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(54) **Load-bearing structure particularly for indoor flooring or outdoor paving**

Tragkonstruktion insbesondere für Innen-Bodenbeläge oder für Aussenoberflächen-Pflaster

Structure porteuse, en particulier pour revêtement de sol pour surface intérieures ou pavement pour surfaces extérieures

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(73) Proprietor: **Skema S.r.l.**
31046 Oderzo (Treviso) (IT)

(72) Inventor: **Friso, Edoardo**
35100 Padova (IT)

(74) Representative: **Modiano, Guido, Dr.-Ing. et al**
Modiano & Associati SpA
Via Meravigli, 16
20123 Milano (IT)

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Description

[0001] The present invention relates to a load-bearing structure particularly for indoor flooring or outdoor paving.

[0002] The construction of indoor flooring nowadays usually entails preparing a foundation in which the ducting for water and electric lines must be laid and embedded beforehand.

[0003] This known method therefore requires the preliminary study of the water and electric system and the laying of all the associated ducting at a solid base prepared beforehand; said ducts must then be embedded for example by a casting of cement-like material.

[0004] One of the many drawbacks of this solution is the fact that during the construction of the building said ducting, particularly the electrical ducting, is exposed for some time (at least until the laying of said ducting is completed) and is therefore subject to crushing both by treading on it and by the passing of the wheels of wheelbarrows or other tools over them.

[0005] Moreover, once the thin ducting covering slab has been cast, the flooring cannot be laid immediately because said casting must be able to dry appropriately.

[0006] Only after this condition also has been met it is possible to lay parquet, tiles or fitted carpeting.

[0007] Among the other drawbacks, mention can be made, in the case of indoor flooring, of the considerable weight of the thin base slabs, which force a preliminary calculation of the load of the floors.

[0008] As regards instead the optional use of outdoor paving, said paving is usually built by using thin cement or inert slabs laid over sand or cement and this requires a long time and entails high costs; these components are also heavy and therefore require suitable tools or means to transport them. An example of a panel unit for use in double floors and which allows installation of wiring is known from the document EP-A-0 506 499 A1.

[0009] The aim of the present invention is to solve the above technical problems, eliminating the drawbacks of the cited prior art and thus providing an invention which allows to lay indoor flooring or outdoor paving quickly and easily.

[0010] Within the scope of this aim, an important object is to provide an invention in which said laying can occur even without a preliminary laying of water and electric ducting, of course with the option of subsequently laying said ducting quickly and easily.

[0011] Another important object is to provide an invention that allows to obtain an indoor flooring or outdoor paving which is stable over time and safe in use.

[0012] Another important object is to provide an invention which is structurally simple and easy to industrialize.

[0013] Another object is to provide an invention which has low manufacturing costs and allows to produce indoor flooring or outdoor paving at an overall cost which is lower than in the cited prior art.

[0014] This aim, these objects and others which will become apparent hereinafter are achieved according to the invention by a load-bearing structure with the features set forth in claim 1.

[0015] Further characteristics and advantages of the present invention will become apparent from the following detailed description of a particular but not exclusive embodiment, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a top view of a load-bearing structure;
figure 2 is a detail view of the corner of a modular body;
figure 3 is a sectional view, taken along the plane III-III of figure 2;
figure 4 is a sectional view, taken along the plane IV-IV of figure 1;
figure 5 is a sectional view, taken along the plane V-V of figure 1;
figure 6 is an axonometric view of a leveling means;
figure 7 is an axonometric view of four of said modular bodies arranged mutually side by side together with a means for removably locking them;
figures 8, 9 and 10 illustrate said removable locking means for the modular bodies in a first side view, in a top view and in a second side view;
figure 11 is a view, similar to figure 7, of the arrangement of a panel on top of a plurality of mutually locked modular bodies;
figure 12 is a view, similar to figure 7, of the use of a different means for the removable locking of a plurality of bodies for outdoor pavings or for covering said pavings by means of tiles or fitted carpeting or parquet;
figures 13, 14 and 15 are views, similar to those of figures 8, 9 and 10, of the locking means of figure 12;
figure 16 is a sectional view, taken along the plane XVI-XVI of figure 1.

[0016] With reference to the above figures, 1 designates a load-bearing structure for supporting panels or coverings, designated by the reference numeral 2, or for outdoor pavings.

[0017] Said load-bearing structure is constituted by a plurality of modular and load-bearing bodies 3 for supporting the panels or coverings 2 for indoor and outdoor use.

[0018] Said body 3 can be formed for example by using recycled and recyclable material for cost containment.

[0019] Each body 3 is provided with a flat upper surface 4 and, at the corners 5, with a recess or depression 6 whereat first through holes 7 are formed at right angles.

[0020] Means for leveling said body can be arranged within said first holes 7 and can be activated from the upper surface 4 thereof; said means are constituted by

a suitable screw 8 provided with a head 9 which can be arranged on a stable plane 10 and with a threaded stem 11 which can be inserted in a complementarily threaded seat formed at said first holes 7.

[0021] Activation of the screw 9 from the upper surface 4 of the body 3 is allowed because at the end of the stem 11 there is provided a seat 12, for example for an Allen screw, or a slot for inserting a complementarily shaped screwdriver or other tool.

[0022] On each body 3 there are also provided second through holes 13, which are proximate to the outer perimetric edge 14 and approximately at the center of each body.

[0023] Below the upper surface 4, each body 3 is provided with partitions 15 which form a grid-like structure and have a shape forming, in a downward region, a plurality of connected compartments 16 whereat it is possible to pass ducting which is not shown in the figures.

[0024] Furthermore, the load-bearing structure 1 comprises means for the removable mutual locking of a plurality of bodies 3 or of panels or coverings 2 arranged side by side; said means can be activated from the upper surface 4 of each body 3.

