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(54) SUPPORTING ELEMENT FOR SYNTHETIC GROUND COVERS AND SYSTEM COMPRISING SUCH AN ELEMENT

TRAEGERELEMENT FÜR KUENSTLICHE BODENBELAEGE UND SYSTEM MIT EINEM SOLCHEN TRAEGERELEMENT

ÉLÉMENT DE SUPPORT POUR DES COUVRE-SOLS SYNTHÉTIQUES ET SYSTÈME COMPRENANT UN TEL ÉLÉMENT

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Description

[0001] The present invention refers, in general, to a supporting element for synthetic turfs.

[0002] More particularly, the present invention refers to a supporting element for synthetic turfs, which is particularly easy to use.

[0003] As is known, there exist various types of synthetic turfs which differ in the material used for their realization, the bottom on which the turfs are laid and the conformation of the supporting elements used for their laying.

[0004] In particular, the known supporting elements, used for the laying of synthetic turfs, take the form of perforated grids having standardized dimensions and are laid directly on the bottom of the synthetic turf.

[0005] The drilling obtained on the grids of each element allows water drainage through the holes.

[0006] Once the grids have been laid on the bottom, the grids being kept side by side, the grids are connected through iron wires that pass through the holes of the grids. Then, the iron wires are twisted.

[0007] This assembly procedure is long and laborious because it is necessary to bind all the grids one by one after laying them on the ground.

[0008] WO 2011/036600 discloses a supporting element for synthetic turfs comprising a main body shaped with a corrugated profile forming overhanging portions which give a desired yield. The supporting element comprises connecting means for connection to another supporting element.

[0009] An aim of the invention is to realize a supporting element overcoming the problems of the prior art.

[0010] Another aim of the invention is to offer a supporting element which is not expensive and is easy to use.

[0011] Another aim of the invention is to reduce the number of elements used to realize the support.

[0012] All the above-mentioned aims are achieved according to the invention with a supporting element for synthetic turfs according to claim 1. The supporting element comprises a main body shaped with a corrugated profile and comprising crests and valleys. The supporting element comprises one or more beaks disposed on a first side of the main body, and a bar disposed on a second side of the main body. The one or more beaks and the bar are adapted to be removably coupled with shape coupling, an arc-of-circle opening being formed in the beak and the bar being shaped to be homologous to the beak.

[0013] The so-described construction allows to removably connect the supporting elements realized according to the invention.

[0014] Furthermore, the one beak or more beaks develop from a valley upward and the bar develops from a valley upward, the sum of the height of the beak from the valley and the height of the bar from the valley being equal to the height from a valley to a crest, so that the connection of the one or more beaks of a supporting el-

ement with the bar of another supporting element allows to maintain the corrugated development of the main body.

[0015] Thus, it is possible to maintain the corrugated development of the main body regardless of the fact that there is a connection in that point or not. Besides, the meeting point between beak and bar may be at the wished distance from the valleys.

[0016] Grooves are provided next to the bar around to enable the one or more beaks to rotate when the bar and the one or more beaks are connected to each other.

[0017] Advantageously, one or more protrusions may be comprised and disposed on a third side of the main body and one or more recesses obtained on a fourth side of the main body. In this way, the one or more protrusions may be easily connected with the one or more recesses, for instance with a shape coupling with snap removal.

[0018] It is possible to form protrusions and recesses in both the third side and the fourth side and to allow a greater flexibility in mounting the supporting elements according to the invention.

[0019] Moreover, a plurality of slots may be formed in the main body to allow the fluid drainage through the supporting element itself so as to keep the synthetic turf as dry as possible or to drain any fluids such as rainwater or more.

[0020] Advantageously, one or more inlets may be formed between a crest and a valley in the main body, the shape and/or dimensions of the inlets being preferably different from the shape and/or dimensions of the slots.

[0021] The presence of the one or more inlets makes it possible to provide the supporting element with another element of possible coupling with other supporting elements according to the invention.

[0022] All the above-mentioned aims are also achieved through a system comprising two or more supporting elements. The supporting elements may be connected to each other by connecting a beak to a bar. In this way, when the two or more supporting elements are disposed according to a compact configuration, the volume occupied by the system can be reduced to a minimum but the connection between the at least two supporting elements is maintained. In other words, it is possible to obtain that the corrugated development of a supporting element follows the corrugated development of the next supporting element. Then, it is possible to join the supporting elements together with an easy connecting means.

[0023] Advantageously, the system comprises a jointing element adapted to be coupled with the supporting elements, forming a further connecting means. The jointing element comprises one or more feet, the one or more feet being received in one or more inlets of said supporting elements, wherein the jointing element comprises also a wing adapted to be disposed between the two supporting elements.

[0024] The presence of the wing allows to position

more precisely the supporting elements and/or to maintain a useful distance between them.

[0025] Furthermore, the two or more supporting elements may be equal and may be connected so as each supporting element is upside-down in comparison with the preceding one. This feature makes possible to use supporting elements that are all equal to each other, without requiring the construction of two or more models of supporting elements that are different from each other, which allows to obtain significant savings in terms of production costs and installation costs.

[0026] If the operators are given the supporting elements in the compact configuration, it is also possible to save a considerable space and to provide the operators with a system of supporting elements which are already connected to each other. Then, it is sufficient to unwind and stretch the system of supporting elements.

[0027] Further features and details of the invention will be better understood from the following specification which is provided as a non-limiting example, as well as from the accompanying drawings, wherein:

Figure 1 shows a supporting element, realized according to the invention;

Figures 2, 3, 4 show some details of the supporting element in Figure 1;

Figures 5 to 8 show three supporting elements according to the invention, coupled together through a first connecting means and disposed according to different configurations;

Figures 9 and 10 show the coupling of supporting elements according to the invention through a second connecting means;

Figure 11 shows an expanse of elements according to the invention, coupled together so as to be joined together and form a continuous support for a synthetic turf which is laid on the support itself;

Figures 12 and 14 show a supporting element, realized according to a variant of the invention;

Figures 13 and 16 show a jointing element, realized according to a variant of the invention;

Figures 15 and 17 show a detail of the supporting element denoted by a in Figure 14 and a detail of the jointing element denoted by B in Figure 16, respectively;

Figures 18 to 23 are views of the jointing element in Figure 13, taken from different angles;

Figures 24 and 25 show the coupling of the supporting elements according to a variant of the invention through a first connecting means and through a third connecting means;

Figures 26 to 28 show views of a detail of the third connecting means in Figure 25, taken from different angles.

[0028] With reference to the accompanying figures, in particular Figure 1, number 10 denotes a supporting element for synthetic turfs comprising a main body 11

which is substantially rectangular, with prevailing development on a plane and may be inscribed within a parallelepiped.

[0029] As visible in Figure 2, the main body 11 is shaped with a corrugated development forming crests 14 and valleys 16 defining the upper and lower limits, respectively, of the parallelepiped in which the main body 11 itself can be inscribed.

[0030] The portions of the supporting element 10 corresponding to the crests 14 and valleys 16 are continuous while leaks 18 are formed in the portions connecting such crests and valleys so as to allow the drainage of water and to act as elastic elements operating as a shock-absorber.

[0031] The main body 11 has a substantially rectangular shape and therefore, its sides correspond two by two so as to be removable connectable.

[0032] In particular, the opposite sides are connectable so that it is possible to join together two supporting elements by connecting a first side of a first supporting element to the respective opposite side of a second supporting element, as explained in detail below.

[0033] As visible in Figure 1, along the first side 20, two grooved beaks 30 protrude from the valley 16 which is the valley closest to the side 20, as represented in detail in Figure 2. The two beaks are formed by following the corrugated development.

[0034] An arc-of-circle groove is obtained in the two beaks.

[0035] An arc-of-circle bar 32 protrudes along a second side 22, opposite to the first side 20, so that the bar 32 can be grasped by the two beaks 30. The bar 32 is raised from the valley opposed to the valley 16.

[0036] In correspondence of the grasping sector of the two beaks 30 on the bar 32, two grooves 34 are formed which allow the passing of the elements of each beak 30 when the beak rotates about the bar 32.

[0037] A beak 30 and the bar 32 grasped by the beak 30 itself form a first connecting means between supporting elements according to the invention.

[0038] As visible in Figure 1, on a third side 24 and on a fourth side 26, second connecting means are obtained between supporting elements according to the invention, described below.

[0039] Two protrusions 36 are provided on the third side, which protrude from the portions in the valleys in proximity to the first side 20 and second side 22.

[0040] As visible in the detail of Figure 3, each protrusion 36 comprises a tooth 38.

[0041] Besides, three recesses 40 are formed in some of the crests on the third side 24. In the described embodiment, the recesses 40 are formed on the fourth, seventh and tenth crest.

[0042] As from the detail in Figure 4, a seat 42 is formed in each recess 40 to receive a tooth 38 of a respective protrusion 36.

[0043] On the fourth side 26, recesses 40 are formed in correspondence of the protrusions 36 of the third side

24 and are arranged according to symmetry while three protrusions 36 protrude in correspondence of the three recesses 40 formed on the third side 24.

