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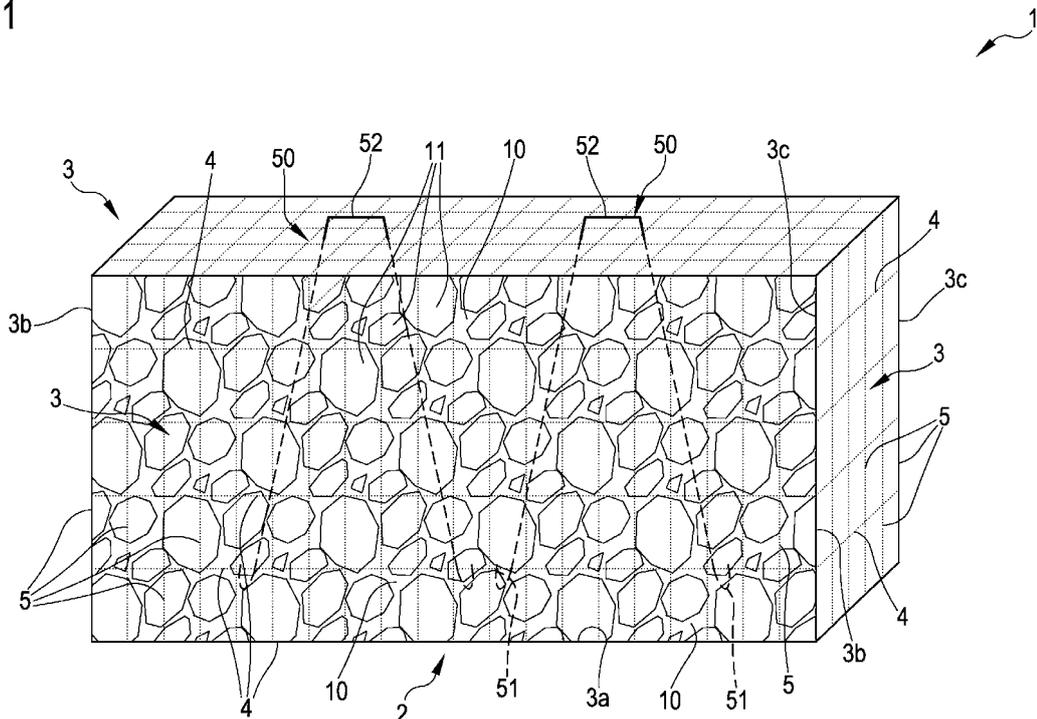
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(54) **Gabion**

(57) It is described a basket (1) for inert material comprising in form of wire meshes composed by an intertwining of horizontal (4) and vertical (5) rods, a bottom wall (2) and several vertical walls (3), each one connected to the bottom wall at a respective lower edge (3a) and to the adjoining vertical walls at a respective side edge (3b, 3c), so that to define a space inside the basket filled with inert material (11). The vertical rods end with a hooking portion (6) comprising a first folding (7) externally enveloping

the most outer horizontal rod (2a) of the edge of the bottom wall, a straight portion (8) beyond the first folding towards the rod end, and a second folding (9), in the same direction of the first folding, externally enveloping a subsequent horizontal rod (2b) of the bottom wall, more internal from the edge relatively to said most outer horizontal rod and parallel thereto, so that the hooking portions adopt a J-shaped configuration structured to connect the vertical wall to the bottom wall.

**FIG.1**



## Description

### Field of the Invention

[0001] The present invention relates to a basket for inert material, consisting of wire mesh walls, of the type known as "gabion".

### State of the Art

[0002] Metal baskets are known, in the field of the building works, intended for being filled with inert materials, such as rocks, stones, pebbles, and employed for realizing retaining walls and embankments. Such baskets, suitably placed side by side and stacked, allow to realize a uniform while flexible structure, able to fit with the ground pattern and to support possible ground failures without breaking, as it happens on the contrary to concrete or masonry walls and embankments.

[0003] The baskets for inert material are composed by several flat parts, denoted walls, consisting in a wire mesh and connected to form a container provided with an upper opening, for inserting inert material, and an inner volume occupied, in use, by the inert material itself. Typically the whole shape of the basket is a parallelepiped, realized by joining a squared or rectangular bottom wall with four vertical walls. Each vertical wall is connected below to a respective side of the bottom wall, laterally to the two adjoining vertical walls and is free on top, at the opening.

[0004] Different ways for connecting the walls composing the basket are known. For example, the walls can be welded at the contacting sides, or spiral threadlike elements may be arranged to be alternately inserted in the mesh of two adjoining panels so that to tie and join them together.

[0005] Alternatively, the walls are connected one to another by the U-shaped, suitable folding of one or more of the ends of the horizontal or vertical metallic rods composing the mesh of each panel, such that the foldings "envelop" as a hook the first rod of the adjoining panel arranged orthogonally to the rods provided with a folding. This allows to connect the walls without soldering and without having complex connecting means.

[0006] The Applicant however found that the current baskets for inert material can be improved in different aspects.

