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(54) **Floor and floor construction**

Bodenbelag und Fussbodenkonstruktion

Plancher et construction de plancher

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Description

[0001] The invention relates to a floor which is constructed from floor tiles which are supported by supports resting on a substructure, wherein the floor tiles are provided on their longitudinal edges with bent flanges which are received in the upper ends of grooves arranged in the supports such that a flange of a first floor tile and a flange of an adjacent floor tile lie in one groove.

[0002] US-A-5 749 188 discloses a floor constructed from floor tiles which are supported by supports resting on a ground surface, wherein the floor tiles are provided on their longitudinal edges with bent flanges which are received in grooves arranged in the upper ends of the supports such that a flange of a first floor tile and a flange of an adjacent floor tile lie in one groove, wherein at least some measure of interspacing is present between flanges lying opposite each other in the groove, said floor tiles electrically conductive. US-A-5499476 discloses a floor and a hot constructed from floor tiles according to the preamble of claim 1 and claim 8 respectively.

[0003] The invention has for its object to obtain a floor of the above stated type wherein, while maintaining an effective clamping of the flanges of the floor tiles in the grooves of the support, the floor can follow possible unevenness in the surface of the ground on which the support rest, while in addition the floor tiles can be arranged and removed in simple manner. Also, the invention has for its object to improve safety of such floor.

[0004] This can be achieved according to the invention with a floor constructed from floor tiles which are supported by supports resting on a ground surface, wherein the floor tiles are provided on their longitudinal edges with bent flanges which are received in grooves arranged in the upper ends of the supports such that a flange of a first floor tile and a flange of an adjacent floor tile lie in one groove, wherein at least some measure of interspacing is present between flanges lying opposite each other in the groove, said floor tiles electrically conductive and said supports provided with electrical conducting means which make contact with the floor tiles for electrical interconnection thereof, characterised by the electrical conducting means comprising a peripheral contact ring or contact wire arranged in the support electrically interconnecting the floor tiles.

[0005] When a floor according to the invention is applied the tiles can follow a sloping floor surface, since the parts of the flanges lying in the grooves can, within certain limits, pivot relative to each other. Movements between the floor tiles occurring for instance as a result of temperature changes and/or stresses in the floor can further be absorbed by the space present between the floor tiles.

[0006] The interspacing is preferably in the order of 0.4 to 1 mm, this space being found adequate for a sufficient pivoting to make it possible to follow slopes in the ground surface occurring in (office) buildings, as well as to absorb expansion of commonly occurring materials, wherein deforming of the tiles is prevented since they are always arranged without mutual contact.

[0007] The flanges can be connected continuously along their whole length to the remaining parts of the floor tiles, so that a reliable connection is obtained between flanges and floor plates, which will prevent undesirable deformation of the flanges.

[0008] The floor tiles are electrically conductive and the supports are provided with electrical conducting means which make contact with the floor tiles for electrical interconnection thereof. In addition to the above stated advantages, an electrical earthing of the floor tiles is thus obtained for the purpose of greater safety.

[0009] The electrical conducting means preferably comprise a conductive profile, such as a metal sleeve or extrusion profile, in which the grooves are arranged.

[0010] In a further preferred embodiment the flanges on the side of the floor tile are provided with scraping protrusions which are in contact with the electrical conducting means. In addition to an electrical connection for earthing of the tiles, the scraping protrusions also provide a clamping for a more robust fixing of the tiles in the supports.

[0011] The supports are preferably provided with damping means, whereby vibrations from footsteps and the like are absorbed.

[0012] In yet another preferred embodiment the floor tiles are provided on the underside with centring protrusions which drop into centring openings in the top side of the supports. This construction is found to provide a more robust and precise fixing and positioning.

[0013] The invention will be further elucidated hereinbelow with reference to the accompanying figures, in which:

Figure 1 shows a top view of a kit of support and floor tiles according to a first preferred embodiment of the present invention;

Figure 2 shows a side view in cross-section of the kit of figure 1;

Figure 3 shows a top view of a kit of support and floor tiles according to a second preferred embodiment of the present invention;

Figure 4 shows a side view in cross-section of the kit of figure 3;

Figure 5A is a perspective view of an illustrative embodiment of a floor:

Figure 5B is a side view in cross-section of a stop of the floor tile of figure 5A against a projection of a support;

Figure 6 is a perspective view of an illustrative preferred embodiment;

Figure 7 shows a side view in cross-section of a groove having therein two adjacent flanges in an illustrative embodiment;

Figure 8 shows a side view in cross-section of a groove having therein two flanges in a an illustrative embodiment; and

Figures 9 to 12 show types of floor tiles.

[0014] Figures 1 and 2 show a first preferred embodiment of a kit 1 according to the present invention, comprising rectangular or square floor tiles 2 having bent flanges 4 on the edges. In the assembled situation the flanges drop into grooves 6 which are arranged for this purpose in an upper outer end of support 8, with which the kit rests on a ground surface which is further not shown.

[0015] In the exemplary embodiment shown in the figures floor tile 2 has a square form with four flanges 4 on the edges of floor tile 2 and bent at right angles relative thereto. Flanges 4 are arranged connecting to floor tile 2 along their whole length and end close to the corner points of floor tile 2.

[0016] Arranged in the upper outer end of support 8 at equal distances from each other are four centring holes 10 into which drop centring protrusions (not shown) arranged on the underside of floor tiles 2 for the purpose of positioning floor tile 2 in correct manner relative to support 8.

[0017] In a side view are shown electrical conducting means, in a first preferred embodiment a contact ring 12 which is pressed by means of a spring construction 14 against flanges 4 for electrical interconnection thereof. A floor constructed from floor tiles 2 and supports 8 of kit 1 are earthed electrically on at least one floor tile. Owing to the interconnection provided by the electrical conducting means the whole floor is thus earthed for greater safety.