[0044] Each tooth 38 is shaped in such a way as to snap-fit in the respective seat 42 with which the tooth is coupled in order to oppose, owing to the coupling, a pre-determined resistance to the release.

[0045] Below, with reference to Figures 5 to 8, there is a description of the passage from a compact configuration to an extended configuration of a first supporting element, a second supporting element and a third supporting element according to the invention, denoted by reference numbers 10, 110 and 210, respectively.

[0046] The compact configuration, visible in Figure 5, corresponds to the preferred configuration for the transport of a set of supporting elements according to the invention, which are connected to each other through connecting means, or through the respective beaks and bars, analogous to the beaks 30 and bar 32 described above.

[0047] As visible in Figure 8, the three supporting elements, which are disposed now according to a stretched configuration, are coupled according to an alternate orientation in which the first supporting element 10 is oriented in an analogous way as shown in Figure 1, while the second supporting element 110 is oriented in an analogous way as the first supporting element 10.

[0048] This alternating orientation in their coupling allows to obtain a set of supporting elements which are connected to each other and, at the same time, are stackable. This result can not be achieved with the supporting elements of the prior art.

[0049] Obtaining such a result is made possible by the particular conformation of the beaks and bars: the beaks develop from the valley on following a corrugated development and arrive at the level of the crests while the bars are substantially at the level of the valleys. The connection of beaks and bars allows to continue the corrugated development of the main body without interruptions.

[0050] Thus, a synergistic effect is obtained by the combination of the characteristic of having the first and second connecting means integrated in a single body in the supporting element according to the invention and by the connection mode with alternate orientation or, in other words, the supporting elements are equal and are connected to each other, each of them being upside-down in comparison with the preceding one.

[0051] The operative advantage deriving from the possibility of having, at the same time, the supporting elements connected to each other and stacked so as to unwind and stretch them according to the extended configuration in Figure 8 is added to the constructive advantage of having an only supporting element that can be connected to other supporting elements, all of them being equal to each other, which involves a considerable saving as concerns molds and production equipment.

[0052] In fact, to obtain the same connection result and possibility of stacking the elements, two different elements would be to be realized: one element correspond-

ing to the first element 10 and to the third element 210, and one different element that would be utilized in place of the second element 110.

[0053] As visible in Figure 9, three supporting elements realized according to the invention are placed at the side of other three supporting elements arranged according to the extended configuration so that it is possible to connect them to each other through the second connecting means.

[0054] In this case, the connection takes place between the protrusions and the respective recesses as visible in the detail of Figure 10, where the tooth 38 reaches the respective seat 42.

[0055] As visible in Figure 11, it is thus possible to obtain an extent of supporting elements according to the invention that can be laid down between the supporting layer and the synthetic turf. For example, the extent of supporting elements can be laid down between a draining gravel support layer and a turf made of synthetic grass to realize a synthetic football field or the like.

[0056] The extent of supporting elements according to the invention does not have any interruption in the development of the corrugated profile so as to maintain a uniform behavior for both the draining function and the shock-absorbing function. The shock-absorbing function allows to absorb the shocks as required, for example, by the National Amateur League and the F.I.F.A.

[0057] Moreover, the extent of supporting elements is entirely realized by coupling the single supporting elements which are equal, without utilizing further connecting means while the supporting elements of the prior art need further connecting means.

[0058] Another advantage of the supporting element according to the invention consists in that the supporting element can be supplied to the operator performing the laying, the supporting element being already connected to other supporting elements through the first connecting means according to the compact configuration in Figure 5.

[0059] Hence, the operator has just to unwind each element, as visible in the progression of Figures 5 to 8, and effect only the connections between the second connecting means. Thus, the operator saves a considerable amount of time for the laying of the supporting elements according to the invention in comparison with the laying made necessary by the known supporting elements which are all separated from each other and need to be connected with a great quantity of pieces of iron wire.

[0060] According to a variant of the invention, a supporting element may comprise additional recesses and/or protrusions in respect to what described above to obtain greater coupling possibilities between elements and have a greater flexibility for the realization of the support for the synthetic mantle. For example, in Figure 1 two recesses 90 are visible which are placed in correspondence of the two valley of the main body 11.

[0061] Moreover, a utilization of such additional recesses may be to allow, in any case, a binding when it

is not possible to couple the relative recesses with protrusions or when any protrusion should break.

[0062] According to another variant of the invention, a fourth supporting element 310, as visible in Figures 12 and 14, is shaped in an analogous way as the supporting element 10 as concerns all its components denoted in the figures by references increased by 300 in respect to analogous components of the supporting element 10.

[0063] Near the third side 324 and the fourth side 326, inlets 370 are formed which are obtained in the main body 311 of the fourth element 310 in a similar way to leaks 318 but with dimensions different from the leaks.

[0064] As visible in Figures 13 and 16, a jointing element 360 comprises a body 362 developing according to a first main axis.

[0065] Two wings 364 protrude from the body 362, only one of them being shown in Figures 13 and 17, and four feet 366, only one of them being shown in Figures 13 and 17.

[0066] The jointing element 360 is symmetric to its first main axis and to a second axis passing through the two wings 364 of the same jointing element 360.

[0067] Below, with reference to Figures 24 to 26, an extended configuration of a fourth supporting element, a fifth supporting element, a sixth supporting element and a seventh supporting element is described according to said variant of the invention, said elements being denoted by the reference numbers 310, 410, 510 and 610, respectively.

[0068] Likewise, a compact configuration, not shown in the drawing, corresponds to the preferred configuration for the transport of a set of supporting elements according to said variant of the invention, which are connected to each other through the first connecting means, or by means of the respective beaks and bars, analogous to the beaks 30 and bar 32 as described above.

[0069] The four supporting elements, which are disposed now according to an extended configuration, are coupled according to an alternate orientation in which the fourth supporting element 310 is oriented in an analogous way as visible in Figure 12 while the fifth supporting element 410 is upside-down in comparison with the fourth supporting element 310. Likewise, the sixth supporting element 510 and the seventh supporting element 610 are oriented so that the seventh supporting element 610 is upside-down in comparison with the same supporting element 510.

[0070] This alternation in the orientation in their coupling allows to obtain a set of supporting elements which are, at the same time, connected to each other and also stackable while this result could not be obtained by means of supporting elements realized according to the prior art.

[0071] According to this variant of the invention, the feet 366 and the inlets 370 are realized to be coupled as visible in the details of Figures 27 and 28.

[0072] In other words, in this variant of the invention, the function of the protrusions 36 and relative teeth 38 is

performed by the feet 366 of the jointing element 360 while the function of the recesses 40 and seats 42 is performed by the inlets 370.

[0073] As visible in Figure 27, the feet 366 of the jointing element 360 protrude to be inserted in the inlets 370 so as to go beyond them and be inserted under the crests 314 so that the jointing element 360 can not be extracted with a simple vertical translation once it has been coupled with the respective inlets 370.

[0074] A rotation of the jointing element 360 itself relative to the fourth supporting element is required to extract the jointing element 360 so that the feet 366 are allowed to go out of the inlets 370.

[0075] As from Figure 28, the jointing element 360 is inserted between supporting elements placed side by side so that a separation of the respective supporting elements is possible through the wings 364 and a connection of the same supporting elements is obtained by inserting the feet 366 of the jointing element 360 in the inlets 370 of the respective supporting elements. In this way, it is possible to obtain a third connecting means according to the invention.

[0076] The simple construction of the jointing element 360 and the presence of inlets 370 formed along the whole third side 324 and along the whole fourth side 326 allows to obtain a connection between supporting elements which are disposed in various configurations. This only requires a verification of the combination of crests of a supporting element with the crests of the respective supporting element that has been placed at the side of said supporting element in order to effect the connection of the two supporting elements by inserting the jointing element 360.

