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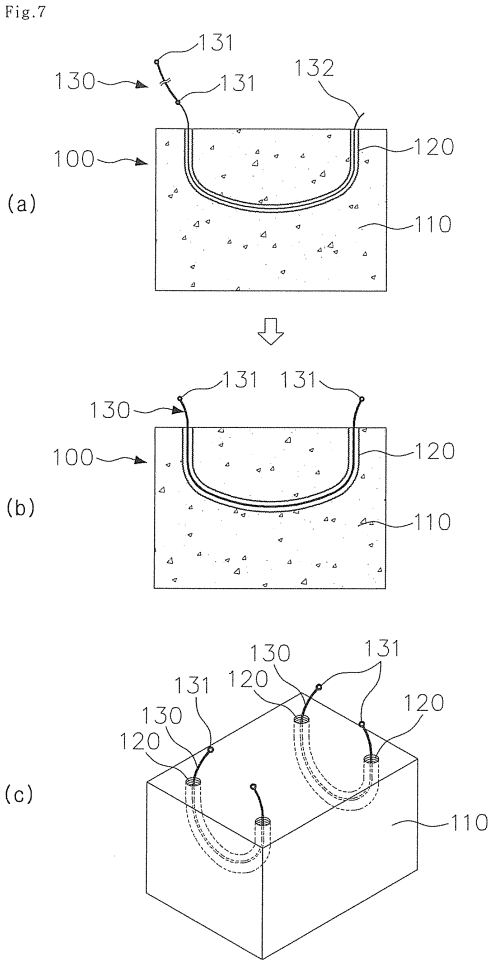
(54) LARGE CONCRETE BLOCK FOR LIFTING A CRANE, METHOD FOR MANUFACTURING SAME, AND METHOD FOR INSTALLING SAME

(57) Disclosed herein is a large concrete block for crane lifting. The large concrete block includes a large concrete block body (110) made of concrete, and a connection-wire-rope insert tube (120) made of synthetic resin. The connection-wire-rope insert tube is embedded at a medial portion thereof in the concrete block body in such a way that opposite ends of the connection-wire-rope insert tube are disposed at an upper surface of the concrete block body and oriented upwards. The present invention having the above construction can solve problems which have been caused in the conventional technique that uses a lifting eye member.

Fig.7



EP 2 679 533 A2

Description

Technical Field

[0001] The present invention relates, in general, to a large concrete block, a method for manufacturing the same and a method for installation of the same and, more particularly, to a large concrete block which is lifted by a crane.

Background Art

[0002] Large concrete blocks are widely used in a variety of fields such as harbor construction work, piping work, and so on.

[0003] The large concrete blocks typically refer to concrete structures. Hereinafter, although a large concrete block for harbor construction work will be illustrated as one example of such large concrete blocks, the present invention is not limited to this, and all kinds of concrete structures which are lifted by cranes fall within the bounds of the present invention.

[0004] A large concrete block 10 shown in Figs. 1 and 2 has lifting eye members 20 in an upper surface thereof, which are used when the large concrete block 10 is lifted by a crane.

[0005] Because large concrete blocks 10 are placed on top of one another, if the lifting eye members 20 protrude upwards from the upper surface of the large concrete block 10, they interfere with another large concrete block which is placed on the top of the large concrete block 10.

[0006] To avoid the above problem, lifting eye member receiving depressions 11 are formed in the upper surface of the large concrete block 10, and an upper end of each lifting eye member 20 is disposed in the corresponding lifting eye member receiving depression 11.

[0007] The lifting eye members 20 are disposed in a mold before concrete is cast into the mold to form the large concrete block 10. When the concrete casting is completed, lower ends of the lifting eye members 20 are embedded in the concrete so that the lifting eye members 20 can be fixed to the concrete block 10. Furthermore, the lower end of each lifting eye member 20 generally has a fixing structure by which the lifting eye member 20 is more reliably fixed to the concrete block.

[0008] Meanwhile, Fig. 3 illustrates a hollow block type of large concrete block 10 where a central portion thereof is empty and an upper end thereof is open.

[0009] Each lifting eye member 20 can be formed by different kinds of methods, for example, using a reinforcing bar, a wire rope, etc.

[0010] However, the conventional large concrete block has the following problems.

(1) Although the lifting eye members are used only when lifting the concrete block, because the lifting eye members are firmly fixed in the concrete block, they cannot be reused.
Particularly, in the case where the large concrete block is installed under the surface of the sea, the lifting eye member is made of a stainless wire rope which is comparatively expensive. Thus, there is a problem in that the lifting eye member that is expensive cannot be reused.
(2) Concrete does not corrode, but the lifting eye member that is made of metal may corrode. If the lifting eye member corrodes, the volume thereof is increased. If the volume of the lifting eye member is excessively increased, the concrete block may be broken. This problem is increased when the concrete block is used for sea construction work, in other words, installed under the surface of the sea.
(3) As stated above, in the case of the large concrete block configured such that large concrete blocks are placed on top of one another, separate depressions for receiving lifting eye members must be formed. Such a structure where the lifting eye member receiving depressions must be formed makes it difficult to manufacture the concrete block and increases construction time.
(4) After the large concrete block has been placed on a predetermined place, if a long period of time has passed, the lifting eye members easily corrode. Thus, when it is required to lift the large concrete block again, it may be impossible to lift the large concrete block.
(5) If the force with which the lifting eye members are fixed to the large concrete block is not sufficient, a lifting eye member may be undesirably removed from the large concrete block while lifting the large concrete block, thus causing an accident. In this case, the large concrete block that has been dropped and shocked may become unusable.

Disclosure

Technical Problem

[0011] Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and an object of the present invention is to provide a large concrete block which includes a concrete block body made of concrete, and a connection-wire-rope insert tube which is made of synthetic resin and is provided in the concrete block body in such a way that a medial portion thereof is embedded in the concrete block body and opposite ends thereof are disposed in an upper surface of the concrete block body and oriented upwards.

Technical Solution

[0012] In order to accomplish the above object, in an aspect, the present invention provides a large concrete block for crane lifting, including: a concrete block body made of concrete; and a connection-wire-rope insert tube

made of synthetic resin, the connection-wire-rope insert tube being embedded at a medial portion thereof in the concrete block body in such a way that opposite ends of the connection-wire-rope insert tube are disposed in an upper surface of the concrete block body and oriented upwards.

[0013] The medial portion of the connection-wire-rope insert tube may be arranged to have an arc shape that is convex downwards along a longitudinal direction thereof.

[0014] The connection-wire-rope insert tube may have a corrugated tube shape.

[0015] A tube stopper may be removably coupled to each of opposite ends of the connection-wire-rope insert tube.

[0016] The large concrete block may further include a connection wire rope, with lifting eyes provided on respective opposite ends of the connection wire rope, wherein the connection wire rope is disposed in the connection-wire-rope insert tube so as to be movable along the connection-wire-rope insert tube, and the lifting eyes of the connection wire rope are exposed to the outside from the connection-wire-rope insert tube.

[0017] In another aspect, the present invention provides a method for manufacturing a large concrete block for crane lifting, including: disposing a connection-wire-rope insert tube made of synthetic resin in a mold for forming a concrete block body in such a way that the connection-wire-rope insert tube has a U shape; and casting concrete into the mold and forming a concrete block body in such a way that a medial portion of the connection-wire-rope insert tube is embedded in the concrete block body and opposite ends of the connection-wire-rope insert tube are disposed at an upper surface of the concrete block body and oriented upwards.

