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(54) **Device and method for collecting waste**

(57) A device (2) for collecting waste, comprising a number of upright walls for hoisting into and out of an opening (10) arranged in the ground, one or more flap parts (8) which are arranged movably on the upright walls and which are movable from a closed position to an open position in which the content of the device (2) can be unloaded, and an opening/closing mechanism (20) controllable from an upper side of the device (2) for respectively opening and closing the flap parts (8) on the underside, wherein at least one partition wall is arranged in the interior of the device (2) and divides the interior into two or more compartments and wherein the opening/closing mechanism (20) is configured such that each of the flap parts (8) arranged on the underside can be respectively closed and opened separately.

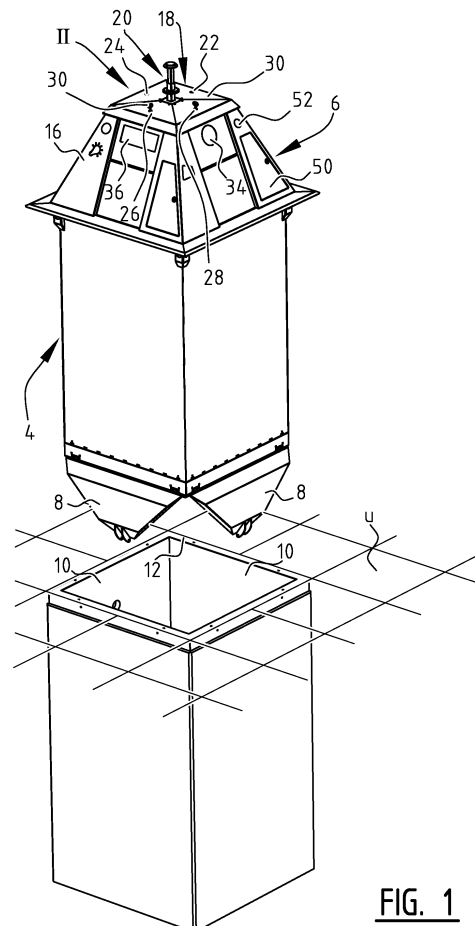


FIG. 1

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Description

[0001] Underground containers have been placed on a relatively large scale in the Netherlands, wherein a container is provided with one or more insertion openings, for instance for glass.

[0002] In current practice separate containers for different colours of glass, paper waste, KGW (Kitchen and Garden Waste), textile and residual waste are disposed adjacently of each other, usually underground. Such a so-called recycling centre requires considerable space. In inner cities in the Netherlands, but also outside them, where underground waste containers are likewise becoming increasingly common, this space is not available everywhere to sufficient extent.

[0003] The present invention provides a device for collecting waste, comprising: a number of upright walls for hoisting into and out of an opening arranged in the ground; one or more flap parts which are arranged movably on the upright walls and movable from a closed position to an open position in which the content of the device can be unloaded; and an opening/closing mechanism controllable from an upper side of the device for respectively opening and closing the flap parts on the underside, wherein at least one partition wall is arranged in the interior of the device and divides the interior into two or more compartments and wherein the control mechanism is configured such that one or more at a time of the flap parts arranged on the underside can be respectively closed and opened separately.

[0004] Owing to this device glass or paper can for instance be collected in the same container, while it is possible during unloading to unload only one of the compartments of the container into the truck; the other compartment can then be unloaded by another truck which collects for instance only paper.

[0005] Although opening/closing mechanisms of many types can be envisaged and are also applied in practice, use is preferably made in the present invention of a so-called mushroom mechanism which has been found in practice to be extremely robust and which can be operated with an existing gripper arm on a truck.

[0006] In a further preferred embodiment use is made of at least one hook at each flap and a latch mechanism or lock on the upper side of the container. This preferred embodiment has the advantage that a robust control mechanism for the bottom flap can be received in a limited central space.

[0007] In another preferred embodiment according to the present invention use is made of two hoisting beams and a so-called loop construction which has likewise been found to be robust and for which existing trucks are also available.

[0008] This waste container is more preferably provided with two or more hoisting beams on which the container can be hoisted via a loop construction and with which the compartments can be separately unloaded.

[0009] Finally, the present invention provides a method

for collecting a waste container comprising a number of upright walls for hoisting into and out of an opening arranged in the ground; one or more flap parts which are arranged movably on the upright walls and which are movable from a closed position to an open position in which the content of the device can be unloaded; and an opening/closing mechanism controllable from an upper side of the device for respectively opening and closing the flap parts on the underside, wherein at least one partition wall is arranged in the interior of the device and divides the interior into two or more compartments and wherein the control mechanism is configured such that one or more at a time of the flap parts arranged on the underside can be respectively closed and opened separately.

[0010] Further advantages, features and details of the present invention will be elucidated with reference to the accompanying drawing, in which:

Figure 1 shows a three-dimensional view of a preferred embodiment of a waste container according to the present invention;

Figure 2 shows a three-dimensional view of detail II of figure 1;

Figure 3 shows a three-dimensional bottom view of the container of figure 1 in closed position;

Figure 4 shows a three-dimensional view of detail IV of figure 3;

Figure 5 shows a partially three-dimensional, cut-away view of detail V of figure 1;

Figures 6A and 7A show side views of detail VIA, VIIA of figure 5 in respectively a first and second position;

Figures 6B and 7B show side views of detail VIB, VIIB in respectively a first and second position;

Figures 6C and 7C show side views of details VIC, VIIC in respectively a first and second position; and

Figure 8 shows a partially cut-away side view of a further preferred embodiment according to the present invention.

[0011] A waste container 2 (figure 1) comprises an underground part 4 and an above-ground part 6. Unloading flaps 8 are arranged hinged on the underside. Underground part 4 can be hoisted into and out of a hole 10 provided with concrete walls 12 using a hoisting arm (not further shown) of a truck into the waste is unloaded at set times.

