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(54) **SELECTIVELY ENABLED CONTAINER FOR THE DISPOSAL OF WASTE**

(57) A partializing element (5) operating between the cover (3) and the vessel (2) of the container (1), is movable between an operating condition in which it partializes access to the vessel, and a distancing condition therefrom. A locking mechanism (12) of the cover is selectively deactivatable to unlock the cover with respect to the vessel. A selector unit (25) comprises a fixed portion (26), a movable portion (27) and an intermediate portion (28), connected to the vessel (2), to the cover (3) and to the partializing element (5). The intermediate portion (28) carries a latch (29) movable between a first and a second operating position in which it locks the intermediate portion (28) respectively to the fixed portion (26) and to the movable portion (27). An electronic control unit (8) is configured to control, in response to the identification of a code belonging to a first or, respectively, a second series, the selective positioning of the latch (29) in the first or, respectively, in the second operating position, together with the deactivation of the locking mechanism (12).

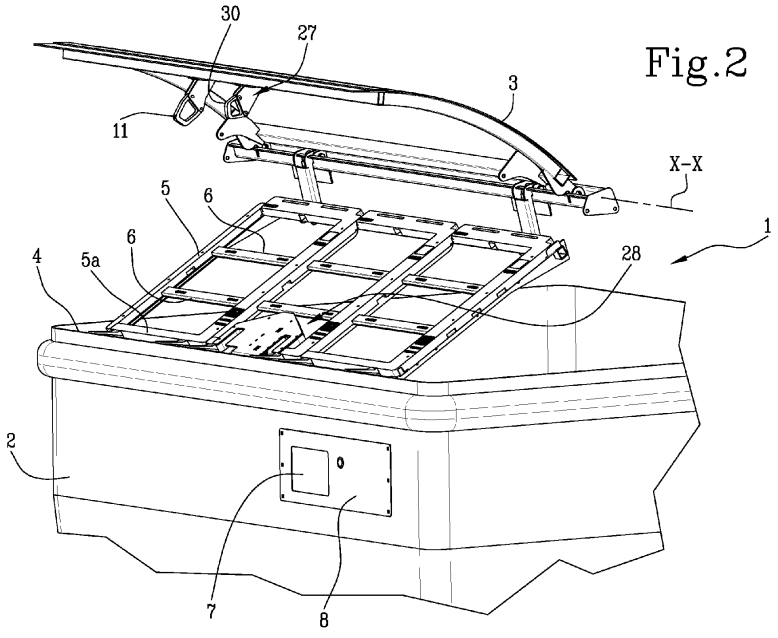

Fig.2

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Description

[0001] The present invention relates to a selectively enabled container for the disposal of waste.

[0002] As is known, waste collection in urban areas is normally carried out with the aid of special containers, for example bins, suitably located in the urban territory and accessible by citizens for the disposal of waste. The containers are periodically emptied by suitably equipped vehicles, which transport the waste to the respective treatment sites.

[0003] For the purpose of waste collection in urban environments, where separate collection is required, the containers are each conveniently configured for the disposal of a specific type of waste by the user.

[0004] To allow a control and monitoring of the disposal of waste by the user, solutions have been proposed which enable and possibly record the disposal of waste after user identification.

[0005] These solutions include a locking system which prevents the direct disposal of waste, making it possible only after unlocking a hatch or other access system by means of an electromechanical device. The electromechanical device is automatically activated following identification of the user, usually by means of an electronic interface by reading a code stored or storable on a badge or other type of optical, magnetic, RFID medium and/or on smartphones or the like. Furthermore, in order to configure each container for the collection of a specific fraction of waste, Italian patent IT 000140069 includes the use of a partializing element interposed between the cover and the containment vessel, provided with openings suitably shaped as a function of the typical dimensions of the waste to be disposed. This inhibits the possibility of disposing inappropriate waste either by hindering the introduction of objects of excessive size, or by reducing the possibility of error thanks to the aid of visual messages such as shapes and colours, which help the user choose the correct bin in which to dispose the different types of waste.

[0006] In the current state of the art, obtaining the selective opening according to the degree of enablement of the user who has identified himself, requires the installation of two separate locks. A first lock, operating between the cover and the containment vessel or the partializing element, can be unlocked upon recognition of any enabled user, regardless of their degree of enablement. A second lock operates between the partializing element and the container, and can be unlocked only upon recognition of a user with a higher degree of enablement, hereinafter referred to as non-domestic user, to free the lifting of the partializing element from the vessel for the purposes of emptying the bin. However, the Applicant has found that in the known containers the synchronized management of the two locks as a function of the type of user is quite problematic and costly from an energy point of view. In this regard, there is an increasing demand for containers which are capable of operating with an autonomous power supply, normally by means of photovoltaic panels and/or batteries, in order to avoid the complications required by a connection to an electrical power supply network. Since the performance of the photovoltaic panels and/or batteries, in terms of efficiency and durability, is closely linked to the energy needs of the system, their use makes it important to reduce the energy consumption of the computer and automation equipment of the containers as much as possible, and in particular of the electromechanical systems used for locking and unlocking the cover and/or the partializing element. Another problem which emerges in the current state of the art consists of malfunctions which occur when a user tries to operate the opening mechanism of the disposal opening, controlled by a lever and/or a pedal, when he has not yet completed the identification operation. In this case, it can easily occur that the mechanical components subjected to the stress transmitted by the user through the lever or the pedal, are unable to move to determine the unlocking of the disposal opening when the electronic interface, upon recognition of the code transmitted by the user, enables the disposal operation. In many cases the user interprets the failure to unlock as a malfunction of the system, and feels entitled to abandon his waste outside the bin.

[0007] Another drawback found with the use of the current control devices is their relative vulnerability to tampering. In particular, it has been possible to verify that the current systems lend themselves to being tampered with by ill-intentioned users who, with a certain dexterity, manage to introduce cards or other flexible laminar elements into the gaps present between respectively movable parts near the disposal opening, until reaching and unlocking the unlocking mechanism so as to carry out a disposal in the absence of identification, for example to anonymously introduce materials other than those for separate collection, or to circumvent tariff charge systems which are based on the number of disposals completed and/or the amount of waste disposed of by the user.

[0008] The invention proposes to improve the state of the art and/or overcome the drawbacks highlighted above, by proposing a device which lends itself to more effectively govern the selective unlocking of the cover and the partializing element as a function of the type of enablement attributed to the user who is set to use the container.

[0009] A further object of the invention is to provide a device which lends itself to minimizing the energy expenditure required for operating the unlocking of the cover and/or the partializing element.

[0010] A further object of the invention is to propose a device which lends itself to operating in an efficient and reliable manner, even where an inexperienced user has acted clumsily by trying to open the cover when the identification operation has not yet completed.

[0011] A further object of the invention is to provide a device which lends itself to effectively inhibiting any tam-

pering actions aimed at determining the unlocking of the access opening in a fraudulent manner.

[0012] In a first aspect, the invention relates to a selectively enabled container for the disposal of waste, comprising: a containment vessel; a cover constrained to the containment vessel around a hinging axis and movable between a closed condition in which it lies next to a terminal edge of the vessel, and an open condition in which it is spaced from the terminal edge to enable access to the vessel itself; and a partializing element operatively interposed between the cover and the vessel and oscillatably constrained to the latter, said partializing element being movable between an operating condition in which it lies near the terminal edge of the vessel to partialize the access thereto, and a distancing condition in which it is spaced from the terminal edge of the vessel to free the access thereto.

[0013] A locking unit is preferably provided comprising: a fixed part integral with the containment vessel; a movable part integral with the cover; and a locking mechanism normally active to lock the movable part with respect to the fixed part when the cover is in a closed condition, and selectively deactivatable to unlock the movable part with respect to the fixed part. A selector unit is preferably provided comprising: a fixed portion integral with the containment vessel; a movable portion integral with the cover; and an intermediate portion integral with the partializing element.

