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(54) **A LIGHT-GUIDING BLOCKWORK AND MANUFACTURING METHOD**

(57) A method for manufacturing a light-guiding blockwork (1), said method comprising:

- providing one or more light-guiding members (100) with two ends;
- providing a formwork (2) comprising a first panel (21) comprising:
 - an inner side (3);
 - an opposite side (4); and
 - a plurality of through holes (5) extending completely through;

- threading each of said light-guiding members (100) into a pair of through holes (5) of said first panel (21) such that said two ends are at said inner side (3) of said first panel (21);
- adding said cast material (200) in said formwork (2), thereby embedding said light-guiding members (100) in said cast material (200); and
- allowing said cast material (200) to set, thereby forming said light-guiding blockwork (1).

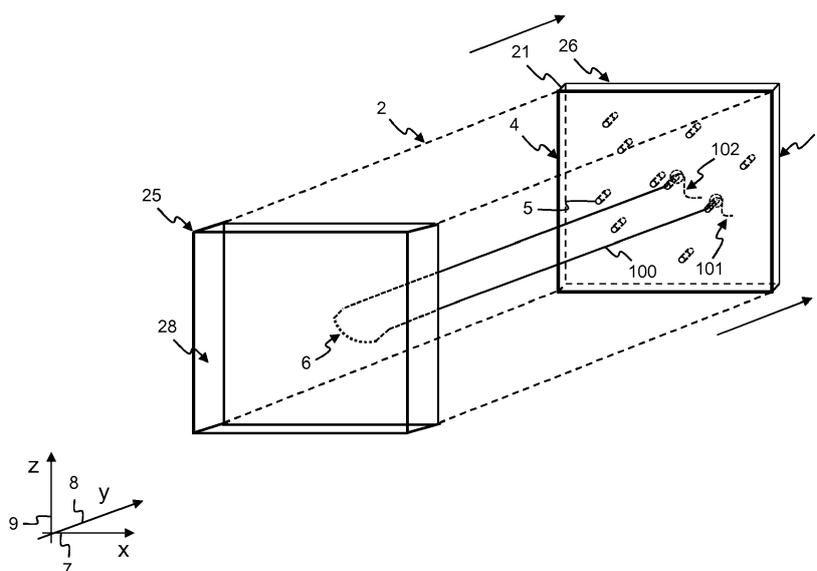


Fig. 6

Description

Field of the Invention

[0001] The present invention generally relates to a light-guiding blockwork comprising light-guiding members embedded in a cast material. The present invention also relates to a method for manufacturing a light-guiding blockwork comprising light-guiding members embedded in a cast material.

Background of the Invention

[0002] In the field of architecture and interior design and decoration, the use of light is increasingly popular. Architects and designers aim at optimizing the luminosity in the designed rooms, thereby creating the impression that the designed rooms are larger in size. It is for example frequent that a wall-, a floor-, a ceiling-surface is illuminated by one or several separate sources of light.

[0003] Traditional concrete used in as construction material is mostly opaque in property, i.e. light is not allowed to pass the concrete. In order to satisfy the demand for a high luminosity in designed rooms, some architects and interior designers rely on glass bricks to build a transparent structure, for example a transparent wall. However, glass is a material which demonstrates lower mechanical strength than concrete when it comes to withstanding heavy construction loads. Alternatively, lamps may be mounted in concrete building elements, such that they are recessed in drilled holes and/or flush with the surface, providing some lighting over the surface and/or some lighting in adjoining rooms adjacent to the surface. But this increases the complexity of the manufacturing of the construction material.

[0004] There is a need for a construction material structurally adapted to bear heavy construction loads and providing some lighting over the surface and some lighting in adjoining rooms adjacent to the surface.

[0005] US2007/0074484A1 describes a light-transmissible construction material to construct a light-transmissible or semi-light-transmissible structure. The method for manufacturing the light-transmissible construction material comprises juxtaposing two side formworks. When both side formworks juxtapose, the corresponding holes on both side formworks are aligned. A light-transmitting unit comprising a plurality of light conducting fibres, each fibre comprising two ends, is then passed through corresponding holes of the two side formworks. Each end of each fibres of the light-transmitting unit is located outside the outer wall of one of the side formworks. In other words, both ends of each fibres of the light-transmitting unit are not located outside the outer wall of the same side formwork. The two side formworks are then outwardly separated to opposite sides of the bottom formwork. An outward pulling force is exerted on two opposite ends of each of the fibres of the light-transmitting unit to tense the light-transmitting unit. A fastening

device is placed at the outer wall of the side formworks and engages in the holes to prevent the light-transmitting unit from inwardly sliding. Concrete or grout is then poured over the light-transmitting unit.

[0006] The method described in US2007/0074484A1 requires the use of concrete or grout containing light weight aggregate. The liquid grout used in US2007/0074484A1 has a gravity that can be larger than the gravity of the light-transmitting unit. There exists a risk that the light-transmitting unit floats in the formwork when the formwork is filled with liquid grout. The light-transmitting unit would therefore not be distributed in the volume of the light-transmissible structure when the liquid grout sets, and the resulting light-transmissible structure would not let light pass through from one side of the light-transmissible structure to an opposite side. Additionally, there is a risk that the light-transmitting unit slides inwardly in the formwork in the case where the gravity of the light-transmitting unit is smaller than the gravity of the liquid grout. The light-transmitting unit would also in this case not be uniformly distributed in the volume of the light-transmissible structure when the liquid grout sets, and the resulting light-transmissible structure would not let light pass through from one side of the light-transmissible structure to an opposite side. Additionally, liquid grout does not demonstrate structural properties equivalent to concrete when it comes to bearing heavy construction loads. There exists a risk that a structure made of liquid grout comprising the light-transmitting unit will structurally break under heavy construction loads. In addition, during the spacing out of the two side formworks of the formwork, the light-transmissible unit is not secured to the side formwork. There exists a risk that one or more of the fibres of the light-transmissible unit therefore slide inwardly in the formwork as the side formworks are spaced out, and slides out of the holes of one of the side formworks or out of the corresponding holes of both side formworks.

[0007] JP2006220981 describes a method to manufacture a light-permeable block. The light-permeable block comprises a plurality of optical fibres embedded in high fluidity cement past, mortar or concrete cured flowable material. The method for manufacturing the light-permeable block comprises juxtaposing a first and a second spacers. When both spacers juxtapose, the corresponding holes on both spacers are aligned. Optical fibres comprising two ends are delivered from a bobbin and are passed through corresponding holes of the two spacers such that one end of each optical fibre can be fixed on the side of the second spacer opposite to the first spacer. The first and the second spacers are then spaced out, thereby tightening the optical fibres between the first and the second spacers. The high fluidity cement paste, mortar or concrete is then poured over the optical fibres in the formwork. After allowing the high fluidity cement paste, thereby forming a light-permeable block, mortar or concrete to set, the second spacer as well as the light-permeable block are spaced out from the first

spacer, and additional high fluidity cement paste is poured over the optical fibres in the formwork.

[0008] The method described in JP2006220981 requires the use of high fluidity cement past, mortar or concrete cured flowable material. The high fluidity cement past, mortar or concrete used in JP2006220981 has a gravity that can be larger or smaller than the gravity of the optical fibres. There exists a risk that the optical fibres either float or sink in the formwork when the formwork is filled with high fluidity cement past, mortar or concrete. The optical fibres would therefore not be distributed in the volume of the light-permeable block when the high fluidity cement past, mortar or concrete sets, and the resulting light-permeable block would not let light pass through from one side of the light-transmissible structure to an opposite side. Additionally, high fluidity cement past, mortar or concrete does not demonstrate structural properties equivalent to concrete when it comes to bearing heavy construction loads. There exists a risk that a structure made of high fluidity cement past, mortar or concrete comprising optical fibres will structurally break under heavy construction loads. In addition, in order to manufacture a light-permeable structure comprising more than one light-permeable blocks, the manufacturing of one light-permeable block must be iterated several times. There exists a risk that the surface of the formed light-permeable block previously in contact with the first spacer is damaged when separating the second spacer as well as the formed light-permeable block out from the first spacer as the light-permeable block was allowed to set on the first spacer. For example, the surface of the formed light-permeable block previously in contact with the first spacer might be uneven, not flat, and the edges of the light-permeable block might break. A subsequent light-permeable block would then have to be formed between the first spacer and this damaged surface, thereby resulting in an unsmooth transition between two adjacent light-permeable blocks.

[0009] It is an objective of the present invention to disclose a solution that overcomes the above identified shortcomings of existing solutions. More particularly, it is an objective to disclose a light-guiding blockwork which lets some light pass through and which demonstrates mechanical and structural properties allowing it to bear heavy construction loads.

Summary of the Invention

[0010] According to a first aspect of the present invention, the above defined objectives are realized by a method for manufacturing a light-guiding blockwork comprising light-guiding members embedded in a cast material, the method comprising the steps of:

- providing one or more light-guiding members, each light-guiding member comprising two ends;
- providing a formwork comprising a first inner surface and an opposite inner surface and a first panel, the

first panel comprising:

- o an inner side facing the opposite second inner surface;
- o an opposite side facing the first inner surface;
- o a plurality of through holes extending completely through the first panel from the inner side to the opposite side;

- threading each of the light-guiding members into a pair of through holes of the first panel such that the two ends are at the inner side of the first panel;
- adding the cast material in the formwork between the opposite side of the first panel and the first inner surface, thereby embedding the light-guiding members in the cast material; and
- allowing the cast material to set, thereby forming the light-guiding blockwork.

[0011] The light-guiding members of the light-guiding blockwork in accordance with the present invention guide light through the light-guiding blockwork from a surface of the light-guiding blockwork adapted to be in contact with an opposite side of a first panel to a surface of the light-guiding blockwork adapted to be in contact with a first inner surface of a formwork comprising the first panel. The light-guiding blockwork comprises a cast material embedding the light-guiding members, thereby providing the light-guiding blockwork with the mechanical strength to bear heavy construction loads. This way, the light-guiding blockwork or parts of the light-guiding blockwork may be used to build a light-guiding structure such as a ceiling, a wall, a low wall, a floor, but also light-guiding furniture such as tables, doors, desks, panels for a ceiling or for a wall, isolation panels, stairs, etc.. The light-guiding members are threaded in a pair of through holes of the first panel such that a section of each of the light-guiding members remains at the opposite side of the first panel after threading each light-guiding member in the first panel. This way, the light-guiding members cannot slide out of the through holes of the first panel before the cast material is added in the formwork between the first panel and the formwork. The through holes of the panels are spread such that the volume of the light-guiding blockwork comprises light-guiding members. This way, the light-guiding members are distributed in the volume of the light-guiding blockwork. Light-guiding blockworks of different lengths may be manufactured by adapting the distance between the first panel and the first inner surface of the formwork. Light can be coupled to the light-guiding members of a light-guiding blockwork through their ends and can be guided in the light-guiding members until another surface of the light-guiding blockwork. This way, if an object, an animal, a person is positioned between a light source and a surface of a light-guiding blockwork comprising ends of light-guiding members, a shadow of the object, the animal, the person can be seen when facing a surface of the light-guiding blockwork comprising

the opposite corresponding ends of the light-guiding members.

