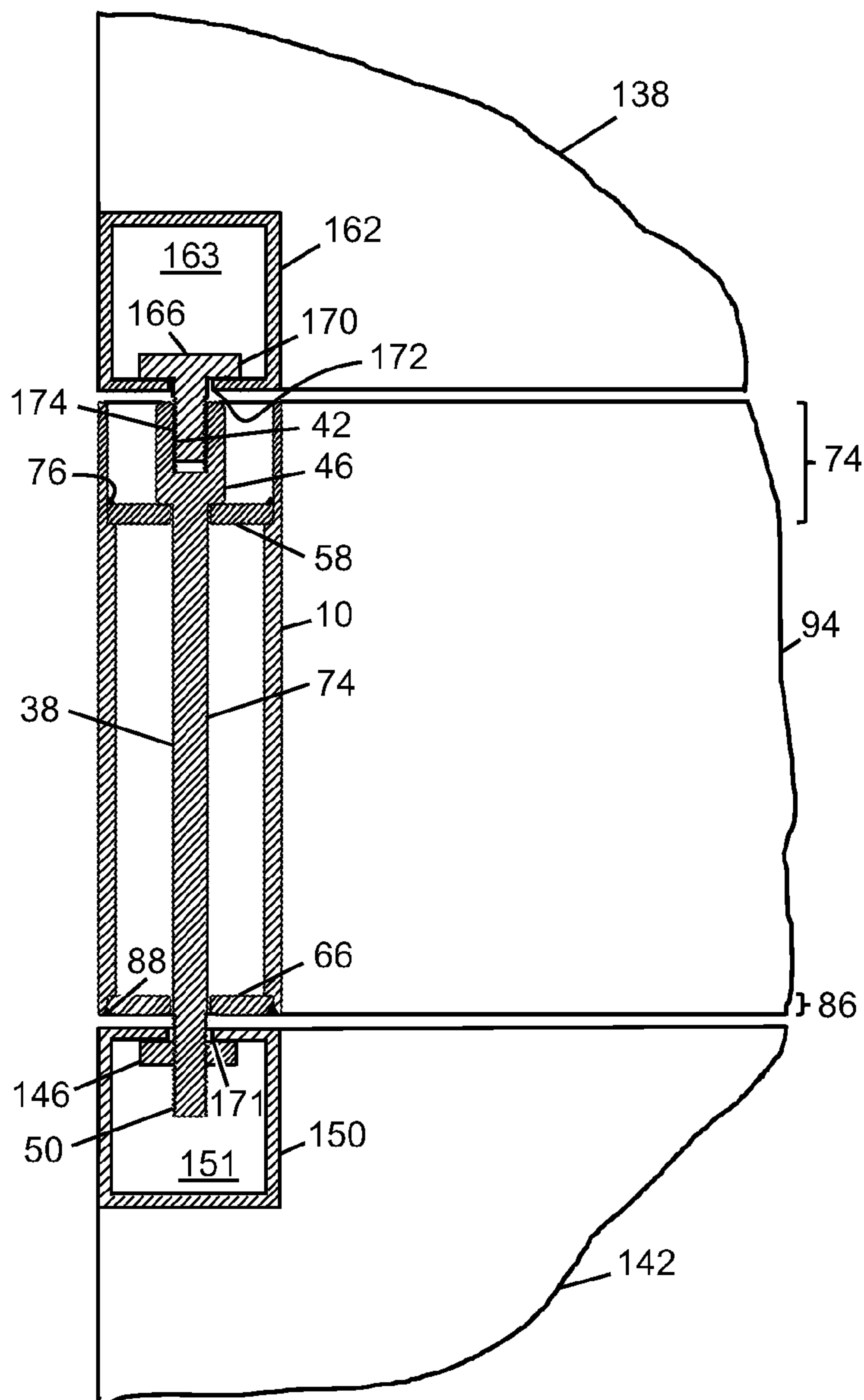


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Dombowsky et al.(10) **Pub. No.: US 2021/0238843 A1**(43) **Pub. Date: Aug. 5, 2021**(54) **HORIZONTAL BUILDING PANEL WITH
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(2013.01); *E04B 2103/02* (2013.01); *E04C*
2/044 (2013.01)(57) **ABSTRACT**

A floor panel includes hollow floor connector blocks that are reinforced with anchor pins embedded in cementitious material in the body of the panel. The floor connector blocks have two internal plates, which have holes that guide a tapped-head bolt. The tapped-head bolt has a threaded hole in its head and a bottom end thread that are used as anchoring sites respectively for upper and lower wall panels, which are also equipped with connector blocks.