[0077] Furthermore, 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. Supporting element (10; 110; 210; 310; 410; 510; 610) for synthetic turfs comprising a main body (11; 311) shaped with a corrugated profile comprising crests (14; 314) and valleys (16; 316), said supporting element being **characterized by**

- at least one opened beak (30; 330) comprising an arc-of-circle opening and which is disposed on a first side (20; 320) of the main body (11; 311), and

- a bar (32; 332) which has a cross-section homologous to the cross-section of the opening and which is disposed on a second side (22; 322) of the main body (11; 311), said beak (30; 330) being adapted to be removably coupled with the bar of another identical supporting element and said bar (32; 332) being

- adapted to be removably coupled with the beak of another identical supporting element, wherein the at least one beak (30; 330) develops from a valley (16; 316) upward and the bar (32; 332) develops from a valley (16; 316) upward, the sum of the height of the beak (30; 330) from the valley (16; 316) and the height of the bar (32; 332) from the valley (16; 316) being equal to the height from a valley (16; 316) to a crest (14; 314), so that the connection of the at least one beak (30; 330) of a the supporting element with the bar (32; 332) of another identical supporting element which is oriented upsidedown in comparison with the supporting element allows to maintain the development of the corrugated profile of the main body (11; 311); wherein grooves (34; 334) are provided next to the bar (32; 332) which allow the passing of the beak (30; 330) to enable the at least one beak (30; 330) to rotate around the bar when the bar (32; 332) of the supporting element and the beak (30; 330) of another identical supporting element are coupled to each other.
2. Supporting element (10; 110; 210) according to the preceding claim, wherein at least one protrusion (36) is comprised and disposed on a third side (24) of the main body (11) and having a protruding body, and at least one recess (40) is comprised and obtained on a fourth side (26) of the main body (11) and having an opening, the protruding body of a protrusion (36) being adapted to be inserted in the opening of the at least one recess obtained in another supporting element.
 3. System comprising a first supporting element (10; 110; 210; 310; 410; 510; 610) according to one of the preceding claims and a second supporting element (10; 110; 210; 310; 410; 510; 610) according to one of the preceding claims.
 4. System according to claim 3 and further comprising at least one jointing element (360) having a first foot and a second foot, wherein at least one inlet (370) is provided between a crest (314) and a valley (316) in the third side and/or in the fourth side of the main body (11; 311) of each of the supporting elements, wherein the first foot of the jointing element (360) is to be received in the inlet of the first supporting element and the second foot of the jointing element (360) is to be received in the inlet of the second supporting element.
 5. System according to the preceding claim, wherein the at least one jointing element (360) comprises a wing (364), wherein the wing (364) of the jointing element (360) is to be disposed between the first supporting element and the second supporting ele-

ment when they are coupled to each other through the jointing element (360).

5 Patentansprüche

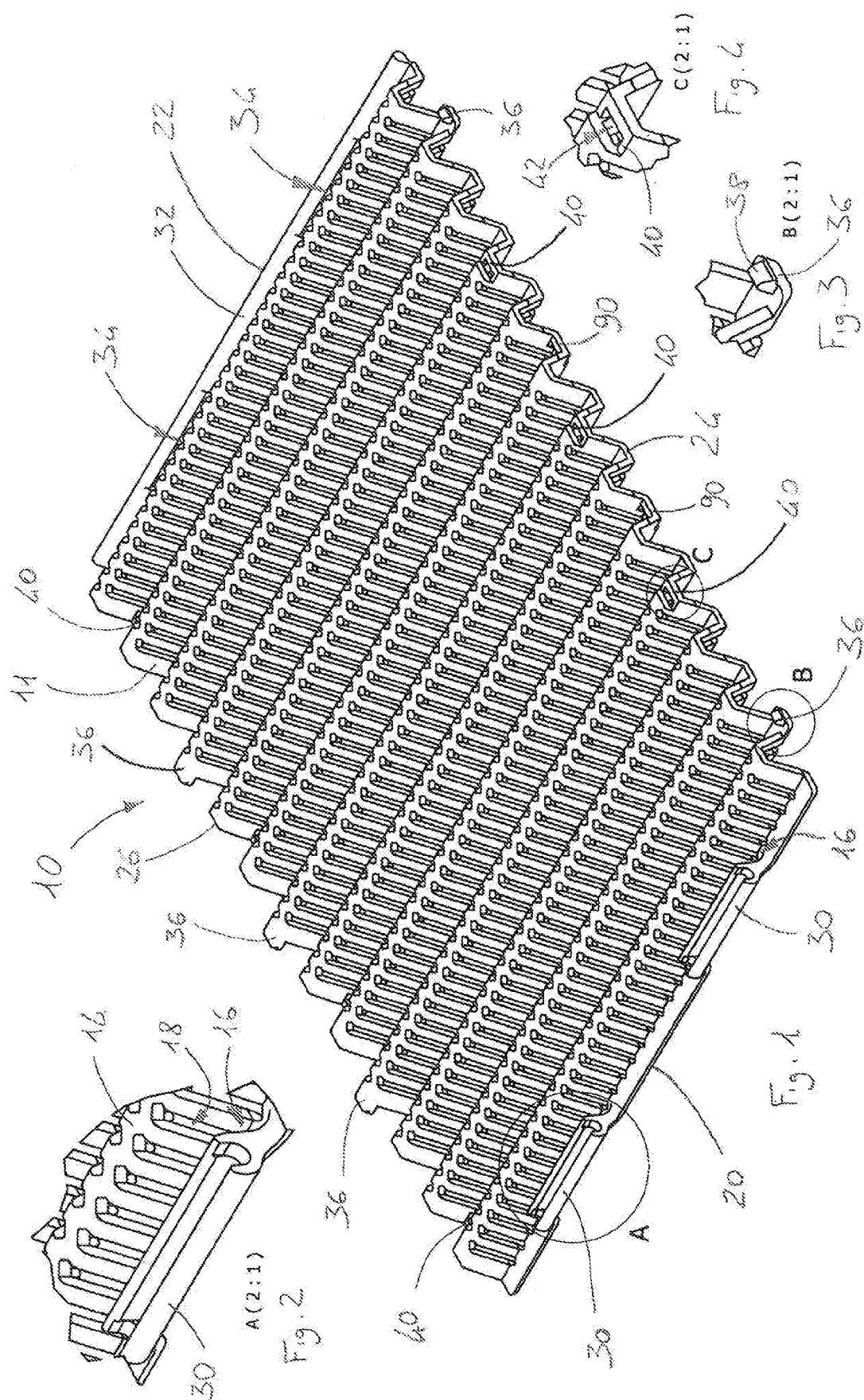
1. Stützelement (10; 110; 210; 310; 410; 510; 610) für synthetische Mäntel, umfassend einen Hauptkörper (11; 311), der nach einem Wellenmuster geformt ist und Grate (14; 314) und Täler (16; 316) aufweist, wobei das Stützelement ist **gekennzeichnet durch**
 - zumindest einen Schnabel (30; 330), in dem eine kreisbogenförmige Öffnung erhalten und auf einer ersten Seite (20; 320) des Hauptkörpers (11; 311) angeordnet ist, und
 - eine Stange (32; 332), die kreisbogenförmig geformt und auf einer zweiten Seite (22; 322) des Hauptkörpers (11; 311) angeordnet ist, wobei der Schnabel (30; 330) angepasst ist, um entfernbar mit einer Stange eines anderen Stützelements gekoppelt zu sein, wobei die Stange (32; 332) angepasst ist, um entfernbar mit einem Schnabel eines anderen Stützelements gekoppelt zu sein, wobei sich der mindestens eine Schnabel (30; 330) von einem Tal (16; 316) nach oben erstreckt und sich die Stange (32; 332) von einem Tal (16; 316) nach oben erstreckt, wobei die Summe der Höhe des Schnabels (30; 330) aus dem Tal (16; 316) mit der Höhe der Stange (32; 332) aus dem Tal (16; 316) gleich der Höhe zwischen einem Tal (16; 316) und einem Grat (14; 314) ist, so dass durch die Verbindung des mindestens einen Schnabels (30; 330) eines Stützelements mit der Stange (32; 332) eines anderen Stützelements, das wellenförmige Muster des Hauptkörpers (11; 311) beibehalten wird; wobei Rillen (34; 334) in der Stange (32; 332) derart ausgebildet sind, dass sie die Drehung des mindestens einen Schnabels (30; 330) ermöglichen, wenn die Stange (32; 332) eines Stützelements und der Schnabels (30; 330) eines anderen Stützelements miteinander gekoppelt sind.
2. Stützelement (10; 110; 210) nach dem vorhergehenden Anspruch, in dem mindestens ein an einem dritten Seite (24) des Hauptkörpers angeordneter Vorsprung (36) vorgesehen ist, der einen vorstehenden Körper aufweist, und mindestens eine Aussparung (40), die in einer vierten Seite (26) des Hauptkörpers (11) ausgebildet ist und eine Öffnung aufweist, wobei der hervorstehende Körper eines Vorsprungs (36) sich in die Öffnung der mindestens einer Aussparung einführen kann, die in einem anderen Stützelement vorgesehen ist.

