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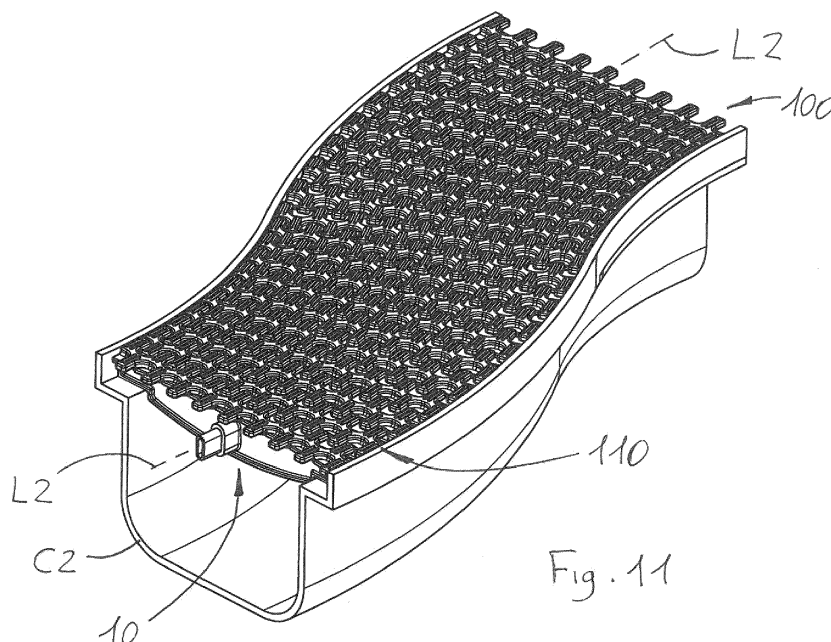
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(54) **ELEMENT FOR SWIMMING POOL GRIDS AND SWIMMING POOL GRID COMPRISING SAID ELEMENT**

(57) The present invention refers to an element (10, 110) for swimming pool grids (100). Said element (10, 110) is adapted to be connected to other elements in order to obtain a swimming pool grid (100), said swimming pool grids (100) being adapted to define a walking surface. Said element (10, 110) comprising:
- a main body (11) which is developed along a first line (L1) and which defines a first plane (P1) corresponding to the walking surface of the grids (100);

- at least one tooth (12) which protrudes from the main body (11) and is developed on the first plane (P1);
- a connector (24) which is connected to the main body (11) and is adapted to removably connect the element (10, 110) to other elements (10, 110).

Besides, the present invention refers to a swimming pool grid (100) comprising one or more of the elements (10, 110) according to the invention.



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Description

[0001] The present invention refers in general to an element for swimming pool grids and to a swimming pool grid comprising said element.

[0002] More particularly, the present invention refers to an element for the formation of grids for swimming pools and to a swimming pool grid comprising said element, said grid being suitable for swimming pools that need a perimetrical grid surrounding, at least partially, a pool.

[0003] As is known, there exist various types of swimming pools that can be grouped in a first category, i.e. the swimming pools having a difference in height between the edge of the pool and the water surface, and a second category, i.e. the swimming pools having the touch of water at the level of the surrounding floor.

[0004] The swimming pools of the second category, known as swimming pool skimmers, are spreading rapidly since they give more aesthetic pleasantness than the pools of the first category.

[0005] The swimming pool skimmers provide that the edge of the pool tank comprises a channel to collect the water that overflows from the pool tank itself.

[0006] The channel is covered by a grid that has a double function of allowing water overflowing from the pool tank to pass through and to support the weight of the pool users when the grid of the pool is trampled.

[0007] The grids utilized in swimming pools having rectilinear edges comprise a plurality of slats. Each slat includes an upper horizontal lath which is coplanar to the upper laths of the other adjacent slats. The set of the upper laths of the slats form a walking surface allowing water to pass through empty spaces between two adjacent upper laths and enter the channel.