[0007] Specifically, the Applicant believes to be able to introduce connecting ways different from those shown in known prior art documents, to be employed for the realization of the connections between the side walls and the bottom wall or else between couples of adjoining walls.

### Objects and summary of the invention

[0008] Therefore the object of the present invention, in its various aspects and/or embodiments, is to provide a

basket for inert material characterized by a structure resistant to the stresses typically present during the use and provided with original connecting means between the walls.

5 [0009] Specifically, the Applicant intends to provide a basket provided with connections between adjoining walls able to effectively bear the weight of the inert material contained therein or in overhanging baskets and suitable to every operative condition, such as filling, lifting or displacing steps, or in case of disruption of the supporting ground below the basket.

10 [0010] A further object of the present invention is to provide a basket with easy and/or cost effective realization.

15 [0011] These and other objects are achieved by a basket for inert material having the technical characteristics disclosed in one or more of the following claims, as well as according to the following aspects and/or exemplary embodiments, variously combined, also with the afore said claims.

20 [0012] Therefore one of the aspects of the present invention relates to a basket according to the claim 1.

25 [0013] Specifically the present invention relates to a basket for inert material comprising a plurality of flat parts, or walls, in the shape of wire mesh composed by an intertwining of horizontal and vertical rods, said plurality of walls comprising a bottom wall and several vertical walls, each connected to the bottom wall at a respective lower edge and to the adjoining vertical walls at a respective side edge, so that to define a space inside the basket intended to be filled with inert material.

30 [0014] In a preferred embodiment, the vertical rods of at least two vertical, preferably not adjoining, walls end at the lower edge with a respective hooking portion comprising a first folding adapted to externally envelop the most outer horizontal rod of the edge of the bottom wall the wall is connected thereto, a straight portion beyond the first folding towards the rod end, and a second folding, closer to the rod end relatively to the first folding and in the same direction of the first folding, adapted to envelop externally a subsequent horizontal rod of the bottom wall, more internal from the edge relatively to said most outer horizontal rod and parallel thereto, so that said hooking portions adopt a J-shaped configuration structured for connecting the vertical wall to the bottom wall.

35 [0015] In one embodiment, the horizontal rods of one or several vertical walls end with a hooking portion structured for connecting to the adjoining vertical wall. Such a hooking portion comprises a folding, substantially of 40 180° and adapted to externally envelope the most outer vertical rod of the edge of the adjoining vertical wall, and a straight portion, beyond the first folding up to the rod end, substantially oriented in parallel to the horizontal rod, so that the hooking portion adopts a U-shaped (horizontal) configuration for connecting the vertical wall to the adjoining vertical wall. Preferably the horizontal rods of one, or each, vertical wall end at both sides with a U-shaped hooking portion, so that to realize the connection

with both the adjoining walls, one on each side.

**[0016]** In a further embodiment, the horizontal rods of at least one couple of adjoining vertical walls each one end, at the edge to be connected, with a respective U-shaped, or closed-eyelet, hooking portion and the basket comprises at last one pin able to be fitted vertically in every U-shaped, or closed eyelet, hooking portion of the rods of the couple of adjoining walls so that the hooking portions are all enveloped thereto, on different levels and alternately, that is with a vertical alternation of a hooking portion of a horizontal rod belonging to a wall and a hooking portion of a horizontal rod belonging to the other wall of the couple.

**[0017]** The Applicant believes that the combination of the afore said technical characteristics allows to obtain a basket able to keep, when filled with inert material, its whole shape during the lifting and handling steps and in use, and at the same time characterized by a simple, easy and cost effective to manufacture structure.

**[0018]** In addition, the Applicant verified that the J-shaped hooking portions, for the connection between the vertical walls and the bottom wall, being structured so that to envelop each one of two horizontal rods of the bottom wall, realize a wide and stable connection able to react to vertical stress determined by the inert material weight (which tends to deform the bottom wall downwards) sharing it among the connected walls). Also, the J-shape avoids accidental decoupling between the connected walls.

### Brief Description of the Drawings

**[0019]** Further characteristics and advantages will mostly result from the detailed description of some exemplary but not exclusive embodiments, among whom also a preferred implementation, of a basket for inert material in accordance with the present invention. Such a description will be set forth hereinbelow referring to the attached drawings, only provided for indicative purpose and, therefore, not limitative, wherein:

- figure 1 is a perspective schematic representation of a basket for inert material in accordance with the present invention;
- figure 2 is a partial side view of the basket of figure 1, highlighting the connection between a vertical wall and the bottom wall;
- figure 2A is a magnification of the detail of figure 2 contained in the dashed circle;
- figure 3 is a partial side view of the basket of figure 1, taken orthogonally to figure 2, highlighting the connection between a further vertical wall and the bottom wall;
- figure 3A is a magnification of the detail of figure 3 contained in the dashed circle;
- figure 4 is a partial top view of the basket of figure 1, with the bottom wall removed, highlighting the con-

nection between two adjoining vertical walls;

- figure 4A is a magnification of the detail of figure 4 contained in the dashed circle;
- figure 5 is a side view of a connecting means between vertical walls;
- figures 5A and 5B are views, similar to the view of figure 4A, each one showing an embodiment variation of the connection between two adjoining vertical walls.