[0018] A further provision is an interspace 16 which in the assembled situation is present between the edges and flanges 4 of adjacent floor tiles 2. This gap is preferably larger than 0.2 mm and up to for instance 2 mm, and most preferably in the order of 0.5 mm. In order to fix floor tiles 2 with sufficient clamping so as to prevent vibrations and loosening by vibration, flanges 4 are preferably provided on the side directed toward floor tile 2 with protrusions 18 with which the flanges are arranged clampingly in the groove 6 which in side view is diabolo-shaped.

[0019] The gap 16 is advantageous in making the upper surfaces of floor tiles 2 sufficiently pivotable relative to each other to be able to follow slopes and other unevenness in the ground surface. Gap 16 also ensures that possible expansion of floor tiles 2, as a consequence of for instance temperature, is absorbed without deformation of the floor tiles occurring, this due to the absence of contact between the floor tiles. This pivotability is also made possible by the diabolo shape of the side walls of grooves 6 (Fig. 2).

[0020] In a second preferred embodiment according to the present invention a floor is constructed from a kit 28 comprising floor tiles 30 with bent flanges 32 on the side edges thereof as according to the above described first embodiment. The flanges drop into grooves 34 of supports 36. In the assembled situation a gap 38 is present between floor tiles 30 and between flanges 32 which has the advantages and features in accordance with the above described gap 16. The flanges are further fixed clampingly by protrusions 40 into the groove 34 which in side view is diabolo-shaped (Fig. 4).

[0021] The electrical conducting means are formed in this second variant by a peripheral contact wire 42 which is arranged running around the top end of support 36 and touches the centring holes 44 therein. Floor tiles 30 are herein provided with threaded pins 46 which fall into centring holes 44 for the purpose of positioning the floor tiles relative to the supports and which also contact the contact wire 42 for electrical interconnection of the floor tiles. The floor tiles are herein manufactured from an electrically conductive material, for instance a metal or preferably galvanized steel.

[0022] An illustrative embodiment relates to a floor constructed from a kit 50 as shown in figure 5A. The kit comprises floor tiles 52 having bent flanges 54 on the side edges thereof, which flanges are arranged connecting along practically the whole length to floor tiles 52. The bent flanges 54 drop into grooves 56 arranged in supports 58 for the purpose of supporting the floor tiles at a height relative to a ground surface 60.

[0023] At both outer ends the flanges of the floor tiles are interrupted at some distance before the end of floor tile 52. A standing cylindrical projection 59 is arranged in the middle of support 58. The projection takes a form corresponding to the outer ends 55 of flanges 54, so that it acts as a stop against which the flanges of the floor tiles come to rest (fig. 5B). The projection thus also provides the correct gap between the floor tiles, preferably about 0.4 - 1 mm.

[0024] A support 58 in this illustrative embodiment comprises a bottom mat 62 of a suitable material. In the shown variant these bottom mats 62 are approximately round and mutually connected by a grid of strips 64, which enables quicker laying of the floor. A support preferably comprises a roughly cylindrical steel sleeve 66 which provides the electrical interconnection of floor tiles 52 arranged therein, so that these tiles are earthed electrically despite the gap present between them. A cup-shaped damper 68 of an appropriate material such as plastic is arranged inside sleeve 66 for the purpose of damping shocks caused by for instance footsteps on the floor. Grooves 56 are arranged continuously in both sleeve 66 and damper 68.

[0025] In order to ensure an electrical contact between the floor tiles and the conductive sleeve or the conductive part of the support, the flanges 72 arranged on floor tiles 70 are provided in a preferred embodiment with protrusions 74 which make a scraping contact with edges 76 of a groove arranged in the support (Fig. 7).

[0026] It remains possible here to arrange a gap 78 between the floor tiles, wherein an electric contact is still ensured and sufficient clamping is obtained.In a further preferred embodiment grooves are arranged in a support, with in each case a groove 80 and a second groove 82 separated by a dividing wall 84 with a width preferably lying between about 0.4 and 1 mm (Fig. 8). Floor tiles 86

once again have bent flanges 88 provided with protrusions 90 which come into scraping contact with walls 92, 94 of grooves 80, 82 respectively. Electrical interconnection is obtained in that floor tiles 86 and protrusions 90, as well as a part of the supports, are electrically conductive. Sufficient space is present here in grooves 80, 82 to ensure that floor tiles 86 are at least slightly pivotable relative to the support, and that (thermal) expansion of the floor tiles can also be absorbed (Fig. 8).

[0027] The illustrative embodiments described with reference to figures 7 and 8 can also be combined with a further illustrative variant shown in Fig. 6. A floor 100 herein comprises floor tiles 102, only a fourth part of which is shown here, which floor tiles comprise on the edges bent flanges 104 which rest in groove-like recesses 106 in supports 108. Close to the corner points of floor tiles 102 centring protrusion 110 are arranged by being pressed through which drop into openings 112 arranged in the top side of supports 108.

[0028] The supports comprise an extrusion form 114 of a suitable material such as plastic, aluminium or zamak. In the shown form the extrusion form 114 has a practically cylindrical outer surface, and continuous openings 116 are arranged therein along the whole length which correspond with centring openings 112. A damper 118 is arranged on top of extrusion form 114. The damper is roughly cylindrical and grooves 106 are arranged therein at angles of 90° to each other, and a centring opening 112 is arranged in each case between the grooves. In the middle of damper 118 is arranged a cylindrical projection 120 against which the corner points of floor tiles 102 come to rest for the purpose of better positioning thereof. Damper 118 serves to damp shocks and is preferably manufactured from a conductive plastic which provides a correct damping and also for electrical interconnection of floor tiles 102 (Fig. 6).