[0008] Usually, the distance between an upper lath and an adjacent lath is determined by coming to a compromise between the requirement of safety for the user, for which a very short distance would be preferable, and the requirement of an efficient passage for water, for which a very large distance would be preferable.

[0009] In fact, for the safety of the user it is necessary that, in addition to other requirements, there are no conditions causing entrapments of parts of the body of the user between a slat and an adjacent slat, for example an entrapment of fingers or toes, as provided for also in specific regulations such as the rule UNI EN 13451-1: 2011.

[0010] Besides, each slat includes a cross-piece that extends under the upper lath in a perpendicular direction to the same upper lath. The cross-piece is shaped so as to rest on the channel and, usually, includes connections with the other cross-pieces to maintain the connection between slats in order to form a continuous grid.

[0011] The connections between slats develop in perpendicular directions to the cross-pieces and can be single or multiple.

[0012] In the case of single connections, it is possible to obtain a rotation between the cross-pieces and, con-

sequently, also between the slats so that it is possible to follow any curvature of the channel. In the case of multiple connections it is possible to obtain a greater solidity of the grid.

5 **[0013]** In the case of a curved channel, when the single connections enable to obtain a rotation between the cross-pieces, this rotation enables to approach the internal ends, internal with respect to the curve, and to move away the external ends of the slats.

10 **[0014]** However, in the empty spaces obtained between the external ends of the slats that have moved away, the conditions to ensure the safety of the user do not occur since entrapments, for example of fingers or toes, are possible.

15 **[0015]** Such situations disregard the compliance with the regulations and compromise the safety of the users.

[0016] Accordingly, an aim of the present invention is to provide an element for the formation of grids for swimming pools in order to overcome the problems of the prior art.

20 **[0017]** A further aim of the invention is to offer an element for swimming pool grids, that is inexpensive, simple to be used and simple to be mounted.

[0018] Another aim of the invention is to avoid entrapments, for example of fingers and toes, even in the presence of curvilinear sections.

25 **[0019]** Another aim of the invention is to provide a swimming pool grid ensuring a good passage of water through the elements forming the grid.

30 **[0020]** All the aims and still others are achieved according to the invention through an element for swimming pool grids. Said element is adapted to be connected to other elements in order to obtain a swimming pool grid. Said swimming pool grids are adapted to define a walking surface. Said element comprises:

- a main body which is developed along a first line and which defines a first plane corresponding to the walking surface of the grids;
- 40 - one or more teeth which protrude from the main body and are developed on the first plane;
- a connector which is connected to the main body and is adapted to removably connect the element to other elements.

45 **[0021]** The element is characterized by the fact that one or more shelves protrude from the main body and are developed on a second plane.

50 **[0022]** Through the presence of the one or more shelves in the element and through their development on a second plane it is possible to obtain two levels or more of components of the element according to the invention, which protrude to reach or approach an adjacent element so as to obtain, if necessary, a closeness and an overlap of teeth and shelves and avoid interferences between adjacent elements.

55 **[0023]** In this way, a greater safety is obtained avoiding the entrapment and, at the same time, a good passage

is obtained for the water.

[0024] Advantageously, the second plane may be disposed below the first plane so that the shelves are arranged under the teeth and the teeth may define the walking surface.

[0025] Besides, the one or more teeth have a thickness less than or equal to the distance between the first plane and the second plane so that each tooth may be superimposed on the respective shelf, without any interference, and the shelves do not interfere when the teeth of an element, disposed adjacent, approach. Thus, there is the possibility for each tooth to be superimposed on the respective shelf that the tooth has reached.

[0026] Advantageously, an element according to the invention may comprise at least two teeth and an inlet is defined between the at least two teeth, in which inlet the one or more shelves are disposed, said inlet being adapted to receive one or more teeth of another adjacent element.

[0027] Through said particular construction, there is a continuity of material between the teeth and the shelves so as to give a greater strength to the element according to the invention.

