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(54) Sectional modular elements for making non-permanent floors

(57) Modules for making provisional floors or platforms are based on a groove and tongue assembling arrangement that permits a longitudinal or transverse or mixed laying with an exact symmetry of the inserting points.

In general, the present modules are obtained by molding plastic materials or the like and comprise a base element (1) which shows an essentially rectangular shape having a certain height and is hollow inside

and open to the lower side.

Grooves (2) are arranged two by two along the four perimetric edges. The grooves of two adjacent sides are flanged with particular tongue projections (3) which are arranged around the grooves like a flange. The tongue projections (3) mate with the grooves (2) of an adjacent module.

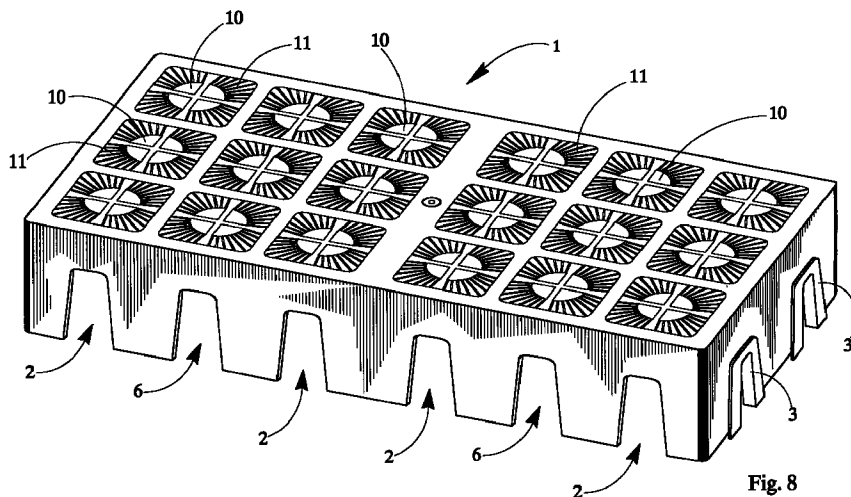


Fig. 8

Description

[0001] The present invention proposes sectional modular elements for making non-permanent floors.

[0002] These elements are essentially base modules which may be reciprocally connected with a lock joint in such a way as to obtain a floor to be used to protect, isolate and tread on places or grounds which are not floored, for instance sandy soils, grassy soils or the like.

[0003] In particular, the modular elements according to the present invention may be used for the following main purposes:

a) to make platforms or footboards for grassland or lawns which do not damage them because the particular shape of each module permits grass to breathe and not to rot, the drainage being safeguarded;

b) to walk in places without flooring or with a precarious soil, to walk in places where the access is only seasonal or to walk in gardens and vegetable gardens where it is necessary to use a sidewalk or a platform;

c) to isolate damp places, unfloored surfaces or surfaces that can not be floored permanently, rooms subjected to jets or sprinklings of water or other liquids such as greenhouses for nurseries, cheese factories, cattlesheds and farms, wineries etc.

d) to protect precarious electric cables arranged on the soil as in building yards or the like;

e) to use base surfaces for camping grounds in place of matting, for instance for supporting the tent beds, or in the pre-entrances of verandas, in laundries, bathrooms, shower cubicles or in workplaces such as laboratories, workshops, storehouses, open-air markets, covered markets, open-air places of entertainment and so on.

[0004] In addition, there may be other aims besides the above-mentioned ones for which it is possible to use the modular elements according to the present invention. These modular elements have been in short set up in favour of a practical, rapid assembly and disassembly. As it will be better described below, such modular elements may be used very easily, independently of their position.

[0005] As it is known, according to the present art there are footboards or provisional floorings to be used in some of the above-mentioned fields, these floorings being also sectional and being based on the principle of the mutual lock joint of sectional modular elements.

[0006] However, the known sectional, modular elements are subjected to the following practical drawbacks:

1) The known sectional, modular elements are provided with means of reciprocal joint which makes the assembling difficult in many cases. In addition, such means almost always has a limited tightness because the modules release themselves easily owing to a lack of efficient locking means.

2) The resting surface of the known modules is essentially level. Thus, if it is necessary to make provisional bearing surfaces for grassland, the resting surfaces cause damage to the grassland because they choke the small seedling of the lawn and cause the rottenness of the small plants owing to the impossibility of a water drainage.