[0029] Figures 9 to 12 show further possible alternative floor tiles that may be used in combination with the invention. Fig. 9 thus shows a practical embodiment of a floor tile 140, which in practice has sides in the order of 200 to 300 mm. In the shown embodiment the supports 142 are arranged with a mutual spacing in the order of 125 mm and are optionally provided with a reinforcement. Also shown are connecting pieces 114 for mutual connection of supports 142.

[0030] Fig. 10 shows a tile 140 as in Fig. 9 provided with supports 142, wherein a foot connecter 144 is also shown which on the upper side has four square recesses in which the square supports 142 come to rest. A further foot connecter 146 is also shown wherein an earth clip 148 is arranged in the middle thereof for electrical interconnection of the supports resting on foot connecter 146 for the purpose of earthing thereof.

[0031] Fig. 11 shows a larger floor tile 160 with sides of for instance 450 mm. Supports 162 are arranged at a mutual spacing of 150 mm.

[0032] A larger tile 170 has for instance sides in the order of 600 mm and is arranged on a plurality of supports 172 which are arranged not only at the corner points of tile 170 but also therebetween, at a mutual distance of for instance 133 mm. The height of the foot is in this case the same as that of the above stated feet, but can also amount to about 55 mm. Such larger tiles have in the middle of the tile a support (not shown) arranged on the underside. The thickness of the tile is further in the order of 2 mm, just as the above mentioned tiles.

[0033] The present invention is not limited to the above described preferred embodiments thereof, in which many modifications can be envisaged within the scope of the appended claims.

Claims

1. Floor constructed from floor tiles (2, 30, 52, 70, 86, 102, 140, 160, 170) which are supported by supports resting on a ground surface, wherein the floor tiles are provided on their longitudinal edges with bent flanges (4, 32, 54, 72, 88, 104) which are received in grooves (6, 34, 56, 80, 82, 106) arranged in the upper ends of the supports (8,36, 58, 108, 142, 162, 172) such that a flange of a first floor tile and a flange of an adjacent floor tile lie in one groove, wherein at least some measure of interspacing (16, 38, 78) is present between flanges,lying opposite each other in the groove, said floor tiles being electrically conductive, **characterised in that** said supports are provided with electrical conducting means which make contact with the floor tiles for electrical interconnection thereof, the electrical conducting means comprising a peripheral contact ring (12) or peripheral contact wire (42) arranged in the support electrically interconnecting the floor tiles.

2. Floor as claimed in claim 1, wherein the interspacing is in the order of 0.5 mm.

3. Floor as claimed in claims 1 or 2, wherein a floor tile is constructed from a floor plate and flanges extending at right angles on the edges of this floor plate and formed integrally with the floor plate, wherein the flanges are connected continuously along their whole length to the floor plate.

4. Floor as claimed in claims 1, 2 or 3, wherein the electrical conducting means comprise a conductive profile, such as a metal sleeve or extrusion profile, in which the grooves are arranged.

5. Floor as claimed in any of the foregoing claims, wherein the flanges on the side of the floor tile are provided with scraping protrusions (40, 90, 110) which are in contact with the electrical conducting means.

6. Floor as claimed in any of the foregoing claims,

wherein the supports are provided with damping means.

7. Floor as claimed in any of the foregoing claims, wherein the floor tiles are provided on the underside with centring protrusions which drop into centring openings (44, 112) in the top side of the supports.

8. Kit (1, 28, 50) of two or more floor tiles (2, 30, 52, 70, 86, 102, 140, 160, 170) and one or more supports (8, 36, 58, 108,142,162,172) for the purpose of constructing a floor according to claim 1, wherein the supports are provided with a groove and the floor tiles are provided with flanges fitting into the groove (6, 34, 56, 80, 82, 106), wherein the groove and/or flanges (4, 32, 54, 72, 88, 104) are embodied such that the flanges engage in clamping manner on walls of the groove, and in the assembled situation are pivotable relative to the groove due to a gap (16, 38, 78) present between the flanges, said floor tiles being electrically conductive and **characterized in that** said supports are provided with electrical conducting means which make contact with the floor tiles for electrical interconnection thereof, the electrical conducting means comprising a peripheral contact ring (12) or peripheral contact wire (42) arranged in the support electrically interconnecting the floor tiles.

Patentansprüche

1. Boden, der aus Bodenfliesen (2,30,52,70,86,102, 140,160,170) aufgebaut ist, die von Stützen gestützt werden, die auf einer Grundfläche ruhen, wobei die Bodenfliesen auf ihren Längskanten mit gebogenen Flanschen (4, 32, 54, 72, 88, 104) ausgestattet sind, die in Rillen (6, 34, 56, 80, 82, 106) aufgenommen sind, die derart in den oberen Enden der Stützen (8,36, 58, 108, 142, 162,172) angeordnet sind, dass ein Flansch einer ersten Bodenfliese und ein Flansch einer benachbarten Bodenfliese in einer Rille liegen, wobei weinigstens ein gewisses Maß an Zwischenraum (16, 38, 78) zwischen Flanschen vorhanden ist, die einander in der Rille gegenüber liegen, wobei die Bodenfliesen elektrisch leitend sind, **dadurch** gekennzeichet, dass die Stützen mit elektrischen Leitmitteln ausgestattet sind, die Kontakt mit den Bodenfliesen zu ihrer elektrischen Verbindung herstellen, wobei die elektrischen Leitmittel einen Umfangskontaktring (12) oder Umfangskontaktdraht (42) umfassen, der in der Stütze angeordnet ist, die die Bodenfliesen elektrisch miteinander verbindet.

2. Boden gemäß Anspruch 1, wobei der Zwischenraum in der Größenordnung von 0.5 mm ist.

3. Boden gemäß einem der Ansprüche 1 oder 2, wobei eine Bodenfliese aus einer Bodenplatte und Flanschen gebildet ist, die sich in rechten Winkeln auf den Kanten dieser Bodenplatte erstrecken und einstückig mit der Bodenplatte gebildet sind, wobei die Flansche kontinuierlich entlang ihrer gesamten Länge mit der Bodenplatte verbunden sind.