[0028] Furthermore, a rib may extend in perpendicular direction from the main body to give a greater rigidity to the element and the connector may cross the rib from side to side. The rib may culminate with an edge surrounding its whole perimeter in order to increase the structural rigidity of the element itself. A plug may protrude from an end of the connector and a cavity may be formed at the opposite end of the connector with respect to the plug.

[0029] Advantageously, a plurality of shelves and a plurality of teeth may be comprised, the shelves and the teeth being alternated with one another. More precisely, a tooth may be arranged between two consecutive shelves and a shelf may be arranged between two consecutive teeth so as to obtain an alternating pattern that facilitates the cooperation when the elements are disposed adjacent to each other.

[0030] Besides, on a first side of the main body, each shelf may correspond to a tooth of a second side of the main body, opposite to the first side with respect to the first line. In addition, a tooth of the first side may correspond to each shelf of the second side. In this way, it is possible to obtain a conformation that allows adjacent elements to have a perfect match between teeth and shelves.

[0031] Advantageously, the shelves may protrude from the main body by following a parabolic trend with respect to the first line. Through this parabolic trend it is possible to obtain the covering function of the shelves where this function is more necessary, and more precisely at the ends of the element, the covering being reduced where a greater passage of water is desired.

[0032] Furthermore, the shelves may protrude from the first line more at the ends of the element than at the axial correspondence of the connector. Through this configuration,

it is possible to obtain the advantage of maintaining a good covering at the ends of the elements even when the elements are mounted on curved edges of swimming pools while in these conditions, the prior art provides that there is a separation of the external ends with respect to the curvature.

[0033] All the aims and advantages are also achieved by a swimming pool grid comprising one or more first elements and one or more second elements. Each first element may be connected to each second element by connecting the connector of the first element with the connector of the second element.

[0034] Through the connection of two or more elements in series, it is possible in fact to obtain a continuous grid that may be utilized to cover a channel or, in any case, a swimming pool edge, with a rectilinear arrangement or a curved arrangement, without modifying the element or performing complex operations as in the prior art.

[0035] Advantageously, one or more teeth of the first element may stand above the one or more shelves of the second element to ensure, at the same time, the safety since an entrapment of the user is avoided but the passage for the flowing of water is in any case maintained for the water discharge.

[0036] Besides, one or more teeth of the first element may rest on the one or more shelves of the second element so as to increase the structural strength of the grid.

[0037] Further features and details of the invention can be better understood from the following specification that is provided by way of a non-limiting example, as well as from the annexed drawings, wherein:

Figures 1 to 3 and Fig. 5 are views from different angles of an element made according to the invention for the formation of swimming pool grids;

Figure 4 is a detail of the element denoted by A in Figure 5;

Figures 6 to 8 are views from different angles of the element according to the invention, and precisely a bottom view, a front view and a side view, respectively;

Figure 9 is a perspective view of the element according to the invention;

Figures 10 and 11 show a plurality of elements according to the invention, coupled together to compose a swimming pool grid and arranged according to different configurations, in a rectilinear channel and in a curvilinear channel, respectively.

[0038] With reference to the annexed drawings, in particular to Figures 1 to 5, number 10 denotes an element to compose swimming pool grids, comprising a main body 11 which extends along a first line L1 which separates the main body 11 in a left side 20 and a right side 22. The main body 11 defines the walking surface.

[0039] A rib 16 extends from the main body in a perpendicular direction with respect to the main body 11 and

to the walking surface, to give rigidity to the element 10 and to rest on relative supports, defined by the edges of a channel, as represented in Figures 10, 11. The rib 16 culminates with a border 18 that surrounds the perimeter of the rib 16.

[0040] The rib 16 is crossed by a connector 24 obtained in single body, which extends along a second line L2, orthogonal to the first line L1.