[0025] Said removable locking means are constituted by a suitable coupling 17 which can be positioned at, and is shaped complementarily to, a suitable seat which is formed by arranging side by side a plurality of bodies 3 at a corner 5; said seat is formed by the presence of the mutually adjacent recesses or depressions 6.

[0026] The coupling 17 is thus constituted by a plate 18 which is provided, in a downward region, with four bridges 19 located at the corners and arranged along the diagonals; said bridges are essentially shaped like an inverted U, the wings 20a, 20b whereof can be arranged at complementarily shaped guides 21 formed on the portion of the body 3 whereon the first through holes 7 are located; said guides 21 are parallel to the laterally adjacent outer perimetric edge 14 of the body 3 and merge at a region adjacent to the corner 5.

[0027] On the opposite side with respect to the bridges 19, again at the corners and along the diagonals, four tabs 22 arranged in a cross-like configuration protrude above the plate 18; their function is to allow, as shown in figure 11, to position and lock between two of said tabs the corresponding sides of a panel or of a covering 2.

[0028] The height of the tabs 22 is such that they can protrude, once the coupling 17 has been inserted, beyond the upper surface 4 of the body 3, by an extent which is equal to the thickness of the panel or covering 2.

[0029] As an alternative, if the load-bearing structure must be used for a paving for example for outdoor use or to allow the laying of tiles or fitted carpeting or parquet, as shown in figure 2, the coupling 17 is similar to the one shown in figure 7 as regards the presence of the plate 18 and of the bridges 19, except for the tabs 22.

[0030] In this manner, it is possible to obtain a flat surface for laying tiles or fitted carpeting or parquet.

[0031] As an alternative, the load-bearing structure can be wall-mounted in order to form a ventilated structure.

[0032] It has thus been observed that the invention has achieved the intended aim and objects, a load-bearing structure having been provided which allows to form a surface for obtaining an indoor flooring or outdoor paving and, at the same, an underlying cellular region for the passage of cables and/or ducting and/or radiating panels; furthermore, said structure can be quickly and easily laid as flooring, avoiding and indeed replacing conventional thin slabs and thus providing faster and shorter laying times, saving time as regards the accessibility and/or walkability of the spaces.

[0033] Moreover, said structure, thanks to the particular use of the couplings, allows to inspect at all times and in any point the area underlying the indoor flooring or outdoor paving.

[0034] Said structure also allows to achieve a significant weight reduction, since it is possible to use lower thicknesses for the panel and/or the finishing covering; said reductions can be on the order of one third in the case of wood panels and of approximately four fifths in comparison with panels made of inert material, and this also entails global cost reduction.

[0035] The structure can also be used for outdoor pavings since it is made of materials which are not affected by the weather conditions.

[0036] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0037] Thus the materials and the dimensions that constitute the individual components may also be the most pertinent according to specific requirements.

[0038] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A load-bearing structure for supporting panels or coverings or for use as outdoor paving, constituted by a plurality of modular bodies (3), each provided with leveling means (8) which can be activated from the upper surface (4), said body (3) being internally provided with a grid-like structure (15) with connected compartments (16) for ducting, each said body having corners, the load bearing structure further comprising means (17) for the removable locking of a plurality of bodies (3) and/or panels (2) arranged side by side, said locking means (17) being actuatable from the upper surface (4) of said bodies (3), and being constituted by a suitable coupling, said

coupling (17) being constituted by a plate (18), **characterized in that** said plate has, in a downward region and at the corners, four bridges (19) which are arranged along diagonals thereof and are essentially shaped like an inverted U, the wings (20a- 20b) whereof being arrangeable at complementarily shaped guides (21) formed on a portion of the corner (5) of each said body (3) on which first through holes (7) are located, said guides (21) being parallel to the laterally adjacent outer perimetric edge of said body (3) and merging at a region which is adjacent to the corner (5).

2. A structure according to claim 1, **characterized in that** said body (3), is preferably formed by using recycled and recyclable material, and comprises a flat upper surface (4) and, at the comers (5), a recess or depression (6) whereat said first through holes (7) are formed at right angles.

3. A structure according to claims 1 and 2, **characterized in that** means (8) for leveling said body (3) can be arranged within said first holes (7) and can be activated from said upper surface (4) of said leveling means, said leveling means being constituted by a suitable screw (8) provided with a head (5) which can be arranged on a stable plane and a threaded stem (11) which can be inserted in a complementarily threaded seat formed at said first holes (7).

4. A structure according to claims 1 and 3, **characterized in that** it further comprises a seat (12) located at the end of said stem (11), for example a seat for an Allen screw or a slot for the insertion of a complementarily shaped screwdriver or other tool, for the activation of said screw (8) from said upper surface (4) of said body (3).

5. A structure according to claims 1 and 4, **characterized in that** on each one of said bodies (3) there are also provided second through holes (13), which are proximate to the outer perimetric edge and, substantially, at the center of each body (3).

6. A structure according to claims 1 and 5, **characterized in that** below said upper surface (4) of each one of said bodies (3) are provided partitions (15) forming a grid-like structure, said partitions (15) having a configuration which forms, in a downward region, a plurality of connected compartments (16) at which ducting can be passed.

7. A structure according to claims 1 and 6, **characterized in that** said load-bearing structure (1) comprises said locking means (17) for the removable mutual locking of a plurality of bodies (3) or of panels or coverings (2) arranged side by side, said locking means (17) allowing activation from said upper surface (4) of each one of said bodies (3) and being constituted by said plate (18) which can be arranged at, and is shaped complementarily to, a suitable seat being formed by said mutually adjacent recesses or depressions (6) by arranging side by side a plurality of bodies (3) at one of said corners (5).