[0012] Upper part 6 comprises four standing edges, two of which 14, 16 are visible, and an upper plate 18 through which protrudes a so-called mushroom construction 20, also known under the name Kinshofer. In the present exemplary embodiment an upper part is provided with keyholes 22, 24, 26, 28, wherein keys 30, 32 are placed in two of the four keyholes - see also figure 2.

[0013] Arranged in standing wall 14 is a round insertion opening 34 into which for instance bottles can be inserted, while in an upward sloping edge 16 is arranged a

rectangular insertion opening 36 for insertion of paper.

[0014] Owing to the sloping walls the upper part 6 has a somewhat truncated pyramid shape, wherein the height of the structure above the insertion openings, which are located at about 1.20 metres, is insignificant and has no or hardly any adverse effect on the lines of view on the street.

[0015] The mushroom construction 20 comprises an upper flange 42 arranged on a square inner tube 44 and a lower flange 46 arranged on an outer tube 24 of square cross-section, wherein inner tube 44 is movable relative to outer tube 48. Small compartments with insertion openings, for instance for light bulbs and batteries, are also visible in the pyramid-like structure of figure 1. The batteries inserted via an insertion opening 52 can for instance be collected by manually opening door 50.

[0016] Bottom flaps 8 (figure 4) are also each provided with respective sloping sides 54 and 56 in order to guide the flaps during lowering of the container with opened flaps into the opening in the ground 12. Arranged on each of the flaps are guide plates 58 between which a bolt 59 is arranged. In closed position of the flaps, hooks 60, 61 engage on bolt 59 in order to hold the flaps in closed position during subsequent hoisting-out of the container.

[0017] Arranged centrally in waste container 2 are guide rods 70, 72, manufactured in the present exemplary embodiment from sheet steel, for the purpose of respectively unlocking and keeping locked the compartment associated with a bottom flap. The rods are each coupled on the underside via first hinges 74, 76 to hooks 61. Control rods 70, 72 are also provided with a bent part 74, 76 so that they extend outside the inner tube 20 of the mushroom mechanism arranged in the central upper part. The inner tube is provided with catch members 80, 82, while rods 70, 72 are provided with indentations. Rods 70, 72 are attached via a first hinge 82 to a bent rod 84, this rod being attached in turn via hinge 86 to an upper plate 88. Bent rod 84 is provided with a keyhole 90 via which a transverse pin 92 is movable via a key 30, 32. In order to enable easier arrangement and removal of the sheet steel rods they are provided about halfway along (see fig. 5B) with hinges.

[0018] As shown particularly in figure 7A, transverse pin 92 is urged outward in the shown position of key 30, whereby rod 72 is not co-displaced by catch members 80 when inner tube 20 is pulled, and hook 61 (fig. 7C) remains locked. In the position of key 32 in figure 7A rod 70 is pulled upward together with inner tube 20 and hook 61' (fig. 7C) is moved outward, whereby the flap on the right-hand side of hook 61' is unlocked.

[0019] Owing to the first embodiment of the above described mechanism the flaps of the four compartments can each be separately locked and unlocked using keys, and therefore separately unloaded.

[0020] The shown exemplary embodiment is provided with a mechanical construction controllable with the key. It will be apparent that the mechanism can likewise be controllable using an electronic (remote) control, this hav-

ing the advantage that the keys cannot be lost and that no errors are made in respect of the compartment to be opened. A truck loaded with paper will then automatically empty only the compartment filled with paper.

[0021] In an exemplary embodiment with two compartments (figure 8) use is made of a so-called loop mechanism 101, also known as a three-hook system, wherein the middle loop 102 is used to lift the container and the lateral loops 103, 104 can be used to open and keep respective flaps 105, 106 and 107 locked. Arranged under a pyramid-like structure 110 shown with broken lines are two cross beams 111, 112 along which cables are guided. The cables which are coupled to loop member 103 are guided via ducts 120, 121 and attached at their outer ends via pulleys 122 to flaps 105, 106. As also known for glass containers, the cables 131, 132 coupled to loop 104 are guided through the inner space of the somewhat smaller compartment to flap 107 to enable operation thereof.

[0022] It will be apparent that the present invention is not limited to the above described preferred embodiments; the rights sought are defined by the following claims.

Claims

1. Device for collecting waste, comprising:

a number of upright walls for hoisting into and out of an opening arranged in the ground;
one or more flap parts which are arranged movably on the upright walls and which are movable from a closed position to an open position in which the content of the device can be unloaded; and
an opening/closing mechanism controllable from an upper side of the device for respectively opening and closing the flap parts on the underside, wherein at least one partition wall is arranged in the interior of the device and divides the interior into two or more compartments and wherein the control mechanism is configured such that one or more at a time of the flap parts arranged on the underside can be respectively closed and opened separately.