### Detailed description of the invention

**[0020]** Referring to the enclosed figures, a monitoring and predicting apparatus according to the present invention is wholly indicated with reference number 1. In general, the same reference number is used for the same elements, possibly in their embodiment variations.

**[0021]** The basket 1, schematically represented in figure 1 filled with inert material 11 such as stone, rock or porphyry, comprises a plurality of flat parts, denoted walls, in the shape of wire mesh composed by an intertwining of horizontal 4 and vertical 5 rods. Such a plurality of walls comprises a bottom wall 2 and several vertical walls 3, each one connected to the bottom wall at a respective lower edge 3a and to the adjoining vertical walls at a respective side edge 3b and 3c, so that to define a space inside the basket to be filled with inert material. Based on the mesh size, the basket is to be filled with consistent size inert material.

**[0022]** In an embodiment, as shown in figures, each wall can be composed by vertical rods and dual coupled horizontal rods (instead of single horizontal rods), for example by soldering, from opposite sides of the vertical rods. Similarly, the walls can be composed by horizontal rods and double vertical rods.

**[0023]** Preferably, as shown in figures, the bottom wall 2 is quadrangular, the basket comprises four vertical walls 3 (perpendicular to the bottom wall) and has an overall shape of a parallelepiped.

**[0024]** Preferably the horizontal 4 and vertical 5 rods of each wall are perpendicular one to another, so that to form a rectangular - shaped wire mesh 10, for example of dimensions 50 mm x 200 mm.

**[0025]** Within the scope of the present invention, with the term 'rod' a reinforcing bar, rod or staff is intended, with elongate shape and constant section (typically circular), having diameter typically from 1 mm to 20 mm, possibly with ribbed or indented surface.

**[0026]** The basket can be open on top or comprise an upper wall closing the space inside the basket.

**[0027]** The vertical rods 5 of at least two vertical walls 3, preferably not adjoining (for example two opposite walls), end at the lower edge 3a with a respective hooking portion 6 comprising a first folding 7 externally enveloping the most outer horizontal rod 2a of the edge of the bottom wall 2 the wall is connected thereto, a straight portion 8 beyond the first folding towards the rod end, and a second folding 9, closer to the rod end relatively to the first folding

and in the same direction of the first folding, externally enveloping a subsequent horizontal rod 2b of the bottom wall, more internal from the edge relatively to said most outer horizontal rod and parallel thereto. This way the hooking portions adopt a J-shaped configuration connecting the vertical wall to the bottom wall.

**[0028]** The distance between the folding centers of the first 7 and the second 9 folding of each hooking portion, that is the length of the straight portion 8, is substantially equal to the distance between the most outer horizontal rod 2a and the subsequent rod 2b of the bottom wall.

**[0029]** Preferably, the first folding is substantially of 90° and the second folding is greater than 90° and lower than 180°, by way of example equal to about 160° (as in figure 2 and 2a).

**[0030]** Preferably, as shown in figure 2 and 2a, the afore said subsequent rod 2b is the immediately more internal rod relatively to the afore said most outer horizontal rod 2a, that is to say it is the second horizontal rod from the edge.

**[0031]** Advantageously, the vertical rods of all the vertical walls end with a J-shaped hooking portion.

**[0032]** Alternatively, as shown in figures 3 and 3a, the vertical rods of the remaining vertical walls, that is the walls not provided with a J-shaped hooking portion, end at the lower edge with a respective hooking portion 16 comprising a folding 17, substantially of 180° and adapted to externally envelop the most outer horizontal rod 2a of the edge of the bottom wall the vertical wall is connected thereto, and a straight portion 18, beyond the first folding up to the rod end, oriented substantially in parallel to the vertical rod itself. This way the hooking portion 16 adopts a U-shaped (vertical) configuration to connect the vertical wall to the bottom wall.

**[0033]** Preferably, as shown in figures 4 and 4a, the horizontal rods 4 of one or several vertical walls 3 end with a hooking portion 20 structured for the connection to the adjoining vertical wall. Such a hooking portion 20 comprises a folding 21, substantially of 180° and adapted to externally envelop the most outer vertical rod 5a of the edge of the adjoining vertical wall, and a straight portion 22, beyond the first folding up to the rod end, oriented substantially in parallel to the horizontal rod 4. This way the hooking portion 20 adopts a U-shaped (horizontal) configuration to connect the vertical wall to the adjoining vertical wall. Preferably the horizontal rods of one, or each, vertical wall end at both sides with a U-shaped hooking portion, so that to realize the connection with both the adjoining walls, one on each side.

**[0034]** In a further embodiment, shown in figure 5a, each one of the horizontal rods 4 of at least one couple of adjoining vertical walls 3 end, at the edge to be connected, with a respective U-shaped hooking portion 20 and the basket comprises at least one pin 30 (shown in figure 5) able to be vertically inserted in all the U-shaped hooking portions of the rods of the couple of adjoining walls so that all the hooking portions are enveloped to the pin. Specifically, the hooking portions are enveloped

to the pin on different levels and alternately, that is with a vertical alternation of a hooking portion of a horizontal rod belonging to a wall and a hooking portion of a horizontal rod belonging to the other wall of the couple.