4. Boden gemäß Ansprüchen 1, 2 oder 3, wobei die elektrischen Leitmittel ein leitendes Profil, wie beispielsweise eine Metallmuffe oder ein Extrusionsprofil umfassen, in dem die Rillen angeordnet sind.

5. Boden gemäß einem der vorhergehenden Ansprüche, wobei die Flansche auf der Seite der Bodenfliese mit Kratzvorsprüngen (40, 90, 110) ausgestattet sind, die in Kontakt mit den elektrischen Leitmitteln sind.

6. Boden gemäß einem der vorhergehenden Ansprüche, wobei die Stützen mit Dämpfungsmitteln ausgestattet sind.

7. Boden gemäß einem der vorhergehenden Ansprüche, wobei die Bodenfliesen auf der Unterseite mit zentrierenden Vorsprüngen ausgestattet sind, die in zentrierende Öffnungen (44, 112) in die Oberseite der Stützen fallen.

8. Bausatz (1,28,50) aus zwei oder mehreren Bodenfliesen (2, 30, 52, 70, 86, 102, 140, 160, 170) und einer oder mehrerer Stützen (8, 36,58,108, 142, 162, 172) zum Zwecke des Bauens eines Bodens gemäß Anspruch 1, wobei die Stützen mit einer Rille ausgestattet sind und die Bodenfliesen mit Flanschen ausgestattet sind, die in die Rille (6, 34, 56, 80, 82,106) passen, wobei die Rille und/oder Flansche (4, 32,54,72,88,104) derart verkörpert sind, dass die Flansche klemmend auf Wänden der Rille ansetzen, und in der zusammengesetzten Situation schwenkbar sind relativ zur Rille wegen einer Lücke (16, 38, 78), die zwischen den Flanschen vorhanden ist, wobei die Bodenfliesen elektrisch leitend sind und **dadurch gekennzeichnet sind, dass** die Stützen mit elektrischen Leitmitteln ausgestattet sind, die Kontakt mit den Bodenfliesen zu ihrer elektrischen Verbindung herstellen, wobei die elektrischen Verbindungsmittel einen Umfangskontaktring (12) oder Umfangskontaktdraht (42) umfassen, der in der Stütze angeordnet ist, die die Bodenfliesen elektrisch miteinander verbindet.

Revendications

1. Plancher construit à partir de carreaux de plancher (2, 30, 52, 70, 86, 102, 140, 160, 170) qui sont supportés par des supports reposant sur une surface de sol, dans lequel les carreaux de plancher sont prévus sur leurs bords longitudinaux avec des rebords cour-

bés (4, 32, 54, 72, 88, 104) qui sont reçus dans des rainures (6, 34, 56, 80, 82, 106) agencées dans les extrémités supérieures des supports (8, 36, 58, 108, 142, 162, 172) de sorte qu'un rebord d'un premier carreau de plancher et un rebord d'un carreau de plancher adjacent se trouvent dans une rainure, dans lequel au moins une certaine mesure d'espacement (16, 38, 78) est présente entre les rebords qui se trouvent à l'opposé l'un de l'autre dans la rainure, lesdits carreaux de plancher étant électriquement conducteurs, **caractérisé en ce que** lesdits supports sont prévus avec des moyens de conduction électrique qui établissent le contact avec les carreaux de plancher pour leur interconnexion électrique,
les moyens de conduction électrique comprenant une bague de contact périphérique (12) ou un fil de contact périphérique (42) agencé dans le support qui interconnecte électriquement les carreaux de plancher.

2. Plancher selon la revendication 1, dans lequel l'espacement est de l'ordre de 0,5 mm.

3. Plancher selon les revendications 1 ou 2, dans lequel un carreau de plancher est construit à partir d'une plaque de plancher et de rebords s'étendant en angle droit sur les bords de cette plaque de plancher et formés de manière solidaire avec la plaque de plancher, dans lequel les rebords sont raccordés de manière continue le long de toute leur longueur à la plaque de plancher.

4. Plancher selon les revendications 1, 2 ou 3, dans lequel les moyens de conduction électrique comprennent un profil conducteur, tel qu'un manchon métallique ou un profil d'extrusion, dans lequel les rainures sont agencées.

5. Plancher selon l'une quelconque des revendications précédentes, dans lequel les rebords sur le côté du carreau de plancher sont prévus avec des saillies de raclage (40, 90, 110) qui sont en contact avec les moyens de conduction électrique.

6. Plancher selon l'une quelconque des revendications précédentes, dans lequel les supports sont prévus avec des moyens d'amortissement.

7. Plancher selon l'une quelconque des revendications précédentes, dans lequel les carreaux de plancher sont prévus sur la face inférieure avec des saillies de centrage qui tombent dans les ouvertures de centrage (44, 112) dans le côté supérieur des supports.

8. Ensemble (1, 28, 50) de deux carreaux de plancher ou plus (2, 30, 52, 70, 86, 102, 140, 160, 170) et un ou plusieurs supports (8, 36, 58, 108, 142, 162, 172) afin de construire un plancher selon la revendication 1, dans lequel les supports sont prévus avec une rainure et les carreaux de plancher sont prévus avec des rebords se fixant dans la rainure (6, 34, 56, 80, 82, 106), dans lequel la rainure et/ou les rebords (4, 32, 54, 72, 88, 104) sont mis en oeuvre de sorte que les rebords se mettent en prise d'une manière serrée sur les parois de la rainure, et dans la situation assemblée, peuvent pivoter par rapport à la rainure en raison d'un espace (16, 38, 78) présent entre les rebords, lesdits carreaux de plancher étant électriquement conducteurs et
caractérisé en ce que lesdits supports sont prévus avec des moyens de conduction électrique qui établissent le contact avec les carreaux de plancher pour leur interconnexion électrique, les moyens de conduction électrique comprenant une bague de contact périphérique (12) ou un fil de contact périphérique (42) agencé dans le support qui interconnecte électriquement les carreaux de plancher.

