

(19) **DANMARK**

(10) **DK/EP 2344403 T3**



Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

-
- (51) Int.Cl.: **B 65 F 1/14 (2006.01)** **B 65 F 3/02 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2022-02-28**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2021-12-22**
- (86) Europæisk ansøgning nr.: **08813053.9**
- (86) Europæisk indleveringsdag: **2008-10-08**
- (87) Den europæiske ansøgnings publiceringsdag: **2011-07-20**
- (86) International ansøgning nr.: **PT2008000038**
- (87) Internationalt publikationsnr.: **WO2010041969**
- (84) Designerede stater: **AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR**
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- (74) Fuldmægtig i Danmark: **CHAS. HUDE A/S, Langebrogade 1, 2. B2, 1411 København K, Danmark**
- (54) Benævnelse: **System med underjordisk system til indsamling af affald**
- (56) Fremdragne publikationer:
EP-A1- 1 508 535
DE-A1-102005 062 795
FR-A- 2 461 664
NL-C- 1 032 120
US-A1- 2008 203 097
None

DESCRIPTION

Summary of the invention

[0001] The present invention refers to a system according to the preambles of claims 1 and 2, comprising a subsurface refuse collection system. The system comprises an underground bunker located inside a surface area, a refuse container, a deposit bin and a cover with automatic opening and closing which can be powered electrically using a solar system. The container is collected by means of an automated crane with automatic hitching to facilitate collection. The system is equipped with multiple devices to measure volume and weight of the refuse deposited in the deposit bin, for the purpose of system monitoring or improvements to the management of truck routes. It also includes a safety device to prevent accidental falls into the underground bunker during collection.

Prior art

[0002] Current subsurface refuse collection systems employ containers which are placed within an underground bunker located under a cover to which the deposit bin is coupled. The cover may be opened manually or automatically. Containers are collected using the crane on the collection truck. When the container is positioned above or next to the collection vehicle, it is opened from below or turned in order to unload the refuse into the vehicle. Hitching of the hook on the truck's crane to the bar on the container is performed manually.

[0003] Portuguese patents 101968, 102148, 102748 and Spanish patents 2036916, 2138480, 2153733, 2228225, 2228226, all issued to MBE SOTKON S.A., exemplify the features of prior art.

[0004] Portuguese patent 101968 and Spanish patent 2138480 refer to urban refuse deposits incorporating a number of independent compartments suitable for depositing refuse of the same or different types, for each of which there is at least one input bin or chute located on the corresponding hinged cover, positioned at a suitable height for refuse to be deposited inside it. Each of the compartments comprises, in its hinged cover, at least one unloading trapdoor into which an emptying chute can be inserted which, by means of vacuum or any other similar effect, empties the refuse into the collection vehicle.

[0005] Portuguese patent 102148 and Spanish patent 2153733 refer to a subsurface refuse system comprising one or more independent compartments for depositing of refuse of the same or different types, for each of which there is at least one input bin or chute located on a hinged cover, each compartment comprising at least one refuse container resting on a platform fitted with suitable means for lifting/lowering the unit between two positions, one underground, concealed by the hinged cover and the other for collection, in which refuse is

transferred to the collection vehicles using the vehicle's emptying method, with or without tipping. Said container is equipped with a tray at the bottom fitted with its own means of opening and closing for resulting emptying of refuse without tipping. A different execution model includes a container with a fixed base fitted with its own means of manipulation by a collection vehicle and resulting emptying of refuse by tipping.

[0006] Portuguese patent 102748 and Spanish patents 2228225 and 2228226 refer to a system for opening the cover of underground deposits for solid urban refuse with a hinged cover. The cover comprises one or more hinges which allow it to swing open to an angle of around 90°; one or more locks locking the cover into the closed position; one or more fluid-operated, gas-operated or electric cylinders connecting the cover to the deposit to facilitate opening. The container, consisting of a single body, open on the upper side for use in systems for emptying by turning, equipped with a pair of diametrically opposed latches on the sides, or a double body for use in systems for emptying from below, said container also possessing a double cover with a perforated or multi-perforated tray at the top for drainage of liquids from the refuse towards a closed base.

[0007] There are in all such systems problems to be resolved: Performing automatic hitching of the truck's crane to the bar on the container, performing collection with a single operator, employing alternative energy sources to open the cover, monitoring the entire deposit/collection system and increasing safety during collection.

[0008] EP1508535A1 is considered to represent the most relevant state of the art and discloses a system according to the preambles of claims 1 and 2. It differs from the present invention essentially because it doesn't disclose a moving element (33) which remains stowed against the wall of the bunker (4) when the container (3) is inside the bunker (4) and tips into the horizontal position when the container (3) is collected, covering the bunker (4) opening; Means to open and close the input bin (1); Means to measure the weight of a container; and Means to automatically hitch the automatic crane (18) of a collection truck (17) to the container (3) equipped:

- on each side with a set of arms (22), which at their upper extremity are connected to a coupling system (21) located at the top of the crane (18), and at the lower end joined to the base (19), which is articulated by means of hinges (20); said set of arms (22) comprising a movable arm (25) located within a fixed arm (26) coupled to the body of the container (3) and both arms having at the upper end grooves (27 and 27') for coupling; said coupling system (21) connected to the arms of the crane (18) having a horizontal arm (23) able to rotate 360 degrees and two other vertical arms (24) which move vertically by means of fluid-operated cylinders; each of the two vertical arms (24) of the coupling system (21) comprising an outer element (28) and an inner element (29) which in turn possess at the lower extremity a grip (30 and 30') for coupling; said coupling being effected by means of hitching of the lower element (29) to the grooves (27) on the movable arms (25) of the container and hitching of the outer element (28) to the grooves (27') of the fixed arm (26) of the container, thus enabling rigid and

automatic lifting of the container to the emptying point; by vertically moving the inner element (29) of the vertical arms (24) of the coupling system (21) by means of fluid-operated cylinders, and by pushing or pulling of the movable arm (25) on the container it is thus possible to open and close the base of the container in order to empty it of refuse; and on each inner side a fixed arm (31) which at its upper extremity has a groove (32) enabling it to be hitched to the outer element (28) of the coupling system (21).

