FIG. 24



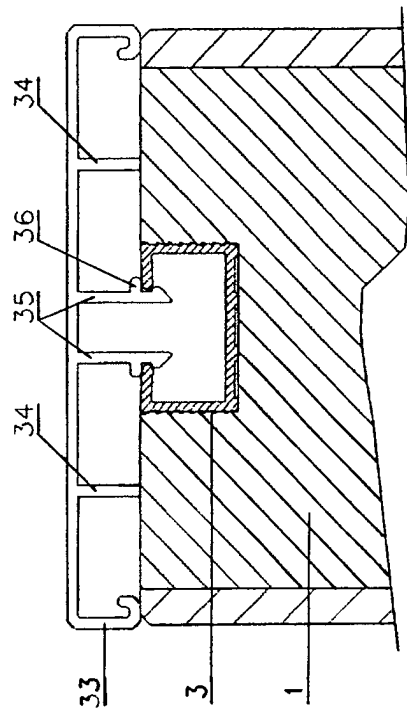


FIG. 33

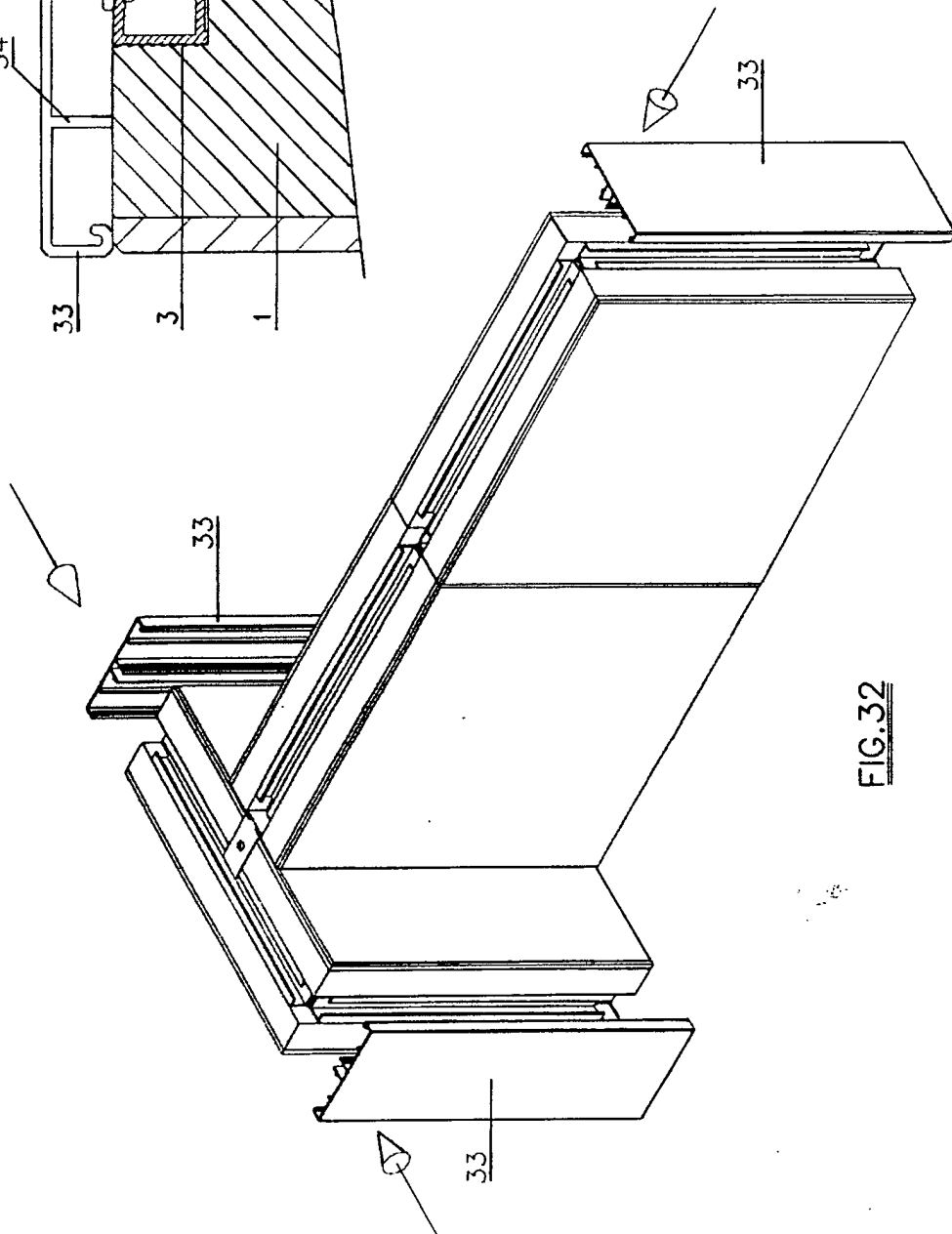


FIG. 32

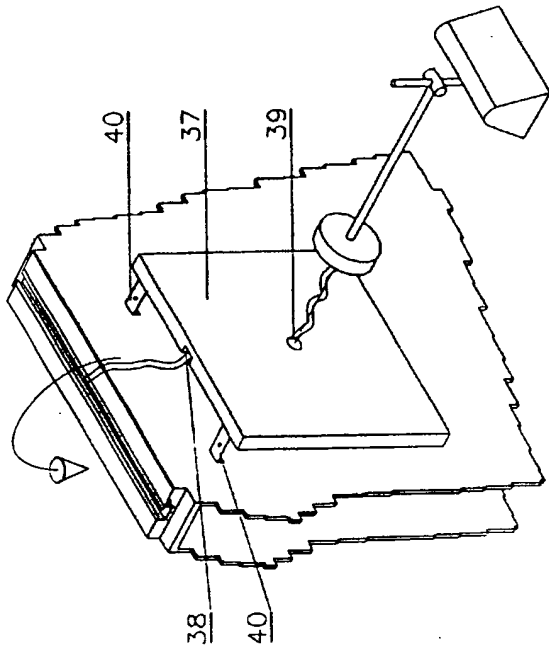


FIG. 35

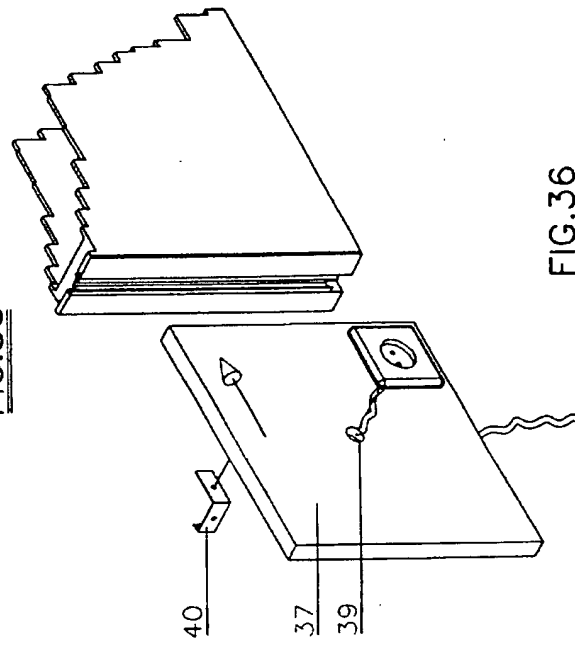


FIG. 36

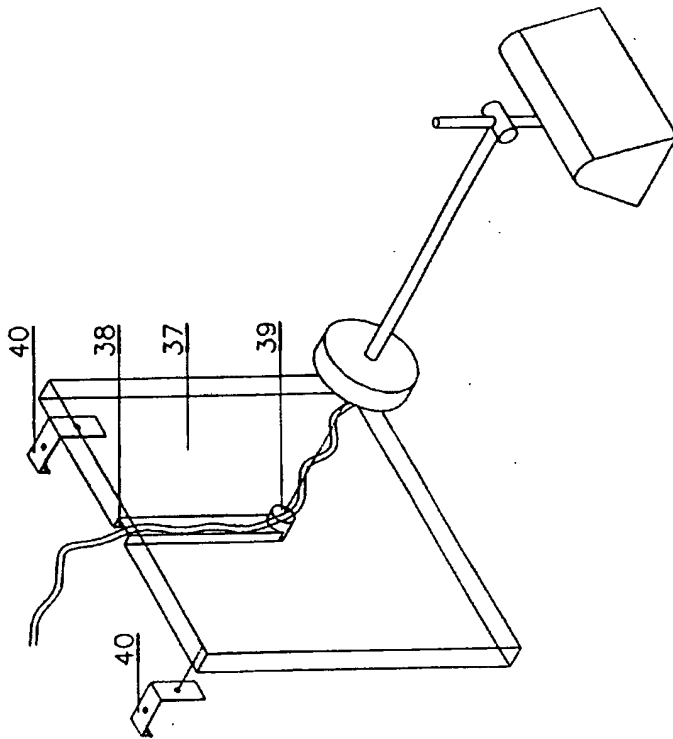


FIG. 34



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EUROPEAN SEARCH REPORT

Application Number
EP 01 50 0077

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)
Y	BE 673 982 A (MINVIELLE EIB) 15 April 1966 (1966-04-15) * page 5, line 12 - page 8, line 27; figure 2A *	1	E04B2/74
Y	US 5 927 032 A (RECORD GRANT C) 27 July 1999 (1999-07-27) * column 4, line 50 - column 4, line 62; figure 1 *	1	
A	GB 1 600 179 A (MARLER HALEY EXPOSYSTEMS LTD) 14 October 1981 (1981-10-14) * claim 1; figure 1 *	1	