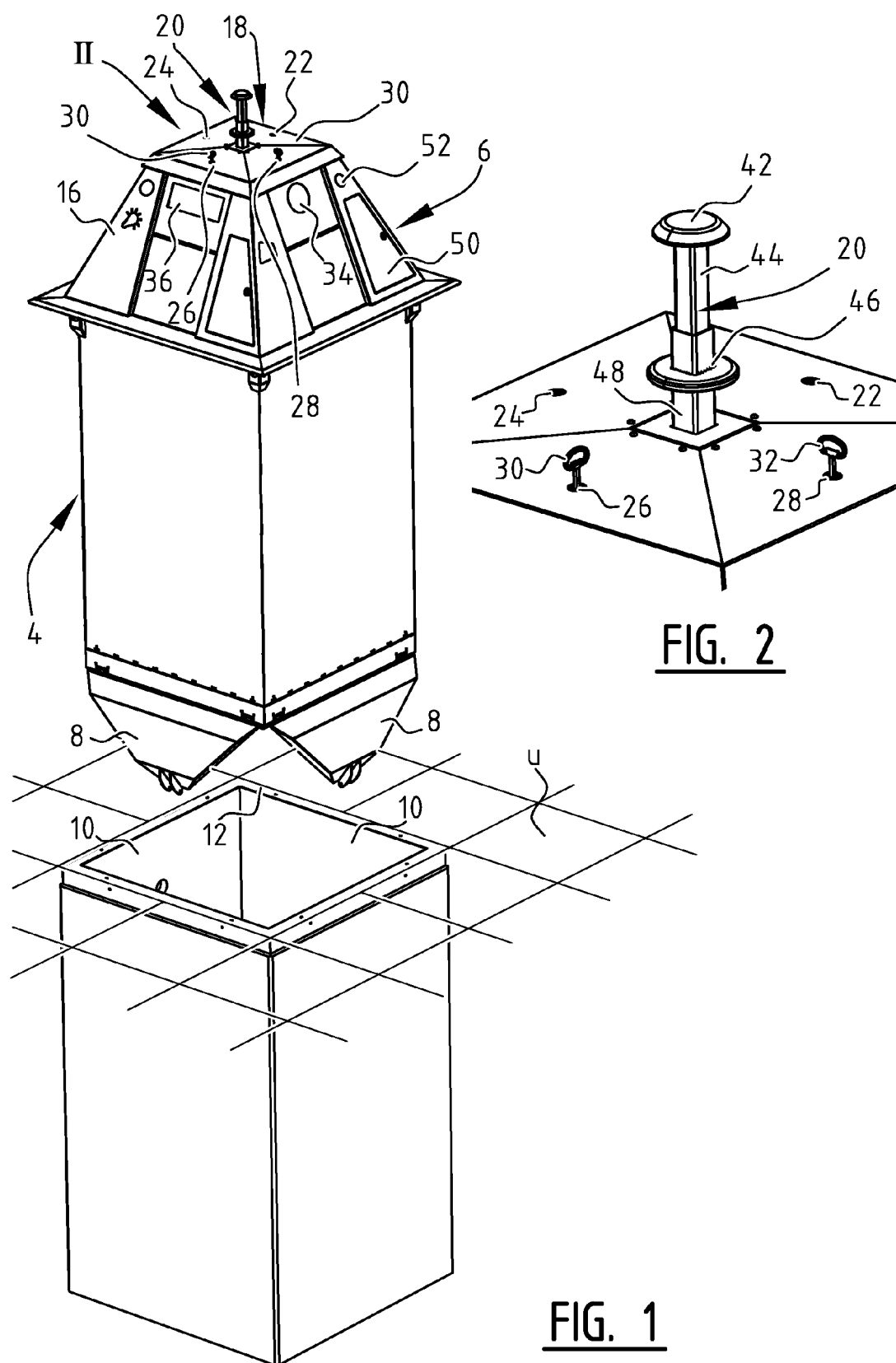
2. Device as claimed in claim 1, wherein the upright walls are configured so as to be at least partially hoistable into and out of the opening arranged in the ground.

3. Device as claimed in claim 1, wherein the device is an underground, above-ground or semi-underground container.

4. Device as claimed in claim 1, 2 or 3, wherein the

opening/closing mechanism is coupled to a mushroom construction on which the container is also hoisted.