3. System umfassend ein erstes Stützelement (10; 110; 210; 310; 410; 510; 610) nach einem der vorhergehenden Ansprüche, und ein zweites Stützelement (10; 110; 210; 310; 410; 510; 610) nach einem der vorhergehenden Ansprüche. 5
4. System nach Anspruch 3 und ferner umfassend ein Verbindungselement (360) mit einem ersten Fuß und einen zweiten Fuß, wobei in einer dritten Seite und/oder in einer vierten Seite des Hauptkörpers (11; 311) jedes Stützelements mindestens ein Einlass (370) zwischen einem Grat (314) und einem Tal (316) erhalten wird, wobei der erste Fuß des Verbindungselements (360) derart angepasst ist, dass er in den Einlass des ersten Stützelements eingeführt werden kann, und der zweite Fuß des Verbindungselements (360) derart angepasst ist, dass er in den Einlass des zweiten Stützelements eingesetzt werden kann. 10
5. System nach dem vorhergehenden Anspruch, wobei das wenigstens ein Verbindungselement (360) einen Flügel (364) umfasst, wobei der Flügel (364) des Verbindungselements (360) zwischen dem ersten Stützelement und dem zweiten Stützelement angeordnet ist, die mittels des Verbindungselements (360) miteinander verbunden sind. 20

Revendications

1. Élément de support (10; 110; 210; 310; 410; 510; 610) pour des manteaux synthétiques comprenant un corps principal (11; 311) en forme de motif ondulé et comprenant des arêtes (14; 314) et des vallées (16; 316), ledit élément de support étant **caractérisé par**
 - au moins un bec (30; 330) dans lequel une ouverture en forme d'arc de cercle est obtenue et disposée sur un premier côté (20; 320) du corps principal (11; 311), et
 - une barre (32; 332) en forme d'arc de cercle et disposée sur un deuxième côté (22; 322) du corps principal (11; 311),
 ledit bec (30; 330) étant adapté pour être couplé de manière amovible avec une barre d'un autre élément de support, et ladite barre (32; 332) étant adaptée pour être couplée de manière amovible avec un bec d'un autre élément de support,
 dans lequel au moins un bec (30; 330) s'étend depuis une vallée (16; 316) vers le haut et la barre (32; 332) s'étend depuis une vallée (16; 316) vers le haut, étant la somme de la hauteur du bec (30; 330) de la vallée (16; 316) avec la hauteur de la barre (32; 332) de la vallée (16; 316) égale à la hauteur entre une vallée (16; 316) et une arête (14; 314), de sorte qu'en connectant au moins un bec (30; 330) d'un élément de support avec la barre (32; 332) d'un autre élément de support, le motif ondulé est maintenu du corps principal (11; 311);
 dans lequel des rainures (34; 334) sont formées dans la barre (32; 332) de manière à permettre la rotation du au moins un bec (30; 330) lorsque la barre (32; 332) d'un élément de support et le bec (30; 330) d'un autre élément de support sont couplés ensemble.

2. Élément de support (10; 110; 210) selon la revendication précédente, dans lequel sont compris au moins une saillie disposé sur un troisième côté (24) du corps principal (11) et ayant un corps en saillie, et au moins un évidement (40) formé dans un quatrième côté (26) du corps principal (11) et ayant une ouverture, le corps saillant d'une saillie (36) pouvant s'insérer dans l'ouverture d'au moins un évidement obtenu dans un autre élément de support. 25
3. Système comprenant un premier élément de support (10; 110; 210; 310; 410; 510; 610) selon l'une des revendications précédentes et un deuxième élément de support (10; 110; 210; 310; 410; 510; 610) selon l'une des revendications précédentes. 25
4. Système selon la revendication 3 et comprenant en outre un élément de jonction (360) comprenant un premier pied et un deuxième pied, dans lequel, dans un troisième côté et/ou un quatrième côté du corps principal (11; 311) de chaque élément de support au moins une entrée (370) est obtenue entre une arête (314) et une vallée (316), dans lequel le premier pied de l'élément de jonction (360) est adapté pour être inséré dans l'entrée du premier élément de support et le deuxième pied de l'élément de jonction (360) est adapté pour être inséré dans l'entrée du deuxième élément de support. 30
5. Système selon la revendication précédente, dans lequel au moins un élément de jonction (360) comprend une aile (364), dans lequel l'aile (364) de l'élément de jonction (360) est disposée entre le premier élément de support et le deuxième élément de support couplés l'un à l'autre au moyen de l'élément de jonction (360). 35