3) The known sectional, modular elements are in general to be used only in the field they are designed to and are not versatile as the present invention.

[0007] The aim of the present invention is the removal of the aforesaid disadvantages by using modular elements for making provisional floors or footboards on the basis of a groove-and-tongue joint assembling arrangement which permits a longitudinal or transverse or mixed laying with an exact symmetry of the joint points.

[0008] Another advantage of the present invention is the realization of modular elements with an excellent capacity of bearing, the joining being obtained by means of a particular type of joint which is efficient even if the ground is rough.

[0009] All the specific aims, advantages and functions are reached according to the present invention with a series of sectional modular elements for making non-permanent floors, characterized for consisting of a base module having an essentially rectangular shape of a certain height, the module being hollow internally and open to the lower side, its length being preferably twice its width, and two of the adjacent sides being provided with particular couples of projecting connecting elements while the remaining two adjacent sides are provided with couples of hollow connecting groove elements.

[0010] In addition, further intermediate connecting modular elements are provided, the dimensions of which are half the dimensions of the main modular elements. More precisely, these intermediate elements have a perimetric square shape, the side length being the same as the length of the short side of the main module.

[0011] Finally, there are modular elements with inclined plane to be positioned on the outer sides of the assembled footboard.

[0012] Further features and details of the present invention will be better understood from the following description given as a not-limiting example on the base of the accompanying drawing wherein:

- figure 1 shows a schematic front view of one of the base modules according to the present invention on

the whole;

- figure 2 shows a schematic plan view of the base module;
- figures 3 and 3' show schematic views in vertical section of modular elements with inclined plane, in a version with a groove connection and in a version with a tongue connection, respectively;
- figures 4 and 4' show schematic plan views of the modular elements with inclined plane, in a version with a groove connection and in a version with a tongue connection, respectively;
- figure 5 shows a schematic view of the lower side of one of the base modular elements;
- figure 6 represents schematically one of the modular elements showing a square shape, this modul being a joint module;
- figure 7 shows a schematic plan view of a footboard, which is obtained by connecting some base modules;
- figure 8 shows a schematic, perspective view of one of the base modules on the whole.

[0013] With reference to the accompanying drawing, number 1 denotes a base modular element on the whole for making non-permanent floors according to the present invention. This base modular element may be carried out by moulding plastic material according to the following preferred compositions:

- PPc copolymer polypropylene, which is suitable for an outer-inner use and has the characteristics of a good light resistance and a good resistance to extreme temperatures (from -10°C to +80°C). In addition, it is water repellent and is washable with the conventional deteratives;
- PE-HD high density polyethylene, which is suitable for particular environments and has the characteristics of an optimal resistance to ultra-violet rays, to very rigorous climates (-30/40°C), and to the common hydrocarbons (oils, gasolines, etc.);
- PPc self-extinguishing UL94V-0, which is suitable for special uses in environments where there is a danger of fire and in those environments that must comply with strict provisions for the prevention; this material has the characteristic of an optimal heat resistance (+125°C).

[0014] The modular element 1 may be carried out by moulding different materials from the ones indicated by

way of examples. The modular element 1 has an essentially rectangular shape of a certain height and is hollow inside and open to the lower side. The rectangular shape of the module has a length that is twice its width.

5 **[0015]** As it appears from figures 1 and 2, grooves 2 are arranged two by two along the four perimetric edges. The grooves of two adjacent sides are flanged with tongue projections 3 which are arranged around the grooves like a flange.

10 **[0016]** Such grooves are essentially shaped like a reverse "U" which is slightly flared toward the lower side.

[0017] In this way, two adjacent sides are provided with tongue joint means while the remaining two adjacent sides are provided with groove joint means so that it is possible to carry out a platform or footboard of any shape, for instance like the one shown in figure 7.

15 **[0018]** As it appears from figure 5, the inner lower side of the module 1 is provided with orthogonal ribs 4 which are elements of reinforcement. Vertical tubes 5 are arranged centrally along the orthogonal ribs 4. The lower end of each vertical tube is aligned with the lower border of the module, and rests on the ground in order to support the central part of the module.

20 **[0019]** Finally, each module is provided with further grooved openings 6 along the perimetric edges. Electric cables or through conduits or the like may be inserted in such grooved openings 6. The alignment lines of the grooved openings meet with the vertical supporting tubes 5 at incisions 7 which are obtained on their lower ends.