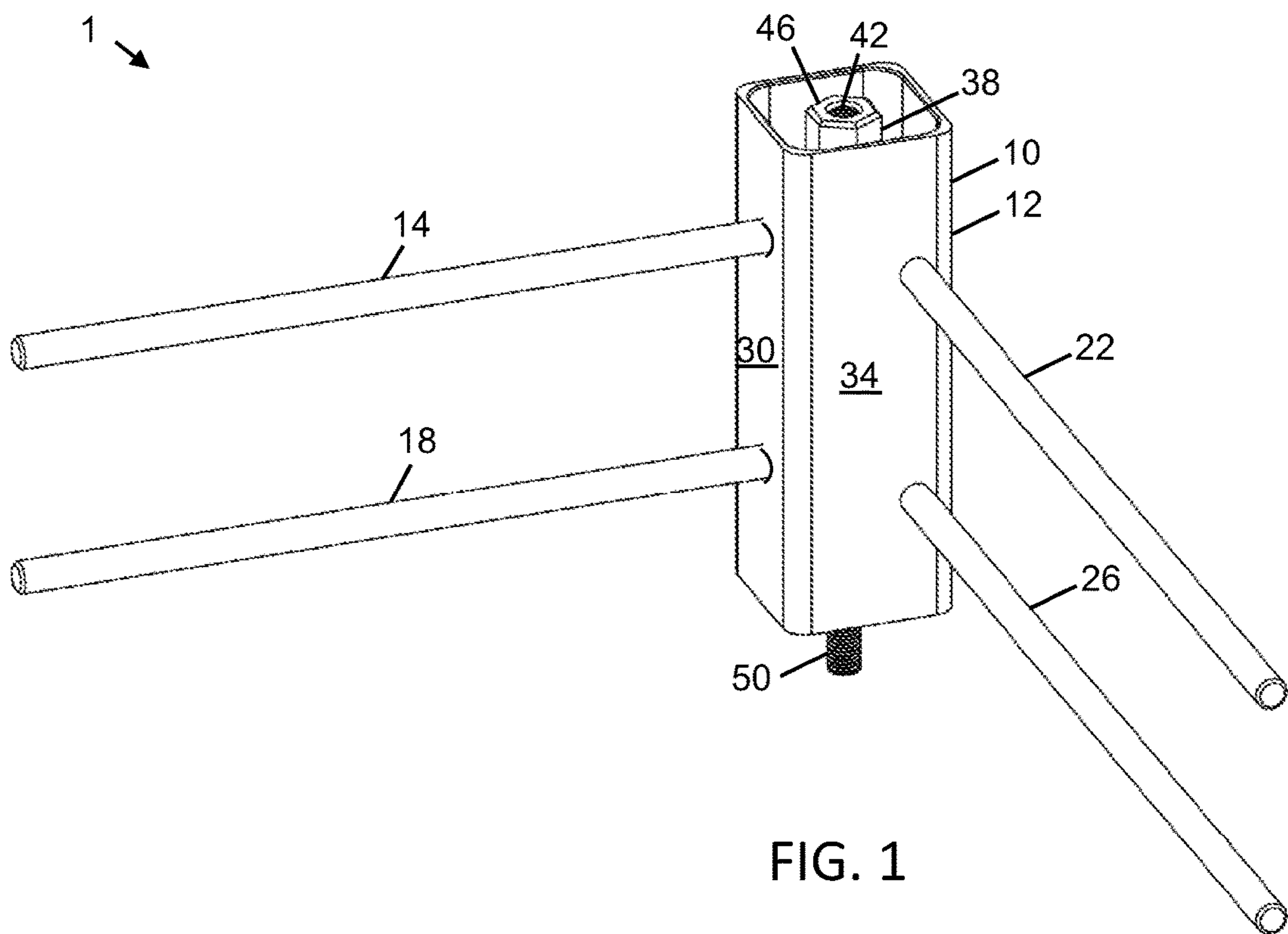


FIG. 1

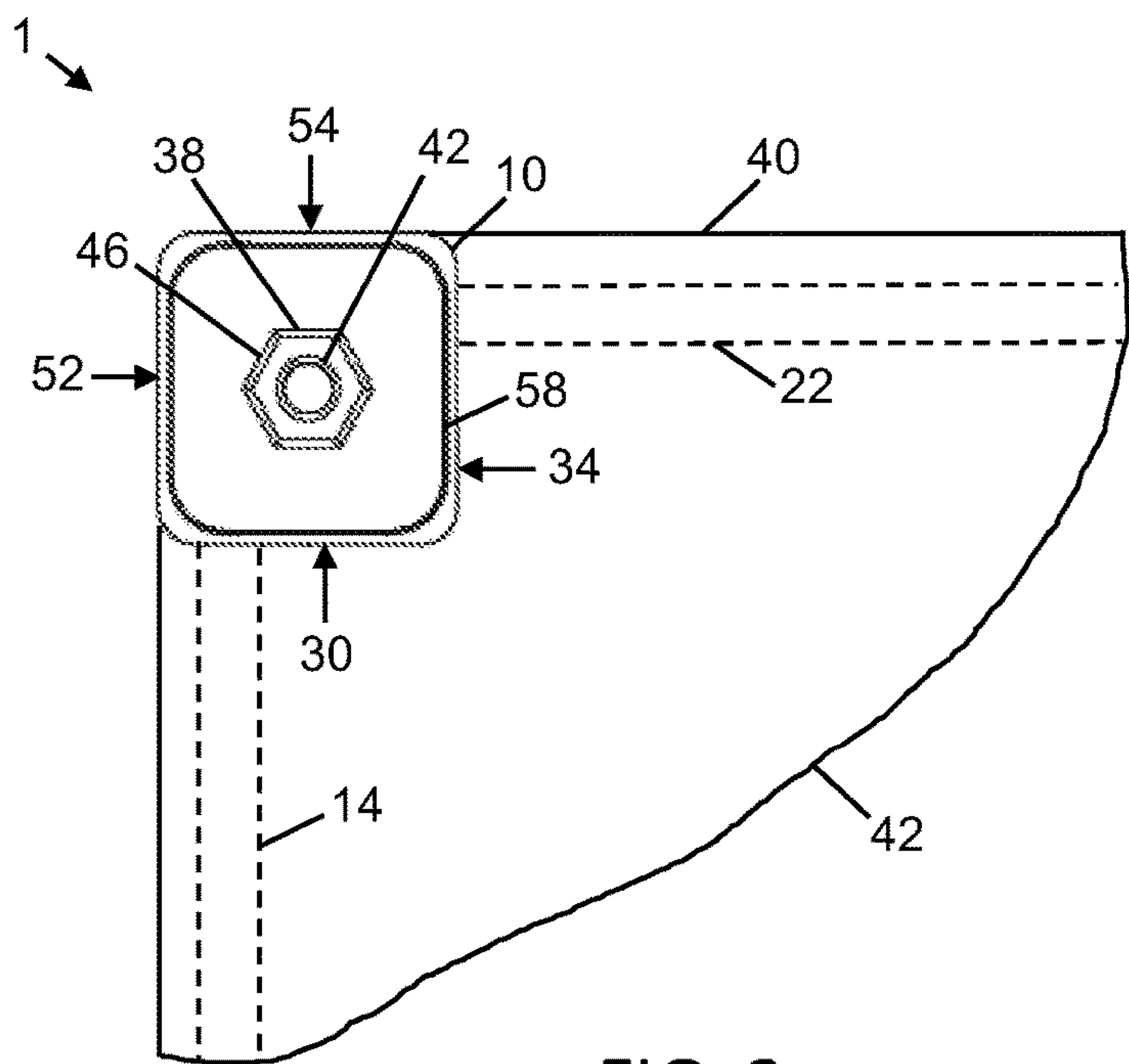


FIG. 2

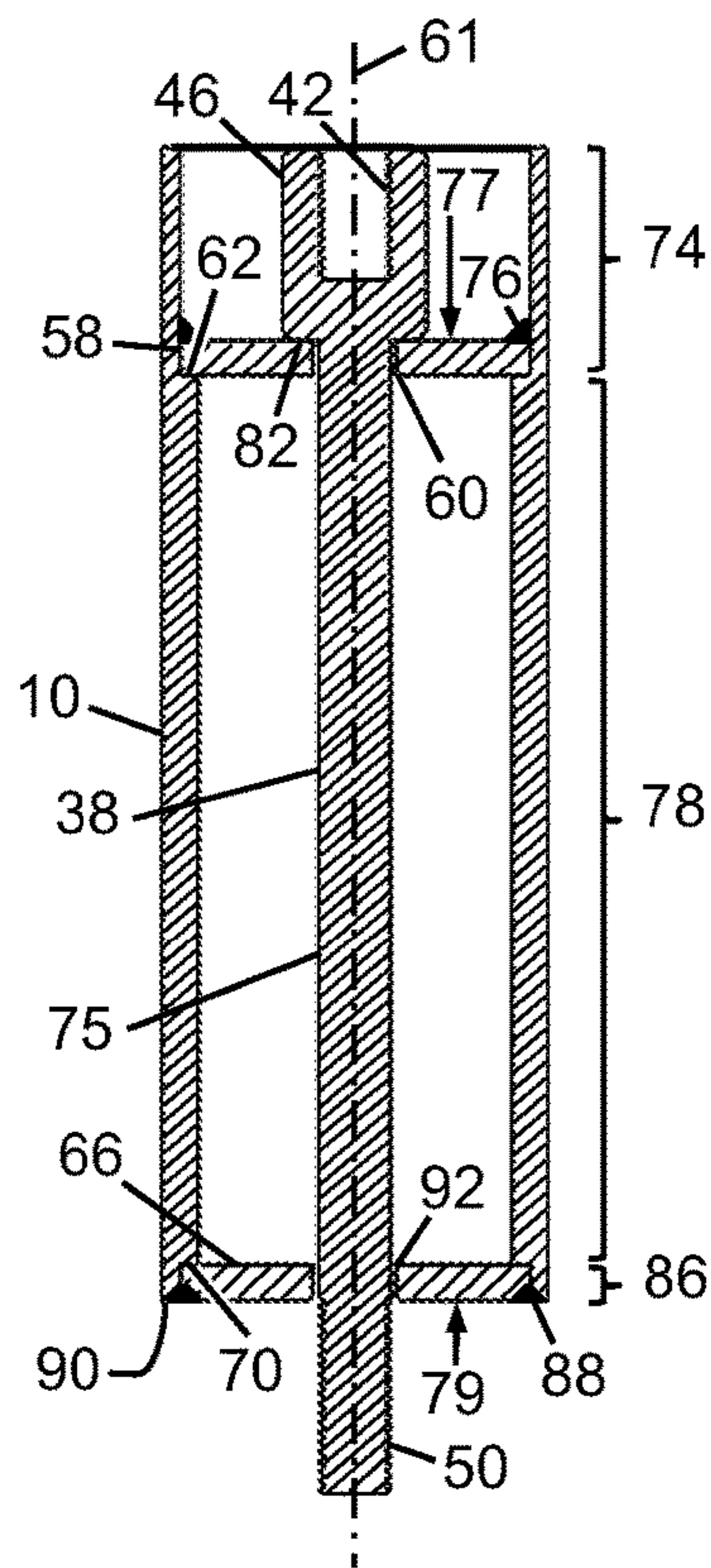
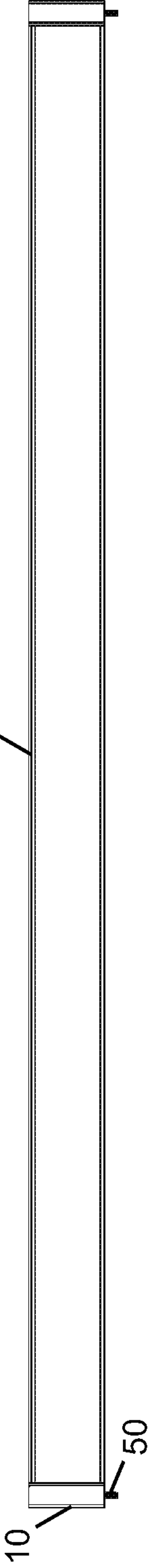
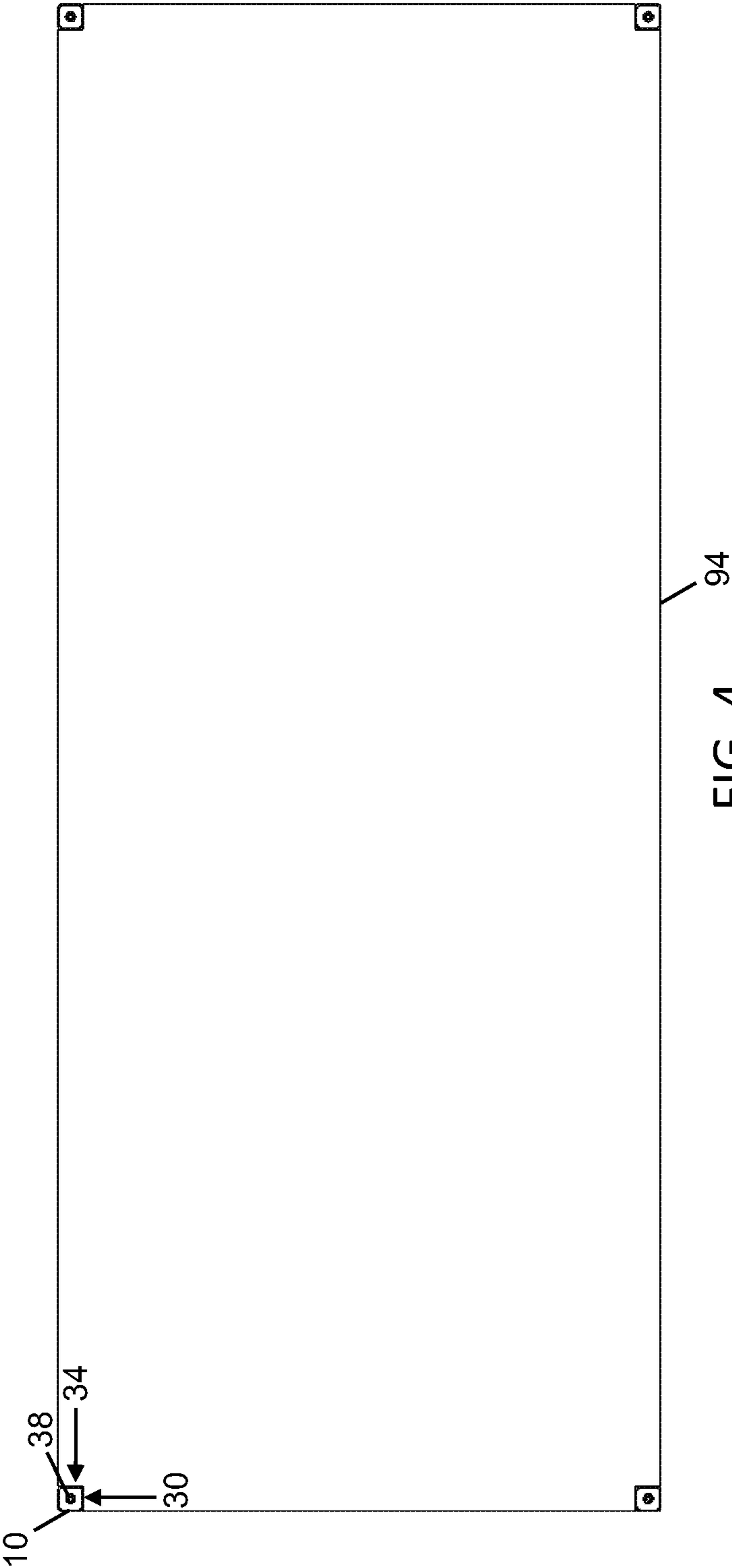