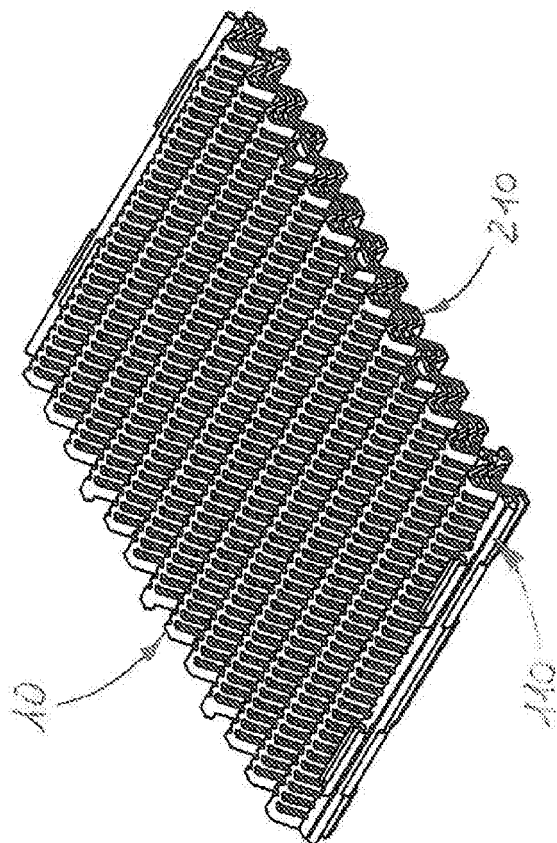


Fig. 5

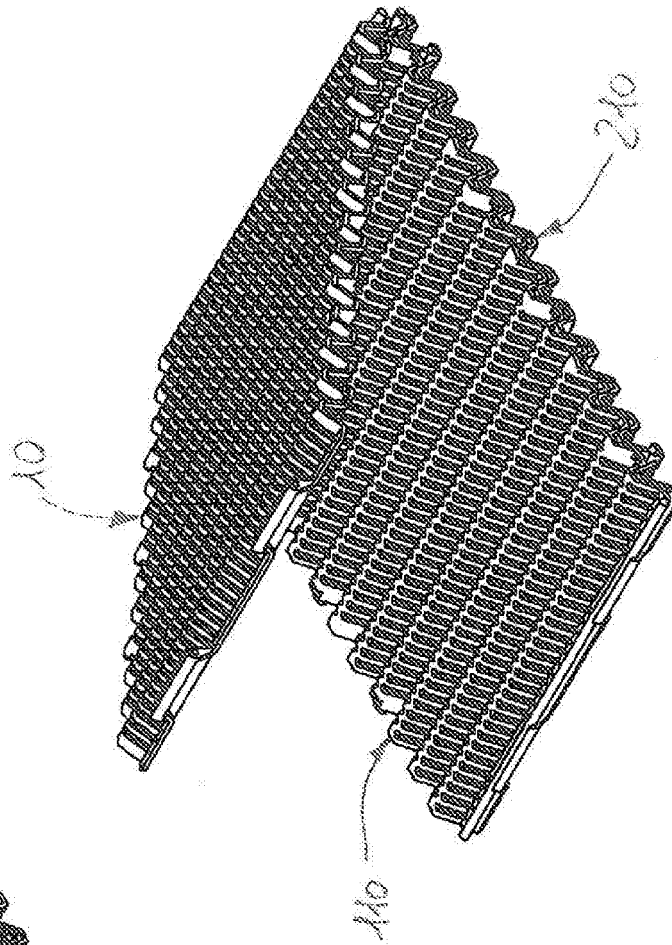


Fig. 6

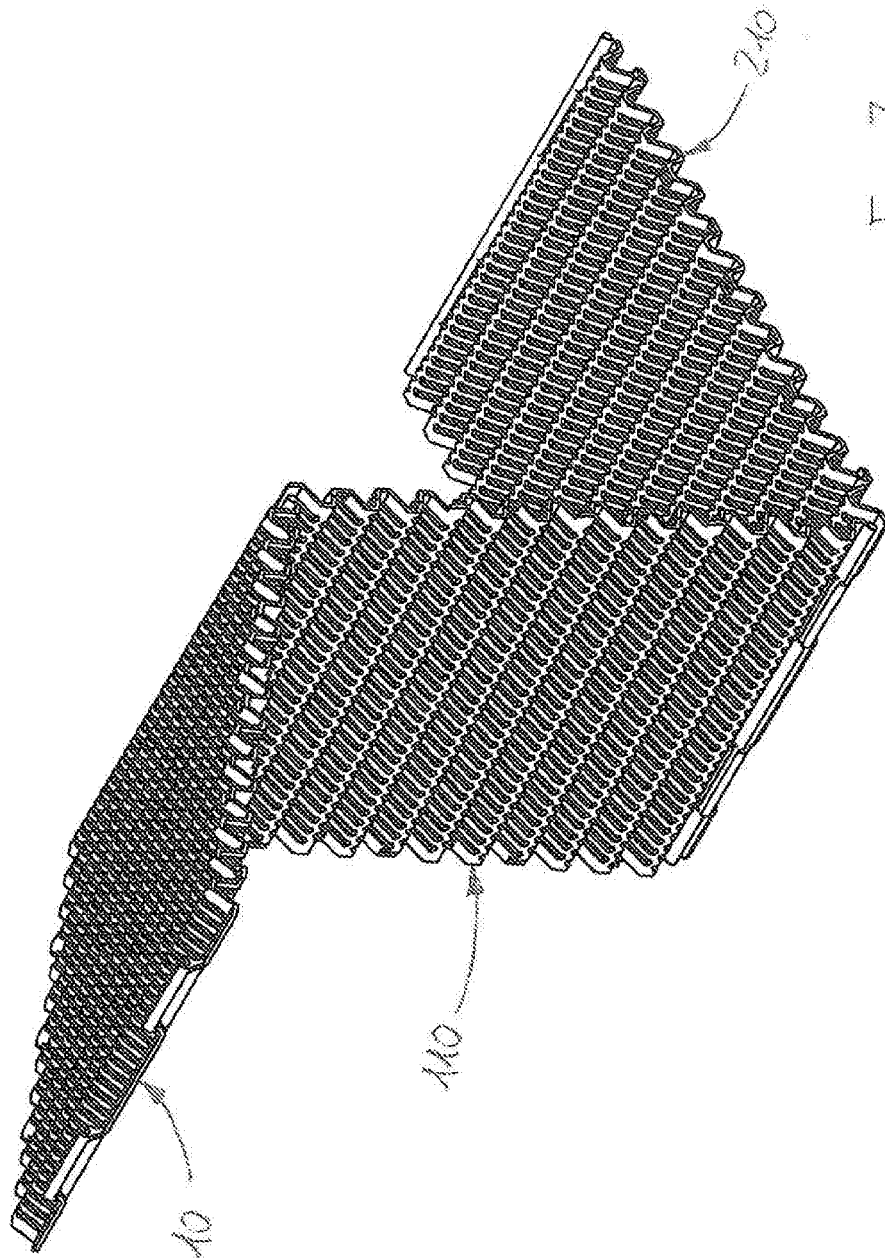