[0014] A latch is operatively carried by the intermediate portion and selectively movable between a first operating position in which it locks the intermediate portion with respect to the fixed portion, and a second operating position in which it locks the intermediate portion with respect to the movable portion.

[0015] An electronic control unit is also present, provided with a user identification unit configured to recognize at least a first and a second series of enabling codes.

[0016] The electronic control unit is configured to control, in response to the identification of a code belonging to the first or, respectively, the second series, the selective positioning of the latch in the first or, respectively, in the second operating position, together with the deactivation of the locking mechanism.

[0017] In at least one convenient embodiment, the invention can further comprise one or more of the following preferential technical solutions. Preferably, the axis of the cover is constrained above the containment vessel.

[0018] Preferably, said terminal edge is arranged over the containment vessel. Preferably, said terminal edge extends according to a polygonal extension.

[0019] Preferably, the hinging axis of the cover extends above the containment vessel.

[0020] Preferably, the hinging axis of the cover extends at the terminal edge of the containment vessel.

[0021] Preferably, the hinging axis of the cover extends above the terminal edge of the containment vessel.

[0022] Preferably, the hinging axis of the cover extends parallel to at least one of the sides of the upper edge.

[0023] Preferably, the partializing element is movable around a constraint axis which is parallel and proximate, preferably coincident, with respect to the hinging axis of the cover.

[0024] Preferably, the partializing element comprises a panel extending substantially according to the entire surface extension of an opening made accessible by the cover in the open position, and having one or more waste disposal openings suitably shaped based on the size and shape of the individual waste to be introduced.

[0025] Preferably, the selector unit further comprises a movement device operating on the latch for selectively positioning it in the first and second operating positions.

[0026] Preferably, the movement device of the latch comprises a selection actuator activatable to move the latch along a straight direction between the first and second operating positions.

[0027] Preferably, the straight direction of movement of the latch is parallel to an inner wall of the vessel carrying the fixed portion of the selector unit. Preferably, the selection actuator operates on at least one thrust lever rotatably pivoted with respect to the fixed portion of the selector unit and operating on a pusher interacting with the latch.

[0028] Preferably, the pusher is slidably guided along a tubular guide rigidly carried by the fixed portion.

[0029] Preferably, the selection actuator comprises a second electric servomotor integral with respect to the fixed portion of the selector unit and operating on a control cam to move the thrust lever.

[0030] Preferably, the thrust lever is movable in contrast to antagonistic elastic elements.

[0031] Preferably, the selection actuator operates on a selection arm rotatably pivoted to the fixed portion of the selector unit and carrying a support seat on which the thrust lever acts in an elastic thrust relationship. Preferably, the selection arm and the thrust lever are pivoted around a common axis.

[0032] Preferably, the actuator alternately operates on two thrust levers rotatably pivoted with respect to the fixed portion of the selector unit and operating on respective pushers interacting from opposite sides with the latch to position it in the first and second operating positions, respectively.

[0033] Preferably, each pusher is slidably guided along a tubular guide rigidly carried by the fixed portion.

[0034] Preferably, the fixed portion of the selector unit has a manoeuvring recess facing the intermediate portion and housing the thrust plate of the latch.

[0035] Preferably, the manoeuvring recess is closed below by a base wall inclined towards the inside of the vessel.

[0036] Preferably, the manoeuvring recess is delimited between two side walls each slidably crossed by one of the pushers.

[0037] Preferably, each pusher is movable between a resting position in which it is retracted from the manoeuvring recess and a working position in which it protrudes

into the manoeuvring recess to push the latch towards the first or second operating position.

[0038] Preferably, the selection actuator is configured to angularly rotate the cam in opposite directions starting from a resting position, to alternately act on the one and the other of the thrust levers.

[0039] Preferably, the selector unit comprises sensor devices for detecting the position of the latch.

[0040] Preferably, the sensor devices comprise a first and a second sensor configured to detect the positioning of the latch in the first and second operating positions, respectively.

[0041] Preferably, the first and the second sensor interact with the thrust plate of the latch to detect the presence of the latch in the first and the second operating position, respectively.

[0042] Preferably, the electronic control unit is configured to:

interrogate the sensor devices in conjunction with the detection of the identification code;
command the translation of the latch into the second operating position when the identification code detected by the user interface belongs to the first series and the sensor devices detect the positioning of the latch in the second operating condition;
command the translation of the latch into the first operating position when the identification code detected by the user interface belongs to the second series and the sensor devices detect the positioning of the latch in the first operating condition;
command the deactivation of the locking mechanism when the identification code detected by the user interface belongs to the first series and the sensor devices detect the positioning of the latch in the first operating condition and when the identification code detected by the user interface belongs to the second series and the sensor devices detect the positioning of the latch in the second operating condition.

[0043] Preferably, the fixed portion of the selector unit comprises a casing housing the movement device of the latch.

[0044] Preferably, the casing of the selector unit is fixed to an inner wall of the containment vessel.

[0045] Preferably, the fixed portion of the selector unit further comprises a fixed coupling element, arranged to engage with the latch in the first operating position.

[0046] Preferably, the fixed coupling element protrudes externally with respect to said casing.

[0047] Preferably, the movable portion of the selector unit comprises a second movable coupling element protruding from the cover and engageable by the latch.

[0048] Preferably, the intermediate portion of the selector unit comprises a guide structure slidably engaging the latch along a straight direction parallel to an inner wall of the containment vessel carrying the fixed portion of the selector unit.

[0049] Preferably, the guide structure comprises two mutually spaced blocks slidably crossed by the latch.

[0050] Preferably, the latch comprises a stem which is movable through the blocks and a thrust plate interposed between the blocks and integral with a central part of the stem.

[0051] Preferably, the stem of the latch has terminal portions carrying abutment seats protruding radially from the surface of the stem.

[0052] Preferably, the locking mechanism is carried by the fixed part of the locking unit.

[0053] Preferably, the fixed part of the locking unit comprises a box-like structure housing the locking mechanism.

[0054] Preferably, the box-like structure of the locking unit is fixed to an inner wall of the containment vessel.

[0055] Preferably, the movable portion of the locking unit comprises a first movable coupling element protruding from the cover and engageable by the locking mechanism.

[0056] Preferably, said coupling element is insertable into a housing arranged in the fixed part of the locking unit.

[0057] Preferably, the locking mechanism comprises a hook rotatably pivoted to the fixed part, and an unlocking actuator activatable to move the hook between an engagement condition and a disengagement condition of the movable part.

[0058] Preferably, the unlocking actuator comprises a first electric servomotor integral with the fixed part and operating on a control cam to move the hook towards the disengagement position in contrast to elastic return elements.

[0059] Preferably, the unlocking actuator operates on an unlocking arm rotatably pivoted to the fixed part and carrying an abutment seat on which the hook acts in elastic thrust relationship.

[0060] Preferably, the unlocking arm and the hook are pivoted around a common axis.

[0061] Preferably, the locking unit comprises a closing sensor for detecting the positioning of the cover in the closing condition.

[0062] Preferably, the closing sensor comprises a reed sensor internal to the fixed part of the locking unit and interacting with a magnet carried by the coupling element.

[0063] Further features and advantages will become more apparent from the detailed description of a preferred, but not exclusive, embodiment of a selectively enabled container for the disposal of waste, according to the present invention. Such description will be set forth hereinafter with reference to the accompanying drawings given only for illustrative and, therefore, non-limiting purpose, in which:

figure 1 shows a partially interrupted perspective view of the selectively enabled container according to the present invention, in the closed condition;
figure 2 shows a partially interrupted perspective

view of the container of figure 1 in the open condition during use by a domestic user;

figure 3 is a perspective similar to figure 2, illustrating the container in an open condition during use by a non-domestic user;

figure 4 shows a locking unit and a selector unit positioned from inside the container;

figure 5 shows the locking unit and a selector unit from a different perspective with respect to figure 4;

figures 6 to 8 schematically exemplify an operating sequence which can be implemented by the selector unit and the locking unit, seen frontally from the outside of the container, to enable a domestic user to use the container;

figures 9 and 10 schematically exemplify some steps which can be implemented by the selector unit and the locking unit, seen frontally from the outside of the container, to enable a non-domestic user to use the container.