25 **[0020]** In addition, the present system is provided with further modular elements 8, as it is represented in figures 6 and 9. The modular elements 8 act as "jolly" elements in the sense that they may be positioned in whatever point of a platform which has been realized with the above described base modular elements 1.

30 **[0021]** The dimensions of the intermediate modular elements 8 are half the dimensions of the main modular elements.

35 **[0022]** More precisely, the intermediate modular elements have a square shape, the length of the side being the same as the length of the shorter sides of the main module.

40 **[0023]** Finally, there are modular elements 9 with inclined wall for the formation of a chute for facilitating the ascent and descent to and from the footboard. These latest modular elements may be positioned along the perimetric edge of the assembled footboard and comprise connecting means which are positioned along the coupling side and are carried out according to the groove version indicated at 9 in figures 3 and 4 or according to the tongue version indicated at 9' in figures 3' and 4' depending on their configuration.

45 **[0024]** By using the so-described modular elements it is therefore possible to carry out platforms, footboards, floors or supporting surfaces. It is sufficient to connect the modular elements so as to cover the surface concerned.

[0025] To this end, a first module is positioned by keeping the groove sides toward the first most external angle of the platform. Then, the subsequent modules are positioned so that the groove sides of each module are positioned on the tongue sides of the modules which already rest on the ground. In this way, it is possible to obtain a mutual lock joint and a perfect locking.

[0026] The coupling profiles permit the modules to be perfectly blocked one with another so that the structure is self-supporting once it is positioned on the ground and it is not possible to release an element if the more external elements are not released before.

[0027] In addition, it is provided as an advantage that notches 10 are obtained on the upper surface of the modules and are surrounded by knurled sectors 11. The notches 10 avoid water stagnation and facilitate the ground airing. The knurled sectors 11 act as nonslip elements.

[0028] The so-described modules offer all the above mentioned advantages, namely, the greatest ease in assembling and laying the structure, the possibility of positioning the modules on grassland or lawns without damaging them thanks to the particular shape of each module, which shape permits grass to breathe and not to rot, the drainage being safe-guarded. The modules may be positioned also on earthy, sandy, wet, moist surfaces.

[0029] The modular elements in question have been described and represented according to the preferred embodiment. However, a person skilled in this field will be able to make changes that will be considered included in the scope of protection of the present invention.

Claims

1. A series of sectional modular elements for making non-permanent floors, characterized for consisting of a base module (1) having an essentially rectangular shape of a certain height, the module being hollow internally and open to the lower side, its length being preferably twice its width, and that two of the adjacent sides are provided with particular couples of projecting connecting elements (3) while the remaining two adjacent sides are provided with couples of hollow connecting groove elements (2).
2. Series of sectional modular elements as claimed in claim 1, characterized for comprising further intermediate connecting modular elements (8) having dimensions which are half the dimensions of the main modular elements, these intermediate elements having a perimetric square shape, the side length being the same as the length of the short side of the main module, as well as modular elements (9) with inclined plane to be positioned on the outer sides of the assembled footboard.

3. A series of sectional modular elements as claimed in the preceding claims, characterized in that grooves (2) are arranged two by two along the four perimetric edges,

