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(54) END SURFACE PARTITION AND METHOD FOR MANUFACTURING PILES

(57) The present invention relates to an end surface partition and corresponding method for mutually separating elongate concrete products, such as piles, which are formed by pouring concrete into and curing concrete in an elongate mould with the end surface partition and one or more post-tension cables placed therein.

The end surface partition according to the present invention comprises a wall comprising a slot in which at least one of the one or more pre-tension cables can be received, confining means which are configured to confine the post-tension cable(s) received in the slots in order to ensure a respective minimum penetration depth into the slot for each received pre-tension cable, and operating means for releasing the confinement by the confining means so that the end surface partition can be removed from the elongate mould, wherein the operating means are configured so that they can be operated after pouring and at least partial curing of the concrete in the elongate mould.

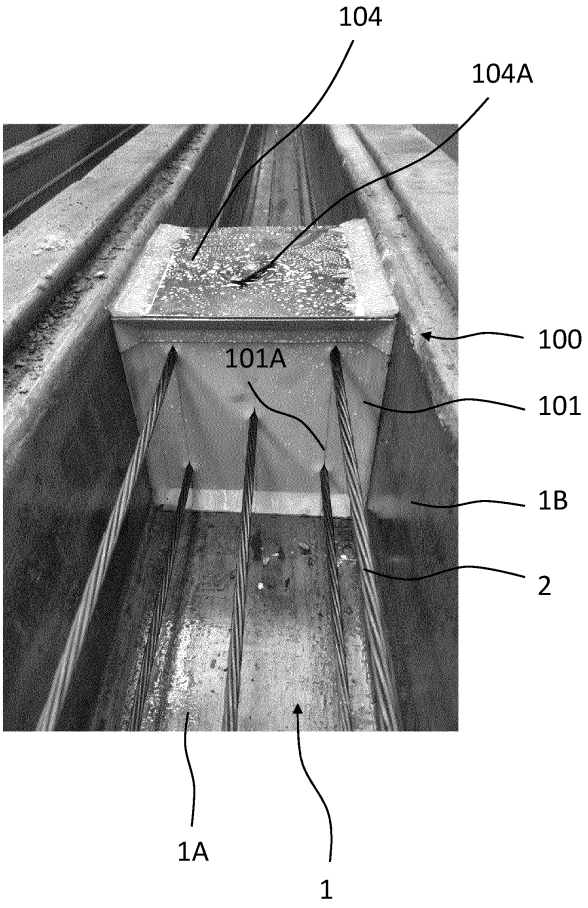

FIG. 2

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Description

[0001] The present invention relates to an end surface partition for mutually separating elongate concrete products, such as piles, which are formed by pouring concrete into and curing concrete in an elongate mould with the end surface partition and one or more post-tension cables placed therein. The present invention further relates to a method for simultaneously forming elongate concrete products, such as piles, wherein this end surface partition is used.

[0002] Figure 1 shows a known method for simultaneously forming a plurality of piles by pouring concrete into an elongate mould. Before the concrete is poured into a mould 1, post-tension cables 2 are first placed in mould 1. These are for instance unwound from a roll situated at a first outer end of mould 1. A pulling device 5, with which post-tension cables 2 can be pulled through mould 1 toward the second outer end, can optionally be provided at the opposite, second outer end of mould 1. Before post-tension cables 2 are pulled toward the second outer end by pulling device 5, an end surface partition 100 is first placed in mould 1. An example of an end surface partition 100 is shown in figure 1 at top left.

[0003] Figure 1 shows an example wherein two piles 4 are manufactured by means of a single end surface partition 100. It must be noted that this is merely a simplified representation. Mould 1 can thus have a length of more than 200 metres, wherein a plurality of end surface partitions 100 is used. The length of a pile 4 can for instance lie between 2.5 and 25 metres.

[0004] End surface partition 100 comprises a pair of side walls 101, 102 which are placed at a mutual distance and which are connected by an upper wall 104. A first side wall 101 forms here the underside of a pile 4 and a second side wall 102 the upper side of another pile 4. Second side wall 102 is usually provided with a recess 102A through which pile 4, shown at bottom left, is provided on an upper side with a convex portion 4A.

[0005] Shown in the centre of figure 1 is a top view of mould 1 with placed therein end surface partition 100 and three post-tension cables 2 for the formation of two piles 4. Mould 1 comprises a mould bottom 1A and mould side walls 1B.

[0006] An example of a pile 4 made with mould 1 is shown at left in figure 1. The schematic view of end surface partition 100 at top left in figure 1 and the cross-sections of end surface partition 100 at two different positions in the longitudinal direction of mould 1 show openings 103 in first side wall 101 and second side wall 102, through which post-tension cables 2 are passed. In order to pass post-tension cables 2 through openings 103 a user must manually insert an end of a post-tension cable 2 through opening 103 and then string end surface partition 100 onto post-tension cables 2. After this, the ends of post-tension cables 2 can be engaged by pulling device 5. For this purpose pulling device 5 can comprise a pulling plate to which post-tension cables 2 are attached. Pulling device 5 can further comprise a winch with which the pulling plate is pulled toward the second end. Once attached at the second outer end, post-tension cables 2 can be pre-tensioned by a pulling device 6. Once pre-tensioned, post-tension cables 2 are further fully tensioned by means of pulling device 5. After the pre-tension has been applied, cage reinforcement can likewise be positioned in mould 1 at the end surface partitions and be coupled to post-tension cables 2. This cage reinforcement serves to strengthen pile 4 close to the head and foot of pile 4.

[0007] As subsequent step, mould 1 is poured full of concrete. Two piles 4 are hereby formed more or less simultaneously. After the concrete has cured, end surface partition 100 must be removed. For this purpose a user must cut through post-tension cables 2 in the space of an end surface partition 100 between the first and second side walls 101, 102. Piles 4 can then be removed from wall 1, for instance using vacuum lifting equipment. During this removal, end surface partition 100 will also be pulled out of mould 1 because it is still coupled to the post-tension cable ends protruding from pile 4. A user must then separate end surface partition 100 from pile 4. As final step, the post-tension cable ends must be cut off.

[0008] The above method for manufacturing piles is particularly labour-intensive, particularly the stringing of the end surface partitions onto the post-tension cables and the removal of the end surface partitions from the mould.

[0009] An object of the present invention is to provide an end surface partition whereby a plurality of piles or other type of elongate concrete product can be formed in a less labour-intensive manner.

[0010] According to the present invention, this object is achieved with the end surface partition according to claim 1, which is configured to mutually separate elongate concrete products which are formed by pouring concrete into and curing concrete in an elongate mould with the end surface partition and one or more post-tension cables placed therein. According to the present invention, the end surface partition comprises a wall comprising a slot in which at least one of the one or more pre-tension cables can be received. The end surface partition further comprises confining means which are configured to confine the pre-tension cable(s) received in the slot in order to ensure a respective minimum penetration depth into the slot for each received pre-tension cable. The end surface partition also comprises operating means for releasing the confinement by the confining means so that the end surface partition can be removed from the elongate mould, wherein the operating means are configured so that they can be operated after pouring and at least partial curing of the concrete in the elongate mould.

[0011] Making use of a slot in which the pre-tension cable(s) can be confined makes it possible to place the end surface partition in simple manner. This is because, in the known end surface partition, the pre-tension cables

had to be passed through openings in the end surface partition. With the end surface partition according to the present invention the end surface partition is placed over the pre-tension cable(s) such that the pre-tension cable(s) enter(s) the slot. Such a placing is much less intensive than stringing end surface partitions onto pre-tension cables.

[0012] The confining means provide for a determined positioning of the pre-tension cable(s) relative to a bottom of the mould. Without confining means, the pre-tension cable(s) would sag, whereby the position of the pre-tension cable(s) relative to the bottom of the mould would become highly dependent on the position in the longitudinal direction of the mould and could even come into contact with the bottom of the mould. In respect of the known end surface partition, confinement of the pre-tension cable(s) to prevent the pre-tension cable(s) from entering further into the slot is not necessary or not present.