[0064] In the accompanying figures, 1 globally indicates a selectively enabled container for the disposal of waste, according to the present invention. In the example illustrated, the container 1 is of the bin type. The invention can also be applied to any other type of container, for example stationary or movable containers, which can be emptied by means of rear, side and bilateral loading vehicles and also for underground containers, which can be emptied by tipping or by unloading from below.

[0065] The container 1 comprises a containment vessel 2 to which a covering element comprising a cover 3 is associated above. In the example described, the cover 3 is oscillatably carried by a fixed part of the covering element, not illustrated in the accompanying drawings, and is constrained with respect to the vessel 2 around a respective hinging axis X-X. Preferably, the cover 3 is movable between a closed condition (figure 1) in which it lies next to a terminal edge 4 of the vessel 2, and an open condition (figures 2 and 3) in which it is spaced from the terminal edge 4 to enable access to the vessel 2 itself for the introduction of waste. The opening of the cover 3 can be performed by acting on a possible handle directly applied thereto, or through a lever and/or a control pedal not illustrated since they can be made in a known manner. The cover 3 can also be opened by gravity as a result of a tipping action of the container 1, to allow emptying.

[0066] Between the cover 3 and the vessel 2, at least one partializing element 5 is operatively interposed, made, for example, in the form of a panel extending substantially according to the entire surface extension of an opening (not visible in the drawings) made accessible by the cover 3 in an open condition. The partializing element 5 has one or more waste disposal openings 6 suitably shaped based on the size and shape of the individual waste to be introduced. In the example shown, the partializing element 5 takes the form of a grid, defining a plurality of quadrangular disposal openings 6 of equal size. Depending on the type of waste for which the container 1 is intended, the disposal openings 6 can take different shapes and sizes.

[0067] The partializing element 5 is oscillatably constrained to the vessel 2, around a constraint axis parallel and proximate to the hinging axis X-X of the cover 3, preferably coincident therewith. The partializing element 5 is movable between an operating condition in which, at least along a side 5a thereof opposite the hinging axis X-X, it lies substantially near the terminal edge 4 of the vessel 2 to partialize the access thereto (figure 2), and a distancing condition in which it is spaced from the terminal edge 4 of the vessel 2 to free the access thereto (figure 3).

[0068] On an outer wall of the vessel 2, a user identification interface 7 can be installed, preferably combined with an electronic control unit 8 which, in a manner known per se, is used to enable the use of the container 1 for the purpose of waste disposal following the identification of an authorized user, by reading an access code shown, for example, on a magnetic card, RFID badge, or other. In possible embodiments not shown, the electronic unit 5 can have different placements, for example on the cover 3.

[0069] The user identification interface 7 is conveniently configured to recognize at least a first and a second series of enabling codes, respectively assigned to different types of users. More in particular, a first series of identification codes can be assigned to domestic users, e.g., private citizens, who are enabled to dispose of waste of relatively small dimensions, while a second series of codes can be assigned to commercial and/or industrial users, who are also enabled to dispose of larger waste, here referred to as "non-domestic users".

[0070] A locking unit 9 operates between the vessel 2 and the cover 3, the locking unit being controlled by the electronic control unit 8 to selectively enable and inhibit the opening of the cover 3.

[0071] As better seen in figure 4, the locking unit 9 essentially comprises a fixed part 10 integral with the containment vessel 2 and a movable part 11 integral with the cover 3, between which a locking mechanism 12 operates.

[0072] As better seen in figures 4 and 5, the fixed part 10 of the locking unit 9 comprises a box-like structure 13 fixed to an inner wall 2a of the containment vessel 2, preferably placed on the opposite side with respect to the hinging axis X-X of the cover 3 and of the partializing element 5.

[0073] The movable part of the locking unit 9 comprises a first movable coupling element 11, for example having an annular shape, protruding below the cover 3. The first movable coupling element 11 is preferably insertable into a housing 14 arranged in the fixed part 10 of the locking unit 9, when the cover 3 is in the closed position. The first movable coupling element 11 inserted in the housing 14 is adapted to be operatively engaged by the locking mechanism 12.

[0074] Preferably, the locking mechanism 12 is nor-

mally active to lock the movable part 11 with respect to the fixed part 10 when the cover 3 is in a closed condition, and selectively deactivated to unlock the movable part 11 with respect to the fixed part 10. The locking mechanism 12, preferably housed and adequately protected inside the box-like structure 13, comprises a hook 15 rotatably pivoted to the fixed part 10, and an unlocking actuator 16 activatable to move the hook 15 between an engaged condition and a disengaged condition of the movable part 11. The unlocking actuator 16 can, for example, comprise a first electric servomotor integral with the fixed part 10 and operating on a control cam 17 which operates on the hook 15 to move it towards the disengaged position, in contrast to at least a first spring 18 or other elastic return elements. Preferably, an unlocking arm 19 pivoted to the fixed part 10 is operatively interposed between the hook 15 and the unlocking actuator 16. Preferably, the unlocking arm 19 is constrained around a pivoting axis Y1 common with the hook 15. The control cam 17 operates on the unlocking arm 19, which carries an abutment seat 20 on which the hook 15 acts in an elastic thrust relationship thanks to the action of a second return spring 21 or equivalent elastic elements (figure 5).

[0075] The actuation of the unlocking actuator 16 determines, through the unlocking arm 19, a movement of the hook 15 from a gripping position (figures 4 and 5), in which an active apex 22 thereof is operatively engaged through the first movable coupling element 11 to retain the cover 3 in a closed position, to an release position (figures 8 and 9) in which the active apex 22 is extracted and laterally offset from the first movable coupling element 11 to free the movement away from the fixed part 10. The pivoting axis Y1 is preferably positioned so that a possible traction transmitted from the first movable coupling element 11 to the active apex 22 in the vertical opening direction of the cover 3 tends to recall the hook 15 towards the gripping position, instead of towards the release position, so as to improve the resistance of the system to a forced opening of the cover 3 against the action of the locking mechanism 12.

[0076] The cooperation with the unlocking arm 19 avoids undesired operating overloads to the unlocking actuator 16 if the latter is activated when the hook 15 is locked and unable to move from the gripping position. For example, it may occur that the user tries to open the cover 3 before the identification procedure by the electronic control unit 8 and/or the consequent deactivation of the locking mechanism 12 are completed. In this case, the actuation of the unlocking actuator 16 when the hook 15 is locked by the traction exerted through the first movable coupling element 11, can determine the movement of only the unlocking arm 19 by prevailing only the force exerted by the second return spring 21. Upon the release of the lifting action exerted by the user on the cover 3, the hook 15 is freed from the retention exerted up to that moment by the first movable coupling element 11 and is promptly brought into the release position. By means of a possible unlocking sensor 23 operating between the unlocking arm 19 and the hook 15, the electronic control unit 8 detects the movement of the latter in the release position and can consequently command the emission of an acoustic and/or optical signal of consent to the opening of the cover 3 by the user.

[0077] A closing sensor 24, for example of the reed type, placed inside the box-like structure 13 interacts with the coupling element 15 and/or a magnet possibly carried thereby, to detect the presence/absence thereof inside the housing 14. Through the closing sensor 24, the electronic control unit 8 is therefore able to detect the state of closing and opening of the cover 3. Upon the opening of the cover 3, the electronic control unit 8 can command the unlocking actuator 16 to return the hook 15 to the gripping position. When the cover 3 is closed again, the first movable coupling element 11 slides against an inclined surface 22a of the active apex 22 to move it momentarily in contrast to the second return spring 21 and be coupled again when reaching the closed position.