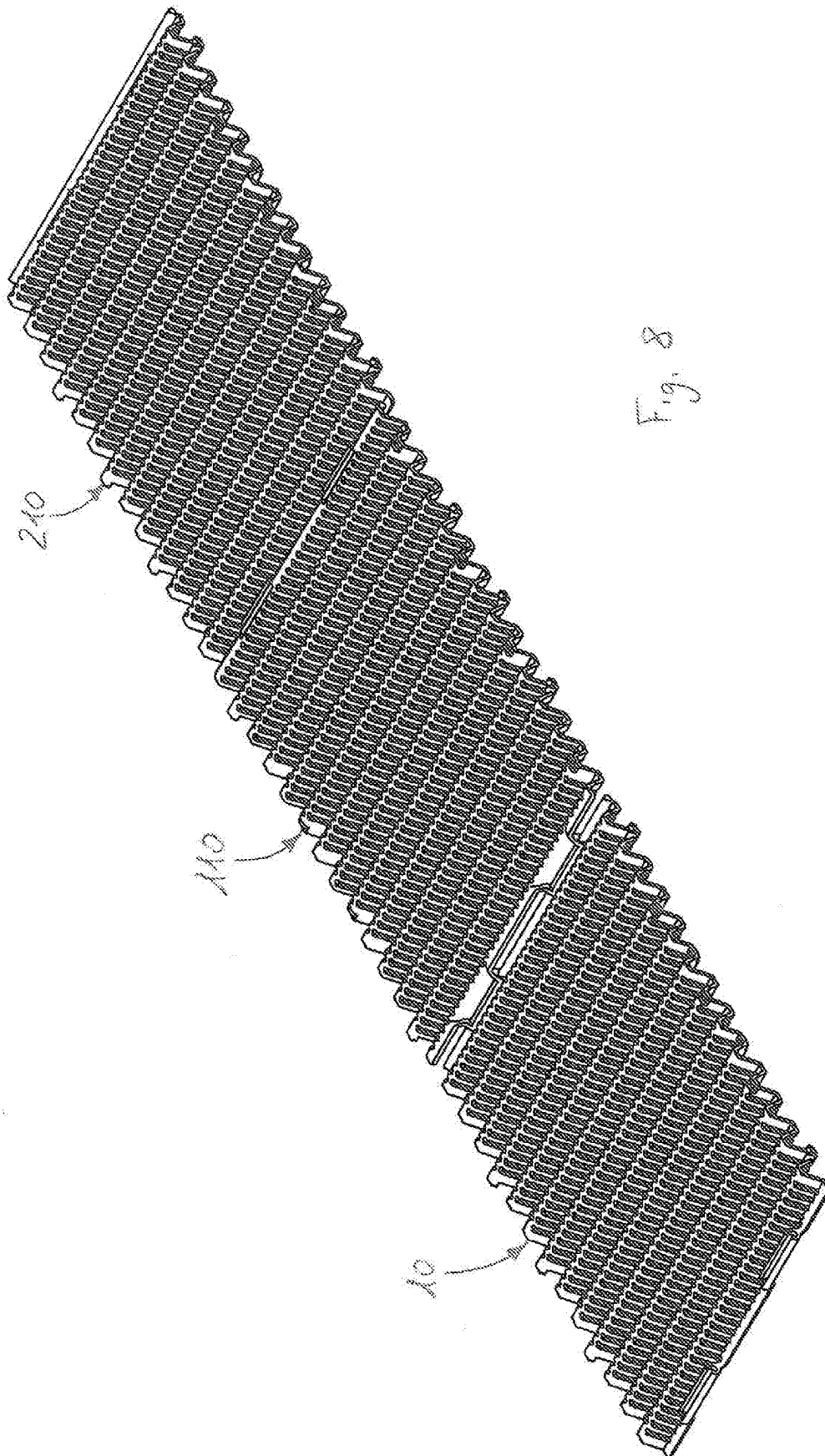


Fig. 7



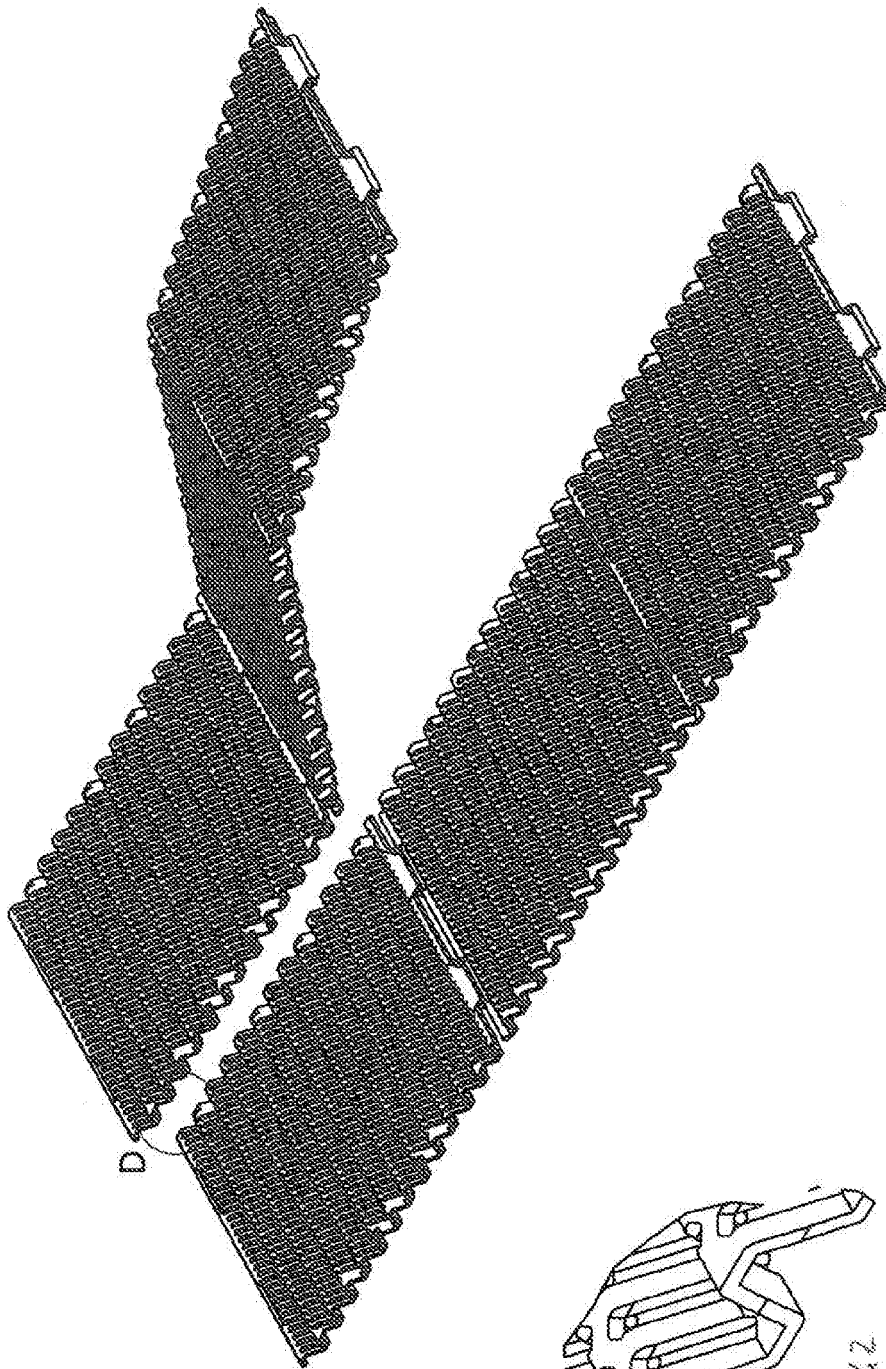


Fig. 9

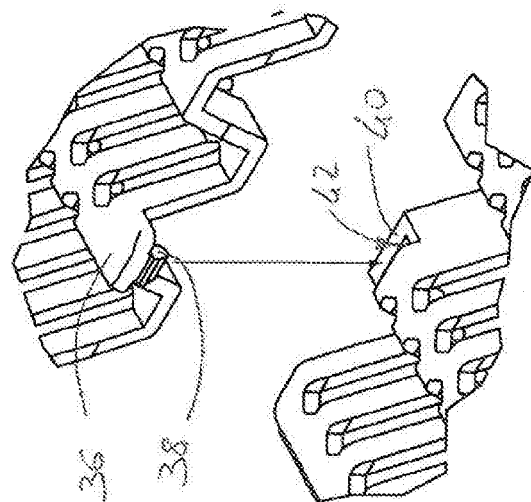


Fig. 10

D(2:1)

