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(54) **Irrigation and drainage box**

Kasten zur Irrigation und Drainage

Boitier d'irrigation et de drainage

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Description

[0001] The invention relates to an irrigation and/or drainage box according to the preamble of claim 1.

[0002] A drainage box of this type is disclosed in JP-A-4-26648. The known drainage box has a conical shape with oblique side walls. The circumferential edge of the box provided with connection parts by means of which two same boxes can be connected to one another.

[0003] The object of the invention is to provide an improved irrigation and/or drainage box which, in combination with another box or other boxes according to the invention in order to form an irrigation and/of drainage unit or system to be placed in the ground, can withstand loads from the surrounding earth and/or loads on the ground better than the known drainage box.

[0004] This object is achieved by an irrigation and/or drainage box having the features of the characterising part of claim 1.

[0005] EP-A-0787865 discloses an irrigation and/or drainage box with columns. However, this box is designed for combination with a lid.

[0006] Advantageous embodiments of an irrigation and/or drainage box according to the invention are specified in the subclaims.

[0007] The invention will be explained in more detail in the following description of a specific embodiment of the irrigation and/or drainage box according to the invention, with reference to the drawing, in which:

- Fig. 1 shows a perspective view of a specific embodiment of the box according to the invention,
- Fig. 2 shows a plan view of the box shown in Fig. 1,
- Fig. 3 shows a side view of the long side of the box shown in Fig. 1,
- Fig. 4 shows a side view of the short side of the box shown in Fig. 1,
- Fig. 5 shows a perspective view of a unit formed from two boxes shown in Fig. 1 which have been placed with the open sides towards one another, and
- Fig. 6 shows an irrigation and/or drainage system which has been formed from boxes in accordance with Fig. 1.

[0008] The irrigation and/or drainage box 1 according to the invention which is illustrated in the drawing, preferably consists of plastic and is made by injection-moulding, comprises a base 2, long side walls 3 and short side walls 4. The side walls 3, 4 are substantially perpendicular to the base 2 and are integrally connected thereto. The box 1 is open on the side which lies opposite the base.

[0009] The base 2 and the side walls 3, 4 are provided with perforations or openings 5 and 6, respectively, which openings may have many different forms. These perforations or openings 5, 6 serve to allow water to pass through.

[0010] The box 1 is furthermore provided with columns 7, 8 which extend substantially vertically from the base 2 towards the open side of the box, the columns 7 adjoining the side walls 3, 4 and being integral therewith, while the columns 8 stand free in the box 1. The columns 7 which are integral with the side walls 3, 4 are of planar design at least on the side which adjoins the side walls 3, 4. In the embodiment of the box 1 illustrated, this planar side lies in the same plane as the outer side of the side wall 3, 4 in question, and the columns 7 in question are preferably substantially square in cross section. The columns 8 standing inside the box are preferably round in cross section, since this is advantageous from the manufacturing technology viewpoint.

[0011] In the irrigation and/or drainage box 1 according to the invention, the base 2 and the side walls 3, 4, as can also be seen in the drawing, are preferably of substantially planar design and free from projections on the outer side of the box. This has the advantage that the boxes are easier to manufacture and furthermore avoids damaging nets or filter cloths made from geotextile which are arranged around the boxes in order to prevent soil particles from entering the box via the openings 5 and 6.

[0012] On the open side, the box 1 according to the invention is designed in such a manner that two same boxes can be placed with the open sides towards one another and can be connected to one another without the need for further accessories, producing a unit as shown in Fig. 5.

[0013] Preferably, for this purpose, at least some of the columns 7, 8, usually half of the columns 7, 8, are provided, on the open side of the box, with first connection parts, and other columns 7, 8, usually the other half of the columns 7, 8, are provided, on the open side of the box, with second connection parts. When two boxes 1 are placed with the open sides towards one another, the first connection parts of one box are able to interact with the second connection parts of the other box, thus forming a connection between the two boxes.