[0078] The locking unit 9 cooperates with a selector unit 25 on the action of which the partializing element 5 is alternatively locked with respect to the vessel 2 or with respect to the cover 3. The selector unit 25 essentially comprising a fixed portion 26 integral with the containment vessel 2, a movable portion 27 integral with the cover 3 and an intermediate portion 28 integral with the partializing element 5.

[0079] The intermediate portion 28 carries a latch 29 movable selectively between a first operating position (figures 4, 5, 7 and 8) in which the intermediate portion 28 is blocked with respect to the fixed portion 26, and a second operating position (figures 3, 6, 9 and 10) in which the intermediate portion 28 is blocked with respect to the movable portion 27. Consequently, the partializing element 5 is alternatively locked with respect to the vessel 2 or with respect to the cover 3, depending on whether the latch 29 is in the first or in the second operating position. The movable portion 27 of the selector unit 25 comprises a second movable coupling element 30, preferably of annular shape, fixed below the cover 3 and protruding therefrom so as to be engageable by the latch 29 in the second operating position.

[0080] The fixed portion 26 of the selector unit 25 can in turn comprise a casing 31 fixed to the inner wall 2a of the vessel 2, externally to which a fixed coupling element 32 is fixed, also preferably of annular shape, arranged to engage with the latch 29 in the first operating position. Inside the casing 31 is housed and adequately protected a movement device 33 operating on the latch 29 to selectively and alternatively position it in the first operating position, in which it engages the fixed coupling element 32, or in the second operating position, in which it engages the second movable coupling element 30.

[0081] The intermediate portion 28 of the selector unit 25 comprises in turn a guide structure 28a slidably engaging the latch 29 along a straight direction, parallel to the inner wall 2a carrying the casing 31. In the example

shown, the guide structure 28a comprises two mutually spaced blocks, protruding below the partializing element 5 and slidingly crossed by the latch 29.

[0082] The latch 29 preferably comprises at least one stem 34 movable through the blocks of the guide structure 28a, and a suitably shaped thrust plate 35, substantially centred with respect to the longitudinal extension of the latch 29 and extending according to a plane orthogonal to the sliding direction of the latter. The thrust plate 35 is interposed between the blocks of the guide structure 28a and movable inside a manoeuvring recess 36 formed in the casing 31. The manoeuvring recess 36 is facing the intermediate portion 28 of the selector unit 25, and accommodates the thrust plate 35 between two side walls 37 suitably spaced apart from each other. Preferably, the manoeuvring recess 36 is closed below by a base wall 38 inclined towards the inside of the vessel 2, so as to facilitate the evacuation by falling of any liquids or fragments conveyed by the disposed waste, without these invading the movement device 33 and/or other components housed in the casing 31. The mutual distance between the blocks of the guide structure 28a and between the side walls 37 delimiting the manoeuvring recess 36 is chosen so as to offer the thrust plate 35 sufficient freedom of movement inside the manoeuvring recess 36, between the first and the second operating position of the latch 29.

[0083] Preferably, the stem 34 of the latch 29 has respectively opposite terminal portions with respect to the thrust plate 35, bearing surface discontinuities defining respective abutment seats 39 (figure 4). Each of these abutment seats 39, obtainable for example by flattening an outer cylindrical surface of the stem 34, protrudes radially from the surface of the latter so as to inhibit undesired sliding of the latch 29 where the radial positioning of the latter is not adequately centred inside the second movable coupling element 30 and/or the fixed coupling element 32. Undesirable fraudulent actions aimed at obtaining a sliding of the latch 29 to unlock the partializing element 5 attempting to lift the cover 3 from the closed position are thereby hindered.

[0084] The movement device 33 housed in the casing 31 comprises a selection actuator 40, which can be activated to move the latch 29 through the guide structure 28a.

[0085] Preferably, the selection actuator 40 operates on at least one thrust lever 41 rotatably hinged with respect to the fixed portion 26 of the selector unit 25. More particularly, two thrust levers 41 are preferably provided, placed in symmetrically opposite positions with respect to the control cam 17, and each operating on a respective pusher 42 interacting with the latch 29.

[0086] Each pusher 42, made for example in the form of a cylindrical pin, is slidingly guided through one of the side walls 37 of the manoeuvring recess 36, along a tubular guide 43 rigidly carried by the fixed portion 26. More in particular, the tubular guides 43 are preferably each fixed to the respective side wall 37, and extend therefrom away from the manoeuvring recess 36.

[0087] The selection actuator 40 can comprise a second electric servomotor integral with the casing 31, and operating on a selection cam 44 to actuate it with angular rotations in one direction or the other starting from a resting position. Depending on the rotation direction, the selection cam 44 acts on the one or the other thrust lever 41, in contrast with at least one first spring 45 or other antagonistic elastic elements. The movement of each thrust lever 41 results in a movement of the respective pusher 42 through the respective side wall 37 towards the inside of the manoeuvring recess 36. The movement of the pusher 42 preferably occurs starting from a resting position in which it is concealed inside the respective tubular guide 43 and retracted from the manoeuvring recess 36 without protruding therefrom (figures 5, 6, 8 and 10), up to a working position in which it protrudes into the manoeuvring recess 36 as depicted in figures 7 and 9, to push the latch 29 towards the respective first or second operating position.

[0088] Preferably, a selection arm 46 pivoted in the casing 31 is operatively interposed between each of the thrust levers 41 and the selection actuator 40. More in particular, each selection arm 46 is preferably constrained around a pivoting axis Y2 common with the respective thrust lever 41. The selection cam 44 operates on the selection arm 46, which carries a support seat 47 against which the respective thrust lever 41 acts elastically thanks to the action of a second antagonist spring 48 or equivalent elastic elements.

[0089] The selector unit 25 further comprises sensor devices 49a, 49b for detecting the position occupied by the latch 29. In particular, a first sensor 49a and a second sensor 49b configured to detect the positioning of the latch 29 in the first and second operating positions, respectively, are preferably included. The first and second sensors 49a, 49b, for example of the reed type, are positioned inside the casing 31 against the base wall 38 of the manoeuvring recess 36, each near one of the side walls 37 of the latter, and are operatively connected with the electronic control unit 8 to detect the presence of the latch 29 in the first and second operating positions, respectively. Preferably, the interaction between the first and the second sensor 49a, 49b and the thrust plate 35 can be aided by one or more magnets 39a carried by the latter.

[0090] The use of the container 1 includes that the user set for use identifies himself by means of the reading of his identification code by the identification interface 7 associated with the electronic control unit 8.

[0091] The electronic control unit 8 is configured to control, in response to the identification of a code belonging to the first or, respectively, the second series, the selective positioning of the latch 29 in the first or, respectively, in the second operating position, together with the deactivation of the locking mechanism 12.

[0092] More in particular, if the identification code detected through the identification interface 7 belongs to

the first series, which in the case described qualifies domestic users, the electronic control unit 8 implements a first mode of operation according to which the deactivation of the locking unit 9 of the cover 3 is enabled only if the latch 29 is in the first operating position.

[0093] To this end, the electronic control unit 8 interrogates the sensor devices 49a, 49b to determine whether, in conjunction with the detection of the identification code, the latch 29 is in the first or second operating position.

[0094] If, as exemplified in figure 6, the sensor devices 49a, 49b detect that the latch 29 is in the second operating position, such as to keep the partializing element 5 constrained to the cover 3, the electronic control unit 8 controls the activation of the selection actuator 40 so as to move the latch 29 to the first operating position, so as to lock it on the vessel 2, as depicted in figure 7.