5. Device as claimed in claim 1, 2, 3 or 4, wherein each bottom flap part is provided with at least one locking hook for respectively locking and unlocking each compartment separately. 5
6. Device as claimed in claim 5, wherein each hook is coupled to a rod extending in a central shaft of the waste container in the direction of the opening/closing mechanism on the upper side. 10
7. Device as claimed in claim 6, wherein each rod is optionally coupled via a rod system to the movable tube of the mushroom mechanism. 15
8. Device as claimed in one or more of the foregoing claims, wherein the rod at each hook is coupled to a mechanical or electronic lock in order to hold the associated hook in locking position or move it into the operating position for the purpose of opening the flap parts. 20
25
9. Device as claimed in claim 8, wherein the lock moves the rod at the hook respectively inward and outward in order to respectively keep the hook locked and to unlock it in order to open the flap. 30
10. Device as claimed in claim 1, 2 or 3, wherein the container is provided with at least two hoisting beams which are each connected to at least one opening/closing mechanism. 35
11. Device as claimed in claim 9, wherein the bottom flaps are controllable by means of cables extending through a compartment, wherein the cables can be operated using a loop construction on the upper side of the waste container. 40
12. Device as claimed in claim 8 or 9, wherein at least one of the cables extends through a separate compartment for guiding the cables. 45
13. Device as claimed in any of the foregoing claims, wherein the opening/closing mechanism is controllable using a remote control.
14. Method for collecting waste, wherein in a device as claimed in one or more of the claims 1-12 a hole is made in the ground and wherein after the container has been hoisted out at least one compartment can be separately unloaded from the waste container. 50
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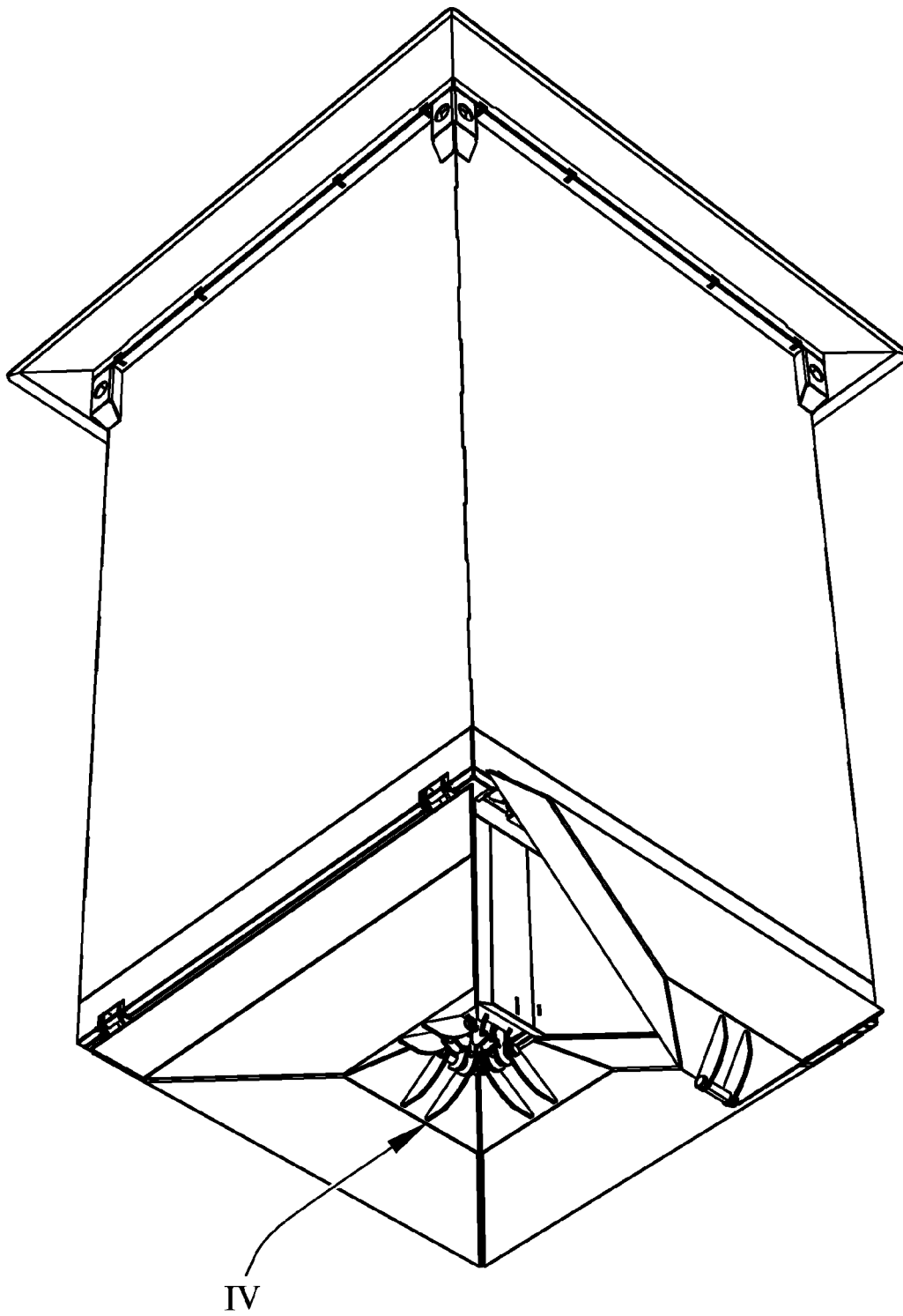
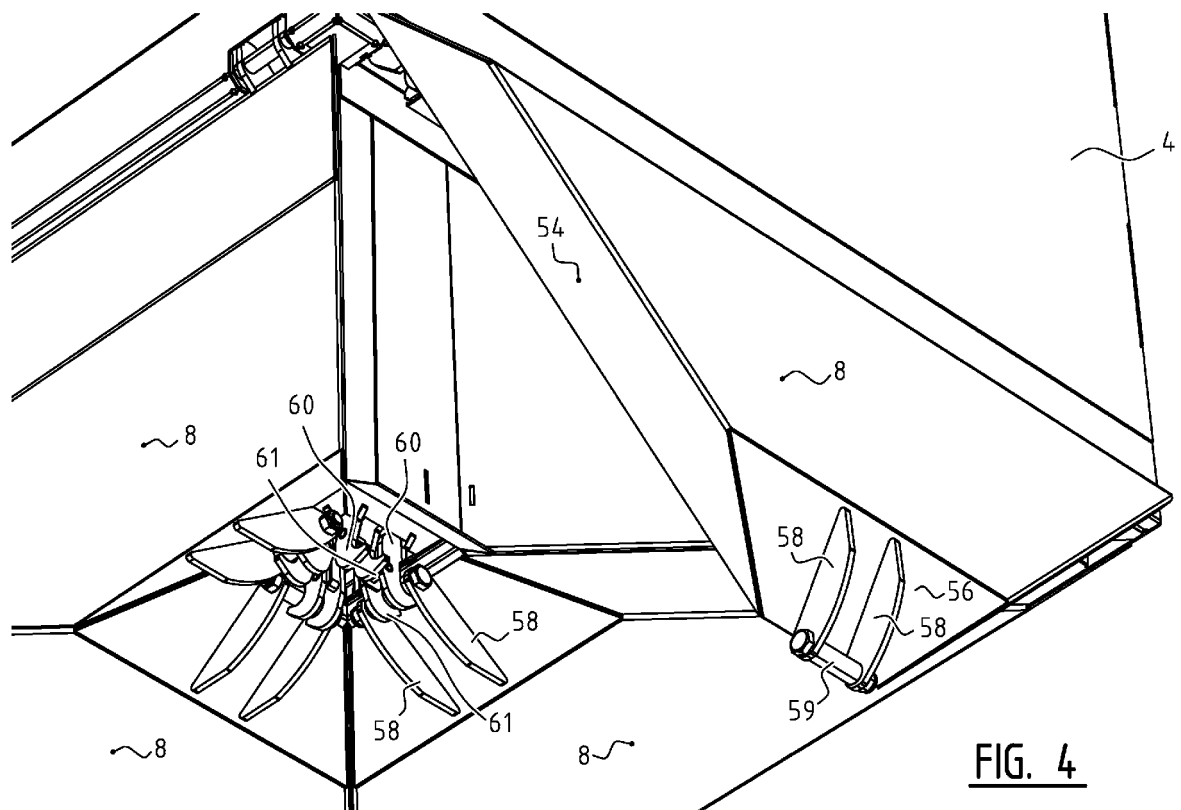


