(19) Europäisches Patentamt / European Patent Office / Office européen des brevets

(11) **EP 4 166 296 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.04.2023 Bulletin 2023/16

(21) Application number: **22201532.3**

(22) Date of filing: **14.10.2022**

(51) International Patent Classification (IPC):
B28B 23/02 *(2006.01)* ***B28B 23/04*** *(2006.01)*
B28B 23/06 *(2006.01)* ***B28B 7/28*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B28B 23/022; B28B 7/28; B28B 23/043; B28B 23/06

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(30) Priority: **15.10.2021 BE 202105814**

(71) Applicant: **Betonwerken Vets en Zonen nv**
2400 Mol (BE)

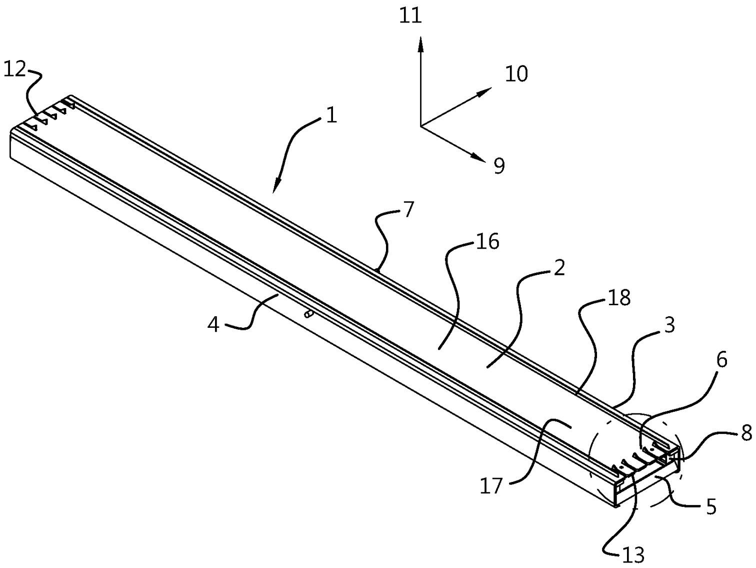
(72) Inventors:
- **Aertgeerts, Rudy**
  2400 Mol (BE)
- **Houbracken, Steven**
  2400 Mol (BE)

(74) Representative: **Brantsandpatents bv**
Pauline Van Pottelsberghelaan 24
9051 Ghent (BE)

(54) **METHOD AND TABLE FOR MANUFACTURING A CONCRETE SLAB**

(57) The present invention relates to a method of manufacturing a hollowcore concrete slab comprising fixing an active reinforcement to a table (1), the table (1) extending along a longitudinal direction (9), the table (1) comprising a table surface (2), the active reinforcement extending above the table surface (2) and parallel to the table surface (2) along the longitudinal direction (9) of the table (2); prestressing the active reinforcement; pouring concrete into a mold formed by the table (1) and at least two side walls (18); curing the concrete into a hollowcore concrete slab; removing the hollowcore concrete slab from the mold (1); wherein a passive reinforcement is provided in the concrete after the concrete has been poured and before the concrete has cured. The invention also relates to a table (1) for manufacturing a hollowcore concrete slab and a use of the method or the table for manufacturing a hollowcore concrete slab.

Fig. 1



EP 4 166 296 A2

Description

TECHNICAL FIELD

[0001] The invention relates to a method for manufacturing a hollowcore concrete slab, in particular a hollowcore concrete slab comprising an active and a passive reinforcement, and a table for manufacturing such a hollowcore concrete slab.

PRIOR ART

[0002] Hollowcore concrete slabs are known from the prior art for forming floors. The hollowcore concrete slabs span a space. Joints between hollowcore concrete slabs are filled with concrete and a concrete compression layer is poured onto the hollowcore concrete slabs. In this way a ceiling is obtained along a first side and a floor surface along a second side.

[0003] In order to obtain a large load-bearing capacity for a hollowcore concrete slab, a hollowcore concrete slab is reinforced. This is traditionally a passive reinforcement, consisting of rods that extend in a longitudinal direction through the hollowcore concrete slab. The rods are located in a first portion near a side which forms the ceiling. This is the side that experiences a tensile force and stretches when loaded. Reinforcement is therefore required on this side to prevent the hollowcore concrete slab from cracking and eventually breaking. When an even greater load-bearing capacity is required or for long spans, the reinforcement is an active reinforcement. An active reinforcement comprises metal strands that are prestressed and after which the hollowcore concrete slab is formed around the metal strands. As a result, such hollowcore concrete slabs can withstand an even greater tensile force. A disadvantage is that due to the active reinforcement the hollowcore concrete slab is contracted before installation on the side of the ceiling and thus stretches on the side of the floor surface and can possibly break. That is why an active reinforcement is also installed on the side of the floor surface. This active reinforcement is lighter than the active reinforcement on the floor surface side, so that a hollowcore concrete slab with active reinforcement may have an upward curvature before installation.

[0004] According to the prior art, hollowcore concrete slabs with an active reinforcement are produced by means of an extrusion process, using a machine that works via a compacting or extrusion technology. A disadvantage of an extrusion process is that the hollowcore concrete slab are always produced as very long strips of sometimes more than 30 m long to sometimes longer than 150 meters and after which these strips must harden before they can be cut to length to hollowcore concrete slabs. Until the concrete has hardened and been sawn, these very long strips cannot be moved, so that a lot of surface is needed to produce the hollowcore concrete slabs. Because of the sawing, the hollowcore concrete slabs are usually made to measure and therefore to order. Another disadvantage of an extrusion process is that a hollowcore concrete slab with smooth surfaces and a completely constant cross section is obtained. If a top surface has to be finished differently or if the bottom surface (ceiling) has to be finished roughly or if a different cross-section is required locally, then the hollowcore concrete slab must be reworked manually or mechanically after extrusion and preferably before curing of the concrete. This is a very labor-intensive step that leads to a significantly higher production cost. An additional disadvantage is that the reworking takes place before sawing, so that a great deal of attention must be paid to correctly measuring a position where an adjustment is necessary. If the position has not been measured correctly, it is possible that several hollowcore concrete slabs become unusable after sawing. Finally, these reworkings lead to loss of quality.

[0005] The present invention aims to solve at least some of the above problems or drawbacks.

SUMMARY OF THE INVENTION

[0006] In a first aspect, the present invention relates to a method according to claim 1.

[0007] An advantage of this method is that a hollowcore concrete slab with an active reinforcement is manufactured in a mold. By using a mold it is possible to immediately manufacture a hollowcore concrete slab with active reinforcement to a correct length. It is also advantageous that the hollowcore concrete slabs with active reinforcement can be manufactured to a shorter length and can therefore be moved and stacked after the concrete has been poured and before the concrete has cured, so that less floor space is required to produce hollowcore concrete slabs with active reinforcement. It is also very advantageous that by using a mold a hollowcore concrete slab with active reinforcement can be finished in different ways flexibly and automatically.

[0008] Due to the use of an active reinforcement, the hollowcore concrete slab can withstand high tensile forces on a first side of the hollowcore concrete slab and has a high load-bearing capacity. The provision of a passive reinforcement in the concrete is advantageous for absorbing tensile forces on a second side of the hollowcore concrete slab, for instance tensile forces due to contraction of the first side of the hollowcore concrete slab by the active reinforcement or when the hollowcore concrete slab is moved with a forklift truck. The use of passive reinforcement on the second side of the hollowcore concrete slab results in a lower material cost compared to active reinforcement.