[0009] The invention provides a system according to claim 1 and a system according to claim 2.

Brief Description of the figures

[0010] The following description provided to better describe the present invention is based on the attached drawings that without limiting nature represent:

- Figure 1: Schematic side view of the subsurface system in the open position;
- Figure 2: Detail of the central lock;
- Figure 3: Diagram of a solar system to power the cylinders;
- Figure 4: Front view of the outside of the system;
- Figure 5: Detail of a channel attached to the bottom of the cover of the system;
- Figure 6: Schematic section of the subsurface system in the open position with the container being lifted by the automatic crane of the collection truck;
- Figure 7: Automatic hitching system between the automatic crane of the collection truck and the container emptied from below;
- Figure 8: Automatic hitching system between the automatic crane of the collection truck and the container with a closed base for emptying by turning;
- Figure 9: Safety system in the outer vertical position;
- Figure 10: Safety system in the horizontal position to cover the opening of the underground bunker when the container is collected.
- Figure 11: System for detection of the weight of refuse deposited;
- Figure 12: Detail of the decompression chamber attached to the gas cylinder connected to a button located on the surface.

Detailed Description of the Invention

[0011] In the embodiment the system is equipped with a cover (2), which has two hinges (5) on one side and a central lock (6) on the other with a safety bolt (7) placed vertically that

prevents the rotation of the central lock (6) tab and consequently keeps the cover (2) closed. This cover (2) may be opened or closed automatically by means of gas cylinders (8) with a decompression chamber (41) that connected to a button (40) on a box on the surface enables the automatic closure of the cover by means of decompression of the gas from the cylinders into the chamber (41); or by electro-hydraulic cylinders (8); or a mixed system comprising one electro-hydraulic cylinder and one gas cylinder. The gas cylinders (8) attached to the underground bunker (4), said underground bunker (4) located inside a surface area, and to the cover (2) have a driving action system electrically feed and once the safety bolt (7) is withdrawn and the lock is turned around (6) they allow the automated opening of the cover (2) up to 90 degrees and also the automated closing by means of the mentioned button (40) that should be pressed in a continuous way (as it is represented in figure 12). The cylinders (8) may be powered by a solar system comprising one or more photovoltaic panels (10) (As it is represented in picture 3, where the Panel is located on a post next to the cover (2) and the deposit bin (1)), or by mains electricity, or electricity provided by the truck or an external generator.

[0012] In Figure 1 it is represented the subsurface system in the open position, comprising a deposit bin (1) located at a height of approximately 90 cm, a cover (2) which opens up to 90 degrees supporting the paving, a container (3) for collection of refuse and an underground bunker (4). The cover is fitted with two hinges (5) on one side and a central lock (6) on the other. The cover is opened by means of cylinders (8) fastened to the cover and the underground bunker. The deposit bin (1), which has an upper cover, may include a central lock (11) which keeps it closed. For weighing of the refuse deposited in the container (3) or refuse deposited in the deposit bin (1) there may be load cells (14) in the underground bunker or load cells (15) at the bottom of the deposit bin, as described ahead.

[0013] At Figure 2 is possible to see the detail of the central lock (6) with safety bolt (7) keeping the cover (2) closed.

[0014] The movements of the cover (2) are controlled remotely by a mobile device or by a system of buttons as mentioned previously accessible only to the operator located on the street next to the cover (2), or by the positioning of a mobile device near a radio frequency identification post (9), located on the street next to the cover.

[0015] After opening the cover (2), the container (3) is emptied by means of an automatic hitching system between the container (3) and the automatic crane (18) of the collection truck (17).

[0016] The container for collection by opening from below is completely open on the upper side, and each side is equipped with a set of arms (22), the upper extremity of which connects to the system located at the top of the crane, and at the lower end are joined to the base (19), which is articulated by means of hinges (20). The above set of arms (22) comprises a movable arm (25) located within a fixed arm (26) coupled to the body of the container (3). Both arms have at the upper end a number of grooves (27 and 27') to enable coupling.

[0017] The Figure 6 shows the subsurface system in the open position with the container (3) being lifted by the automatic crane (18) of the collection truck (17). As it is possible to observe, the top of the automatic crane (18) is equipped with a coupling system (21) which hitches to a set of arms (22) on each side of the container (3). The set of arms (22) is connected to the base (19), articulated with hinges (20). This coupling system (21) connected to the arms of the crane is equipped with 1 horizontal arm (23) and two vertical arms (24).

[0018] The container with a closed base, for unloading by turning, possesses on the inside of each side a fixed arm (31) coupled to the body of the container (3), which at its extremity is equipped with a number of grooves (32) enabling coupling to the outer element (28) of the coupling system (21) located at the top of the crane.

[0019] The top of the truck's collection crane is equipped with a coupling system (21) with 1 horizontal arm (23) which can rotate 360 degrees and two other vertical arms (24) which move vertically by means of fluid-operated cylinders. Each of the vertical arms (24) of the coupling system (21) comprises an outer element (28) and an inner element (29) which in turn both have at each extremity a grip (30 and 30') for coupling, as it is represented in figure 7.