8. A structure according to claims 1 and 7, **characterized in that** it further comprises four tabs (22) arranged in a cross- like configuration that protrude above said plate (18) on the opposite side with respect to said bridges (19), again at said corners and along the diagonals of the plate (18), to allow to position and lock, between two of said tabs (22), the corresponding sides of one of said panels or coverings (2).

9. A structure according to claims 1 and 8, **characterized in that** said tabs (22) have such a height so as to protrude, once said coupling (17) has been inserted, beyond said upper surface (4) of said body (3), by an extent which is equal to the thickness of said panel or covering (2).

10. A structure according to any of the claims 1-7, **characterized in that** said coupling (17) is constituted by said plate (18) and by said bridges (19) and has a flat surface for laying tiles or fitted carpeting or parquet, for outdoor use or to allow to lay tiles or fitted carpeting or parquet.

11. A structure according to one or more of the preceding claims, **characterized in that** it is wall-mounted so that said grid-like structure (15) provides a ventilated structure.

Patentansprüche

1. Tragekonstruktion, insbesondere zum Tragen von Paneelen oder Belägen oder zur Verwendung als Pflaster im Außenbereich, bestehend aus mehreren modularen Körpern (3), die jeweils mit Nivelliermitteln (8) ausgestattet . sind, welche von der Oberseite (4) aus aktivierbar sind, wobei der Körper (3) innen eine gitterartige Struktur (15) mit verbundenen Abteilen (16) für Leitungen hat, wobei jeder Körper Ecken hat und die Tragekonstruktion ferner Mittel (17) zum lösbaren Befestigen mehrerer nebeneinander angeordneter Körper (3) und/oder Paneele (2) hat, wobei die Befestigungsmittel (17) von der Oberseite (4) der Körper (3) aus betätigbar sind und aus einem geeigneten Koppelelement bestehen, und wobei das Koppelelement (17) aus einer Platte (18) besteht, **dadurch gekennzeichnet, daß** die Platte in einem nach unten zeigenden Bereich

und an den Ecken vier Brücken (10) hat, die entlang ihren Diagonalen angeordnet sind und im wesentlichen die Form eines umgekehrten U haben, dessen Schenkel (20a-20b) an komplementär geformten Führungen (21) an einem Teil der Ecken (5) jedes Körpers (3) angeordnet werden können, an dem sich erste Durchgangslöcher (7) befinden, wobei die Führungen (21) parallel zu der seitlich angrenzenden Außenumfangskante des Körpers (3) sind und in einem Bereich angrenzend an die Ecke (5) zusammenlaufen.

2. Konstruktion nach Anspruch 1, **dadurch gekennzeichnet, daß** der Körper (3) vorzugsweise unter Verwendung von wiederverwertetem oder wiederverwertbarem Material hergestellt ist und eine flache Oberseite (4) und an den Ecken (5) eine Vertiefung (6) hat, an der die ersten Durchgangslöcher (7) rechtwinklig ausgebildet sind.

3. Konstruktion nach den Ansprüchen 1 und 2, **dadurch gekennzeichnet, daß** Mittel (8) zum Nivellieren des Körpers (3) in den ersten Löchern (7) angeordnet sind und von der Oberseite (4) der Nivelliermittel (8) aus betätigt werden können, wobei die Nivelliermittel (8) aus einer geeigneten Schraube (8) mit einem Kopf (5), der auf einer stabilen Ebene angeordnet werden kann, und einem Gewindeschaft (11) bestehen, der in einen an den ersten Löchern (7) ausgebildeten Sitz mit komplementärem Gewinde eingeführt werden kann.

4. Konstruktion nach den Ansprüchen 1 und 3, **dadurch gekennzeichnet, daß** sie ferner am Ende des Schafts (11) einen Sitz (12), beispielsweise einen Sitz für eine Zylinderschraube mit Innensechskant oder einen Schlitz zum Einführen eines komplementär geformten Schraubendrehers oder eines anderen Werkzeugs zum Betätigen der Schraube (8) von der Oberseite (4) des Körpers (3) aus enthält.

5. Konstruktion nach den Ansprüchen 1 und 4, **dadurch gekennzeichnet, daß** an jedem der Körper (3) auch zweite Durchgangslöcher (13) vorgesehen sind, die nahe der Außenumfangskante und im wesentlichen in der Mitte jedes Körpers (3) liegen.

6. Konstruktion nach den Ansprüchen 1 und 5, **dadurch gekennzeichnet, daß** unter der Oberseite (4) jedes Körpers (3) Trennwände (15) vorgesehen sind, die eine gitterartige Struktur bilden, wobei die Trennwände (15) eine konfiguration haben, die in einem nach unten zeigenden Bereich mehrere verbundene Abteile (16) bildet, an denen Leitungen durchgeführt werden können.

7. Konstruktion nach den Ansprüchen 1 und 6, **dadurch gekennzeichnet, daß** die Tragekonstruktion (1) die Befestigungsmittel (17) zum gegenseitigen lösbaren Befestigen mehrerer nebeneinander angeordneter Körper (3) oder Paneele oder Beläge (2) enthält, wobei die Befestigungsmittel (17) die Betätigung von der Oberseite (4) jedes Körpers (3) ermöglichen und aus der Platte (18) bestehen, die an einem geeigneten Sitz angeordnet werden kann und komplementär zu diesem geformt ist, wobei der Sitz durch die aneinander angrenzenden Vertiefungen (6) gebildet wird, wenn mehrere Körper (3) an einer der Ecken (5) nebeneinander angeordnet werden.

8. Struktur nach den Ansprüchen 1 und 7, **dadurch gekennzeichnet, daß** sie ferner vier kreuzförmig angeordnete Ansätze (22) hat, die, ebenfalls an den Ecken und entlang der Diagonalen der Platte (18), auf der den Brücken (19) abgewandten Seite über die Platte (18) hervorstehen, um das Positionieren und Befestigen der entsprechenden Seiten eines der Paneele oder Beläge (2) zwischen zwei Ansätzen (22) zu ermöglichen.