[0018] In a further aspect, the present invention provides a method for installation of a large concrete block, including: a concrete block manufacturing operation of disposing a connection-wire-rope insert tube made of synthetic resin in a mold for forming a concrete block body in such a way that the connection-wire-rope insert tube has a U shape, and casting concrete into the mold and forming a concrete block body in such a way that a medial portion of the connection-wire-rope insert tube is embedded in the concrete block body and opposite ends of the connection-wire-rope insert tube are disposed at an upper surface of the concrete block body and oriented upwards; a connection wire rope installation operation of passing a first end of a connection wire rope through the connection-wire-rope insert tube so that the first end of the connection wire rope is exposed to the outside from a first end of the connection-wire-rope insert tube while a second end of the connection wire rope is exposed to the outside from a second end of the connection-wire-rope insert tube; a lifting and placing operation of connecting a crane to the first and second ends of the connection wire rope, lifting the large concrete block using the crane, and placing the large concrete block at a predetermined place; and a connection wire rope removal operation of removing the connection wire rope from the connection-wire-rope insert tube after the lifting and placing operation has been completed.

[0019] The connection wire rope may include lifting eyes provided on respective opposite ends of the connection wire rope. In the lifting and placing operation, the crane may use both the lifting eyes to lift the large concrete block and place the large concrete block at a predetermined place, and the connection wire rope removal operation may comprise separating either of the lifting eyes from the crane and lifting a remaining one of the lifting eyes using the crane so that the connection wire rope is removed from the connection-wire-rope insert tube.

Advantageous Effects

[0020] The present invention has the following effects.

(1) The present invention does not require a lifting eye member that is made of metal to manufacture a large concrete block, but only uses a connection-wire-rope insert tube made of synthetic resin. Therefore, the present invention can solve the problems which have been caused by using the lifting eye member.

(2) The connection-wire-rope insert tube of the present invention has no problem of corrosion. Hence, whenever it is required to lift the large concrete block again, the connection-wire-rope insert tube can be reused in such a way that a connection wire rope is connected to the connection-wire-rope insert tube.

(3) In the conventional lifting eye member, it is difficult for the lifting eye member to be firmly fixed to the large concrete block. Thus, a problem of the lifting eye member being removed from the large concrete block is frequently caused. On the other hand, in the present invention, the connection-wire-rope insert tube has a downward-convex arc shape, in other words, a U shape, whereby a concrete portion that is disposed above the connection-wire-rope insert tube can stably support the connection-wire-rope insert tube. Therefore, there is no problem of the connection wire rope being removed from the large concrete block when the large concrete block is lifted or placed at a predetermined place.

Description of Drawings

[0021]

Figs. 1 and 2 are, respectively, a perspective view and a sectional view of a large concrete block according to a conventional technique;

Fig. 3 is a perspective view of a large concrete block according to the conventional technique;

Figs. 4 and 5 are, respectively, a perspective view and a sectional view of a large concrete block according to a first embodiment of the present invention;

Fig. 6 is a view illustrating a method for manufacturing the large concrete block of Fig. 4;

Figs. 7 and 8 are views illustrating a method for installation of the large concrete block of Fig. 4;

Fig. 9 and 10 are, respectively, a perspective view and a sectional view of a large concrete block according to a second embodiment of the present invention;

Fig. 11 is a perspective view illustrating a large concrete block according to a third embodiment of the present invention;

Fig. 12 is a perspective view illustrating a large concrete block according to a fourth embodiment of the present invention; and

Fig. 13 is a view illustrating a method for manufacturing the large concrete block of Fig. 12.

<Description of the Reference Numerals in the Drawings>

[0022]

100: large concrete block 110: concrete block body
120: connection-wire-rope insert tube
130: connection wire rope 131: lifting eye
132: towing wire
140: tube stopper 141: external threaded part
142: rotation handling part

Best Mod

[0023] Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the attached drawings, such that those skilled in the art can easily implement the present invention. The present invention is realized in various manners and is not limited to the following embodiments. Furthermore, in the drawings, portions which are not related to the present invention should be omitted to explain the present invention more clearly. Reference should be made to the drawings, in which similar reference numerals are used throughout the different drawings to designate similar components.

[0024] In the specification, when the explanatory phrase "a part includes a component" is used, this means that the part may further include other components rather than excluding the components, so long as special explanation is not given.

[0025] First, a large concrete block for crane lifting according to a first embodiment of the present invention will be explained with reference to Figs. 4 and 5.

[0026] Figs. 4 and 5 are, respectively, a perspective view and a sectional view of a large concrete block according to a first embodiment of the present invention.

[0027] The large concrete block 100 according to the present invention includes a concrete block body 110 which is made of concrete, and a connection-wire-rope insert tube 120 which is made of synthetic resin.

[0028] As shown in Fig. 5, the connection-wire-rope insert tube 120 is embedded at a medial portion thereof in the concrete block body 110 in such a way so as to have an arc shape which is convex downwards along the longitudinal direction thereof. In other words, the connection-wire-rope insert tube 120 is configured to have a U shape.

[0029] Furthermore, the connection-wire-rope insert tube 120 is arranged such that opposite ends thereof are disposed in an upper surface of the concrete block body 110 and oriented upwards. In this embodiment, although the opposite ends of the connection-wire-rope insert tube 120 are illustrated as being oriented in the upright direction, this is only one example. For instance, the opposite ends of the connection-wire-rope insert tube 120 may be oriented diagonally upwards towards the central portion of the concrete block body 110.

[0030] Even if the connection-wire-rope insert tube 120 is exposed to seawater or the like for a long period of time, there is no probability of corrosion of the tube 120, because it is made of synthetic resin.

[0031] Preferably, the connection-wire-rope insert tube 120 has a corrugated tube shape. For example, the connection-wire-rope insert tube 120 may be an ELP tube which is a kind of corrugated tube and is used to arrange wires. The reason for this is due to the fact that, because corrugated tubes are typically flexible, when the connection-wire-rope insert tube 120 is installed in the concrete block body at a site, work of bending the connection-wire-rope insert tube 120 into a downward-convex arc shape can be facilitated.

[0032] Furthermore, if the connection-wire-rope insert tube 120 has a corrugated tube shape, there is an advantage in that it can be more closely integrated with the concrete block body 110.

[0033] A method for manufacturing the large concrete block of Fig. 4 will be described with reference to Fig. 6.

[0034] Fig. 6a illustrates the shape of a mold before concrete casting.

[0035] The mold is formed corresponding to the size and shape of the concrete block body. A Sepa bolt and a Sepa nut are provided in the mold so that the mold can withstand lateral pressure of concrete that is poured into the mold.

[0036] A method for installation or disassembly of the mold and the Sepa nut and bolt are the same as that of a process of manufacturing a typical large concrete block, therefore further detailed explanation is deemed unnecessary.

[0037] The connection-wire-rope insert tube 120 is fixed in the mold by the Sepa bolt, etc.

[0038] The connection-wire-rope insert tube 120 is fixed in a U shape. The connection-wire-rope insert tube 120 may be a tube which has been manufactured to have

a U shape or, alternatively, it may be a flexible linear tube and bent into a U shape at a site.

[0039] Further, because the opposite ends of the connection-wire-rope insert tube 120 are open, it is preferable that when concrete casting, the opposite ends of the connection-wire-rope insert tube 120 are sealed with tape or the like so that concrete can be prevented from entering the connection-wire-rope insert tube 120.