[0014] In the embodiment of the box 1 illustrated, the first connection parts are formed by projections 9 which lie at the free end of the columns 7, 8 in question and form an extension of these columns, and the second connection parts are formed by cavities 10 which are formed in the free end section of the columns 7, 8 in question. The distribution of the projections 9 and the cavities 10 is such that when two boxes 1 are placed with the open sides towards one another, projections 9 on columns 7, 8 of one box fit into cavities 10 in columns 7, 8 of the other box, thus forming the connection between the two boxes.

[0015] Preferably, the connection between a first connection part (projection 9) and second connection part (cavity 10) is a click-fit or clamp-fit connection.

[0016] Advantageously, openings 11 through which water can run into or out of the columns 7, 8 are formed in the projections 9. Furthermore, the openings 11 are

advantageous when moulding the columns, since they provide the option of supporting a core which forms the inside of the column 7, 8, during injection-moulding of a box 1 in an injection mould, on a mould part which forms the outside of the column 7, 8.

[0017] As can be seen in the embodiment of the box according to the invention which is illustrated in the drawing, the top side of the columns 7, 8 extends approximately as far as the plane which is defined by the edges 12 of the side walls 3, 4 and the projections 9 project beyond this plane.

[0018] In the irrigation and/or drainage box according to the invention, it is preferable for at least one of the side walls to be provided with a preferably round opening 13. In the embodiment illustrated, the two short side walls 4 are provided with such an opening 13. The opening 13 is provided with a grate 14, which can easily be removed. A connection pipe 15 (cf. Fig. 6) can be fitted into the opening 13, preferably after the grate 14 has been removed. It is also possible firstly to position a half pipe socket (not shown) in the opening 13, which socket is connected, preferably with a clamp fit, to the edge 16 of the opening 13. A connection pipe can then again be fitted into this half pipe socket. The connection between the connection pipe 15 and the box 1 does not have to be leaktight. The connection using a half pipe socket prevents the connection pipe from slipping out of the opening 13 in the event of any subsidence.

[0019] As has already been stated, two same boxes 1 can be placed with the open sides towards one another, thus forming a unit 17 (cf. Fig. 5) which is delimited by the two bases 2 and side walls 3, 4 and which is able to leave an underground space open. Covering units of this nature with filter cloth prevents soil particles from penetrating into and contaminating the underground space and ultimately limiting the capacity of the units.

[0020] Preferably, in the irrigation and/or drainage box 1 according to the invention, the ratio between the length and the width is 2:1. In this case, the columns 7, 8 are preferably provided with connection parts 9, 10 and positioned in such a manner that two boxes 1 can be placed against one another with their longitudinal axes parallel to one another so that they completely overlap, but also with their longitudinal axes perpendicular to one another. In the first case, two boxes form a separate unit which is delimited by the bases and side walls, as illustrated in Fig. 5. In the second case, it is possible to assemble larger irrigation and/or drainage units, with a large number of boxes being placed on top of one another in the form of building bricks.

[0021] In a practical embodiment, the dimensions (length x width x height) of a box are 100 x 50 x 23.4 cm. The openings 13 in the side walls 10 have a diameter of approx. 18 cm. A half pipe socket for a connection pipe with a diameter of 16 cm fits into these openings.

[0022] A plurality of units 17 formed by two boxes 1 which have been placed with the open sides towards one another can be placed on top of and/or next to one

another and coupled together, so as to form larger systems. Fig. 6 shows such a system with six units 17 (twelve boxes 1). A connection pipe 15 is connected to one of the boxes. In Fig. 6, two units 17 which are indicated by dashed lines are positioned transversely with respect to the other units 17. Connection parts (not shown) can be used to couple together the boxes. The connection parts may be simple loose clamps, but may also be integral connection parts formed on the boxes themselves.

[0023] If the short sides are coupled together, the grates 14 do not have to be removed from the openings 13.

[0024] The base 2, which is planar on the outer side, is provided, inside the box, with a relatively large number of columns 7, 8 and ribs 18, in order to make the boxes able to withstand any loads on the ground which arise.