9. Struktur nach den Ansprüchen 1 und 8, **dadurch gekennzeichnet, daß** die Ansätze (22) eine derartige Höhe haben, daß sie nach dem Einsetzen des Koppelelements (17) um ein Maß, das der Dicke des Paneels oder Belags (2) entspricht, über die Oberseite (4) des Körpers (3) hervorstehen.

10. Struktur nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, daß** das Koppelelement (17) aus der Platte (18) und den Brücken (19) besteht und eine flache Oberfläche hat, um Platten oder Teppichboden oder Parkett für die Verwendung im Außenbereich zu vetiegen oder um das Verlegen von Platten oder Teppichboden oder Parkett zu ermöglichen.

11. Struktur nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** es wandmontiert ist, so daß die gitterartige Struktur (15) eine belüftete Struktur darstellt.

Revendications

1. Structure porteuse pour supporter des panneaux ou revêtements ou pour utilisation comme pavage extérieur, constituée par une pluralité de corps modulaires (3), chacun étant pourvu de moyens de mise à niveau (8) qui peuvent être activés depuis la surface supérieure (4), ledit corps (3) étant pourvu intérieurement d'une structure de type grillagé (15) avec des compartiments reliés (16) pour les canalisations, chacun desdits corps ayant des coins, la structure porteuse comprenant en outre des

moyens (17) pour le blocage amovible d'une pluralité de corps (3) et/ou de panneaux (2) placés côte à côte, lesdits moyens de blocage (17) pouvant être actionnés depuis la surface supérieure (4) desdits corps (3), et étant constitués d'un accouplement adéquat, ledit accouplement (17) étant constitué d'une plaque (18), **caractérisée en ce que** ladite plaque a, dans une partie inférieure et aux coins, quatre ponts (19) qui sont placés le long de ses diagonales et qui sont essentiellement de la forme d'un U renversé, dont les ailes (20a-20b) sont adaptables à des guidages de formes complémentaires (21) formés sur une portion du coin (5) de chacun desdits corps (3) sur lequel des premiers trous traversants (7) sont prévus, lesdits guidages (21) étant parallèles au bord du périmètre latéralement adjacent dudit corps (3) et se rejoignant dans une partie qui est adjacente au coin (5).

2. Structure, selon la revendication 1, **caractérisée en ce que** ledit corps (3) est de préférence formé en utilisant du matériau recyclé et recyclable, et comprend une surface supérieure plane (4) et, aux coins (5), un creux ou une dépression (6) où lesdits premiers trous traversants (7) sont formés à angles droits.

3. Structure selon les revendications 1 et 2, **caractérisée en ce que** des moyens (8) de mise à niveau dudit corps (3) peuvent être disposés à l'intérieur desdits premiers trous (7) et peuvent être activés depuis ladite surface supérieure (4) desdits moyens de mise à niveau, lesdits moyens de mise à niveau étant constitués par une vis adaptée (8) munie d'une tête (5) qui peut être appliquée sur un plan stable et d'une tige filetée (11) qui peut être insérée dans un logement fileté complémentairement formé dans lesdits premiers trous (7).

4. Structure selon les revendications 1 et 3, **caractérisée en ce qu'**elle comprend en outre un logement (12) situé à l'extrémité de ladite tige filetée (11), par exemple un logement pour une vis Allen ou une fente pour l'insertion d'un tournevis à forme complémentaire ou d'un autre outil, pour l'activation de ladite vis (8) depuis ladite surface supérieure (4) dudit corps (3).

5. Structure selon les revendications 1 et 4, **caractérisée en ce que** sur chacun desdits corps (3), on a également prévu des seconds trous traversants (13), qui sont à proximité du bord extérieur périmétrique et, substantiellement, au centre de chaque corps (3).

6. Structure selon les revendications 1 et 5, **caractérisée en ce qu'**en dessous de ladite surface supérieure (4) de chacun desdits corps (3) sont formées des divisions (15) formant une structure de type grillagé, lesdites divisions (15) ayant une configuration formant, dans une partie inférieure, une pluralité de compartiments (16) reliés dans lesquels on peut passer les canalisations.

7. Structure selon les revendications 1 et 6, **caractérisée en ce que** ladite structure porteuse (1) comprend lesdits moyens de blocage (17) pour le blocage mutuel amovible d'une pluralité de corps (3) ou de panneaux ou de couvertures (2) placés côte à côte, lesdits moyens de blocage (17) permettant une activation depuis ladite surface supérieure (4) de chacun desdits corps (3) et étant constitués par ladite plaque (18) qui peut être placée, et est de forme complémentaire à un logement qui est formé par lesdits creux ou dépressions (6) mutuellement adjacents en plaçant côte à côte une pluralité de corps (3) à un desdits coins (5).

8. Structure selon les revendications 1 et 7, **caractérisée en ce qu'**elle comprend en outre quatre taquets (22) placés selon une configuration en croix qui dépassent au-dessus de ladite plaque (18) sur le côté opposé par rapport auxdits ponts (19), encore auxdits coins et le long des diagonales de la plaque (18), pour permettre de positionner et de bloquer, entre deux desdits taquets (22), les côtés correspondants d'un desdits panneaux ou couvertures (2).

9. Structure selon les revendications 1 et 8, **caractérisée en ce que** lesdits taquets (22) ont une hauteur suffisante pour dépasser, une fois que ledit accouplement (17) a été inséré, au-delà de ladite surface supérieure (4) dudit corps (3), selon une amplitude qui est égale à l'épaisseur dudit panneau ou couverture (2).