FIG. 3



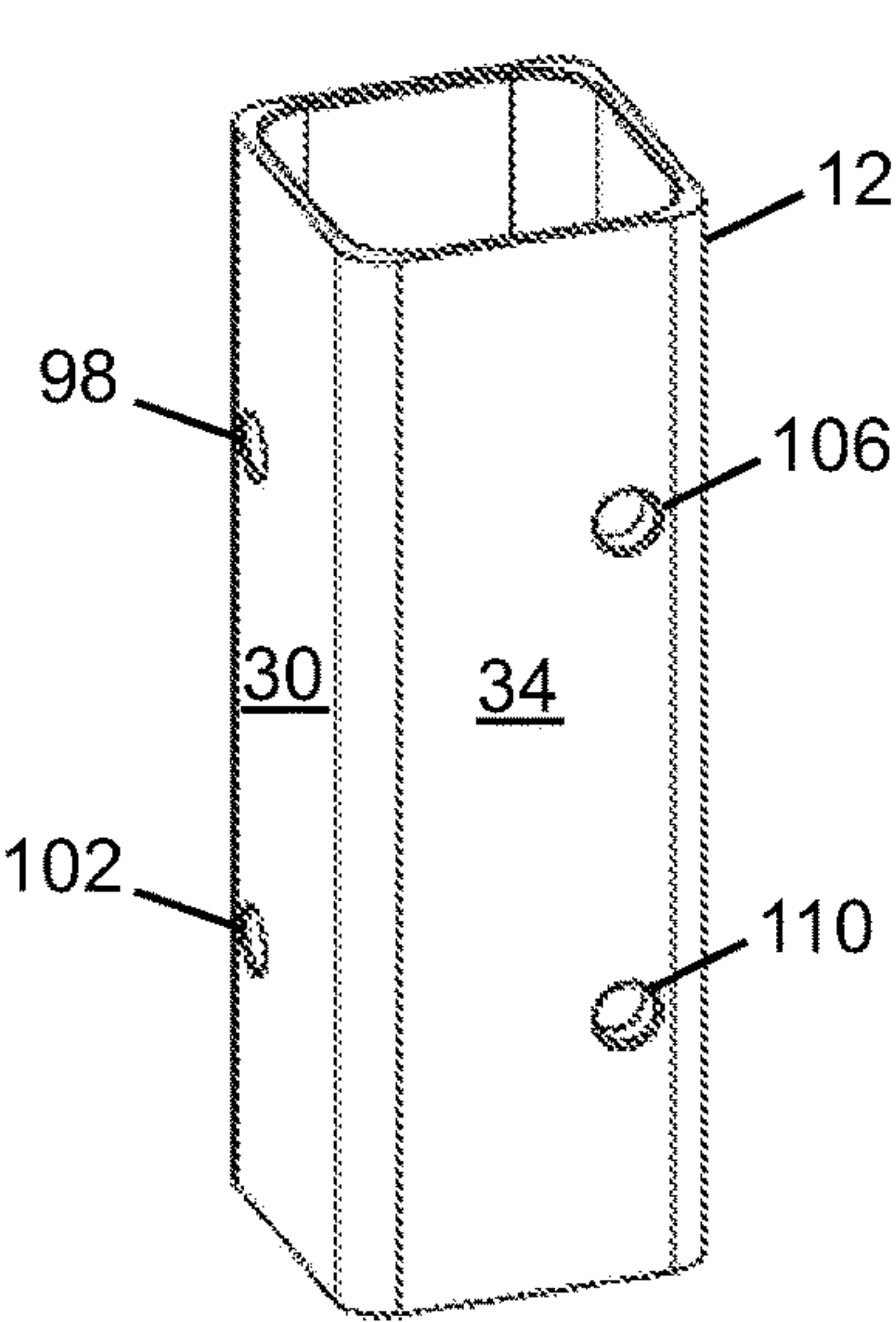


FIG. 6

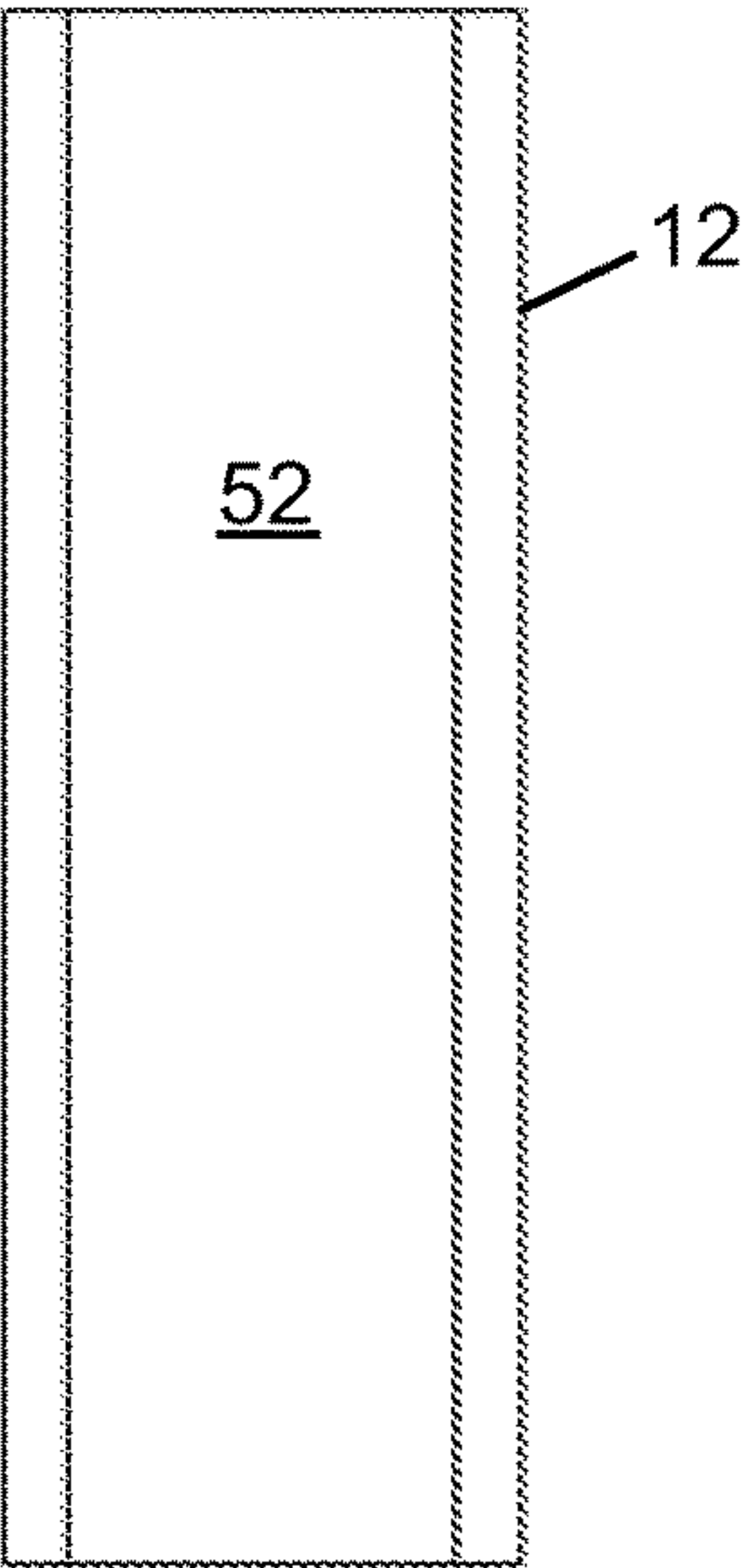


FIG. 7

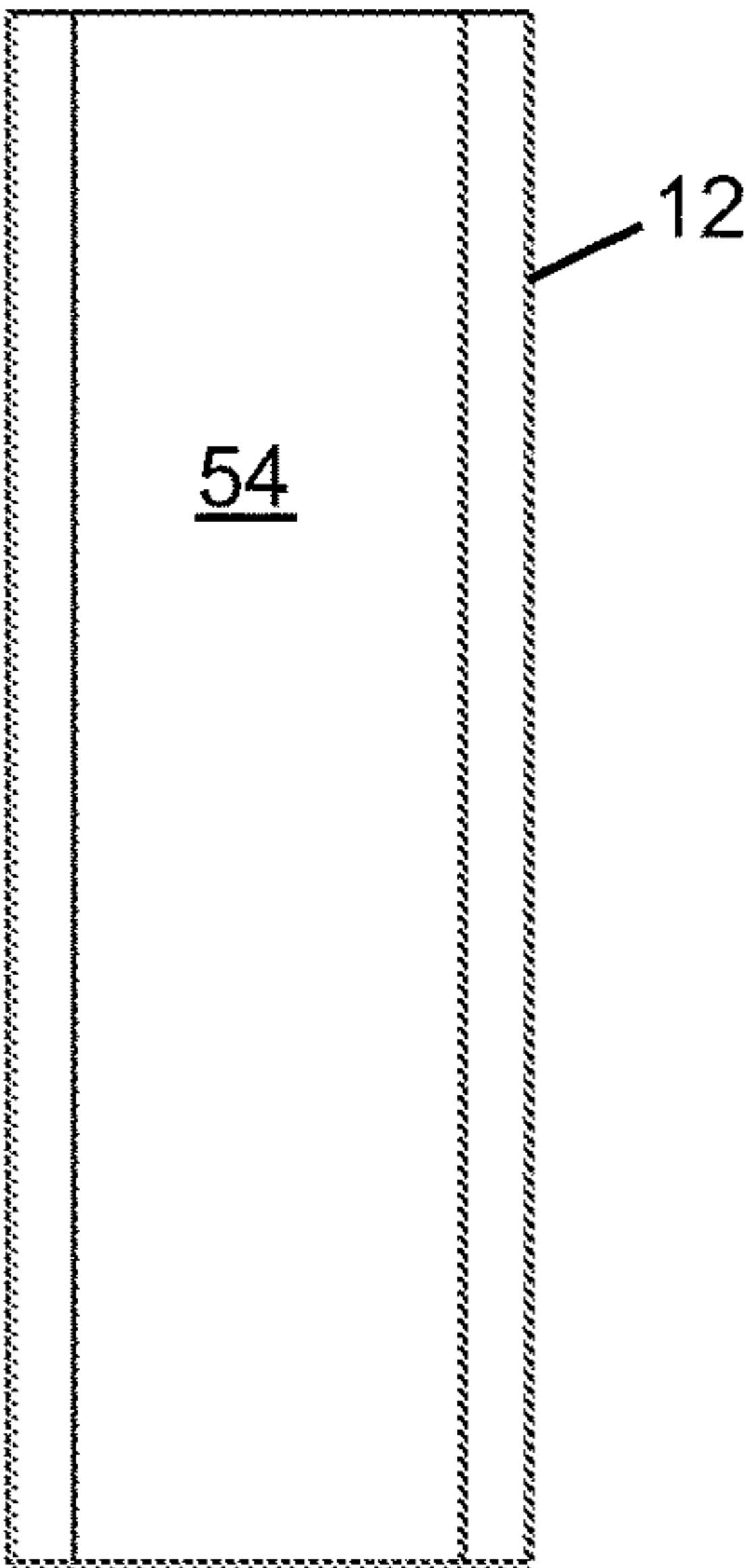


FIG. 8

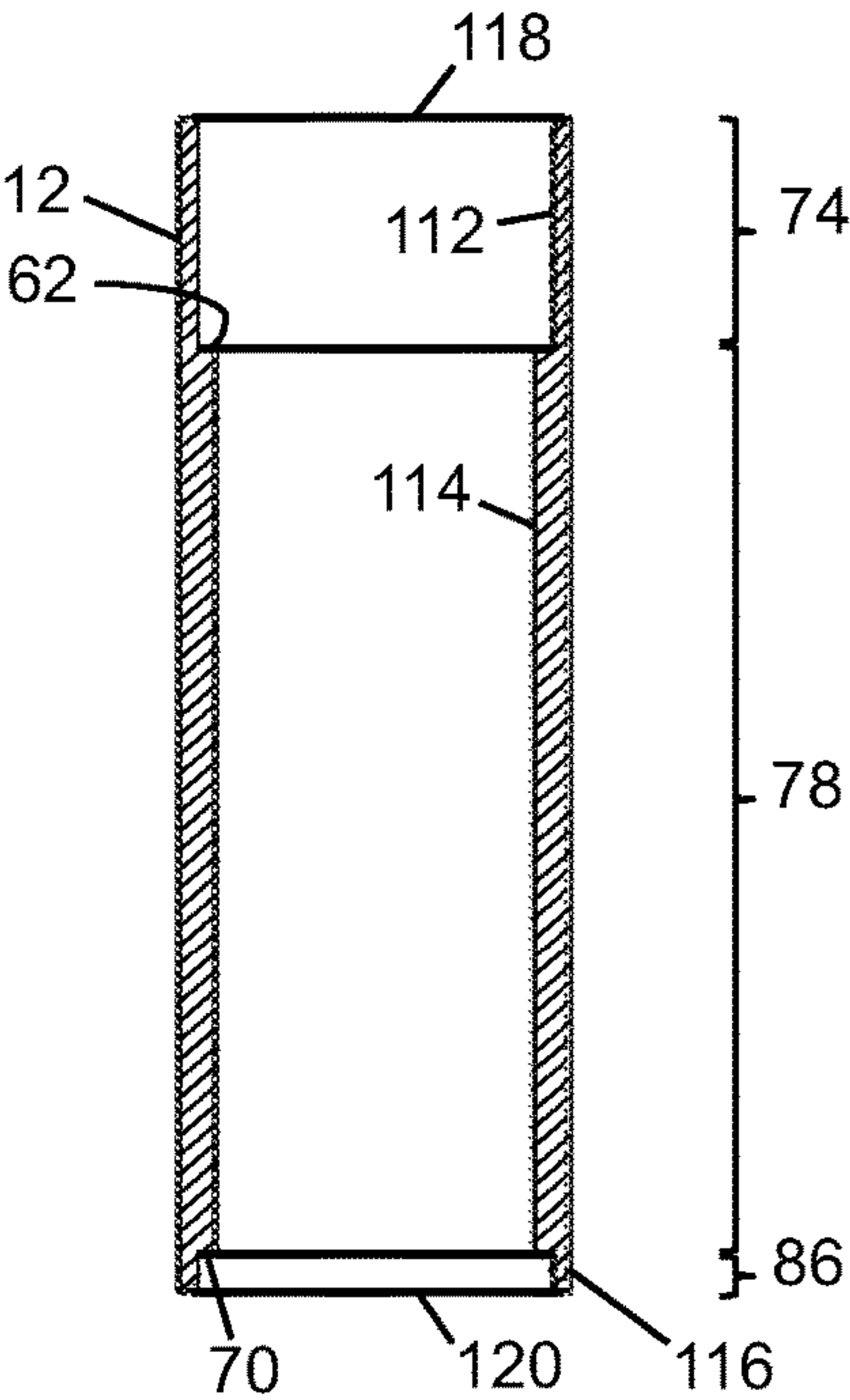


FIG. 9

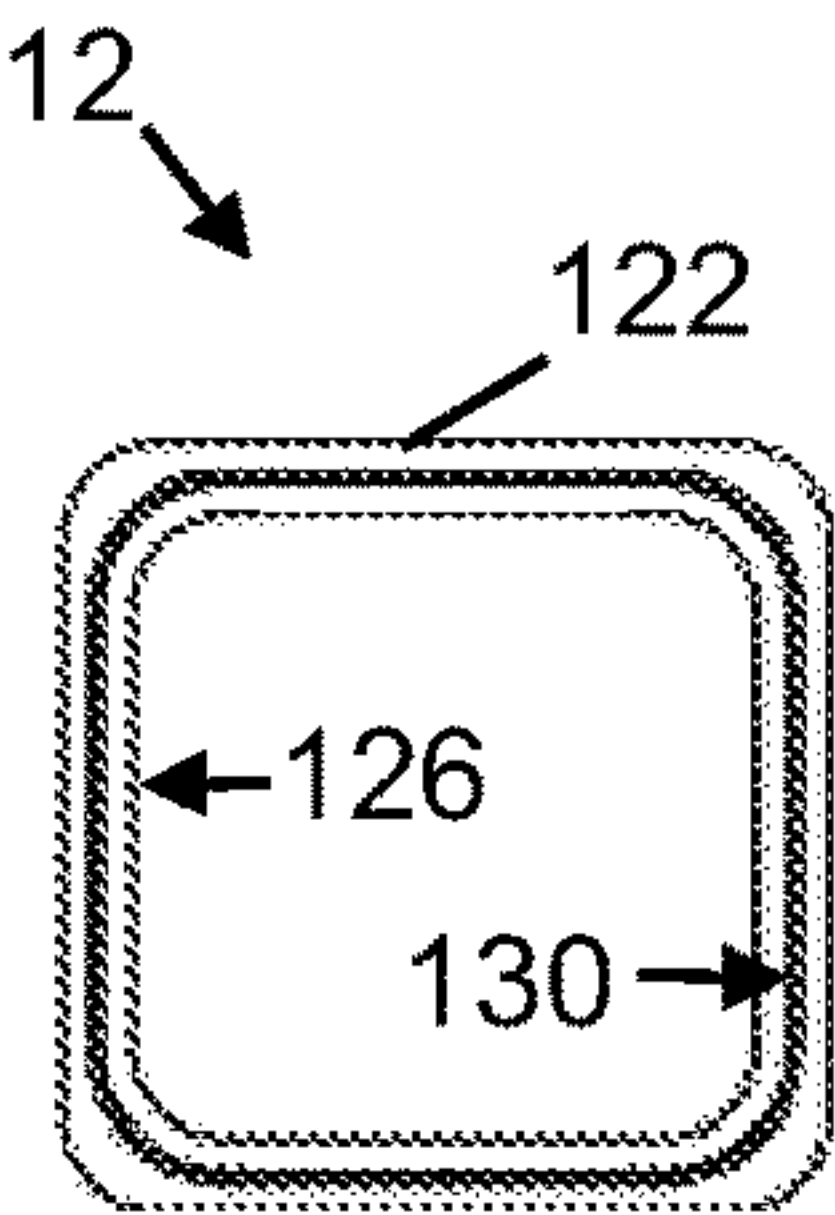


FIG. 10

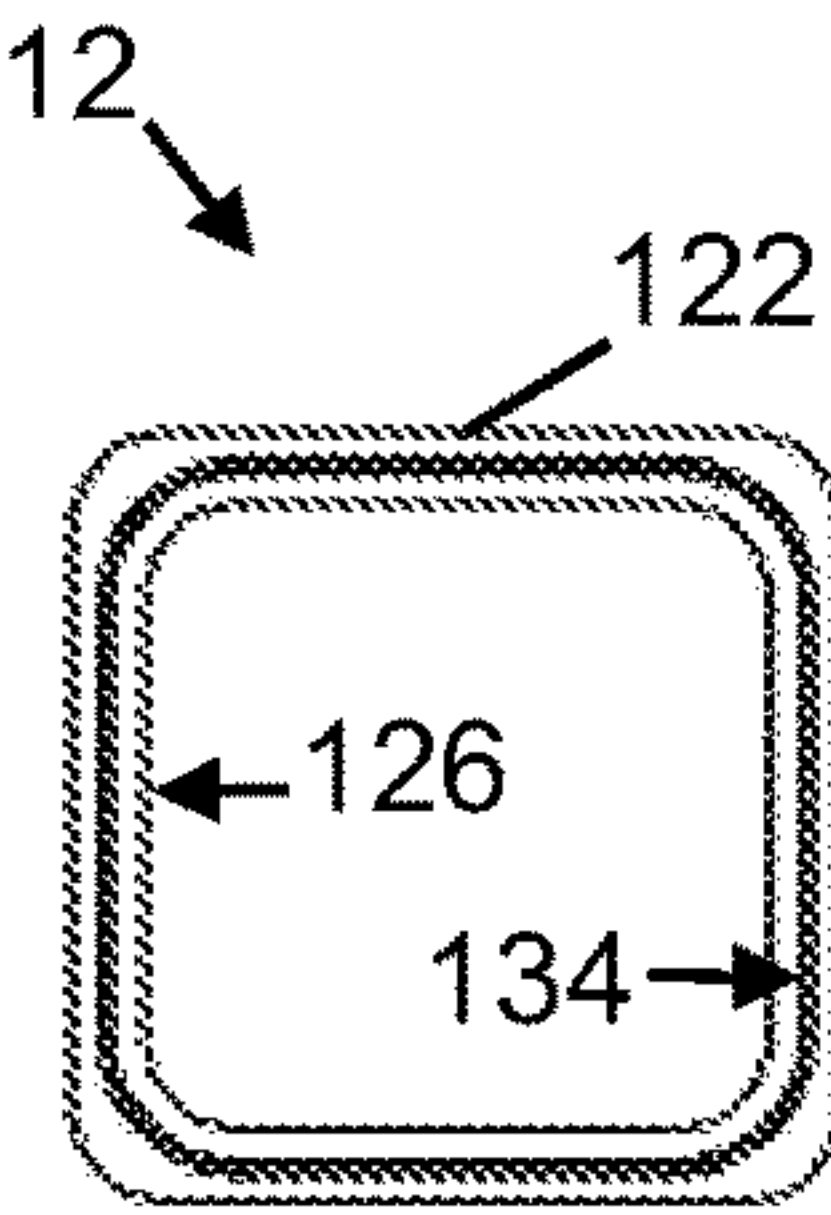


FIG. 11

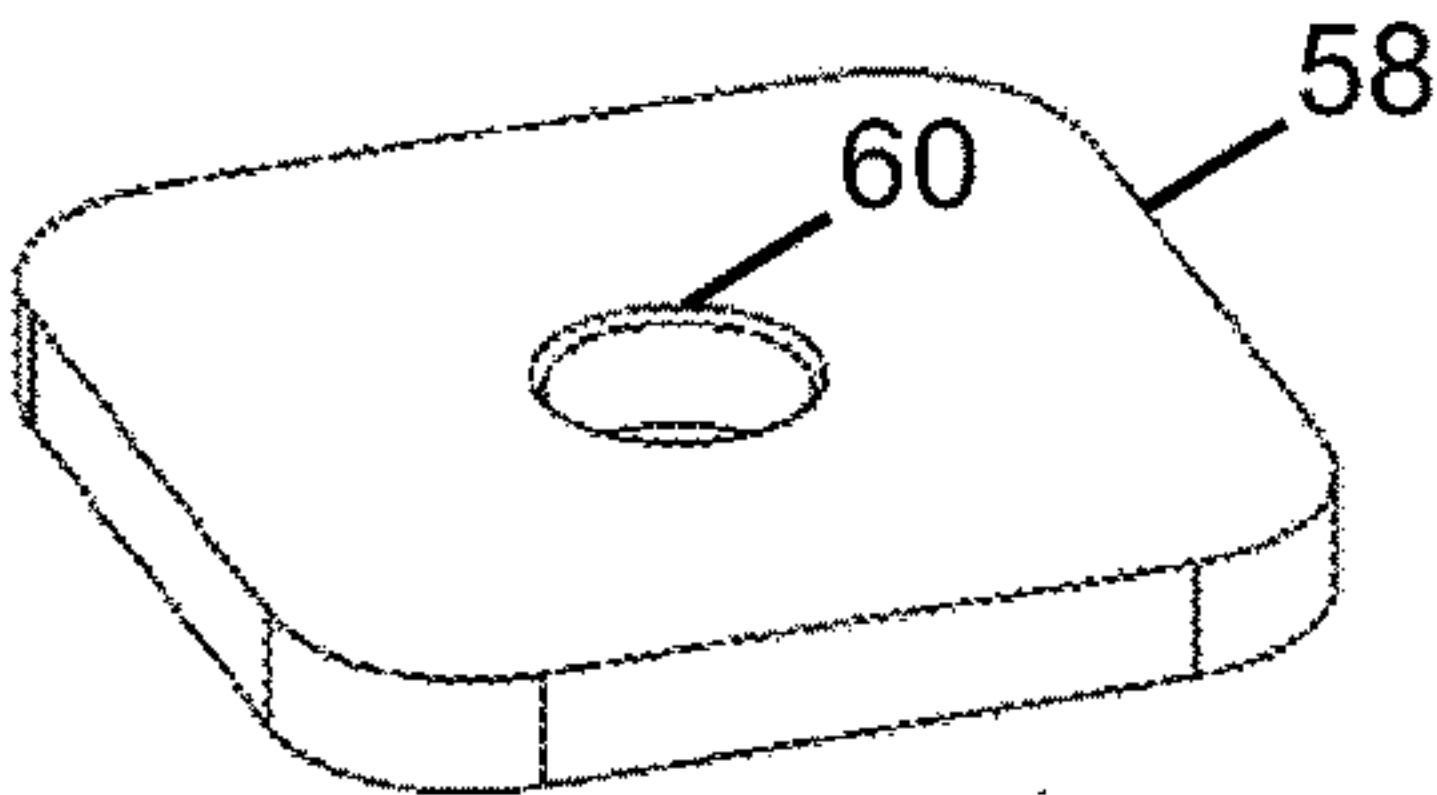


FIG. 12

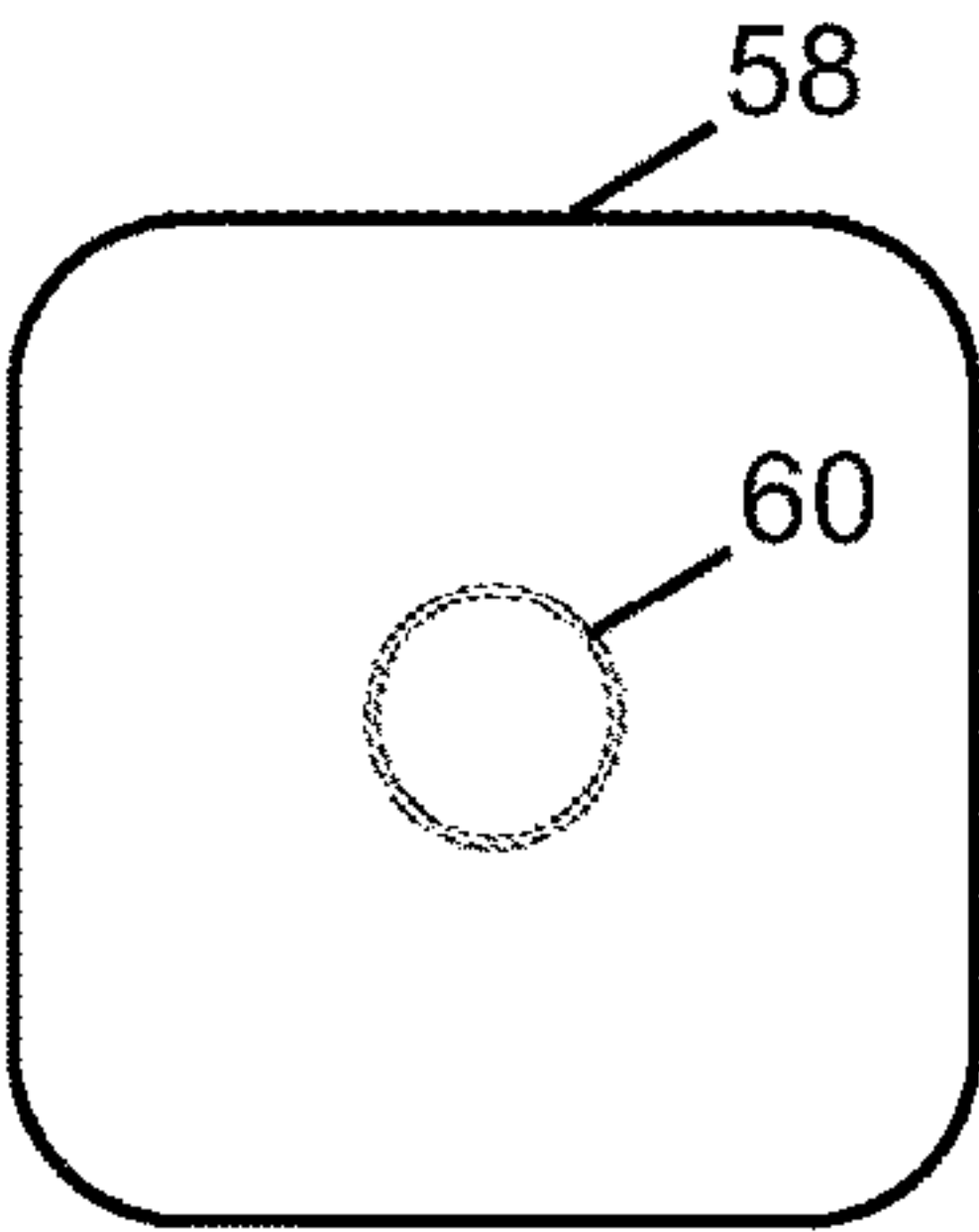


FIG. 13

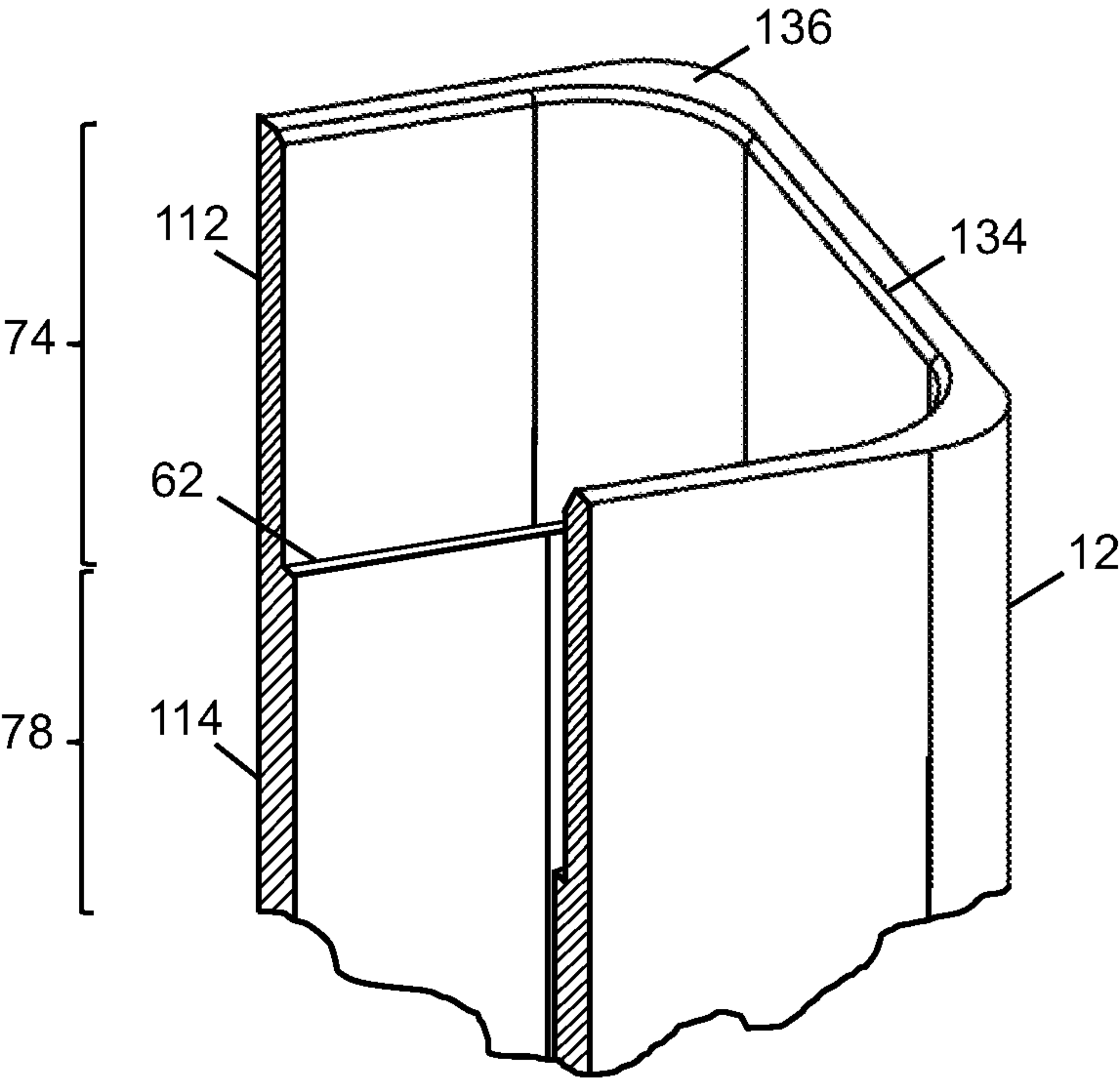


FIG. 14

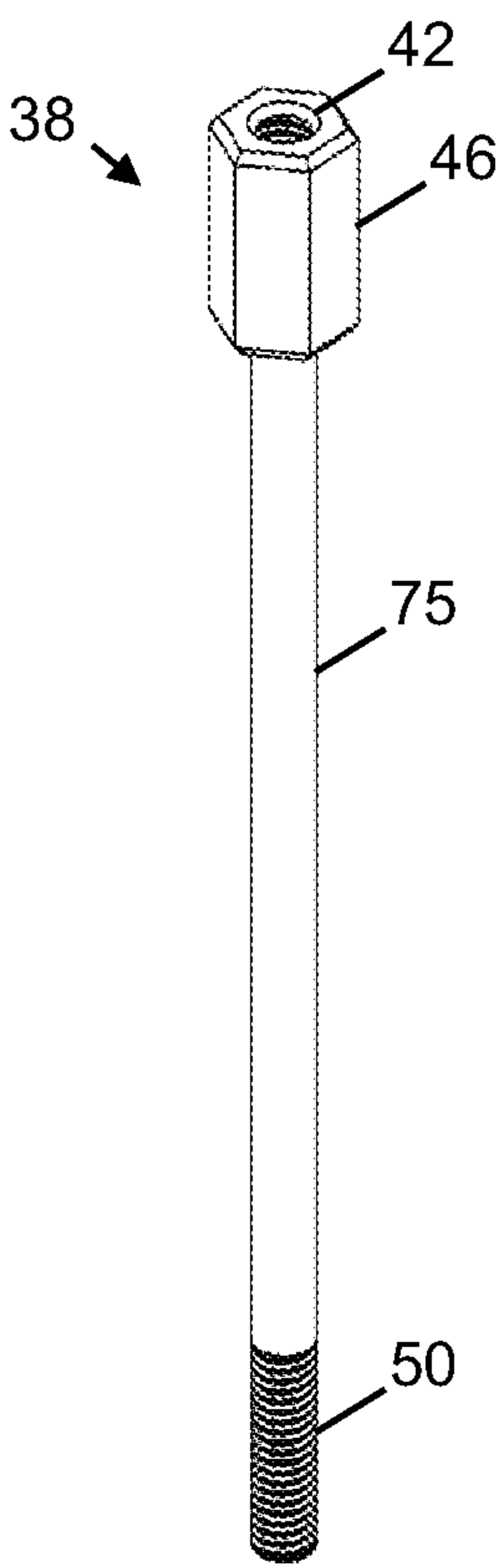


FIG. 15

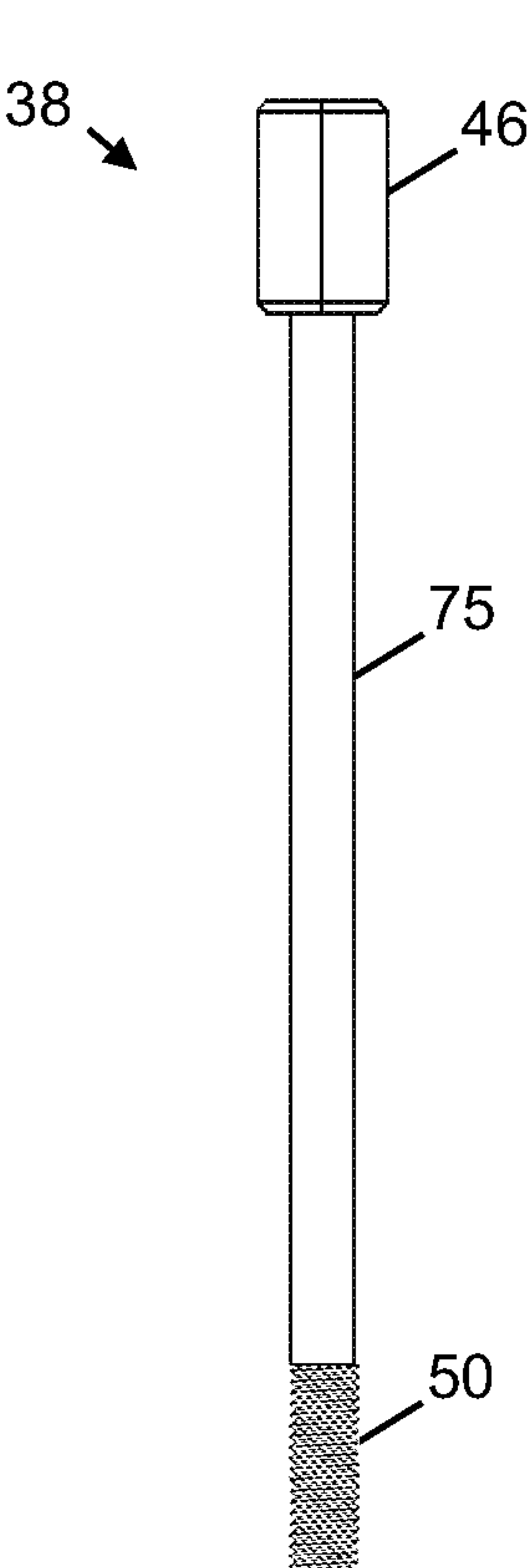


FIG. 16

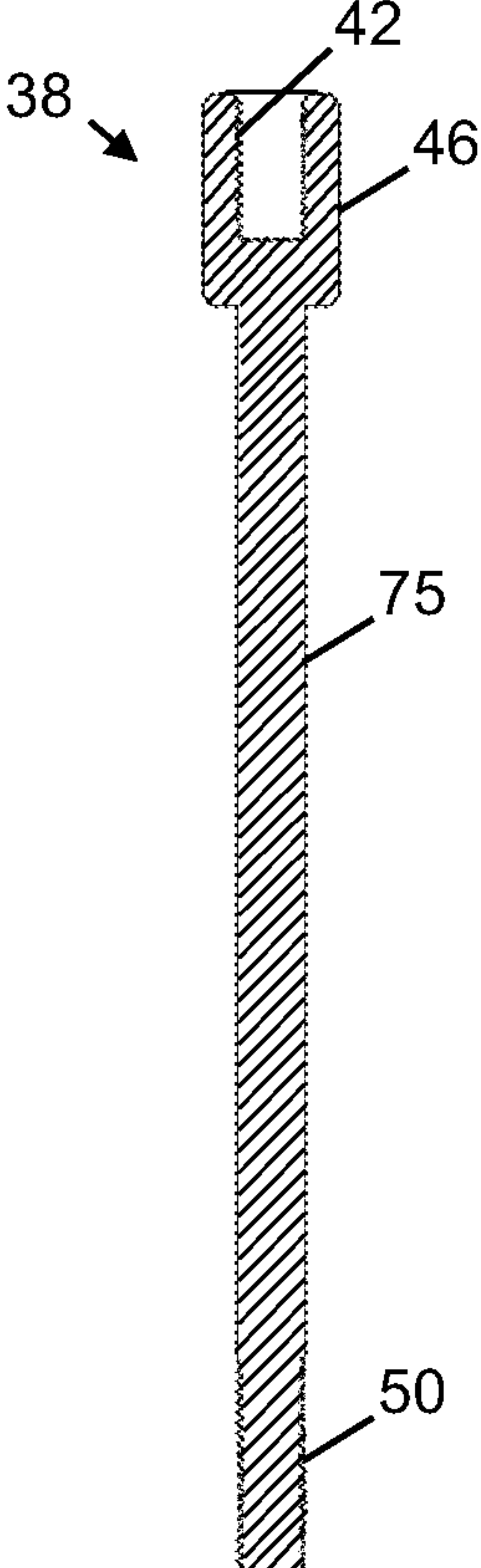


FIG. 17

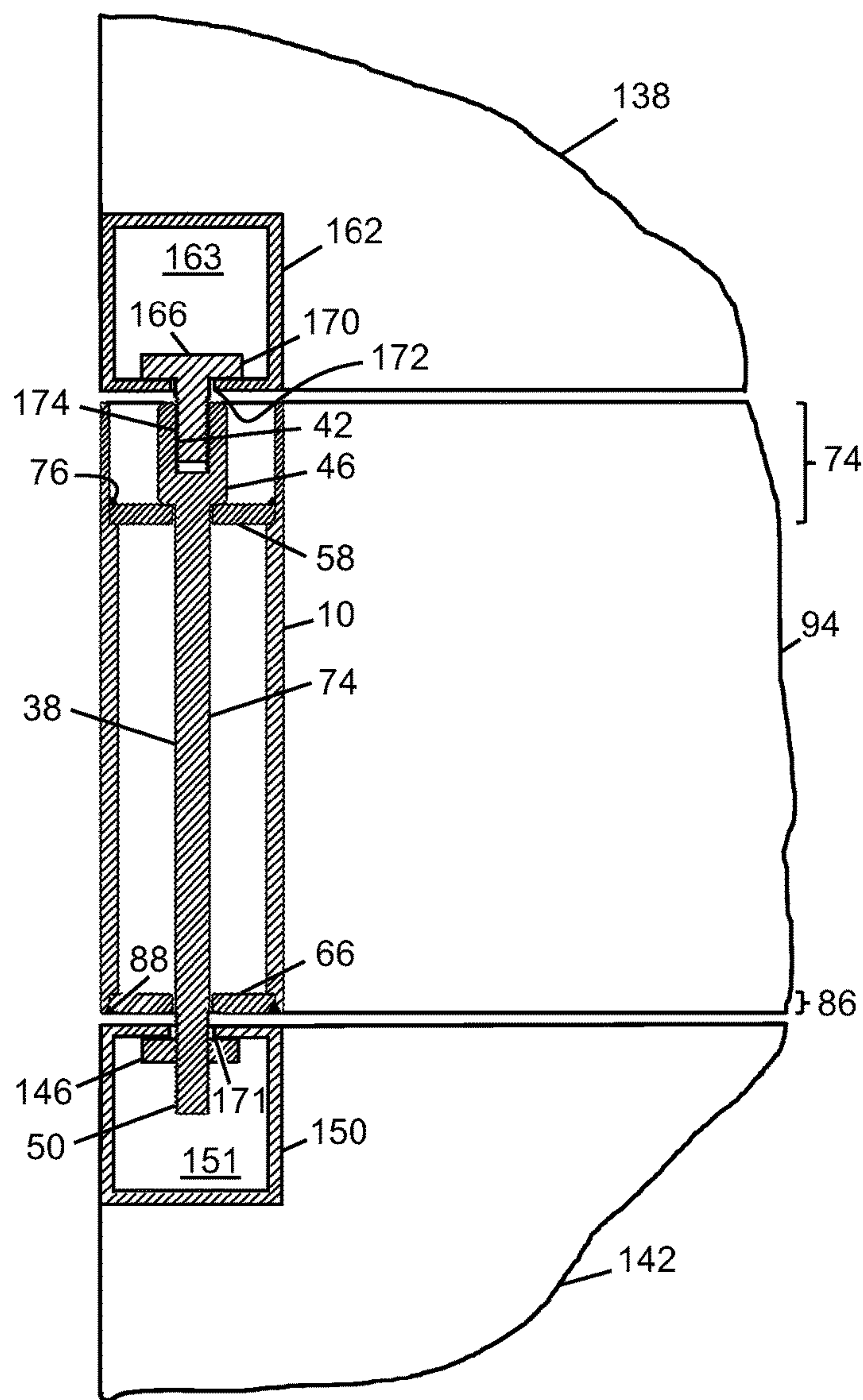


FIG. 18

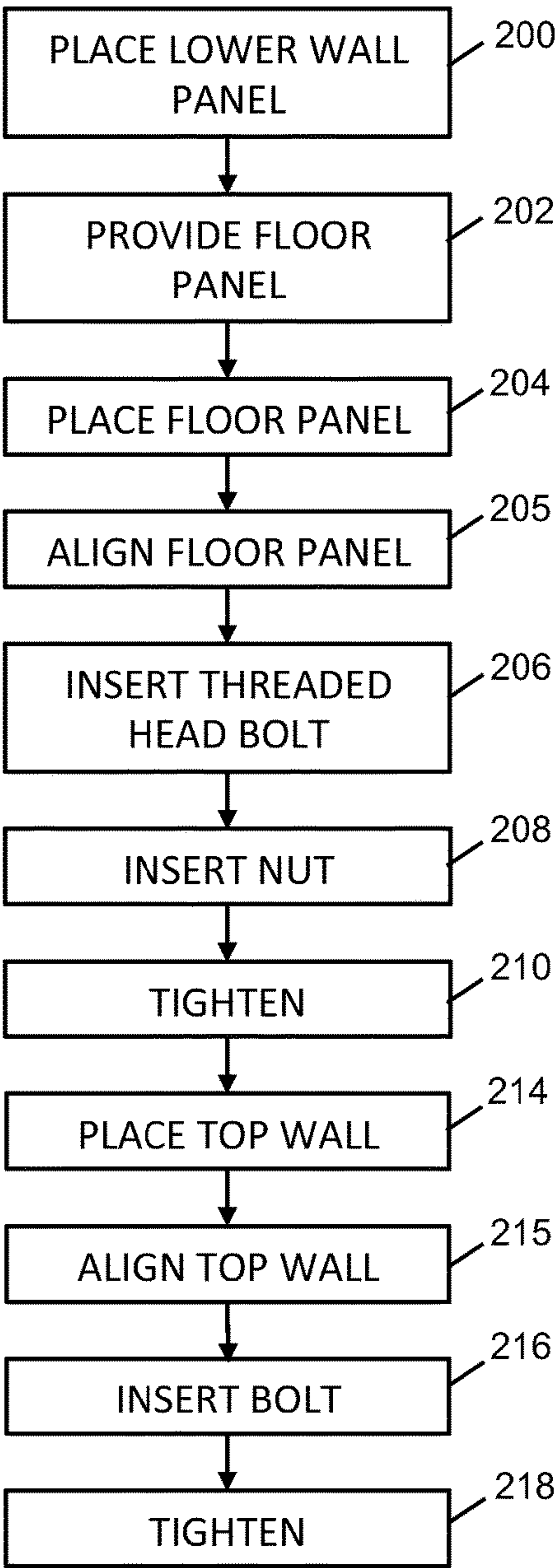


FIG. 19

HORIZONTAL BUILDING PANEL WITH CONNECTOR BLOCK ASSEMBLY

TECHNICAL FIELD

[0001] The present invention is related to a structural horizontal building panel or floor panel. More specifically, it relates to a floor panel with an embedded block that permits connection of the floor panel to wall panels above and below the floor.

BACKGROUND

[0002] Panels that are prepared and fabricated off-site embody a major improvement in the construction field for implementing a high level of standardization for certain building procedures, decreasing costs and facilitating a better quality control of the panels.

[0003] The fabrication and the mounting process of floor panels need a high level of accuracy in order to be assembled properly on-site. The assembly must maintain its integrity as the floor panel may be subjected, over time, to wall panel vibrations or movements that can potentially impair a building's structure.

[0004] This background is not intended, nor should be construed, to constitute prior art against the present invention.

SUMMARY OF INVENTION