[0012] A light-guiding member according to the present invention is an optical fibre cable comprising one or more optical fibres adapted to guide light. Each optical fibre of the optical fibre cable comprises a core and a cladding layer, selected for total internal reflection due to the difference in the refractive index between the two. Alternatively, the light-guiding member according to the present invention is an optical fibre. Alternatively, the light-guiding member according to the present invention comprises a plurality of optical fibres. In accordance with the present invention, the cast material comprises concrete. Concrete is a composite material composed of aggregates bonded together with a fluid cement, such as Portland cement mixed with water, which hardens over time. Sand, natural gravel, crushed stone, rocks, etc. are examples of aggregates used in the composition of concrete. Portland cement for example comprises a mixture of calcium silicates, aluminates and ferrites, i.e. compounds which combine calcium, silicon, aluminium and iron in forms which will react with water. Alternatively, concrete comprises hydraulic cements, such as calcium aluminate cements comprising hydraulic calcium aluminates.

[0013] According to an optional aspect of the invention, threading corresponds to threading both ends of each of the light-guiding members simultaneously into a pair of through holes of the first panel such that the two ends are at the inner side.

[0014] This way, each light-guiding member is thread in a pair of through holes of the first panel such that a section of each light-guiding member remains at the opposite side of the first panel after threading each light-guiding member in the first panel. It is then required to thread light-guiding members only from the opposite side of the first panel. Additionally, threading both ends simultaneously favours the situation for which both sections of a light-guiding member extending from the opposite side of the first panel to the second panel are even long.

[0015] According to an optional aspect of the invention, threading corresponds to:

- threading one of the two ends of each of the light-guiding members into a through hole of the first panel from the inner side to the opposite side; and
- subsequently threading the one of said two ends of each of the light-guiding members into another through hole of the first panel from the opposite side to the inner side such that the two ends are at the inner side of the first panel.

[0016] This way, each light-guiding member is thread in a pair of through holes of the first panel such that a section of each light-guiding member remains at the opposite side of the first panel after threading each light-guiding member in the first panel. It is then required to thread light-guiding members from both sides of the first

panel, which makes the method flexible.

[0017] According to an optional aspect of the invention, the plurality of through holes of the first panel is arranged according to a pseudo-random pattern.

5 **[0018]** The plurality of through holes of the first panel is arranged according to a pseudo-random pattern. The pseudo-random pattern of the through holes is drilled through the first panel. Alternatively, the through holes are bored in the first panel. Alternatively, the plurality of through holes of the first panel is arranged according to periodic pattern. The plurality of through holes of the first panel is arranged according to a pseudo-random pattern.

10 **[0019]** According to an optional aspect of the invention, the method further comprises the steps of tightening the light-guiding members in the formwork.

15 **[0020]** This way, the light-guiding members are tightened once threaded through a pair of holes of the first panel and a distance between both ends of each of the light-guiding members is reduced, and preferably minimized. Additionally, this way, the length of the section of each light-guiding member on the opposite side of the first panel is reduced, and preferably minimized.

20 **[0021]** According to an optional aspect of the invention, the method further comprises the step of securing a section of each of the light-guiding members between the first inner surface and the opposite side of the first panel.

25 **[0022]** Light-guiding members may be threaded in a pair of through holes of the first panel such that a section of each light-guiding member remains at the opposite side of the first panel after threading each light-guiding member in the first panel. The section is secured between the first inner surface of the formwork and the opposite side of the first panel. For example, the section is glued to the opposite side of the first panel. For example, liquid glue is applied on the opposite side of the first panel.

30 Alternatively, cast material is poured on the opposite side of the first panel and is allowed to set on the opposite side of the first panel, thereby securing a section of each of the light-guiding members on the opposite side of the first panel. Alternatively, a resin and/or polymer such as for example epoxy is poured on the opposite side of the first panel and is allowed to set on the opposite side of the first panel, thereby securing a section of each of the light-guiding members on the opposite side of the first panel.

35 A foil, such as for example a plastic foil, may be inserted between the opposite side of the first panel and the resin and/or polymer. This way, the adhesion of resin and/or polymer to the opposite side of the first panel is reduced such that the first panel may freely move in the formwork, while ensuring a section of each of the light-guiding members stays cast in the resin and/or polymer. This way, the light-guiding members cannot slide out of the through holes of the first panel. Additionally, the light-guiding members cannot glide in the through holes of the first panel once a section of the light-guiding members has been secured to the opposite side of the first panel.

40 **[0023]** According to an optional aspect of the invention, the method further comprises the step of securing both

ends of each of the light-guiding members on the inner side of the first panel.

[0024] This way, the light-guiding members cannot glide in the through holes of the first panel and slide inwards the formwork once both ends of light-guiding members are secured on the inner side of the first panel. For example, the method comprises for example the step of gluing both ends of each light-guiding member on the inner side of the first panel, or pinning both ends of each light-guiding member on the inner side of the first panel, or fixing both ends of each light-guiding member on the inner side of the first panel.

[0025] According to an optional aspect of the invention, the method further comprises the steps of spacing out the first panel and the first inner surface, thereby reducing a distance between the inner side of the first panel and the opposite second inner surface.

[0026] This way, the light-guiding members are tensed between the first panel and the first inner surface of the formwork. In other words, the light-guiding members are tensed in the formwork. The light-guiding members are parallel to each other. Alternatively, the light-guiding members are crossing each other and/or are parallel to each other. When embedding the light-guiding members in the cast material, the light-guiding members therefore do not sink inwards in the formwork, but remain under tension such that the light-guiding members are distributed in the volume of the light-guiding blockwork.

[0027] According to an optional aspect of the invention, the formwork further comprises two opposite longitudinal surfaces extending longitudinally along the formwork between the first inner surface and the opposite second inner surface, and wherein:

- one of the opposite longitudinal surfaces is a bulgy surface and comprises one or more bulges extending longitudinally along the bulgy surface; and
- the other of the opposite longitudinal surfaces is a recess surface and comprises one or more recesses corresponding to the one or more bulges of the bulgy surface and extending longitudinally along the recess surface.

[0028] This way, light-guiding blockworks manufactured according to the method can be easily assembled and put together. The bulges of the bulgy surfaces of one light-guiding blockwork fit in the recesses of the recess surface of another light-guiding blockwork. This makes storage of light-guiding blockworks space-efficient and also makes the use of light-guiding blockworks for construction works easier as light-guiding blockworks fit into each other.

[0029] According to an optional aspect of the invention, the cast material comprises concrete and pieces of glass.

[0030] This way, the cast material allows a light-guiding blockwork made of such cast material to let even more light through.

[0031] According to an optional aspect of the invention,

the method further comprises the steps of:

- sawing the light-guiding members at the inner side of the first panel;
- 5 - stripping the formwork; and
- sawing the light-guiding members at the surface of the light-guiding blockwork previously facing the inner surface and at the surface of the light-guiding blockwork previously facing the opposite side of the first panel.

[0032] This way, the surfaces of the light-guiding blockwork are made flat and smooth. This ensures the interface between two adjacent light-guiding blockworks is smooth.

[0033] According to an optional aspect of the invention, the method further comprises the step of sawing light-guiding tiles out of the light-guiding blockwork.

[0034] This way, smaller portions of a light-guiding blockwork may be used to assemble light-guiding structures such as tables, walls, ceilings, doors, etc..

[0035] According to an optional aspect of the invention, the method further comprises the steps of:

- 25 - providing in the formwork a second panel, the second panel comprising:
 - o an inner side facing the first panel;
 - o an opposite side facing the opposite second inner surface; and
 - o a plurality of through holes extending completely through the second panel from the inner side to the opposite side;

- 35 - threading each of the light-guiding members into a pair of through holes of the first panel such that the two ends are at the inner side of the first panel;
- threading each of the light-guiding members into a pair of through holes of the second panel such that the two ends are at the opposite side of the second panel;
- 40 - adding the cast material in the formwork between the first panel and the second panel, thereby embedding the light-guiding members in the cast material; and
- 45 - allowing the cast material to set, thereby forming the light-guiding blockwork.

[0036] According to an optional aspect of the invention, the method further comprises the steps of:

- tightening the light-guiding members between the first panel and the second panel;
- securing a section of each of the light-guiding members on the opposite side of the first panel;
- 55 - spacing out the first panel and the second panel; and
- securing both ends of each of the light-guiding members on the opposite side of the second panel.

[0037] According to a second aspect of the present invention, there is provided a light-guiding blockwork comprising light-guiding members embedded in a cast material, the light-guiding blockwork being manufactured by the method according to a first aspect of the present invention.

[0038] The light-guiding members of the light-guiding blockwork in accordance with the present invention guide light through the light-guiding blockwork from a surface of the light-guiding blockwork adapted to be in contact with an opposite side of a first panel to a surface of the light-guiding blockwork adapted to be in contact with a first inner surface of a formwork comprising the first panel. The light-guiding blockwork comprises a cast material embedding the light-guiding members, thereby providing the light-guiding blockwork with the mechanical strength to bear heavy construction loads. This way, the light-guiding blockwork or parts of the light-guiding blockwork may be used to build a light-guiding structure such as a ceiling, a wall, a low wall, a floor, but also light-guiding furniture such as tables, doors, desks, panels for a ceiling or for a wall, isolation panels, stairs, etc.. The light-guiding members are threaded in a pair of through holes of the first panel such that a section of each of the light-guiding members remains at the opposite side of the first panel after threading each light-guiding member in the first panel. This way, the light-guiding members cannot slide out of the through holes of the first panel before the cast material is added in the formwork between the first panel and the formwork. The through holes of the panels are spread such that the volume of the light-guiding blockwork comprises light-guiding members. This way, the light-guiding members are distributed in the volume of the light-guiding blockwork. Light-guiding blockworks of different lengths may be manufactured by adapting the distance between the first panel and the first inner surface of the formwork. Light can be coupled to the light-guiding members of a light-guiding blockwork through their ends and can be guided in the light-guiding members until another surface of the light-guiding blockwork. This way, if an object, an animal, a person is positioned between a light source and a surface of a light-guiding blockwork comprising ends of light-guiding members, a shadow of the object, the animal, the person can be seen when facing a surface of the light-guiding blockwork comprising the opposite corresponding ends of the light-guiding members.

Brief Description of the Drawings

[0039]

Fig. 1A schematically illustrates a 3D view of an embodiment of a first panel or a second panel according to the present invention, while Fig. 1B schematically illustrates them in front view and Fig. 1C schematically illustrates them in side view.

Fig. 2 schematically illustrates an embodiment of a formwork comprising a first panel and a light-guiding member, wherein one end of the light-guiding member is thread into a through hole of the first panel.

Fig. 3 schematically illustrates an embodiment of formwork comprising a first panel and a light-guiding member, wherein both ends of the light-guiding member are threaded into a pair of through holes of the first panel.

Fig. 4 schematically illustrates an embodiment of formwork comprising a first panel and a light-guiding member, wherein both ends of the light-guiding member are tightened into a pair of through holes of the first panel.

Fig. 5 schematically illustrates an embodiment of formwork comprising a first panel and a light-guiding member, wherein both ends of the light-guiding member are threaded into a pair of through holes of the first panel and wherein a section of the light-guiding member is secured on the opposite side of the first panel.