10. Structure selon l'une quelconque des revendications 1 à 7 **caractérisée en ce que** ledit accouplement (17) est constitué par ladite plaque (18) et par lesdits ponts (19) et a une surface plane pour poser du carrelage ou de la moquette ou du parquet, pour un usage extérieur ou pour permettre de poser du carrelage, de la moquette ou du parquet.

11. Structure selon une ou plusieurs des revendications précédentes, **caractérisée en ce qu'**elle est montée en parois de telle sorte que ladite structure de type grillagé (15) réalise une structure ventilée.

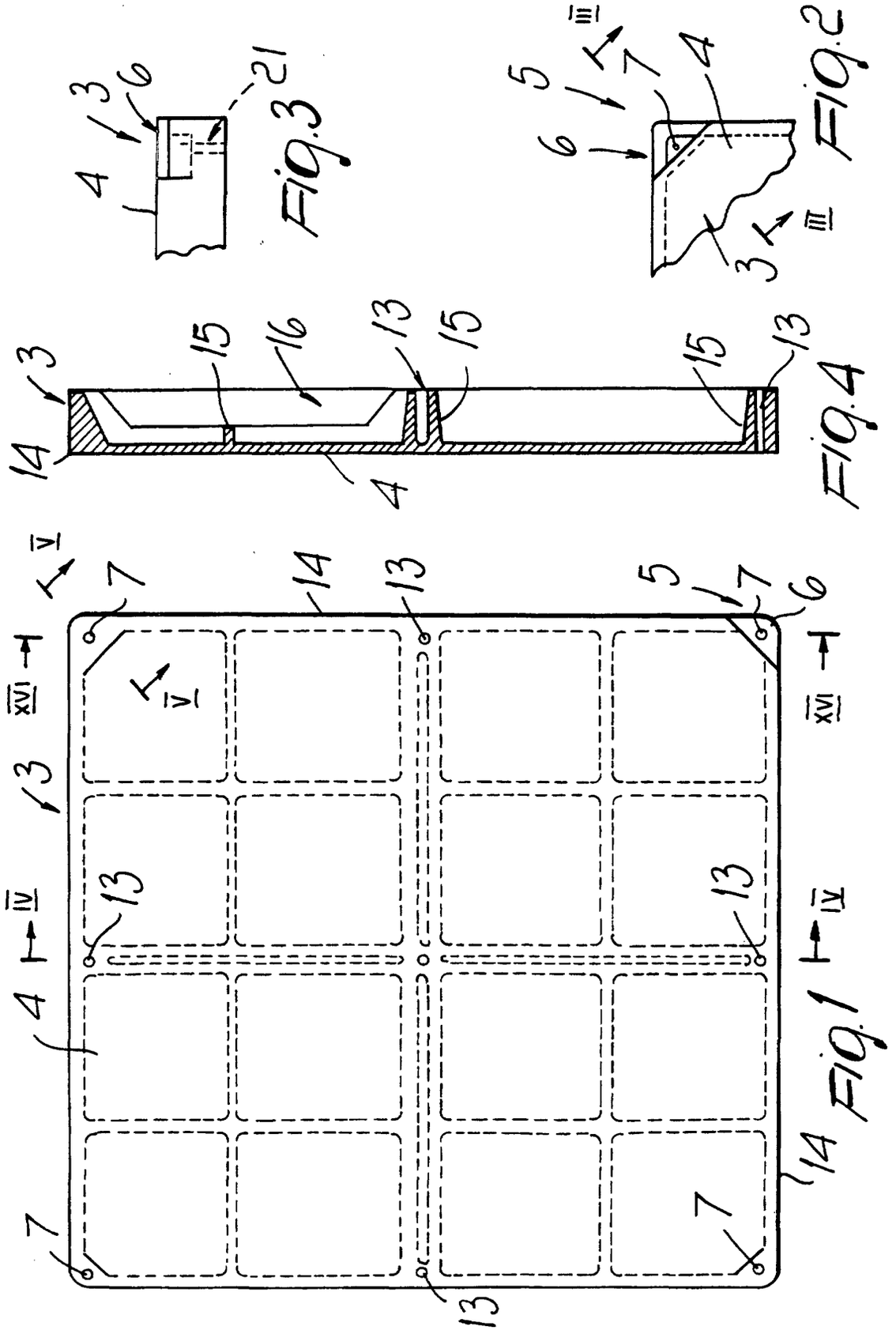
III
III
5
6
7
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Fig.2
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21
Fig.3
14
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4
Fig.4
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V
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XVI
XVI
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Fig.1