[0013] The operating means can also be configured to, by engagement thereof, remove the end surface partition from the elongate mould after at least partial curing of the concrete. The operating means can thus be configured to remove the end surface partition from the elongate mould after at least partial curing of the concrete by means of pulling on the operating means. The operating means can particularly be configured to, when pulled, perform a movement wherein the confinement is released and wherein the end surface partition can simultaneously or contiguously be removed from the mould.

[0014] The confining means can comprise a first arm which is connected pivotally to the wall and which can be moved between a first position, in which position the first arm overlaps the slot at least partially, and a second position, in which position the first arm does not overlap the slot, or hardly so. The first arm is here movable from the first position to the second position by engagement with a pre-tension cable which moves into the slot, and wherein the confining means are configured to hold the first arm in the first position when engaging with a pre-tension cable which wants to move out of the slot. The first arm can for instance comprise an end which, with the first arm in the first position, prevents the pre-tension cable in the slot from dropping toward the bottom of the mould below a determined height relative to the bottom of the mould.

[0015] The operating means can be translatable in a direction parallel to the slot. The confining means can also comprise a connecting element which is connected pivotally to the first arm and which is connected pivotally to the operating means. By operating the operating means, more particularly by translating the operating means, the first arm will pivot with interposing of the connecting element. The wall can here comprise a first plate part in which the slot is arranged and the operating means can comprise a second plate part which is attached slidably to the first plate part. The first plate part can further comprise a slotted hole and the second plate part can comprise a coupling element, such as a pin, whereby the second plate part is coupled slidably to the first plate part. It is however also possible for the second plate part to comprise a slotted hole and the first plate part a coupling element, such as a pin, whereby the first plate part is coupled slidably to the second plate part. Using a plurality of slotted holes and a plurality of coupling elements makes it possible to limit the freedom of movement of the second plate relative to the first plate, for instance to just the above stated translating movement in the longitudinal direction of the slot.

[0016] The connecting element can be a rigid element which is connected pivotally to the second plate part at a pivot point, wherein the pivot point is configured to move relative to the connecting element or the second plate part when the first arm moves from the first position to the second position. The connecting element can for instance comprise a slotted hole, wherein the second plate part comprises a coupling element, such as a pin, which engages in the slotted hole and thus forms a hinge for pivoting the connecting element relative to the second plate part. It is however also possible for the second plate part to comprise a slotted hole and the connecting element a coupling element, such as a pin, which engages in the slotted hole and thus forms a hinge for pivoting the connecting element relative to the second plate part.

[0017] The connecting element can be a rigid element which is connected pivotally to the second plate part at a pivot point, wherein the pivot point is stationary relative to the connecting element and the second plate part when the first arm moves from the first position to the second position. In this case the first arm can move from the first position to the second position by the mutual translation of the first and second plate part.

[0018] The connecting element can however also be a flexible element which can move between a taut state, in which further extension of the flexible element is not possible, or hardly so, and a slack state. The connecting element can be configured to, in the taut state, hold the first arm in the first position upon engagement with a pre-tension cable which wants to move out of the slot and to move from the taut state to the slack state by engagement with a pre-tension cable which moves into the slot.

[0019] The wall can comprise a plurality of the above stated slots, wherein each slot is configured to receive at least one of the one or more pre-tension cables. Additionally or instead, the slot can be configured to receive a plurality of pre-tension cables per slot, wherein the confining means are configured to ensure a respective minimum penetration depth into the slot for each received pre-tension cable.

[0020] The end surface partition can comprise a first side wall and a second side wall, wherein the end surface partition is configured to simultaneously form a first end surface of a first elongate concrete product with the first side wall and a second end surface of an adjacent, second elongate concrete product with the second side wall during pouring of the concrete into and curing of the concrete in the elongate mould. The above stated wall is

placed between the first side wall and second side wall.

[0021] The top of a pile, i.e. the side which is struck during placing of the pile, can comprise a protrusion for better distribution of the exerted forces. The inverse of this shape can be arranged in the first or second side wall. The first or second side wall can for instance be provided with a recess.

[0022] The first side wall can be provided at a surface thereof which is directed toward the first elongate concrete product to be formed with a first flexible sealing layer comprising a first cut which coincides with the slot. The second side wall can also be provided at a surface thereof which is directed toward the second elongate concrete product to be formed with a second flexible sealing layer comprising a second cut which coincides with the slot. The first and second flexible sealing layer are configured to prevent concrete from entering the end surface partition during pouring of the concrete and/or curing thereof.

[0023] The first and second side walls can be configured to pivot toward each other to enable the end surface partition to be released from the mould. After pivoting, the end surface partition will widen in upward direction, as seen from the bottom of the mould. The end surface partition can here comprise an upper wall, wherein the first side wall and second side wall are pivotally connected to the upper wall to enable the first and second side wall to be pivoted toward each other. The upper wall can be provided at a side remote from the mould with a third sealing layer to prevent or impede concrete from entering the end surface partition from an upper side during pouring of the concrete. This third sealing layer can comprise a third cut through which the operating means extend outward.

[0024] The operating means can be configured to, when engaged, pivot the first and second side walls toward each other. The end surface partition can thus comprise a first coupling arm which couples the first side wall pivotally to the operating means and a second coupling arm which couples the second side wall pivotally to the operating means, such that when the operating means are engaged, the first and second side walls pivot toward each other.

The first and second coupling arm can here each be pivotally connected to the second plate part.

[0025] According to a second aspect of the present invention, a method is provided for simultaneously forming elongate concrete products, such as piles. The method comprises here the steps of arranging one or more pre-tension cables in an elongate mould, placing an end surface partition according to the present invention in the elongate mould, sliding the pre-tension cable(s) into the slot or slots of the end surface partition such that it is/they are confined in the slot or slots, pouring concrete into and allowing at least partial curing of concrete in the elongate mould, and operating the operating means of the end surface partition and removing the end surface partition from the elongate mould.

[0026] Prior to placing of the end surface partition in the elongate mould, the one or more post-tension cables can be pre-tensioned. The tension in the one or more pre-tension cables can further be increased after the end surface partition is placed in the elongate mould.

[0027] The present invention will be discussed further hereinbelow with reference to the accompanying figures, wherein the same or similar components will be designated with identical reference numerals and wherein:

Figure 1 shows an example of a known device for manufacturing piles;
Figure 2 shows an embodiment of an end surface partition according to the present invention which is placed in a mould;
Figure 3 shows a perspective side view of the end surface partition of figure 2;
Figures 4A and 4B show schematically the confinement of a post-tension cable according to the present invention;
Figures 5 and 6 show the internal mechanism of the end surface partition of figures 2 and 3 in two different states; and
Figures 7 and 8 show the embodiment of figures 2 and 3 corresponding with the states of respectively figure 5 and 6.

[0028] Figure 2 shows an embodiment of an end surface partition 100 according to the present invention, which is placed in a mould 1 having a mould bottom 1A and mould side walls 1B. End surface partition 100 comprises a first side wall 101 which is provided with a flexible sealing layer, for instance made of polyurethane. This sealing layer comprises a cut 101A which coincides with a slot 122 of end surface partition 100 as shown in figure 5. The sealing layer prevents liquid concrete from entering end surface partition 100. As shown, end surface partition 100 comprises three slots 122 in which a total of five post-tension cables 2 are received. A handle 104A connected to second plate part 121, as will be elucidated in figure 4A, further protrudes from upper wall 104.