[0041] A plug 26 protrudes from the connector 24 on the left side 20 while a cavity 28 is formed in the same connector 24 on the right side 22. The dimensions of the plug 26 are compatible with those of the cavity 28 in which the plug 26 has to be inserted so that the element 10 can be coupled through the plug 26 and the cavity 28 of its connector 24 with the respective parts of other elements constructed in the same way as the element 10 itself.

[0042] A plurality of teeth 12 and a plurality of shelves 14 protrude from the main body 11 and are arranged according to an alternating pattern proceeding along the first line L1. The teeth 12 and the shelves 14 protrude from both the right side 22 and the left side 20 of the element 10.

[0043] Two strips 30 protrude from each tooth 12 and act as breakwaters to curb the water coming out from the swimming pool along the first line L1 so that the water is collected in the spaces between the element 10 and the respective adjacent elements, as described below. In addition, the strips 30 will increase the grip, for example the grip of pool users' feet, so that the strips 30 serve as anti-slip.

[0044] Each tooth 12 has the same dimensions as the other teeth 12 and the free end is always at the same distance from the first line L1.

[0045] The shelves 14 protrude from the main body 11 following a parabolic trend. In particular, the shelves 14 protrude more at the ends of the element 10 than at the centre, or at the connector 24.

[0046] Thus, an inlet 34 is formed between two teeth 12 at each shelf 14.

[0047] Proceeding along the first line L1, each tooth 12 protruding from the left side 20 corresponds to a shelf 14 protruding from the right side 22, and vice versa.

[0048] As visible in Figure 6, each tooth 12 is provided with a vein 32 through which the tooth 12 is connected with the rib 16 so as to strengthen the tooth.

[0049] As it appears from Figures 7 and 8, the teeth 12 define a walking surface which is disposed on a first plane P1 while the shelves 14 define a second plane P2 which is closer to the connector 24.

[0050] Thus, the teeth 12 of the element 10 may overlap the shelves of a respective adjacent element when the elements are coupled by means of the respective connectors, as described below.

[0051] As visible in Figure 10, an element 10 may be coupled with a respective element 110 and other elements. All the elements are constructed as the element 10 itself and are connected by means of each connector so as to form a swimming pool grid 100 which may be

thus inserted on a first rectilinear channel C1.

[0052] When the element 10 is utilized to compose a swimming pool grid 100, the first line L1 and the second line L2 are, respectively, perpendicular and parallel to the edge of the first channel C1 and, consequently, perpendicular and parallel to the edge of the swimming pool itself, not visible in the drawing.

[0053] The dimensioning of the teeth 12 and shelves 14 is performed to obtain, in the rectilinear configuration visible in Figure 10, that the teeth are inserted in the inlets and are, consequently, supported by the shelves corresponding to each inlet.

[0054] The distance between two consecutive teeth 12 is greater than the width of each tooth 12 in order to allow a good passage of water. At the same time, the combined presence of teeth 12 and shelves 14, protruding on different planes, allow teeth 12 to form a large support plane on the first plane P1, while the shelves 14 on the second plane P2 allow to avoid undesired passages, for example an unwanted entrapment, so that the safety has improved.

[0055] At the same time, the overlap of teeth 12 and shelves 14 on two staggered planes ensures, in any case, a good passage of water into the channel below.

[0056] As visible in Figure 11, through the particular construction of the element 10 according to the invention, it is possible to utilize the swimming pool grid 100 also for a second channel C2 showing a curvilinear pattern, thanks to the flexibility provided by the construction of the connector.

[0057] The presence of shelves 14 is thus advantageous in the curvilinear portion of the channel to prevent the formation of a too large free space in the area outside of the curve that would not guarantee safety for the users and compliance with the regulations. In the inner area of the curve, the shelves 14 overlap the teeth 12 of the adjacent elements so that the structural solidity of the entire swimming pool grid 100 has been improved.

[0058] Obviously, the swimming pool grid 100 may be adapted to patterns of channels or pool edges different from the pattern represented in Figure 11.

[0059] Through the particular construction of the element 10 it is possible to meet the safety requirements imposed by regulations such as the rule cited above, overcoming the grids of the prior art.