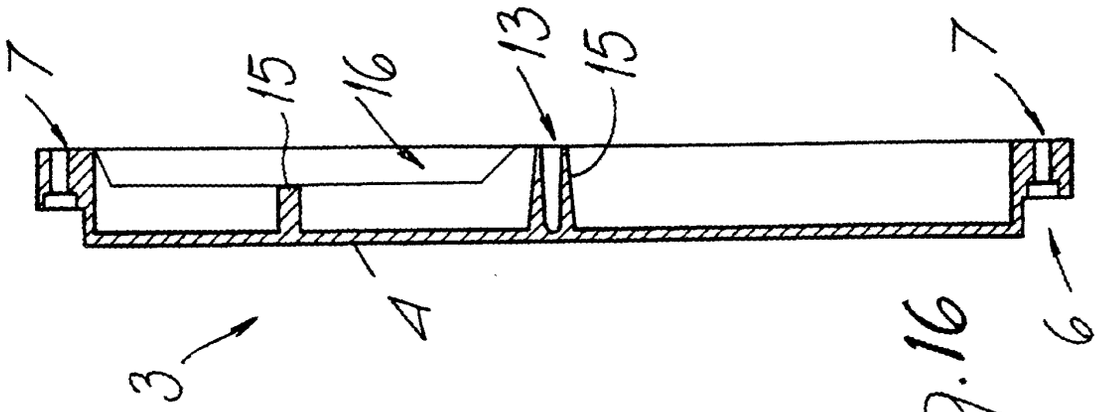

Fig.16

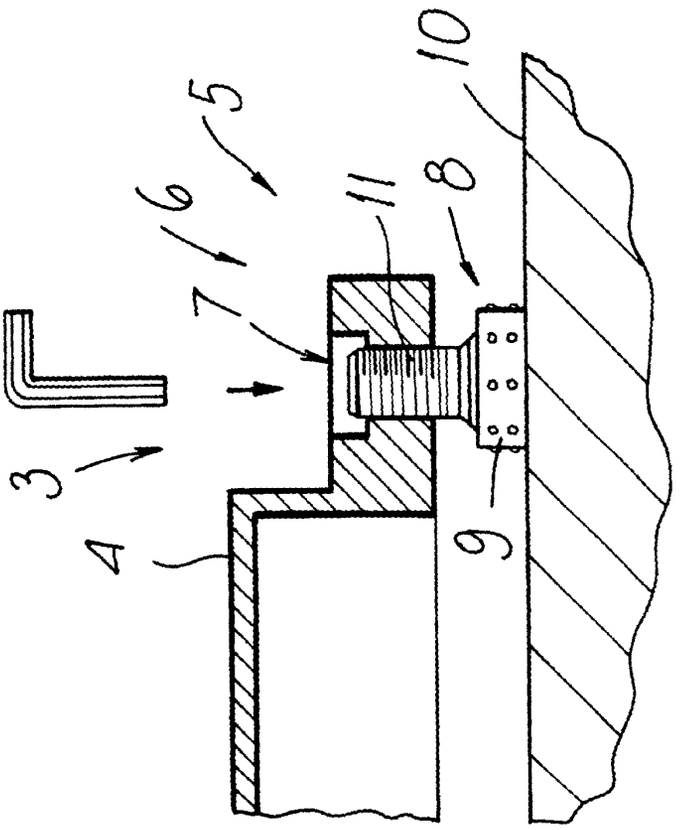

Fig.5

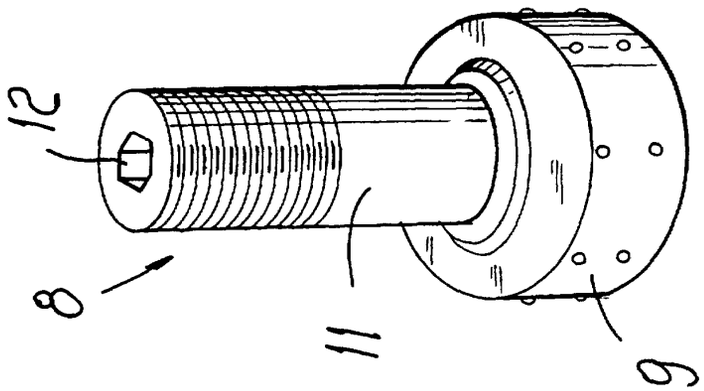

Fig. 6

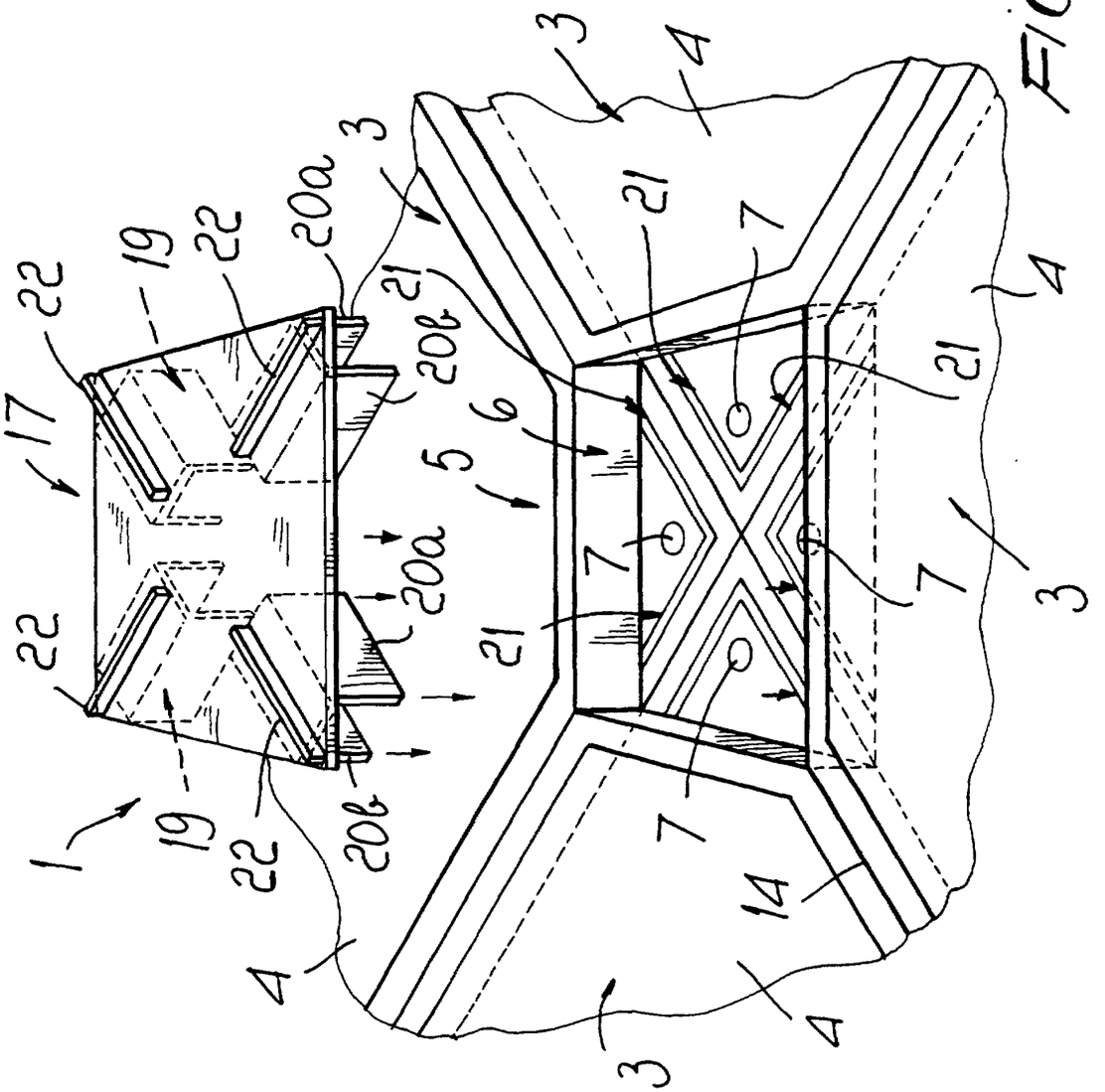

Fig. 7