[0029] Figure 3 shows a perspective side view of the end surface partition of figure 2. An internal mechanism 110 of end surface partition 100, which will be further elucidated in figures 5 and 6, is visible here. Figure 3 shows that internal mechanism 110 comprises a transverse connection 111 which is connected by means of hinges 112A, 112B to support parts 113A, 113B of respectively first side wall 101 and second side wall 102. It can further be seen that support part 113B is connected pivotally to second plate part 121 by means of hinge 114, coupling arm 115, second hinge 116 and plate part 117. Support part 113A is connected pivotally to second plate part 121 in similar manner. Figure 3 also shows a recess 102A for the formation of a protrusion 4A of pile 4 as shown in figure 1.

[0030] Figure 4A shows schematically the operation of a part of internal mechanism 110 and shows the confine-

ment of a post-tension cable 2 as according to the present invention

[0031] Internal mechanism 110 comprises a first plate part 120 and a second plate part 121. First plate part 120 is provided with a slot 122 in which a post-tension cable 2 is received. First plate part 120 is connected pivotally to an arm 124 by means of a hinge 123, which arm is in turn connected to second plate part 121 by means of a hinge 125, rigid coupling arm 126 and hinge 127. Hinge 127 is here formed by a pin which is fixed to coupling arm 126 and which can translate in a slotted hole 128.

[0032] The figure at top left in figure 4A shows that a post-tension cable 2 moves upward in slot 122. If post-tension cable 2 comes into contact with first arm 124, which lies partially over slot 122, post-tension cable 2 pushes hinge 127 to the right as shown at top right in figure 4A. If post-tension cable 2 moves further into slot 122, first arm 124 will return to the position as shown at top left in figure 4A.

[0033] Hinge 123, arm 124, hinge 125, coupling arm 126 and hinge 127 form part of confining means which can confine post-tension cable 2. The operation of these confining means is as follows. If post-tension cable 2 moves further into slot 122, on the basis of the situation at top right in figure 4A, arm 124 will move back to the position shown at top left in figure 4A. This situation is shown at bottom left in figure 4A. Arm 124 can optionally be under spring tension in order to bring about this movement. If post-tension cable 2 moves downward in this position of arm 124, arm 124 will block this movement. This is because post-tension cable 2 presses on arm 124, whereby hinge 127 runs up against an end of slotted hole 128.

[0034] The confinement can be released by translating second plate part 121 relative to first plate part 120. Other relative movements of first plate part 120 and second plate part 121 for the purpose of releasing the confinement are not precluded.

[0035] By moving second plate part 121 upward, for instance by pulling handle 104A, arm 124 is pulled out of engagement with post-tension cable 2 and the situation as shown at bottom right in figure 4A is reached.

[0036] In the embodiment shown in figure 4A post-tension cable 2 can push arm 124 away during an upward movement in slot 122. This is possible in that hinge 127 is able to move in slotted hole 128.

[0037] In another embodiment hinge 127 is unable to move, and coupling arm 126 is coupled to second plate part 121 at a fixed position. In such a case arm 124 can only move away by moving second plate part 121 upward. Confinement can be achieved by moving second plate part 121 back down at the moment that post-tension cable 2 is positioned sufficiently high in slot 122.

[0038] Figure 4B shows an alternative embodiment wherein, in contrast to figure 4A, coupling arm 126 does not take a rigid form but a flexible form. In the position of arm 124 shown at top left in figure 4B coupling arm 126 is here in a taut state, wherein coupling arm 126 is not extendable, or hardly so. If arm 124 is however engaged by a post-tension cable 2, as shown at top right in figure 4B, coupling arm 126 will take on a slack state and arm 124 will be moved by post-tension cable 2. Confinement is in this embodiment similar to that shown at bottom left in figure 4A, with the difference that further movement of coupling arm 126 is prevented in that further extension of coupling arm 126 is impossible, as opposed to hinge 127 running up against an end of slotted hole 128. Releasing the confinement proceeds similarly to the figure at bottom right in figure 4A.

[0039] Coupling arm 126 can comprise a resilient element which presses first arm 124 against a stop 129. In such a case confinement is achieved in that arm 124 lies against stop 129. In this case the confinement can also be released by moving first plate part 120 and second plate part 121 relative to each other. A post-tension cable 2 which is placed in slot 122 will here move counter to the spring tension in arm 124 and coupling arm 126.

[0040] Figures 5 and 6 show internal mechanism 110 of the end surface partition of figures 2 and 3 in two different states. Figure 5 shows the situation in which arm 124 is in a position for confining a post-tension cable and figure 6 a situation in which a post-tension cable can move up and downward in slot 122. Compared to the schematic operation shown in figure 4A, it is noted that the embodiment in figures 5 and 6 has three slots and, per slot, two confining means for confining different post-tension cables 2 at different heights. It is further noted that the position of the middle post-tension cable in figure 2 does not correspond with the position shown in figures 5 and 6, but it will be apparent that the same operating principle can be applied.

[0041] Second plate part 121 further comprises slotted holes 130 and first plate part 120 comprises pins 131 which engage in slotted holes 130. The use of a plurality of slotted holes 130 and pins 131 limits the relative movement of first plate part 120 and second plate part 121 to a translation. It is further shown that plate part 117, likewise shown in figure 3, is coupled to second plate part 121.

[0042] Figures 7 and 8 show the embodiment of figures 2 and 3 corresponding to the states of respective figures 5 and 6. In figure 8 the second plate part 121 has been moved upward. Side walls 101, 102 have hereby pivoted inward relative to the situation shown in figure 7. It can further be seen that upper wall 104 comprises parts 104B, 104C which connect to side walls 101, 102 in the situation shown in figure 7, but which are located at a distance in figure 8.

[0043] The operation of the end surface partition of figures 2 and 3 will be elucidated hereinbelow. On the basis of a situation in which post-tension cables 2 have been pre-tensioned in mould 1, end surface partitions 100 are placed over post-tension cables 2. First plate part 120 and second plate part 121 are here in the position as shown in figure 5. Owing to engagement of the post-tension cables on arms 124 they will move from the position

as shown at top left in figure 4A to the position as shown at top right in figure 4A. A user will here generally pull post-tension cables 2 upward in slot 122 because, in the pre-tensioned state, they do not have the height which corresponds with the height reached in slot 122 after post-tension cables 2 have been confined therein. In practice, the user will move post-tension cable 2 to a position above the desired height in slot 122, after which arm 124 can take up the desired position for confinement of post-tension cables 2.

[0044] After end surface partitions 100 have been placed, the concrete can be poured. If the concrete has cured sufficiently, the user can operate handle 104A, whereby side walls 101, 102 pivot inward on one hand and the downward movement of post-tension cables 2 in slot 122 is released on the other. This makes it possible to remove end surface partition 100 from mould 1 without post-tension cables 2 having to be cut. After removal of end surface partitions 100, post-tension cables 2 can be cut very close to the end surfaces of the formed piles. The piles can then be removed from mould 1.

[0045] The present invention has been elucidated in the foregoing on the basis of embodiments thereof. It will be apparent to the skilled person that the present invention is not limited to these embodiments but that various modifications are possible without departing from the scope of protection of the present invention as defined by the appended claims and equivalents thereof.

Claims

1. End surface partition (100) for mutually separating elongate concrete products which are formed by pouring concrete into and curing concrete in an elongate mould (1) with the end surface partition (100) and one or more post-tension cables (2) placed therein, the end surface partition (100) comprising:

   a wall comprising a slot (122) in which at least one of the one or more pre-tension cables (2) can be received;
   confining means which are configured to confine the pre-tension cable(s) (2) received in the slot (122) in order to ensure a respective minimum penetration depth into the slot (122) for each received pre-tension cable (2);
   operating means for releasing the confinement by the confining means so that the end surface partition (122) can be removed from the elongate mould (1), wherein the operating means are configured so that they can be operated after pouring and at least partial curing of the concrete in the elongate mould (1).