[0025] In embodiments of the irrigation and/or drainage box according to the invention which are not shown, it is possible to position the columns 8 in such a manner that there are no columns in a straight line between the openings 13 in the short side walls 4, so that in principle the units can be cleaned internally by using a hose to spray through them via the openings 13.

Claims

1. Irrigation and/or drainage box (1), comprising a base (2) which is provided with perforations (5) and side walls (3,4) which are provided with perforations (6) and which are integrally connected to the base, the box being open on the side which lies opposite the base, and the box being designed, on the open side, such that two same boxes (1) can be placed with the open sides towards one another and can be connected to one another without the need for further accessories, **characterized in that** the side walls (3,4) are substantially perpendicular to the base (2), **in that** the box (1) comprises columns (7,8) which extend substantially vertically from the base (2) towards the open side, and **in that** at least some of the columns (7,8) are provided, on the open side of the box, with first connection parts (9), and other columns (7,8) are provided, on the open side of the box, with second connection parts (10), such that, when two same boxes according to the invention are placed with the open sides towards one another, the first connection parts (9) of one of the two same boxes are able to interact with the second connection parts (10) of the other of the two same boxes in order to form a connection between the two same boxes.
2. Irrigation and/or drainage box according to claim 1, **characterized in that** the first connection parts are formed by projections (9) which lie at the free end of the columns (7,8) in question and form an exten-

sion of these columns, and the second connection parts are formed by cavities (10) which are formed in the free end section of the columns (7,8) in question, such that, when two same boxes are placed with the open sides towards one another, projections (9) on columns of one of the two boxes fit into cavities (10) in columns of the other of the two boxes.

3. Irrigation and/or drainage box according to claim 2, **characterized in that** the connection between the first (9) and the second connection part (10) is a click-fit or clamp-fit connection. 5
4. Irrigation and/or drainage box according to one of claims 1-3, **characterized in that** the box (1) is provided with columns (7) which adjoin and are integral with the side walls (3,4) and are of planar design at least on the side which adjoins the side walls. 15
5. Irrigation and/or drainage box according to claim 4, **characterized in that** the planar side of the column (7) which is integral with a side wall (3,4) lies in the same plane as the outer side of the side wall in question. 20
6. Irrigation and/or drainage box according to one of claims 1-5, **characterized in that** the base (2) and the side wall (3,4) of the box (1) are of substantially planar design on the outer side of the box. 25
7. Irrigation and/or drainage box according to one of claims 1-6, **characterized in that** columns (8) which do not adjoin the side walls (3,4) are substantially round in cross section. 30
8. Irrigation and/or drainage box according to one of claims 1-7, **characterized in that** at least one of the side walls (4) is provided with an opening (13) in which a pipe part can be placed. 35
9. Irrigation and/or drainage box according to claim 8, **characterized in that** the opening (13) is provided with a grate (14). 40
10. Irrigation and/or drainage box according to claim 9, **characterized in that** the grate (14) is removable. 45
11. Irrigation and/or drainage box according to one of claims 8-10, **characterized in that** two side walls (4) which lie opposite one another are provided with an opening (13) 50
12. Irrigation and/or drainage box according to one of claims 1-11, **characterized in that** the ratio between the length and the width of the box (1) is 2:1. 55
13. Irrigation and/or drainage box according to claim

12, **characterized in that** the first and second connection parts (9, 10) are positioned such that two same boxes (1) can be placed with the open sides against one another and connected to one another with their longitudinal axes parallel to one another so that they completely overlap, and also with their longitudinal axes perpendicular to one another.

14. Irrigation and/or drainage unit comprising two same boxes (1) according to one or more of claims 1-13 which have been placed towards one another and have been connected to one another.
15. Irrigation and/or drainage system comprising a plurality of boxes (1) according to one or more of claims 1-13.