[0005] The present invention is related to a floor panel that has features for connecting it to wall panels. The floor panel has floor connector blocks placed at each corner, for example, integrated in the floor panel. The floor connector blocks also act as anchoring sites where hooks can be mounted in order to lift the floor panel. The floor connector block has projecting anchor pins that provide a mechanical anchor in the cementitious material of the floor panel. The structure of the floor connector block facilitates the fixation of the wall panels to the floor panel using a tapped-head bolt, which has a female threaded head and acts as a double fixation component. Two plates for stabilizing the position of the tapped-head bolt are located inside the floor connector block.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The following drawings illustrate embodiments of the invention, which should not be construed as restricting the scope of the invention in any way.

[0007] FIG. 1 is a three-dimensional view of a floor connector block assembly, according to an embodiment of the present invention.

[0008] FIG. 2 is a broken, top view of a floor panel with a floor connector block assembly, according to an embodiment of the present invention.

[0009] FIG. 3 is a cross-sectional view of a floor connector block, according to an embodiment of the present invention.

[0010] FIG. 4 is a top view of a floor panel, according to an embodiment of the present invention.

[0011] FIG. 5 is a side view of a floor panel, according to an embodiment of the present invention.

[0012] FIG. 6 is a three-dimensional view of a floor connector block without the tapped-head bolt and anchor pins, according to an embodiment of the present invention.

[0013] FIG. 7 is a side view of the first external face of a floor connector block, according to an embodiment of the present invention.

[0014] FIG. 8 is side view of the second external face of a floor connector block, according to an embodiment of the present invention.

[0015] FIG. 9 is a cross-sectional view of a floor connector block body without its tapped-head bolt and plates, according to an embodiment of the present invention.

[0016] FIG. 10 is a top view of a floor connector block body without its tapped-head bolt, according to an embodiment of the present invention.