2. End surface partition (100) according to claim 1, wherein the operating means are also configured to, by engagement thereof, remove the end surface partition (100) from the elongate mould (1) after at least partial curing of the concrete.

3. End surface partition (100) according to claim 1 or 2, wherein the operating means are configured to remove the end surface partition (100) from the elongate mould (1) after at least partial curing of the concrete by means of pulling on the operating means, wherein the operating means are preferably configured to, when pulled, perform a movement wherein the confinement is released and wherein the end surface partition (100) can simultaneously or contiguously be removed from the mould (1).

4. End surface partition (100) according to any one of the foregoing claims, wherein the confining means comprise a first arm (124) which is connected pivotally to the wall and which can be moved between a first position, in which position the first arm (124) overlaps the slot (122) at least partially, and a second position, in which position the first arm (124) does not overlap the slot, or hardly so;

   wherein the first arm (124) is movable from the first position to the second position by engagement with a pre-tension cable (2) which moves into the slot (122) and wherein the confining means are configured to hold the first arm (124) in the first position when engaging with a pre-tension cable (2) which wants to move out of the slot (122);
   wherein the operating means are translatable in a direction parallel to the slot (122) and wherein the confining means comprise a connecting element (126) which is connected pivotally to the first arm (124) and which is connected pivotally to the operating means.

5. End surface partition (100) according to claim 4, wherein the wall comprises a first plate part (120) in which the slot (122) is arranged and wherein the operating means comprise a second plate part (121) which is attached slidably to the first plate part (120), wherein:

   the first plate part preferably comprises a slotted hole and the second plate part a coupling element, such as a pin, whereby the second plate part (121) is coupled slidably to the first plate part (120), or
   the second plate part (121) preferably comprises a slotted hole (130) and the first plate part (120) a coupling element, such as a pin (131), whereby the first plate part (120) is coupled slidably to the second plate part (121).

6. End surface partition (100) according to any one of the claims 4-5,

wherein:

the connecting element (126) is a rigid element which is connected pivotally to the second plate part (121) at a pivot point, wherein the pivot point is configured to move relative to the connecting element (126) or the second plate part (121) when the first arm (124) moves from the first position to the second position, wherein the connecting element (126) preferably comprises a slotted hole (128) and wherein the second plate part (121) comprises a coupling element, such as a pin (127), which engages in the slotted hole (128) and thus forms a hinge for pivoting the connecting element (126) relative to the second plate part (121), or
the second plate part (121) preferably comprises a slotted hole (128) and wherein the connecting element (126) comprises a coupling element, such as a pin (127), which engages in the slotted hole (128) and thus forms a hinge for pivoting the connecting element (126) relative to the second plate part (121); or
wherein the connecting element (126) is a rigid element which is connected pivotally to the second plate part (121) at a pivot point, wherein the pivot point is stationary relative to the connecting element (126) and the second plate part (121) when the first arm (124) moves from the first position to the second position; or
wherein the connecting element (126) is a flexible element which can move between a taut state, in which further extension of the flexible element is not possible, or hardly so, and a slack state, wherein the connecting element (126) is configured to, in the taut state, hold the first arm (124) in the first position upon engagement with a pre-tension cable (2) which wants to move out of the slot (122), and wherein the connecting element (126) is configured to move from the taut state to the slack state by engagement with a pre-tension cable (2) which moves into the slot (122).

7. End surface partition (100) according to any one of the foregoing claims, wherein the wall comprises a plurality of said slots (122), wherein each slot (122) is configured to receive at least one of the one or more pre-tension cables (2); and/or
wherein the slot (122) is configured to receive a plurality of pre-tension cables (2) per slot (122), wherein the confining means are configured to ensure a respective minimum penetration depth into the slot (122) for each received pre-tension cable (2).

8. End surface partition (100) according to any one of the foregoing claims, wherein the end surface partition (100) comprises a first side wall (101) and a second side wall (102), wherein the wall is placed between the first side wall (101) and second side wall (102) and wherein the end surface partition (100) is configured to simultaneously form a first end surface of a first elongate concrete product with the first side wall (101) and a second end surface of an adjacent, second elongate concrete product with the second side wall (102) during pouring of the concrete into and curing of the concrete in the elongate mould (1).

9. End surface partition (100) according to claim 8, wherein the first side wall (101) is provided at a surface thereof which is directed toward the first elongate concrete product to be formed with a first flexible sealing layer, wherein the first sealing layer comprises a first cut (101A) which coincides with the slot (122), and wherein the second side wall (102) is provided at a surface thereof which is directed toward the second elongate concrete product to be formed with a second flexible sealing layer, wherein the second sealing layer comprises a second cut which coincides with the slot (122).

10. End surface partition (100) according to claim 8 or 9, wherein the first and second side walls (101, 102) can pivot toward each other to be able to release the end surface partition from the mould (1), the end surface partition (100) preferably further comprising an upper wall (104), wherein the first side wall (101) and second side wall (102) are connected pivotally to the upper wall (104) to be able to pivot the first and second side wall (101, 102) toward each other, wherein the upper wall (104) is preferably provided at a side remote from the mould (1) with a third sealing layer in order to prevent or impede concrete from entering the end surface partition (100) from an upper side during pouring of the concrete, wherein the third sealing layer preferably comprises a third cut through which the operating means (104A) extend outward.

11. End surface partition (100) according to claims 3 and 10, wherein the operating means are configured to, when engaged, pivot the first and second side walls (101, 102) toward each other, the end surface partition (100) further comprising a first coupling arm which couples the first side wall pivotally to the operating means and a second coupling arm (115) which couples the second side wall (102) pivotally to the operating means, such that when the operating means are engaged, the first and second side walls (101, 102) pivot toward each other.

12. End surface partition (100) according to claim 11 and claim 5, wherein the first coupling arm and second coupling arm (105) are each pivotally connected to the second plate part (121).

13. End surface partition (100) according to any one of

the foregoing claims, wherein the elongate concrete products are piles.

14. Method for simultaneously forming elongate concrete products, such as piles, comprising of:

arranging one or more pre-tension cables in an elongate mould;
placing an end surface partition as defined in any one of the foregoing claims in the elongate mould;
sliding the pre-tension cable(s) into the slot or slots of the end surface partition such that it is/they are confined in the slot or slots;
pouring concrete into and allowing at least partial curing of concrete in the elongate mould; and
operating the operating means of the end surface partition and removing the end surface partition from the elongate mould;
the method preferably further comprising of pre-tensioning the one or more pre-tension cables prior to placing the end surface partition in the elongate mould;
the method more preferably further comprising of increasing the tension in the one or more post-tension cables after placing the end surface partition in the elongate mould.