[0020] For containers with a cover (2) in the base, collection can be carried out as follows:

- Automatic opening of the cover (2) of the subsurface system.
- Movement of the crane (18) until the top is located above the underground container, controlled automatically by the operator.
- By means of a system using proximity sensors located on the crane (18) and the container (3), the inner element (29) is automatically hitched to the grooves (27) on the movable arms (25) of the container, and the outer element (28) to the grooves on the fixed arm (26) of the container.
- Based on memorisation of the above movements, the container (3) is automatically lifted using the crane (18) of the collection vehicle to the unloading point.
- The base of the container is opened by the operator by means of vertical movement of the inner element (29) of the vertical arms (24) of the coupling system (21), pushing the movable arm (25) on the container which supports the base.
- The base of the container is closed by the operator following emptying of the refuse by means of opposite vertical movement of the inner element (29) of the vertical arms (24) of the coupling system (21).
- Automatic movement of the container (3) from the unloading point into the underground bunker (4).
- Automatic disengagement of the inner element (29) from the grooves (27) on the movable arms (25) of the container, and of the outer element (28) from the grooves on the fixed arm (26) of the container.
- Movement of the crane (18) to the collection point, controlled automatically by the operator.
- Automatic closure of the cover (2) of the subsurface system.

[0021] Containers with a closed base can be emptied as follows:

- Automatic opening of the cover (2) of the subsurface system.
- Movement of the crane (18) until the top is located above the underground container, controlled automatically by the operator.
- By means of a system using proximity sensors located on the crane (18) and the container (3), the outer elements (28) of the coupling system (21) located at the top of the crane are automatically hitched to the fixed arms (31) coupled to each side of the container
- Based on memorisation of the above movements, the container is automatically moved to the rear of the collection vehicle.
- Positioning of the container onto the rear lifting mechanism for emptying, controlled by the operator
- Automatic movement of the container (3) from the unloading point into the underground bunker (4).
- Automatic disengagement of the elements connecting the container (3) to the crane (18)
- Movement of the crane (18) to the collection point, controlled automatically by the operator.
- Automatic closure of the cover (2) of the subsurface system.

[0022] The described automatic hitching system between the automatic crane (18) of the collection truck (17) and the container with a closed base for emptying by turning is represented in figure 8. The container is equipped on each side with a fixed arm (31) which at the upper extremity has a groove (32) enabling hitching to the outer element (28) of the coupling system (21).

[0023] When the container (3) is removed from inside the underground bunker (4), a safety device covers the entirety of the opening of the underground bunker (4) in order to avoid accidental falls during collection. The safety device remains concealed against one of the walls of the underground bunker (4) whenever the container (3) is located inside the underground bunker (4). When the container (3) is lifted for collection, the device swings into the horizontal position, covering the opening of the bunker(4).

[0024] This safety device, connected to one wall of the underground bunker (4), is equipped with the following elements to allow automatic positioning and shock absorption: a rotating arm (35), a gas shock absorber (36) and a shock-absorbing spring (34). When the safety device is in the horizontal position during collection of the container (3), there are two locks (37) located on the front wall of the bunker (4) which keep the device secure and stable. When the container (3) is replaced inside the underground bunker (4), the locks (37) are released mechanically by means of two pedals (38) which are simultaneously depressed by the container (3), forcing the device to swing back into its initial position. As it is possible to observe

in figure 9, the safety system in the outer vertical position comprises a movable element (33) connected to the rear wall of the underground bunker by means of a unit comprising a rotating arm (35), a gas shock absorber (36) and a shock absorbing spring (34). In figure 10 it is represented the safety system in the horizontal position to cover the opening of the underground bunker (4) when the container (3) is collected. The movable element (33) is connected to the front wall of the underground bunker (4) with two locks (37) which are released mechanically when two pedals (38) are depressed simultaneously.

[0025] It is also possible to move the device manually from the inner horizontal position to the outer vertical position for access to the underground bunker (4) for cleaning or maintenance.

[0026] The upper part of the deposit bin (1) can be kept closed by means of a lock (11). This enables it to be opened only by specified users. The lock is operated by positioning a mobile device close to a radio frequency identification system (16) located in the deposit bin (1) post, allowing opening of the upper part of the deposit bin. Such situation is visible in figure 4 where the deposit bin (1) is equipped with a radio frequency identification system (16) that enables the lock (11) opening of the deposit bin (1) by the positioning of a mobile device close to it. Outside the perimeter of the cover (2) of the system there is also a radio frequency identification post (9) which can control the movements of the cover by positioning a mobile device close to it.

[0027] The level of refuse in the container can be monitored by means of a mobile probe (12) or probes located in the cover (2) which supply the data to a microprocessor which calculates the level of refuse as a percentage and sends this information to a central module controlling the management of refuse collection, via a communication device. When the percentage of refuse reaches a preset value, the microprocessor can also send a message resulting in activation of a locking device (11) in the deposit bin (1) of the subsurface system.

[0028] Is possible to observe in figure 5 a channel (13) attached to the bottom of the cover (2) of the system which enables the movement of a probe (12) to read various levels of volume in different parts of the subsurface container (3) .

[0029] The weight of refuse held in the container can also be monitored by means of a load cell (14) fastened to the underground bunker (4) and placed under the container (3) allowing continuous weighing of the container (3) and refuse placed inside it. A microprocessor receives the information from multiple weighings of the container (3) according to a preset schedule, calculates the weight of refuse as a percentage, and sends it to a central module controlling the management of refuse collection, via a communication device.

[0030] The weighing of refuse placed in a subsurface refuse collection system, accessible only to specified users, can be carried out in one of two ways:

- A cell (15) located in the lower part of the bin (1) allowing continuous weighing of the opening and refuse placed within it.

- A load cell (39) enabling weighing of the user and the refuse to be deposited, placed on the cover (2) of the subsurface system next to the deposit bin (1), configured in such a way that the user must place both feet on it in order for the lock (11) at the upper part of the deposit bin to be opened, enabling refuse to be deposited.

[0031] Information received from the weighings of each deposit is processed by a microprocessor which calculates the weight of the refuse as a percentage, and sends it to a central module controlling the management of refuse collection via a communication device.

[0032] In picture 11 it is represented the system for detection of the weight of refuse deposited comprising a load cell (39) enabling weighing of the user and of the refuse to be deposited, located on the cover (2) of the subsurface system next to the deposit bin (1) which is fitted with a lock (11) on the upper hatch.