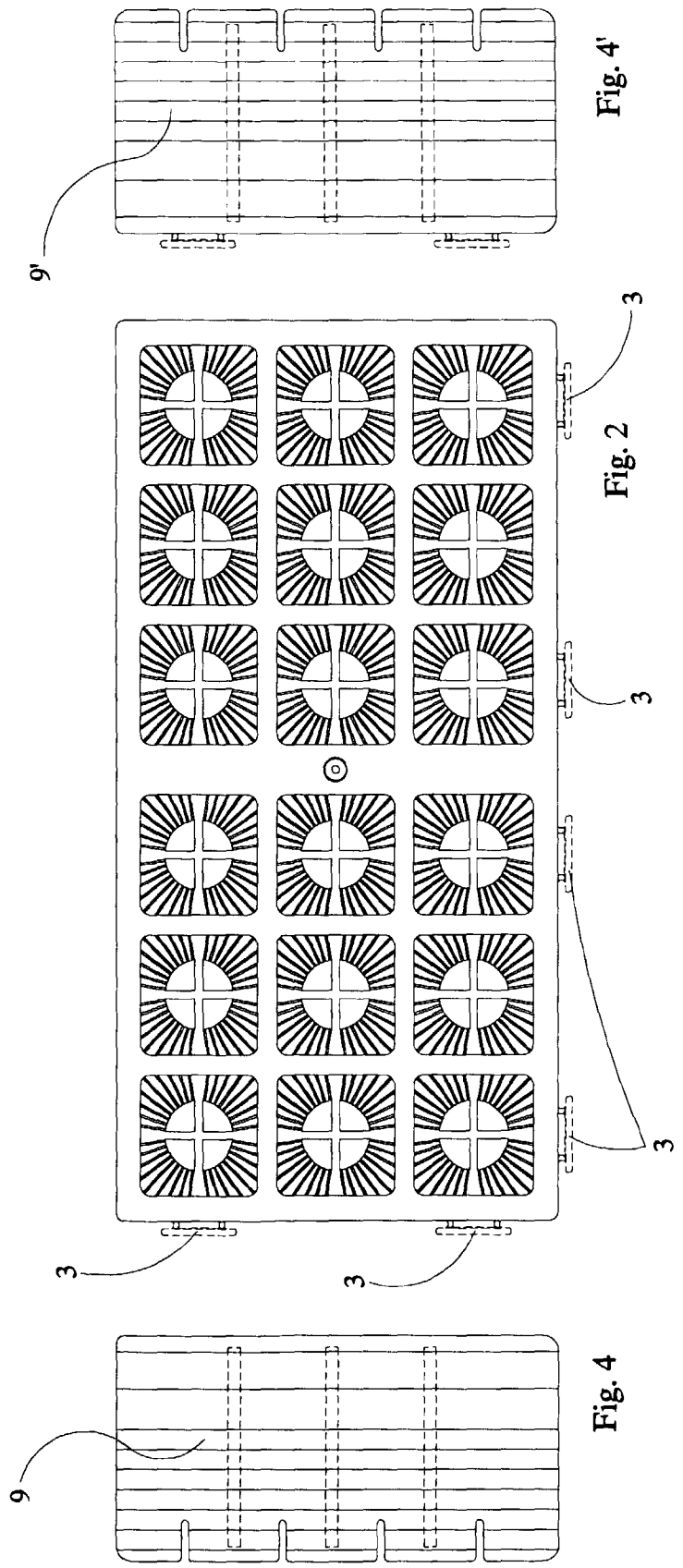
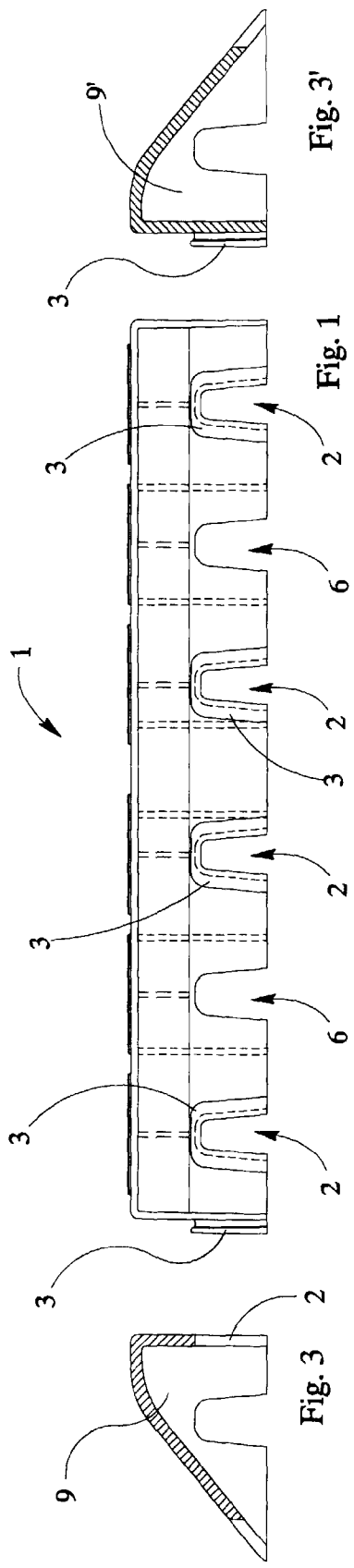
5 the grooves of two adjacent sides being flanged with tongue projections (3) which are arranged around the grooves like a flange, such grooves being essentially shaped like a reverse "U" which is slightly flared toward the lower side.