**[0035]** In a further embodiment, shown in figure 5b, the horizontal rods of at least one couple of adjoining vertical walls each one end, at the edge to be connected, with a respective closed-eyelet 28 hooking portion and the basket comprises at least one pin 30 able to be vertically inserted in all the closed-eyelets of the rods of the couple of adjoining walls so that the eyelets are all enveloped to the pin, on different levels and alternately, that is with a vertical alternation of an eyelet of a horizontal rod belonging to a wall and an eyelet of a horizontal rod belonging to the other wall of the couple.

**[0036]** Preferably, every vertical wall of the basket are connected one another by pins 30 vertically inserted in U-shaped 20 or closed-eyelet 28 hooking portions of the vertical rods. Specifically, the basket comprises a number of pins 30 equal to the number of vertical edges for connecting between vertical walls, that is equal to the number of vertical walls.

**[0037]** The pin is a rod itself, comprising a stem 31 of the length of the side edge of the vertical walls and a pinhead 32 at the upper end, having a section larger than the stem section, adapted to come into abutment against the first hooking portion from the top when the pin is inserted into the hooking portions.

**[0038]** Preferably, the closed eyelet 28 can be realized from a U-shaped hooking portion 20 by simply closing (for example with a solder) the straight portion 22 on the horizontal rod itself, in a point placed before the folding 21, or, in the case the wall is composed by dual horizontal rods, on the coupled horizontal rod 4. In this latter instance the two coupled horizontal rods will be adjoined, continuously, by the eyelet of their own hooking portion.

**[0039]** The basket 1 can comprise at least one lifting part 50 having the shape of arched rod provided, at its two ends, with two hooking portions 51 intended for being connected each one to a respective rod of the bottom wall, and with a median portion 52 to allow the basket grip and its lifting and carrying. The median portion is positioned flush with, or slightly below, the upper opening of the basket. Preferably the hooking portions 51 can be of the afore described J-shaped or U-shaped type. In figure 1 two lifting parts 50 are schematically shown.

## Claims

1. Basket (1) for inert material, comprising a plurality of flat parts, or walls (2, 3), in the shape of wire mesh composed by an intertwining of horizontal rods (4) and vertical rods (5), said plurality of walls comprising a bottom wall (2) and several vertical walls (3), each connected to the bottom wall at a respective lower edge (3a) and to the adjoining vertical walls at a respective side edge (3b, 3c), so that to define a

space inside the basket intended for being filled with inert material (11),

wherein each of the vertical rods of at least a vertical wall end, at the lower edge (3a), with a respective hooking portion (6) comprising a first folding (7) adapted to envelop externally the most outer horizontal rod (2a) of the edge of the bottom wall to which the wall is connected, a straight portion (8) beyond the first folding towards the rod end, and a second folding (9), closer to the rod end relatively to the first folding and in the same direction of the first folding, adapted to envelop externally a subsequent horizontal rod (2b) of the bottom wall, more internal from the edge with respect to said most outer horizontal rod and parallel thereto, so that said hooking portions adopt a J-shaped configuration structured for connecting the vertical wall to the bottom wall.

2. Basket (1) according to claim 1, wherein the distance between the folding centers of the first (7) and the second (9) folding of each hooking portion (6) is substantially equal to the distance between said most outer horizontal rod (2a) and said subsequent rod (2b) of the bottom wall.
3. Basket (1) according to claim 1 or 2, wherein the first folding (7) is substantially of 90° and the second folding (9) is greater than 90° and lower than 180°.
4. Basket (1) according to any one of the preceding claims, wherein the afore said subsequent rod (2b) is the immediately more internal rod relatively to the afore said most outer horizontal rod (2a), or rather it is the second horizontal rod from the edge.
5. Basket (1) according to any one of the preceding claims, wherein the vertical rods (5) of every vertical walls end with a J-shaped hooking portion (6) or wherein the vertical rods of the remaining vertical walls, that is the walls not provided with J-shaped hooking portion, end at the lower edge with a respective hooking portion (16) comprising a folding (17), substantially of 180°, and adapted to envelop externally the most outer horizontal rod (2a) of the edge of the bottom wall the vertical wall is connected thereto, and a straight portion (18), beyond the first folding up to the rod end, oriented substantially in parallel to the vertical rod itself, so that the hooking portion adopts a U-shaped configuration to connect the vertical wall to the bottom wall.
6. Basket (1) according to any one of the preceding claims, wherein the horizontal rods (4) of one or more vertical walls (3) end with a hooking portion (20) structured for the connection to the adjoining vertical wall and comprising a folding (21), substantially of 180° and adapted to envelop externally the most outer vertical rod of the edge of the adjoining vertical

wall, and a straight portion (22), beyond the first folding up to the rod end, oriented substantially parallel to the horizontal rod, so that the hooking portion adopts a U-shaped configuration to connect the vertical wall to the adjoining vertical wall.

