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(54) SAFETY PLATFORM

(57) The present invention relates to a safety platform for buried and/or semi-buried containers, which acts automatically with the removal of the waste-holding container, solely and exclusively by mechanical action, automatically and independently of the vat, without recourse to thrust lifting mechanisms such as torsion springs or counterweight systems, hydraulic or air lifting means such as gas springs or hydraulic or electrically driven pistons/plungers using energy to raise and close the safety platform. It is comprised of a perforated base (4), a cassette system (3) and latches. The base of the waste holding container (1) has four parts intended for coupling to the cassette system (3) which allow the latches to be unlocked when in contact with the safety platform. The present invention allows that when the container (1) is removed from the concrete vat, people and/or animals are prevented from falling into the hole, and thus this platform operates automatically, i.e., it can be actuated and coupled without being dependent on human intervention.

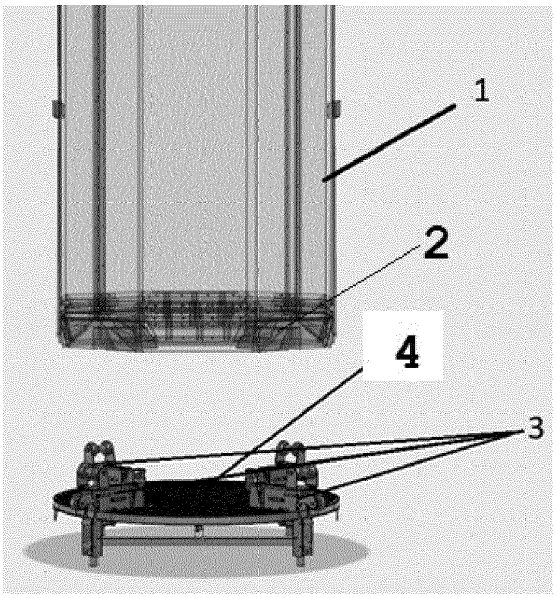

Figure 1

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Description

SCOPE OF THE INVENTION

[0001] The present invention relates to a safety platform for buried and/or semi-buried containers, which acts automatically with the removal of the waste-holding container, solely and exclusively by mechanical action, automatically and independently of the vat, without recourse to thrust lifting mechanisms such as torsion springs or counterweight systems, hydraulic or air lifting means such as gas springs or hydraulic or electrically driven pistons/plungers using energy to raise and close the safety platform.

[0002] It consists of a perforated base (4), which can be made of plastic or metal, a cassette system (3) and latches (5). The base (2) of the waste-holding container (1) has four coupling parts to the cassette system (3) which allow the latches (5) to be unlocked when in contact with the safety platform.

STATE OF THE ART OF THE INVENTION

[0003] According to the provisions of the European standard EN13071, safety containers are required to have a safety guard or safety barrier which is automatically triggered upon the removal of the container, in order to protect the vat from which the container is removed, from the accidental fall of people or animals.

[0004] Compliance with the above-mentioned standard means that all the systems available on the market must be driven by:

a) thrust lifting mechanisms such as torsion springs, or counterweight systems, examples of which are the systems Villinger, Vconsyst, Sopinal, Resopre, OMB, Plasticomnium:

- https://www.youtube.com/watch?v=fWW3kTw3cf4&index =8&list=PL8C24715C59E284AE; https://www.youtube.com/watch?v=EBSgTyEV2-w;
- https://www.youtube.com/watch?v=gn5bAECcYxA; e
- https://www.youtube.com/watch?v=mhm63EWbQ9k;

b) hydraulic lifting means or with gas springs, examples of which are the systems Sotkon, Acrex:

- https://www.youtube.com/watch?v=-e5pTXYkzss; or

c) hydraulic or electrically driven lifting means, such as for instance the systems TNL, Villinger, BAUER:

- https://www.youtube.com/watch?v=_n_fvn73-Lc;
- https://www.youtube.com/watch?v=PbIIbYk1Wzo.

[0005] The present invention differs from the state of the art in that the raising and lowering, disengaging and engaging is mechanically performed without the aid of counterweights, gas springs, electric or hydraulic or pneumatic actuation, as in the previously mentioned existing systems. Therefore, this solution intended for the automatic and mechanical drive, which operates independently of thrust, hydraulic and/or electrical systems, has the following advantages comparatively to the state of the art:

- usable space inside the vat / capacity optimization; since it is a counterweight-free and vat-independent mechanism, it does not require inner guides for implementing counterweight or hydraulic or gas springs systems;
- reliability, when compared for example to counterweights or hydraulic springs and/or electrically driven systems. There is no more intersection between the two systems in the collection or placement of the container inside the vat, thus eliminating the chance for collisions and shocks between the systems which put at risk the operation of safety platforms/barriers; and
- as a result of the two points above, it proves to be a more competitive equipment as it requires less volume to achieve the same useful capacities, offering at the same time an improved safety for users due to an increased reliability of the system.

SHORT DESCRIPTION OF THE FIGURES

Indication of the reference numbers

[0006]

(1) container;
(2) base of the container (1);
(3) cassette system - (3a) right cassette structure, (3b) left cassette structure;
(4) perforated base;
(5) latches;
(6) vat;
(7) perforated base ring (4);
(8) plunger;
(9) floor height;
(10) safety latch.

Figure 1 - exploded view corresponding to the figure for publication of the present invention, showing the container (1), the base (2) of the container (1), the perforated base (4) and the cassettes (3).

Figure 2 - representation of the assembly - platform, container (1) - in closed position. This figure shows the vat (6) and the floor height (9), i.e. the height above the floor or ground on the street.

Figure 2a - representation of the detail A marked on figure 2, showing the position of the latch (5) when the assembly is in the closed position.

Figure 2b - detailed representation of the latch (5) when the assembly is in the closed position.

Figure 3 - representation of the assembly - platform, container (1), in the intermediate position of removal.

Figure 3a - representation of the detail B marked on figure 3, when the assembly is in the intermediate position of removal.

Figure 3b - detailed representation of the position of the latch (5) when the assembly is in the intermediate position of removal.

Figure 4 - Representation of the assembly - platform, container (1), when in position for decoupling and opening of the platform.

Figure 4a - representation of detail C marked on figure 4, when in position for decoupling and opening of the platform.

Figure 4b - detailed representation of the position of the latch (5) when the assembly is in position for decoupling and opening of platform.

Figure 5 - exploded view of the safety latch (5), wherein the cassette system is shown, which is comprised of the right cassette structure (3a) and the left cassette structure (3b), as well as the plungers (8) and safety latch (10) .

Figure 6 - exploded view of the safety platform, wherein the perforated base (4) and the ring (7), and the latch (5) are shown.

Figure 7 - perspective view of the assembled components of figure 6, i.e., of the platform.

Figure 8 - top view of the assembled components of figure 6, i.e., of the platform.

Figure 9 - front view of the assembled components of figure 6, i.e., of the platform, wherein the plungers (8) and respective latches (5) are shown in greater detail.