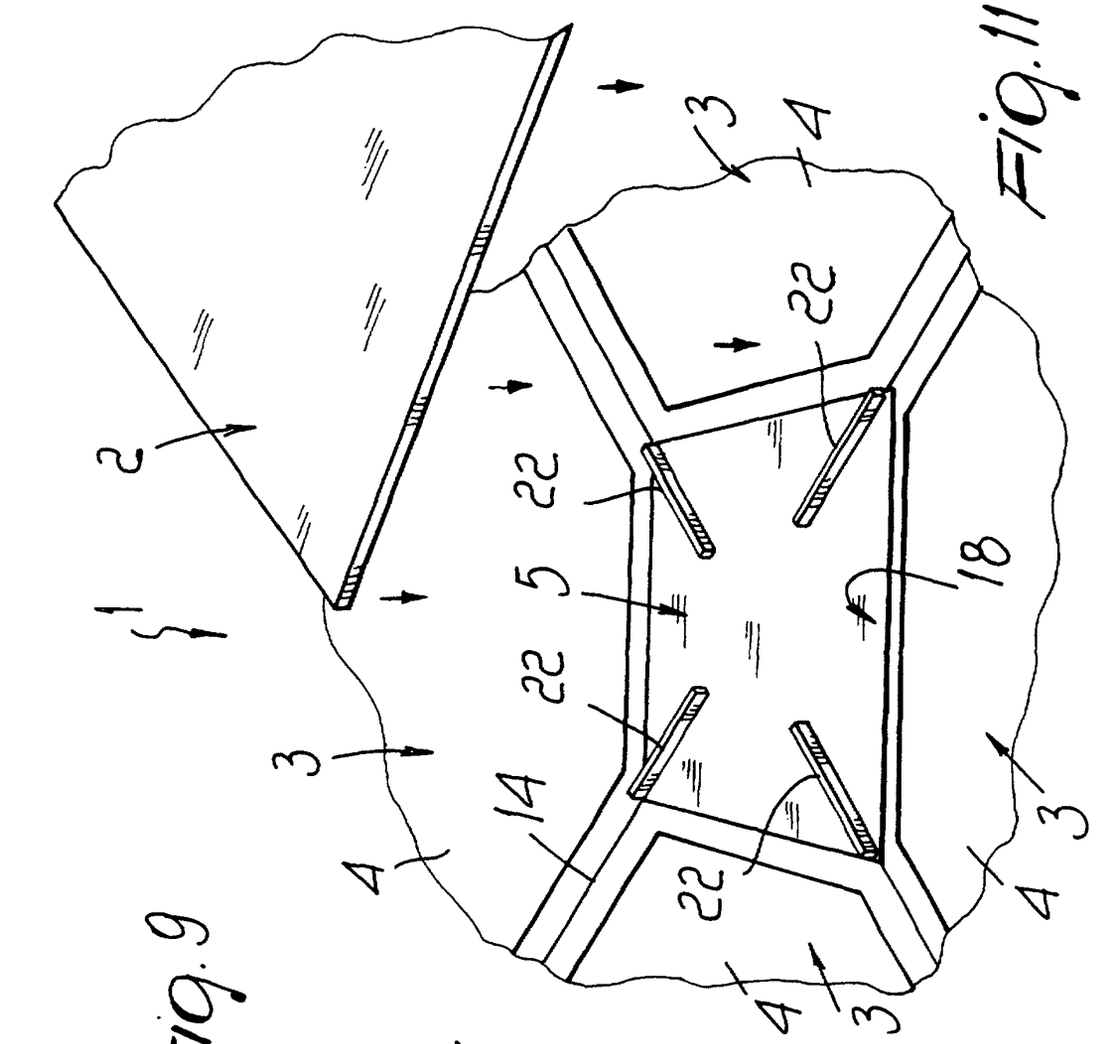

Fig. 11

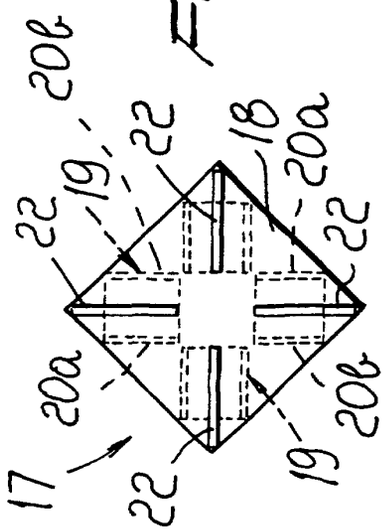

Fig. 9

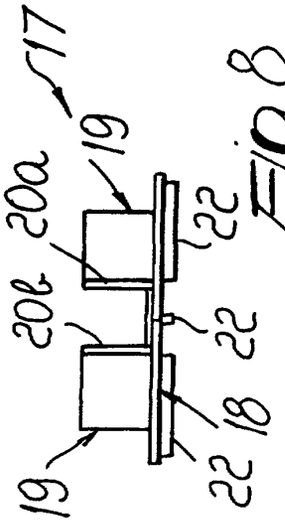

Fig. 8

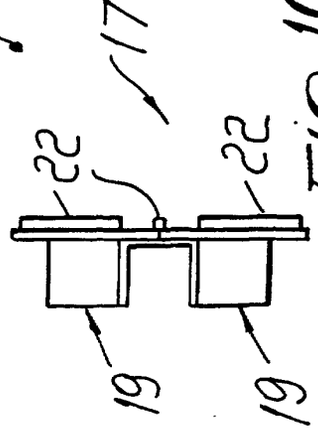

Fig. 10