FIG. 3



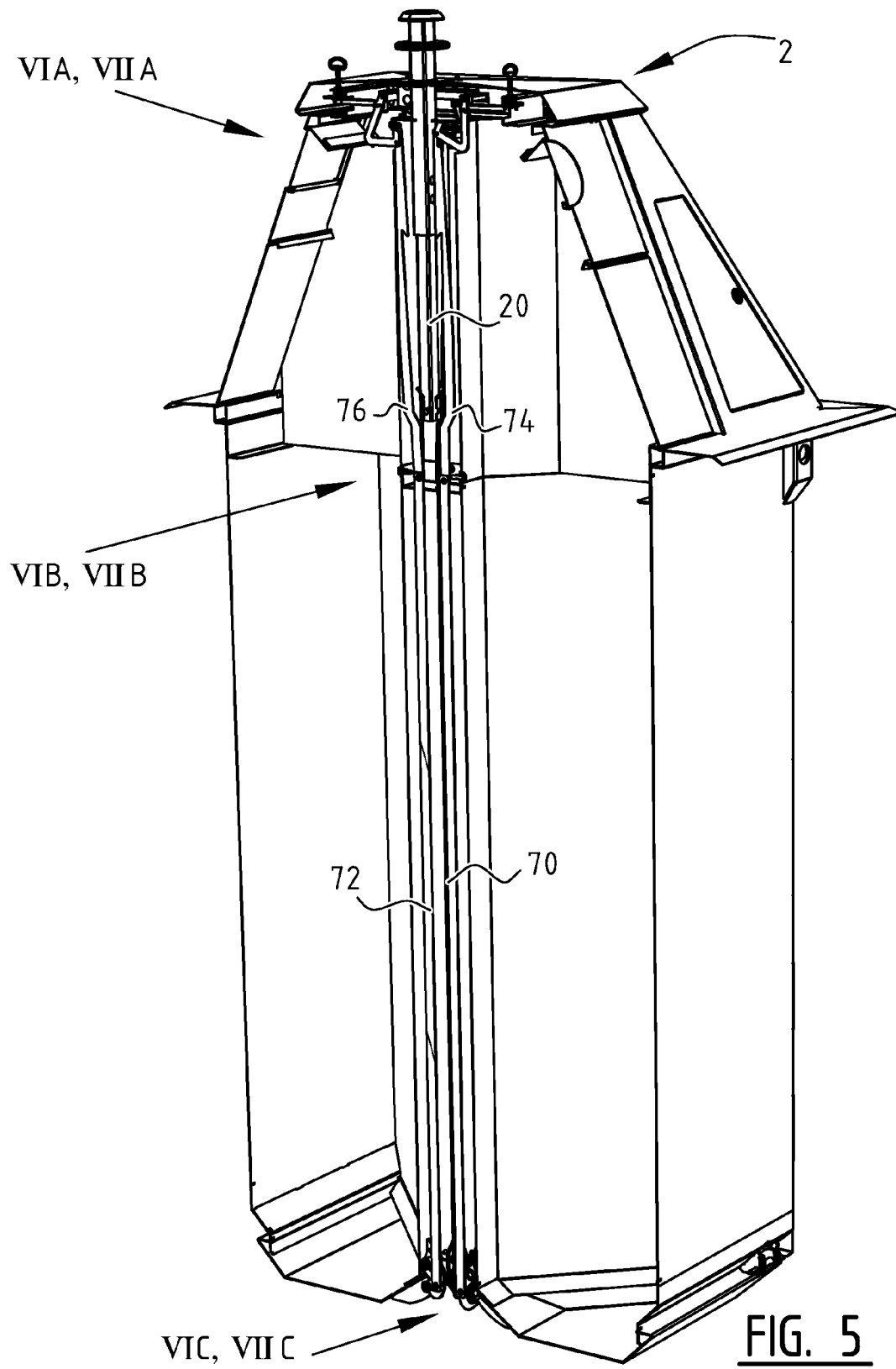
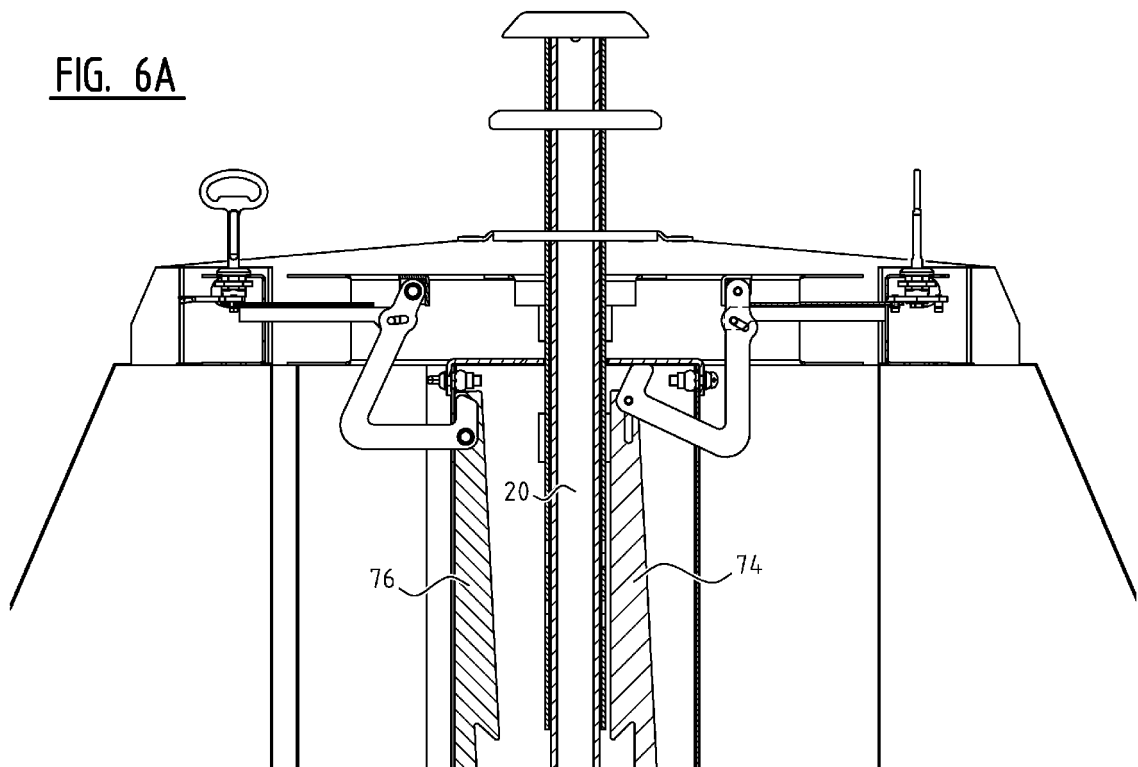