[0040] Fig. 6b shows the shape of the mold after the concrete casting has been completed.

[0041] When concrete is poured into the mold, the concrete block body 110 is formed, and the medial portion of the connection-wire-rope insert tube 120 is embedded in the concrete block body 110 while the opposite ends of the connection-wire-rope insert tube 120 are exposed to the outside from the upper surface of the concrete block body 110.

[0042] Fig. 6c is a sectional view of the completed large concrete block.

[0043] After the concrete has been cured in the state of Fig. 6b, the mold and the Sepa nut and bolt are removed. The opposite ends of the connection-wire-rope insert tube 120 that protrude from the upper surface of the concrete block body 110 are cut out such that they are level with the upper surface of the concrete block body 110, thus forming the stat of Fig. 6c. A hole formed by the Sepa bolt or the like is not shown in Fig. 6c.

[0044] A method for installation of the large concrete block of Fig. 4 that has been manufactured by the method of Fig. 6 will be explained in detail with reference to Figs. 7 and 8.

[0045] Fig. 7a illustrates a process of inserting a connection wire rope 130 into the large concrete block 100. Fig. 7b illustrates the connection wire rope 130 installed in the large concrete block 100.

[0046] In this embodiment, the connection wire rope 130 is a typical wire rope, and lifting eyes 131 are respectively provided on opposite ends of the connection wire rope 130.

[0047] A first end of the connection wire rope 130 passes through the connection-wire-rope insert tube 120, so that the first end of the connection wire rope 130 is exposed to the outside from a first end of the connection-wire-rope insert tube 120, and a second end of the connection wire rope 130 is exposed to the outside from a second end of connection-wire-rope insert tube 120. In other words, both of the lifting eyes 131 must be exposed to the outside from the large concrete block 100.

[0048] It is advantageous for the connection-wire-rope insert tube 120 to have a diameter which is as small as possible, and for the lifting eye 131 to have a diameter which is as large as possible and for the connection wire rope 130 to have as large a thickness as possible.

[0049] For this, it is preferable that the diameter of the lifting eye 131 of the connection wire rope 130 is merely slightly smaller than the diameter of the connection-wire-rope insert tube 120.

[0050] Due to this size relation, it is not easy to pass the connection wire rope 130 through the connection-wire-rope insert tube 120.

[0051] Given this, as shown in Fig. 7a, a towing wire 132 that has a small diameter is previously connected to the lifting eye 131 that is provided on the first end of the connection wire rope 130. The towing wire 132 is thereafter inserted into the connection-wire-rope insert tube 120 such that the towing wire 132 passes through the connection-wire-rope insert tube 120.

[0052] Subsequently, the towing wire 132 is further pulled until the connection wire rope 130 enters the state of Fig. 7b. Then, the towing wire 132 is removed from the connection wire rope 130.

[0053] The state of Fig. 7b is a state in which the large concrete block 100 is prepared for lifting or placement.

[0054] Fig. 7c is a perspective view of Fig. 7b.

[0055] As shown in the drawings, in this embodiment, two connection wire ropes 130 and four lifting eyes 131 are provided for the single large concrete block 100.

[0056] Fig. 8a illustrates a process in which the crane lifts the large concrete block 100 using the connection wire rope 130, in detail, the lifting eyes 131. Fig. 8b illustrates a process in which the crane places the large concrete block 100 at a predetermined place.

[0057] Fig. 8c shows disconnecting the crane from either of the lifting eyes 131 of the connection wire rope 130 after the installation of the large concrete block 100 has been completed. From this state, as shown in Fig. 8d, when the crane lifts the connection wire rope 130 using the other lifting eye 131, the connection wire rope 130 is removed from the large concrete block 100.

[0058] The connection wire rope 130 that has been removed from the large concrete block 100 may then be reused to lift another large concrete block.

[0059] Figs. 8c and 8d show facilitation of removal of the connection wire rope 130 from the large concrete block, given the fact that the large concrete block may be placed under water. In other words, Figs. 8c and 8d illustrate that, even when a diver separates only either of the lifting eyes from the crane, the connection wire rope 130 can be easily removed from the large concrete block.

[0060] If installation of the concrete block is performed on land, work of removing the connection wire rope 130 from the large concrete block 100 may be simply conducted in such a way that the worker separates both lifting eyes 131 from the crane and pulls the connection wire rope 130 in either direction.

[0061] Figs. 9 and 10 illustrate a hollow block type of large concrete block according to a second embodiment of the present invention.

[0062] Fig. 9 is a perspective view of the large concrete block according to the second embodiment of the present invention, and Fig. 10 is a sectional view of Fig. 9.

[0063] Fig. 11 is a perspective view illustrating a large concrete block according to a third embodiment of the present invention.

[0064] In the present invention, because a tensile load

is applied to the lifting eyes 131 provided on the opposite ends of the connection wire rope 130, stress applied to the connection wire rope 130 is about double that of the conventional technique in which a tensile load is applied to the connection wire rope in only one direction, so that the connection wire rope 130 of the present invention must be thicker than that of the conventional technique. In response to this, the diameter of the connection-wire-rope insert tube 120 must also be increased.

[0065] With regard to this, as shown in Fig. 11, if two connection-wire-rope insert tubes 120 are installed in a portion where the single connection-wire-rope insert tube 120 would be ordinarily provided, the two connection-wire-rope insert tubes 120 share the load applied thereto. As a result, the thickness of each connection wire rope 130 can be the same as that of the conventional technique.

[0066] That is, in the embodiment of Fig. 11, a total of four connection-wire-rope insert tubes 120 are provided (this means that a total of four connection wire ropes 130 are used), wherein a connection wire rope that has a typical thickness can be used as each connection wire rope 130. Thereby, the diameter of each connection-wire-rope insert tube 120 can also be reduced.

[0067] Fig. 12 is a perspective view illustrating a large concrete block according to a fourth embodiment of the present invention.

[0068] In the case where the large concrete block 100 is stored for a long period of time before it is installed or a long period of time has passed after it has been installed, there is a possibility of a foreign substance entering the connection-wire-rope insert tube 120 if the opposite ends of the connection-wire-rope insert tube 120 is in the open state.

[0069] If a comparatively large foreign substance enters the connection-wire-rope insert tube 120, it may become difficult to pass the connection wire rope 130 through the connection-wire-rope insert tube 120.

[0070] To prevent the above problem, a tube stopper 140 is provided on each of the opposite ends of the connection-wire-rope insert tube 120 in such a way that the tube stopper 140 is removably coupled to the corresponding end of the connection-wire-rope insert tube 120.

[0071] For this, an external threaded part 141 is formed on a lower end of the tube stopper 140 so that the tube stopper 140 can be threadedly coupled to the connection-wire-rope insert tube 120. A rotation handling part 142 is provided on an upper surface of the tube stopper 140 so that a worker can rotate the tube stopper 140 using the rotation handling part 142. In this way, the opposite ends of the connection-wire-rope insert tube 120 can be easily sealed by the tube stoppers 140, and removal of the tube stoppers 140 from the connection-wire-rope insert tube 120 can also be facilitated. That is, a relationship between the tube stopper 140 and the connection-wire-rope insert tube 120 corresponds to that between a nut and bolt.

[0072] Fig. 13 is a view illustrating a method for manufacturing the large concrete block of Fig. 12.

[0073] Fig. 13a illustrates a mold into which concrete has been poured.