7. Basket (1) according to the preceding claim, wherein the horizontal rods (4) of one, or each, vertical wall (3) end at both sides with a U-shaped hooking portion, so that to realize the connection with both adjoining walls (3), one for every side.
8. Basket (1) according to any one of the preceding claims, wherein the each horizontal rods (4) of at least one couple of adjoining vertical walls (3) end, at the edge to be connected, with a respective U-shaped hooking portion (20) and the basket comprises at least one pin (30) able to be vertically inserted in all the U-shaped hooking portions of the rods of the couple of adjoining walls so that all the hooking portions are enveloped to the pin, on different levels and alternately, that is with a vertical alternation of a hooking portion of a horizontal rod belonging to a wall and a hooking portion of a horizontal rod belonging to the other wall of the couple.
9. Basket (1) according to any one of the preceding claims, wherein each of the horizontal rods (4) of at least one couple of adjoining vertical walls (3) end, at the edge to be connected, with a respective closed-eyelet hooking portion (28) and the basket comprises at least one pin (30) able to be vertically inserted in all the closed-eyelets of the rods of the couple of adjoining walls so that all eyelets are enveloped to the pin, on different levels and alternately, that is with a vertical alternation of an eyelet of a horizontal rod belonging to a wall and an eyelet of a horizontal rod belonging to the other wall of the couple.
10. Basket (1) according to any one of the preceding claims, comprising at least one lifting part (50) having the shape of arched rod provided, at its two ends, with two hooking portions (51) intended for being positioned in the space inside the basket and each connected to one or more respective rods of the bottom wall, and with a median portion (52) positioned flush with, or slightly below, the upper opening of the basket and adapted to allow the basket grip and its lifting and carrying, said hooking portions (51) being of the afore said J-shaped type.