15. Pile manufactured by applying the method as defined in claim 14.

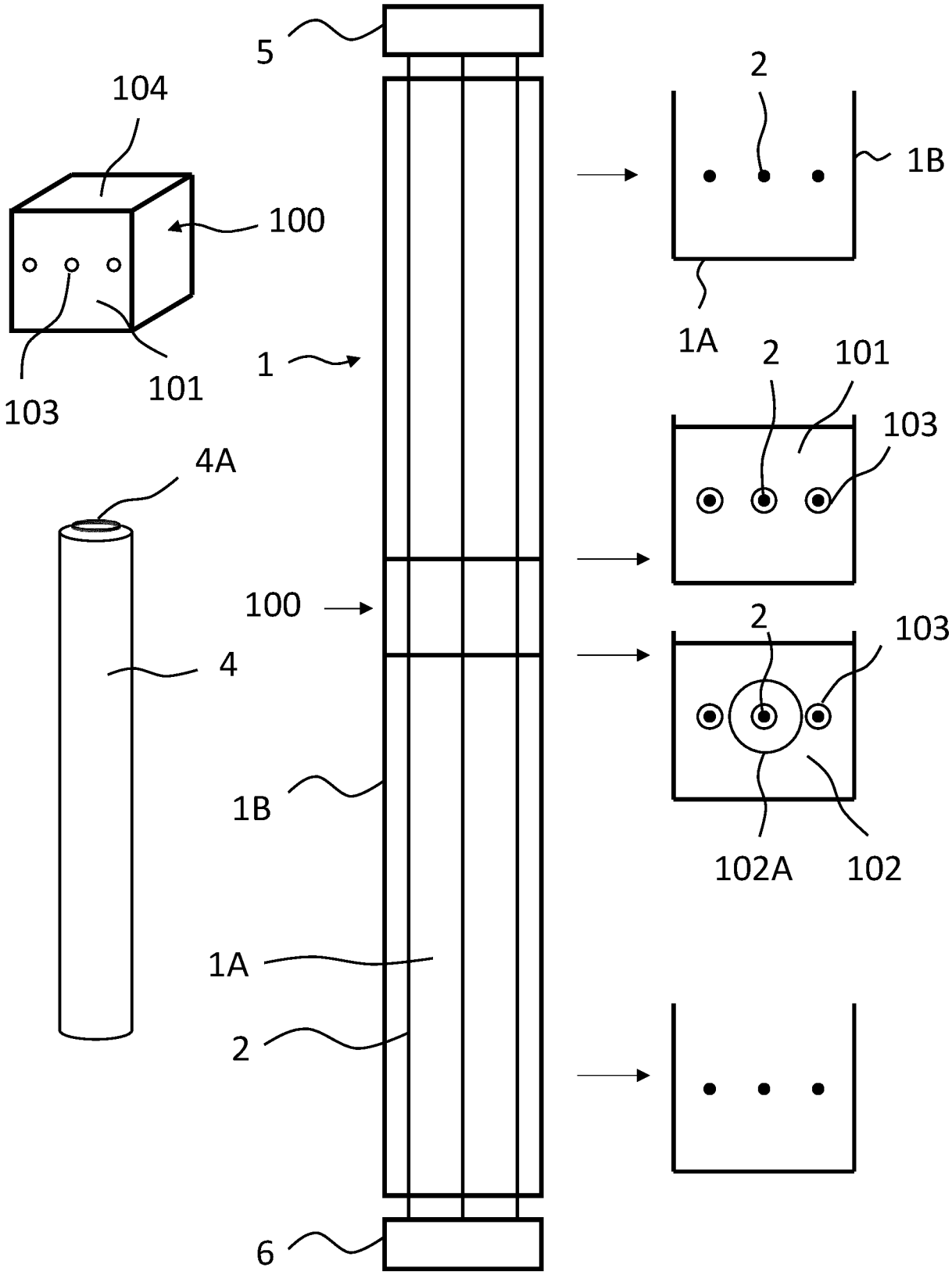


FIG. 1

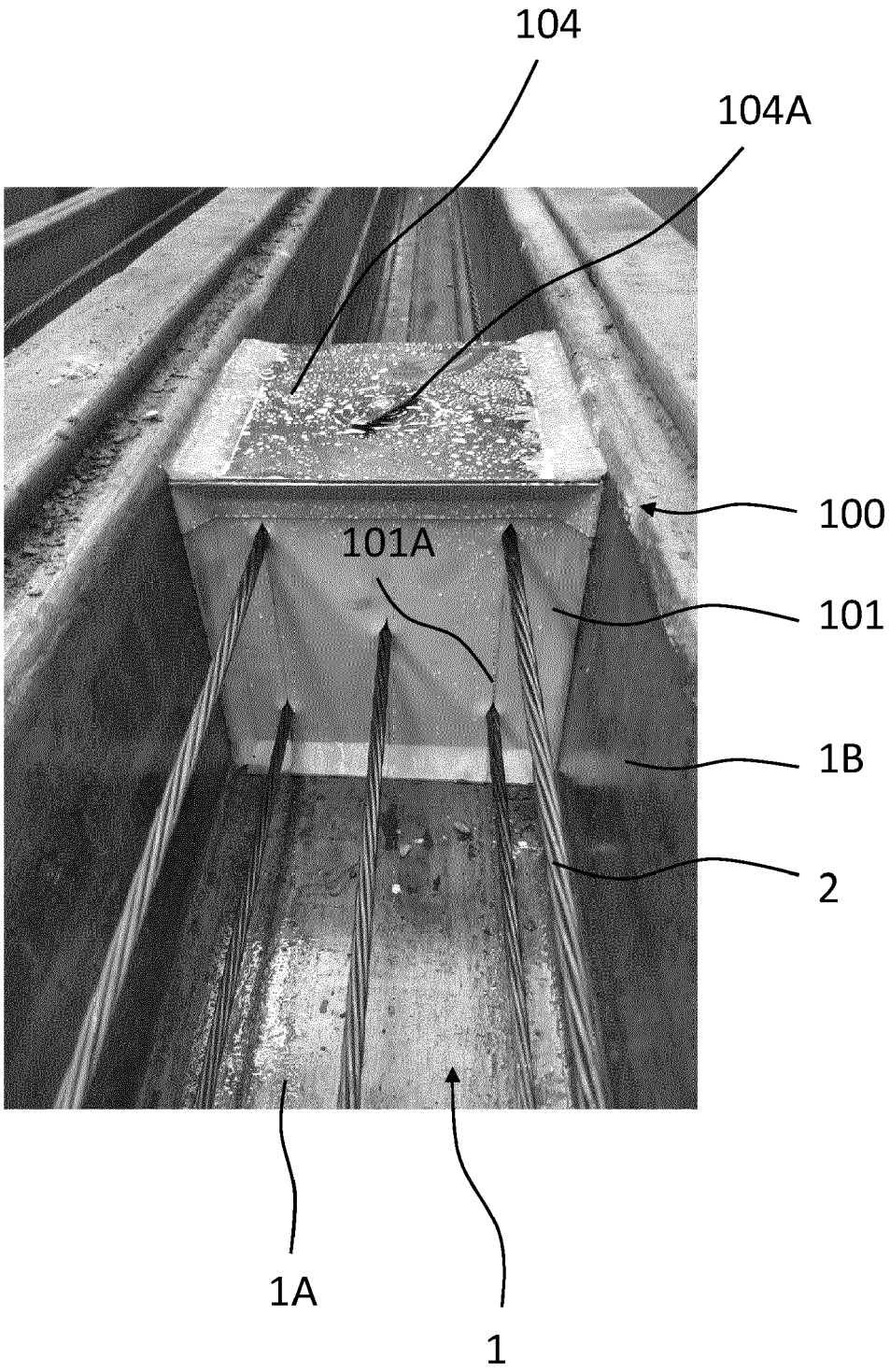


FIG. 2

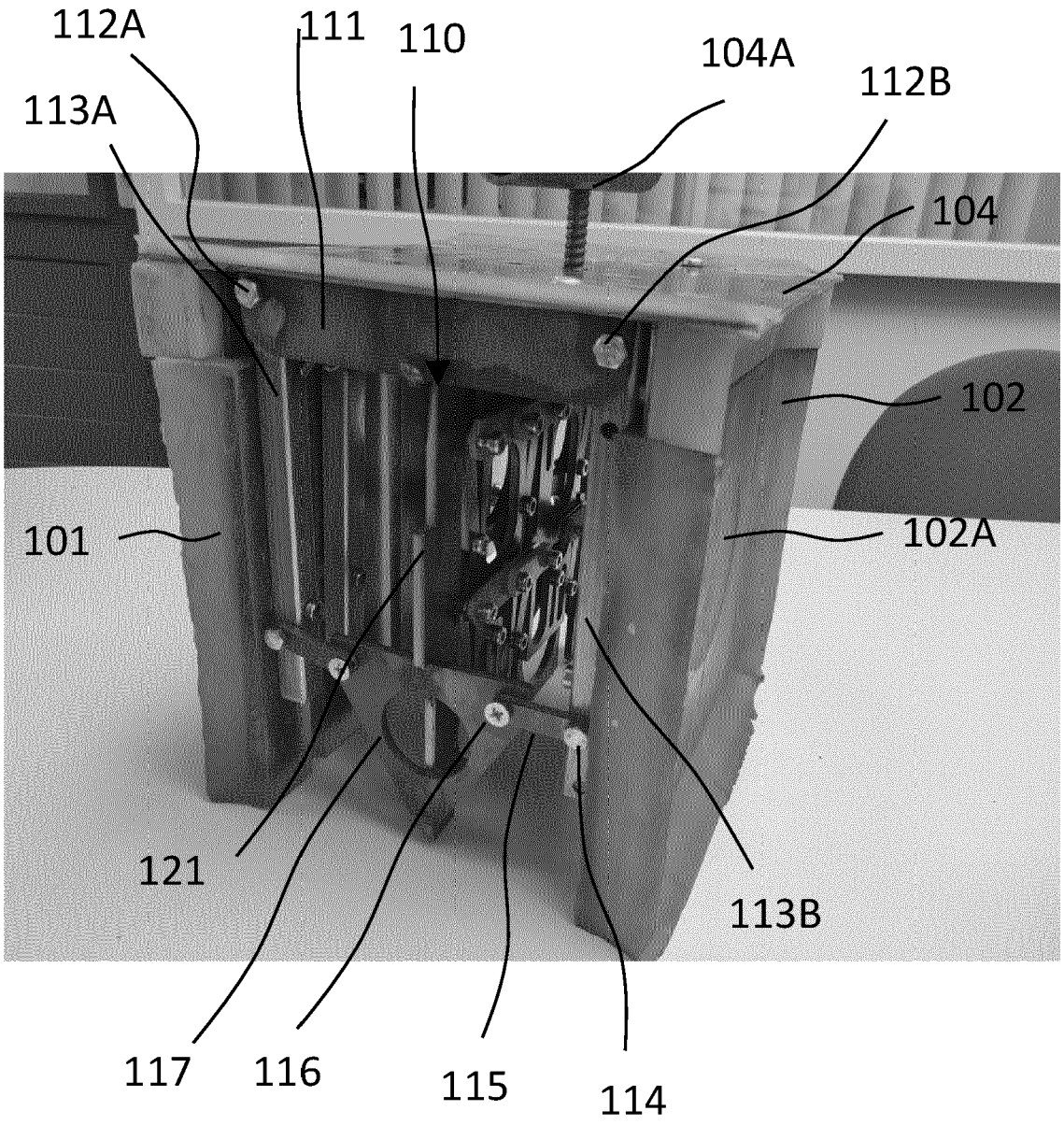

112A
111
110
104A
112B
113A
104
102
101
102A
121
113B
117