[0060] The structural integrity is ensured by the one piece construction of the element 10 and the continuity of profile between teeth and shelves as well as by the presence of veins supporting each tooth.

[0061] The test methods regarding the entrapment of fingers and toes have been overcome through the development of teeth and shelves on a first plane and a second plane so that the shelves define an inlet that may receive a tooth. Also in presence of curvilinear channels, the tests of entrapment of fingers or toes have been passed while the grids of the prior art have too large empty spaces, especially in presence of curves.

[0062] The particular parabolic trend of the shelves al-

lows to maximize the passage of water near the connector and to obtain shelves that protrude slightly right where the distance between teeth of adjacent elements changes little even if the elements are arranged on curvilinear channels.

[0063] The shelves 14 protrude more at the ends of the element 10 than at the centre so as to prevent an entrapment just in the critical area where the known grids do not meet the safety requirements or the outer zones of the curves of the curvilinear channels.

[0064] The slip resistance is guaranteed by the alternating arrangement of teeth and shelves and also by the presence of strips that are another element preventing slipping.

[0065] Finally, other variants and implementation methods are possible which are to be considered as included in the scope of protection defined by the following claims.

Claims

1. Element (10, 110) for swimming pool grids (100), said element (10, 110) being adapted to be connected to other elements in order to obtain a swimming pool grid (100), said swimming pool grids (100) being adapted to define a walking surface, said element (10, 110) comprising:

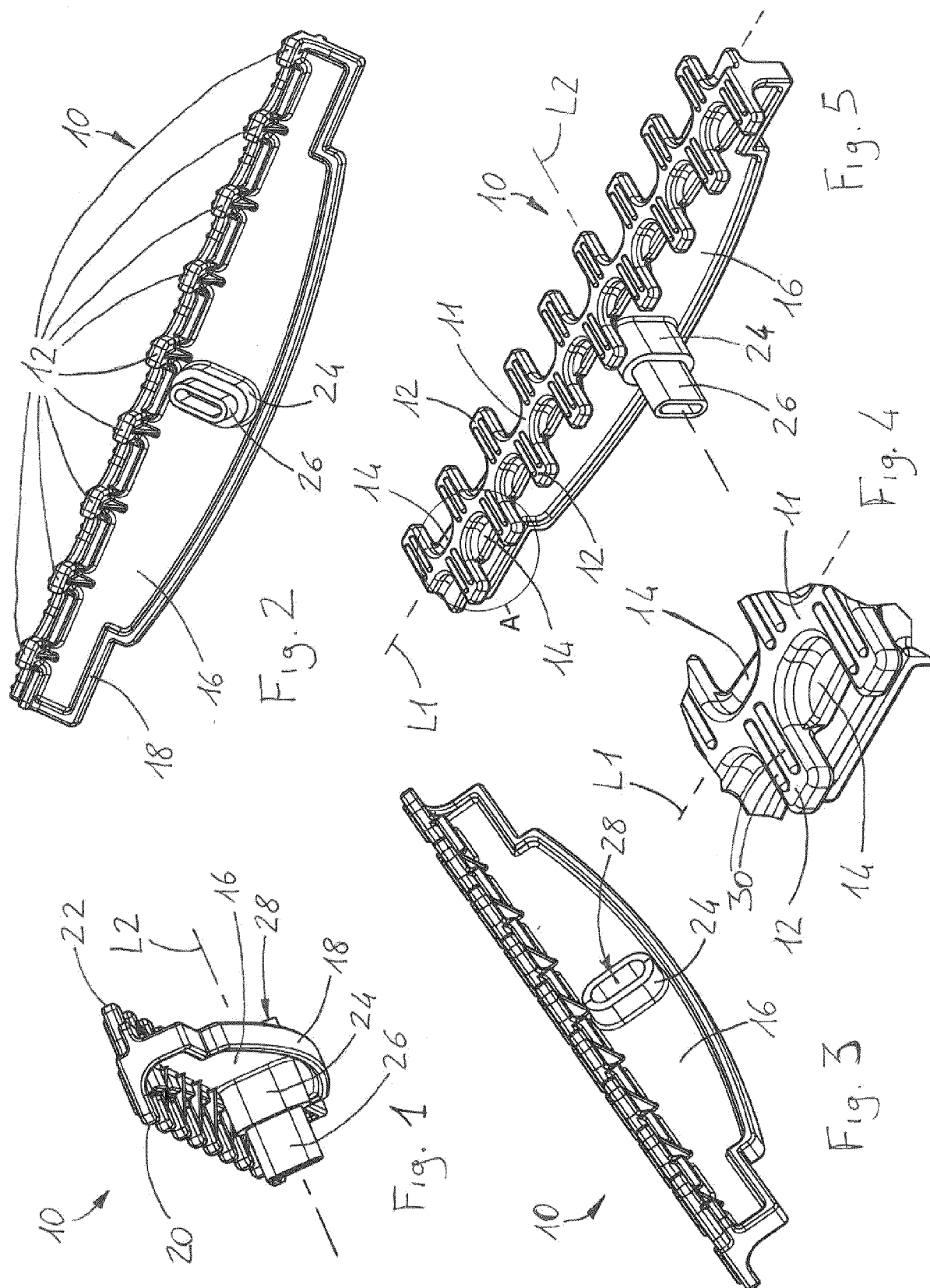
- a main body (11) which is developed along a first line (L1) and defines a first plane (P1) corresponding to the walking surface defined by the grids (100);
- at least one tooth (12) which protrudes from the main body (11) and is developed on the first plane (P1);
- a connector (24) which is connected to the main body (11) and is adapted to removably connect the element (10, 110) to other elements (10, 110);