4. A series of sectional modular elements as claimed in the preceding claims, characterized in that the lower inner side of each module shows orthogonal ribs (4) which are elements of reinforcement, vertical tubes (5) being arranged centrally along the orthogonal ribs, the lower end of each vertical tube being aligned with the lower border of the module and resting on the ground in order to support the central part of the module.

5. A series of sectional modular elements as claimed in the preceding claims, characterized in that each module is provided with further grooved openings (6) along the perimetric edges, electric cables or through conduits or the like being inserted in such grooved openings, the alignment lines of the grooved openings meeting with the vertical supporting tubes (5) at incisions (7) which are obtained on their lower ends.

6. A series of sectional modular elements as claimed in the preceding claims, characterized for comprising modular elements (9) with inclined wall for the formation of a chute for facilitating the ascent and descent to and from the footboard, these latest modular elements comprise connecting means which are positioned along the coupling side and carried out according to the groove version and according to the tongue version depending on their configuration.

7. A series of sectional modular elements as claimed in the preceding claims, characterized in that notches (10) are obtained on the upper surface of the modules and are surrounded by knurled sectors (11), the notches avoiding water stagnation and facilitating the ground airing and the knurled sectors acting as nonslip elements.



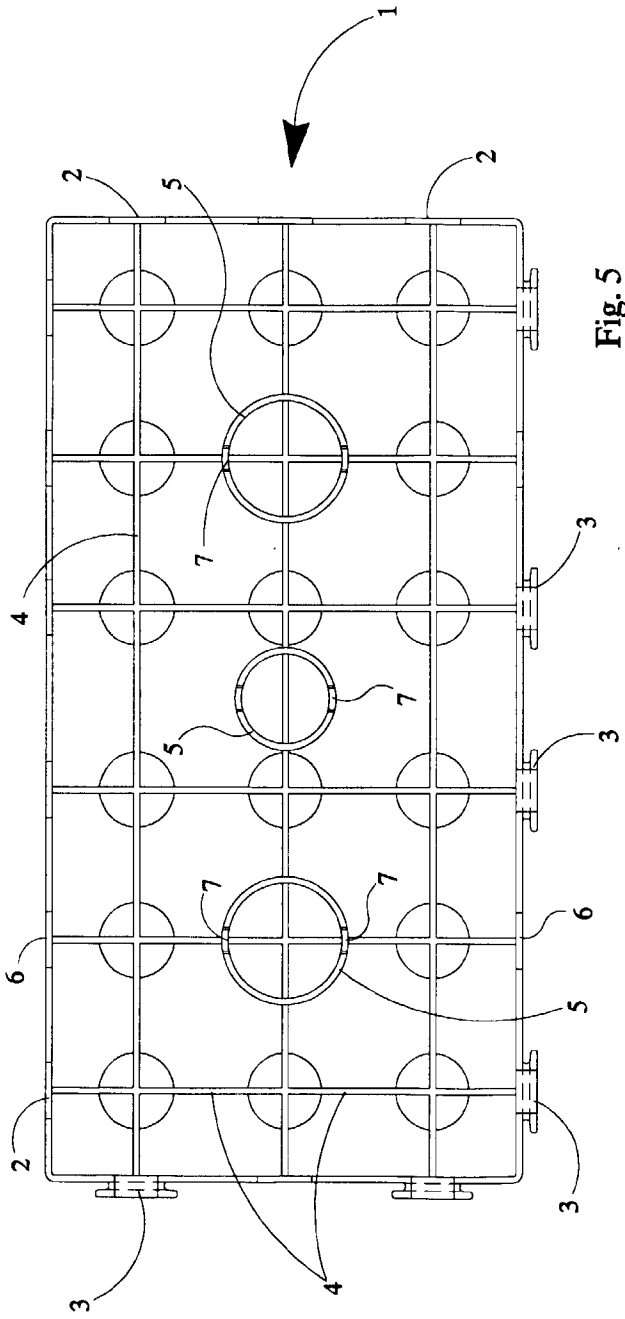


Fig. 5

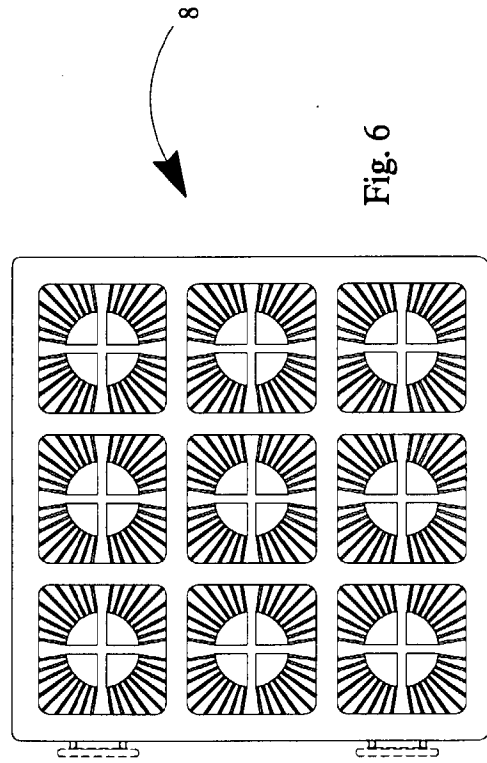
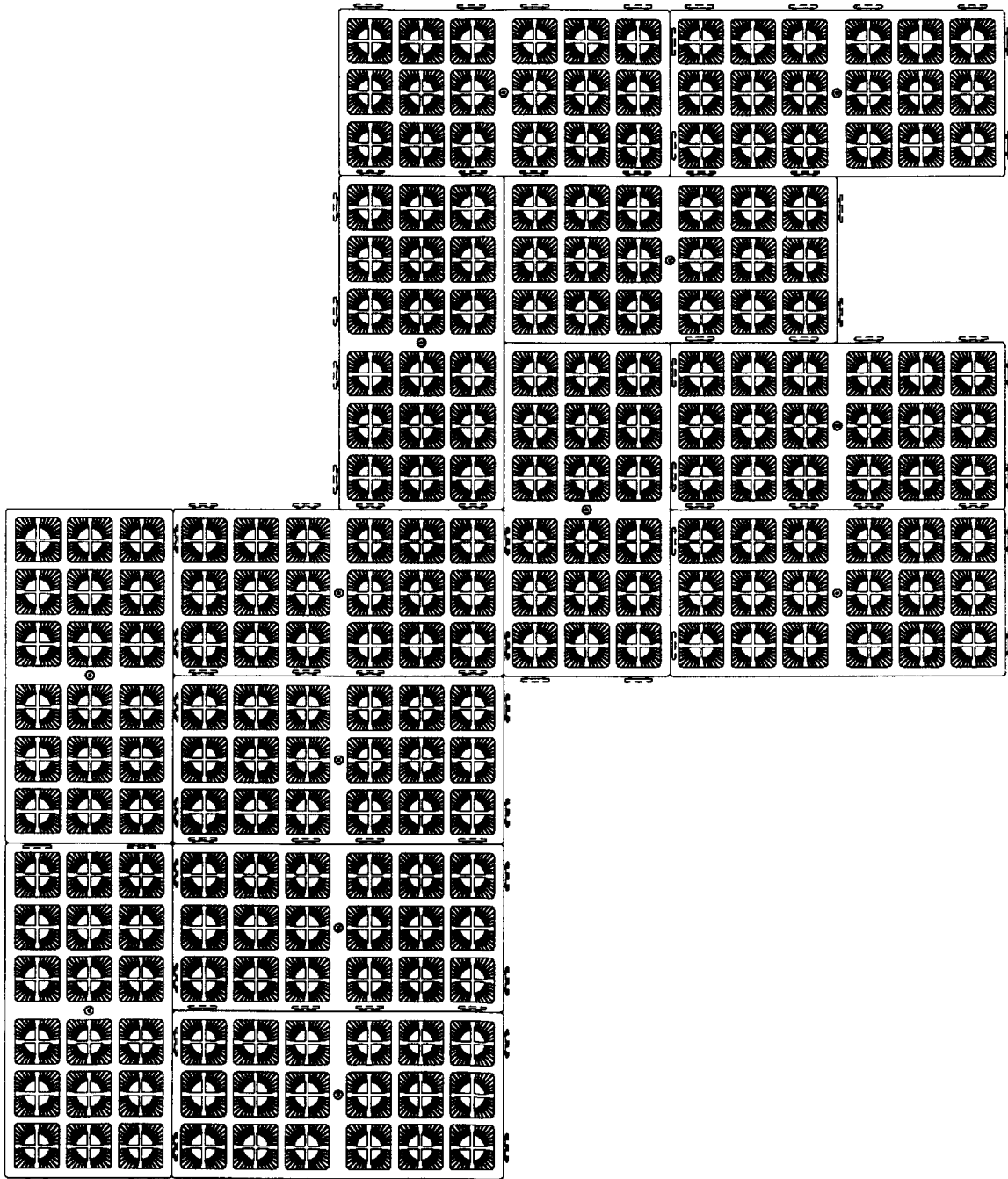