Fig. 6 schematically illustrates an embodiment of formwork comprising a first panel and a light-guiding member, wherein both ends of the light-guiding member are threaded into a pair of through holes of the first panel and wherein the first panel is spaced out from the first inner surface of the formwork.

Fig. 7 schematically illustrates an embodiment of a light-guiding blockwork comprising a light-guiding member embedded in a cast material.

Fig. 8 schematically illustrates an embodiment of a light-guiding blockwork comprising a light-guiding member embedded in a cast material and sawed at the inner side of the first panel.

Fig. 9 schematically illustrates an embodiment of a light-guiding blockwork stripped out a formwork.

Fig. 10 schematically illustrates an embodiment of a light-guiding blockwork comprising a light-guiding member embedded in a cast material and sawed at its surfaces.

Fig. 11B schematically illustrates an embodiment of a light-guiding blockwork comprising bulges and recesses extending longitudinally along the light-guiding blockwork and Fig. 11A schematically illustrates an embodiment of a formwork comprising bulges and recesses.

Fig. 12 schematically illustrates an embodiment of two light-guiding tiles sawed out of a light-guiding

blockwork according to the present invention.

Detailed Description of Embodiment(s)

[0040] According to an embodiment shown in Fig. 1A, a first panel 21 is a rectangular volume. According to an alternative embodiment, the first panel 21 is cubic, trapezoidal, conic, etc.. A front side of the first panel 21 depicted in Fig. 1B is defined along the (x, z) plane labelled 7;9. The depth of the first panel 21 extends along the direction y labelled 8. The first panel 21 comprises a plurality of through holes 5. As visible on Fig. 1C, the plurality of through holes 5 extends completely through the first panel 21 from an inner side 3 of the first panel 21 to an opposite side 4 of the first panel 21. The through holes 5 therefore extends along the direction y labelled 8. According to an alternative embodiment, the through holes may extend under predefined angles in the plane (y, z) labelled 8;9. The inner side 3 of the first panel 21 is adapted to be facing the second panel 22 in the formwork 2. The opposite side 4 of the first panel 21 is adapted to be facing away from the second panel 22 in the formwork 2. The plurality of through holes 5 of the first panel 21 is arranged according to a pseudo-random pattern. In other words, the position of the through holes is predefined, but the distance between two consecutive through holes 5 on the first panel 21 is not identical everywhere on the first panel 21. According to a further alternative embodiment, the plurality of through holes 5 is arranged according to a periodic pattern, and/or according to a predefined pattern, such as a logo, a letter, a word, a shape, for example a circle, a rectangle, a triangle, etc.. The second panel 22 is identical to the first panel 21. The second panel 22 then comprises a plurality of through holes 5 extending completely through the second panel 22 from an inner side 3 of the second panel 22 to an opposite side 4 of the second panel 22. The through holes 5 therefore extends along the direction y labelled 8. According to an alternative embodiment, the through holes may extend under predefined angles in the plane (y, z) labelled 8;9. The inner side 3 of the second panel 22 is adapted to be facing the first panel 21 in the formwork 2. The opposite side 4 of the second panel 22 is adapted to be facing away from the first panel 21 in the formwork 2. The plurality of through holes 5 of the second panel 22 is arranged according to a pseudo-random pattern. In other words, the position of the through holes is predefined, but the distance between two consecutive through holes 5 on the second panel 22 is not identical everywhere on the second panel 22. According to a further alternative embodiment, the plurality of through holes 5 is arranged according to a periodic pattern, and/or according to a predefined pattern, such as a logo, a letter, a word, a shape, for example a circle, a rectangle, a triangle, etc.. According to a further alternative embodiment, the second panel 22 is different from the first panel 21.

[0041] For clarity reasons, only one light-guiding mem-

ber 100 is represented in Fig. 2 to Fig. 12. According to the present invention, a light-guiding blockwork 1 comprises a plurality of light-guiding members 100.

[0042] According to an embodiment shown in Fig. 2, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. The first panel 21 is positioned such that the inner side 3 and the opposite side 4 of the first panel 21 are defined in the plane (x, z) labelled 7;9 and such that the depth of the first panel 21 extends along the direction y labelled 8. Components having the same reference number than on Fig. 1A, 1B or 1C perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The end 102 of the light-guiding member 100 is at the inner side 3 of the first panel 21. The end 101 of the light-guiding member 100 is at the opposite side 4 of the first panel 21, inside the formwork 2, i.e. between the first inner surface 25 and the opposite side 4 of the first panel 21.

[0043] According to an embodiment shown in Fig. 3, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 2 perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of threading the end 101 of the light-guiding member 100 into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding mem-

ber 100 into a pair of non-adjacent through holes 5 of the first panel 21.

[0044] According to an embodiment shown in Fig. 4, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 3 perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of threading the end 101 of the light-guiding member 100 into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of non-adjacent through holes 5 of the first panel 21. The method further comprises tightening the light-guiding member 100 thread into a pair of through holes 5 of the first panel 21 in the formwork 2 such that a distance between both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21 is reduced and/or such that the length of the section 6 of the light-guiding member 100 remaining at the opposite side 4 of the first panel 21 is reduced.

[0045] According to an embodiment shown in Fig. 5, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 4 perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of threading the end 101 of the light-guiding member 100

into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of non-adjacent through holes 5 of the first panel 21. The method further comprises tightening the light-guiding member 100 thread into a pair of through holes 5 of the first panel 21 in the formwork 2 such that a distance between both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21 is reduced and/or such that the length of the section 6 of the light-guiding member 100 remaining at the opposite side 4 of the first panel 21 is reduced. The method further comprises the step of securing the section 6 of the light-guiding member 100 on the opposite side 4 of the first panel 21. In other words, the method further comprises securing the section 6 of the light-guiding member 100 between the first inner surface 25 of the formwork 2 and the opposite side 4 of the first panel 21. For example, the method comprises adding a polymer 28 between the first inner surface 25 and the opposite side 4 of the first panel 21 such that the section 6 of the light-guiding member 100 is embedded in the polymer 28. For example, a suitable polymer 28 may be epoxy. The method further comprises allowing the polymer 28 to set, thereby embedding the section 6 of the light-guiding member 100 in the polymer 28. According to the present invention, a plastic foil is inserted between the opposite side 4 of the first panel 21 and the polymer 28. This way, the adhesion of the polymer 28 to the opposite side 4 of the first panel 21 is minimized and the first panel 21 may be freely translated along the direction y labelled 8.

[0046] According to an embodiment shown in Fig. 6, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 5 perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of

threading the end 101 of the light-guiding member 100 into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of non-adjacent through holes 5 of the first panel 21. The method further comprises tightening the light-guiding member 100 thread into a pair of through holes 5 of the first panel 21 in the formwork 2 such that a distance between both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21 is reduced and/or such that the length of the section 6 of the light-guiding member 100 remaining at the opposite side 4 of the first panel 21 is reduced. The method further comprises the step of securing the section 6 of the light-guiding member 100 on the opposite side 4 of the first panel 21. In other words, the method further comprises securing the section 6 of the light-guiding member 100 between the first inner surface 25 of the formwork 2 and the opposite side 4 of the first panel 21. For example, the method comprises adding a polymer 28 between the first inner surface 25 and the opposite side 4 of the first panel 21 such that the section 6 of the light-guiding member 100 is embedded in the polymer 28. For example, a suitable polymer 28 may be epoxy. The method further comprises allowing the polymer 28 to set, thereby embedding the section 6 of the light-guiding member 100 in the polymer 28. The method further comprises the step of spacing the first panel 21 from the first inner surface 25 of the formwork 2 along the direction y labelled 8 towards the opposite second surface 26, thereby tensing the light-guiding member 100 between the polymer 28 and the first panel 21. In other words, the light-guiding member 100 is tightening by translating the first panel 21 along the direction y labelled 8. The method further comprises the step of securing both ends 101;102 of the light-guiding member 100 on the inner side 3 of the first panel 21. For example, the method comprises for example the step of gluing both ends 101;102 on the inner side 3 of the first panel 21, or pinning both ends 101;102 on the inner side 3 of the first panel 21, or fixing both ends 101;102 on the inner side 3 of the first panel 21.

[0047] According to an embodiment shown in Fig. 7, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 6 perform the same function. The first panel 21 com-

prises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of threading the end 101 of the light-guiding member 100 into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of non-adjacent through holes 5 of the first panel 21. The method further comprises tightening the light-guiding member 100 thread into a pair of through holes 5 of the first panel 21 in the formwork 2 such that a distance between both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21 is reduced and/or such that the length of the section 6 of the light-guiding member 100 remaining at the opposite side 4 of the first panel 21 is reduced. The method further comprises the step of securing the section 6 of the light-guiding member 100 on the opposite side 4 of the first panel 21. In other words, the method further comprises securing the section 6 of the light-guiding member 100 between the first inner surface 25 of the formwork 2 and the opposite side 4 of the first panel 21. For example, the method comprises adding a polymer 28 between the first inner surface 25 and the opposite side 4 of the first panel 21 such that the section 6 of the light-guiding member 100 is embedded in the polymer 28. For example, a suitable polymer 28 may be epoxy. The method further comprises allowing the polymer 28 to set, thereby embedding the section 6 of the light-guiding member 100 in the polymer 28. The method further comprises the step of spacing the first panel 21 from the first inner surface 25 of the formwork 2 along the direction y labelled 8 towards the opposite second surface 26, thereby tensing the light-guiding member 100 between the polymer 28 and the first panel 21. In other words, the light-guiding member 100 is tightening by translating the first panel 21 along the direction y labelled 8. The method further comprises the step of securing both ends 101;102 of the light-guiding member 100 on the inner side 3 of the first panel 21.

For example, the method comprises for example the step of gluing both ends 101;102 on the inner side 3 of the first panel 21, or pinning both ends 101;102 on the inner side 3 of the first panel 21, or fixing both ends 101;102 on the inner side 3 of the first panel 21. The method further comprises the step of adding a cast material 200 in the formwork 2 between the first panel 21 and the polymer 28, thereby embedding the light-guiding member 100 in the cast material 200. For example, the method comprises the step of pouring cast material 200 over the light-guiding member 100 in the formwork 2, thereby forming a light-guiding blockwork 1. The cast material 200 comprises concrete. Concrete is a composite material composed of aggregates bonded together with a fluid cement, such as Portland cement mixed with water, which hardens over time. Sand, natural gravel, crushed stone, rocks, etc. are examples of aggregates used in the composition of concrete. Portland cement for example comprises a mixture of calcium silicates, aluminates and ferrites, i.e. compounds which combine calcium, silicon, aluminium and iron in forms which will react with water. Alternatively, concrete comprises hydraulic cements, such as calcium aluminate cements comprising hydraulic calcium aluminates. According to an alternative embodiment, the method comprises the step of adding pieces of glass to the cast material 200.