[0009] Preferred embodiments of the device are set out in claims 2-9.

[0010] A particular preferred embodiment concerns a method according to claim 9.

[0011] In this preferred embodiment, the table surface is curved when the active reinforcement is prestressed.

Ends of the table surface move in a direction away from the table surface due to the prestressing. This is advantageous for compensating for the contraction of the hollowcore concrete slab on the first side by the active reinforcement, whereby the hollowcore concrete slab is substantially flat after removal from the mold. As a result, a lighter passive reinforcement can be used on the second side.

[0012] In a second aspect, the present invention relates to a table according to claim 10.

[0013] Such a table is advantageous for forming a hollowcore concrete slab with active reinforcement in a mold. The table comprises wedge-shaped guides with which the active reinforcement can be prestressed above the table surface and after which a hollowcore concrete slab can be formed by filling the mold with concrete.

[0014] Preferred embodiments of the method are described in the dependent claims 11-14.

[0015] In a third aspect the present invention relates to a use according to claim 15. This use results in an improved production of hollowcore concrete slabs with active reinforcement with a high load-carrying capacity. A hollowcore concrete slab can immediately be manufactured to a desired length and finished differently in a flexible and automated manner, so that no additional manual actions are required during the manufacture of hollowcore concrete slabs. It is also advantageous that less floor space is required to produce hollowcore concrete slab with active reinforcement. It is also advantageous that, as a result of the passive reinforcement, a hollowcore concrete slab with active reinforcement is manufactured with a lower material cost.

DESCRIPTION OF THE FIGURES

[0016]

Figure 1 shows a perspective view of a table according to an embodiment of the present invention.

Figure 2 shows a detail representation of the perspective view from Figure 1.

Figure 3 shows a front view of a table according to an embodiment of the present invention.

Figure 4 shows a section view of a table according to an embodiment of the present invention.

DETAILED DESCRIPTION

[0017] Unless otherwise defined, all terms used in the description of the invention, including technical and scientific terms, have the meaning as commonly understood by a person skilled in the art to which the invention pertains. For a better understanding of the description of the invention, the following terms are explained explicitly.

[0018] In this document, "a" and "the" refer to both the singular and the plural, unless the context presupposes otherwise. For example, "a segment" means one or more segments.

[0019] The terms "comprise", "comprising", "consist of", "consisting of", "provided with", "include", "including", "contain", "containing", are synonyms and are inclusive or open terms that indicate the presence of what follows, and which do not exclude or prevent the presence of other components, characteristics, elements, members, steps, as known from or disclosed in the prior art.

[0020] Quoting numerical ranges by endpoints includes all integers, fractions and/or real numbers between the endpoints, these endpoints included.

[0021] In the context of this document, a trapezoid is a quadrilateral with two opposite parallel sides, wherein the two opposite parallel sides have different lengths. The side with the shortest length is the minor base and the side with the greatest length is the major base. An isosceles trapezoid is a trapezoid where non-parallel sides are of equal length.

[0022] In the context of this document, a strand is an assembly of wires arranged in spiral form.

[0023] In the context of this document, a 'hollowcore concrete slab' comprises a beam-shaped concrete element that extends in a longitudinal direction, a transverse direction and a height direction. The beam-shaped concrete element comprises a first side which extends in the longitudinal direction and the transverse direction. The first side is a plane that is parallel to the longitudinal direction and the transverse direction. After placing the hollowcore concrete slab, the first side forms the ceiling of a space on which the hollowcore concrete slab is placed. The beam-shaped concrete element comprises a second side which extends in the longitudinal direction and the transverse direction. The second side is a plane that is parallel to the longitudinal direction and the transverse direction. The second side is opposite the first side. The second side forms the floor surface of an overlying space after placement of the hollowcore concrete slab, wherein the overlying space is located above the space on which the hollowcore concrete slab is placed. The beam-shaped concrete element preferably has a constant cross section transverse to the longitudinal direction. The cross-section is rectangular, trapezoidal or other suitable shape. The beam-shaped concrete element comprises a first end and a second end along the longitudinal direction. The first end and the second end are opposite ends. At the first end is a plane which is transverse to the first side and the second side of the beam-shaped concrete element. At the second end is a plane which is transverse to the first side and the second side of the beam-shaped concrete element. Alternatively, the plane at the first end and the plane at the second end are inclined to the first side and the second side of the beam-shaped concrete element, wherein a cross-section along the longitudinal direction centrally through the beam-shaped concrete element is trapezoidal, wherein the major base of the trapezoidal shape is located on the first side. The beam-shaped concrete element comprises a first side wall and a second side wall. The first side wall and the second side wall connect the first end and the second end and the first side and the second side of the beam-shaped concrete element.

[0024] In the context of this document, an active reinforcement is a reinforcement that is subjected to a tensile force before and during the manufacture of the hollowcore concrete slab and that has already been partially stretched along a longitudinal direction. This is different from a passive reinforcement, which is not subjected to a tensile force before and during the formation of the hollowcore concrete slab.

[0025] In the context of this document, no-slump concrete is a concrete mortar with a consistency of moist soil. This corresponds to consistency class C0 or C1 according to NEN-EN 12350-4:2019 with a compaction size of approximately 1.2 to 1.4.

[0026] In a first aspect, the invention relates to a method for manufacturing a hollowcore concrete slab.

[0027] In a preferred embodiment, the method comprises the steps of:

- fixing an active reinforcement to a table;
- prestressing the active reinforcement;
- pouring concrete into a mold;
- curing the concrete into a hollowcore concrete slab;
- removing the hollowcore concrete slab from the table.

[0028] The table extends in a longitudinal direction. The table comprises a table surface. The table surface is preferably a rectangular surface. The table surface forms a support surface for the first side of the hollowcore concrete slab during manufacture. The table comprises longitudinally fastening elements near opposite ends of the table for fastening the active reinforcement. "Near" in this context means that longitudinally between the fastening elements at the opposite ends there is a distance of at least 50% of a total length of the table, preferably at least 60%, more preferably at least 70%, even more preferably at least 80% and even more preferably at least 90%. The active reinforcement is attached, hooked or clamped to, against or behind the fastening elements by means of, for example, hooks, eyes, clamps or another suitable means. The active reinforcement extends at a distance from the table surface and parallel to the table surface along the longitudinal direction of the table. The distance is a perpendicular distance from the active reinforcement to the table surface. The distance is at least 0.5 cm. In this way, after the concrete has been poured, the active reinforcement is located in a first part of the hollowcore concrete slab, which adjoins the first side of the hollowcore concrete slab.

[0029] The active reinforcement is stretched along the longitudinal direction of the table by the exertion of a tensile force during prestressing. This can be done, for example, by moving the fastening elements along the longitudinal direction of the table. This is preferably done by pulling the active reinforcement along the longitudinal direction, wherein at the same time as achieving a desired prestress in the active reinforcement, the hook, eye, clamp or other suitable means is attached, hooked or clamped to, against or behind the fastening elements and the hook, eye, clamp or other suitable means is fixedly attached to the active reinforcement. In that case, prestressing the active reinforcement is part of the step of attaching the active reinforcement to the table.