[0017] FIG. 11 is a bottom view of a floor connector block body without its tapped-head bolt, according to an embodiment of the present invention.

[0018] FIG. 12 is a three-dimensional view of a plate for a floor connector block, according to an embodiment of the present invention.

[0019] FIG. 13 is a top view of a plate for a floor connector block, according to an embodiment of the present invention.

[0020] FIG. 14 is a close-up view of a cross-sectional three-dimensional view of floor connector block body, without its tapped-head bolt and plates, according to an embodiment of the present invention.

[0021] FIG. 15 is a three-dimensional view of a tapped-head bolt for a floor connector block, according to an embodiment of the present invention.

[0022] FIG. 16 is a side view of a tapped-head bolt for a floor connector block, according to an embodiment of the present invention.

[0023] FIG. 17 is a cross-sectional view of a tapped-head bolt for a floor connector block, according to an embodiment of the present invention.

[0024] FIG. 18 is a cross-sectional view of an assembly of a floor panel and two wall panels see from the side, according to an embodiment of the present invention.

[0025] FIG. 19 is a flowchart for assembling a floor panel with two wall panels, according to an embodiment of the present invention.

DESCRIPTION

A. Exemplary Embodiment

[0026] Referring to FIG. 1, there is shown a floor connector assembly 1, which includes a floor connector block 10, with a body 12 made from a length of rounded-corner hollow section steel (HSS) such that its overall shape approximates a square cuboid with four rectangular faces and two square open faces or apertures. The height of the floor connector block 10 is 12" (or 30 cm) and its width is 4" (10 cm) in some embodiments. The two square open faces are opposite faces and, together with the four rectangular faces, define a hollow space inside the floor connector block 10.