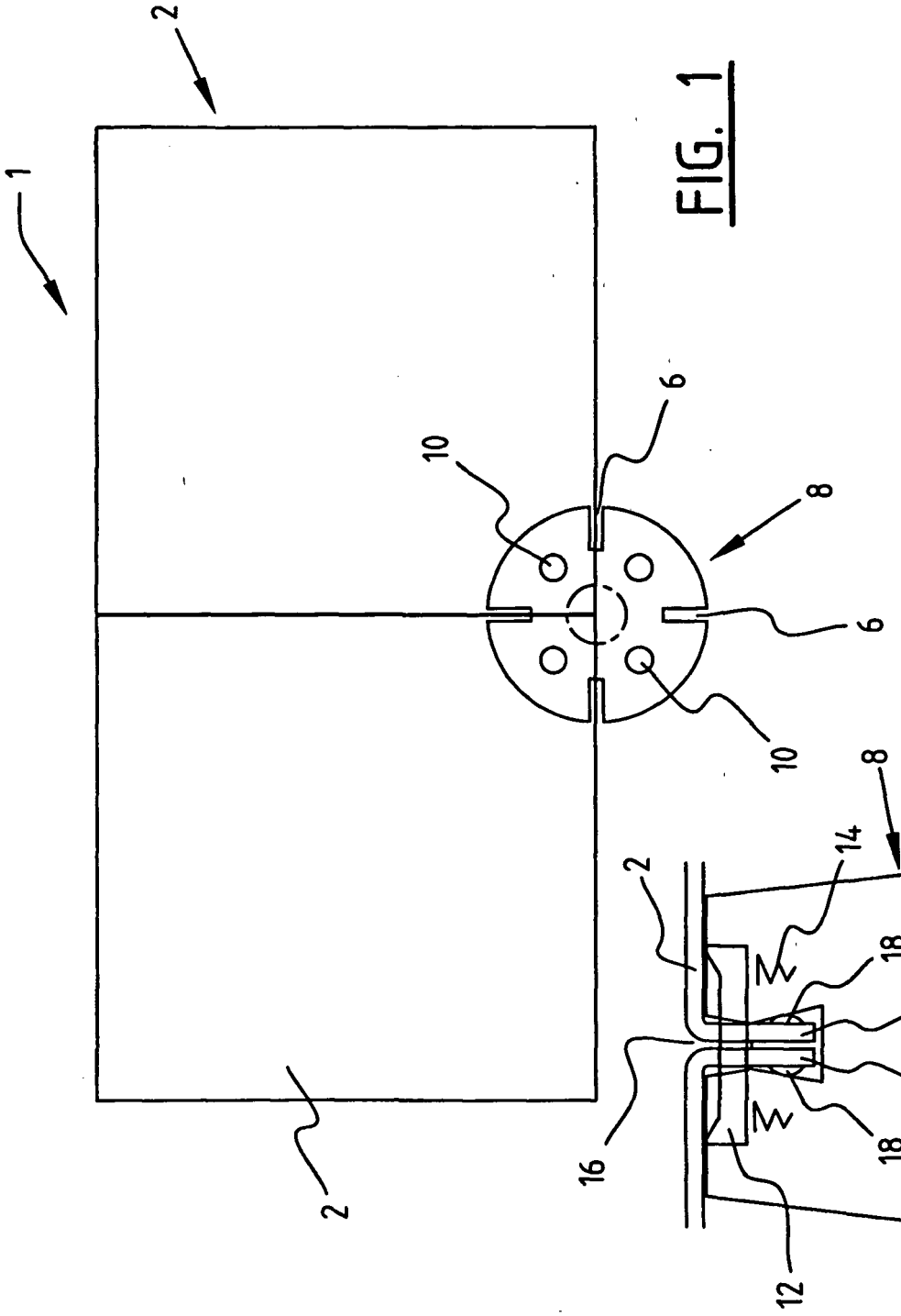

FIG. 1

FIG. 2

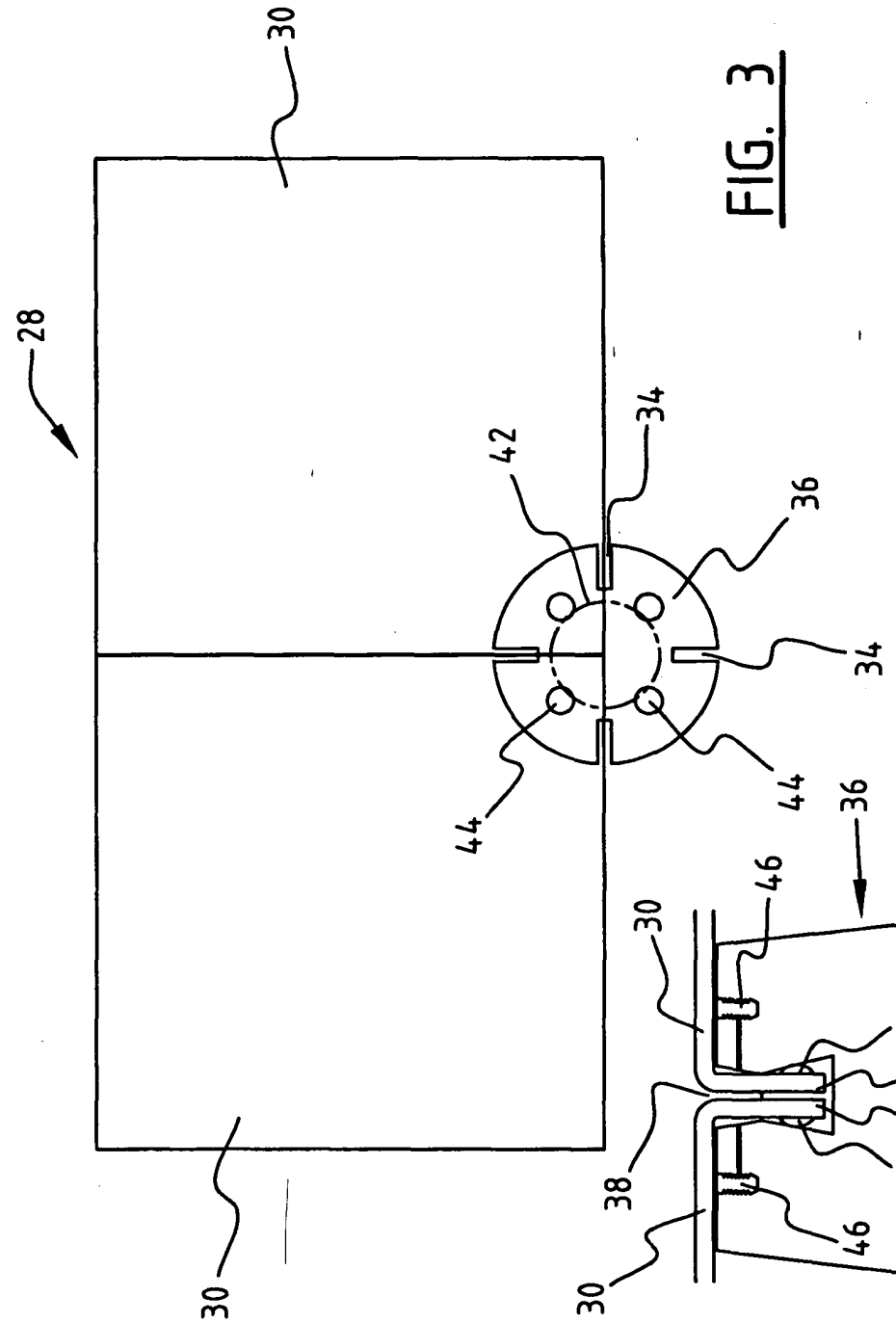

FIG. 3

FIG. 4