FIG. 6A



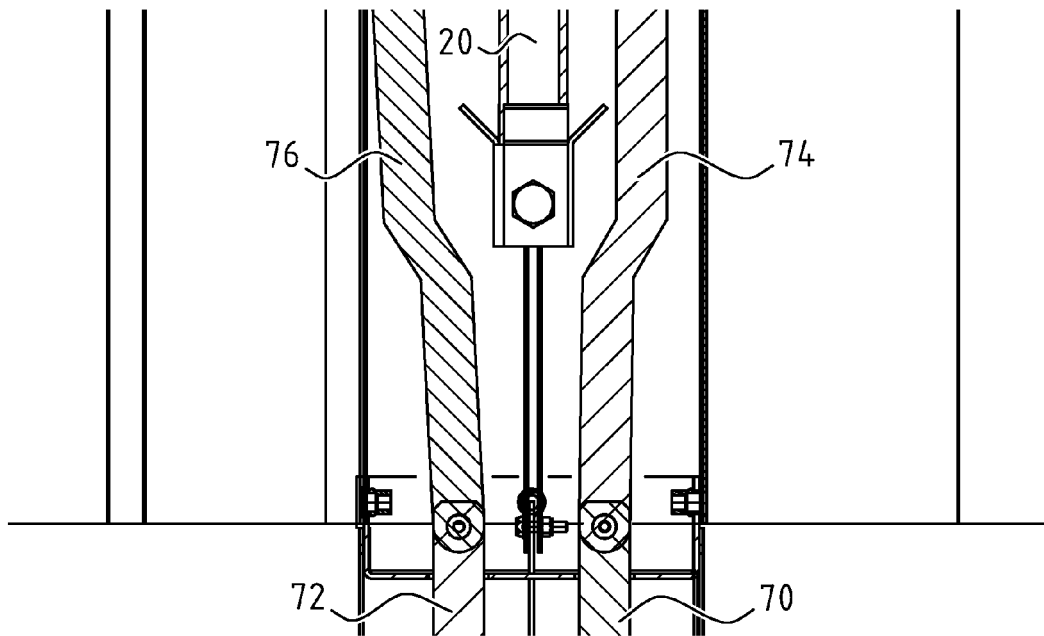


FIG. 6B

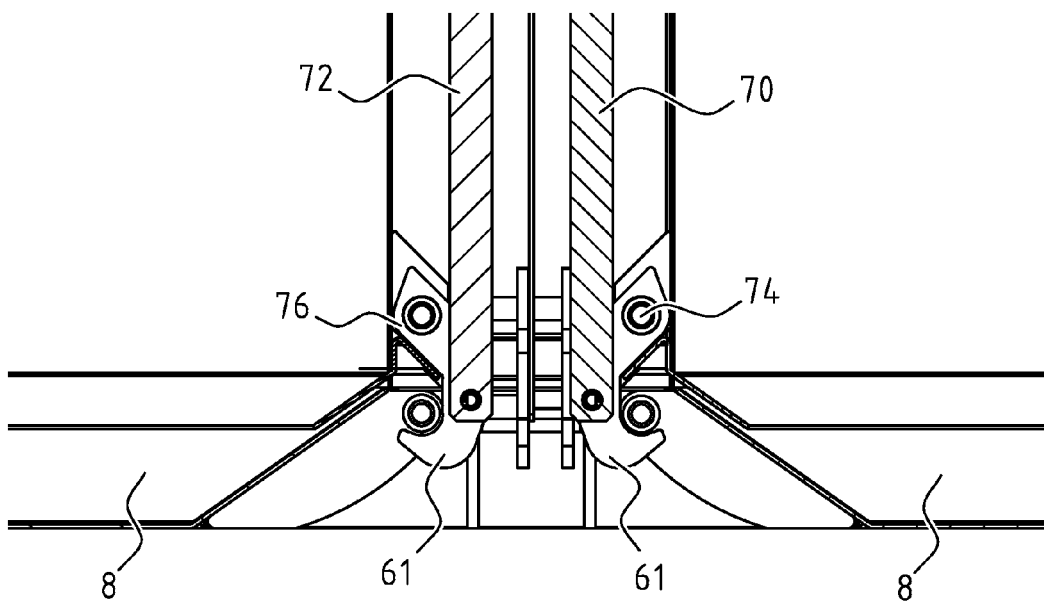
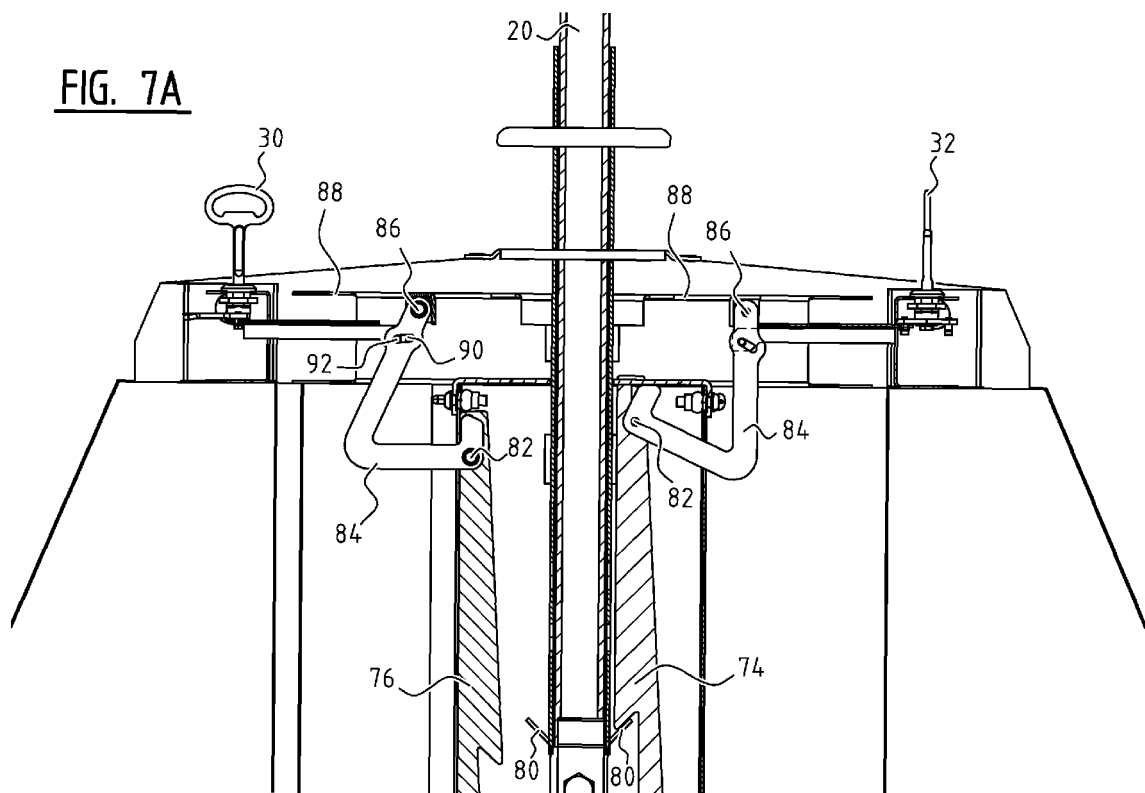