[0027] The anchor pins or bolts 14, 18, 22 and 26 are respectively mounted on the two internal rectangular faces 30 and 34, which face inwards to the floor panel in which the floor connector assembly 1 is embedded. The anchor pins 14, 18, 22 and 26 are used as mechanical fixation points for the surrounding cementitious material used in the fabrication of the floor panel. The anchor pins 14, 18, 22 and 26 are embedded in the cured, cementitious material in order to provide a mechanical anchor between the floor connector block 10 and the floor panel. The anchor pins may be bolts,

threaded bar, rebar, Nelson™ studs or may have another surface texture, the main requirement being that the anchor pins provide a mechanical attachment to the cementitious material. The anchor pins **14**, **18**, **22** and **26** of faces **30** and **34** form an angle of 90° between each other in some embodiments.

[0028] In some embodiments, the anchor pins **14**, **18**, **22** and **26** extend from one floor connector block, embedded along the side of the floor panel to another floor connector block in the floor panel. A tapped-head bolt **38** has at its top a $\frac{5}{8}$ " (or 16 mm) diameter tapped hole **42** in the head **46**. The tapped-head bolt **38** has at its bottom section, at the end opposite the head **46**, a threaded part **50** with a diameter of $\frac{5}{8}$ " (or 16 mm). Dimensions of the tapped-head bolt are exemplary and are different in other embodiments.

[0029] Referring to FIG. 2, there is shown a floor panel **40** with a floor connector block assembly **1** with connector block **10** and two perpendicular anchor pins **14** and **22** shown in hidden detail from above. The tapped-head bolt **38** is positioned at the center of the floor connector block **10**. The external shape of the tapped-head bolt head **46** is hexagonal. In some embodiments, the external shape of the tapped-head bolt head **46** is different. The floor connector block **10** has two internal faces **30** and **34** and two external faces **52** and **54**. The external faces **52**, **54** define the corner of the floor panel **40**. The anchor pins **14**, **22** are embedded in the cementitious material **42** of the floor panel **40**.