[0048] According to an embodiment shown in Fig. 8, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 7 perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of threading the end 101 of the light-guiding member 100 into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of non-adjacent through holes 5 of the

first panel 21. The method further comprises tightening the light-guiding member 100 thread into a pair of through holes 5 of the first panel 21 in the formwork 2 such that a distance between both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21 is reduced and/or such that the length of the section 6 of the light-guiding member 100 remaining at the opposite side 4 of the first panel 21 is reduced. The method further comprises the step of securing the section 6 of the light-guiding member 100 on the opposite side 4 of the first panel 21. In other words, the method further comprises securing the section 6 of the light-guiding member 100 between the first inner surface 25 of the formwork 2 and the opposite side 4 of the first panel 21. For example, the method comprises adding a polymer 28 between the first inner surface 25 and the opposite side 4 of the first panel 21 such that the section 6 of the light-guiding member 100 is embedded in the polymer 28. For example, a suitable polymer 28 may be epoxy. The method further comprises allowing the polymer 28 to set, thereby embedding the section 6 of the light-guiding member 100 in the polymer 28. The method further comprises the step of spacing the first panel 21 from the first inner surface 25 of the formwork 2 along the direction y labelled 8 towards the opposite second surface 26, thereby tensing the light-guiding member 100 between the polymer 28 and the first panel 21. In other words, the light-guiding member 100 is tightening by translating the first panel 21 along the direction y labelled 8. The method further comprises the step of securing both ends 101;102 of the light-guiding member 100 on the inner side 3 of the first panel 21. For example, the method comprises for example the step of gluing both ends 101;102 on the inner side 3 of the first panel 21, or pinning both ends 101;102 on the inner side 3 of the first panel 21, or fixing both ends 101;102 on the inner side 3 of the first panel 21. The method further comprises the step of adding a cast material 200 in the formwork 2 between the first panel 21 and the polymer 28, thereby embedding the light-guiding member 100 in the cast material 200. For example, the method comprises the step of pouring cast material 200 over the light-guiding member 100 in the formwork 2, thereby forming a light-guiding blockwork 1. The cast material 200 comprises concrete. The method further comprises the step of sawing both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21.

[0049] According to an embodiment shown in Fig. 9, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 8 perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method

comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of threading the end 101 of the light-guiding member 100 into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of non-adjacent through holes 5 of the first panel 21. The method further comprises tightening the light-guiding member 100 thread into a pair of through holes 5 of the first panel 21 in the formwork 2 such that a distance between both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21 is reduced and/or such that the length of the section 6 of the light-guiding member 100 remaining at the opposite side 4 of the first panel 21 is reduced. The method further comprises the step of securing the section 6 of the light-guiding member 100 on the opposite side 4 of the first panel 21. In other words, the method further comprises securing the section 6 of the light-guiding member 100 between the first inner surface 25 of the formwork 2 and the opposite side 4 of the first panel 21. For example, the method comprises adding a polymer 28 between the first inner surface 25 and the opposite side 4 of the first panel 21 such that the section 6 of the light-guiding member 100 is embedded in the polymer 28. For example, a suitable polymer 28 may be epoxy. The method further comprises allowing the polymer 28 to set, thereby embedding the section 6 of the light-guiding member 100 in the polymer 28. The method further comprises the step of spacing the first panel 21 from the first inner surface 25 of the formwork 2 along the direction y labelled 8 towards the opposite second surface 26, thereby tensing the light-guiding member 100 between the polymer 28 and the first panel 21. In other words, the light-guiding member 100 is tightening by translating the first panel 21 along the direction y labelled 8. The method further comprises the step of securing both ends 101;102 of the light-guiding member 100 on the inner side 3 of the first panel 21. For example, the method comprises for example the step of gluing both ends 101;102 on the inner side 3 of the first panel 21, or pinning both ends 101;102 on the inner side 3 of the first panel 21, or fixing both ends 101;102 on the inner side 3 of the first panel 21. The method further comprises the step of adding a cast material 200 in the formwork 2 between the first panel 21 and the polymer

28, thereby embedding the light-guiding member 100 in the cast material 200. For example, the method comprises the step of pouring cast material 200 over the light-guiding member 100 in the formwork 2, thereby forming a light-guiding blockwork 1. The cast material 200 comprises concrete. The method further comprises the step of sawing both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21. The method further comprises the steps of stripping the formwork 2 and of sawing the light-guiding member 100 at the surface of light-guiding blockwork 1 previously facing the polymer 28, thereby releasing the light-guiding blockwork 1. In other words, the method further comprises the step of sawing the light-guiding member 100 at the surface of the light-guiding blockwork 1 previously facing the first inner surface 25 of the formwork 2.

[0050] According to an embodiment shown in Fig. 10, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 9 perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of threading the end 101 of the light-guiding member 100 into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of non-adjacent through holes 5 of the first panel 21. The method further comprises tightening the light-guiding member 100 thread into a pair of through holes 5 of the first panel 21 in the formwork 2 such that a distance between both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21 is reduced and/or such that the length of the section 6 of the light-guiding member 100 remaining at the opposite side 4 of the first panel 21 is reduced. The method further comprises the step of securing the section 6 of the light-guiding member 100 on the opposite side 4 of the first

panel 21. In other words, the method further comprises securing the section 6 of the light-guiding member 100 between the first inner surface 25 of the formwork 2 and the opposite side 4 of the first panel 21. For example, the method comprises adding a polymer 28 between the first inner surface 25 and the opposite side 4 of the first panel 21 such that the section 6 of the light-guiding member 100 is embedded in the polymer 28. For example, a suitable polymer 28 may be epoxy. The method further comprises allowing the polymer 28 to set, thereby embedding the section 6 of the light-guiding member 100 in the polymer 28. The method further comprises the step of spacing the first panel 21 from the first inner surface 25 of the formwork 2 along the direction y labelled 8 towards the opposite second surface 26, thereby tensing the light-guiding member 100 between the polymer 28 and the first panel 21. In other words, the light-guiding member 100 is tightening by translating the first panel 21 along the direction y labelled 8. The method further comprises the step of securing both ends 101;102 of the light-guiding member 100 on the inner side 3 of the first panel 21. For example, the method comprises for example the step of gluing both ends 101;102 on the inner side 3 of the first panel 21, or pinning both ends 101;102 on the inner side 3 of the first panel 21, or fixing both ends 101;102 on the inner side 3 of the first panel 21. The method further comprises the step of adding a cast material 200 in the formwork 2 between the first panel 21 and the polymer 28, thereby embedding the light-guiding member 100 in the cast material 200. For example, the method comprises the step of pouring cast material 200 over the light-guiding member 100 in the formwork 2, thereby forming a light-guiding blockwork 1. The cast material 200 comprises concrete. The method further comprises the step of sawing both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21. The method further comprises the steps of stripping the formwork 2 and of sawing the light-guiding member 100 at the surface of light-guiding blockwork 1 previously facing the polymer 28, thereby releasing the light-guiding blockwork 1. In other words, the method further comprises the step of sawing the light-guiding member 100 at the surface of the light-guiding blockwork 1 previously facing the first inner surface 25 of the formwork 2. The method further comprises sawing the light-guiding member 100 at the surface of the light-guiding blockwork 1 previously facing the opposite side 4 of the first panel 21.

[0051] According to an embodiment shown in Fig. 11B, a light-guiding blockwork 1 comprises two bulges 232 and two corresponding recesses 242 extending longitudinally along two opposite surfaces of the light-guiding blockwork 1. Components having the same reference number than on Fig. 10 perform the same function. In Fig. 11A, a formwork 2 comprises two opposite surfaces 23;24. The two opposite longitudinal surfaces 23;24 extend longitudinally along the formwork 2 between the first panel 21 and the second panel 22. One of the opposite longitudinal surfaces 23;24 is a bulgy surface 23 and an-

other opposite longitudinal surface 23;24 is a recess surface 24. The method further comprises the step of providing on the bulgy surface 23 one or more bulges 230 extending longitudinally along the bulgy surface 23. The method further comprises the step of providing on the recess surface 24 one or more recesses 231 corresponding to the one or more bulges 230 and extending longitudinally along the recess surface 24.

[0052] According to an embodiment shown in Fig. 12, a formwork 2 comprises a first inner surface 25 and an opposite second inner surface 26 and a first panel 21. Components having the same reference number than on Fig. 10 perform the same function. The first panel 21 comprises a plurality of through holes 5. The plurality of through holes 5 of the panel 1 is arranged according to a pseudo-random pattern. The first panel 21 comprises an inner side 3 facing the first inner surface 25 of the formwork 2, and an opposite side 4 facing the opposite second surface 26 of the formwork 2. A light-guiding member 100 comprises two ends 101;102. The method comprises the step of threading the end 102 of the light-guiding member 100 into a through hole 5 of the first panel 21. The method further comprises the step of threading the end 101 of the light-guiding member 100 into a different through hole 5 of the first panel 21, from the opposite side 4 to the inner side 3 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 simultaneously into a pair of through holes 5 of the first panel 21 from the opposite side 4 to the inner side 3 of the first panel 21. Both ends 101;102 are at the inner side 3 of the first panel 21, such that a section 6 of the light-guiding member 100 remains at the opposite side 4 of the first panel 21. The method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of adjacent through holes 5 of the first panel 21. According to an alternative embodiment, the method comprises the step of threading both ends 101;102 of the light-guiding member 100 into a pair of non-adjacent through holes 5 of the first panel 21. The method further comprises tightening the light-guiding member 100 thread into a pair of through holes 5 of the first panel 21 in the formwork 2 such that a distance between both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21 is reduced and/or such that the length of the section 6 of the light-guiding member 100 remaining at the opposite side 4 of the first panel 21 is reduced. The method further comprises the step of securing the section 6 of the light-guiding member 100 on the opposite side 4 of the first panel 21. In other words, the method further comprises securing the section 6 of the light-guiding member 100 between the first inner surface 25 of the formwork 2 and the opposite side 4 of the first panel 21. For example, the method comprises adding a polymer 28 between the first inner surface 25 and the opposite side 4 of the first panel 21 such that the section 6 of the light-guiding member 100 is embedded in the polymer 28. For example, a suit-

able polymer 28 may be epoxy. The method further comprises allowing the polymer 28 to set, thereby embedding the section 6 of the light-guiding member 100 in the polymer 28. The method further comprises the step of spacing the first panel 21 from the first inner surface 25 of the formwork 2 along the direction y labelled 8 towards the opposite second surface 26, thereby tensing the light-guiding member 100 between the polymer 28 and the first panel 21. In other words, the light-guiding member 100 is tightening by translating the first panel 21 along the direction y labelled 8. The method further comprises the step of securing both ends 101;102 of the light-guiding member 100 on the inner side 3 of the first panel 21. For example, the method comprises for example the step of gluing both ends 101;102 on the inner side 3 of the first panel 21, or pinning both ends 101;102 on the inner side 3 of the first panel 21, or fixing both ends 101;102 on the inner side 3 of the first panel 21. The method further comprises the step of adding a cast material 200 in the formwork 2 between the first panel 21 and the polymer 28, thereby embedding the light-guiding member 100 in the cast material 200. For example, the method comprises the step of pouring cast material 200 over the light-guiding member 100 in the formwork 2, thereby forming a light-guiding blockwork 1. The cast material 200 comprises concrete. The method further comprises the step of sawing both ends 101;102 of the light-guiding member 100 at the inner side 3 of the first panel 21. The method further comprises the steps of stripping the formwork 2 and of sawing the light-guiding member 100 at the surface of light-guiding blockwork 1 previously facing the polymer 28, thereby releasing the light-guiding blockwork 1. In other words, the method further comprises the step of sawing the light-guiding member 100 at the surface of the light-guiding blockwork 1 previously facing the first inner surface 25 of the formwork 2. The method further comprises sawing the light-guiding member 100 at the surface of the light-guiding blockwork 1 previously facing the opposite side 4 of the first panel 21. The method further comprises sawing light-guiding tiles 110 out of the light-guiding blockwork 1 along the direction z labelled 9. The light-guiding tiles 110 have the same dimensions. According to an alternative embodiment, the light-guiding tiles 110 have different dimensions along the direction y labelled 8, along the direction x labelled 7 and/or along the direction z labelled 9.