116
115
114

FIG. 3

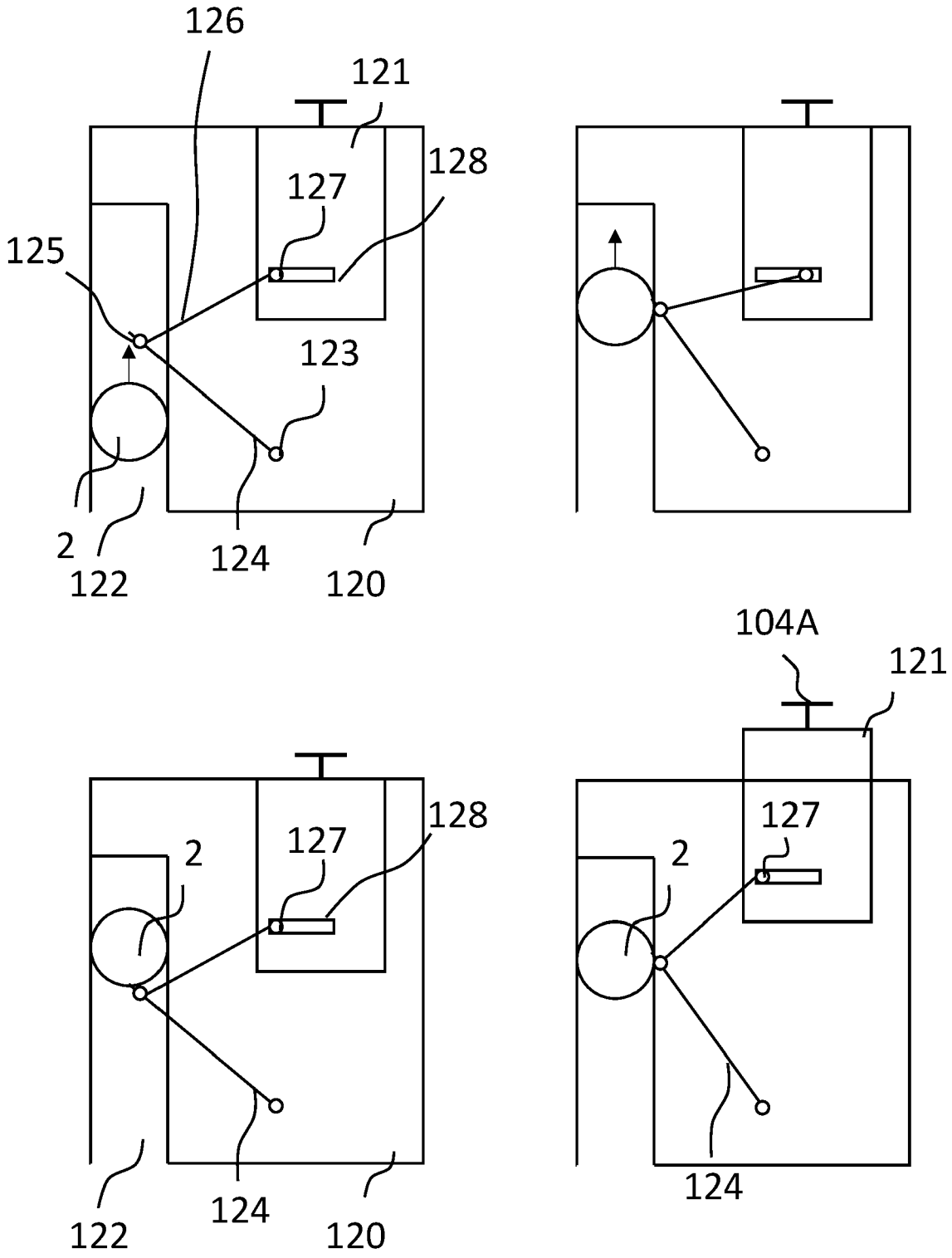

126
121
128
127
125
123
2
122
124
120
104A
121
127
128
2
127
2
122
124
120
124

FIG. 4A

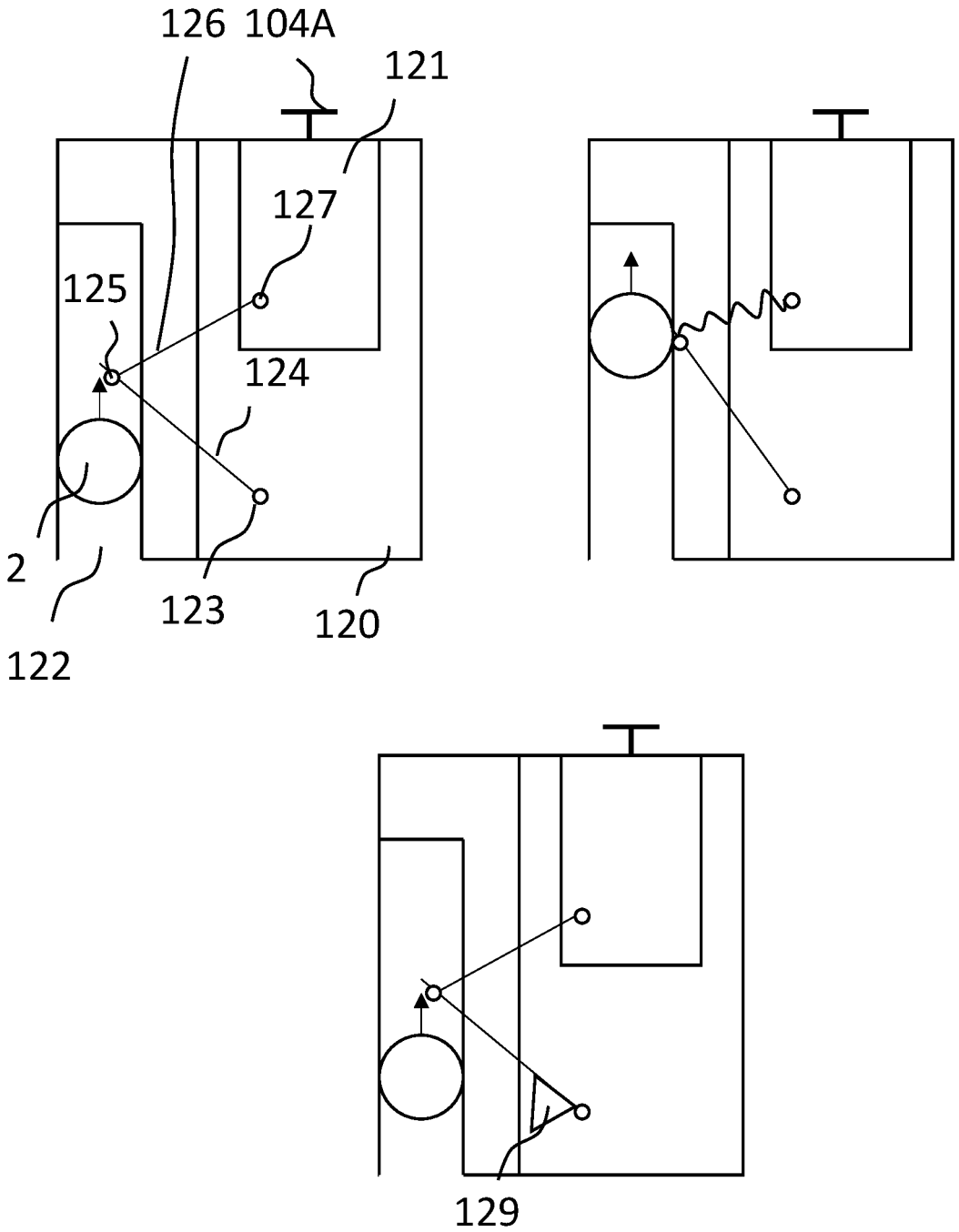
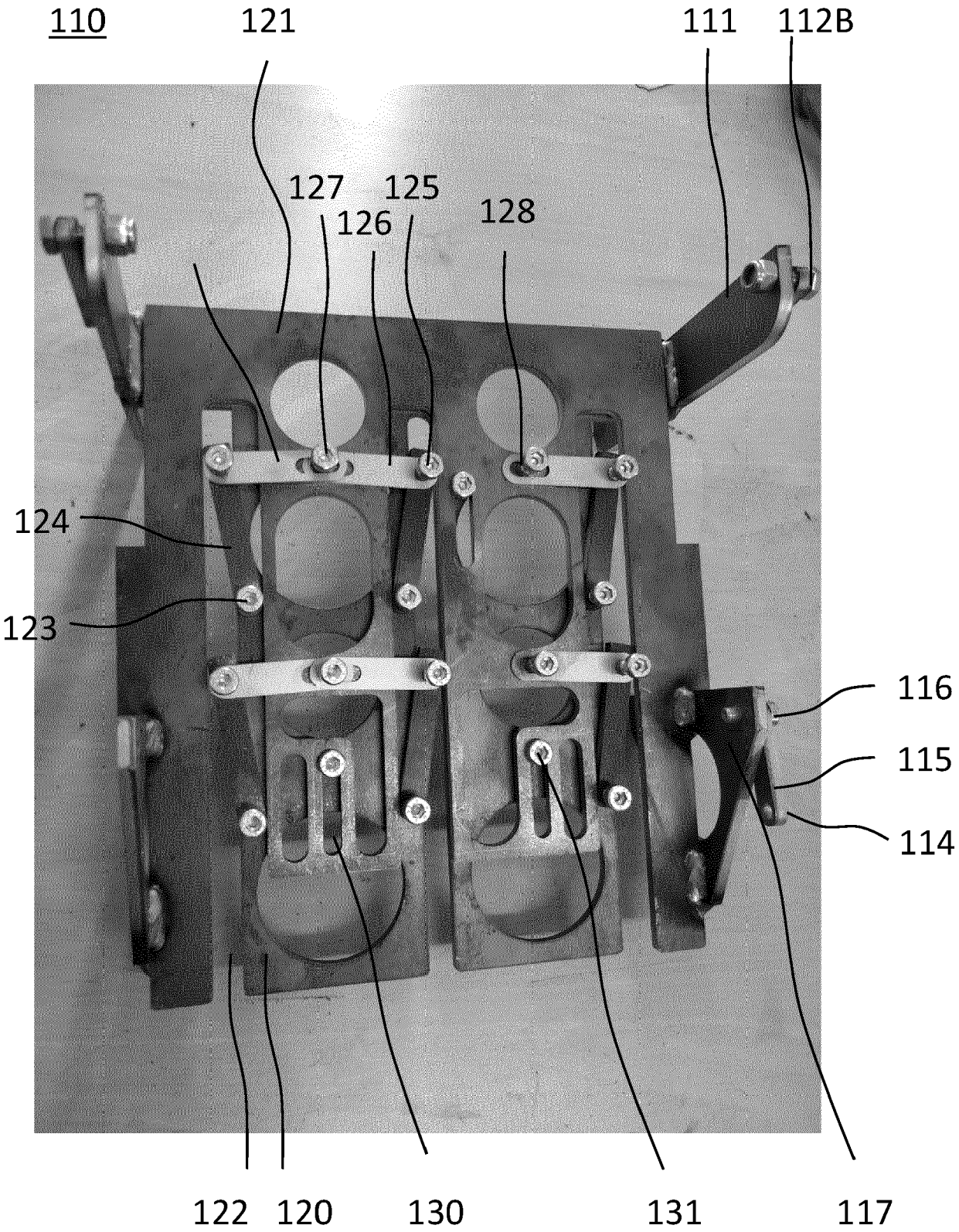


FIG. 4B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112B
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128
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123
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115
114
122
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130
131
117