[0030] At the center of the tapped-head bolt head **46**, there is a $\frac{5}{8}$ " (or 16 mm) diameter threaded hole **42**. The tapped-head bolt head **46** is supported by a top plate **58** fixed in the top section of the floor connector block **10**. The floor connector block **10** has rounded corners. In some embodiments, the radius of the rounded corners differs from that shown here.

[0031] Referring to FIG. 3, there is shown the tapped-head bolt **38** positioned inside the floor connector block **10** and centered on the longitudinal axis **61** of the floor connector block. The floor connector block **10** has a top shoulder **62** on its inner walls. This top shoulder **62** is defined by the difference in thickness between the walls of the top section **74** and the walls of the middle section **78**. The height of the top section **74** is 1.5" (or 4 cm) in some embodiments and the width of the top shoulder **62** is $\frac{3}{16}$ " (or 5 mm) in some embodiments. The top shoulder **62** supports the top plate **58**. The top plate **58** is $\frac{1}{2}$ " (or 13 mm) thick in this embodiment and has an opening **60** in its center for the shank **75** of tapped-head bolt **38** to pass through. The tapped-head bolt head **46** with threaded hole **46** is supported by the top plate **58**.

[0032] The top plate **58** is welded to the floor connector block inner walls at weld points **76**. The dimensions of the top plate **58** ensure that it fits into the top open face of the floor connector block **10** and that it is large enough to be supported by the top shoulder **62**. The top plate **58** welded into the floor connector block **10** must support the forces of one quarter of the total dead weight of the floor plus necessary safety margins when the floor panel is being lifted. The lower face **82** of the tapped-head bolt head rests on the upper surface **77** of the top plate **58**.

[0033] The bottom shoulder **70** supports the bottom plate **66**. The bottom plate **66** is $\frac{3}{8}$ " (or 10 mm) thick and has a $\frac{3}{4}$ " (or 19 mm) diameter hole in this embodiment. The bottom shoulder **70** is $\frac{3}{16}$ " (or 5 mm) wide and is defined by the difference in thickness between the walls of the bottom

section **86** and the middle section **78**. The height of the bottom section **86** is $\frac{3}{8}$ " (or 10 mm) in this embodiment. In some embodiments, the widths of the top and bottom shoulders **62** and **70** are equal. The lower face **79** of the bottom plate **66** is flush with the bottom edge **90** of the floor connector block **10**. The threaded bottom part **50** of the tapped-head bolt **38** passes through the hole **92** located at the center of the bottom plate **66**. Hole **92** may also be large enough for a portion of the shank **75** to pass into. The bottom plate **66** is spot welded to inner walls of the bottom section **86** at weld points **88** and ground flat so as to sit flush on top of the wall connector block of the wall panel connected below the floor panel. The purpose of the bottom plate **66** is to guide the location of the tapped-head bolt **38** and the bottom of the floor panel to prevent sway or drift of the floor panel relative to the top of wall panel below.

[0034] Referring to FIG. 4, there is shown a floor panel **94** with floor connector blocks **10** seen from above. Every floor connector block is CNC (computer numerical control) mill produced for speed and accuracy. A floor connector block is located at each corner of the floor panel **94**, such as the floor connector block **10** located at the top left of the panel. The volume of cementitious material in the floor panel is contiguous and in contact with the internal faces **30** and **34** of the floor connector block **10** and each other floor connector block. A tapped-head bolt **38** is located at the center of the floor connector block **10**. In some embodiments, the floor panel **94** is made of Nexiite™ material.

[0035] Referring to FIG. 5, there is shown the floor panel **94** with floor connector blocks **10** seen from the side. The tapped-head bolt **38** is in position in the floor connector block **10** has its bottom threaded part **50** extending below the lower surface of the floor panel **94**. The floor connector block **10** stands the full thickness of the floor panel **94**, such that the open ends of the connector block are level (i.e. within normal tolerances) with the top and bottom surfaces of the floor panel.

[0036] Referring to FIG. 6, there is shown the body **12** of the floor connector block **10**. Its internal faces **30** and **34** each have two circular holes **98**, **102**, **106** and **110**. FIGS. 7 and 8 show the external faces **52** and **54** of the floor connector block body **12**, which do not have holes.

[0037] FIG. 9 shows a cross-section of the body **12** of a floor connector block **10**, i.e. without top and bottom plates **58** and **66** and the tapped-head bolt **38**. The thickness of the wall **112** of the top section **74** is smaller than the thickness of the wall **114** of the middle section **78**, forming a top shoulder **62** between the top and middle sections. The top shoulder **62** is continuous around the interior of the body **12**. The wall **116** of the bottom section **86** is smaller in thickness than the wall thickness of the middle section **78**, forming a bottom shoulder **70** between the middle and bottom sections. The bottom shoulder **70** is continuous around the interior of the body **12** and follows the shape of the floor connector body **12**.

[0038] FIG. 10 shows the floor connector body **12** seen from below. The outer surface **122** of the floor connector body **12** has a square cross-section with rounded corners. The inner surface **126** is defined by the wall at the middle section **78** of the floor connector body **12** and also has a square cross-section with rounded corners. The internal surface **130** is defined by the wall **116** at the bottom section **86** of the floor connector body **12**, and also has a square cross-section with rounded corners.

[0039] FIG. 11 shows the floor connector body 12 seen from above. The outer surface 122 of the floor connector body 12 has a square cross-section with rounded corners. The internal surface 134 defined by the wall 112 at the top section 74 of the floor connector body 12 has a square cross-section with rounded corners. The internal surface 126 defined by the wall 114 at the middle section 78 of the floor connector body 12 has a square cross-section with rounded corners.

[0040] FIG. 12 shows a view of the top plate 58. The top plate 58 has a square shape with rounded corners. A hole 60 is located at the center of the top plate 58. In some embodiments, the hole 60 of the top plate is threaded. The thickness of the top plate 58 is at least $\frac{1}{2}$ " (or 13 mm).

[0041] FIG. 13 shows a top plate 58 seen from above. The hole 60 at the center of the top plate 58 is $\frac{3}{4}$ " (or 19 mm) diameter. In some embodiments, the hole 60 at the center of the top plate is threaded. In some embodiments, a 1" diameter eye bolt is screwed into the threaded hole 60 of the top plate 58 in order for the floor panel to be lifted. The eye bolt has a $\frac{3}{4}$ " (or 19 mm) threaded end that screws into the hole 60 (when threaded) at the center of the top plate 58.

[0042] The bottom plate 66 is similar in appearance to the top plate 58, except that it is optionally thinner.

[0043] FIG. 14 shows a close-up of the top mid-section of a floor connector block body 12. The top inner edge 134 of top surface 136 of wall 112 of the floor connector body 12 is beveled. The difference in thickness between the wall 112 of the top section 74 and the wall 114 of the middle section 78 forms the top shoulder 62.

[0044] FIGS. 15, 16 and 17 show the tapped-head bolt 38. The tapped-head bolt 38 has a hexagonally shaped head 46 at the top and a threaded part 50 at the bottom separated by the shank 75 of the bolt. The head 46 of the bolt has a threaded hole 42 with a diameter of $\frac{5}{8}$ " (or 16 mm).

[0045] Referring to FIG. 18 there is shown a close-up view of a cross-section of a floor panel 94 and wall panel 138, 142 assembly. The floor panel 94 is attached to an upper wall panel 138 and to a lower wall panel 142. The tapped-head bolt 38 is located in the floor connector block 10. The tapped-head bolt 38 is inserted into the top and bottom plates 58 and 66. A nut 146 located inside the wall connector block 150 of the bottom panel 142 is screwed into the threaded bottom end 50 of the tapped-head bolt 38.

[0046] The bottom plate 66 is welded at location 88 to the inner walls of the bottom section 86 of the floor connector block 10. In the same manner, the top plate 58 is welded at location 76 to the inner walls of the top section 74 of the floor connector block. In some embodiments, other ways of fixing the plates 58 and 66 to the floor connector block 10 are used.

[0047] The bottom, threaded end 50 of the tapped-head bolt enters a hole 171 in the wall connector block 150 of the lower wall panel 142. The wall connector block 150 has an open face 151 flush with the surface of the wall panel 142, into which the nut 146 can be inserted. The nut 146 mounted on the threaded end 50 of the tapped-head bolt is tightened firmly in order to fix the floor connector block 10, and therefore the floor panel 94, to the wall connector block 150 of the lower wall panel 142.

[0048] The wall connector block 162 in the upper wall panel 138 hosts a bolt or screw 166 with a hexagonal head 170 that passes through a hole 172 in the wall connector block 162. The wall connector block 162 has an open face

163 flush with the surface of the wall panel 138, into which the screw 166 can be inserted. The $\frac{5}{8}$ " (or 16 mm) diameter threaded part 174 of the bolt is then inserted and screwed into the threaded hole 42 of the tapped-head bolt. The screw 166 is tightened in order to fasten the top wall panel 138 to the floor panel 94.

B. Exemplary Method

[0049] FIG. 19 shows a method for erecting a building assembly with a floor panel and two wall panels. In step 200 a lower wall panel is provided and fixed in a required position. In step 202, a floor panel 94 is provided and placed, in step 204, onto the top edge of the lower wall panel 142.

[0050] The floor connector blocks 10 of the floor panel 94 are then fastened to the corresponding wall connector blocks 150 of the lower wall panel 142. The floor connector blocks 10 are first aligned, in step 205, to the floor panel connector blocks 150. Then, in step 206, a tapped-head bolt 38 is provided for each floor connector block and passed through the top plate 58, bottom plate 66 and a hole 171 located on the top face of the wall connector block 150. The nut 146 is inserted, in step 208, in the open face 151 of the wall connector block 150 and then onto the threaded end 50 of the tapped-head bolt 38.

[0051] In step 210, the nut 146 on the bottom threaded end 50 of the tapped-head bolt 38 is tightened, in order to fix the wall connector block 150 to the floor connector block 10.

[0052] In step 214, an upper wall panel 138 is placed upright on the floor panel 94 with the wall connector blocks 162 being aligned with the floor connector blocks 10. Specifically, the hole 172 of the wall connector block 162 is aligned with the threaded hole 42 of the tapped-head bolt 38.

[0053] A screw 166 is passed into the open face 163 of the wall connector 162 in step 216 and through the bottom opening 172 of the wall connector block 162, then screwed into the threaded hole 42 located in the head of the tapped-head bolt 38. In step 218, the wall connector block 162 in the upper wall is tightened to the floor connector block 10 by tightening the screw 166.

C. Variations

[0054] While the description has been given largely in terms of a floor panel, it is also applicable to a ceiling panel, or, more generally a horizontal building panel.

[0055] It is worth noting that the actual rectangular shape, the proportions and the dimensions shown are simply an embodiment of the present invention and can be subject to modification. For example, in some embodiments, the connector block body may have a rectangular cross-section or may be cylindrical. Additional play may be incorporated into the connector assembly to allow for a greater range of adjustment to the final positions of the connected wall and floor panels.

[0056] Other methods of fixing the supporting plates to the connector block body may be used in other embodiments. For example, the plates may be fastened in place by shrink fitting the body to them. In this case, the inner walls may not need to have recessed shoulders, and the wall of the floor connector block may have the same thickness throughout. In some embodiments, retaining pins or screws may be used to fasten the supporting plates (e.g. 58, 66) to the body of the connector block. The pins can be inserted and welded into

holes located in the body of the floor connector blocks. Screws or bolts may be used in threaded holes in place of retaining pins.

[0057] In some embodiments, the threads of the tapped-head bolt may be located differently.

[0058] In some other embodiment, materials other than steel may be used, such as glass-fibre reinforced plastic.

[0059] The connector blocks may be positioned or oriented differently than shown in the exemplary embodiments. The anchor pins may be aligned with respect to each other at angles other than 90°, for example at any non-parallel angle including 180°. Anchor pins projecting from the same side of the connector block may not be parallel to each other. The number of anchor pins projecting from the interior faces of the connector block may be other than two.

[0060] The bottom plate may be recessed in the connector block rather than flush with the bottom of it. In this case, the bottom section with thinned walls 116 extends upwards more than shown in the figures. Nevertheless, the bottom plate is still located at the open bottom end of the connector body 12.

[0061] In some embodiments, the block assembly may be located in the horizontal building panel away from the corner. For example, it may be located part way along a side edge of the panel, or in the central area of the panel.