[0053] Although the present invention has been illustrated by reference to specific embodiments, it will be apparent to those skilled in the art that the invention is not limited to the details of the foregoing illustrative embodiments, and that the present invention may be embodied with various changes and modifications without departing from the scope thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims

are therefore intended to be embraced therein. In other words, it is contemplated to cover any and all modifications, variations or equivalents that fall within the scope of the basic underlying principles and whose essential attributes are claimed in this patent application. It will furthermore be understood by the reader of this patent application that the words "comprising" or "comprise" do not exclude other elements or steps, that the words "a" or "an" do not exclude a plurality, and that a single element, such as a computer system, a processor, or another integrated unit may fulfil the functions of several means recited in the claims. Any reference signs in the claims shall not be construed as limiting the respective claims concerned. The terms "first", "second", "third", "a", "b", "c", and the like, when used in the description or in the claims are introduced to distinguish between similar elements or steps and are not necessarily describing a sequential or chronological order. Similarly, the terms "top", "bottom", "over", "under", and the like are introduced for descriptive purposes and not necessarily to denote relative positions. It is to be understood that the terms so used are interchangeable under appropriate circumstances and embodiments of the invention are capable of operating according to the present invention in other sequences, or in orientations different from the one(s) described or illustrated above.

Claims

1. A method for manufacturing a light-guiding blockwork (1) comprising light-guiding members (100) embedded in a cast material (200), said method comprising the steps of:
 - providing one or more light-guiding members (100), each light-guiding member (100) comprising two ends (101; 102);
 - providing a formwork (2) comprising a first inner surface (25) and an opposite second inner surface (26) and a first panel (21), said first panel (21) comprising:
 - o an inner side (3) facing said opposite second inner surface (26);
 - o an opposite side (4) facing said first inner surface (25); and
 - o a plurality of through holes (5) extending completely through said first panel (21) from said inner side (3) to said opposite side (4);
 - threading each of said light-guiding members (100) into a pair of through holes (5) of said first panel (21) such that said two ends (101; 102) are at said inner side (3) of said first panel (21);
 - adding said cast material (200) in said formwork (2) between said opposite side (4) of said first panel (21) and said first inner surface (25),

- thereby embedding said light-guiding members (100) in said cast material (200); and
 - allowing said cast material (200) to set, thereby forming said light-guiding blockwork (1).
2. A method according to claim 1, wherein said threading corresponds to threading both ends (101;102) of each of said light-guiding members (100) simultaneously into a pair of through holes (5) of said first panel (21) such that said two ends (101;102) are at said inner side (3).
3. A method according to claim 1, wherein said threading corresponds to:
- threading one of said two ends (101;102) of each of said light-guiding members (100) into a through hole (5) of said first panel (21) from said inner side (3) to said opposite side (4); and
 - subsequently threading said one of said two ends (101; 102) of each of said light-guiding members (100) into another through hole (5) of said first panel (21) from said opposite side (4) to said inner side (3) such that said two ends (101;102) are at said inner side (3) of said first panel (21).
4. A method according to any of the preceding claims, wherein said plurality of through holes (5) of said first panel (21) is arranged according to a pseudo-random pattern.
5. A method according to any of the preceding claims, wherein said method further comprises the step of tightening said light-guiding members (100) in said formwork (2).
6. A method according to claim 5, wherein said method further comprises the step of securing a section (6) of each of said light-guiding members (100) between said first inner surface (25) and said opposite side (4) of said first panel (21).
7. A method according to claim 6, wherein said method further comprises the step of securing both ends (101;102) of each of said light-guiding members (100) on said inner side (3) of said first panel (21).
8. A method according to claim 7, wherein said method further comprises the step of spacing out said first panel (21) and said first inner surface (25), thereby reducing a distance between said inner side (3) of said first panel (21) and said opposite second inner surface (26).
9. A method according to claim 8, wherein said formwork (2) further comprises two opposite longitudinal surfaces (23;24) extending longitudinally along said formwork (2) between said first inner surface (25) and said opposite second inner surface (26), and wherein:
- one of said opposite longitudinal surfaces (23;24) is a bulgy surface (23) and comprises one or more bulges (230) extending longitudinally along said bulgy surface (23); and
 - the other of said opposite longitudinal surfaces (23;24) is a recess surface (24) and comprises one or more recesses (231) corresponding to said one or more bulges (230) and extending longitudinally along said recess surface (24).
10. A method according to any of the preceding claims, wherein said cast material (200) comprises concrete and pieces of glass.
11. A method according to any of the preceding claims, wherein said method further comprises the steps of:
- sawing said light-guiding members (100) at said inner side (3) of said first panel (21);
 - stripping said formwork (2); and
 - sawing said light-guiding members (100) at the surface of said light-guiding blockwork previously facing said first inner surface (25) and at the surface of said light-guiding blockwork previously facing said opposite side (4) of said first panel (21).
12. A method according to claim 11, wherein said method further comprises the step of sawing light-guiding tiles (110) out of said light-guiding blockwork (100).
13. A method according to claim 1, wherein said method further comprises the steps of:
- providing in said formwork (2) a second panel (22), said second panel (22) comprising:
 - o an inner side (3) facing said first panel (21);
 - o an opposite side (4) facing said opposite second inner surface (26); and
 - o a plurality of through holes (5) extending completely through said second panel (22) from said inner side (3) to said opposite side (4);
 - threading each of said light-guiding members (100) into a pair of through holes (5) of said first panel (21) such that said two ends (101;102) are at said inner side (3) of said first panel (21);
 - threading each of said light-guiding members (100) into a pair of through holes (5) of said second panel (22) such that said two ends (101;102) are at said opposite side (4) of said second panel

(22);

- adding said cast material (200) in said form-work (2) between said first panel (21) and said second panel (22), thereby embedding said light-guiding members (100) in said cast material (200); and
- allowing said cast material (200) to set, thereby forming said light-guiding blockwork (1).

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14. A method according to claim 13, wherein said method further comprises the steps of: 10

- tightening said light-guiding members (100) between said first panel (21) and said second panel (22);
- securing a section (6) of each of said light-guiding members (100) on said opposite side (4) of said first panel (21);
- spacing out said first panel (21) and said second panel (22); and
- securing both ends (101;102) of each of said light-guiding members (100) on said opposite side (4) of said second panel (22).

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15. A light-guiding blockwork (1) comprising light-guiding members (100) embedded in a cast material (200), said light-guiding blockwork (1) being manufactured by the method according to any of the claims 1 to 12. 25

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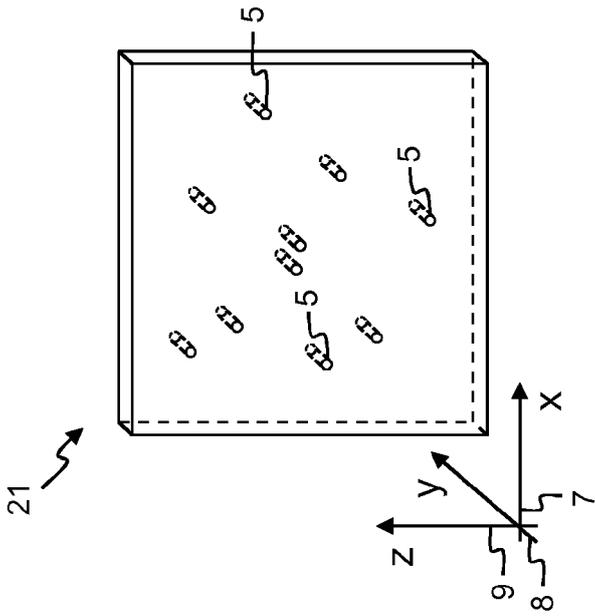