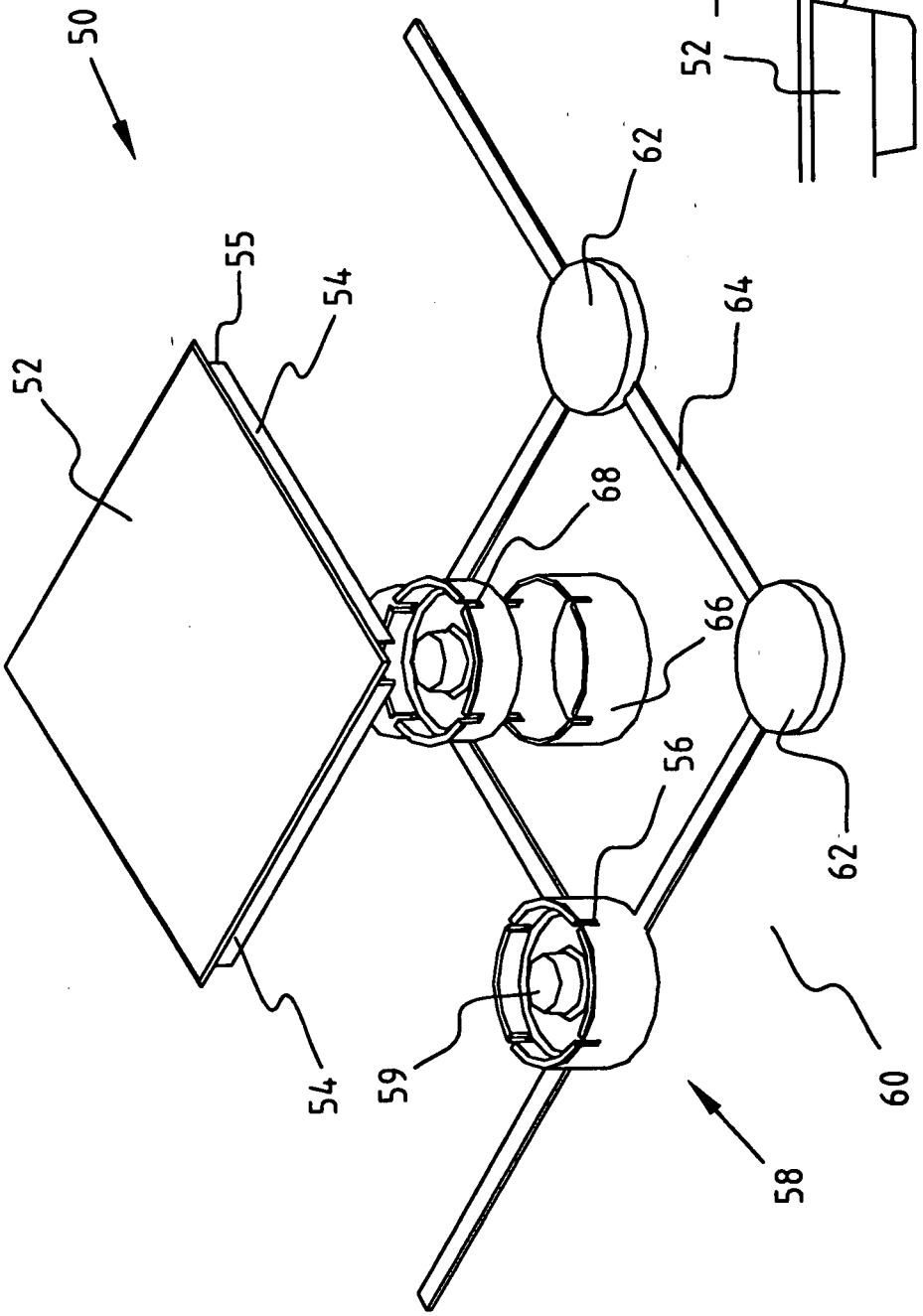

FIG. 5A

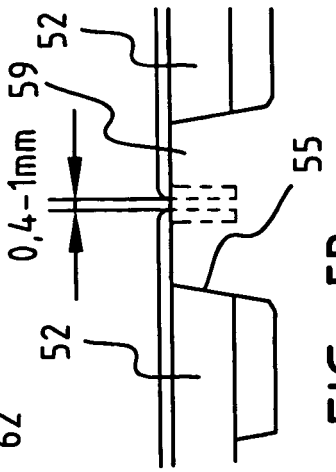

FIG. 5B

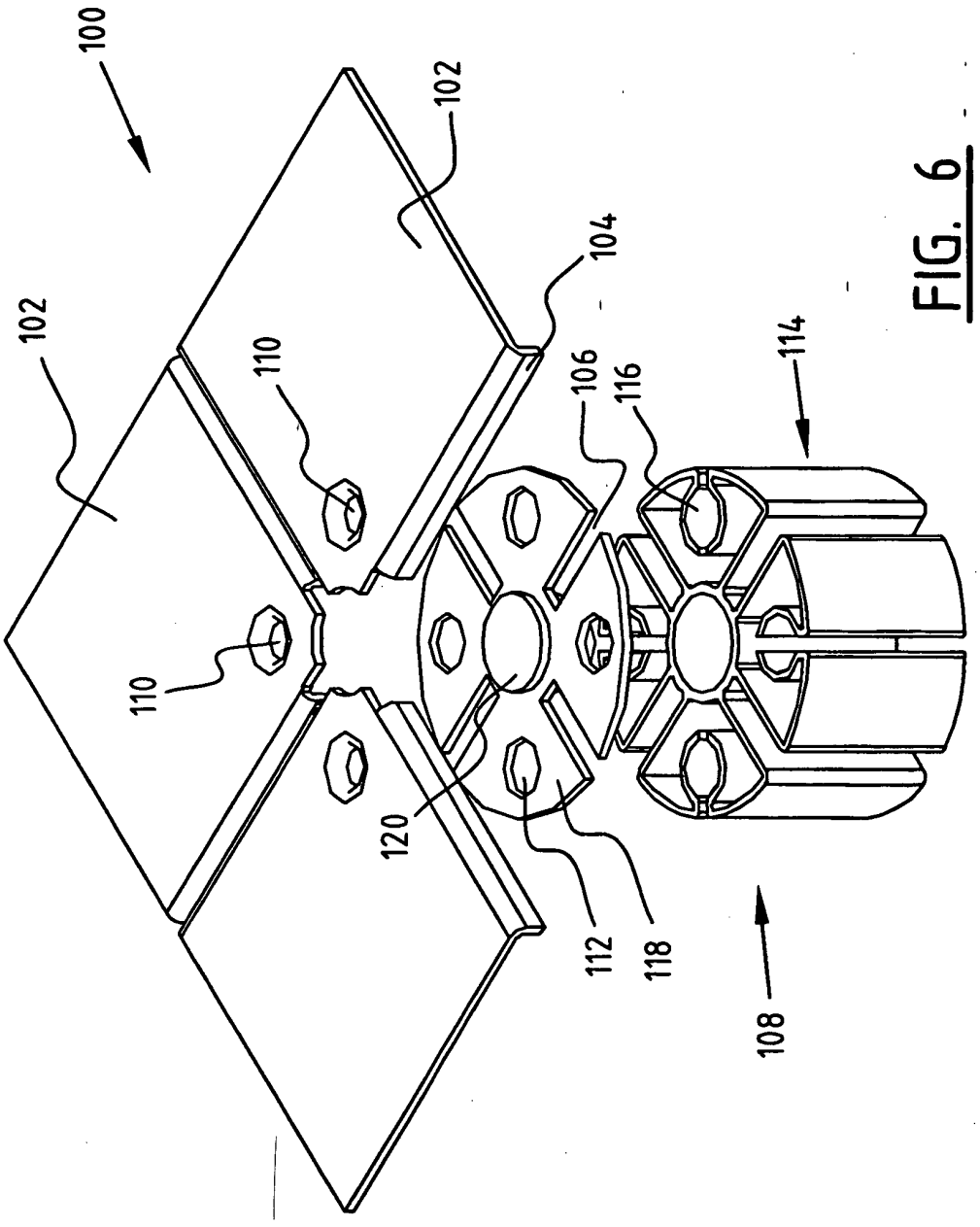

FIG. 6