[0074] In this embodiment, the mold is formed corresponding to the size and shape of the concrete block body. Sepa bolts and Sepa nuts are provided in the mold so that the mold can withstand lateral pressure of concrete that is poured into the mold.

[0075] A connection-wire-rope insert tube 120 is fixed in the mold by the Sepa nuts and bolts, and tube stoppers 140 are coupled to the respective opposite ends of the connection-wire-rope insert tube 120.

[0076] Furthermore, a tube support holder 200 is provided on an upper end of the mold. The tube stoppers 140 which are threadedly coupled to the connection-wire-rope insert tube 120 are temporarily fastened to the tube support holder 200. As a result, the connection-wire-rope insert tube 120 can be fastened to the tube support holder 200.

[0077] As such, when the tube support holder 200 is used, work of accurately disposing the tube stoppers 140 at the correct positions can be facilitated.

[0078] Comparing this state to the state of Fig. 6b, there is no portion of the connection-wire-rope insert tube 120 which is exposed to the outside from the concrete block body 110. Therefore, unlike the case of Fig. 6b, work of cutting out a portion of the connection-wire-rope insert tube 120 is not required.

[0079] Fig. 13b illustrates the concrete block when the mold and other elements are removed from the state of Fig. 13a after the concrete has been cured.

[0080] In this state, even if the large concrete block 100 is stored for a long period of time, there is no possibility of a foreign substance entering the connection-wire-rope insert tube 120.

[0081] Fig. 13c shows the large concrete block 100 from which the tube stoppers 140 are removed to conduct a process of lifting the concrete block and placing it at a predetermined place.

[0082] After the process of lifting the large concrete block 100 and placing it at a predetermined place has been completed, if it is required for the large concrete block 100 to be reused later, as shown in Fig. 13b, the opposite end ends of the connection-wire-rope insert tube 120 are covered again with the tube stoppers 140.

[0083] Although the preferred embodiments of the present invention have been disclosed, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims. Therefore, it should be understood that the preferred embodiments are only for illustrative purposes and do not limit the bounds of the present invention. For instance, components which have been illustrated as being integrated with each other may be implemented in a separate structure, and components which have been illustrated as being separately provided may be provided in an integrated structure.

[0084] Therefore, it is intended that the bounds of the present invention are defined by the accompanying claims, and various modifications, additions and substitutions, which can be derived from the meaning, scope and equivalent concepts of the accompanying claims, fall within the bounds of the present invention.

Industrial Applicability

[0085] The present invention relates to a large concrete block which is used in a variety of fields such as harbor construction work, piping work, etc.

Claims

1. A large concrete block for crane lifting, comprising:

a concrete block body made of concrete; and
a connection-wire-rope insert tube made of synthetic resin, the connection-wire-rope insert tube being embedded at a medial portion thereof in the concrete block body in such a way that opposite ends of the connection-wire-rope insert tube are disposed in an upper surface of the concrete block body and oriented upwards.

2. The large concrete block for crane lifting of claim 1, wherein the medial portion of the connection-wire-rope insert tube is arranged to have an arc shape that is convex downwards along a longitudinal direction thereof.

3. The large concrete block for crane lifting of claim 1, wherein the connection-wire-rope insert tube has a corrugated tube shape.

4. The large concrete block for crane lifting of claim 1, wherein a tube stopper is removably coupled to each of opposite ends of the connection-wire-rope insert tube.

5. The large concrete block for crane lifting of claim 1, further comprising
a connection wire rope, with lifting eyes provided on respective opposite ends of the connection wire rope,
wherein the connection wire rope is disposed in the connection-wire-rope insert tube so as to be movable along the connection-wire-rope insert tube, and the lifting eyes of the connection wire rope are exposed to the outside from the connection-wire-rope insert tube.

6. A method for manufacturing a large concrete block for crane lifting, comprising: disposing a connection-wire-rope insert tube made of synthetic resin in a mold for forming a concrete block body in such a way that the connection-wire-rope insert tube has a U shape; and casting concrete into the mold and forming a concrete block body in such a way that a medial portion of the connection-wire-rope insert tube is embedded in the concrete block body and opposite ends of the connection-wire-rope insert tube are disposed at an upper surface of the concrete block body and oriented upwards.

7. A method for installation of a large concrete block, comprising:

a concrete block manufacturing operation of disposing a connection-wire-rope insert tube made of synthetic resin in a mold for forming a concrete block body in such a way that the connection-wire-rope insert tube has a U shape, and casting concrete into the mold and forming a concrete block body in such a way that a medial portion of the connection-wire-rope insert tube is embedded in the concrete block body and opposite ends of the connection-wire-rope insert tube are disposed at an upper surface of the concrete block body and oriented upwards;
a connection wire rope installation operation of passing a first end of a connection wire rope through the connection-wire-rope insert tube so that the first end of the connection wire rope is exposed to the outside from a first end of the connection-wire-rope insert tube while a second end of the connection wire rope is exposed to the outside from a second end of the connection-wire-rope insert tube;
a lifting and placing operation of connecting a crane to the first and second ends of the connection wire rope, lifting the large concrete block using the crane, and placing the large concrete block at a predetermined place; and
a connection wire rope removal operation of removing the connection wire rope from the connection-wire-rope insert tube after the lifting and placing operation has been completed.

8. The method for installation of a large concrete block of claim 7, wherein the connection wire rope comprises lifting eyes provided on respective opposite ends of the connection wire rope,
in the lifting and placing operation, the crane uses both the lifting eyes to lift the large concrete block and place the large concrete block at a predetermined place, and
the connection wire rope removal operation comprises separating either of the lifting eyes from the crane and lifting a remaining one of the lifting eyes using the crane so that the connection wire rope is removed from the connection-wire-rope insert tube.