Fig. 1A

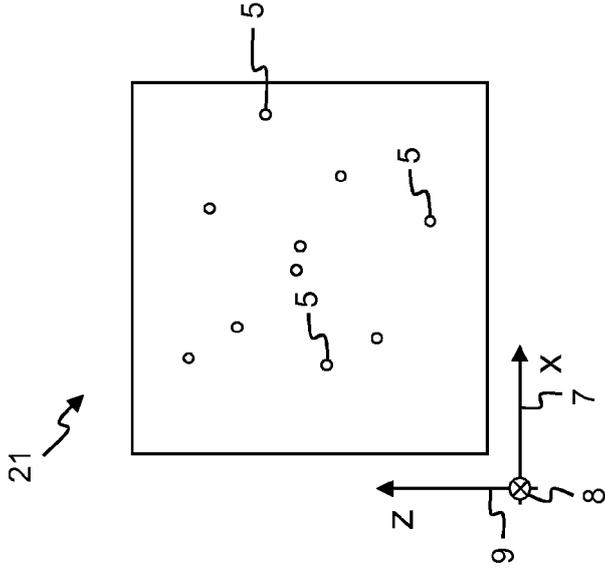


Fig. 1B

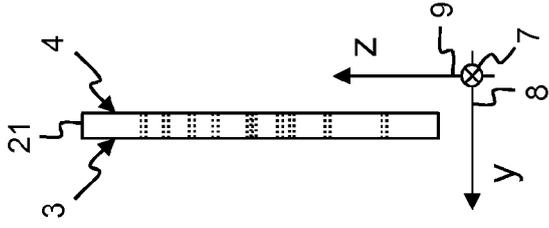


Fig. 1C

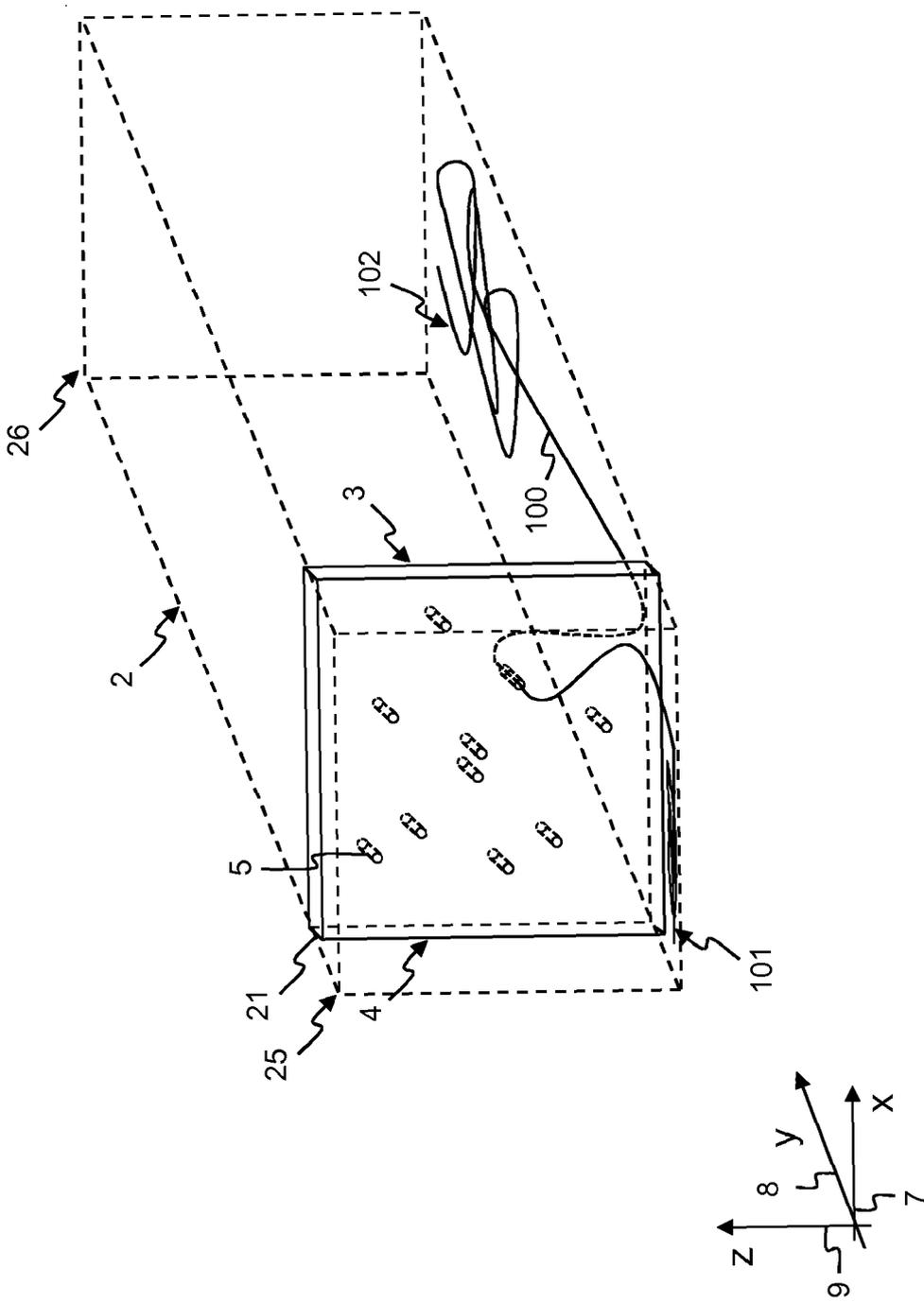


Fig. 2

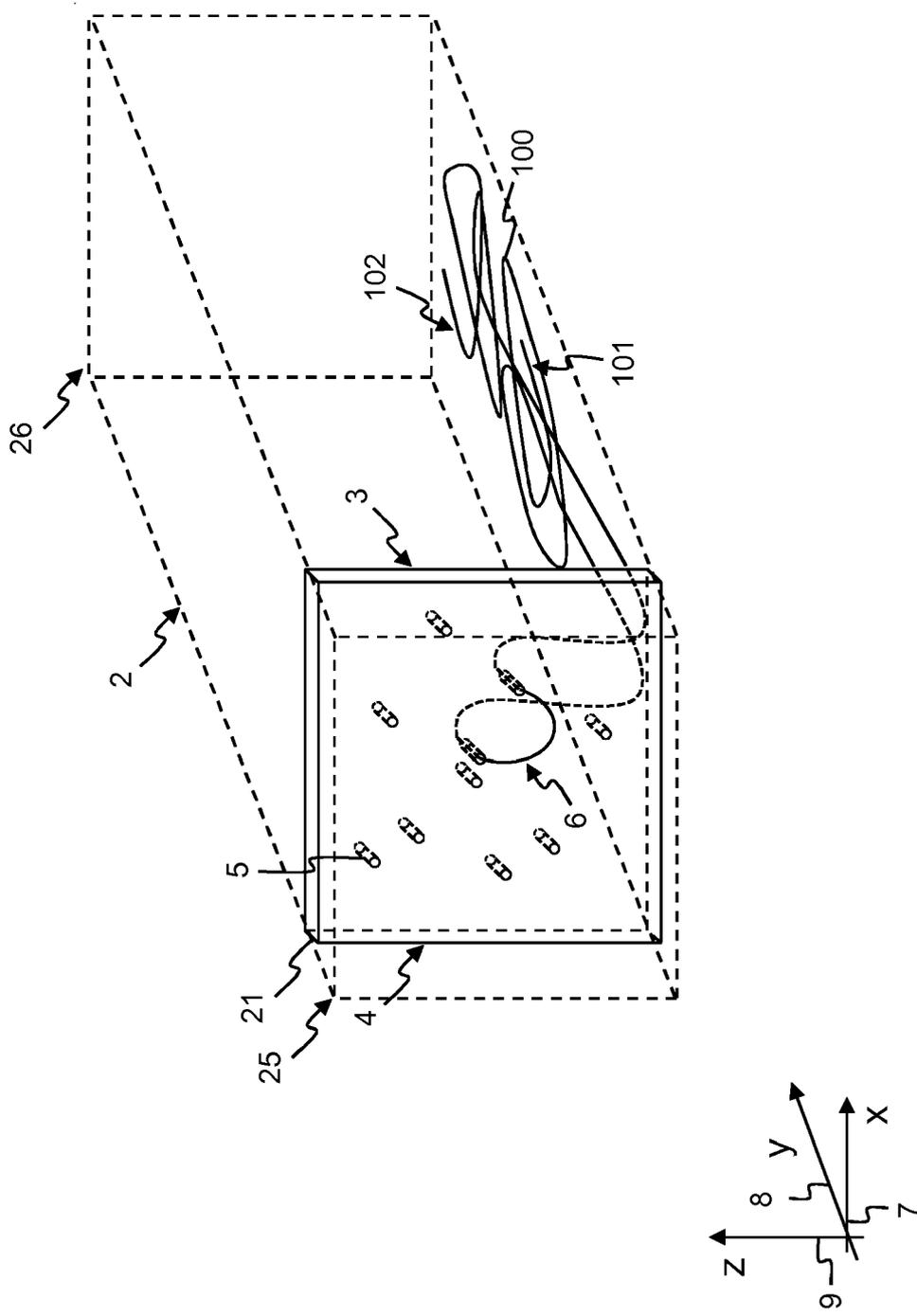


Fig. 3

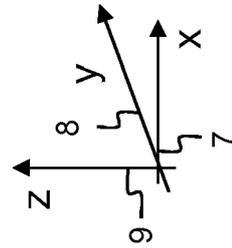
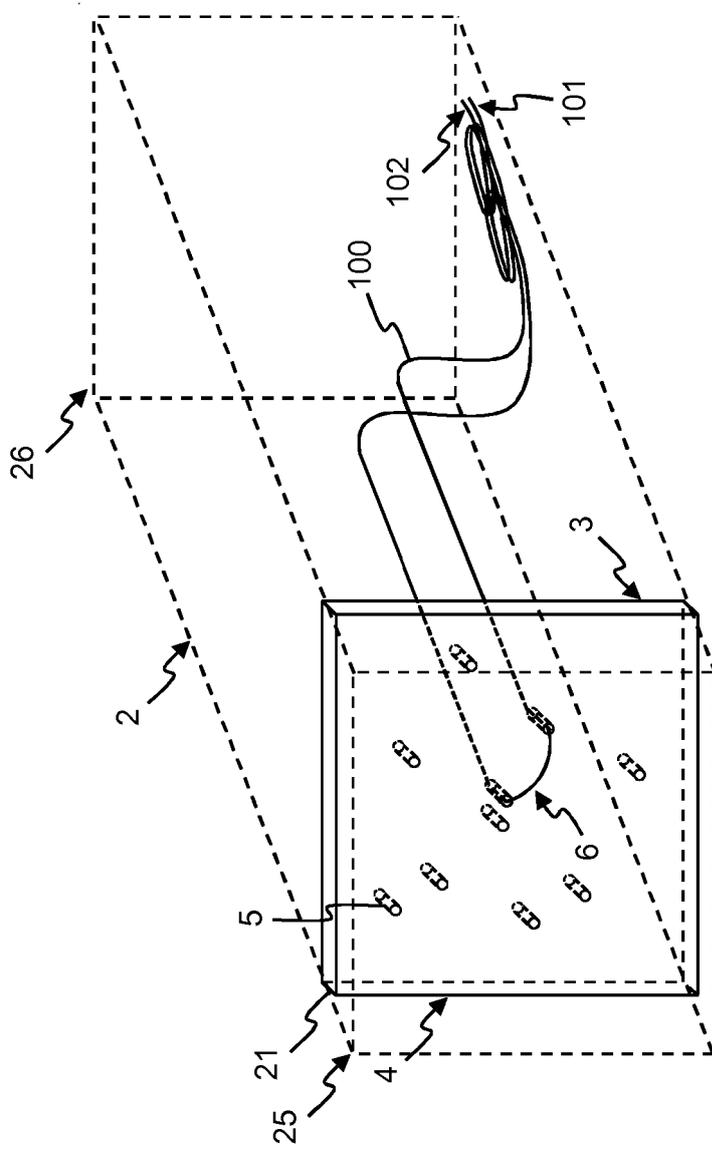