[0033] Measurement of the volume of refuse deposited in the bin, accessible only to specified users, can also be carried out by means of a set of probes located on the inner walls of the deposit bin which detect the approximate volume of the bag deposited.

[0034] As it is evident to experts in the area several changes are possible within the scope of the following claims.

REFERENCES CITED IN THE DESCRIPTION

Cited references

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- [PT102748 \[0003\] \[0006\]](#)
- [ES2036916 \[0003\]](#)
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PATENTKRAV

1. System, omfattende en automatisk kran (18) og et undergrundssystem til opsamling af affald, hvilket system omfatter forskellige uafhængige moduler, alt efter typen af affald, der skal indsamles, hvorved systemet ydermere omfatter, i undergrundsområdet, en underjordisk bunker (4) og en beholder (3) til indsamling af affaldet ved hjælp af den automatiske kran (18), samt et dæksel (2), der åbner op til 90 grader, en brostensbelægning, en post (stolpe) med en affaldsbeholder (1), som befinder sig i en højde på cirka 90 cm og placeret på låget (2), hvorved systemet omfatter:

- midler til at åbne og lukke låget (2);
- en opsamlingsvogn (17) med den automatiske kran (18);
- midler til automatisk at hægte indsamlingsvognens (17) automatiske kran (18) til beholderen (3);

hvorved systemet er **kendetegnet ved**

- en sikkerhedsindretning, omfattende et bevægeligt element (33), der forbliver stuvet mod bunkerens (4) væg, når beholderen (3) befinder sig inden i bunkeren (4), og vipper til vandret position, når beholderen (3) indsamles, og afdækker bunkerens (4) åbning;
- midler til at åbne og lukke affaldsbeholderen (1) til anvendelse for kun specificerede brugere;
- midler til måling af affaldets volumen i beholderen;
- midler til måling af vægten af en beholder;
- midler til måling af vægten af affald, der er deponeret i affaldsbeholderen (1), hvilke midler kun er tilgængelige for specificerede brugere;
- midlerne til automatisk hægning af indsamlingsvognens (17) automatiske kran (18) til en beholder (3), der er tømt nedefra, og som anvendes til automatisk løftning og overføring af beholderen til et tømningssted ved hjælp af et automatisk system med proximity (nærheds)-sensorer, er således, at beholderen (3) har en lukket basis (19) og er helt åben på

oversiden og på hver side er udstyret med et enkelt sæt arme (22), der på deres øvre ende er konfigureret til at blive forbundet til koblingssystemet (21), som befinder sig i toppen af kranen, og på deres nedre ende er forbundet til en basis (19) i beholderen, hvilken basis (19) ved hjælp af hængsler (20) er ledforbundet til beholderens (3) legeme;

5 hvorved sættet af arme (22) omfatter en bevægelig arm (25), der befinder sig inden i en faststående arm (26), som er koblet til beholderens (3) legeme, og begge arme omfatter en rille (27 og 27') på toppen med henblik på kobling;

10 koblingssystemet (21), som er forbundet til kranens arme, omfatter en horisontal arm (23), der er i stand til at rotere 360 grader, samt to andre, vertikale arme (24), som bevæger sig vertikalt ved hjælp af fluid-betjente cylindre i systemet; hver af de to vertikale arme (24) i koblingssystemet (21) omfatter et ydre element (28) og et indre element (29), som igen

15 begge på hver ende omfatter et greb (30 og 30') med henblik på kobling; koblingen udføres ved hjælp af hægtning af det nedre element (29) til rillerne (27) på beholderens bevægelige arme (25) og hægtning af det ydre element (28) til rillerne (27') i beholderens fastholdte arme (26), hvorved der muliggøres stiv og automatisk løftning af beholderen til tøm-

20 ningsstedet;

ved vertikal bevægelse af det indre element (29) i koblingssystemets (21) vertikale arme (24) ved hjælp af de fluidbetjente cylindre og ved skubning af eller træk i den bevægelige arm (25) på beholderen er det således muligt at åbne og lukke beholderens basis med henblik på at tømme be-

25 holderen for affald.

2. System, omfattende en automatisk kran (18) og et undergrundssystem til indsamling af affald, hvilket system omfatter forskellige uafhængige moduler alt efter typen af affald, der skal opsamles, hvorved systemet ydermere omfatter, i under-

30 grundsområdet, en underjordisk bunker (4) og en beholder (3) til indsamling af affaldet ved hjælp af den automatiske kran (18), samt et dæksel (2), der åbner op til 90 grader, en brostensbelægning, en stolpe med en affaldsbeholder (1),

som befinder sig i en højde på cirka 90 cm og er placeret på låget (2), hvorved systemets dæksel omfatter:

- midler til at åbne og lukke dækslet (2);
- 5 - en indsamlingsvogn (17) med den automatiske kran (18);
- midler til automatisk at hægte indsamlingsvognens (17) automatiske kran til beholderen (3);

hvorved systemet er **kendetegnet ved**

- 10 - en sikkerhedsindretning, omfattende et bevægeligt element (33), der forbliver stuvet mod bunkerens (4) væg, når beholderen (3) befinder sig inden i bunkeren (4), og kipper til vandret position, når beholderen (3) indsamles, og afdækker bunkerens (4) åbning;
- 15 - midler til åbning og lukning af affaldsbeholderen (1) til anvendelse for kun specificerede brugere;
- midler til måling af affaldets volumen i beholderen;
- midler til måling af vægten af en beholder;
- midler til måling af vægten af affald, der er deponeret i affaldsbeholderen (1), og som kun er tilgængelig for specificerede brugere;
- 20 - midlerne til automatisk hægtning af indsamlingsvognens (17) automatiske kran (18) til en beholder (3), og som anvendes til automatisk løftning og overføring af beholderen til tømningsstedet ved hjælp af et automatisk system med proximity (nærheds)-sensorer, er således, at beholderen (3)
- 25 omfatter en lukket basis (19) og er helt åben på oversiden, hvorved beholderen (3) på hver inderside omfatter en faststående arm (31), der er koblet til beholderens (3) legeme, hvorved den faststående arm (31) på sin øvre ende omfatter en rille (32), der gør det muligt for den at blive hægtet til et ydre element (28) i koblingssystemet (21), beliggende på
- 30 kranens top på en sådan måde, at der muliggøres automatisk løftning af beholderen til det sted, hvor den kan tømmes ved at blive drejet.