Patentansprüche

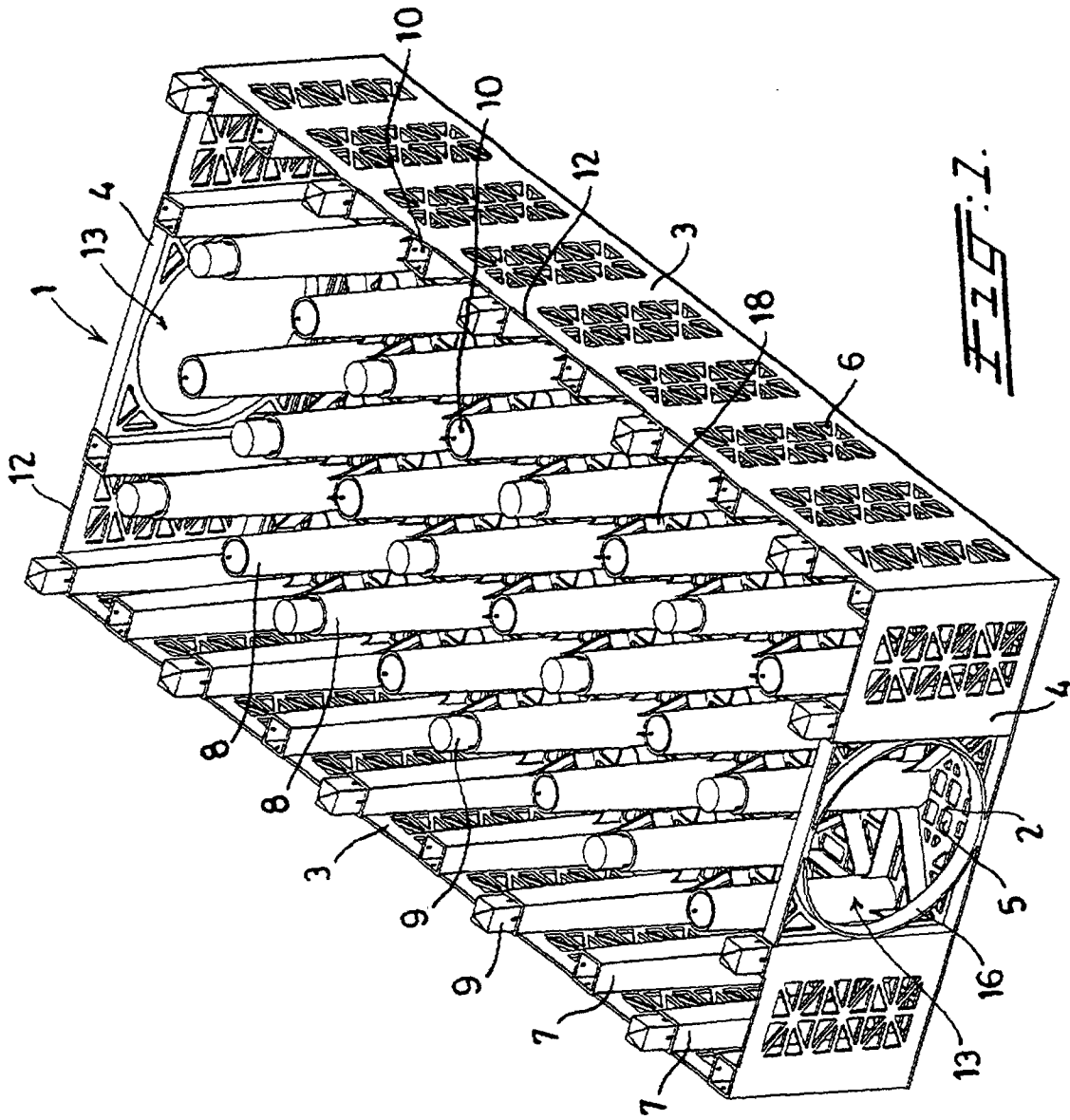
1. Irrigations- und/oder Drainagekasten (1), mit einer Basis (2), die mit Perforationen (5) versehen ist, und Seitenwänden (3,4), die mit Perforationen (6) versehen und einstückig mit der Basis verbunden sind, wobei der Kasten an der Seite offen ist, die der Basis gegenüberliegt, und der Kasten an der offenen Seite derart ausgebildet ist, daß zwei gleiche Kästen (1) mit den offenen Seiten gegeneinandergesetzt und miteinander ohne das Erfordernis weiteren Zubehörs verbunden werden können, **dadurch gekennzeichnet, daß** die Seitenwände (3,4) im wesentlichen senkrecht zur Basis (2) stehen, daß der Kasten (1) Säulen (7,8) aufweist, die sich im wesentlichen senkrecht von der Basis (2) zu der offenen Seite erstrecken, und daß zumindest einige der Säulen (7,8) an der offenen Seite des Kastens mit ersten Verbindungsteilen (9) und andere Säulen (7,8) an der offenen Seite des Kastens mit zweiten Verbindungsteilen (10) versehen sind, derart, daß, wenn zwei gleiche Kästen nach der Erfindung mit den offenen Seiten gegeneinandergesetzt werden, die ersten Verbindungsteile (9) eines der beiden gleichen Kästen in der Lage sind, mit den zweiten Verbindungsteilen (10) des anderen der beiden gleichen Kästen zusammenzuwirken, um eine Verbindung zwischen den beiden gleichen Kästen zu bilden. 20
2. Irrigations- und/oder Drainagekasten nach Anspruch 1, **dadurch gekennzeichnet, daß** die ersten Verbindungsteile von Vorsprüngen (9) gebildet sind, die am freien Ende der fraglichen Säulen (7,8) liegen und eine Verlängerung dieser Säulen bilden, und die zweiten Verbindungsteile von Hohlräumen (10) gebildet sind, die im freien Endabschnitt der fraglichen Säulen (7,8) gebildet sind, derart, daß, wenn zwei gleiche Kästen mit den offenen Seiten gegeneinandergesetzt werden, Vorsprünge (9) an 25