Fig. 6

Fig. 7



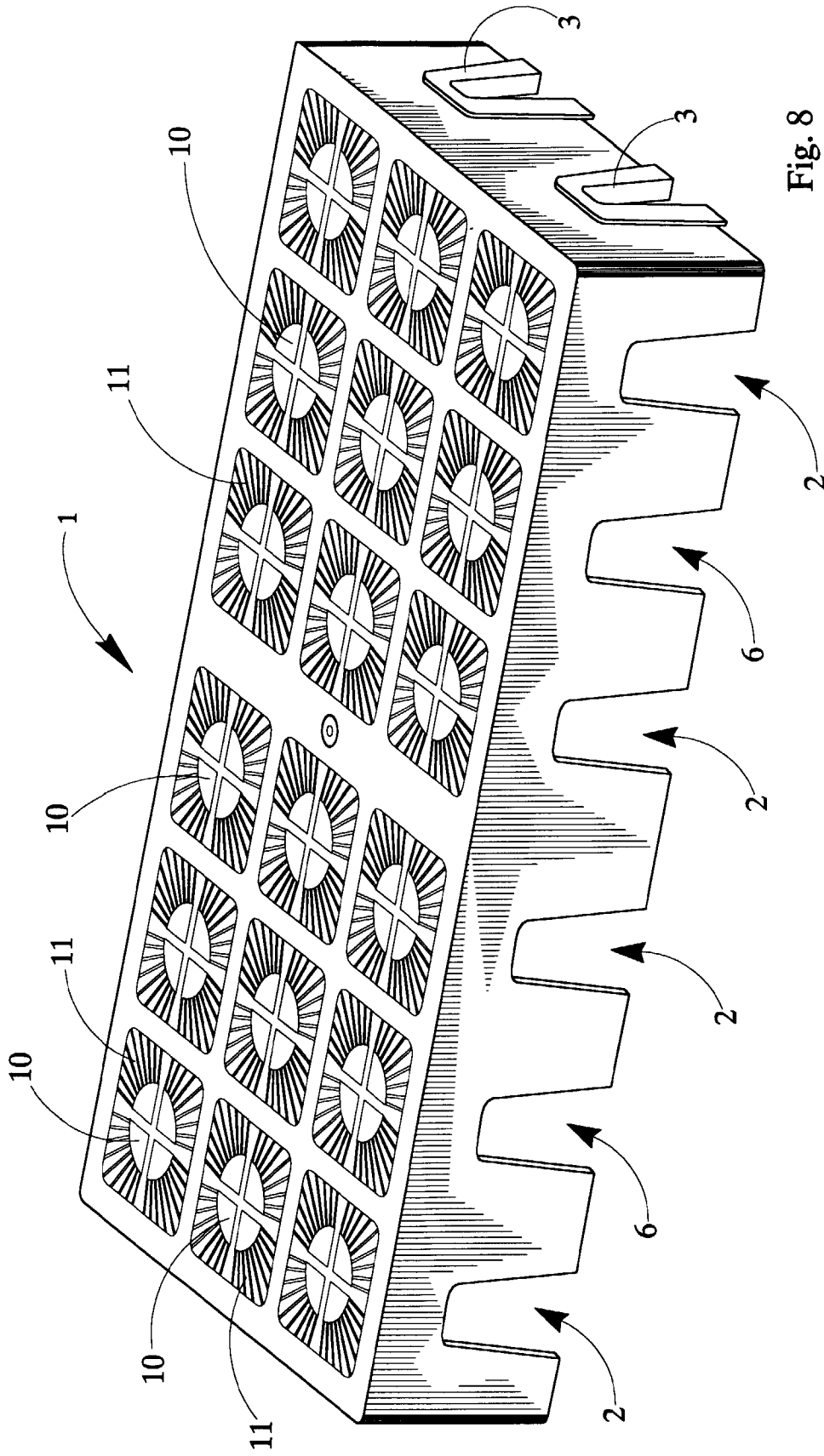


Fig. 8