3. System ifølge et hvilket som helst af kravene 1 eller 2, hvorved midlerne til åbning og lukning af dækslet (2), og som omfatter to hængsler (5) på dækslets (2) ene side, en central lås (6) på den anden side og en eller flere gascylindre (8), der er forbundet med den underjordiske bunker og dækslet (2), er

5 **kendetegnet ved, at** de omfatter en sikringsbolt (7), der er vertikalt positioneret, og som hindrer en laske på den centrale lås (6) i at dreje ved tilstedeværelse af eksterne vibrationer, hvilket ville bringe dækslet (2) til at åbne under uønskede omstændigheder;

ved, at cylindrene (8) er forbundet til en knap (40) på en boks, som befinder sig
10 på overfladen, hvorved der muliggøres automatisk lukning af dækslet ved hjælp af dekompression af gassen fra cylindrene ind i et kammer (41);

ved, at cylindrene (8) drives af et solcellesystem, som omfatter et eller flere solcellepaneler (10);

ved, at bevægelserne af dækslet (2) og kranen (18) fjernstyres ved anvendelse
15 af et enkelt apparat via kontinuerlige styreknapper.

4. System ifølge et hvilket som helst af de foregående krav,

kendetegnet ved, at en eller flere cylindre (8) er elektriske eller elektro-hydrauliske og kan kombineres med andre gascylindre (8).

20

5. System ifølge et hvilket som helst af de foregående krav,

kendetegnet ved, at systemet er konfigureret således, at cylindrene (8) drives af et elektrisk system, som er tilvejebragt af indsamlingsvognen (18).

25 6. System ifølge et hvilket som helst af de foregående krav,

kendetegnet ved, at dækslets (2) bevægelser styres ved hjælp af positioneringen af et mobilapparat nær ved en radiofrekvensidentifikationspost (9), der befinder sig på gaden ved siden af dækslet (2).

30 7. System ifølge krav 1,

kendetegnet ved, at bagvæggen i den underjordiske bunker (4) og det bevægelige element (33) er forbundet ved hjælp af en enhed, omfattende en roterende arm (35), en gasstøddæmper (36) og en stødabsorberende fjeder (34) med

- henblik på at muliggøre automatisk svingnings- og støddæmpning af det bevægelige element (33) fra den indre vertikale position til den indre horisontale position ved indsamlingen i beholderen (3), og manuel vipning fra den indre, horisontale position til den ydre, vertikale position med henblik på tilgang til den underjordiske bunker (4) med henblik på rengøring eller vedligeholdelse;
- 5 frontvæggen for den underjordiske bunker (4) og det bevægelige element (33), når i horisontal position under indsamlingen i beholderen (3), er forbundet ved hjælp af to låse, som frigives mekanisk, når to pedaler (38), der befinder sig på det bevægelige element (33), samtidigt nedtrykkes af beholderen (3).

10

8. System ifølge krav 1,

- kendetegnet ved, at** midlerne til åbning og lukning af affaldsbeholderen (1), udelukkende til anvendelse for specifikke brugere, er udstyret med en lås (11), der låser affaldsbeholderens (1) klap, hvorved den kun tillades at åbne ved aktivering
- 15 under positionering af et mobilapparat nær ved et radiofrekvens-identifikations-system (16), som befinder sig i affaldsbeholderens post (1).