[0030] The mold is formed by the table and at least two side walls. The at least two side walls extend along the longitudinal direction of the table, are transverse to the table surface and lie against the first side wall and the second side wall of the hollowcore concrete slab to be produced. Preferably, the mold comprises two additional side walls. The two additional side walls are transverse to the longitudinal direction of the table and transverse to the at least two side walls. The two additional side walls lies against the plane at the first end and the plane at the second end of the hollowcore concrete slab to be produced. The fastening elements for the active reinforcement lie outside the mold.

[0031] It will be is apparent to one skilled in the art that the longitudinal direction of the table and the longitudinal direction of a hollowcore concrete slab to be produced are the same as long as the hollowcore concrete slab lies on the table. The table has a transverse direction and a height direction that are chosen equal to the transverse direction and the height direction of a hollowcore concrete slab on the table.

[0032] The at least two side walls and any two additional side walls are attached to the table, preferably detachably or rotatably attached to the table. This is advantageous for removing the hollowcore concrete slab from the mold.

[0033] Alternatively, the at least two side walls and any two additional side walls are part of a concrete pouring installation. In that case, after fixing the active reinforcement to the table and prestressing the active reinforcement, a table is moved, preferably automatically, to the concrete pouring installation, after which the at least two side walls and any two additional side walls are automatically pushed into position by the concrete pouring installation to form the mold. This is advantageous because during the pouring of concrete into a mold, active reinforcement can be attached to a second table in preparation for a next hollowcore concrete slab to be produced, so that a higher throughput can be obtained with the concrete pouring installation.

[0034] The concrete is preferably poured with an automatic concrete pouring installation into an opening of the mold formed by edges of the at least two side walls and any two additional side walls. During the pouring of the concrete, the concrete pouring installation moves along the longitudinal direction of the table from a first end to a second end of the mold.

[0035] After the concrete has been poured and before the concrete has cured, a passive reinforcement is placed in the concrete. This passive reinforcement is manually or automatically pressed into the concrete. In this way, after the concrete has been poured, the passive reinforcement is located in a second part of the hollowcore concrete slab, which adjoins the second side of the hollowcore concrete slab. The passive reinforcement extends parallel to the longitudinal direction of the table. Alternatively, the passive reinforcement extends parallel to a diagonal in the plane of the second side of the hollowcore concrete slab to be produced.

[0036] After the passive reinforcement has been placed, the concrete is preferably smoothed out automatically and/or manually at a level formed by the opening of the mold. As a result, a plane is formed. This is the second side of the hollowcore concrete slab to be produced.

[0037] After the concrete has been poured, the concrete hardens into the hollowcore concrete slab. When using a concrete pouring installation, the table with an uncured hollowcore concrete slab thereon is preferably moved to a stacking location, preferably moved automatically. This is advantageous because as a result the concrete pouring installation can be used immediately for the production of a next hollowcore concrete slab, so that a higher throughput can be obtained with the concrete pouring installation. By using the mold it is possible to immediately manufacture a hollowcore concrete slab with active reinforcement at a correct length and therefore also at a shorter length compared to an extrusion process, so that the table can be moved. Uncured hollowcore concrete slabs are stacked on top of each other at the stacking location. The uncured hollowcore concrete slabs remain on the tables. This is advantageous because as a result less floor surface is required to manufacture hollowcore concrete slabs with active reinforcement. It will be apparent to a person skilled in the art that when using a mold where the at least two side walls and any two additional side walls are part of the concrete pouring system, the at least two side walls and any two additional side walls are removed from the table by the concrete pouring installation before moving the table to the stacking location, preferably automatically. Preferably, when the concrete is poured, use is made of no-slump concrete, so that when the at least two side walls and any two additional side walls are removed before the curing of the concrete, the concrete does not run off the table surface.

[0038] After curing of the concrete, the active reinforcement is cut at the first end and the second end of the produced hollowcore concrete slab, which removes the tensile force and causes the active reinforcement to want to return to an original length. As a result, the active reinforcement in the first part exerts a compressive force according to the longitudinal direction of the beam-shaped concrete element on the hollowcore concrete slab, against which concrete is very resistant. This is different from a passive reinforcement, which is not subjected to a tensile force before and during the formation of the hollowcore concrete slab. When a floor surface is loaded, tensile forces in the first part are compensated by the compressive forces due to the active reinforcement, so that the hollowcore concrete slab does not break. An active reinforcement in the first part is advantageous compared to a passive reinforcement because the active reinforcement, in contrast to the passive reinforcement, already exerts a compressive force in the concrete before the floor surface is loaded. A passive reinforcement only exerts a compressive force in the concrete after the hollowcore concrete slab has been stretched on the first side, as a result of which micro-cracks can occur in the concrete and in the long run concrete decay can occur. This is not the case with active reinforcement, so that even with high loads on the floor surface and long spans, no micro-cracks occur in the concrete on the first side and as a result of which the hollowcore concrete slab has a high load-bearing capacity.

[0039] Due to the active reinforcement in the first part, the hollowcore concrete slab is compressed on the first side of the hollowcore concrete slab after manufacture and before loading, e.g. due to loading of a concrete compression layer on the hollowcore concrete slab or due to load on the floor surface, as a result of which the hollowcore concrete slab is stretched on the second side and tensile forces are produced in the second part. In the context of this document, the first part is understood to mean that part of the beam-shaped concrete element of a manufactured hollowcore concrete slab which is stretched according to the longitudinal direction of the beam-shaped concrete element under a load on the floor surface and which experiences a tensile force. In the context of this document, the second part is understood to mean that part of the beam-shaped concrete element of a manufactured hollowcore concrete slab that is compressed under a load on the floor surface and experiences a compressive force. Since concrete does not withstand tensile forces well, it is necessary to also provide reinforcement in the second part to absorb these tensile forces. These tensile forces also occur when the hollowcore concrete slab is moved, for example with a forklift, wherein the first and second ends hang down under the dead load of the hollowcore concrete slab. A passive reinforcement is sufficient to absorb tensile forces in the concrete on the second side by contraction of the active reinforcement on the first side or when the hollowcore concrete slab is moved with, for example, a forklift truck, so that the hollowcore concrete slab is prevented from cracking or even breaking. The use of a passive reinforcement in the second part of the beam-shaped concrete element results in a lower material cost compared to an active reinforcement. It is also advantageous that placing the active reinforcement, as previously described, is a quick and short operation that takes less time than installing an active reinforcement in the second part of the beam-shaped concrete element. Indeed, this would require an additional active reinforcement to be attached to the table and for this additional reinforcement to be prestressed. By using a passive reinforcement, a hollowcore concrete slab can be produced faster according to the current method.

[0040] After cutting the active reinforcement, the hollowcore concrete slab is removed from the table. If the at least two side walls and any two additional side walls are still attached to the table, the at least two side walls and any two additional side walls are removed from the table or rotated so that the manufactured hollowcore concrete slab lies freely on the table surface and can be removed from the table. The table is cleaned, wherein any concrete residues are removed. Any remnants of the active reinforcement on the fastening elements are also removed. Preferably, a mold release oil is sprayed onto the table surface to simplify the removal of a manufactured hollowcore concrete slab from the table surface. The table can be used again for manufacturing a next hollowcore concrete slab with active reinforcement.