[0095] The deactivation of the locking mechanism 12 is then commanded by moving the hook 15 to the release position as shown in figure 8, to enable the lifting of the cover 3 by the user for the purpose of waste disposal.

[0096] If, on the other hand, in conjunction with the detection of an identification code belonging to the first series, the sensor devices 49a, 49b detect that the latch 29 is already in the first operating position of figures 4, 5, 7 and 8, the electronic control unit 8 directly controls the deactivation of the locking mechanism 12 leaving the selection actuator 40 inactive.

[0097] In both cases described above, when the cover 3 is opened, the presence of the partializing element 5 blocked on the vessel 2 as shown in figure 2 prevents the introduction of waste having a shape and/or size such as not to pass through the disposal openings 6.

[0098] When the identification code detected through the identification interface 7 instead belongs to the second series, which in the case described qualifies non-domestic users, the electronic control unit 8 implements a second operating mode according to which the deactivation of the locking unit 9 is enabled only if the latch 29 is in the second operating position.

[0099] In this case, if the sensor devices 49a, 49b detect that the latch 29 is in the first operating position exemplified in figure 8, the electronic control unit 8 controls the activation of the selection actuator 40 so as to move the latch 29 to the second operating position as shown in figure 9, so as to lock it with respect to the cover 3.

[0100] The deactivation of the locking mechanism 12 is then commanded as shown in figure 10, to enable the lifting of the cover 3 by the user for the purpose of waste disposal. In this circumstance, as shown in figure 3, the lifting of the partializing element 5 from the vessel 2 together with the cover 3 also allows the introduction of waste of relevant shape and/or size, as well as the extraction of waste for the purpose of emptying and/or access to the vessel 2 for maintenance operations.

[0101] If, on the other hand, in conjunction with the detection of an identification code belonging to the second series, the sensor devices 49a, 49b detect that the latch 29 is already in the second operating position, the electronic control unit 8 directly controls the deactivation of the locking mechanism 12, leaving the selection actuator 40 inactive.

[0102] Since domestic users are normally in a preponderant number compared to non-domestic users, it will almost always occur that the latch 29 is already in the first operating position when a domestic user is set to use the container 1. This circumstance allows an advantageous energy saving, deriving from the lack of activating the selection actuator 40 at each transfer operation, to the advantage of an efficient autonomous power supply in the absence of connections to power supply lines.

Claims

1. Selectively enabled container for the disposal of waste, comprising:

   a containment vessel (2);
   a cover (3) constrained to the containment vessel (2) around a hinging axis X-X and movable between a closed condition in which it lies flanked to a terminal edge (4) of the vessel (2), and an open condition in which it is spaced from the terminal edge (4) to enable access to the vessel (2) itself;
   a partializing element (5) operatively interposed between the cover (3) and the vessel (2) and oscillatably constrained to the latter, said partializing element (5) being movable between an operating condition in which it lies near the terminal edge (4) of the vessel (2) to partialize the access thereto, and a distancing condition in which it is spaced from the terminal edge (4) of the vessel (2) to free the access thereto;
   a locking unit (9), comprising:

      a fixed part (10) integral with the containment vessel (2);
      a movable part (11) integral with the cover (3);
      a locking mechanism (12) normally active to lock the movable part (11) with respect to the fixed part (10) when the cover (3) is in a closed condition, and selectively deactivated to unlock the movable part (11) with respect to the fixed part (10);

   a selector unit (25) comprising:

      a fixed portion (26) integral with the containment vessel (2);
      a movable portion (27) integral with the cover (3);
      an intermediate portion (28) integral with the partializing element (5);

a latch (29) operatively carried by the intermediate portion (28) and selectively movable between a first operating position in which it locks the intermediate portion (28) with respect to the fixed portion (26), and a second operating position in which it locks the intermediate portion (28) with respect to the movable portion (27);

an electronic control unit (8) provided with a user identification interface (7) configured to recognize at least a first and a second series of enabling codes,
wherein the electronic control unit (8) is configured to control, in response to the identification of a code belonging to the first or, respectively, the second series, the selective positioning of the latch (29) in the first or, respectively, in the second operating position, together with the deactivation of the locking mechanism (12).

2. Container according to claim 1, wherein the partializing element (5) is movable around a parallel constraint axis, coinciding or close, with respect to the hinging axis X-X of the cover (3).

3. Container according to claim 1 or 2, wherein the selector unit (25) further comprises a movement device (33) operating on the latch (29) for selectively positioning it in the first and second operating positions.

4. Container according to claim 3, wherein the movement device (33) of the latch (29) comprises a selection actuator (40) activatable to move the latch (29) along a straight direction between the first and second operating positions.

5. Container according to claim 4, wherein the selection actuator (40) operates on at least one thrust lever (41) rotatably pivoted with respect to the fixed portion (26) of the selector unit (25) and operating on a pusher (42) interacting with the latch (29).

6. Container according to claim 5, wherein the selection actuator (40) comprises an electric servomotor integral with respect to the fixed portion (26) of the selector unit (25) and operating on a selection cam (44) to move the thrust lever (41).

7. Container according to claim 5 or 6, wherein the selection actuator (40) operates on a selection arm (46) rotatably pivoted to the fixed portion (26) of the selector unit (25) and carrying an abutment seat (20) on which the thrust lever (41) acts in an elastic thrust relationship.

8. Container according to one or more of claims 4 to 7, wherein the selection actuator (40) alternately operates on two thrust levers (41) rotatably pivoted with respect to the fixed portion (26) of the selector unit (25) and operating on respective pushers (42) interacting from opposite sides with the latch (29) to position it in the first and second operating positions, respectively.

9. Container according to one or more of the preceding claims, wherein the fixed portion (26) of the selector unit (25) has a manoeuvring recess (36) facing the intermediate portion (28) and housing the thrust plate (35) of the latch (29), the manoeuvring recess (36) being preferably delimited between two side walls (37).

10. Container according to one or more of the preceding claims, wherein the selector unit (25) comprises sensor devices (49a, 49b) for detecting the position of the latch (29), the electronic control unit (8) being configured to:

interrogate the sensor devices (49a, 49b) in conjunction with the detection of the identification code;
command the translation of the latch (29) into the second operating position when the identification code detected by the identification interface (7) belongs to the first series and the sensor devices (49a, 49b) detect the positioning of the latch (29) in the second operating condition;
command the translation of the latch (29) into the first operating position when the identification code detected by the identification interface (7) belongs to the second series and the sensor devices (49a, 49b) detect the positioning of the latch (29) in the first operating condition;
command the deactivation of the locking mechanism (12) when the identification code detected by the identification interface (7) belongs to the first series and the sensor devices (49a, 49b) detect the positioning of the latch (29) in the first operating condition and when the identification code detected by the identification interface (7) belongs to the second series and the sensor devices (49a, 49b) detect the positioning of the latch (29) in the second operating condition.

11. Container according to one or more of claims 3 to 10, wherein the fixed portion (26) of the selector unit (25) comprises a casing (31) housing the movement device (33) of the latch (29) and preferably carrying a fixed coupling element (32) protruding externally with respect to said casing (31).

12. Container according to one or more of the preceding claims, wherein the movable portion (27) of the selector unit (25) comprises a second movable coupling element (30) protruding from the cover (3) and

engageable by the latch (29).

13. Container according to one or more of the preceding claims, wherein the intermediate portion (28) of the selector unit (25) comprises a guide structure (28a) slidably engaging the latch (29) along a straight direction parallel to an inner wall (2a) of the containment vessel (2) carrying the fixed portion (26) of the selector unit (25).

14. Container according to one or more of the preceding claims, wherein the latch (29) comprises a stem (34) movable through the guide structure (28a) and a thrust plate (35) integral with a central part of the stem (34).