DRAWINGS

FIGURE 1

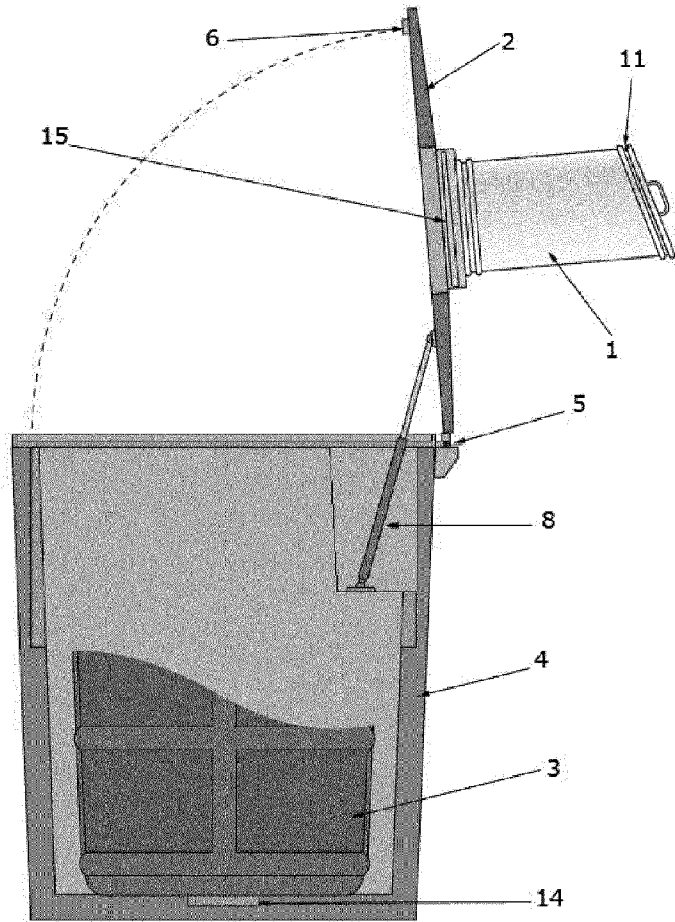


FIGURE 2

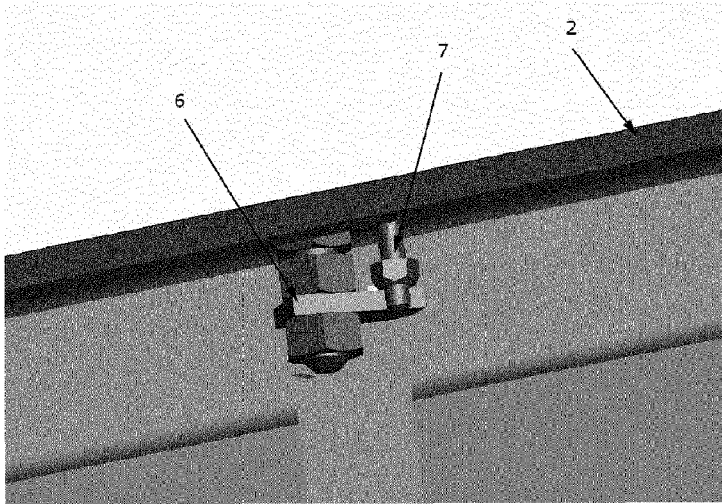


FIGURE 3

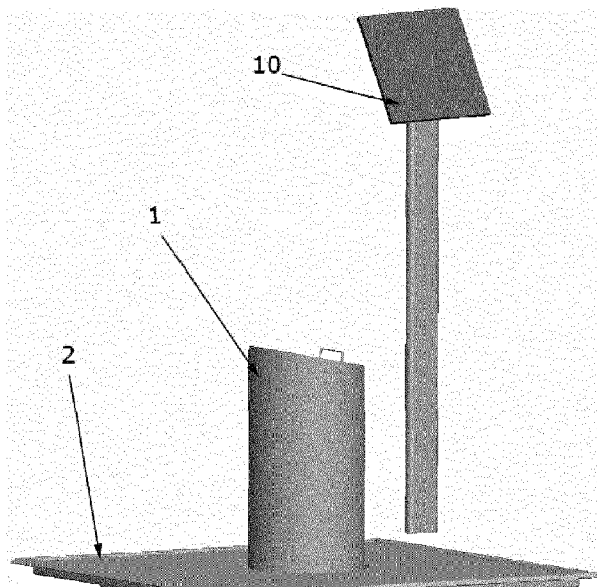


FIGURE 4

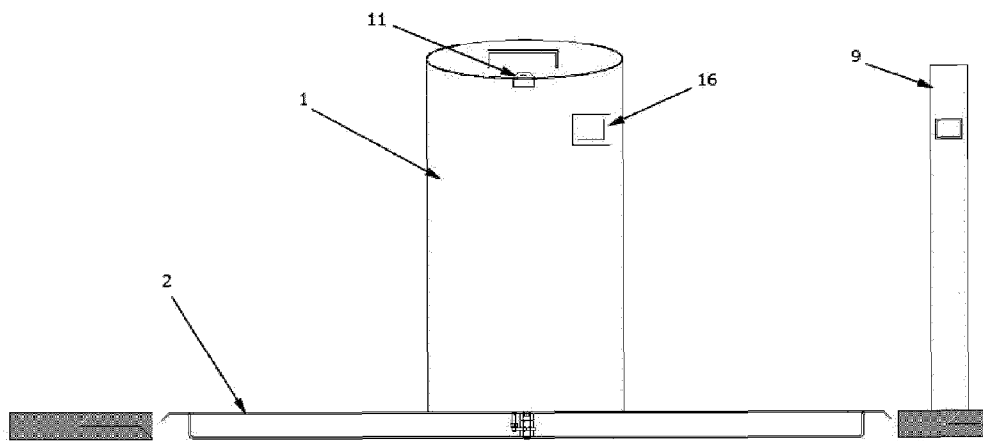