- Säulen eines der beiden Kästen in Hohlräume (10) in Säulen des anderen der beiden Kästen hineinpassen.
3. Irrigations- und/oder Drainagekasten nach Anspruch 2, **dadurch gekennzeichnet, daß** die Verbindung zwischen dem ersten (9) und dem zweiten Verbindungsteil (10) eine Schnapp- oder Klemmverbindung ist. 5
 4. Irrigations- und/oder Drainagekasten nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, daß** der Kasten (1) mit Säulen (7) versehen ist, die an die Seitenwände (3,4) angrenzen, mit diesen einstückig sind und eine ebenflächige Ausbildung zumindest an der Seite aufweisen, die an die Seitenwände angrenzt. 10
 5. Irrigations- und/oder Drainagekasten nach Anspruch 4, **dadurch gekennzeichnet, daß** die ebenflächige Seite der Säule (7), die mit einer Seitenwand (3,4) einstückig ist, in der gleichen Ebene liegt wie die Außenseite der fraglichen Seitenwand. 20
 6. Irrigations- und/oder Drainagekasten nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, daß** die Basis (2) und die Seitenwände (3,4) des Kastens (1) eine im wesentlichen ebenflächige Ausbildung auf der Außenseite des Kastens aufweisen. 25
 7. Irrigations- und/oder Drainagekasten nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, daß** Säulen (8), die nicht an die Seitenwände (3,4) angrenzen, im Querschnitt im wesentlichen rund sind. 30
 8. Irrigations- und/oder Drainagekasten nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, daß** zumindest eine der Seitenwände (4) mit einer Öffnung (13) versehen ist, in die ein Rohrteil eingesetzt werden kann. 35
 9. Irrigations- und/oder Drainagekasten nach Anspruch 8, **dadurch gekennzeichnet, daß** die Öffnung (13) mit einem Gitter (14) versehen ist. 40
 10. Irrigations- und/oder Drainagekasten nach Anspruch 9, **dadurch gekennzeichnet, daß** das Gitter (14) abnehmbar ist. 45
 11. Irrigations- und/oder Drainagekasten nach einem der Ansprüche 8 bis 10, **dadurch gekennzeichnet, daß** zwei Seitenwände (4), die einander gegenüberliegen, mit einer Öffnung (13) versehen sind. 50
 12. Irrigations- und/oder Drainagekasten nach einem der Ansprüche 1 bis 11, **dadurch gekennzeichnet, daß** das Verhältnis zwischen Länge und Breite des Kastens (1) 2:1 beträgt. 55
 13. Irrigations- und/oder Drainagekasten nach Anspruch 12, **dadurch gekennzeichnet, daß** die ersten und zweiten Verbindungsteile (9,10) derart angeordnet sind, daß zwei gleiche Kästen (1) mit ihren offenen Seiten gegeneinandergesetzt und miteinander verbunden werden können, mit ihren Längsachsen parallel zueinander, so daß sie einander vollständig übergreifen, jedoch auch mit ihren Längsachsen senkrecht zueinander.
 14. Irrigations- und/oder Drainageeinheit, mit zwei gleichen Kästen (1) nach einem oder mehreren der Ansprüche 1 bis 13, die mit den offen Seiten gegeneinandergesetzt und miteinander verbunden sind.
 15. Irrigations- und/oder Drainagesystem, mit einer Mehrzahl von Kästen (1) nach einem oder mehreren der Ansprüche 1 bis 13.