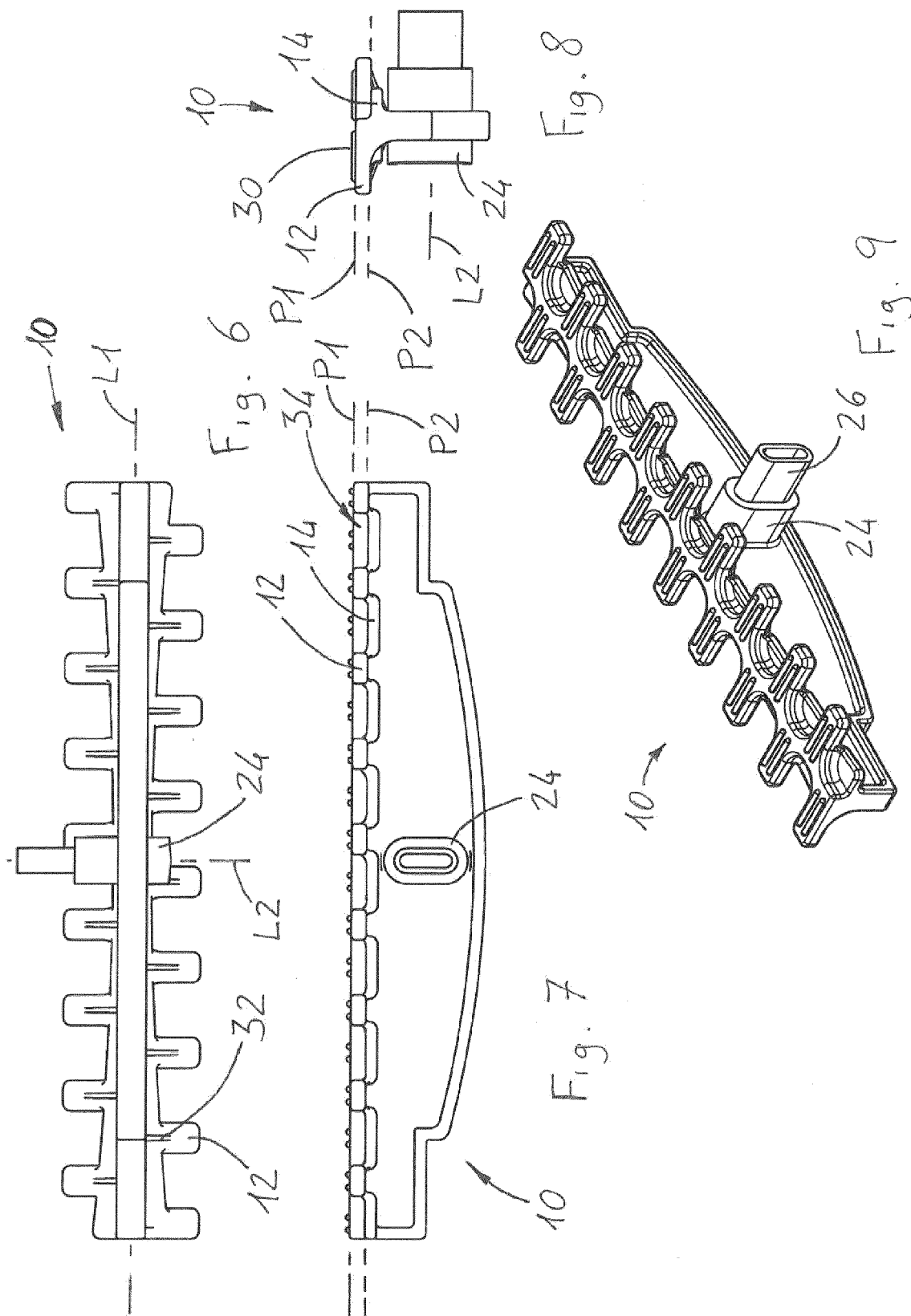
characterized by the fact that at least one shelf (14) protrudes from the main body (11) and is developed on a second plane (P2).