FIG.1

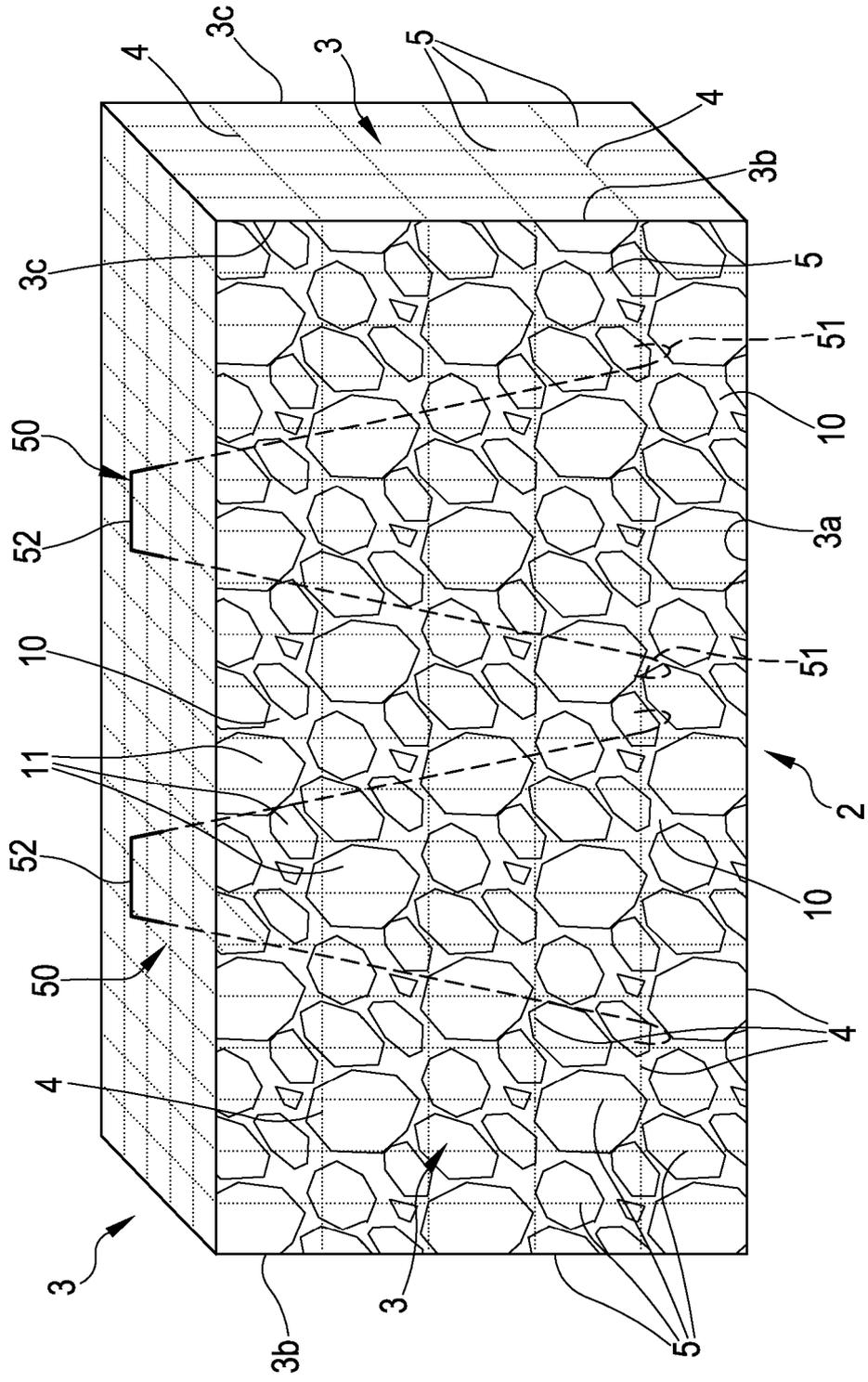


FIG.2

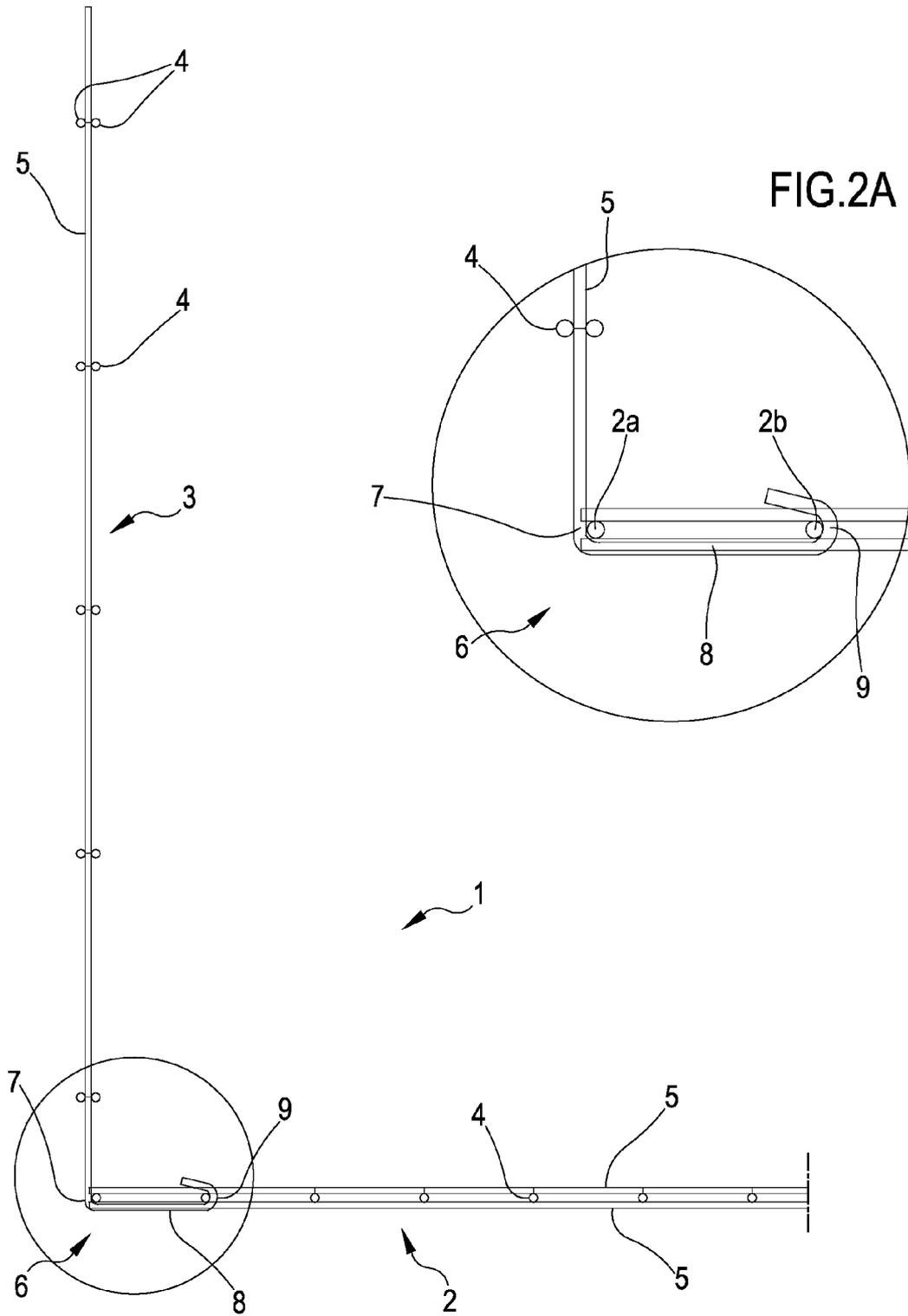


FIG.3

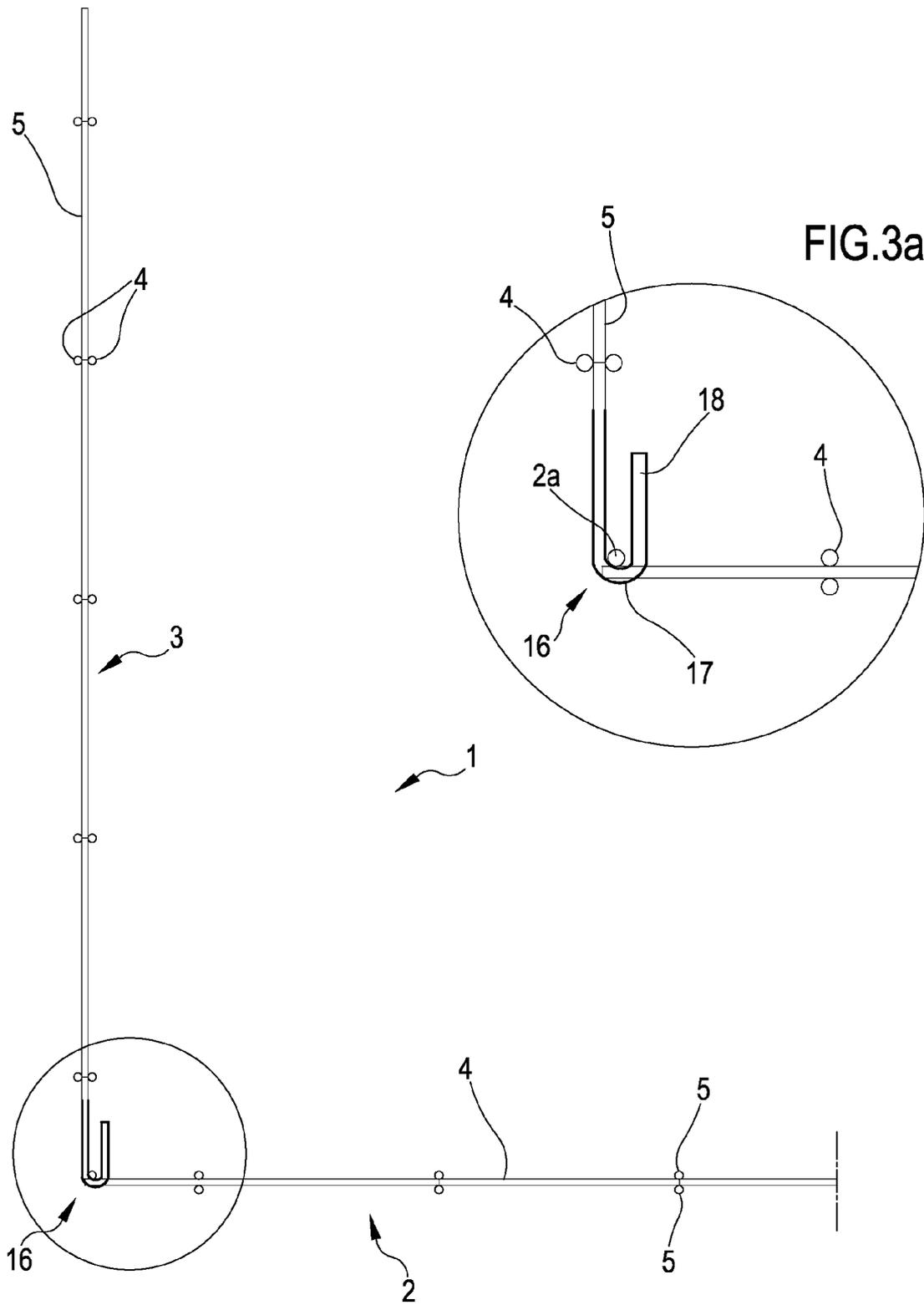


FIG.3a

FIG.4A

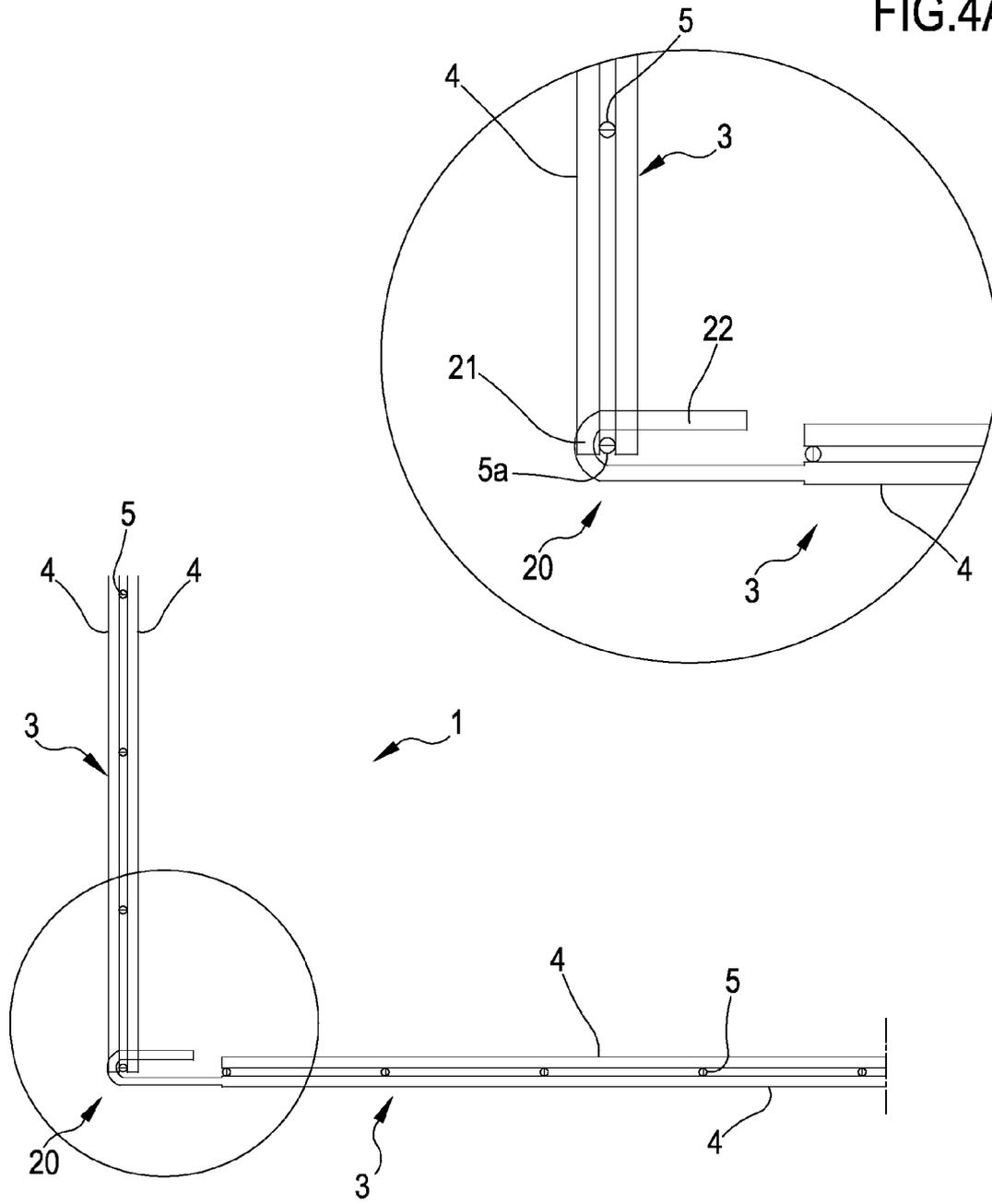


FIG.4

FIG.5

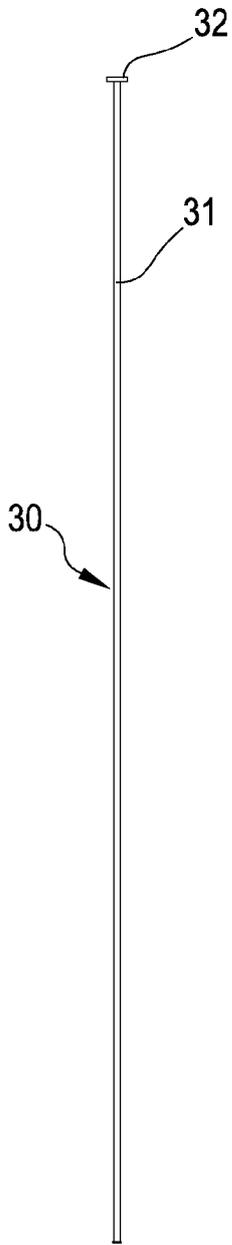