Figure 10 - sequential representation of figures 2, 3 and 4 so that the upward movement of the container (1) of the vat (6) is duly illustrated.

DETAILED DESCRIPTION OF THE INVENTION

[0007] The present invention relates to a safety platform for buried and/or semi-buried containers, which acts automatically with the removal of the waste-holding container, solely and exclusively by mechanical action, automatically and independently of the vat, without recourse to thrust lifting mechanisms such as torsion springs or counterweight systems, hydraulic or air lifting means such as gas springs or hydraulic or electrically driven pistons/plungers using energy to raise and close the safety platform.

[0008] For a better understanding of the invention, the vat (6) is understood as an underground part housing a safety platform and the container (1) for waste retention, while the cassette system (3) is understood as a mechanism consisting of two structures, one right (3a) and one left (3b), which is aimed at coupling and decoupling the waste-holding container (1).

[0009] The present invention is comprised of a perforated base (4), which may be a net/grid or a mesh, and be made of plastic or metal material, as well as of a cassette system (3), with right structure (3a) and left structure (3b), and latches (5).

[0010] The base (2) of the waste-holding container (1) must have suitable coupling means to the cassette system (3) in order to secure the container (1) to the platform cassette system (3) thus allowing to unlock the latches (5) when in contact with the safety platform. These coupling means are not shown in the figures and they may be previously implemented in the container (1) in case it is manufactured for use with the platform object of the present invention, or they may alternatively be attached to the base (2) of an existing container (1) without this specificity and thus allow it to be used with the platform object of the present invention.

[0011] For this system, comprised of container (1) and platform, to achieve the intended purpose, a crane or other equivalent system is required to lift the metal container (1). Once the container (1) is placed on the platform and before it is uplifted, the cassette system (3) together with the latches (5) are locked and cannot leave this position since they are limited by the diameter or inner space of the vat (6) (Figures 2, 2a, 2b).

[0012] Once the container (1) has reached the surface, i.e. the floor height (9), both the cassette system (3) and the latches (5) are no longer limited by the inner space of the vat (6) and are unlocked, then releasing the container (1) which continues to be uplifted to its discharging position.

[0013] Additionally, the cassette system (3) together with the latches (5) has a safety latch (10) which prevents them from retracting in the absence of the container (1).

[0014] As previously mentioned, the container (1) has coupling means at its base (2), which may be rods, which upon repositioning of the container (1) over the perforat-

ed base (4), for placement inside the vat (6), enter the assembly comprised of the cassette system (3) and the latches (5), automatically placing the safety latch (10) in the downward position, and then due to the weight of the container (1), the assembly comprised of the cassette system (3) and the latches (5) retracts into the vat (6) wherein, by geometry of the latch (5) and of the coupling means, it prevents the platform from detaching from the container (1).

[0015] It shall be noted that the assembly comprised of the cassette system (3) and the latches (5) are retracted by the strain caused by their contact with the inner surface of the vat (6) where the container (1) is inserted. In particular, the container (1) itself with its weight rotates the latch (5), and the plunger (8) is retracted, thus allowing the platform to enter the vat (1). Once inside the vat (6), the container (1) is responsible for raising or lowering the platform because there is no physical space between the platform and the vat (6) to allow the plungers (8) to open and release again the container from the platform (1), and so the plungers will only unlock again upon removal of the entire container (1) from the vat (6), which is the position where the plungers (8) have room to open again and release the container (1).

[0016] In short, the assembly comprised of the cassette system (3) and the latches (5) is retracted due to the strain caused by contact with the inner surface of the vat (6) where the container (1) is inserted, the said assembly thus sliding along the inner walls of the vat (6) and uplifting the container (1) until it reaches the perimeter surface thereof, i.e. the floor height (9), and expands due to the absence of contact with the inner wall of the vat (6). After this release, the platform is attached to the vat (6) at its upper part, since it has the perforated base (4) fixed to the ring (7), in its entire area, and the "hole" that results from the absence of the container (1) is covered by the perforated base (4) of the platform.

[0017] After the release of the container (1) from the vat (6), the platform remains fixed to the perimeter of the vat (6) at the floor height (9), but in a position lower than the vat ring (6), commonly referred to as the ground ring, so that no lateral movement is possible and the assembly comprised of the cassette system (3) and the latches (5) cannot be retracted unless a new pressure is exerted on the latches (5).

[0018] Alternatively, there may be a steel wire rope or chain attached to the bottom of the platform that will completely prevent it from being removed from the vat (6).

[0019] Subsequently, the platform, when receiving the container (1) again upon it, retracts the assembly comprised of the cassette system (3) and the latches (5) so that it can be inserted back into the vat. In particular, the weight of the container (1) causes the latch (5) to rotate, which in turn allows the plunger (8) to be retracted, thereby allowing the container (1) to re-enter the vat (6) as the assembly comprised of the cassette system (3) and the latches (5) will slide downwardly along the walls of the vat (6). Additionally, the base (2) of the container (1) has coupling means to the latches (5) and cassette system (3), thus securing the container (1) to the platform.

[0020] The geometry of the latch (5) is adequate so that there is no release of the container (1) unless the plungers (8) are fully opened.

[0021] In short, the present invention relates to a platform consisting of a perforated base (4), which has a cassette system (3) with latches (5) fixed to its perimeter, and embedded plungers (8) which are arranged in such a way that the latches (5) are pivotable under tensile force, and at the same time the plungers (8) retract into the cassette systems (3), but also to the assembly: vat (6); container (1) with base (2); above-mentioned platform; wherein the latches (5) are coupled to the base (2) of the container (1) by coupling means, and the container (1):

- in its downward movement, retracts the plungers (8) as a result of their weight over the assembly comprised of the cassette system (3) and the latches (5) of the platform and inserts the container (1) into the vat (6); and
- in its upward movement, raises the platform up to the surface by means of the coupling means of the base (2); also, the cassette system (3) together with the latches (5), being no longer limited by the inner space of the vat (6), the plungers (8) automatically cease to be retracted into the cassette system (3) unless a new tensile force is exerted on the assembly comprised of the cassette system (3) and the latches (5) of the platform.

Claims

1. Safety platform for buried and/or semi-buried containers, **characterized in that** it comprises a perforated base (4) which has attached to its perimeter a cassette system (3) with latches (5) and embedded plungers (8), said plungers (8) being arranged in such a way that the latches (5) are pivotable by a tensile force and simultaneously the plungers (8) retract into the cassette systems (3).

2. Platform according to the previous claim, **characterized in that** the assembly comprised of the cassettes system (3) and the latches (5) has a safety latch (10) which is actuated by tensile force.

3. Platform according to the previous claims, wherein the perforated base (4) has a ring (7) delimiting its perimeter.

4. Platform according to the previous claims, wherein the perforated base (4) is a net or a grid or a mesh.

5. Platform according to the previous claims, wherein

the perforated base (4) is made of plastic or metal.