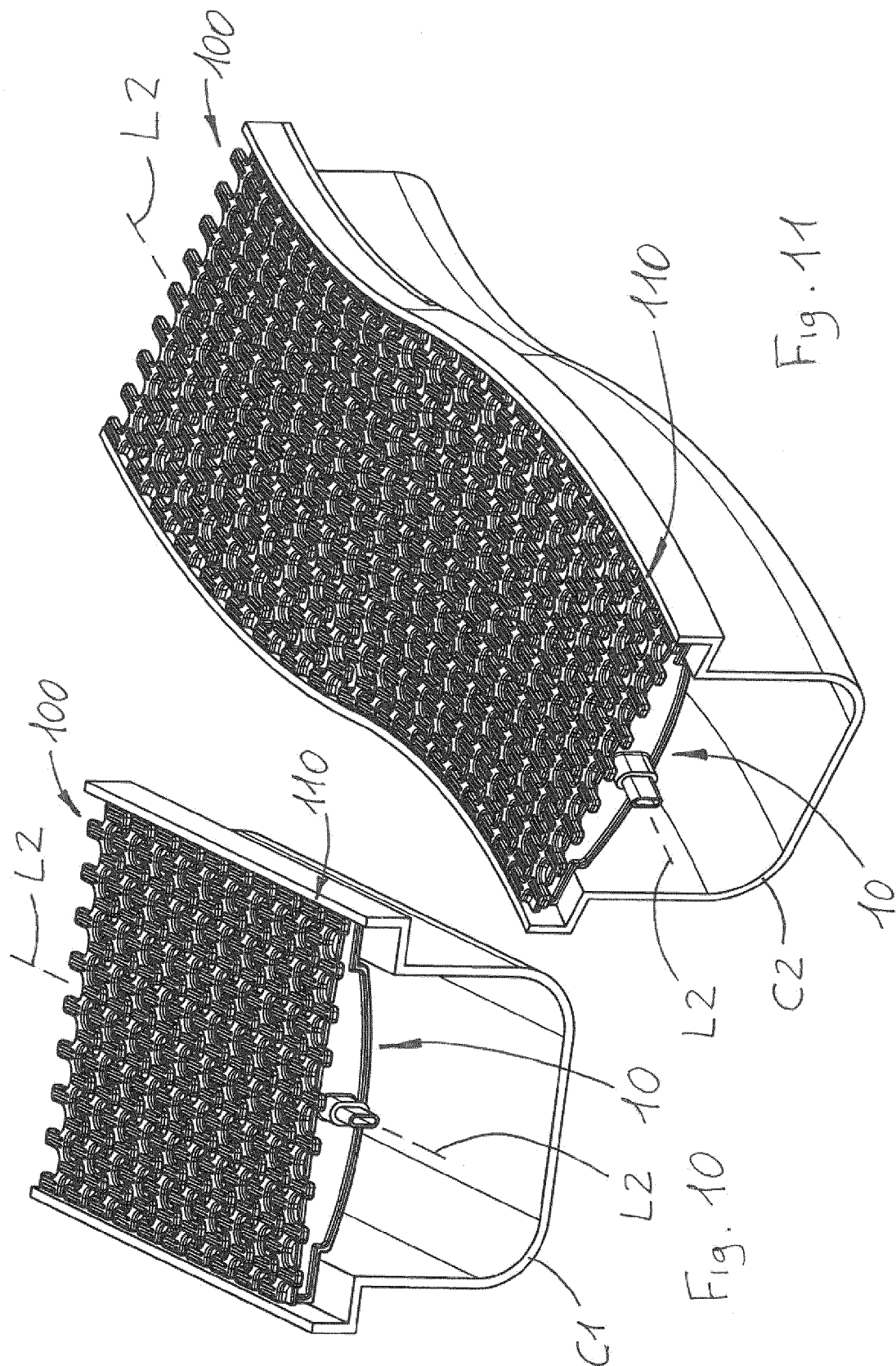
2. Element (10, 110) according to the preceding claim, wherein the second plane (P2) is disposed below the first plane (P1).
3. Element (10, 110) according to one of the preceding claims, wherein the at least one tooth (12) has a thickness less than or equal to the distance between the first plane (P1) and the second plane (P2).
4. Element (10, 110) according to one of the preceding claims, comprising at least two teeth (12), an inlet (34) being defined between the at least two teeth (12), wherein the at least one shelf (14) is disposed