FIGURE 5

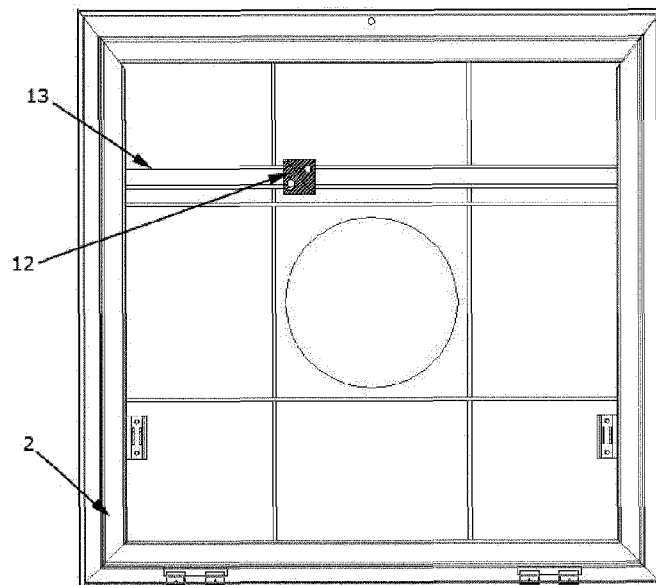


FIGURE 6

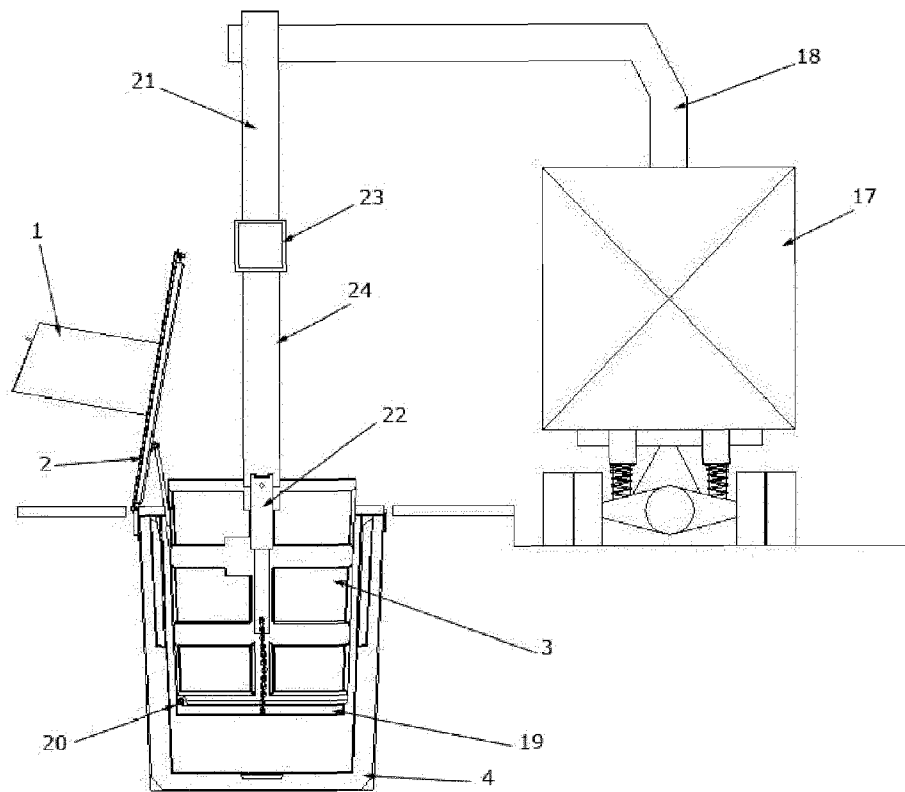


FIGURE 7

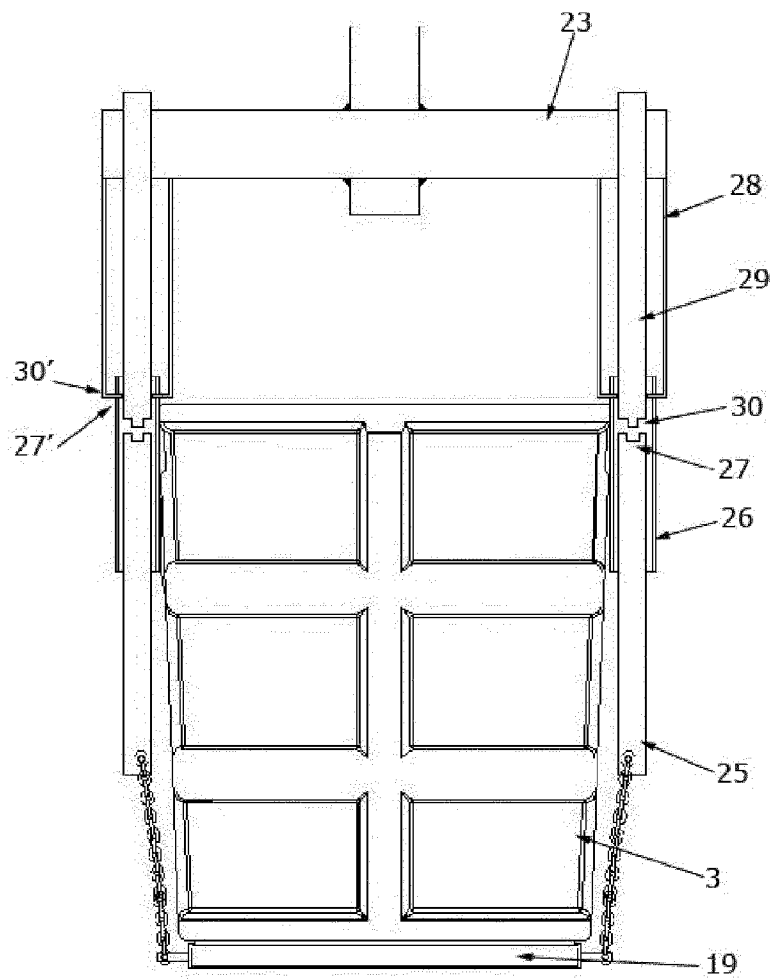


FIGURE 8