Revendications

1. Boîtier d'irrigation et/ou de drainage (1) comprenant une base (2) munie de perforations (5) et des parois latérales (3, 4) qui sont munies de perforations (6) et qui sont reliées solidairement à la base, le boîtier étant ouvert du côté situé à l'opposé de la base et étant conçu, du côté ouvert, de façon que deux boîtiers (1) similaires puissent être placés en ayant leurs côtés ouverts tournés l'un vers l'autre et être reliés l'un à l'autre sans qu'aucun autre accessoire ne soit nécessaire, **caractérisé en ce que** les parois latérales (3, 4) sont sensiblement perpendiculaires à la base (2), **en ce que** le boîtier (1) comprend des colonnes (7, 8) qui s'étendent sensiblement verticalement à partir de la base (2) en direction du côté ouvert, et **en ce que** certaines au moins des colonnes (7, 8) sont pourvues, du côté ouvert du boîtier, de premières parties de liaison (9), tandis que d'autres colonnes (7, 8) sont pourvues, du côté ouvert du boîtier, de secondes parties de liaison (10) de façon que, lorsque deux boîtiers similaires selon l'invention sont placés en ayant leurs côtés ouverts tournés l'un vers l'autre, les premières parties de liaison (9) de l'un des deux boîtiers similaires puissent coopérer avec les secondes parties de liaison (10) de l'autre des deux boîtiers similaires, afin de former une liaison entre les deux boîtiers similaires.
2. Boîtier d'irrigation et/ou de drainage selon la revendication 1, **caractérisé en ce que** les premières parties de liaison sont formées par des protubérances (9) qui s'étendent au niveau de l'extrémité libre des colonnes (7, 8) correspondantes et définissent