Fig.1

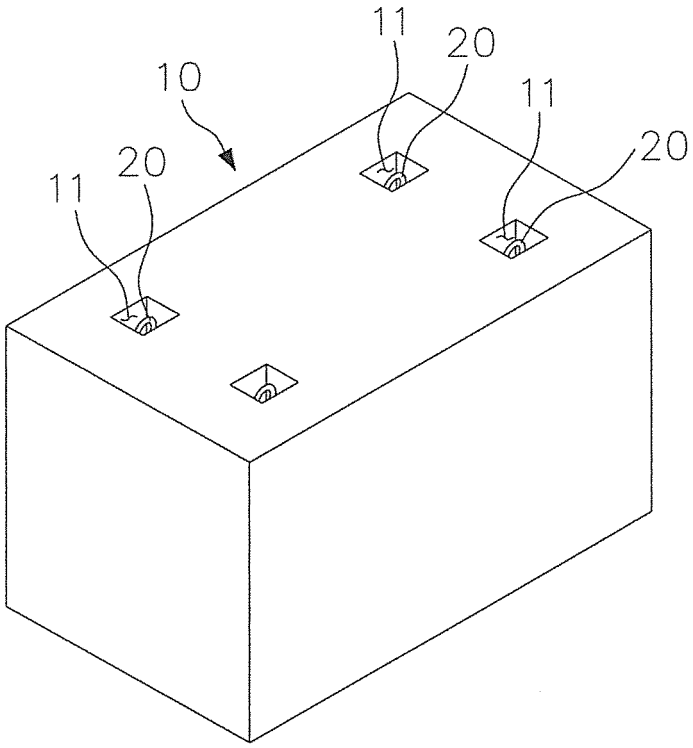


Fig.2

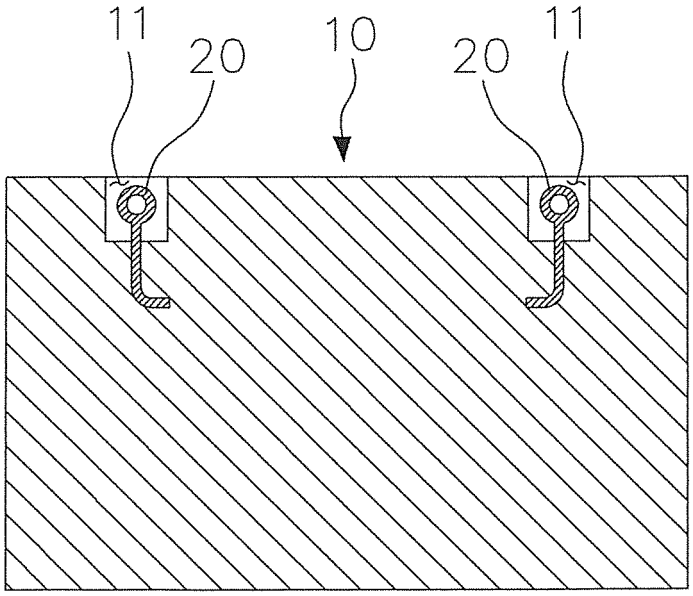


Fig.3

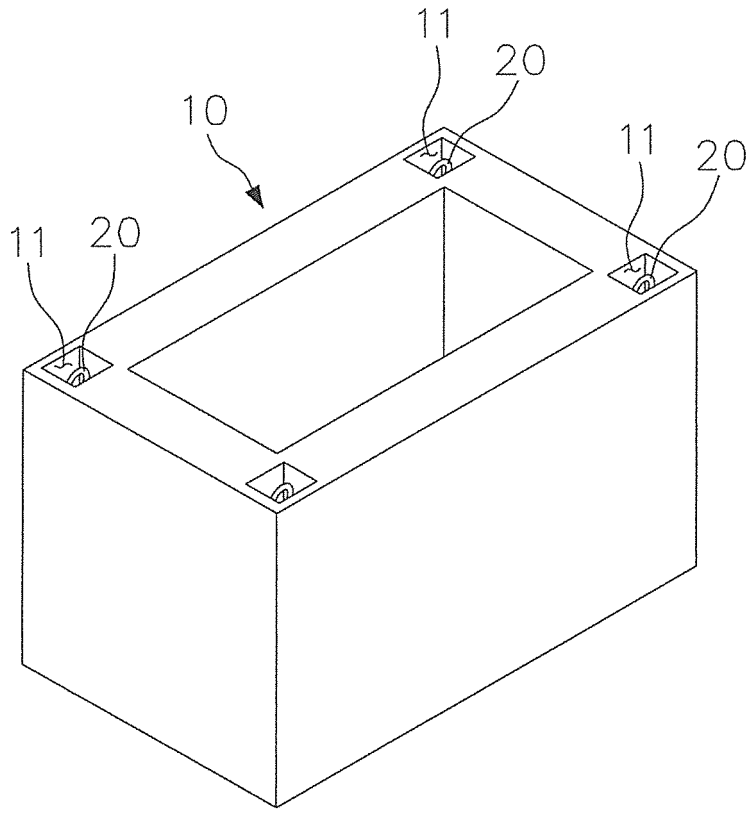


Fig.4

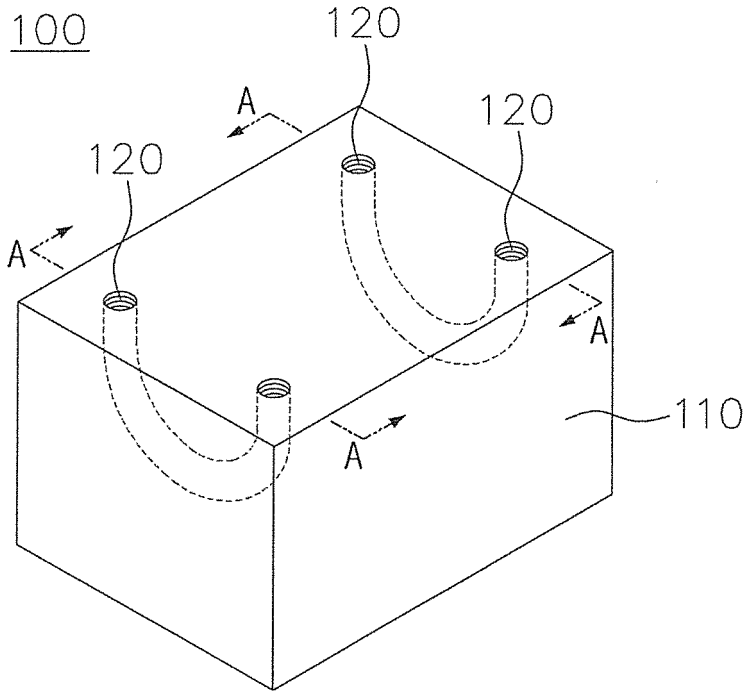


Fig.5

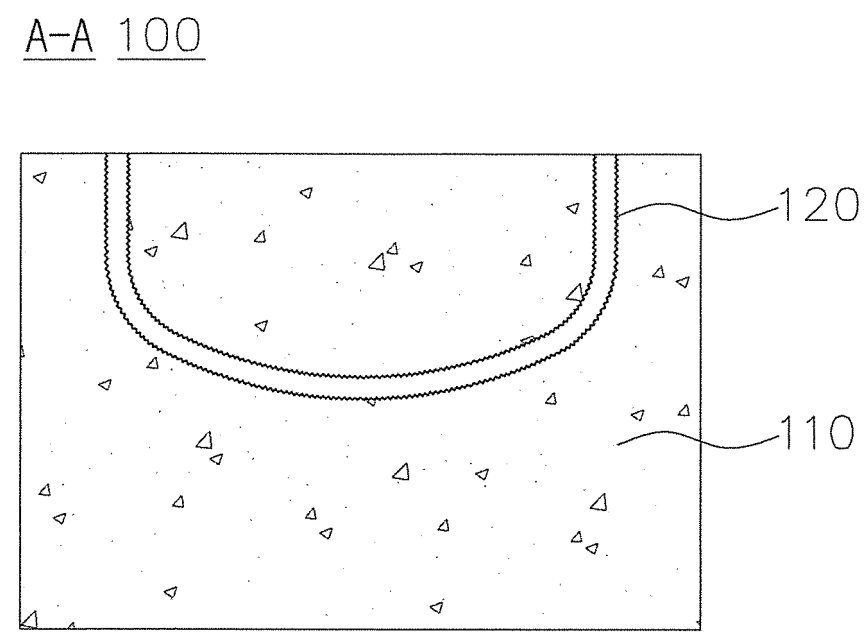


Fig.6

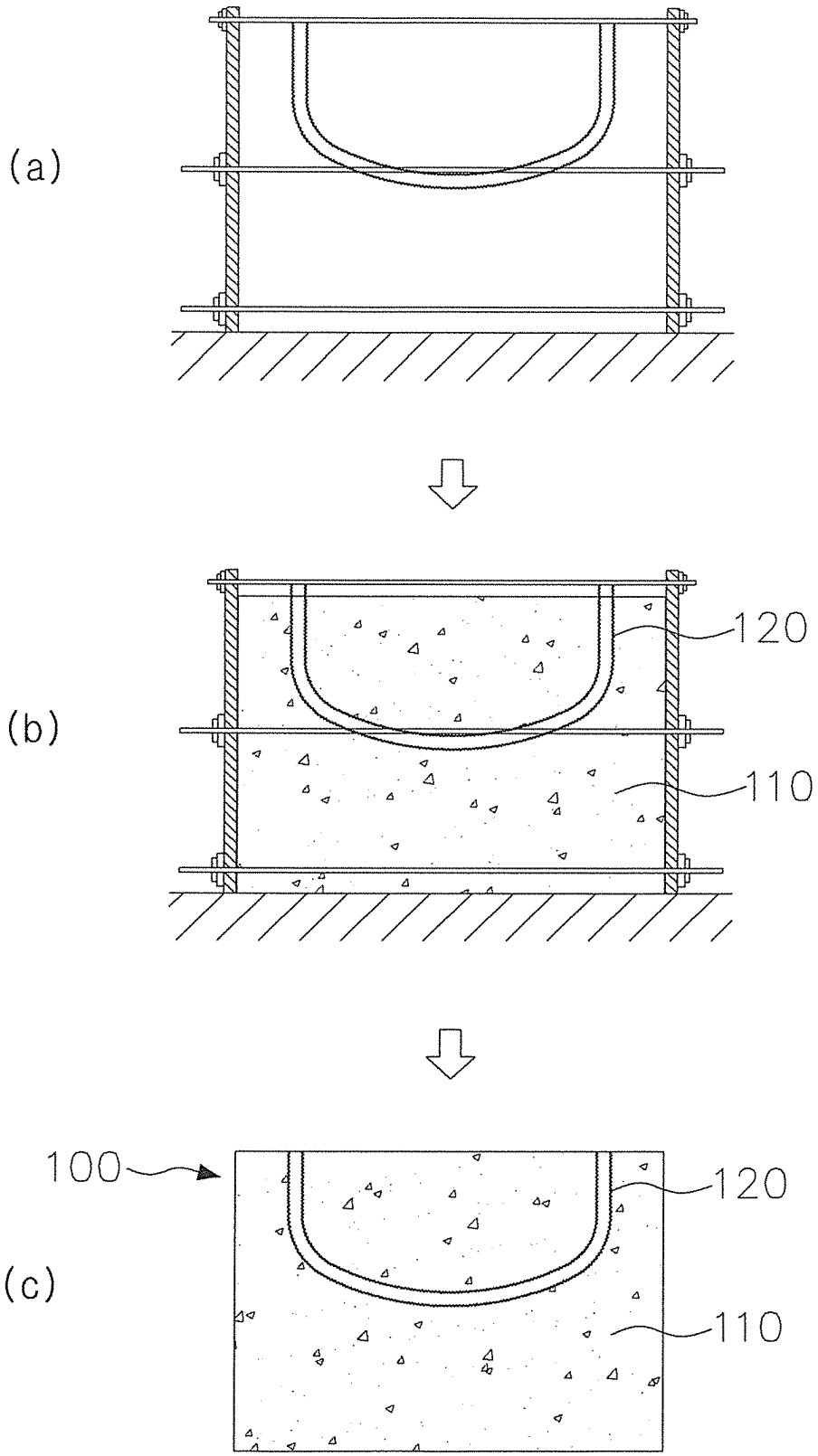