6. Safety system intended for buried and/or semi-buried containers, **characterized in that** it comprises:

a) a vat (6);
b) a container (1) with a base (2);
c) a platform comprising a perforated base (4), which has a cassette system (3) with latches (5) fixed to its perimeter, and embedded plungers (8) which are arranged in such a way that the latches (5) are pivotable under tensile force, and simultaneously the plungers (8) retract into the cassette systems (3);
d) the latches (5) are secured to the base (2) of the container (1) by coupling means, and the container (1) :
e) in its downward movement, retracts the plungers (8) as a result of its weight over the assembly comprised of the cassette system (3) and the latches (5) of the platform, and inserts the container (1) into the vat (6); and
f) in its upward movement, raises the platform up to the surface by means of the coupling means of the base (2); also, the cassette system (3) together with the latches (5), being no longer limited by the inner space of the vat (6), the plungers (8) automatically cease to be retracted into the cassette system (3) unless a new tensile force is exerted on the assembly comprised of the cassette system (3) and the latches (5) of the platform.

7. System according to the previous claim, wherein it presents the platform of the claims 1 to 5.

8. System according to the previous claims, wherein the coupling means of the container (1) are rods.

9. System according to the previous claims, wherein the lower section of the platform comprises a steel wire rope or chain.

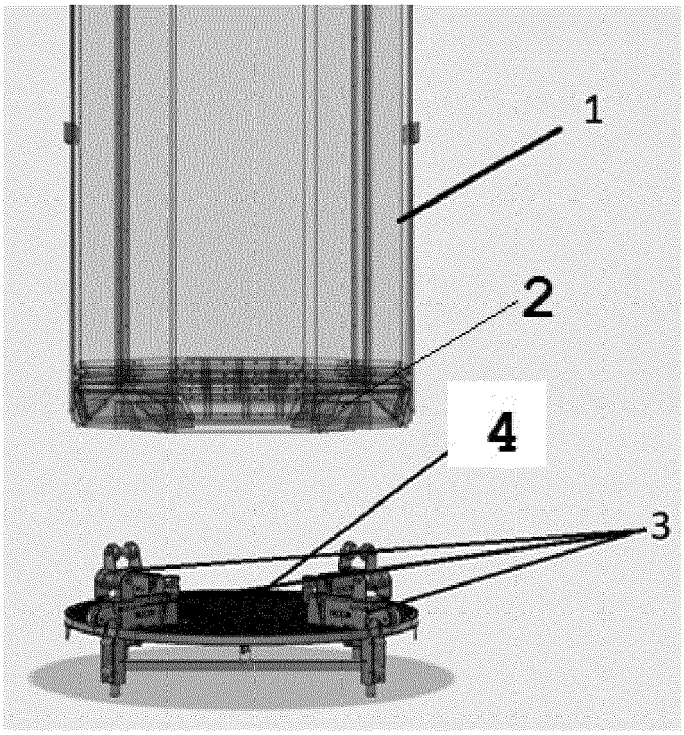

Figure 1

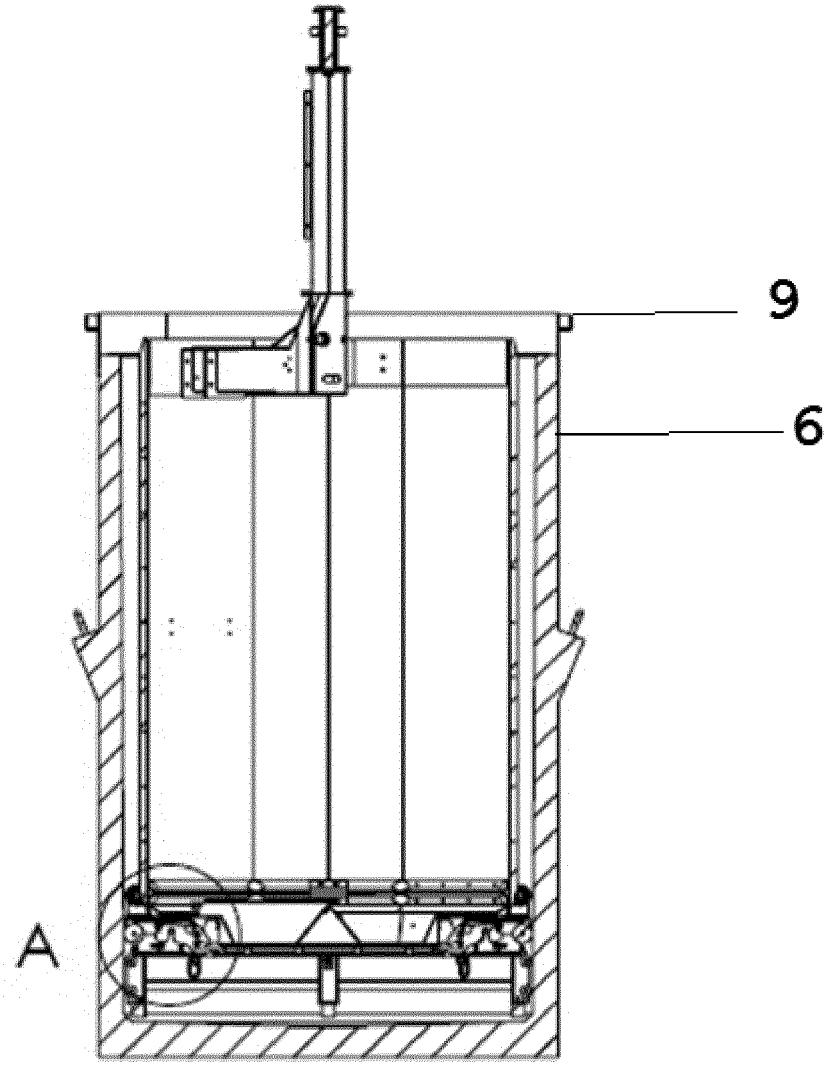

Figure 2

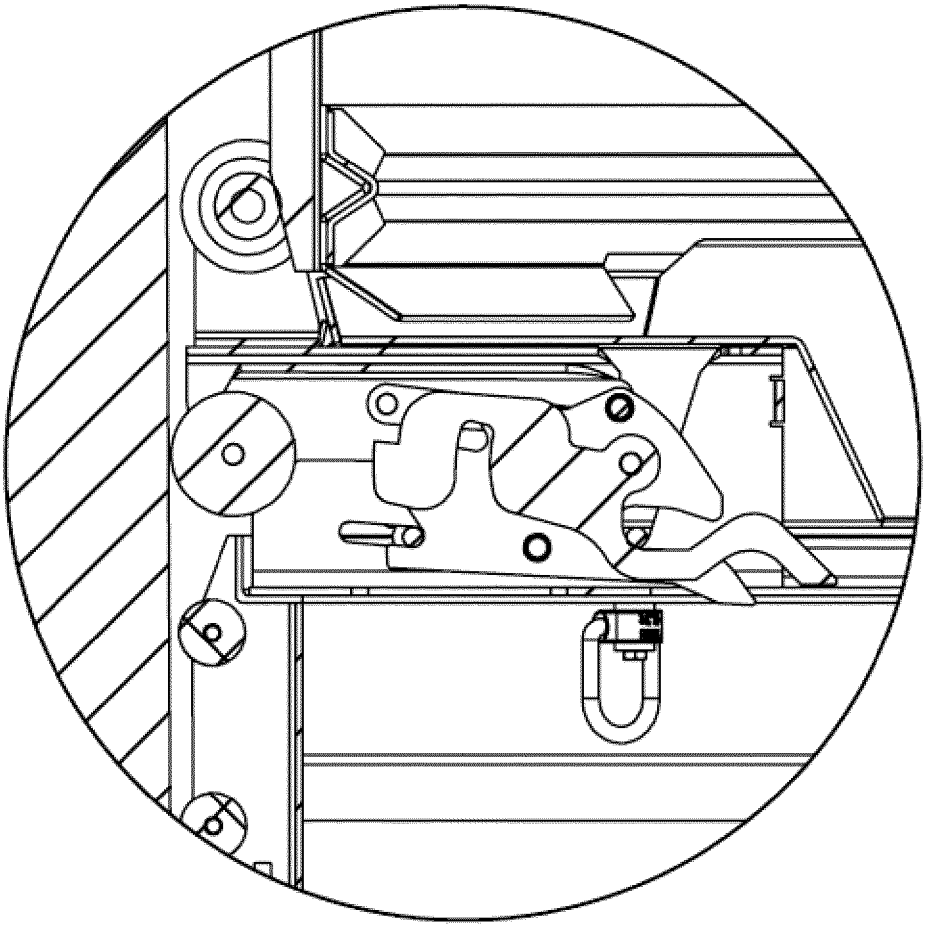

Figure 2a

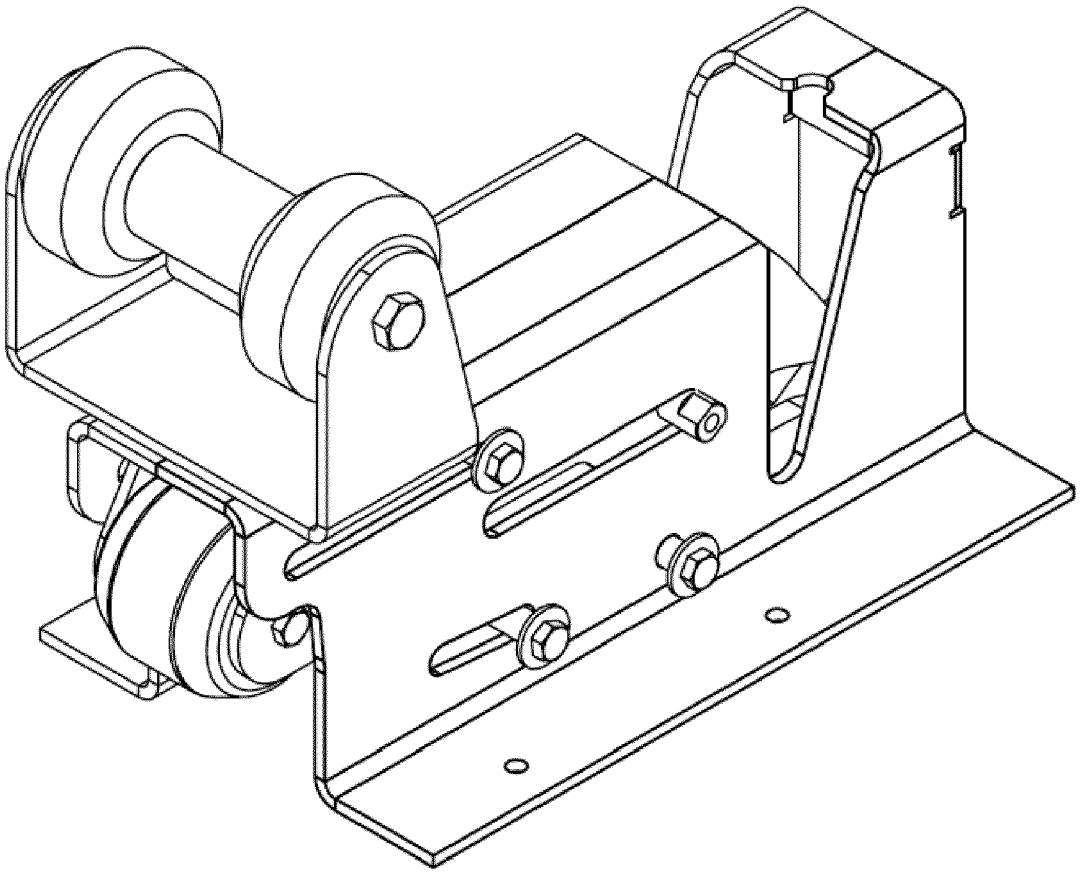

Figure 2b

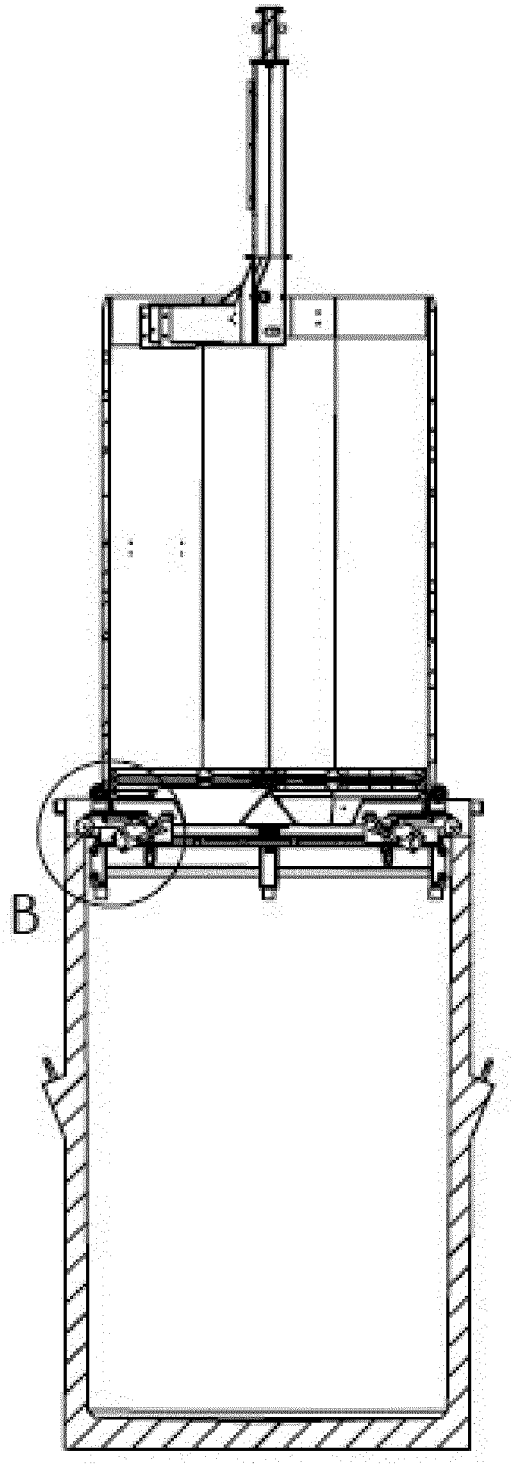

Figure 3