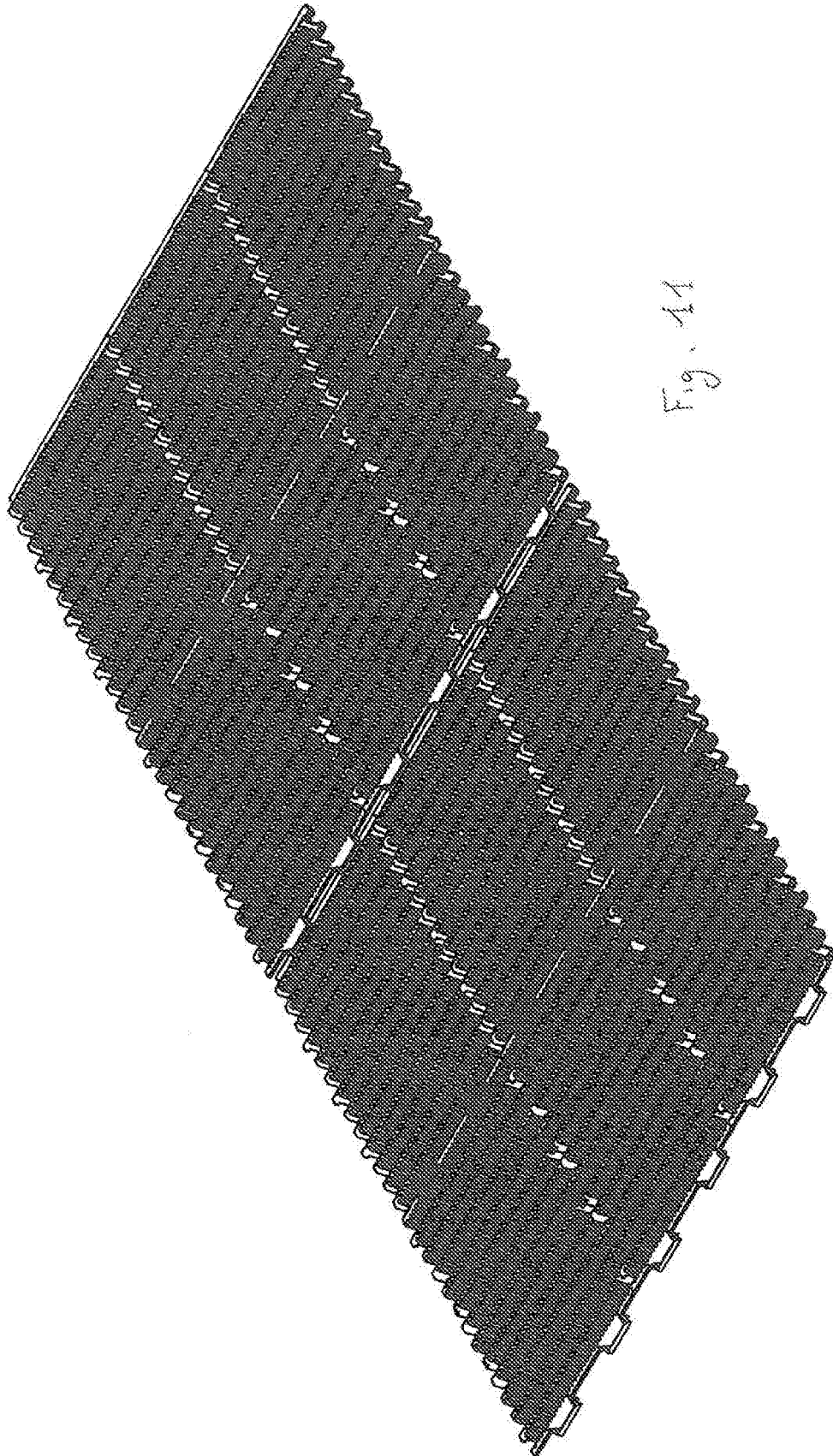
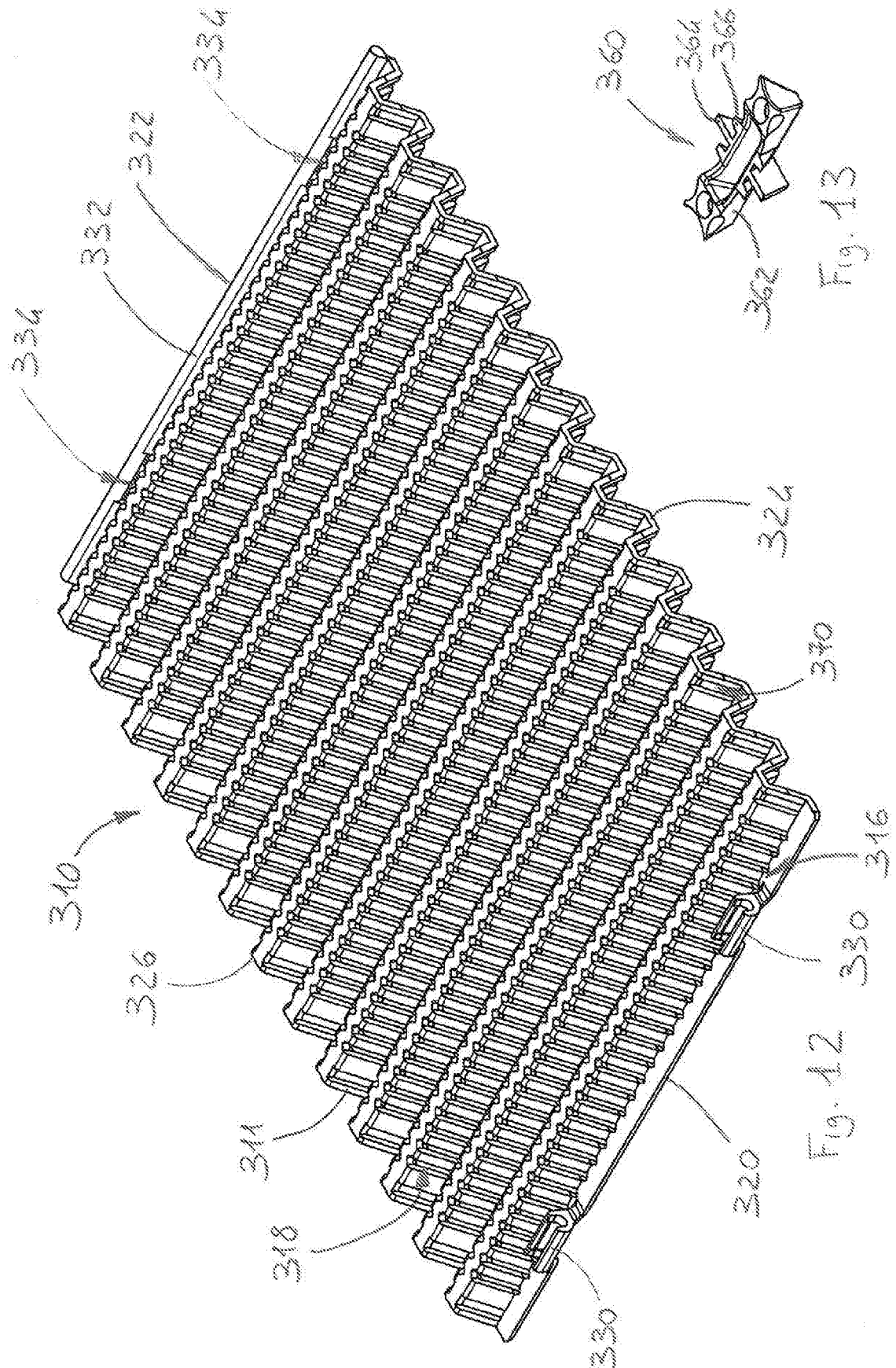
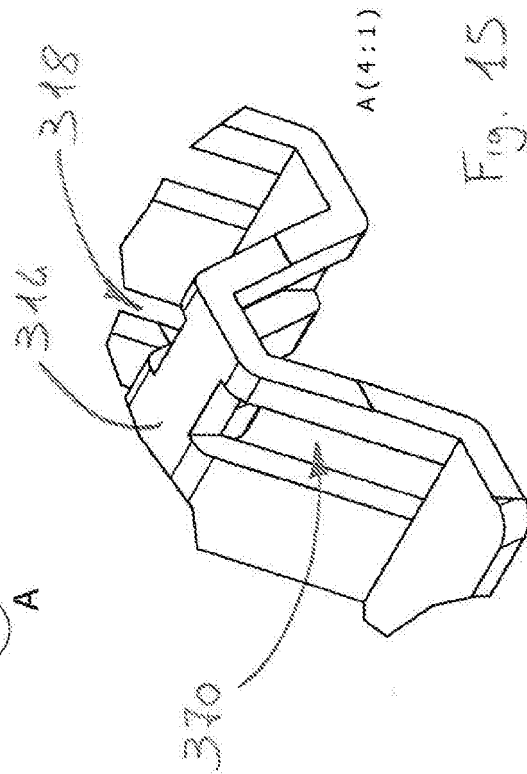
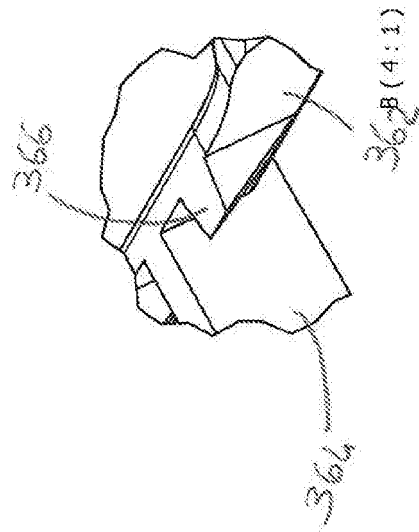
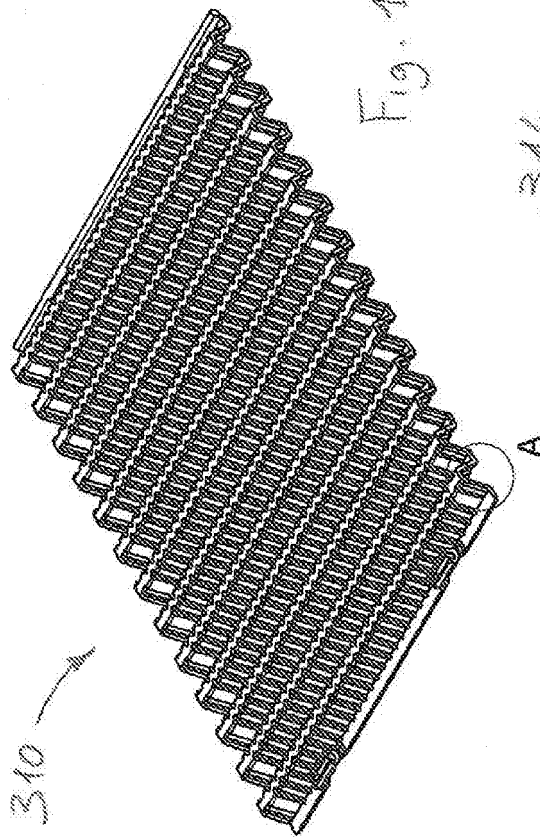