FIG. 5

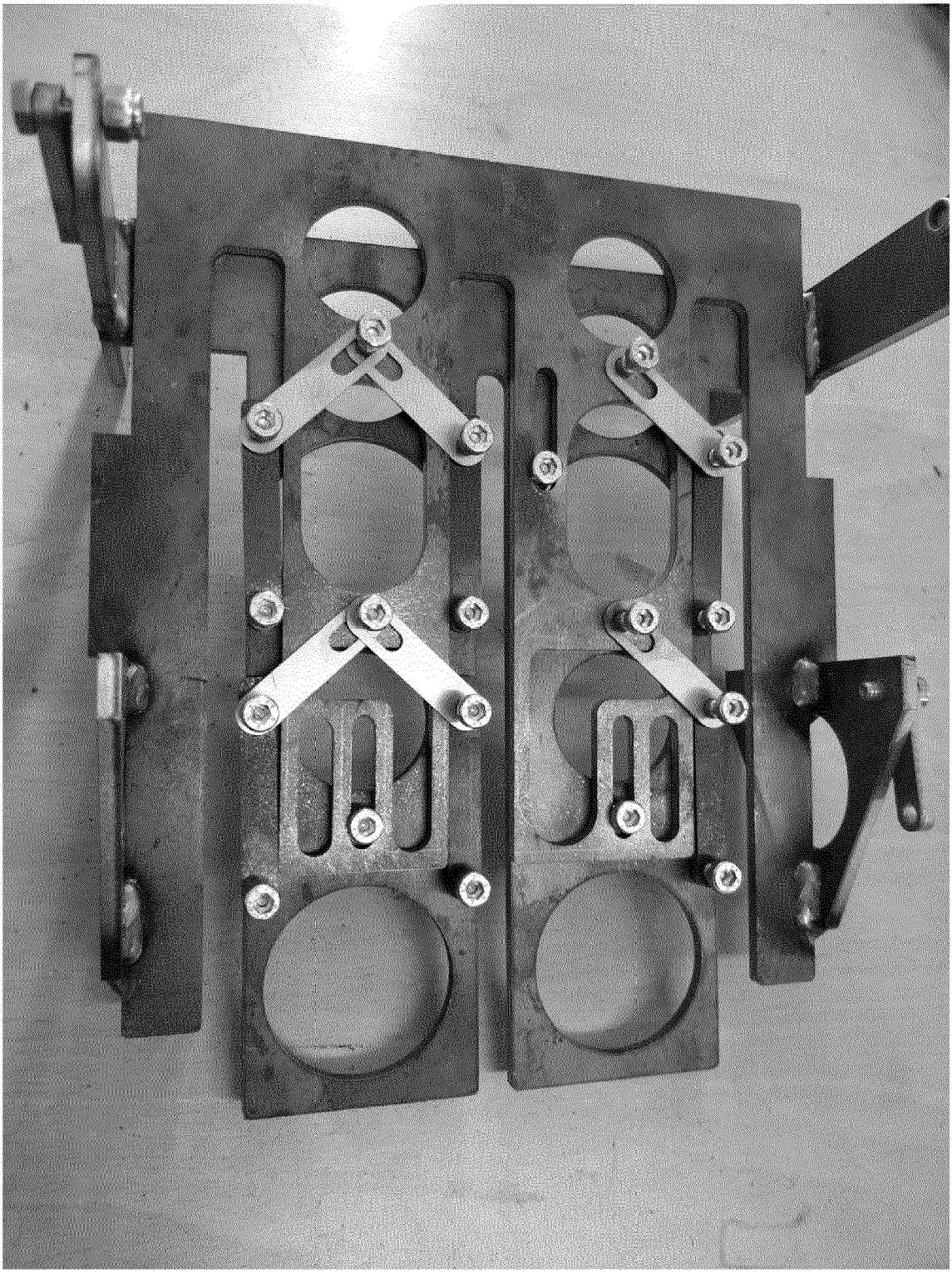

FIG. 6

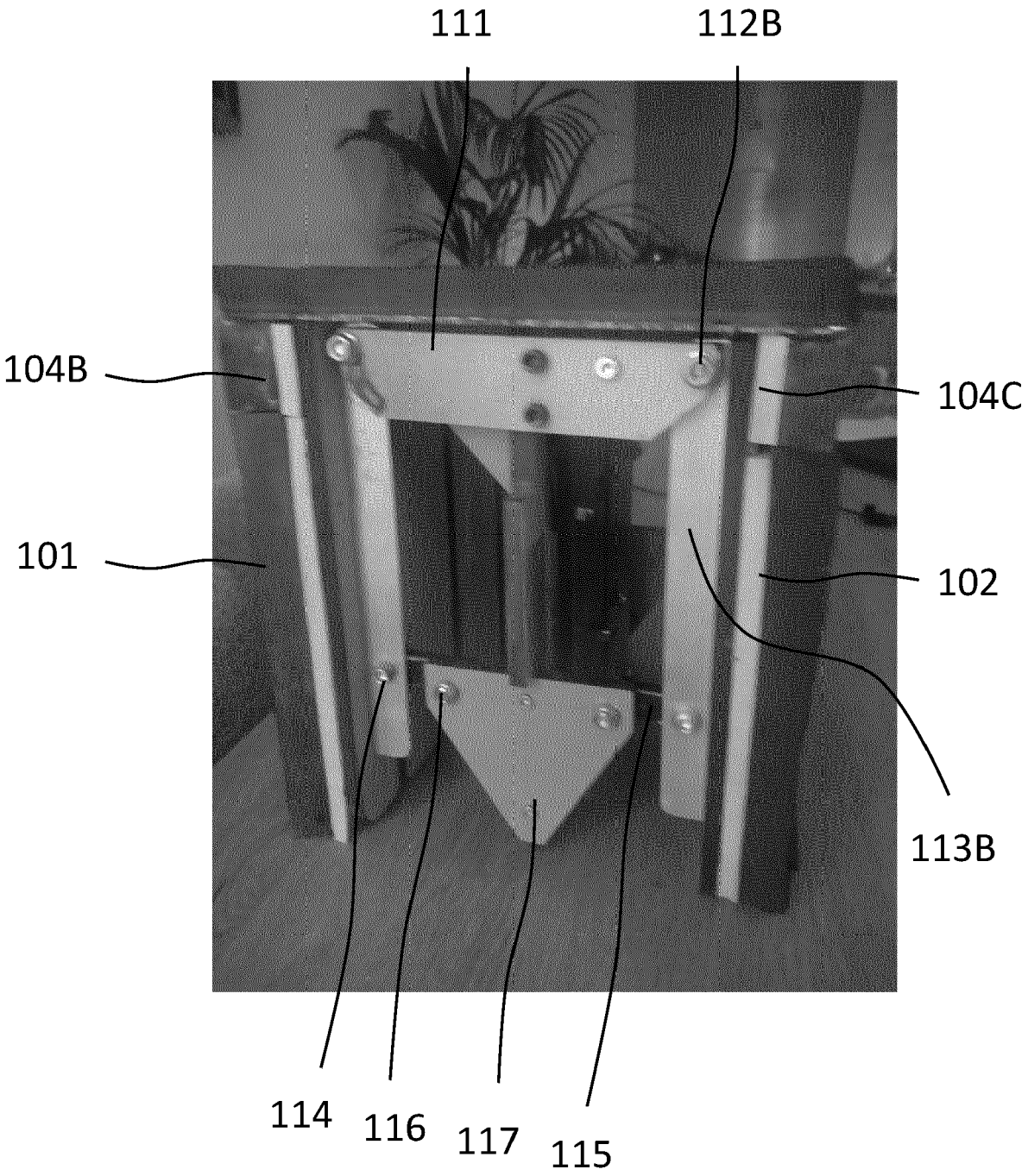

FIG. 7

FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 23 15 5201

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	US 4 900 193 A (MACKINNON ALAN G [US]) 13 February 1990 (1990-02-13) * page 10, lines 1-49 * * page 11, line 59 - page 13, line 13; figures 9,14-17 *	1-3,7, 13-15 4-6,8-12	INV. E02D5/66 E02D5/58 E02D5/30 B28B23/02
X A	NL 1 023 230 C2 (HERIKON B V [NL]) 26 October 2004 (2004-10-26) * page 5 - page 6; claims 1-9; figures 1-3 * *	1-8,10 9,11-15	
X A	US 3 070 867 A (BELLE THEODORE J) 1 January 1963 (1963-01-01) * column 3, line 19 - column 6, line 9; figures 1-8 *	1-3,7,8, 10,13-15 4-6,9, 11,12	
A	DE 942 016 C (WERNER SCHROEDER DIPL ING; ROLF BOENNINGHAUS DIPL ING) 26 April 1956 (1956-04-26) * the whole document *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)
E02D B29C B28B E04C E04G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 June 2023	Koulo, Anicet

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14-06-2023

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