Fig.7

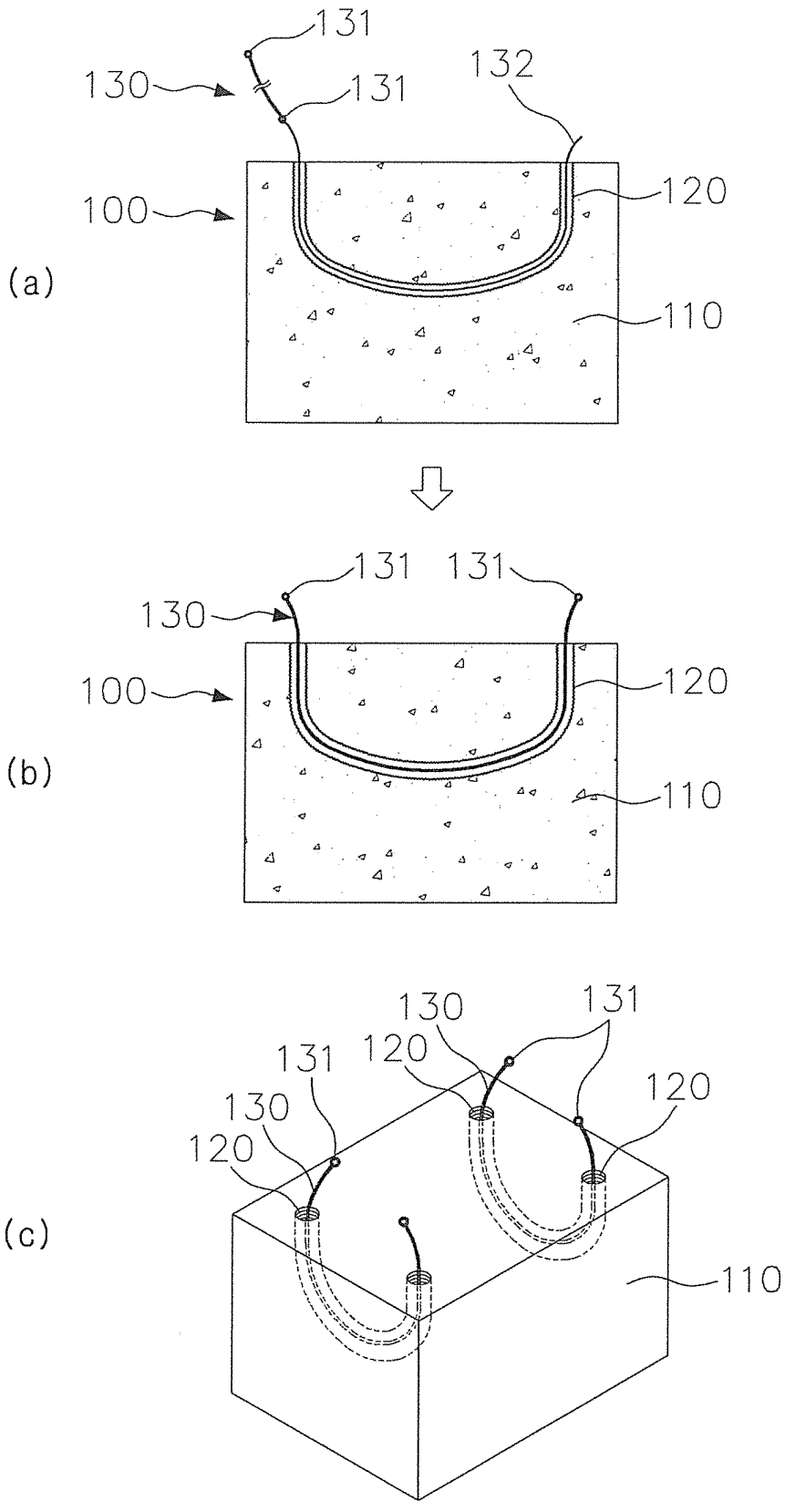

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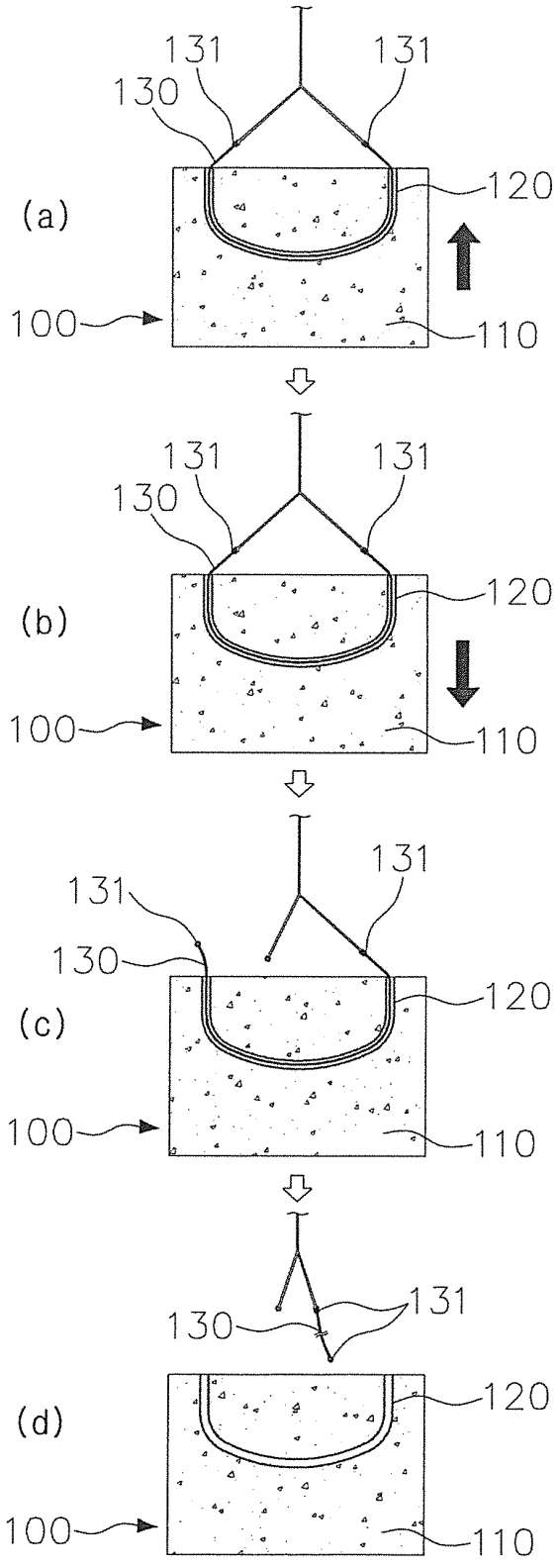
Fig.8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(d)
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Fig.9