FIG. 6C

FIG. 7A



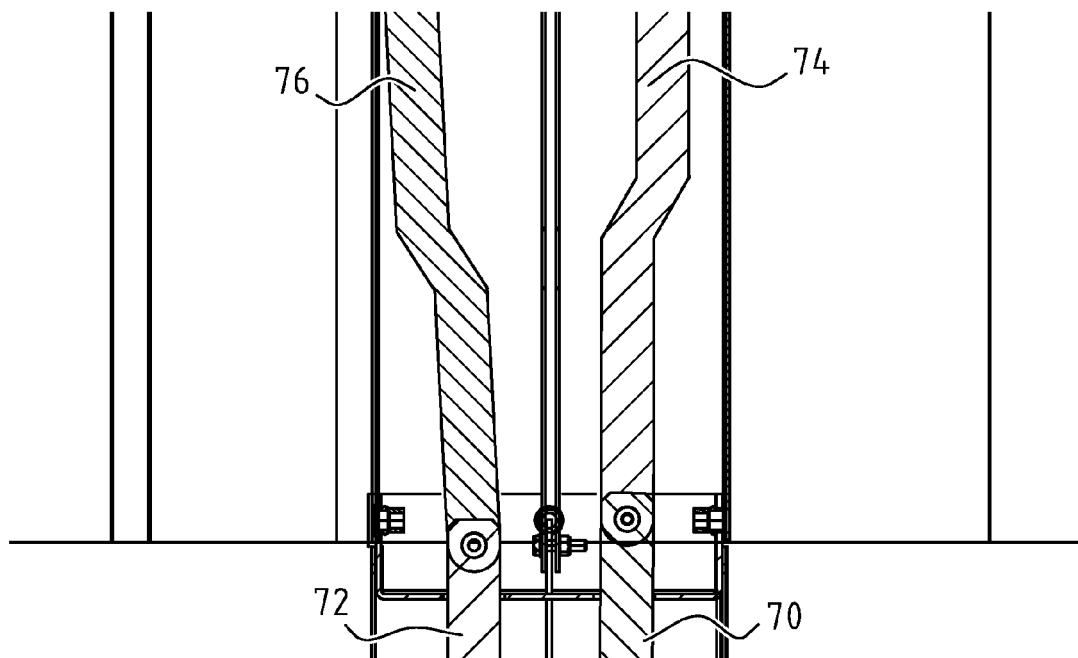


FIG. 7B

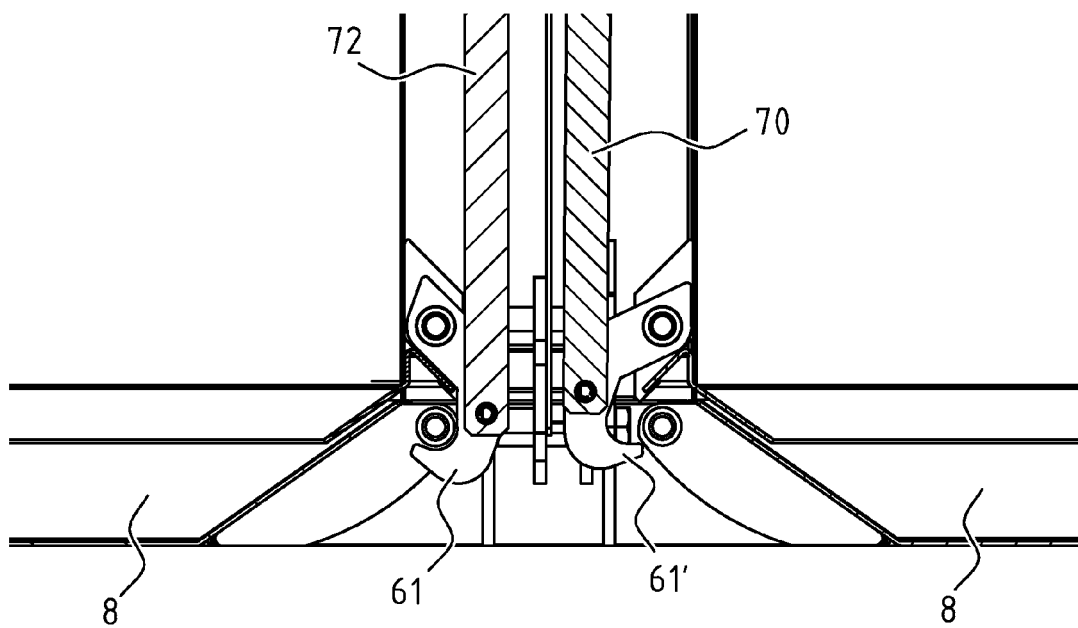


FIG. 7C

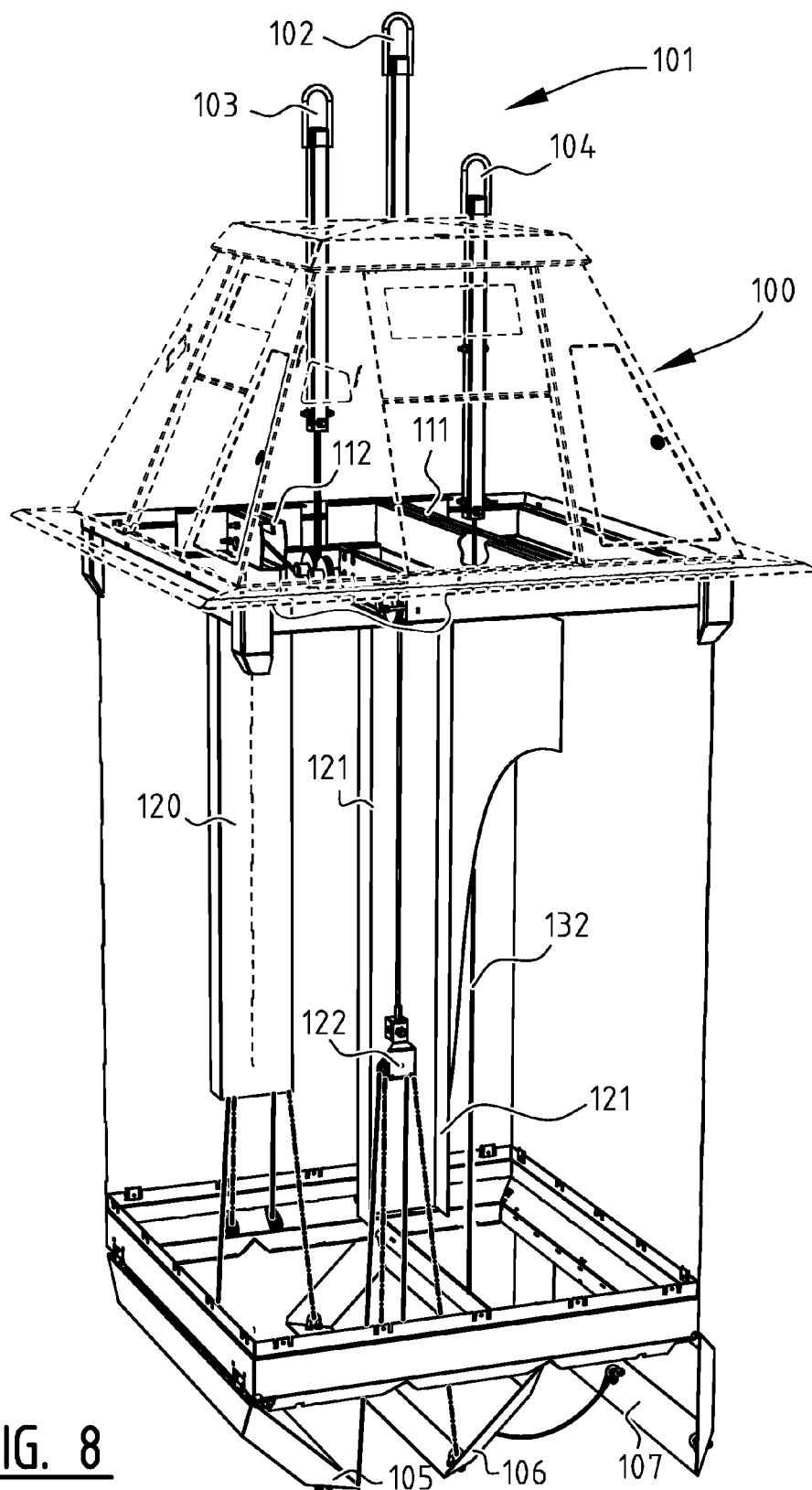


FIG. 8



EUROPEAN SEARCH REPORT

 Application Number
EP 14 16 9061

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 October 2014	Examiner Smolders, Rob
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