15. Container according to one or more of the preceding claims, wherein the locking mechanism (12) comprises a hook (15) rotatably pivoted to the fixed part (10), and an unlocking actuator (16) activatable to move the hook (15) between an engagement condition and a disengagement condition of the movable part (11), wherein the unlocking actuator (16) operates on an unlocking arm (19) rotatably pivoted to the fixed part (10) and carrying an abutment seat (20) on which the hook (15) acts in an elastic thrust relationship.

Fig.1

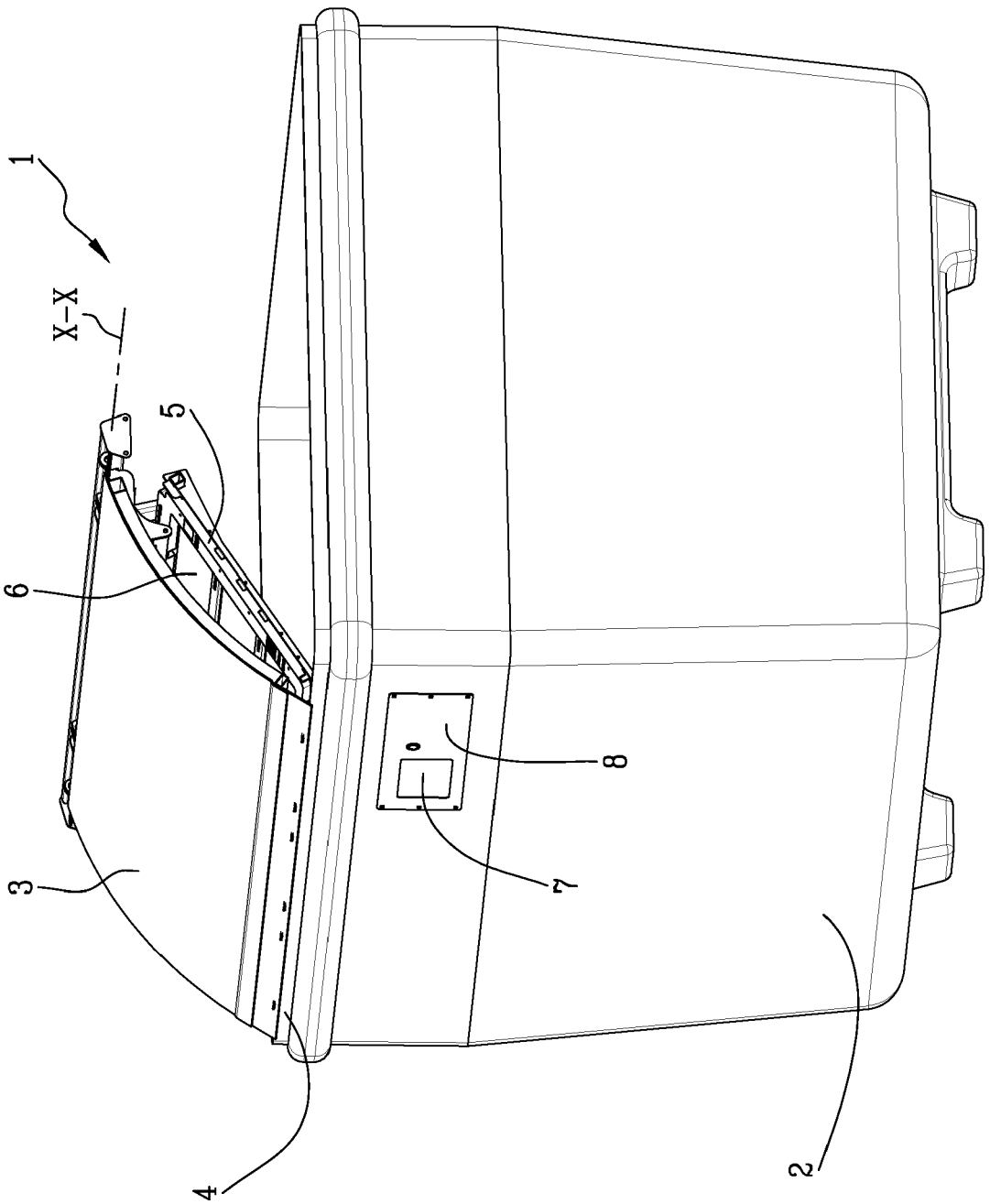

Fig.2

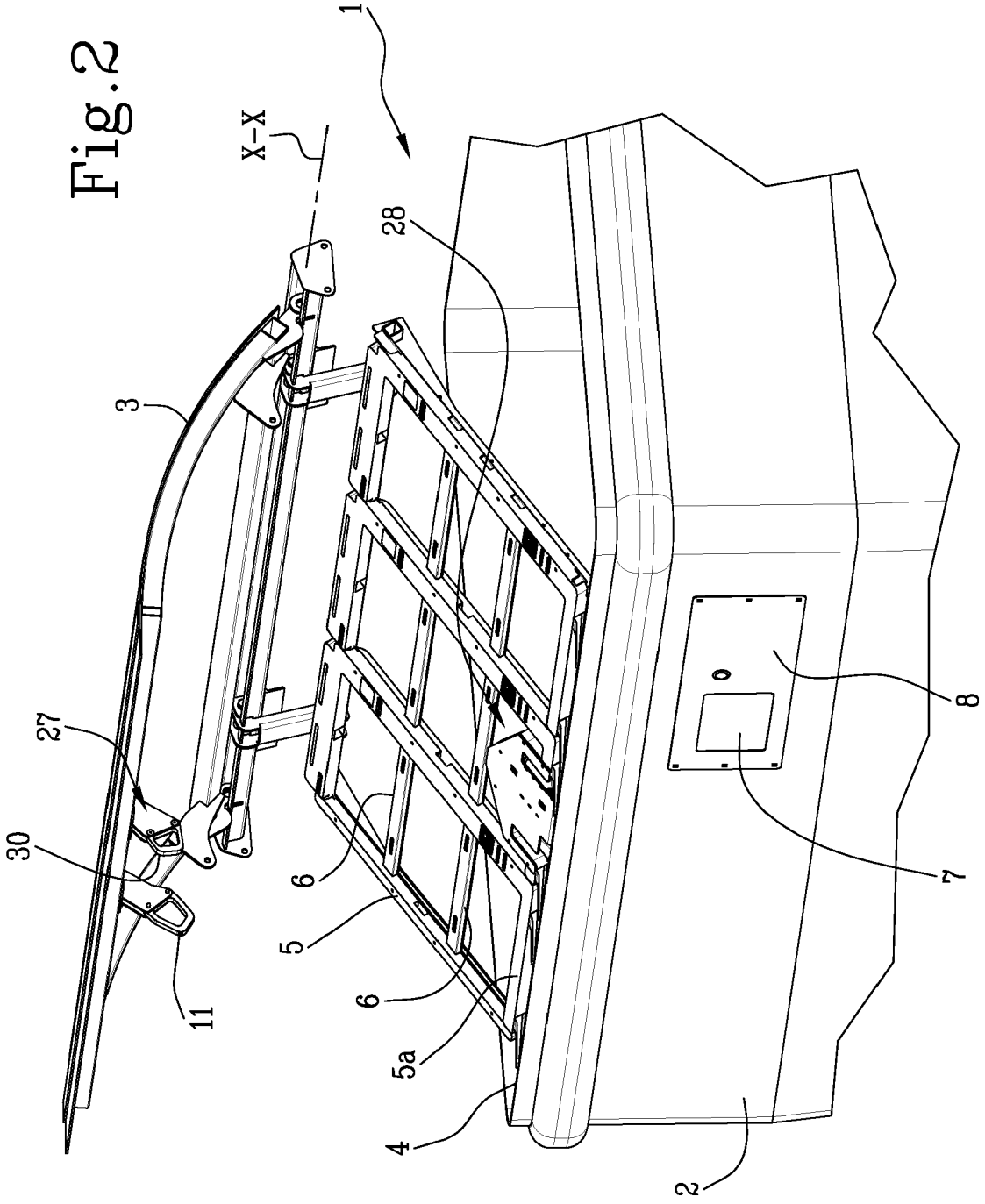

Fig.3

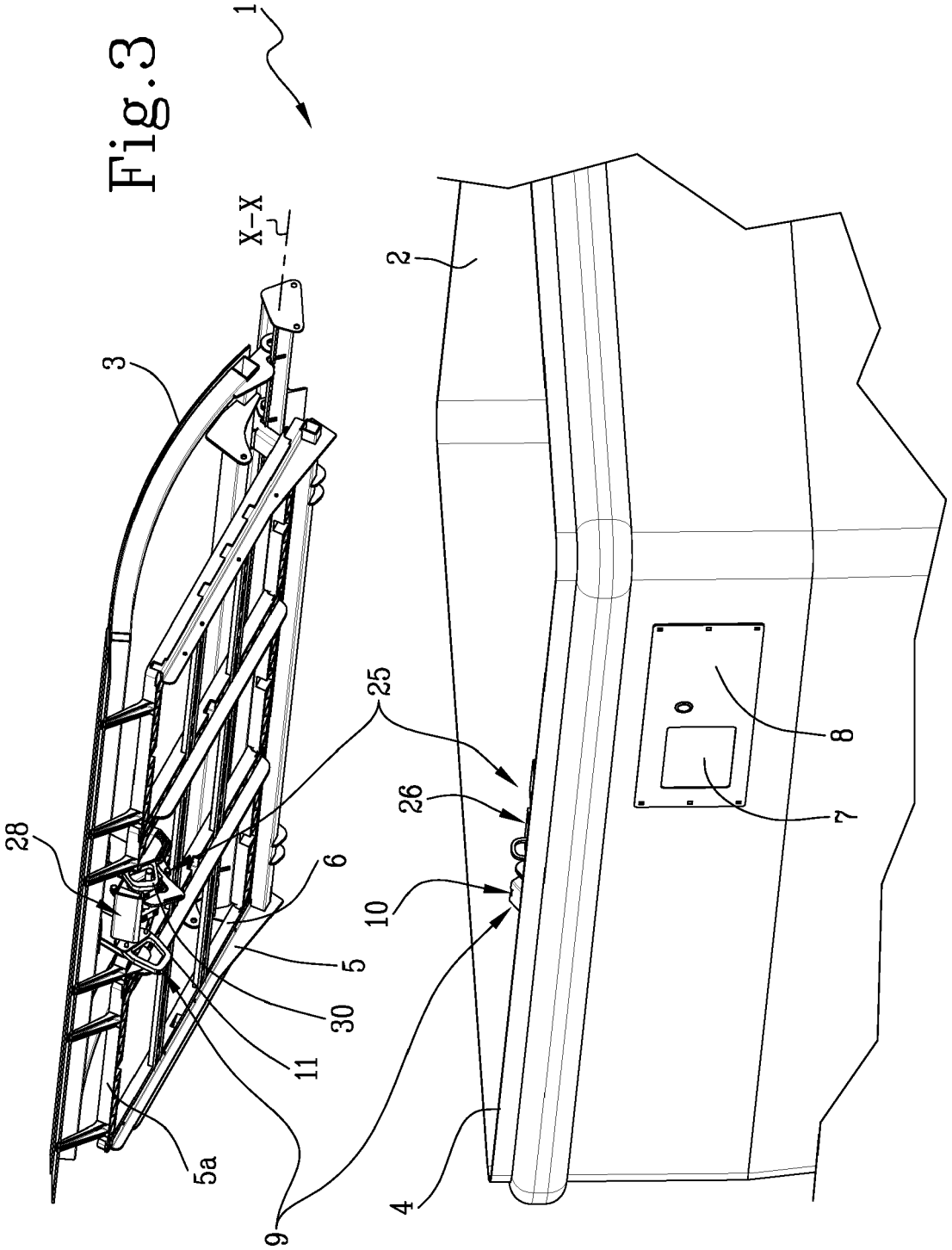

Fig.4

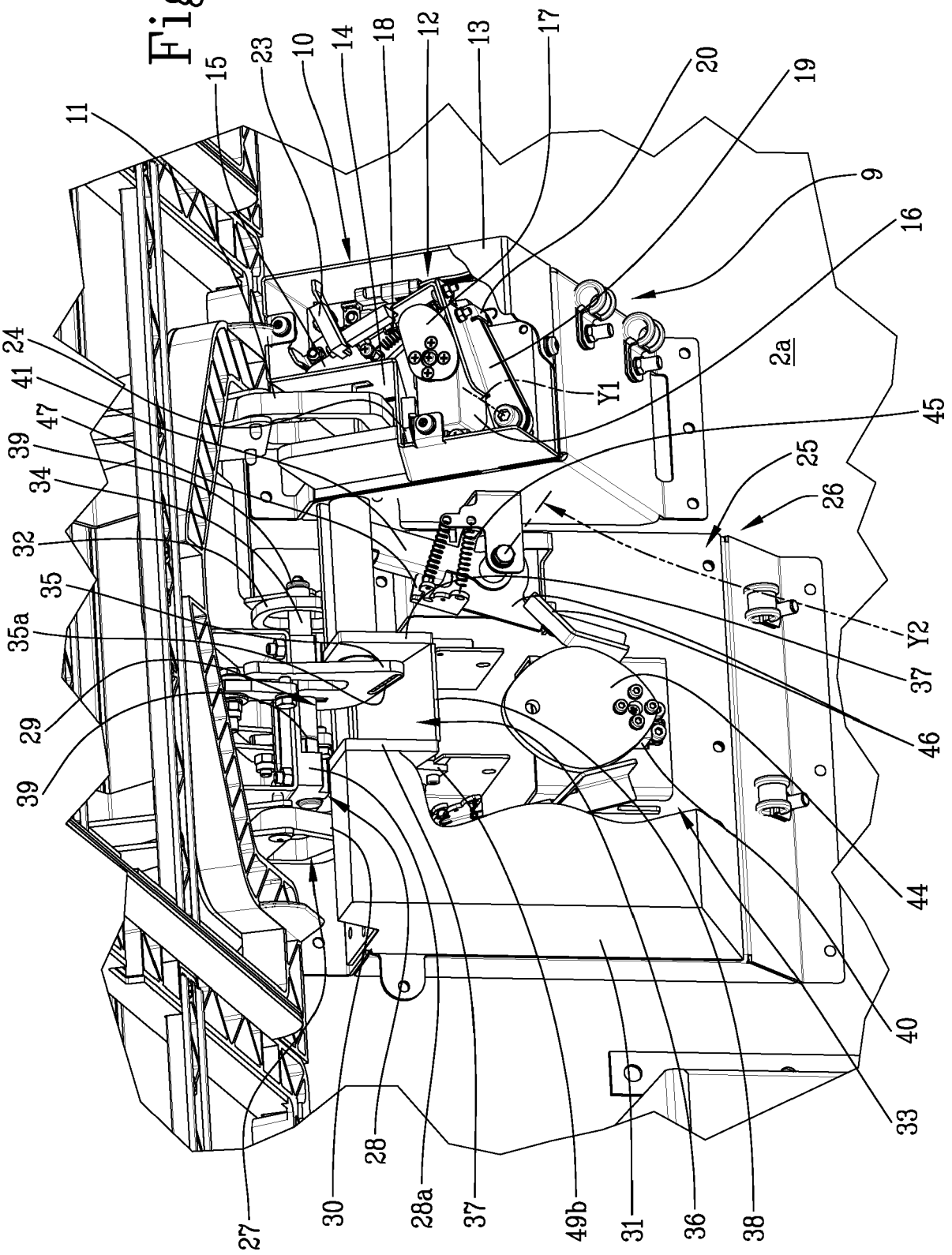
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Fig.5