in said inlet (34), said inlet (34) being adapted to receive at least one tooth (12) of another adjacent element.

5. Element (10, 110) according to one of the preceding claims, wherein a plurality of shelves (14) and a plurality of teeth (12) are comprised, the shelves (14) and the teeth (12) being alternated with each other.
6. Element (10, 110) according to the preceding claim, wherein on a first side (20) of the main body (11), each shelf (14) corresponds to a tooth (12) of a second side (22) of the main body (11), opposite to the first side (20) compared to the first line (L1), and wherein a tooth (12) of the first side (20) corresponds to each shelf (14) of the second side (22).
7. Element (10, 110) according to claim 5 or 6, wherein the shelves (14) protrude from the main body (11) by following a parabolic trend compared to the first line (L1).
8. Element (10, 110) according to the preceding claim, wherein the shelves (14) protrude from the first line (L1) more at the ends of the element (10, 110) than at the connector (24).
9. Swimming pool grid (100) comprising at least one first element (10, 110) according to one of the preceding claims and at least one second element (10, 110) according to one of the preceding claims, the first element being connected to the second element by connecting the connector (24) of the first element to the connector (24) of the second element.
10. Swimming pool grid (100) according to the preceding claim, wherein at least one tooth (12) of the first element (10) stands above the at least one shelf (14) of the second element (110) and/or rests on the at least one shelf (14) of the second element (110).









EUROPEAN SEARCH REPORT

Application Number
EP 15 19 5208

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Place of search Munich		Date of completion of the search 11 March 2016	Examiner Schnedler, Marlon
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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