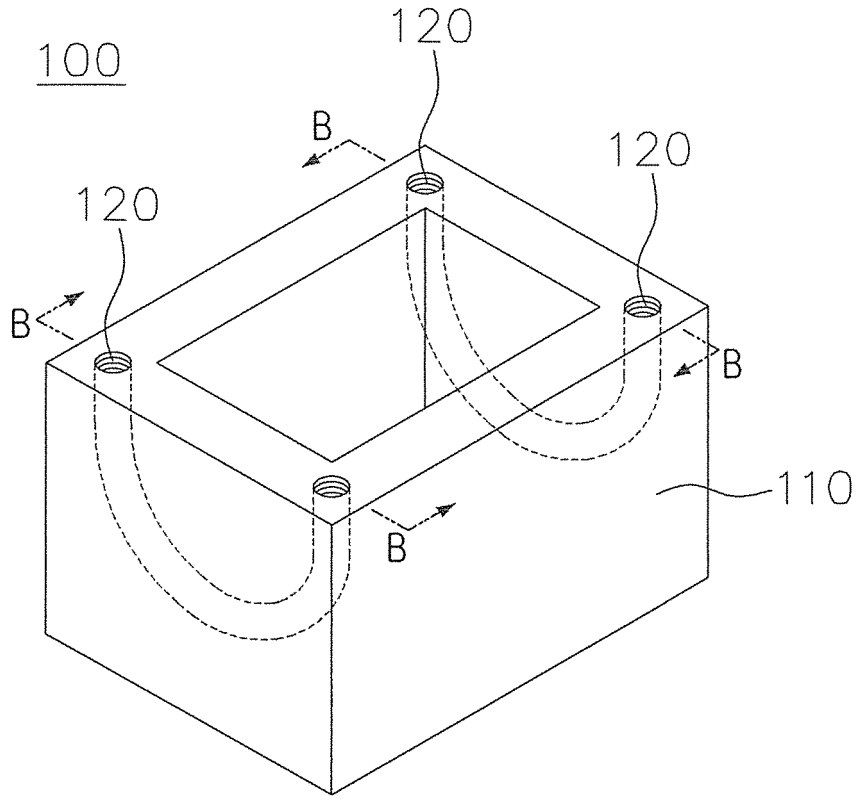


Fig.10

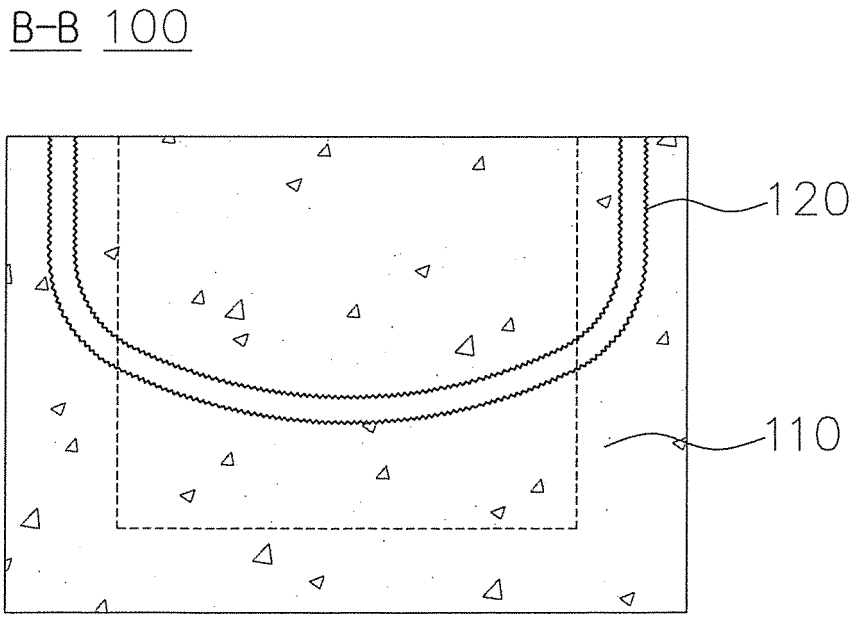


Fig.11

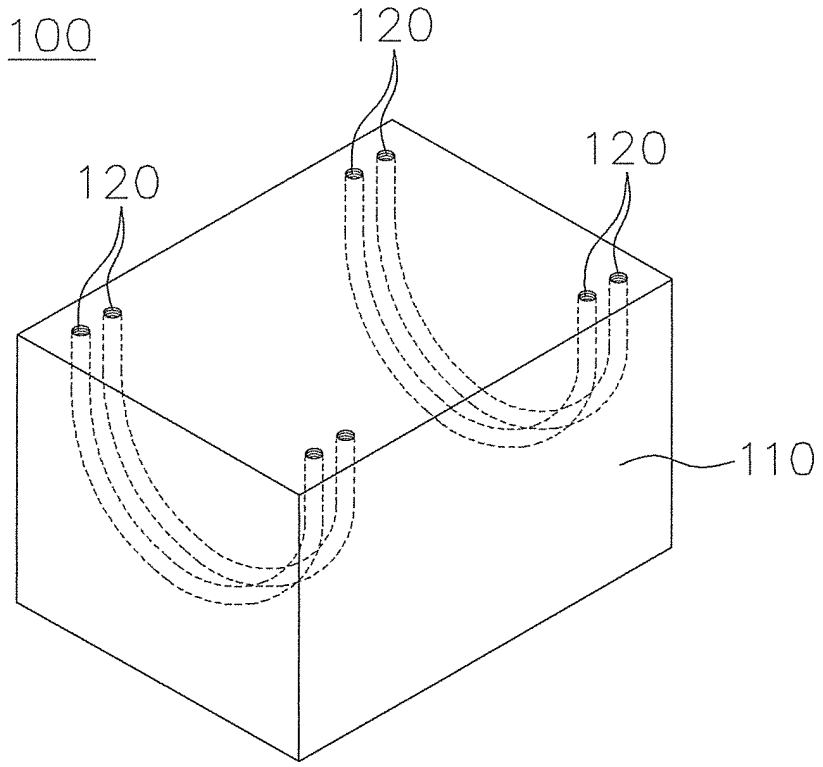