- un prolongement desdites colonnes, et **en ce que** les secondes parties de liaison sont formées par des cavités (10) définies dans la partie d'extrémité libre des colonnes (7, 8) correspondantes de façon que, lorsque deux boîtiers similaires sont placés en ayant leurs côtés ouverts tournés l'un vers l'autre, les protubérances (9) formées sur les colonnes de l'un des deux boîtiers s'emboîtent dans les cavités (10) formées dans les colonnes de l'autre des deux boîtiers.
3. Boîtier d'irrigation et/ou de drainage selon la revendication 2, **caractérisé en ce que** la liaison entre la première partie de liaison (9) et la seconde partie de liaison (10) est une liaison par encliquetage ou par serrage.
4. Boîtier d'irrigation et/ou de drainage selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** le boîtier (1) est pourvu de colonnes (7) adjacentes aux parois latérales (3, 4) et solidaires de celles-ci et qui sont de configuration plane au moins du côté adjacent aux parois latérales.
5. Boîtier d'irrigation et/ou de drainage selon la revendication 4, **caractérisé en ce que** le côté plan de la colonne (7) qui est solidaire d'une paroi latérale (3, 4) s'étend dans le même plan que le côté extérieur de la paroi latérale correspondante.
6. Boîtier d'irrigation et/ou de drainage selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** la base (2) et les parois latérales (3, 4) du boîtier (1) sont de configuration sensiblement plane du côté extérieur du boîtier.
7. Boîtier d'irrigation et/ou de drainage selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** les colonnes (8) qui ne sont pas adjacentes aux parois latérales (3, 4) sont de section transversale sensiblement ronde.
8. Boîtier d'irrigation et/ou de drainage selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** l'une au moins des parois latérales (4) est munie d'une ouverture (13) dans laquelle un élément de tuyau peut être placé.
9. Boîtier d'irrigation et/ou de drainage selon la revendication 8, **caractérisé en ce que** l'ouverture (13) est munie d'une grille (14).
10. Boîtier d'irrigation et/ou de drainage selon la revendication 9, **caractérisé en ce que** la grille (14) est amovible.
11. Boîtier d'irrigation et/ou de drainage selon l'une quelconque des revendications 8 à 10, **caractérisé en ce que** deux parois latérales (4) qui s'étendent l'une en face de l'autre sont munies d'une ouverture (13).
12. Boîtier d'irrigation et/ou de drainage selon l'une quelconque des revendications 1 à 11, **caractérisé en ce que** le rapport entre la longueur et la largeur du boîtier (1) est de 2:1.
13. Boîtier d'irrigation et/ou de drainage selon la revendication 12, **caractérisé en ce que** les première et seconde parties de liaison (9, 10) sont positionnées de façon que deux boîtiers (1) similaires puissent être placés en ayant leurs côtés ouverts l'un contre l'autre et être reliés l'un à l'autre en ayant leurs axes longitudinaux parallèles entre eux, afin de se chevaucher complètement, et en ayant également leurs axes longitudinaux perpendiculaires entre eux.
14. Unité d'irrigation et/ou de drainage comprenant deux boîtiers (1) similaires selon l'une au moins des revendications 1 à 13, qui ont été placés en ayant leurs côtés ouverts tournés l'un vers l'autre et qui ont été reliés l'un à l'autre.
15. Système d'irrigation et/ou de drainage comprenant plusieurs boîtiers (1) selon l'une au moins des revendications 1 à 13.