Fig. 11





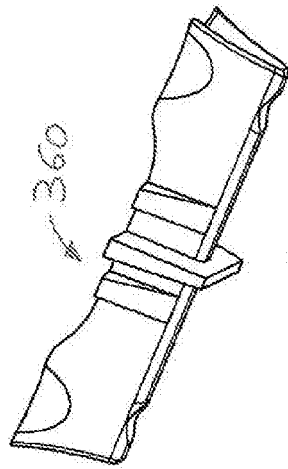


Fig. 20

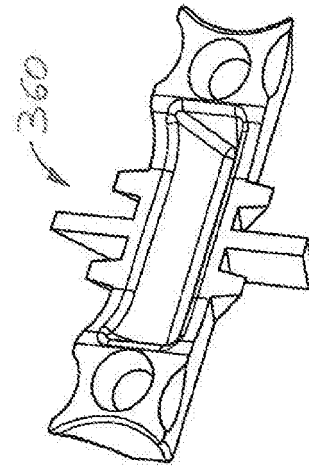


Fig. 23

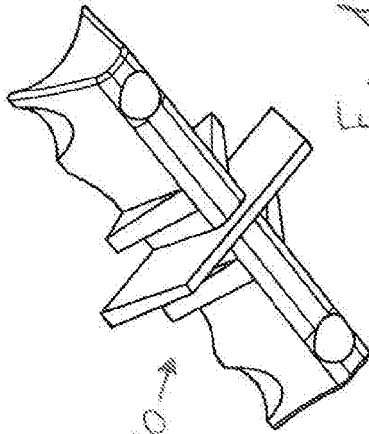


Fig. 19

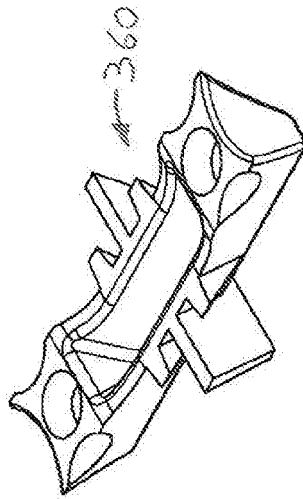


Fig. 22

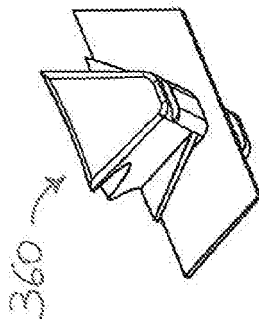


Fig. 18

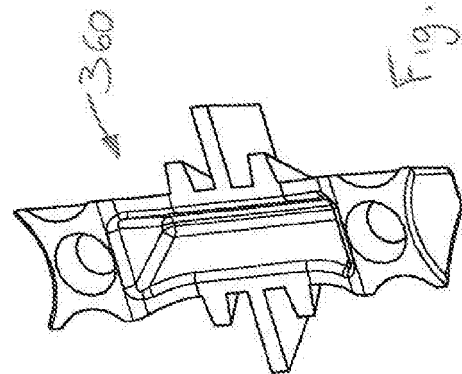
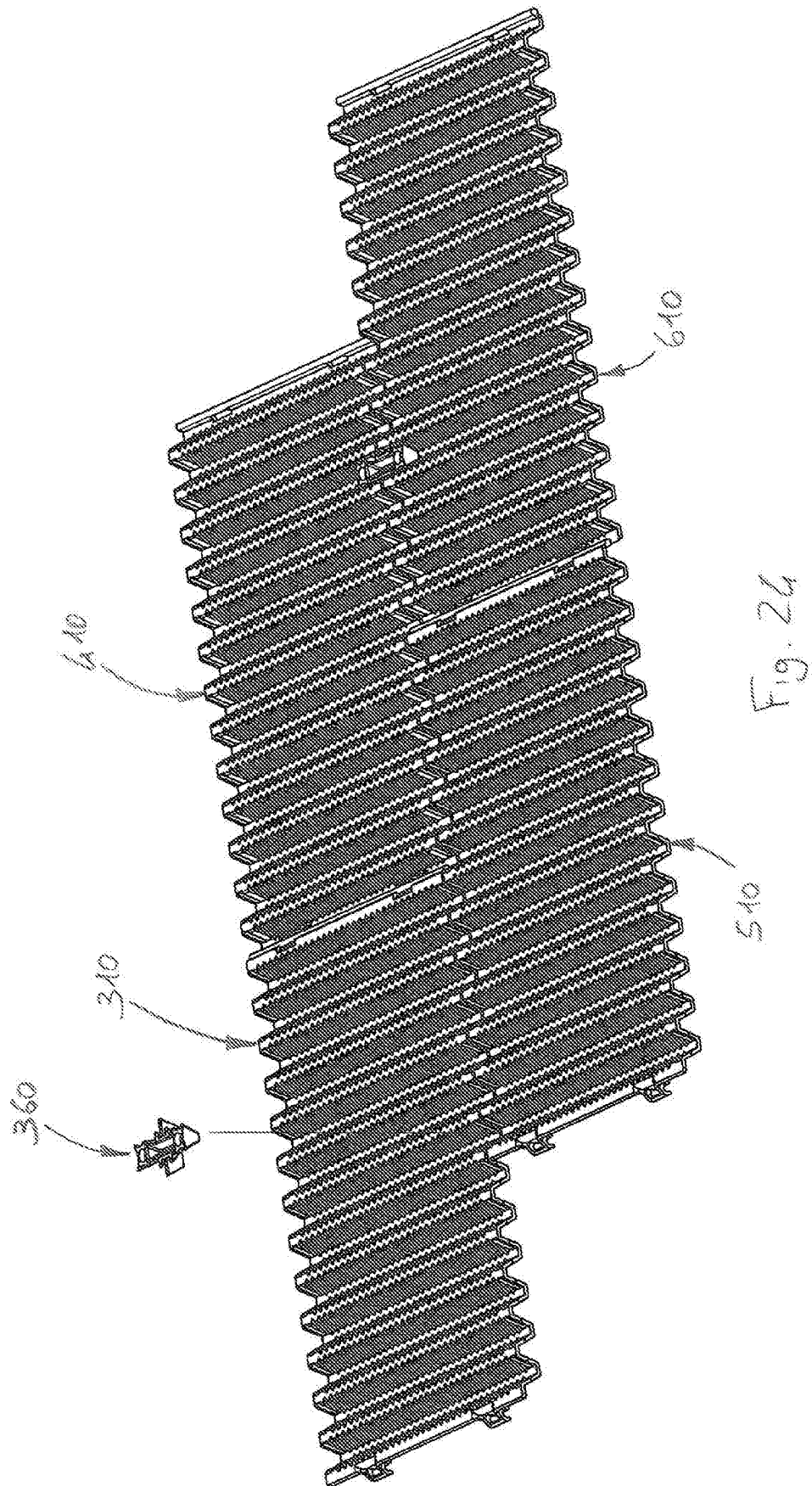
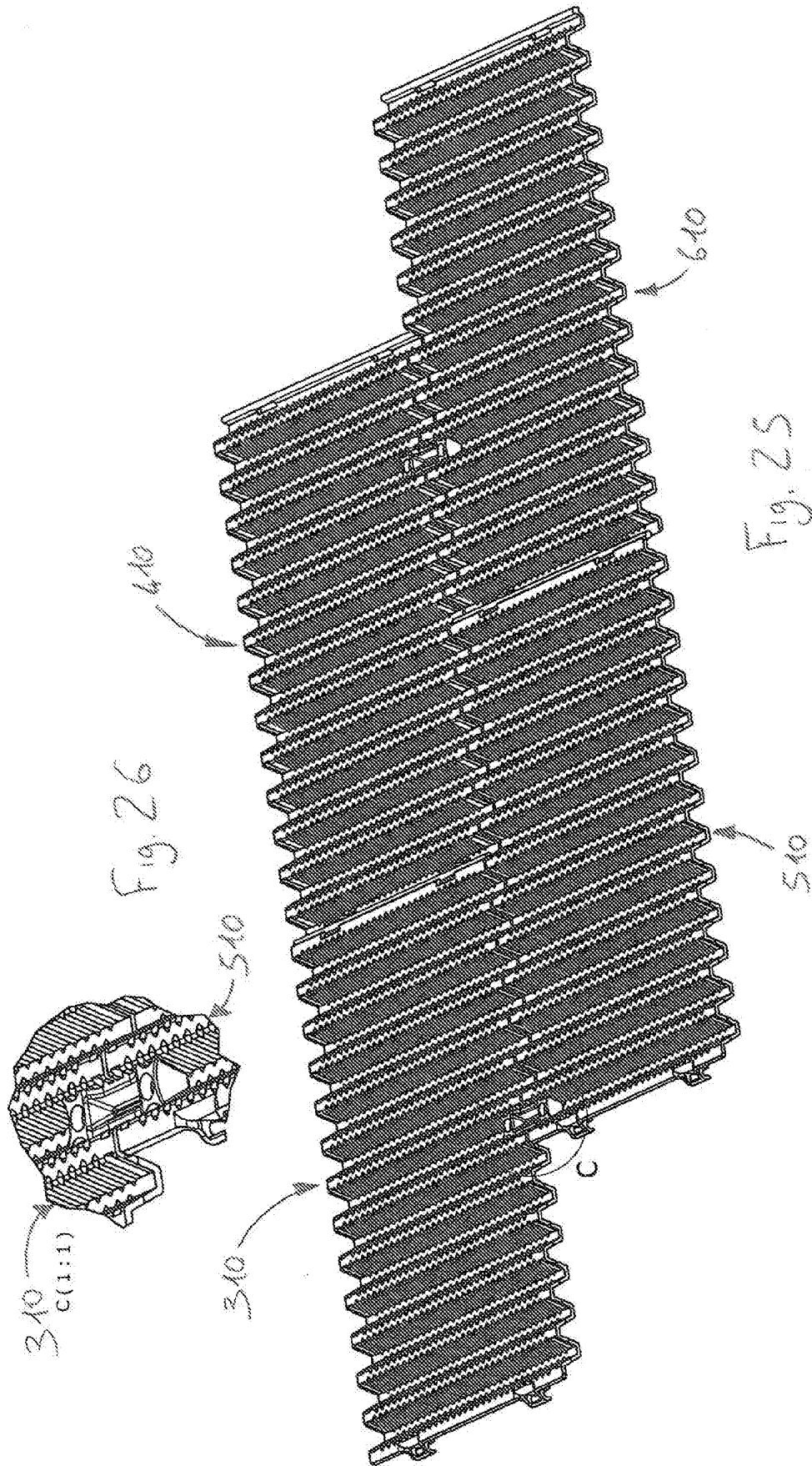
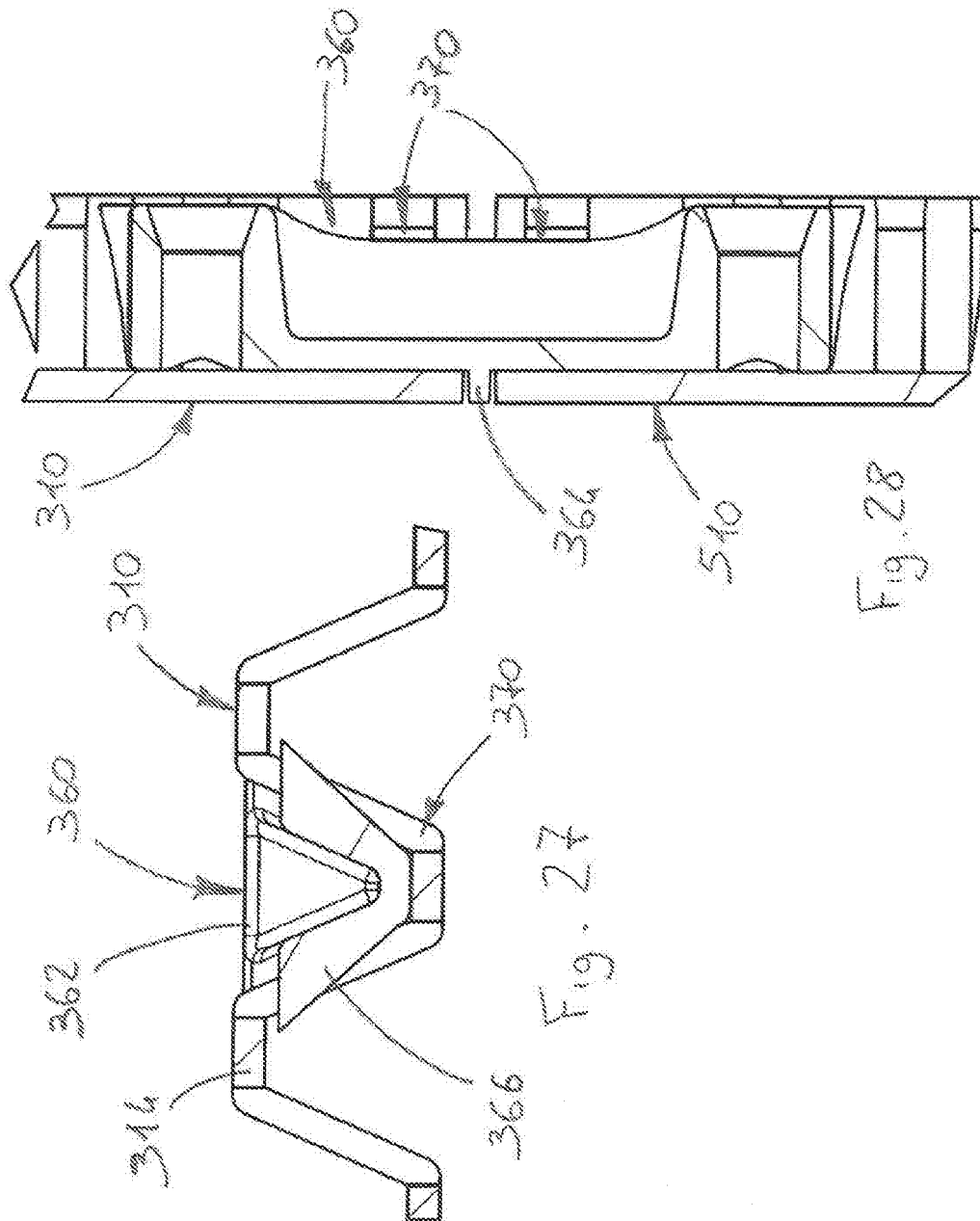


Fig. 24







REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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