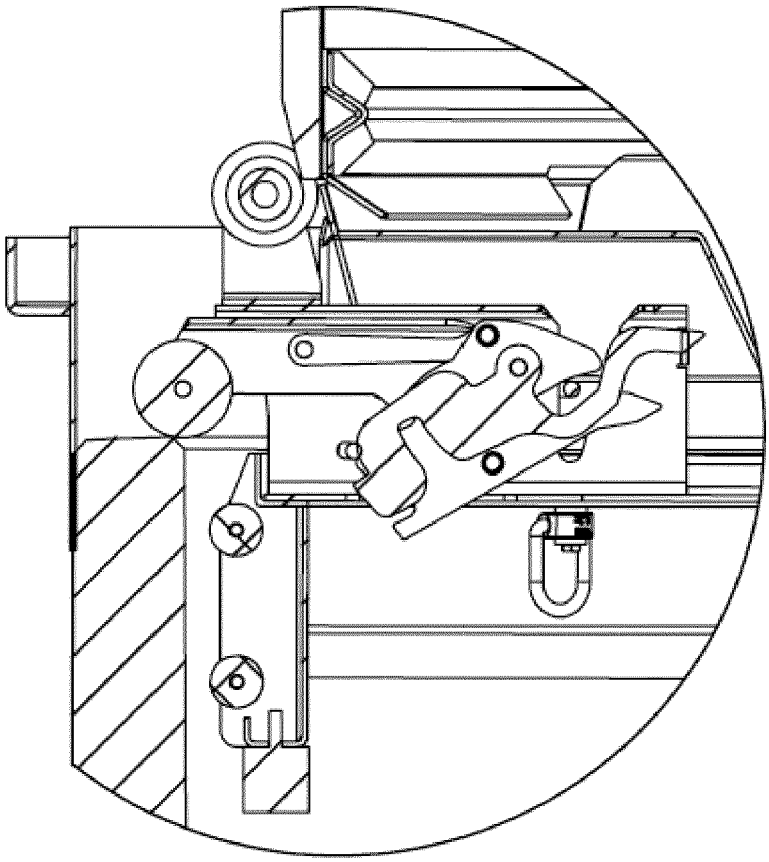

Figure 3a

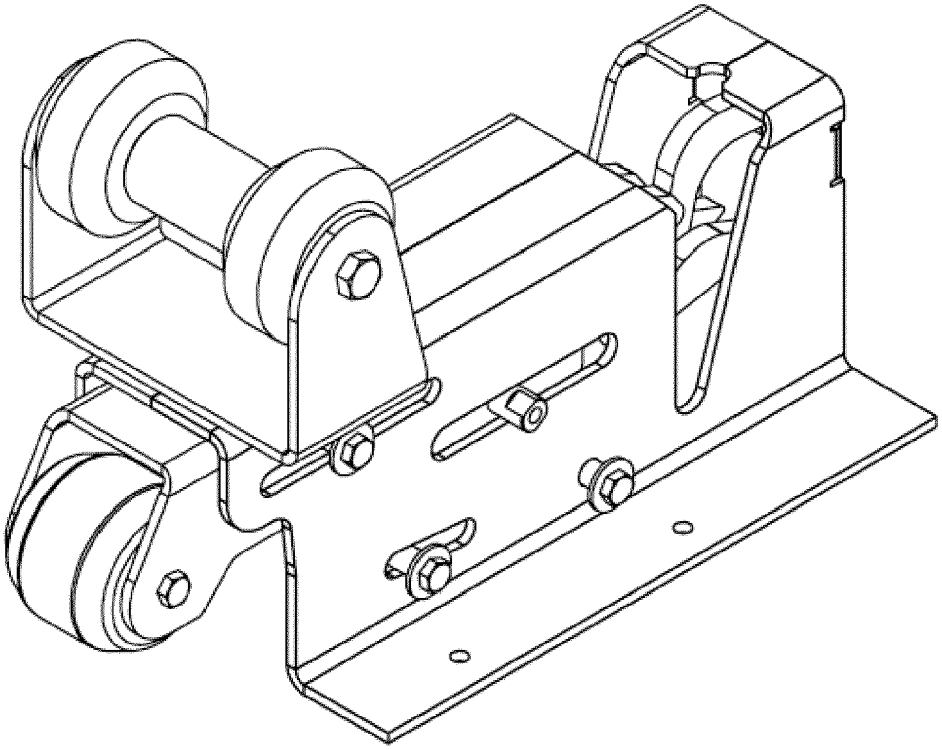

Figure 3b

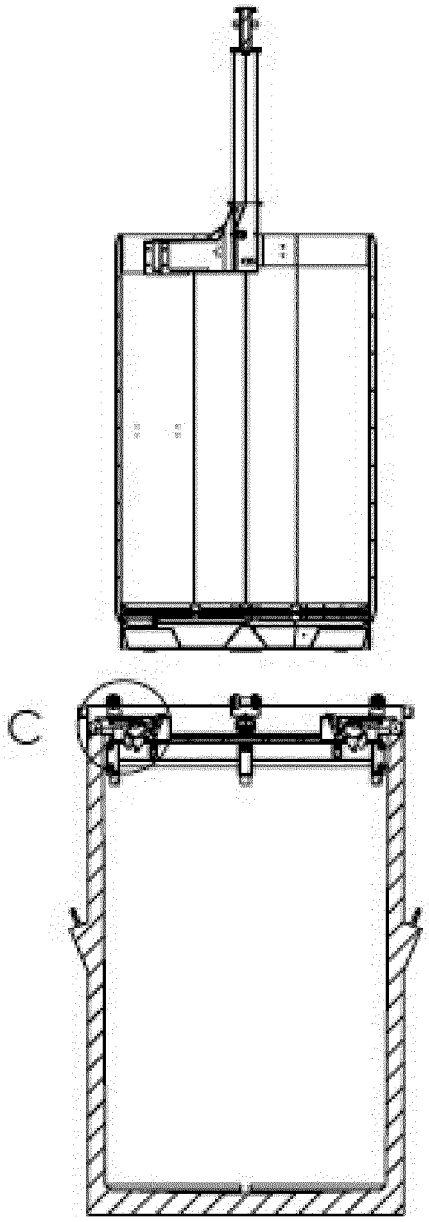

Figure 4

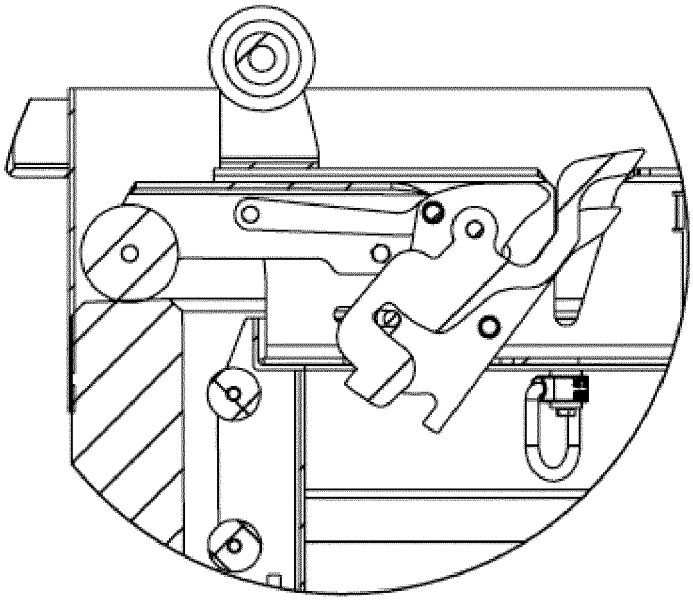

Figure 4a

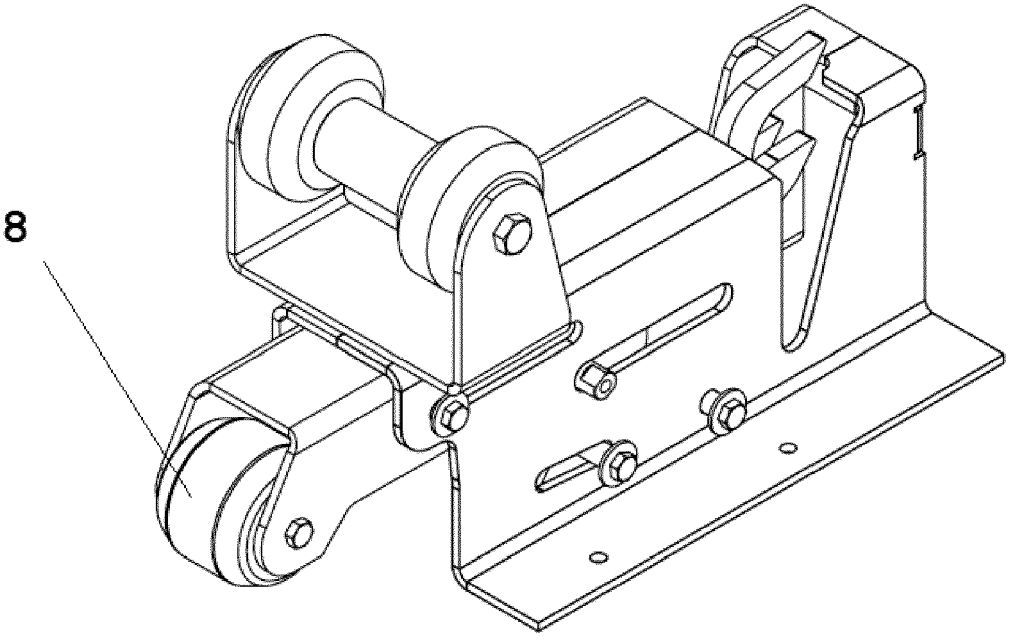

Figure 4b

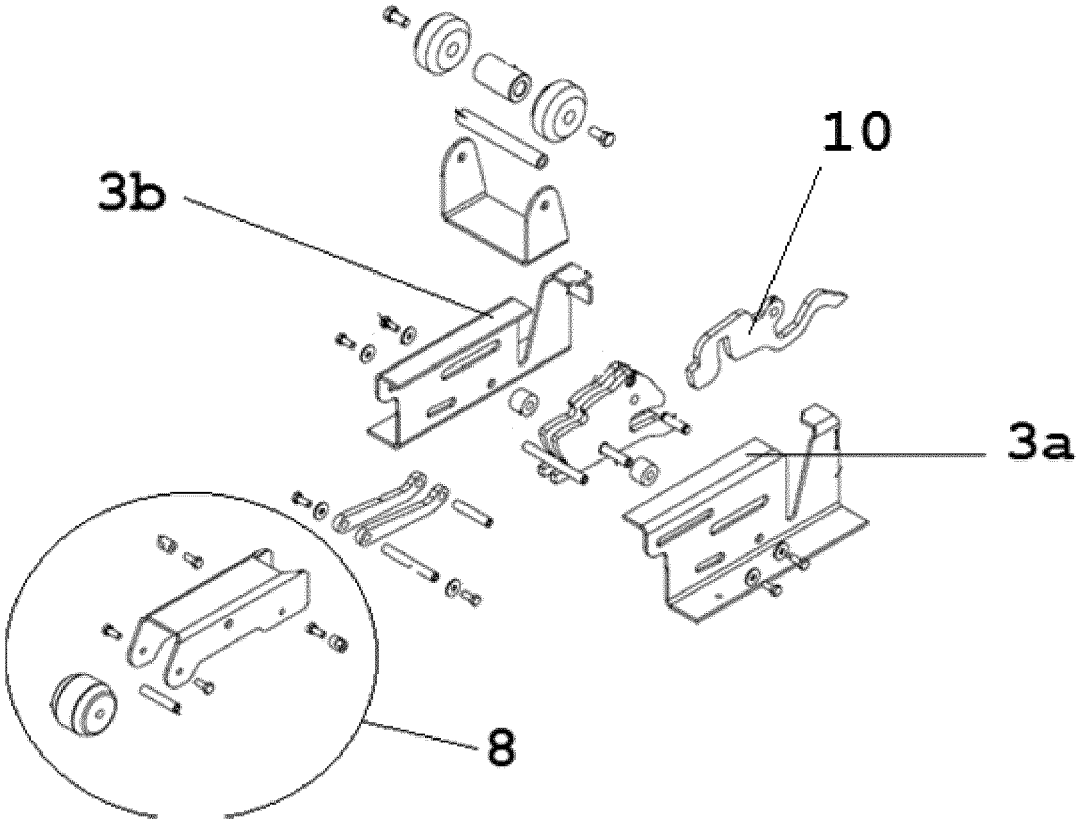

Figure 5

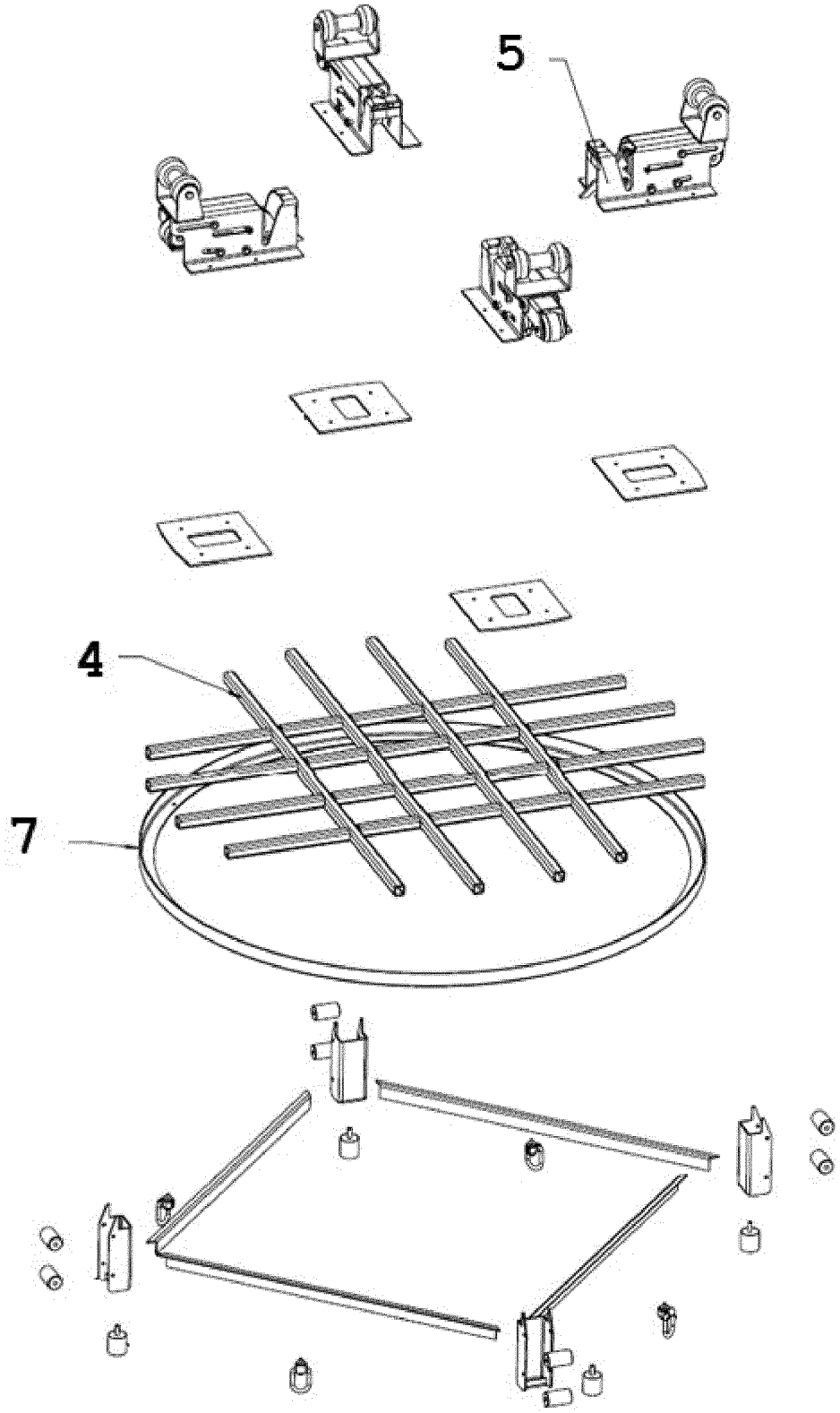

Figure 6

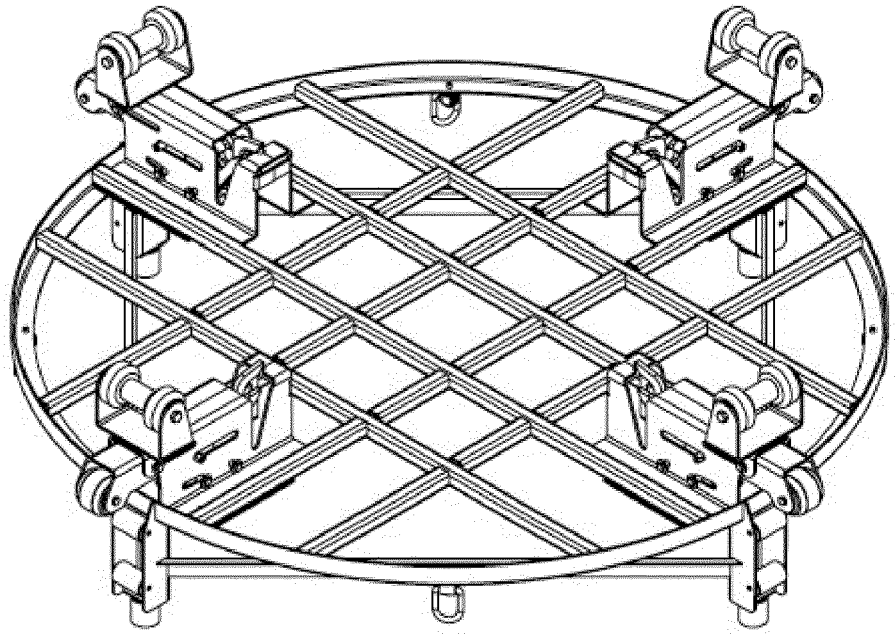

Figure 7

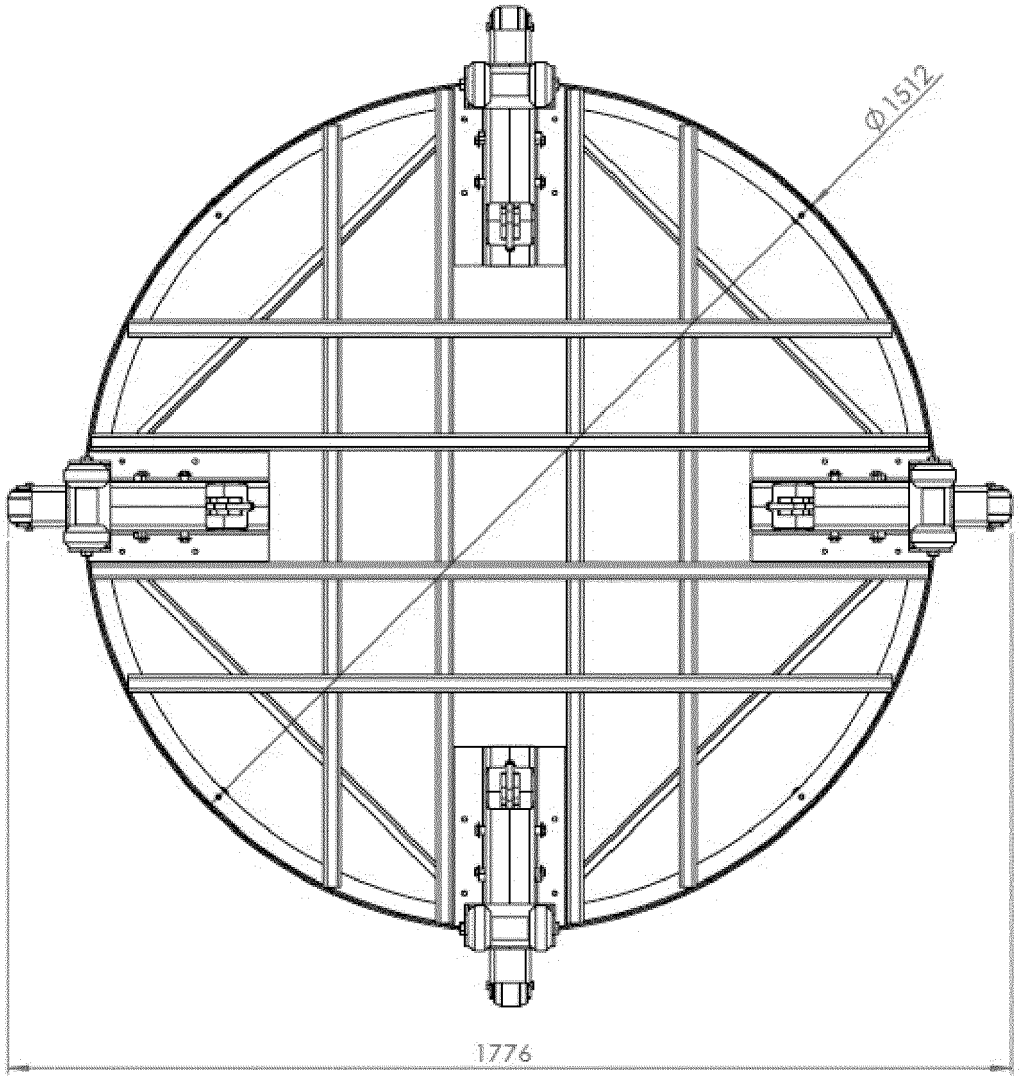

Figure 8

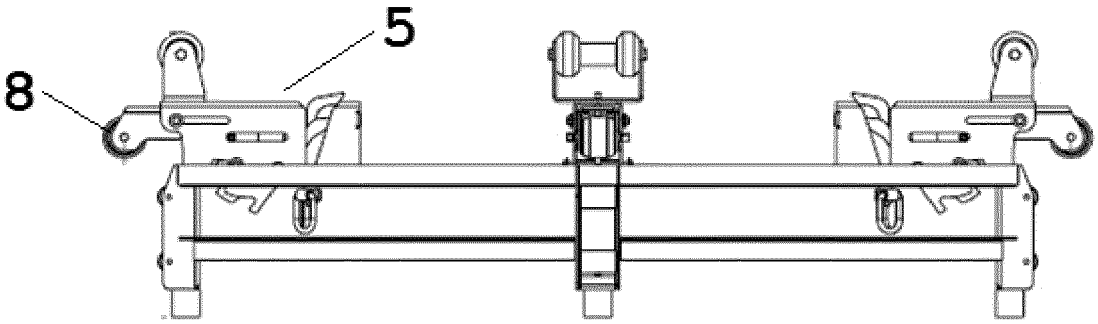

Figure 9

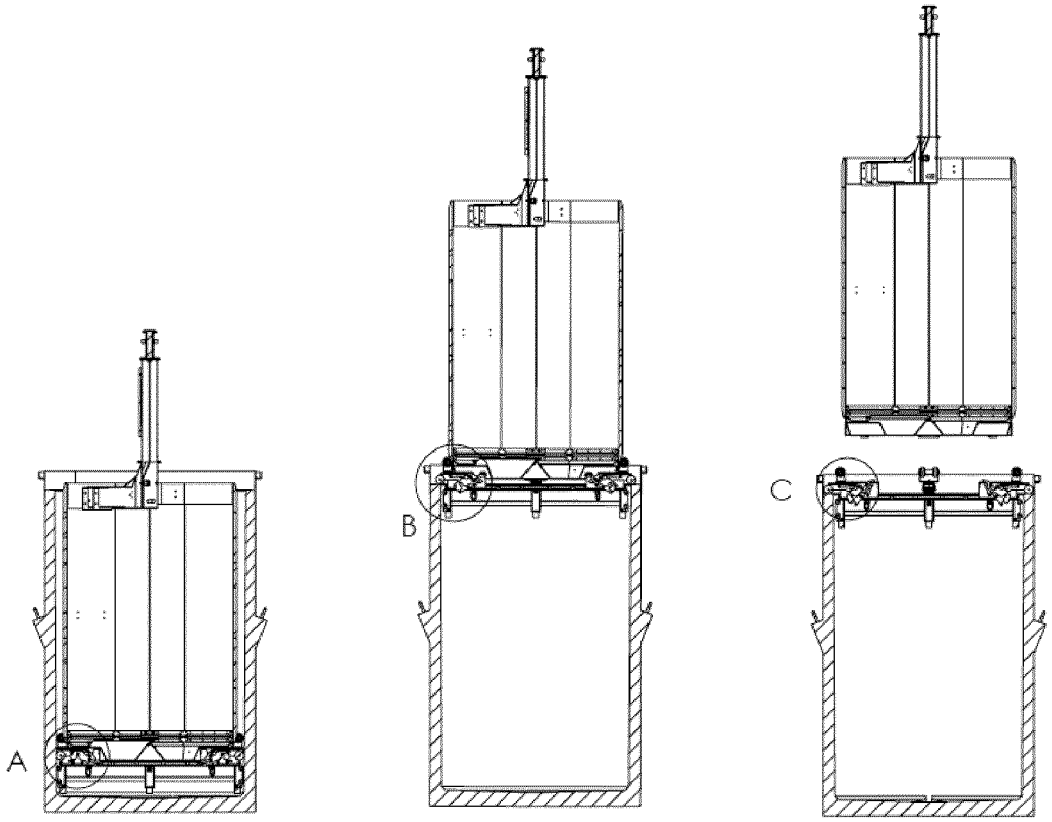

Figure 10

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EUROPEAN SEARCH REPORT

Application Number
EP 19 20 0823

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	FR 2 736 901 A1 (ALLIBERT EQUIPEMENT [FR]) 24 January 1997 (1997-01-24)	1-5	INV. B65F1/14
A	* page 4, line 13 - page 5, line 23; figures 3-5 *	6-9	
X	NL 1 002 026 C1 (METRO WASTE SYSTEMS B V [NL]) 9 July 1997 (1997-07-09)	1,3-9	
A	* the whole document *	2	
X	EP 3 162 737 A1 (BONNA SABLA [FR]; BERARD [FR]) 3 May 2017 (2017-05-03) * paragraphs [0023], [0030] - [0034]; figures 1,5 *	1-6,8,9	
X	NL 1 028 372 C2 (KONINK BAMMENS B V [NL]) 23 August 2006 (2006-08-23)	1-5,7,9	
A	* the whole document *	6,8	
A	NL 1 006 601 C1 (KLIKO MILIEUTECHNIEK BV [NL]) 19 January 1999 (1999-01-19) * the whole document *	1-9	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65F B67C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 March 2020	Kovács, Endre

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 20 0823

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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23-03-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2736901 A1	24-01-1997	NONE	
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EPO FORM P0459

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