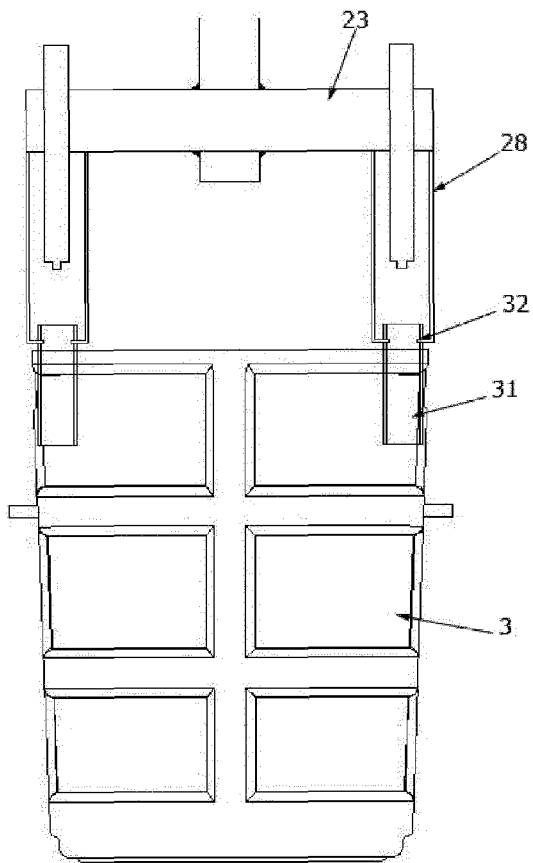


FIGURE 9

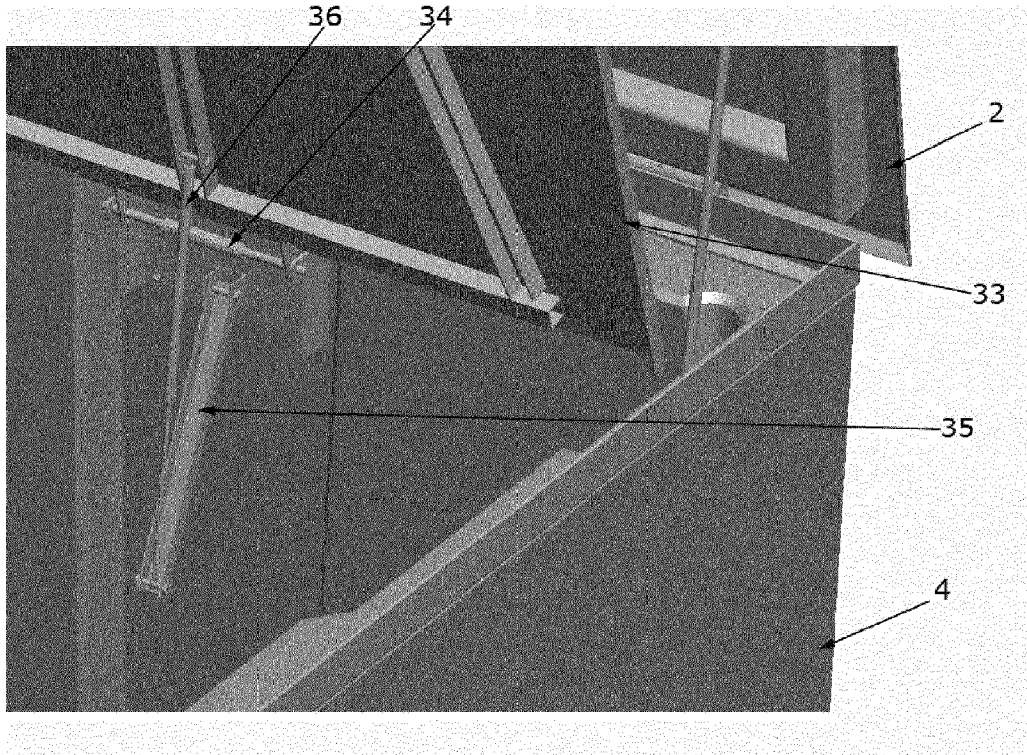


FIGURE 10

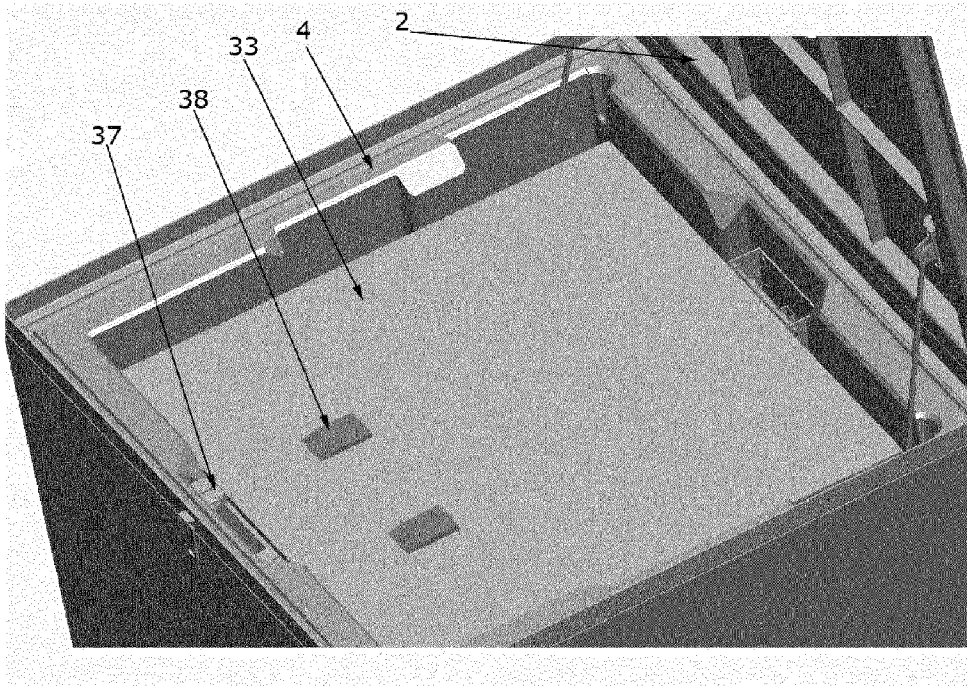


FIGURE 11

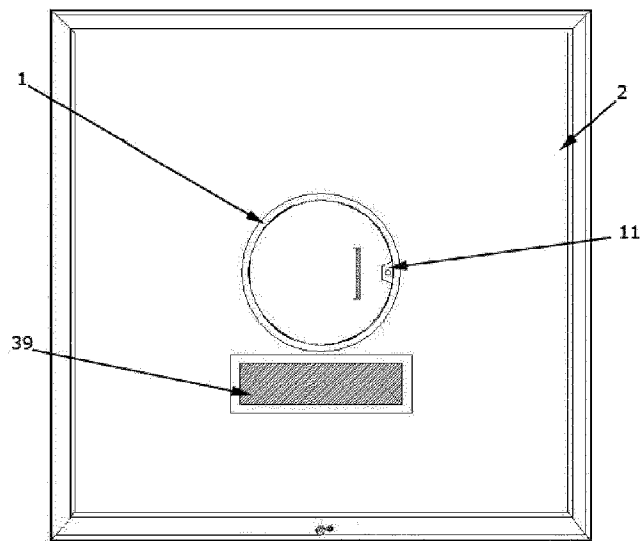


FIGURE 12