Fig. 4

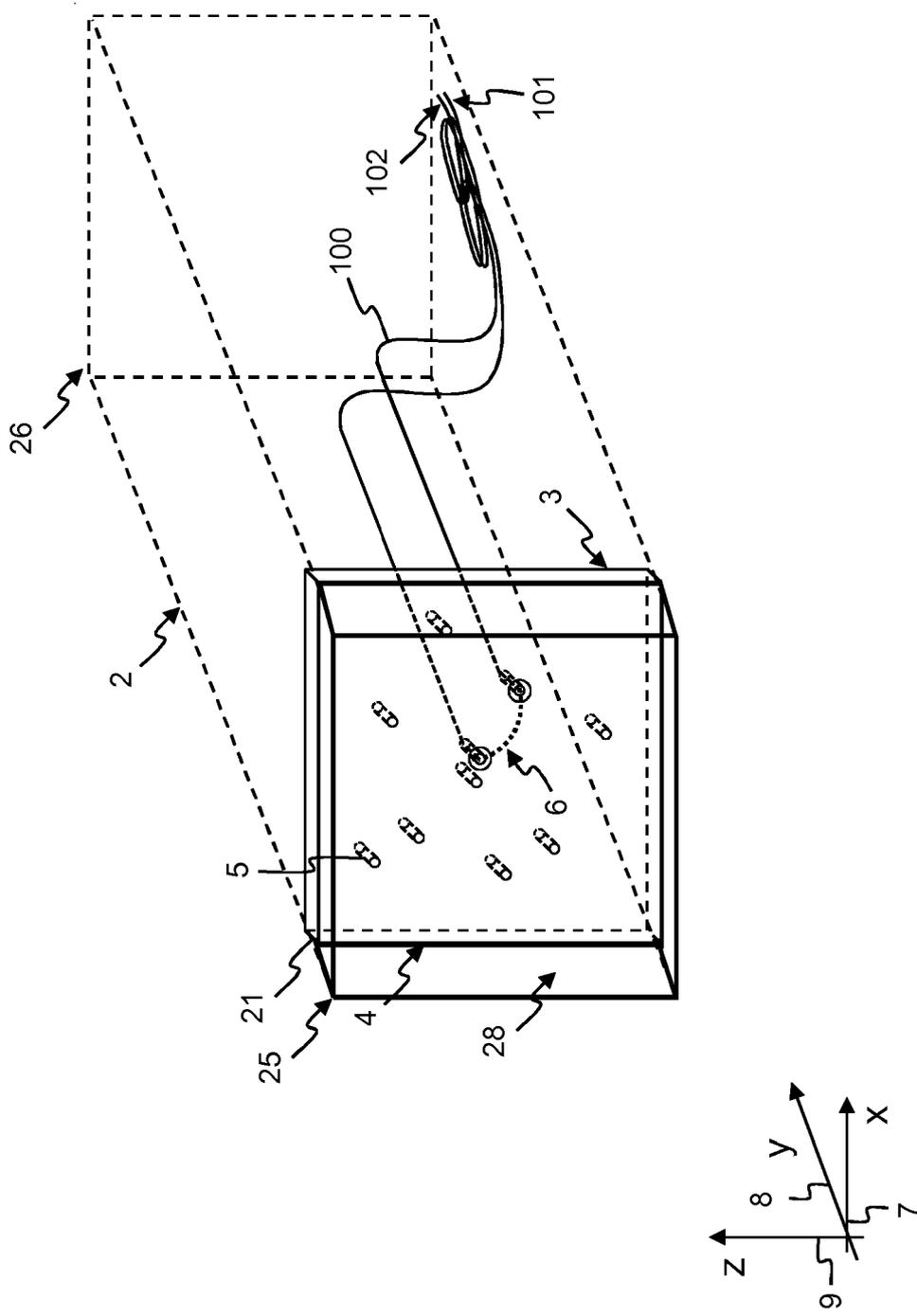


Fig. 5

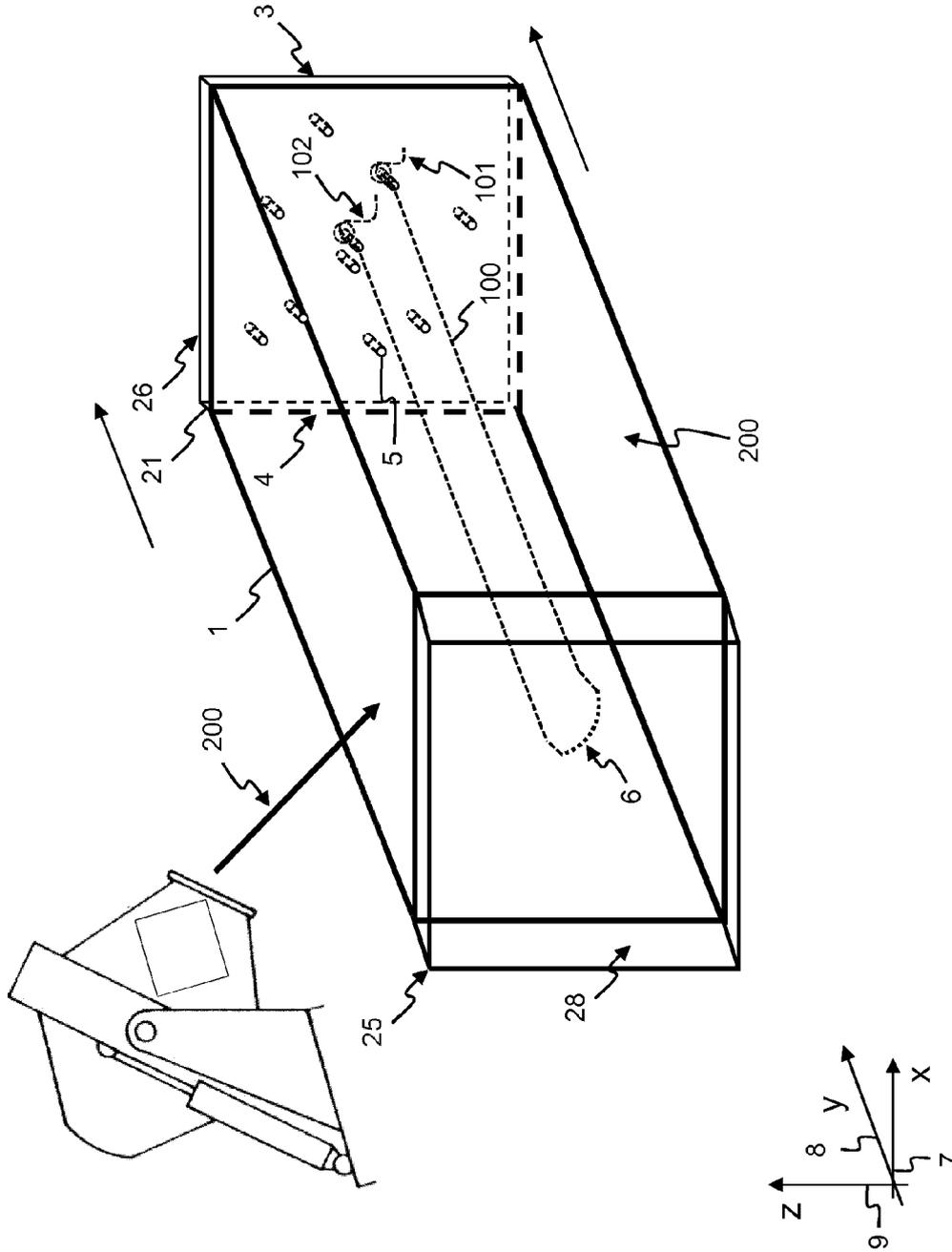


Fig. 7

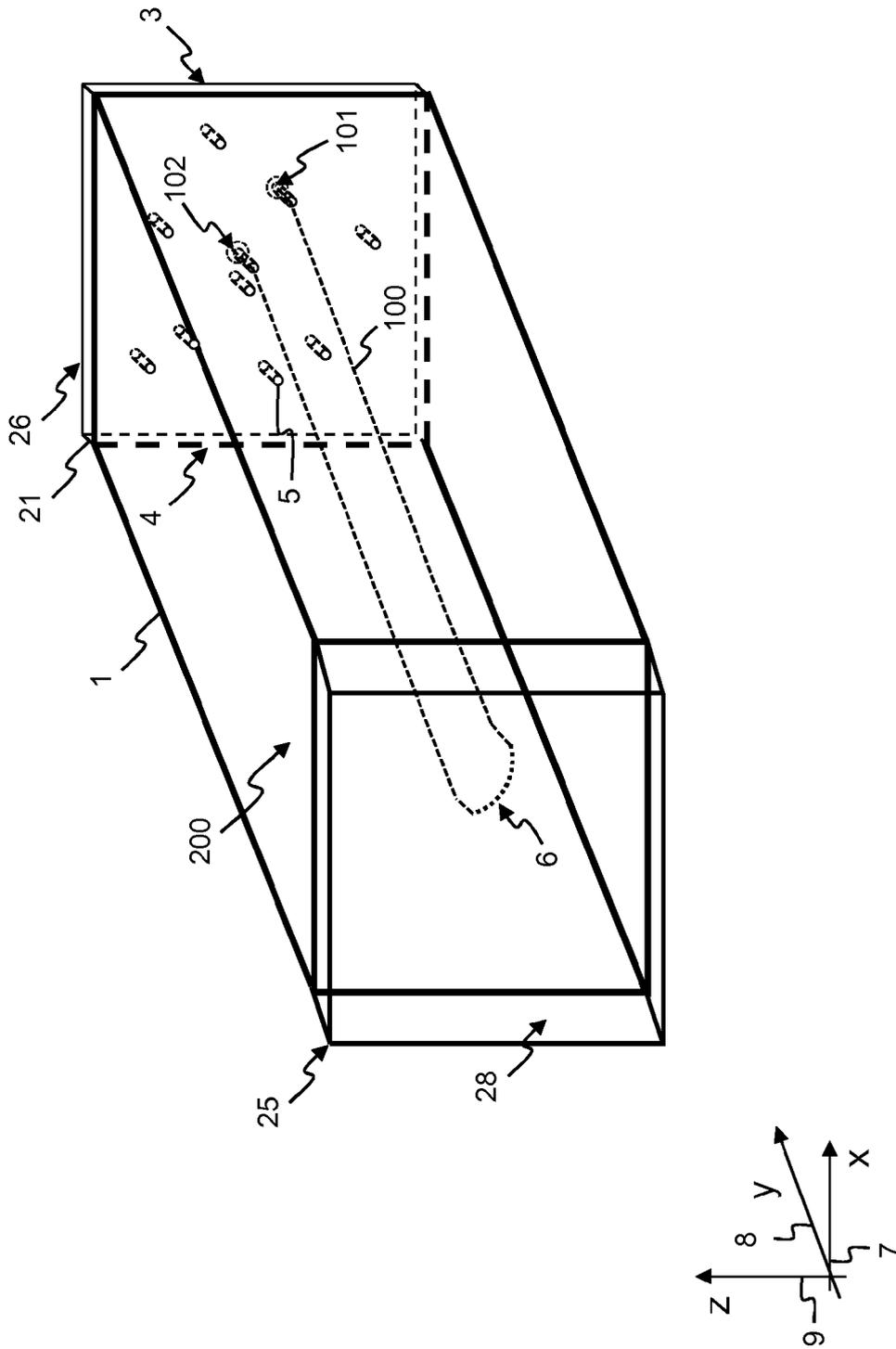


Fig. 8

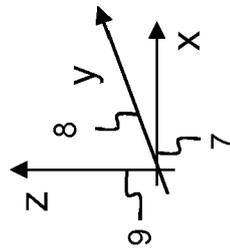
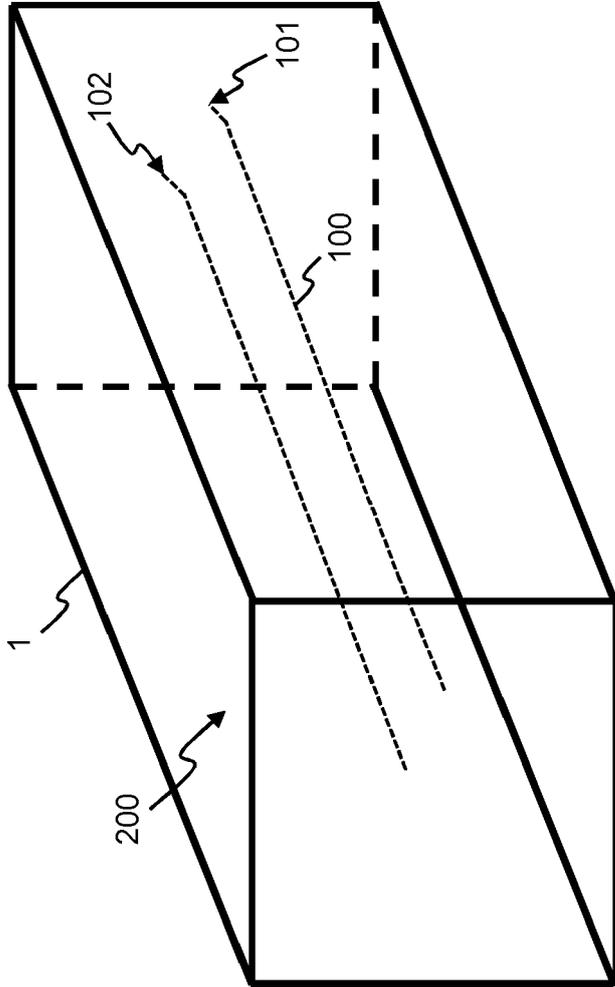