[0041] According to one embodiment, the active reinforcement comprises metal strands. The metal strand comprises at least three wires. The wires are preferably steel wires. The wires are optionally galvanized. The wires are cold drawn wires. Non-limiting examples of metal strands are strands with three steel wires arranged in spiral form and strands with 7 steel wires, wherein there is one core wire and wherein six wires are arranged spirally around the core wire. The metal strands are optionally indented strands. Indented strands comprise indented wires. Indented wires comprise indentations of 0.06 $\pm$ 0.03 mm or 0.07 $\pm$ 0.04 mm. Indented strands are advantageous for a better bonding of concrete of the beam-shaped concrete element of the hollowcore concrete slab to be manufactured to the metal strands. The metal strands are preferably according to a standard. An example of a suitable standard is BENOR PTV 311, Revision 6, 2019. An example of a suitable standard for galvanized metal strands is BENOR PTV 312, Revision 0, 2001.

[0042] Metal strands are characterized by a very high tensile strength. The tensile strength has been determined in accordance with standard ISO 15630-3:2019-10. Metal strands preferably have a minimum tensile strength of 1670 N/mm^2. As a result it is possible to prestress the metal strands very much by applying a high tensile force, without the metal strands breaking, so that the metal strands are particularly suitable as active reinforcement.

[0043] According to one embodiment, the passive reinforcement comprises metal rods. The metal rods are preferably steel rods. The metal rods are preferably cylindrical or square. The metal rods are optionally indented rods. Indented rods include indentations of at least 0.040 times the diameter of the rods. Indented rods are advantageous for better bonding of concrete from the beam-shaped concrete element to the metal rods. The metal rods are preferably according to a standard. An example of a suitable standard is BENOR PTV 302, Revision 12, 2021.

[0044] The ends of the metal rods are preferably at least 2 cm away from the ends of the mold along the length of the table. As a result, the metal rods are protected against corrosion by concrete, which reduces the risk of concrete decay. The ends of the metal rods are preferably at most 5 cm away from the ends of the mold along the length of the table. This is advantageous because the passive reinforcement absorbs tensile forces in the concrete over almost the entire length of the beam-shaped concrete element of a manufactured hollowcore concrete slab.

[0045] Metal rods have a lower tensile strength compared to metal strands. The tensile strength has been determined in accordance with standard ISO 15630-3:2019-10. Metal rods preferably have a minimum tensile strength of 330 N/mm^2. This is sufficient to absorb tensile forces in the concrete in the second part of the beam-shaped concrete element of a manufactured hollowcore concrete slab. Metal rods, on the other hand, are much faster, easier and cheaper to produce than metal strands. Metal rods can simply be pressed into the concrete on the second side during the manufacture of the hollowcore concrete slab. This is a quick and short operation that takes less time than applying an active reinforcement in the second part of the beam-shaped concrete element of a hollowcore concrete slab to be manufactured, whereby a hollowcore concrete slab according to the present invention can be produced more quickly.

[0046] According to an alternative embodiment, the passive reinforcement comprises carbon fiber rods. Carbon fiber rods can simply be pressed into the concrete on the second side during the manufacture of the hollowcore concrete slab. This is a quick and short operation that takes less time than applying an active reinforcement in the second part of the beam-shaped concrete element, whereby a hollowcore concrete slab according to the present invention can be produced more quickly. Carbon fiber rods have the advantage over metal rods that the rods absorb large tensile forces from a very low elongation. As a result, the risk of micro-cracks on the second side of the beam-shaped concrete element of a manufactured hollowcore concrete slab due to the prestress in the active reinforcement in the first part of the beam-shaped concrete element of a manufactured hollowcore concrete slab is very small.

[0047] According to an alternative embodiment, the passive reinforcement comprises nets made of carbon fibers. A non-limiting example of suitable carbon fiber nets is C-GRID® from Chomarat. These nets have the same advantage as carbon fiber rods in that the nets absorb high tensile forces from a very low elongation. These nets are less easy to press into the concrete from the second side of the beam-shaped concrete element during the manufacture of the hollowcore concrete slab and are preferably placed in the mold beforehand.

[0048] According to one embodiment, the passive reinforcement comprises metal rods and rods and/or nets made of carbon fibers. The metal rods and the carbon fiber rods and/or nets are as in previously described embodiments. This embodiment is advantageous for combining the advantages of the different embodiments, wherein a passive reinforcement is obtained with a material cost that is lower than a passive reinforcement that only consists of carbon fiber rods or nets, while the passive reinforcement absorbs large tensile forces even at low elongation.

[0049] According to one embodiment, the active reinforcement is attached to the table at a distance of at most 3 cm from the table surface. The distance is a perpendicular distance from the active reinforcement to the table surface. The active reinforcement is attached to the table at a distance of at least 2 cm from the table surface.

[0050] When the floor surface is loaded, the greatest tensile forces may occur in the concrete on the first side of a manufactured hollowcore concrete slab. The active reinforcement is therefore preferably placed as close as possible to the first side, so that when the floor surface is loaded, the concrete on the first side does not crack, flake or break. On the other hand, it is necessary that the active reinforcement is surrounded by a minimum thickness of concrete, so that there are sufficient forces between the concrete and the active reinforcement, and that the active reinforcement does not tear loose from the concrete. In the case of metal strands as active reinforcement, this embodiment is also advantageous because a layer of concrete protects the metal strands against corrosion. Corroding reinforcement can cause the concrete to flake off on the first side and cause concrete decay to occur. A layer of at least 2 cm and at most 3 cm is optimal for sufficient forces between the active reinforcement and the concrete, for good protection of metal strands comprised in the active reinforcement by the concrete and for maximum performance of the active reinforcement.

[0051] According to a preferred embodiment, the method comprises the additional step of pressing the concrete with the aid of a stamp after the concrete has been poured and before the concrete has cured. Pressing with a stamp is advantageous for compacting the concrete of a hollowcore concrete slab to be manufactured. Pressing the concrete with the stamper is also advantageous because this allows the passive reinforcement to be automatically pressed into the concrete, so that two operations can be performed in one step. Optionally, the stamp comprises a logo or motif that is pressed into the concrete on the second side of the hollowcore concrete slab to be manufactured. Pressing with a stamp is also advantageous for forming a surface on the second side of the hollowcore concrete slab to be manufactured.

[0052] According to a preferred embodiment, a relief is provided in or on the table surface. The relief is applied directly to the table surface or is, for example, a plate comprising the relief applied to the table surface. During manufacture, the first side of a hollowcore concrete slab to be manufactured lies on the table surface or on the plate comprising the relief on the table surface. After the hollowcore concrete slab has been manufactured, a manufactured hollowcore concrete slab comprises a negative of the relief on the first side of the beam-shaped concrete element. A first side with relief is advantageous for plastering the first side of the beam-shaped concrete element of the manufactured hollowcore concrete slab when finishing a ceiling of a room. Due to the presence of the relief, plaster adheres better to the first side of the manufactured hollowcore concrete slab compared to a hollowcore concrete slab with a smooth first side. Because a relief has been applied in or on the table surface, the manufactured hollowcore concrete slab is automatically finished with a negative of the relief. This is not possible with an extrusion process according to the prior art, because smooth sides are always obtained.