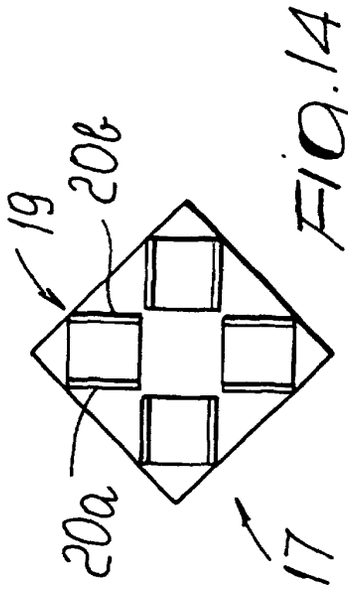

Fig.14

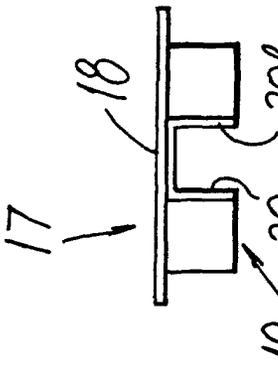

Fig.13

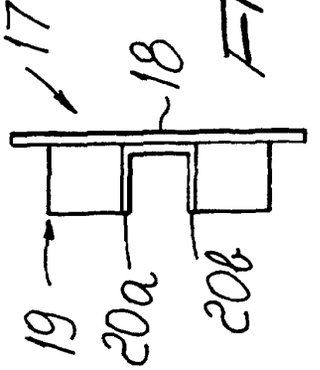

Fig.15

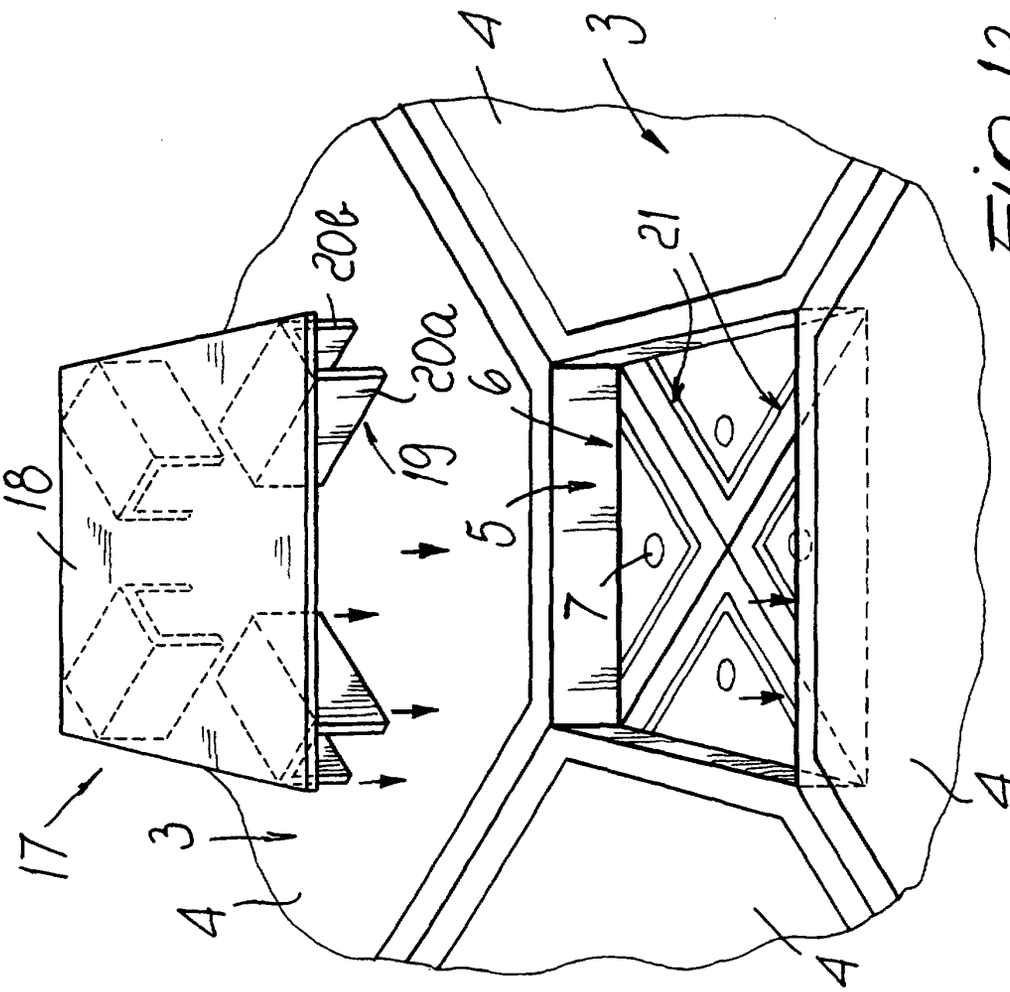

Fig.12