A	US 4 310 995 A (HANNA GARY D) 19 January 1982 (1982-01-19) * figures 2,7 *	1	
A	US 6 148 567 A (MEYER KEVIN ET AL) 21 November 2000 (2000-11-21) * figure 9 *	1	
A	DE 42 19 601 A (HECKELSMUELLER DIETMAR) 23 December 1993 (1993-12-23) * figure 1 *	2	E04B
A	US 4 043 086 A (KAULFUSS WILLIAM P ET AL) 23 August 1977 (1977-08-23) * figure 7 *	3	
A	US 5 033 529 A (KOSCHADE KARL A) 23 July 1991 (1991-07-23) * figure 3 *	4	
A	US 5 142 832 A (BRANHAM SR WILLIAM K ET AL) 1 September 1992 (1992-09-01) * figure 1 *	5	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 22 August 2001	Examiner Rosborough, J
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 50 0077

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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22-08-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
BE 673982 A	15-04-1966	DE 1267955 B ES 123633 Y ES 123634 Y GB 1099481 A NL 6516828 A	 01-03-1968 01-03-1968 17-01-1968 24-06-1966
US 5927032 A	27-07-1999	NONE	
GB 1600179 A	14-10-1981	NONE	
US 4310995 A	19-01-1982	CA 1091887 A BE 878966 A GB 2036827 A,B JP 1363839 C JP 55045987 A JP 61028786 B SE 430180 B SE 7907275 A	 23-12-1980 16-01-1980 02-07-1980 09-02-1987 31-03-1980 02-07-1986 24-10-1983 27-03-1980
US 6148567 A	21-11-2000	EP 1086280 A WO 9964691 A	 28-03-2001 16-12-1999
DE 4219601 A	23-12-1993	NONE	
US 4043086 A	23-08-1977	NONE	
US 5033529 A	23-07-1991	CA 2029819 A	21-01-1992
US 5142832 A	01-09-1992	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82