[0053] According to a preferred embodiment in the mold longitudinally at opposite ends of the mold a beam is placed on the table surface. The beam extends transversely to the longitudinal direction of the table. The beam extends over a full length between the at least two side walls of the mold. The beam is advantageous for automatically finishing a hollowcore concrete slab to be manufactured with a recess on the first side at two opposite ends along the longitudinal direction of the beam-shaped concrete element of the hollowcore concrete slab to be manufactured. This is not possible with an extrusion process according to the prior art, because a hollowcore concrete slab with smooth sides is always obtained in an extrusion process. The recesses are advantageous for laying a manufactured hollowcore concrete slab on, for instance, a lower horizontal flange of an I-shaped metal supporting beam. Due to the recesses, the first side and an underside of the I-shaped metal supporting beam form a horizontal plane. Because there is no difference in level between the underside of the I-shaped metal supporting beam and the first side of the beam-shaped concrete element of the manufactured hollowcore concrete slab, less plaster is required for plastering a ceiling.

[0054] According to a preferred embodiment, molds are arranged in the mold on side walls which extend along the longitudinal direction of the table, and which extend in a direction transverse to the table surface. The side walls are the at least two side walls of previously described embodiments. The molds automatically produce teeth and/or grooves in the side walls of the beam-shaped concrete element of a hollowcore concrete slab to be manufactured. This is not possible with an extrusion process according to the prior art, because a hollowcore concrete slab with smooth sides is always obtained in an extrusion process. The teeth and/or grooves extend according to the height direction of the beam-shaped concrete element. The teeth and/or grooves preferably extend over the full height of the beam-shaped concrete element. The teeth and/or grooves are advantageous for avoiding longitudinal displacements of adjacent hollowcore concrete slabs, after a joint in the longitudinal direction of the beam-shaped concrete element between the two adjacent manufactured hollowcore concrete slabs has been filled with, for example, concrete.

[0055] According to a preferred embodiment, tubes are arranged before pouring the concrete in the mold. The tubes extend through the mold along the longitudinal direction of the table. The optionally additional side walls comprise apertures for this purpose. The apertures in the optionally additional side walls preferably have an inner circumference that is at most 5 mm from an outer circumference of the tubes, preferably at most 4 mm, more preferably at most 3 mm and even more preferably at most 1 mm. The tubes are preferably fitted into the mold in a mechanized manner and more preferably automatically. After the concrete has been poured, the tubes are slid out of the mold, preferably in a mechanized manner and more preferably slid out of the mold automatically. The tubes are preferably slid out of the mold before the concrete has cured. For this purpose, preferably no-slump concrete is used. The tubes are advantageous for forming hollow cores in a hollowcore concrete slab to be manufactured. The hollow cores extend through the beam-shaped element along the longitudinal direction of the hollowcore concrete slab.

[0056] When a manufactured hollowcore concrete slab is loaded as floor surface after placement, the manufactured hollowcore concrete slab bends. The manufactured hollowcore concrete slab is stretched on the first side along the longitudinal direction of the beam-shaped concrete element and is subjected to a tensile force. The hollowcore concrete slab is compressed on the second side along the longitudinal direction of the beam-shaped concrete element and experiences a compressive force. Centrally according to the height direction of the beam-shaped concrete element, the manufactured hollowcore concrete slab remains virtually the same and does not experience any additional forces along the longitudinal direction due to the load on the floor surface. Hollow cores that are centrally located according to the height direction do not weaken the manufactured hollowcore concrete slab for the purpose of withstanding a load on the floor surface. The hollow cores are advantageous for weight saving without weakening the produced hollowcore concrete slab.

[0057] The hollow cores can be arranged with the aid of the tubes in a hollowcore concrete slab to be manufactured, because the tubes are centrally located along the height direction and are therefore not hindered by the active reinforcement attached to the table. Because the passive reinforcement is pressed into the concrete through the opening in the mold after the concrete has been poured, the tubes are also not hindered by the passive reinforcement. This would be the case with an active reinforcement on the second side of a hollowcore concrete slab to be manufactured, because fastening elements would have to extend through the mold and thereby hinder the tubes.

[0058] According to a preferred embodiment, the active reinforcement is prestressed with a force of at least 50 kN, preferably at least 55 kN, more preferably at least 60 kN, even more preferably at least 65 kN and even more preferably at least 70 kN. This is advantageous for exerting a large compressive force in the concrete after manufacture of the hollowcore concrete slab in the first part of the beam-shaped concrete element of the manufactured hollowcore concrete slab, so that the concrete does not crack or break when the floor surface is loaded.

[0059] According to a preferred embodiment, the active reinforcement comprises at least five and at most ten prestressed metal strands per meter in a transverse direction parallel to the table surface and transverse to the longitudinal direction of the table. The passive reinforcement comprises at least one and at most nine rods per meter along the transverse direction. The metal strands and rods are as in previously described embodiments.

[0060] The prestressed metal strands are preferably distributed symmetrically along the transverse direction. A higher number of prestressed metal strands ensures a better distribution in the transverse direction of a compressive force through the active reinforcement in the beam-shaped concrete element of a hollowcore concrete slab to be manufactured. A higher number of prestressed metal strands provides a higher compressive force through the active reinforcement in the beam-shaped concrete element than with a lower number of prestressed metal strands if the diameter of the metal strands remains the same, so that a greater load-bearing capacity is obtained for the hollowcore concrete slab to be manufactured. A lower number of prestressed metal strands results in fewer operations during the manufacture of the hollowcore concrete slab.

[0061] The rods are preferably distributed symmetrically along the transverse direction. When the second side of the beam-shaped concrete element of a hollowcore concrete slab to be manufactured is stretched, a higher number of rods ensures a better distribution according to the transverse direction of a compressive force through the passive reinforcement in the beam-shaped concrete element. A higher number of rods provides a higher compressive force through the passive reinforcement in the beam-shaped concrete element than with a lower number of rods if the diameter of the rods remains the same, allowing a greater prestress in the active reinforcement and consequently a greater load capacity for the hollowcore concrete slab to be produced is obtained. A lower number of rods results in fewer operations when manufacturing the hollowcore concrete slab.

[0062] At least five and at most ten prestressed metal strands per meter ensure a good distribution of the compressive force through the active reinforcement in the beam-shaped concrete element of a hollowcore concrete slab to be manufactured. At least one and at most nine rods per meter ensures a good distribution of the compressive force through the passive reinforcement in the beam-shaped concrete element of the hollowcore concrete slab to be manufactured. The number of operations in the manufacture of a hollowcore concrete slab for applying the active reinforcement and the passive reinforcement remains limited, while a high load-bearing capacity is obtained for the manufactured hollowcore concrete slab.

[0063] According to a preferred embodiment, the table surface is curved when the active reinforcement is prestressed. The table is elastically deformable. During the prestressing of the active reinforcement, ends of the table surface along the longitudinal direction of the table are pulled together by the fastening elements and the ends move in a direction away from the table surface. The table surface has, along the longitudinal direction of the table, a curvature of at least 1 cm, preferably at least 2 cm, more preferably at least 3 cm, even more preferably at least 4 cm and even more preferably at least 5 cm. The curvature is measured as a distance along a direction perpendicular to a center point of the table surface between a lowest point of the table surface and a highest point of the table surface.

[0064] The curvature is preferably at most 15 cm, more preferably at most 14 cm, even more preferably at most 13 cm and even more preferably at most 12 cm.