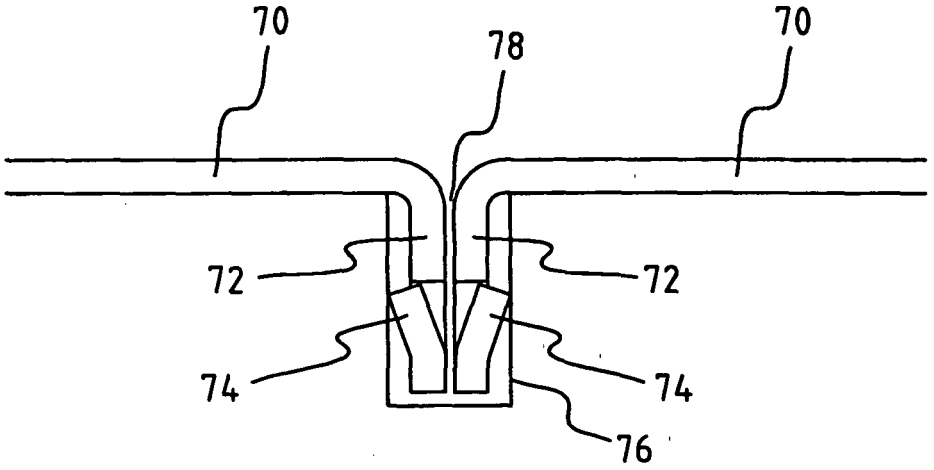

FIG. 7

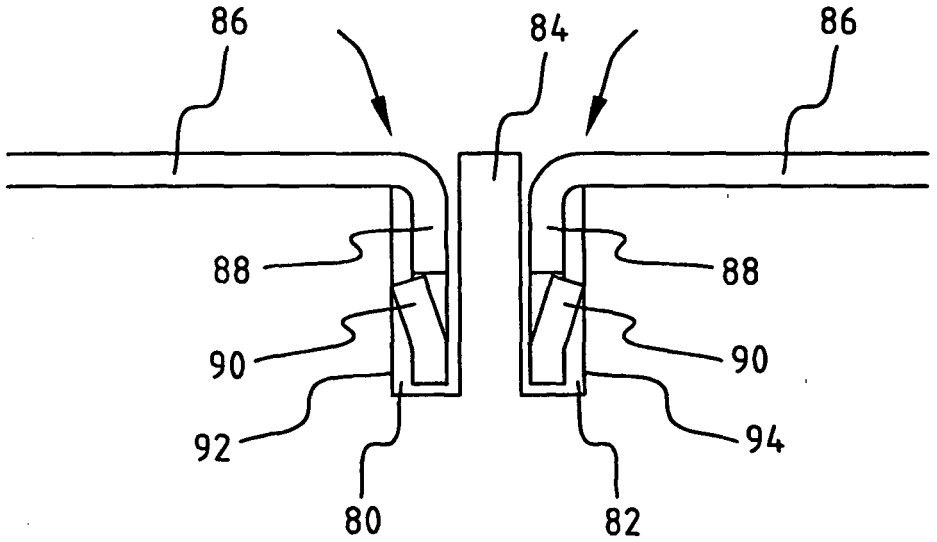

FIG. 8

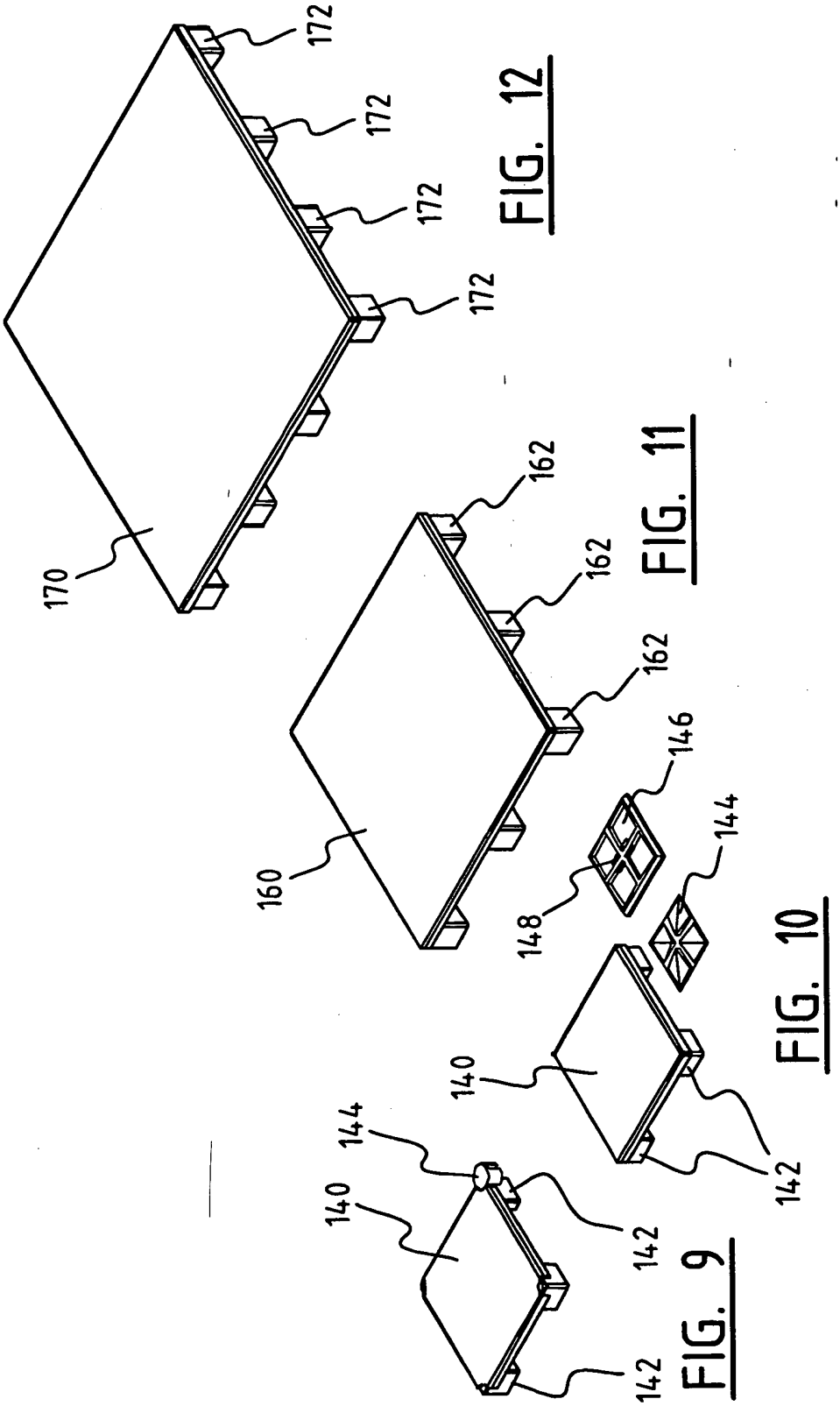

FIG. 12

FIG. 11

FIG. 10

FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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