FIG.5A

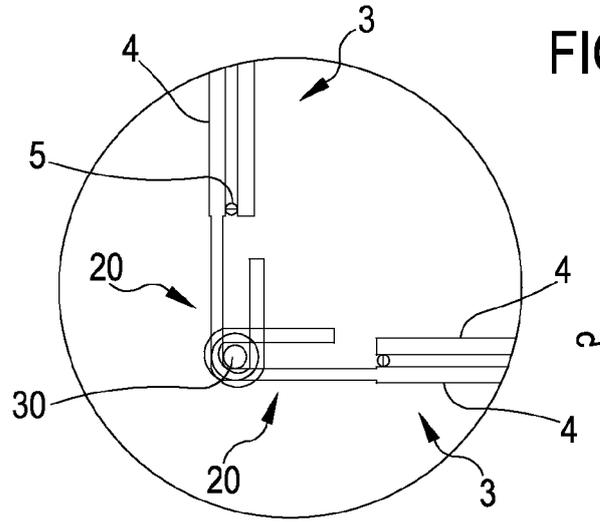
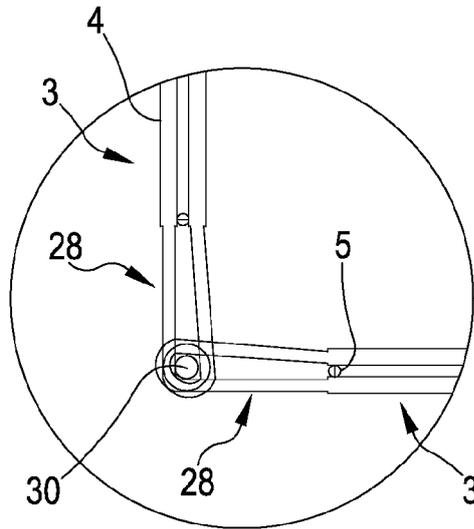


FIG.5B





EUROPEAN SEARCH REPORT

Application Number  
EP 12 18 2311

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Place of search Munich		Date of completion of the search 8 October 2012	Examiner Geiger, Harald
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ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 12 18 2311

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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