[0065] The first side of the hollowcore concrete slab to be manufactured lies on the table surface during manufacture. Because the ends of the table surface, viewed in the longitudinal direction, are drawn towards each other, the first side of the beam-shaped concrete element of the hollowcore concrete slab to be manufactured is stretched. The second side of the beam-shaped concrete element is compressed. The hollowcore concrete slab is curved during manufacture, wherein the first end and the second end of the beam-shaped concrete element of the hollowcore concrete slab to be manufactured are curved towards the second side.

[0066] After manufacture of the hollowcore concrete slab, the manufactured hollowcore concrete slab is removed from the table. Due to the active reinforcement, the manufactured hollowcore concrete slab is compressed on the first side. The second side is thereby stretched, and the passive reinforcement is subject to a tensile load. The passive reinforcement can be considered activated. The hollowcore concrete slab is therefore curved after manufacture, wherein the first end and the second end of the beam-shaped concrete element are curved towards the first side. Because the first end and the second end are curved towards the second side during manufacture, the curvature of the first end and the second end towards the second side is limited to a maximum of 2 cm after the hollowcore concrete slab has been formed, wherein the curvature is measured as a distance according to the height direction of the beam-shaped concrete element between a lowest point of the hollowcore concrete slab and a highest point of the hollowcore concrete slab.

[0067] This embodiment is advantageous for compensating for the contraction of the manufactured hollowcore concrete slab on the first side by the active reinforcement, so that the hollowcore concrete slab is substantially flat after removal from the mold. As a result, a lighter passive reinforcement can be used on the second side.

[0068] This is advantageous for compensating for the contraction of the hollowcore concrete slab on the first side by the active reinforcement, whereby the hollowcore concrete slab is substantially flat after removal from the mold. As a result, a lighter passive reinforcement can be used on the second side.

[0069] In a second aspect, the invention relates to a table for manufacturing a hollowcore concrete slab.

[0070] According to a preferred embodiment, the table comprises a U-shaped metal plate. The U-shaped metal plate extends in a longitudinal direction. The U-shaped metal plate forms a table surface. The table comprises, along the longitudinal direction of the metal plate near a first end of the table and near a second opposite end of the table, wedge-shaped guides for guiding active reinforcement at the first end from a first side of the table surface to a second opposite side of the table surface and at the second end from the second opposite side of the table surface to the first side of the table surface. "Near" in this context means that along the longitudinal direction of the U-shaped metal plate there is a distance of at least 50% of a total length of the table, preferably at least 60%, even more preferably at least 70%, even more preferably at least 80% and even more preferably at least 90%, between the fastening elements at the first end and at the second end.

[0071] The wedge-shaped guides preferably extend through the table surface. Matching wedge-shaped guides at the first end and the second end of the table surface preferably extend equally far through the table surface. A highest point of the wedge-shaped guides extends at least 0.5 cm perpendicularly above the first side of the table surface, preferably at least 1 cm, more preferably at least 1.5 cm, even more preferably at least 2 cm and even more preferably at least 2.5 cm. A highest point of the wedge-shaped guides extends at most 3 cm perpendicularly above the first side of the table surface. The highest point of the wedge-shaped guides defines a distance at which an active reinforcement extends from the first side of the table surface and parallel to the table surface along a longitudinal direction of the table surface. It will be apparent to one skilled in the art that the longitudinal direction of the table and the longitudinal direction of the metal plate are the same direction. The second side of the table surface is thus the table surface on which the first side of the beam-shaped concrete element of a hollowcore concrete slab to be manufactured rests. The second side of the table surface is preferably the side of the table surface which is not located between legs of the U-shaped metal plate. This is particularly advantageous in case a mold is formed by the table and at least two side walls, wherein the two side walls are not fixed to the table, for example wherein the at least two side walls are part of a concrete pouring installation, whereby the movement of the at least two side walls towards and from the table is not hindered by the legs of the U-shaped metal plate.

[0072] Preferably, the wedge-shaped guides are fastening elements for fixing the active reinforcement to the table. The active reinforcement is attached, hooked or clamped to, against or behind the fastening elements by means of, for example, hooks, eyes, clamps or another suitable means. The active reinforcement is preferably attached to, against or behind the fastening element on the first side of the table surface.

[0073] Such a table is advantageous for forming a hollowcore concrete slab with active reinforcement in a mold formed by the table and at least two side walls. The table comprises wedge-shaped guides with which the active reinforcement can be prestressed above the table surface and after which a hollowcore concrete slab can be formed by filling the mold with concrete.

[0074] According to a preferred embodiment, slots are provided in the table surface. The slots extend from the wedge-shaped guides to the first end and the second end of the table. The slots preferably extend along the longitudinal direction of the metal plate. These slots are advantageous for easy attachment of active reinforcement to the table in that the active reinforcement does not have to pass through a small opening of the first side of the table surface and vice versa. This makes it possible to automatically attach the active reinforcement to the table.

[0075] According to a preferred embodiment, the table is made of steel. The steel has a maximum thickness of 8 mm. Steel is a strong and elastic material. As a result, steel with a thickness of up to 8 mm is sufficient to withstand tensile forces due to an active reinforcement prestressed with a force of at least 50 kN, while the steel is only elastically deformed. The elastic deformation of the table is advantageous for compensating for the contraction of a hollowcore concrete slab on the first side of the beam-shaped concrete element of the hollowcore concrete slab to be manufactured by the active reinforcement, as in a previously described embodiment of the method. The elastic deformation is also advantageous because after the removal of a manufactured hollowcore concrete slab, the table returns to an originally flat condition, so that the table is also suitable for forming hollowcore concrete slabs with only passive reinforcement.

[0076] According to a preferred embodiment, the table comprises cross connections between legs of the U-shaped metal plate. This embodiment is particularly advantageous in case the second side of the table surface is not located between the legs of the U-shaped metal plate. A hollowcore concrete slab to be manufactured then rests on the second side of the table surface and the second side of the table surface is supported by the legs of the U-shaped metal plate. The cross connections prevent the legs of the U-shaped metal plate from folding open due to the weight of the hollowcore concrete slab to be produced. The cross connections extend in a direction transverse to the longitudinal direction of the metal plate.

[0077] The cross connections are preferably metal plates with a maximum thickness of 5 mm. Cross connections which also extend in the longitudinal direction make the table rigid, thereby counteracting curvature of the table along the longitudinal direction, which is disadvantageous for compensating for curvature of the hollowcore concrete slab to be produced as described previously.

[0078] According to a preferred embodiment, the wedge-shaped guides are integrated in a metal block. The metal block is placed on the first side of the table surface. The wedge-shaped guides extend through the table surface to the second side of the table surface. The wedge-shaped guides extend through apertures smaller than the metal block. Preferably, the wedge-shaped guides extend through slots as in a previously described embodiment. Preferably, the metal block and wedge-shaped guides are one piece.

[0079] Wedge-shaped guides integrated in a metal block are advantageous in order to avoid that the wedge-shaped guides are pulled away from the table surface by prestress of the active reinforcement, because the metal block cannot be pulled through the table surface of the table.

[0080] A person skilled in the art will appreciate that a method according to the first aspect is preferably performed with a table according to the second aspect and that a table according to the second aspect is preferably configured to perform a method according to the first aspect. Each feature described in this document, both above and below, can therefore relate to any of the three aspects of the present invention.

[0081] In a third aspect, the invention relates to a use of a method according to the first aspect or a table according to the second aspect for manufacturing a hollowcore concrete slab.