Fig. 9

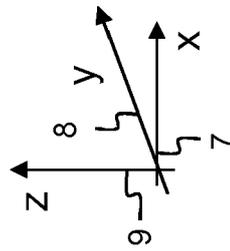
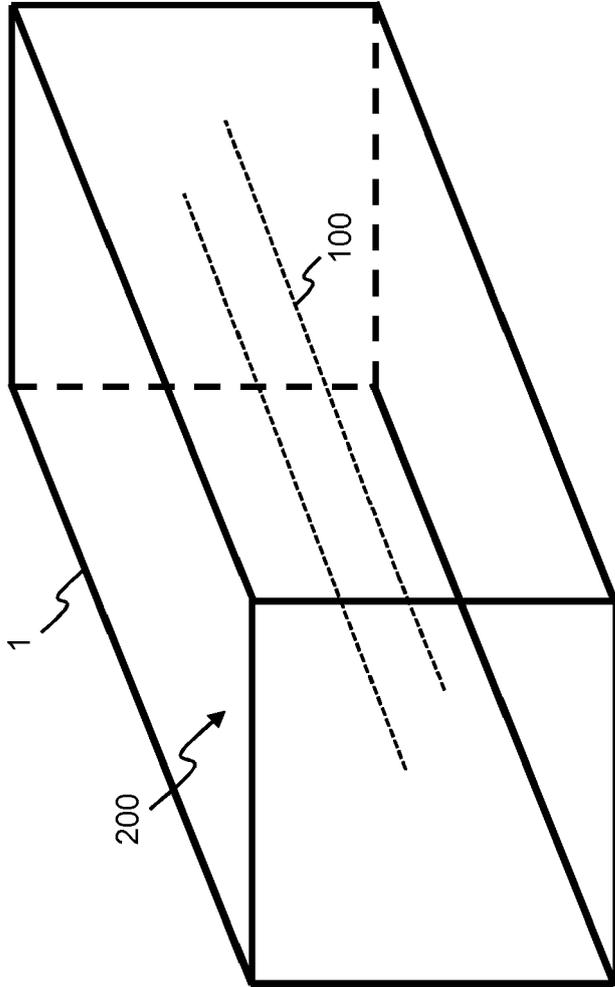


Fig. 10

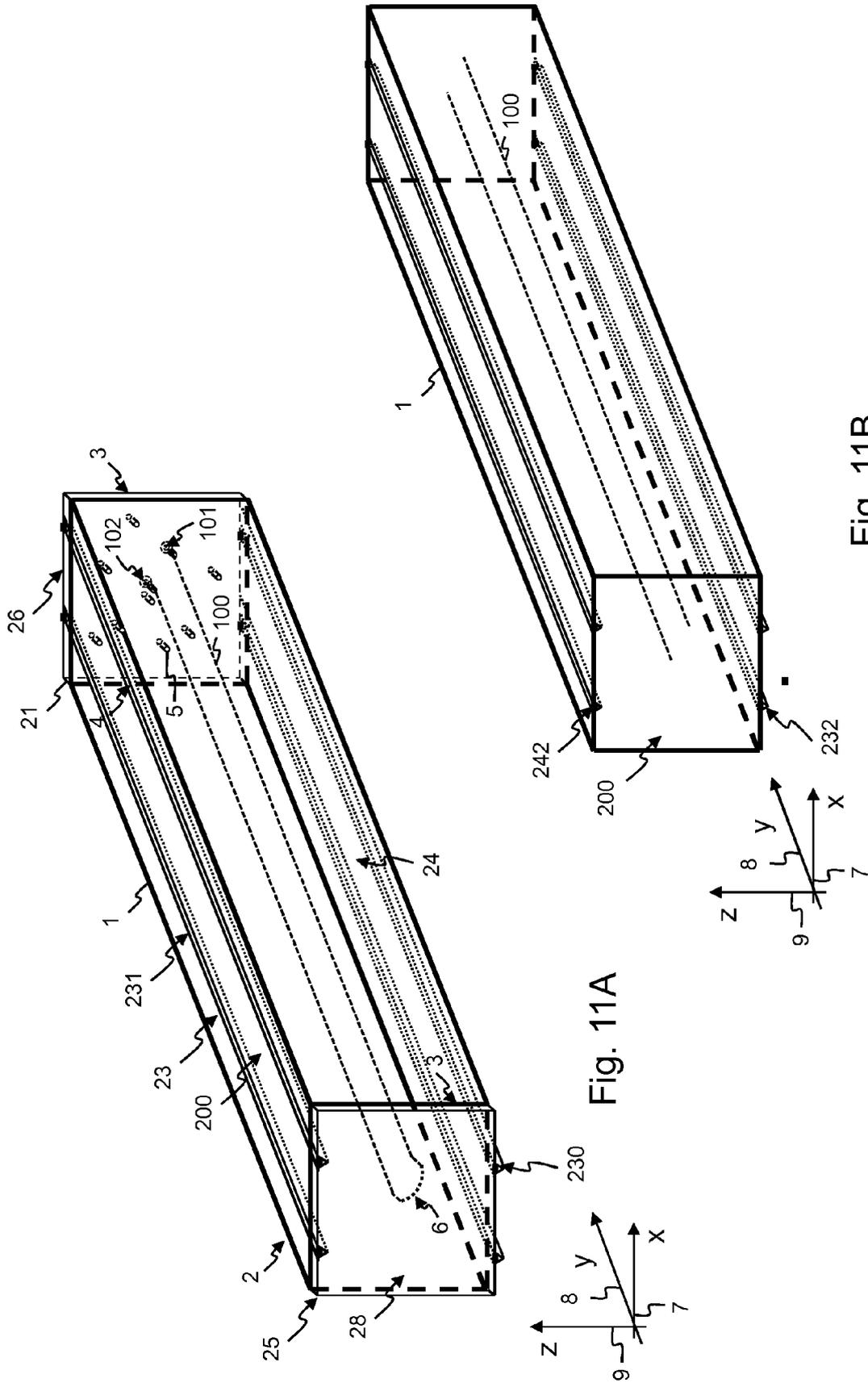


Fig. 11A

Fig. 11B

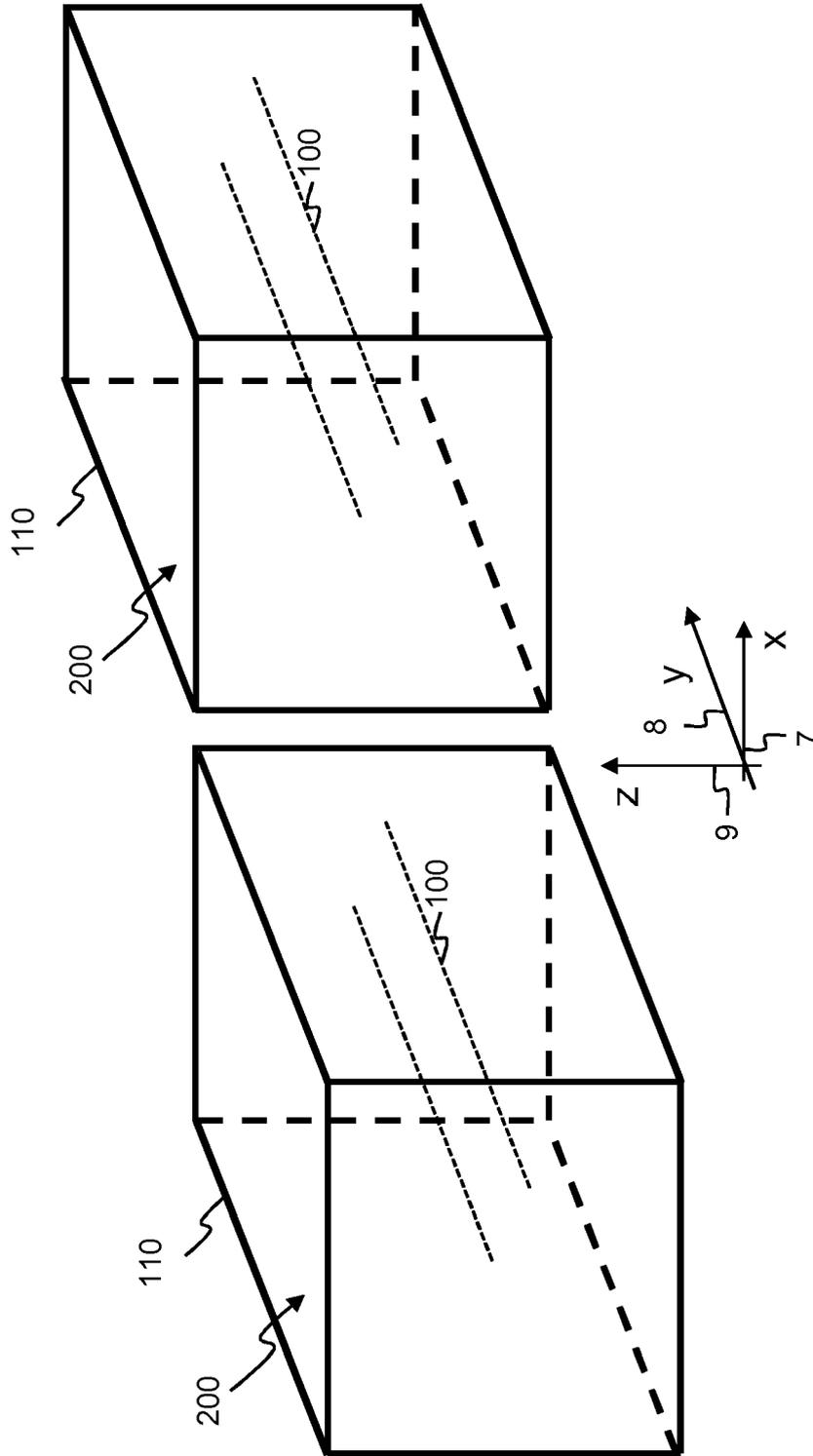


Fig. 12



EUROPEAN SEARCH REPORT

Application Number
EP 16 16 9265

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 102 503 261 A (UNIV NANCHANG) 20 June 2012 (2012-06-20)	15	INV. B28B23/00 E04C1/42
A	* abstract; figures * -----	1	
X	CN 103 043 994 A (UNIV WUHAN TECH) 17 April 2013 (2013-04-17)	15	
A	* abstract; figures * -----	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B28B E04C
Place of search		Date of completion of the search	Examiner
The Hague		22 November 2016	Orij, Jack
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 102503261	A	20-06-2012	NONE

CN 103043994	A	17-04-2013	NONE

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

- US 20070074484 A1 [0005] [0006]
- JP 2006220981 B [0007] [0008]