Fig.12

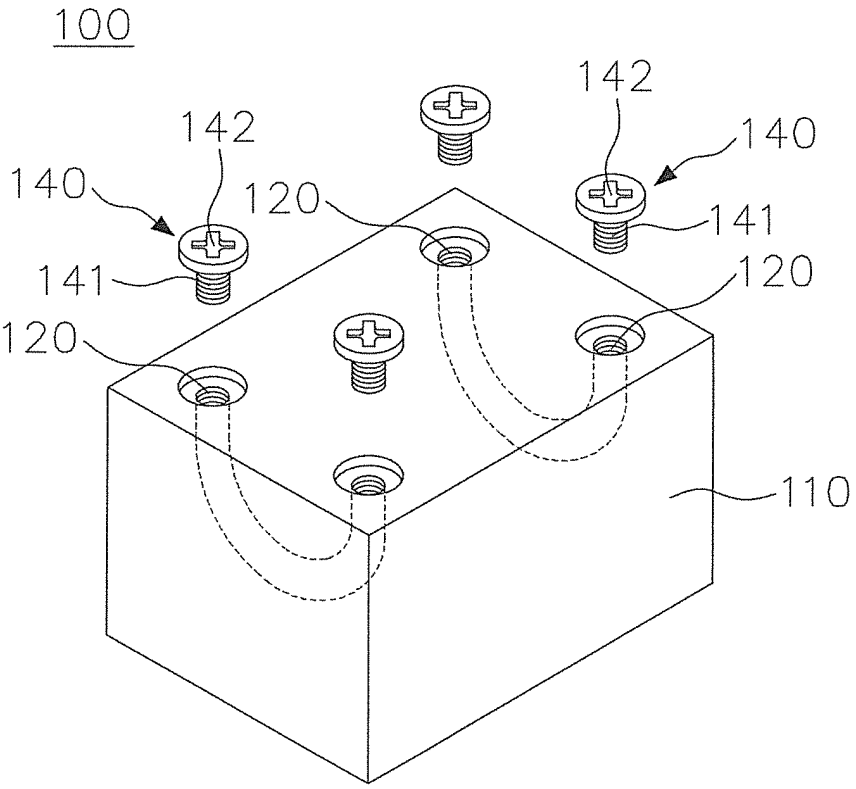
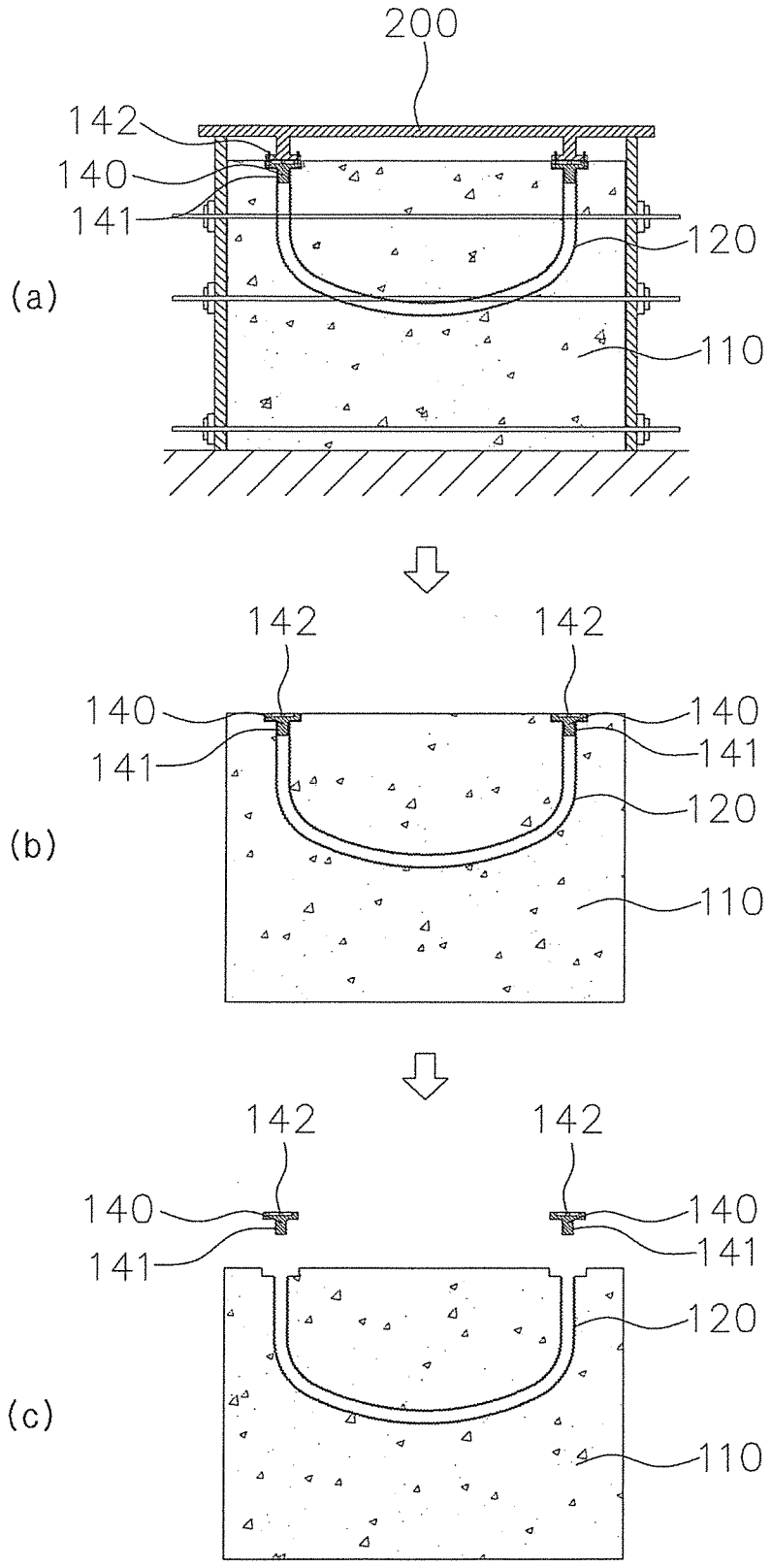


Fig.13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