[0082] This use results in an improved production of hollowcore concrete slabs with active reinforcement with a high load-carrying capacity. A hollowcore concrete slab can immediately be manufactured to a desired length and finished differently in a flexible and automated manner, so that no additional manual actions are required during the manufacture of hollowcore concrete slabs. It is also advantageous that less floor space is required to produce hollowcore concrete slab with active reinforcement. It is also advantageous that, as a result of the passive reinforcement, a hollowcore concrete slab with active reinforcement is manufactured with a lower material cost. In what follows, the invention is described by way of non-limiting figures illustrating the invention, and which are not intended to and should not be interpreted as limiting the scope of the invention.

DESCRIPTION OF THE FIGURES

[0083] **Figure 1** shows a perspective view of a table according to an embodiment of the present invention.

[0084] The table (1) comprises a U-shaped metal plate. The U-shaped metal plate extends in a longitudinal direction (9). The U-shaped metal plate also extends in a transverse direction (10). Dimensions of the U-shaped metal plate are clearly longer in the longitudinal direction (9) than in the transverse direction (10). For example, the U-shaped metal plate has a size of 8 m in the longitudinal direction (9) and a size of 0.6 m or 1.2 m in the transverse direction (10). The U-shaped metal plate comprises a table surface (2), a first leg (3) and a second leg (4). A height direction (11) is defined as a direction perpendicular to the longitudinal direction (9) and the transverse direction (10) and thus transverse to the table surface (2). The table surface comprises a first side (15) and a second opposite side (16). The first side (15) is not visible in this figure. The second side (16) of the table surface (2) supports a first side of a beam-shaped concrete element of a hollowcore concrete slab to be manufactured. In this embodiment, on the second side (16) of the table surface (2) of the U-shaped metal plate, an additional plate (17) with upstanding edges (18) along the longitudinal direction (9) is provided. The upstanding edges (18) adjoin side walls of the beam-shaped concrete element of the hollowcore concrete slab to be manufactured. At least two side walls of a mold for manufacturing the hollowcore concrete slab adjoin on or near the upstanding edges (18). The additional plate (17) is advantageous to avoid having to replace the entire table (1) if the table (1) is worn. It is enough to just replace the additional plate (17). The table (1) comprises longitudinally (9) near a first end (12) and near a second opposite end (13) of the table (1) wedge-shaped guides (6) for guiding an active reinforcement at the first end (12) from the first side (15) to the second side (16) of the table surface (2) and at the second end (13) from the second side (16) to the first side (15) of the table surface (2). Slots (8) are provided in the table surface (2) and in this embodiment also in the additional plate (17). The slots (8) extend from the wedge-shaped guides (6) near the first end (12) to the first end (12) and from the wedge-shaped guides (6) near the second end (13) to the second end (13) of the table (1). The table (1) comprises cross connections (5) between the first leg (3) and the second leg (4). The cross connections (5) extend transversely to the longitudinal direction (9). The table (1) further comprises lifting points (7) for moving the table (1).

[0085] **Figure 2** shows a detail representation of the perspective view from Figure 1.

[0086] Figure 2 clearly shows how the wedge-shaped guides (6) extend on the second side (16) of the table surface through the table surface (2) and in this embodiment through the additional plate (17). The slots (8) are also clearly shown, and it can be seen that the wedge-shaped guides (6) are positioned in these slots (8).

[0087] **Figure 3** shows a front view of a table according to an embodiment of the present invention.

[0088] The table (1) is identical to the table (1) from Figure 1. Figure 3 shows how the wedge-shaped guides (6) are integrated in a metal block (14). The metal block (14) is located on the first side (15) of the table surface (2) and the wedge-shaped guides (6) extend on the second side (16) of the table surface (2) through the table surface (2) and through the additional plate (17).

[0089] **Figure 4** shows a section view of a table according to an embodiment of the present invention.

[0090] The table (1) is identical to the table (1) from Figure 1. Figure 4 shows how the wedge-shaped guides (6) are integrated in the metal block (14). It can be clearly seen how the wedge-shaped guides (6) also continue into the metal block (14) on the first side (15) of the table surface (2). This is advantageous for smoothly and continuously guiding the active reinforcement from the first side (15) to the second side (16) of the table surface (2) and vice versa. It can also be clearly seen that the metal block (14) on the first side (15) of the table surface (2) comprises a plane transverse to a direction in which the active reinforcement is guided by the wedge-shaped guides (6). This is advantageous for securing the active reinforcement to the table using a hook or clamp that hooks or clamps behind or against this plane.

[0091] The numbered elements in the figures are as follows:

1. Table
2. Table surface
3. First leg
4. Second leg
5. Cross connection
6. Wedge-shaped guide
7. Lifting point
8. Slot
9. Longitudinal direction of the table
10. Transverse direction of the table
11. Height direction of the table
12. First end of the table
13. Second end of the table
14. Metal block
15. First side of the table surface
16. Second side of the table surface
17. Additional plate
18. Edge of the additional plate

Claims

1. Method for manufacturing a hollowcore concrete slab, comprising:

- fixing an active reinforcement to a table, the table extending along a longitudinal direction, the table comprising a table surface, the active reinforcement extending at a distance from the table surface and parallel to the table surface along the longitudinal direction of the table;
- prestressing the active reinforcement;

- pouring concrete into a mold formed by the table and at least two side walls;
- curing the concrete into a hollowcore concrete slab;
- removing the hollowcore concrete slab from the table;

characterized in that after the concrete has been poured and before the concrete has cured, a passive reinforcement is placed in the concrete.

2. Method according to claim 1, **characterized in that** the method after the concrete has been poured and before the concrete has cured comprises the additional step of pressing the concrete with the aid of a stamp.

3. Method according to claim 1 or 2, **characterized in that** a relief is applied in or on the table surface.

4. Method according to any of the previous claims 1-3, **characterized in that** a beam is placed longitudinally in the mold on the table surface at opposite ends of the mold, the beam extending transversely to the longitudinal direction of the table.

5. Method according to any of the previous claims 1-4, **characterized in that** molds are arranged in the mold on side walls extending along the longitudinal direction of the table, which extend in a direction transverse to the table surface.

6. Method according to any of the previous claims 1-5, **characterized in that,** before pouring the concrete into the mold, tubes are provided which extend through the mold in the longitudinal direction of the table and which are slid out of the mold after the concrete has been poured and before the concrete has cured.

7. Method according to any of the previous claims 1-6, **characterized in that** the active reinforcement is prestressed with a force of at least 50 kN.

8. Method according to any of the previous claims 1-7, **characterized in that** the active reinforcement in a transverse direction parallel to the table surface and transverse to the longitudinal direction of the table comprises at least five and at most ten prestressed metal strands per meter and that the passive reinforcement along the transverse direction comprises at least one and at most nine rods per meter.

9. Method according to any of the previous claims 1-8, **characterized in that** when the active reinforcement is prestressed, the table surface is curved, wherein the table surface has a curvature of at least 1 cm along the longitudinal direction of the table.

10. Table for manufacturing a hollowcore concrete slab comprising a longitudinally extending U-shaped metal plate, the U-shaped metal plate forming a table surface, **characterized in that** the table comprises, along the longitudinal direction of the metal plate near a first end of the table and near a second opposite end of the table, wedge-shaped guides for guiding active reinforcement at the first end from a first side of the table surface to a second opposite side of the table surface and at the second end from the second opposite side of the table surface to the first side of the table surface.