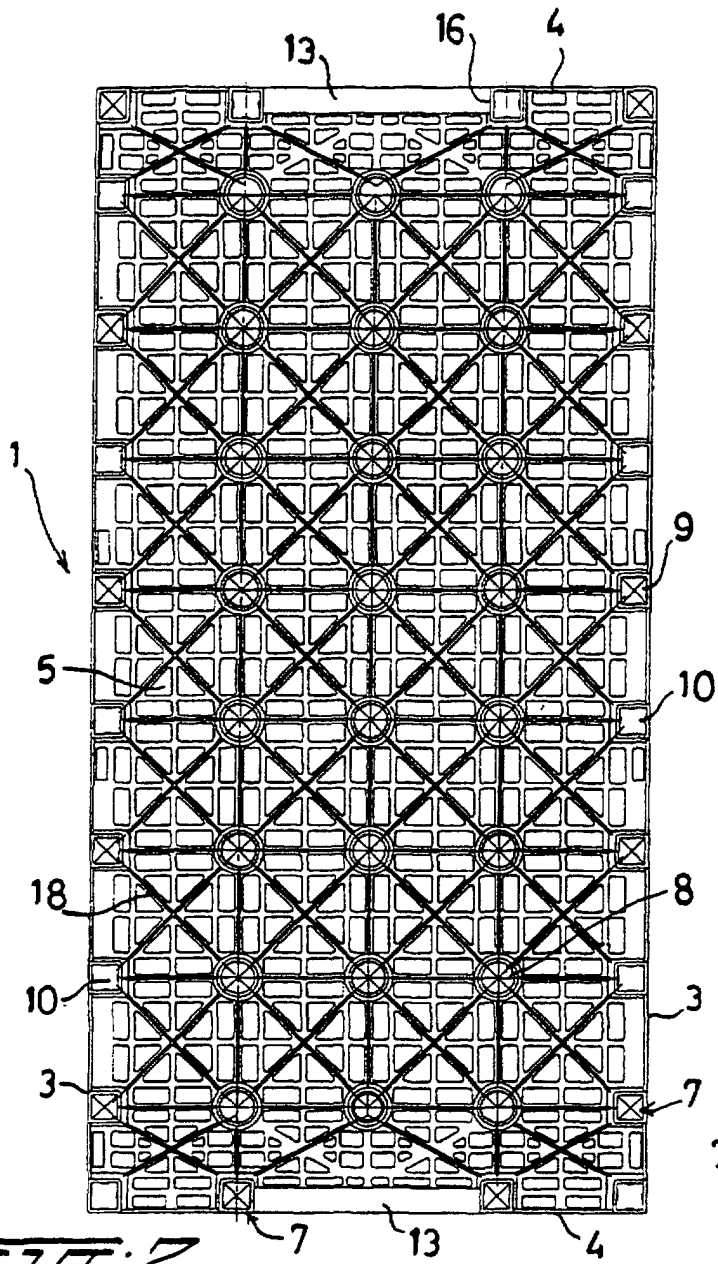


FIG. 2.

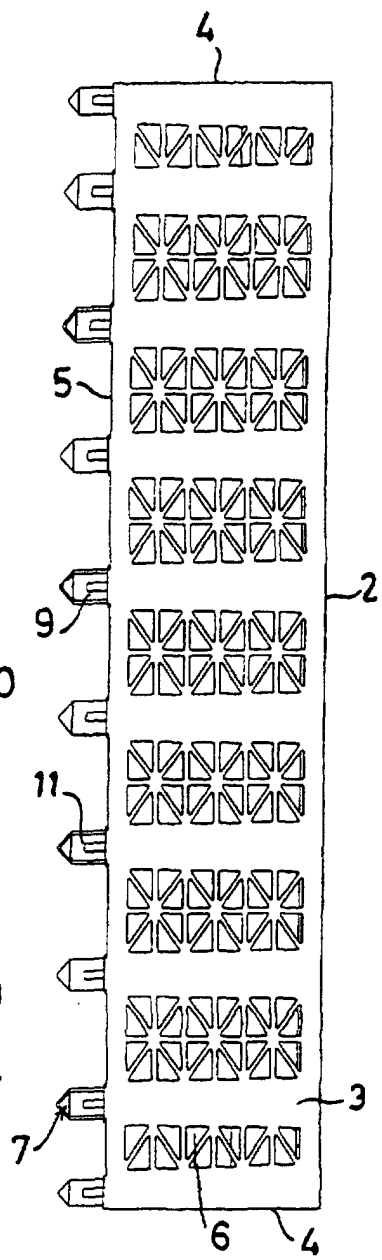


FIG. 3.

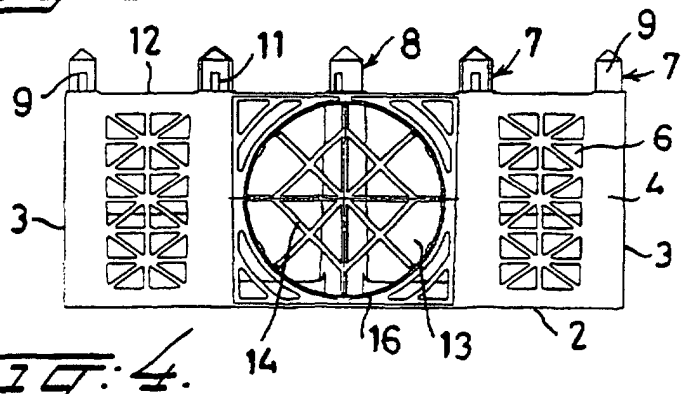


FIG. 4.