[0062] In general, unless otherwise indicated, singular elements may be in the plural and vice versa with no loss of generality.

[0063] Throughout the description, specific details have been set forth in order to provide a more thorough understanding of the invention. However, the invention may be practiced without these particulars. In other instances, well known elements have not been shown or described in detail and repetitions of steps and features have been omitted to avoid unnecessarily obscuring the invention. Accordingly, the specification is to be regarded in an illustrative, rather than a restrictive, sense.

[0064] It will be clear to one having skill in the art that further variations to the specific details disclosed herein can be made, resulting in other embodiments that are within the scope of the invention disclosed. Steps in the flowchart may be performed in a different order, other steps may be added, or one or more may be removed without altering the main function of the invention. All parameters, dimensions, materials, and configurations described herein are examples only and actual ones of such depend on the specific embodiment. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the claims.

D. Claim Support

[0065] Disclosed herein is a connecting assembly for a horizontal building panel, the connecting assembly comprising: a connector block comprising: a body, which is hollow and has an open top end and an open bottom end; a top plate fastened inside the body below the open top end, in a plane perpendicular to a longitudinal axis of the body, the top plate having a hole in its center; and a bottom plate fastened inside the body at the open bottom end, in a plane perpendicular to the longitudinal axis of the body, the bottom plate having a hole in its center; a bolt comprising: a shank that passes through the hole in the top plate; a head that is supported by the top plate and extends not further than the open top end; an internally threaded axial hole in the head; and a threaded end that passes through the hole in the bottom plate and

projects below the bottom plate; at least one anchor pin connected to and projecting outward in a first direction from the body; and at least one other anchor pin connected to and projecting outward from the body in a second direction that is non-parallel to the first direction.

[0066] In some embodiments, the anchor pins are welded into holes in the connector block. In some embodiments, the top and bottom plates are made from steel and are welded to the connector block. In some embodiments, the body comprises: a first internal shoulder upon which the top plate is located; and a second internal shoulder upon which the bottom plate is located.

[0067] In some embodiments, the internally threaded axial hole is $\frac{5}{8}$ " in diameter and 1" deep; the shank is $\frac{5}{8}$ " in diameter; the threaded end has a $\frac{5}{8}$ " diameter; the first and second internal shoulders are $\frac{3}{16}$ " deep; the first internal shoulder is located 1.5" below the open top end; the top plate is $\frac{1}{2}$ " thick and has a $\frac{3}{4}$ " threaded hole in its center; the bottom plate is $\frac{3}{8}$ " thick and has a $\frac{3}{4}$ " hole in its center; and the body has a 4" square section.

[0068] In some embodiments, the body has four walls. In some embodiments, the at least one anchor pin projects from a first of the walls; and the at least one other anchor pin projects from a second of the walls adjacent to the first wall. In some embodiments, the bottom plate is flush with the open bottom end of the body. In some embodiments, third and fourth walls of the body define a corner of a horizontal building panel; and the anchor pins are embedded in cementitious material in the horizontal building panel. In some embodiments, the body is made from hollow structural steel with a rounded-corner square cross-section.

[0069] Also disclosed is a horizontal building panel comprising: connecting assembly comprising: a connector block comprising: a body, which is hollow and has an open top end and an open bottom end; a top plate fastened inside the body below the open top end, in a plane perpendicular to a longitudinal axis of the body, the top plate having a hole in its center; and a bottom plate fastened inside the body at the open bottom end, in a plane perpendicular to the longitudinal axis of the body, the bottom plate having a hole in its center; a bolt comprising: a shank that passes through the hole in the top plate; a head that is supported by the top plate and extends not further than the open top end; an internally threaded axial hole in the head; and a threaded end that passes through the hole in the bottom plate and projects below the bottom plate; at least one anchor pin connected to and projecting outward in a first direction from the body; and at least one other anchor pin connected to and projecting outward from the body in a second direction that is non-parallel to the first direction; and a volume of cementitious material adjacent to the body, in which the anchor pins are embedded; wherein: the open top end is level with a top surface of the horizontal building panel; and the open bottom end is level with a bottom surface of the horizontal building panel.

[0070] Also disclosed herein is a method for connecting building panels comprising: placing a lower wall panel in a required position, the lower wall panel having a first connector block with a top hole on an upper edge of the lower wall panel and a first open face accessible from a side of the lower wall panel; providing a horizontal building panel comprising: a connecting assembly comprising: a connector block comprising: a body, which is hollow and has an open top end and an open bottom end; a top plate fastened inside

the body below the open top end, in a plane perpendicular to a longitudinal axis of the body, the top plate having a hole in its center; and a bottom plate fastened inside the body at the open bottom end, in a plane perpendicular to the longitudinal axis of the body, the bottom plate having a hole in its center; a bolt comprising: a shank that passes through the hole in the top plate; a head that is supported by the top plate and extends not further than the open top end; an internally threaded axial hole in the head; and a threaded end that passes through the hole in the bottom plate and projects below the bottom plate; at least one anchor pin connected to and projecting outward in a first direction from the body; and at least one other anchor pin connected to and projecting outward from the body in a second direction that is non-parallel to the first direction; and a volume of cementitious material adjacent to the body, in which the anchor pins are embedded; wherein: the open top end is level with a top surface of the horizontal building panel; and the open bottom end is level with a bottom surface of the horizontal building panel; placing the horizontal building panel so that the bottom open end is over the top hole of the lower wall panel; providing a bolt comprising: a shank that passes through the hole in the top plate; a head that is supported by the top plate and extends not further than the open top end; an internally threaded axial hole in the head; and a threaded end that passes through the hole in the bottom plate and projects below the bottom plate; placing the bolt through the holes in the top and bottom plates; inserting a nut through the first open face and tightening the nut onto the bolt; providing an upper wall panel having a second connector block with a bottom hole on a lower edge of the upper wall panel and a second open face accessible from a side of the upper wall panel; placing the upper wall panel on the horizontal floor panel so that the bottom hole is aligned with the internally threaded axial hole of the bolt; inserting a further bolt through the second open face and tightening the further bolt into the internally threaded axial hole.

1. A connecting assembly for a horizontal building panel, the connecting assembly comprising:

a connector block comprising:

a body, which is hollow and has an open top end and an open bottom end;

a top plate fastened inside the body below the open top end, in a plane perpendicular to a longitudinal axis of the body, the top plate having a hole in its center; and

a bottom plate fastened inside the body at the open bottom end, in a plane perpendicular to the longitudinal axis of the body, the bottom plate having a hole in its center;

a bolt comprising:

a shank that passes through the hole in the top plate; a head that is supported by the top plate and extends not further than the open top end;

an internally threaded axial hole in the head; and

a threaded end that passes through the hole in the bottom plate and projects below the bottom plate;

at least one anchor pin connected to and projecting outward in a first direction from the body; and

at least one other anchor pin connected to and projecting outward from the body in a second direction that is non-parallel to the first direction.

2. The assembly of claim 1, wherein the anchor pins are welded into holes in the connector block.

3. The assembly of claim 1, wherein the top and bottom plates are made from steel and are welded to the connector block.

4. The assembly of claim 1, wherein the body comprises: a first internal shoulder upon which the top plate is located; and

a second internal shoulder upon which the bottom plate is located.

5. The assembly of claim 4, wherein:

the internally threaded axial hole is $\frac{5}{8}$ " in diameter and 1" deep;

the shank is $\frac{5}{8}$ " in diameter;

the threaded end has a $\frac{5}{8}$ " diameter;

the first and second internal shoulders are $\frac{3}{16}$ " deep;

the first internal shoulder is located 1.5" below the open top end;

the top plate is $\frac{1}{2}$ " thick and has a $\frac{3}{4}$ " threaded hole in its center;

the bottom plate is $\frac{3}{8}$ " thick and has a $\frac{3}{4}$ " hole in its center; and

the body has a 4" square section.

6. The assembly of claim 1, wherein the body has four walls.

7. The assembly of claim 6, wherein

the at least one anchor pin projects from a first of the walls; and

the at least one other anchor pin projects from a second of the walls adjacent to the first wall.

8. The assembly of claim 6, wherein the bottom plate is flush with the open bottom end of the body.

9. The assembly of claim 6, wherein:

third and fourth walls of the body define a corner of a horizontal building panel; and

the anchor pins are embedded in cementitious material in the horizontal building panel.

10. The assembly of claim 1, wherein the body is made from hollow structural steel with a rounded-corner square cross-section.

11. A horizontal building panel comprising:

a connecting assembly comprising:

a connector block comprising:

a body, which is hollow and has an open top end and an open bottom end;

a top plate fastened inside the body below the open top end, in a plane perpendicular to a longitudinal axis of the body, the top plate having a hole in its center; and

a bottom plate fastened inside the body at the open bottom end, in a plane perpendicular to the longitudinal axis of the body, the bottom plate having a hole in its center;

a bolt comprising:

a shank that passes through the hole in the top plate; a head that is supported by the top plate and extends not further than the open top end;

an internally threaded axial hole in the head; and

a threaded end that passes through the hole in the bottom plate and projects below the bottom plate;

at least one anchor pin connected to and projecting outward in a first direction from the body; and

at least one other anchor pin connected to and projecting outward from the body in a second direction that is non-parallel to the first direction; and

a volume of cementitious material adjacent to the body, in which the anchor pins are embedded;

wherein:

the open top end is level with a top surface of the horizontal building panel; and
the open bottom end is level with a bottom surface of the horizontal building panel.

12. The horizontal building panel of claim 8, wherein the anchor pins are welded into holes in the connector block.

13. The horizontal building panel of claim 8, wherein the top and bottom plates are made from steel and welded to the connector block.

14. The horizontal building panel of claim 8, wherein the body comprises:

a first internal shoulder upon which the top plate is located; and
a second internal shoulder upon which the bottom plate is located.

15. The horizontal building panel of claim 8, wherein the body is made from hollow structural steel with a rounded-corner square cross-section.

16. The horizontal building panel of claim 8, wherein:
the body has four walls;
the at least one anchor pin projects from a first of the walls;
the at least one other anchor pin projects from a second of the walls adjacent to the first wall;
third and fourth walls of the body define a corner of the horizontal building panel; and
the anchor pins are embedded in cementitious material in the horizontal building panel.

17. The horizontal building panel of claim 16, wherein the bottom plate is flush with the open bottom end of the body.

18. A method for connecting building panels comprising:
placing a lower wall panel in a required position, the lower wall panel having a first connector block with a top hole on an upper edge of the lower wall panel and a first open face accessible from a side of the lower wall panel;

providing a horizontal building panel comprising:

a connecting assembly comprising:

a connector block comprising:

a body, which is hollow and has an open top end and an open bottom end;
a top plate fastened inside the body below the open top end, in a plane perpendicular to a longitudinal axis of the body, the top plate having a hole in its center; and
a bottom plate fastened inside the body at the open bottom end, in a plane perpendicular to the

longitudinal axis of the body, the bottom plate having a hole in its center;

a bolt comprising:

a shank that passes through the hole in the top plate;
a head that is supported by the top plate and extends not further than the open top end;
an internally threaded axial hole in the head; and
a threaded end that passes through the hole in the bottom plate and projects below the bottom plate;

at least one anchor pin connected to and projecting outward in a first direction from the body; and

at least one other anchor pin connected to and projecting outward from the body in a second direction that is non-parallel to the first direction; and

a volume of cementitious material adjacent to the body, in which the anchor pins are embedded;

wherein:

the open top end is level with a top surface of the horizontal building panel; and
the open bottom end is level with a bottom surface of the horizontal building panel;

placing the horizontal building panel so that the bottom open end is over the top hole of the lower wall panel;

providing a bolt comprising:

a shank that passes through the hole in the top plate;
a head that is supported by the top plate and extends not further than the open top end;
an internally threaded axial hole in the head; and
a threaded end that passes through the hole in the bottom plate and projects below the bottom plate;

placing the bolt through the holes in the top and bottom plates;

inserting a nut through the first open face and tightening the nut onto the bolt;

providing an upper wall panel having a second connector block with a bottom hole on a lower edge of the upper wall panel and a second open face accessible from a side of the upper wall panel;

placing the upper wall panel on the horizontal floor panel so that the bottom hole is aligned with the internally threaded axial hole of the bolt;

inserting a further bolt through the second open face and tightening the further bolt into the internally threaded axial hole.

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