11. Table according to claim 10, **characterized in that** slots are provided in the table surface extending from the wedge-shaped guides to the first end and the second end of the table.

12. Table according to claim 10 or 11, **characterized in that** the table is made of steel, the steel having a maximum thickness of 8 mm.

13. Table according to claim 10, 11 or 12, **characterized in that** the table comprises cross connections between legs of the U-shaped metal plate extending transversely to the longitudinal direction of the metal plate.

14. Table according to any of claims 10-13, **characterized in that** the wedge-shaped guides are integrated in a metal block, wherein the metal block is positioned on the first side of the table surface and wherein the wedge-shaped guides extend through the table surface to the second side of the table surface.

15. Use of a method according to any of claims 1-9 or a table according to any of claims 10-14 for manufacturing a hollowcore concrete slab.

Fig. 1

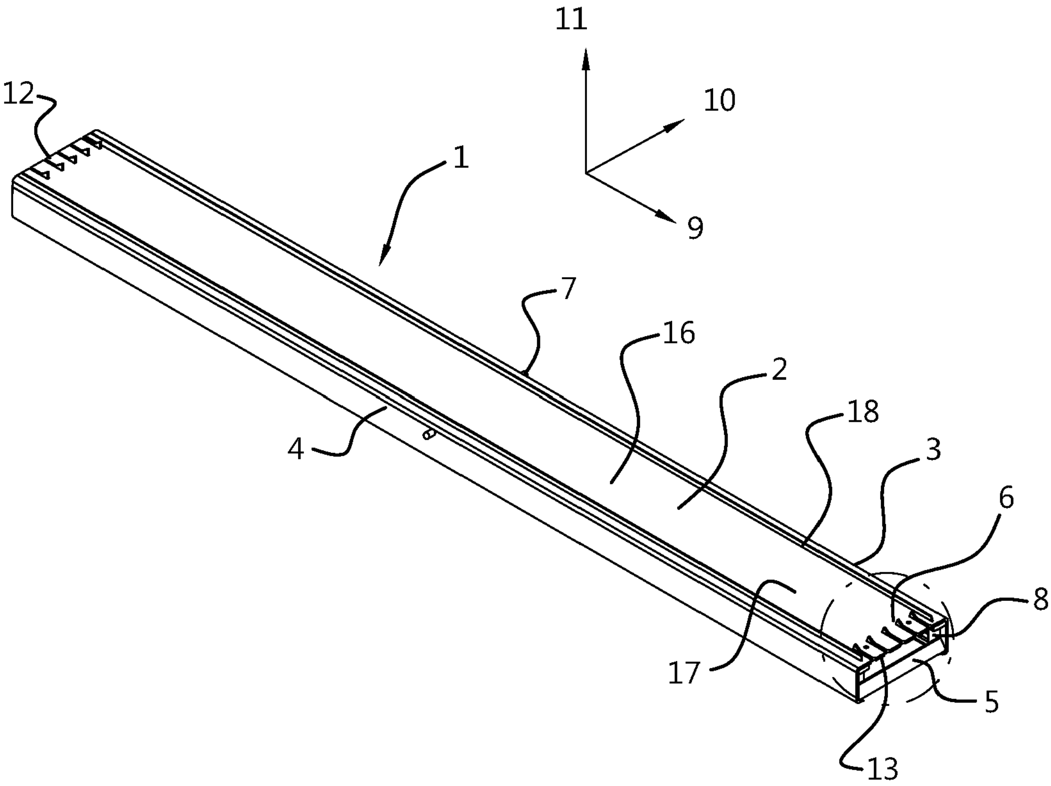


Fig. 2

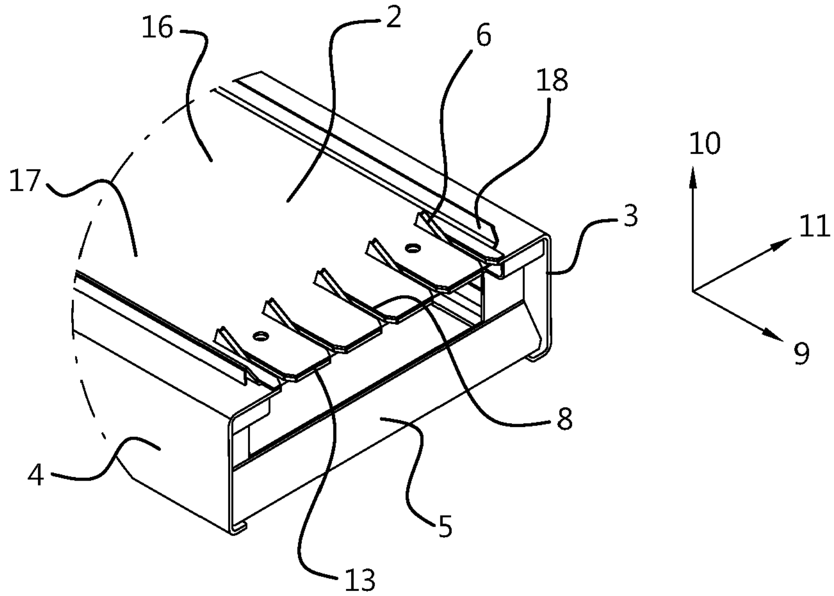


Fig. 3

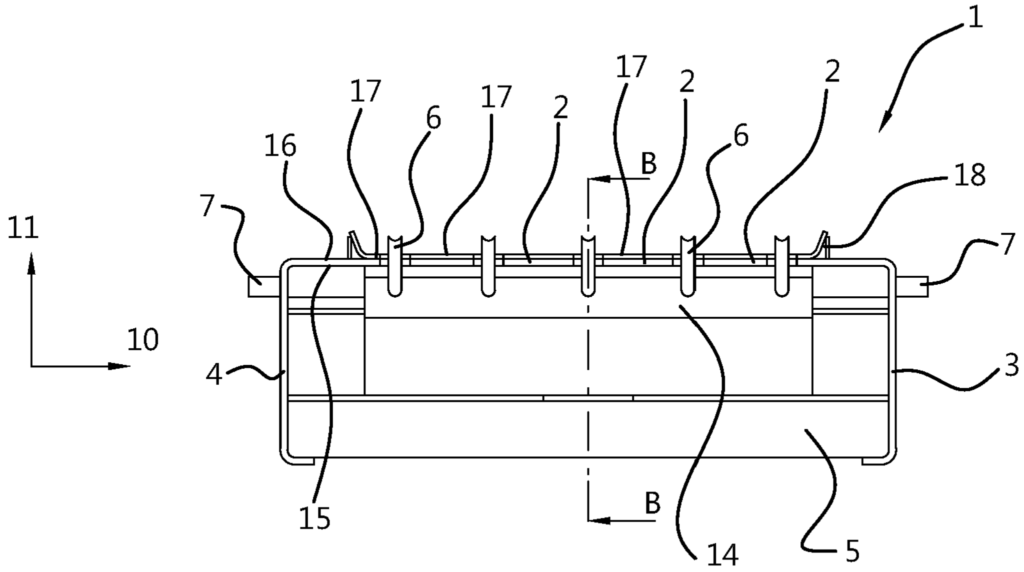


Fig. 4