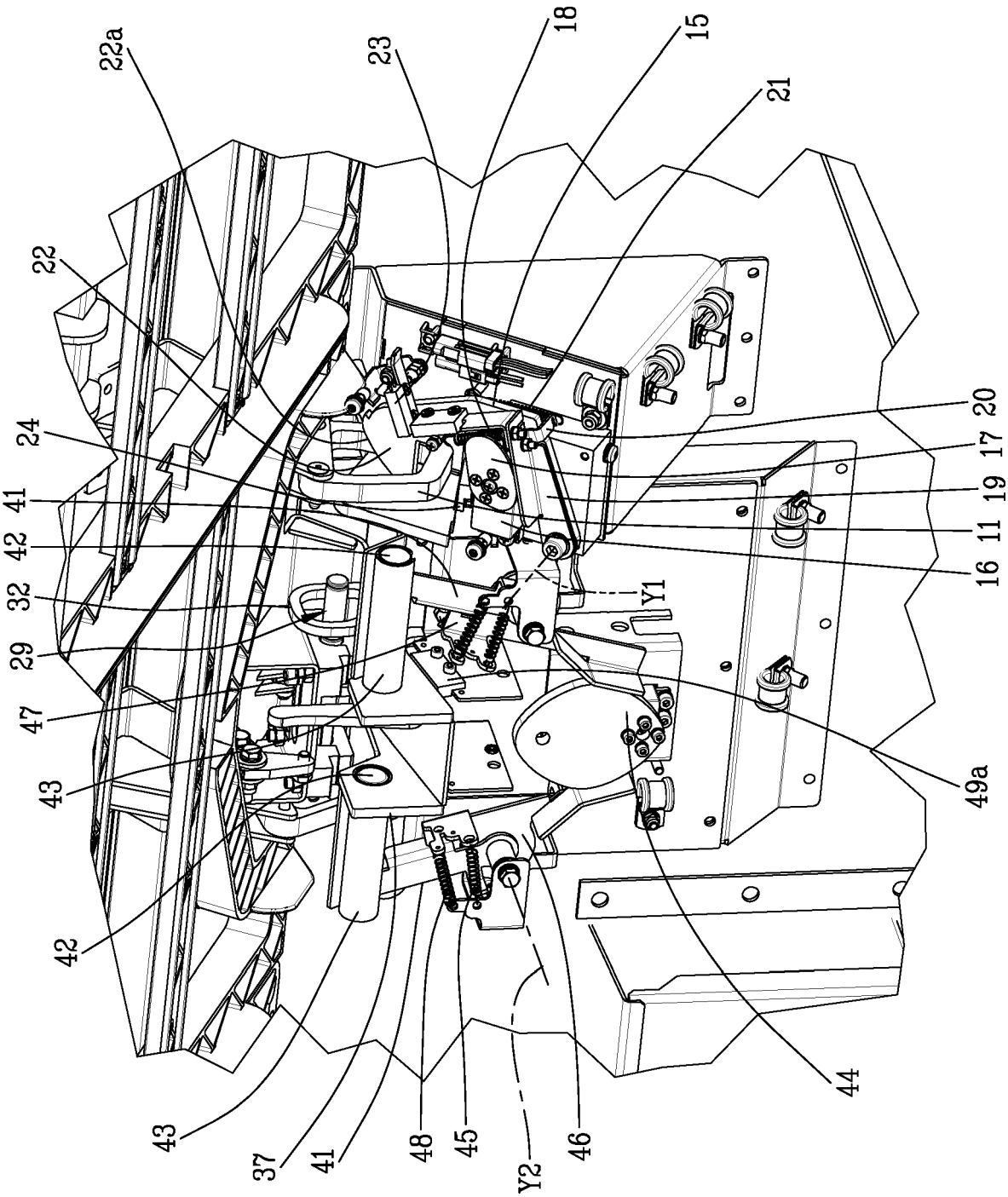
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Fig.6

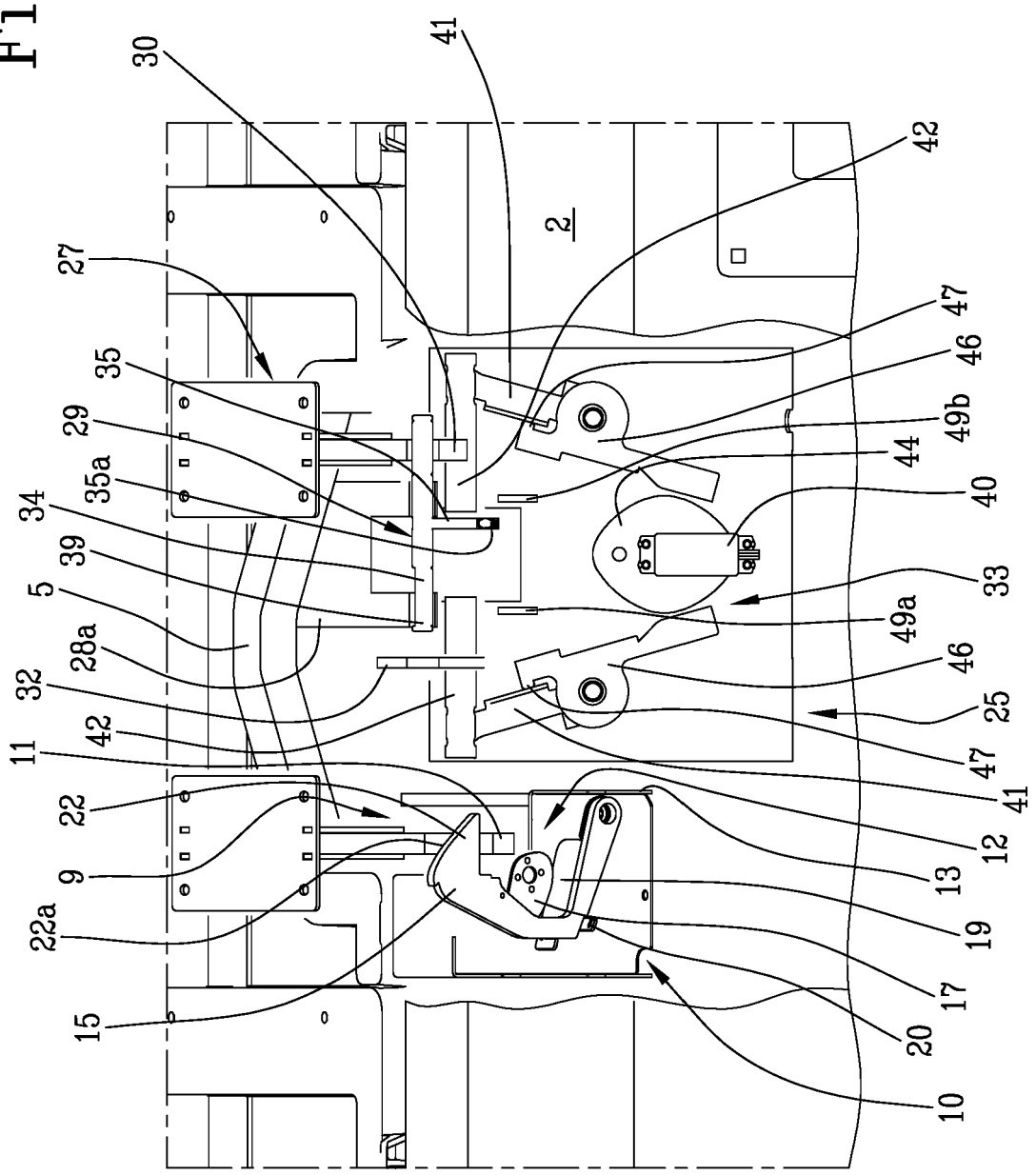
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Fig.7

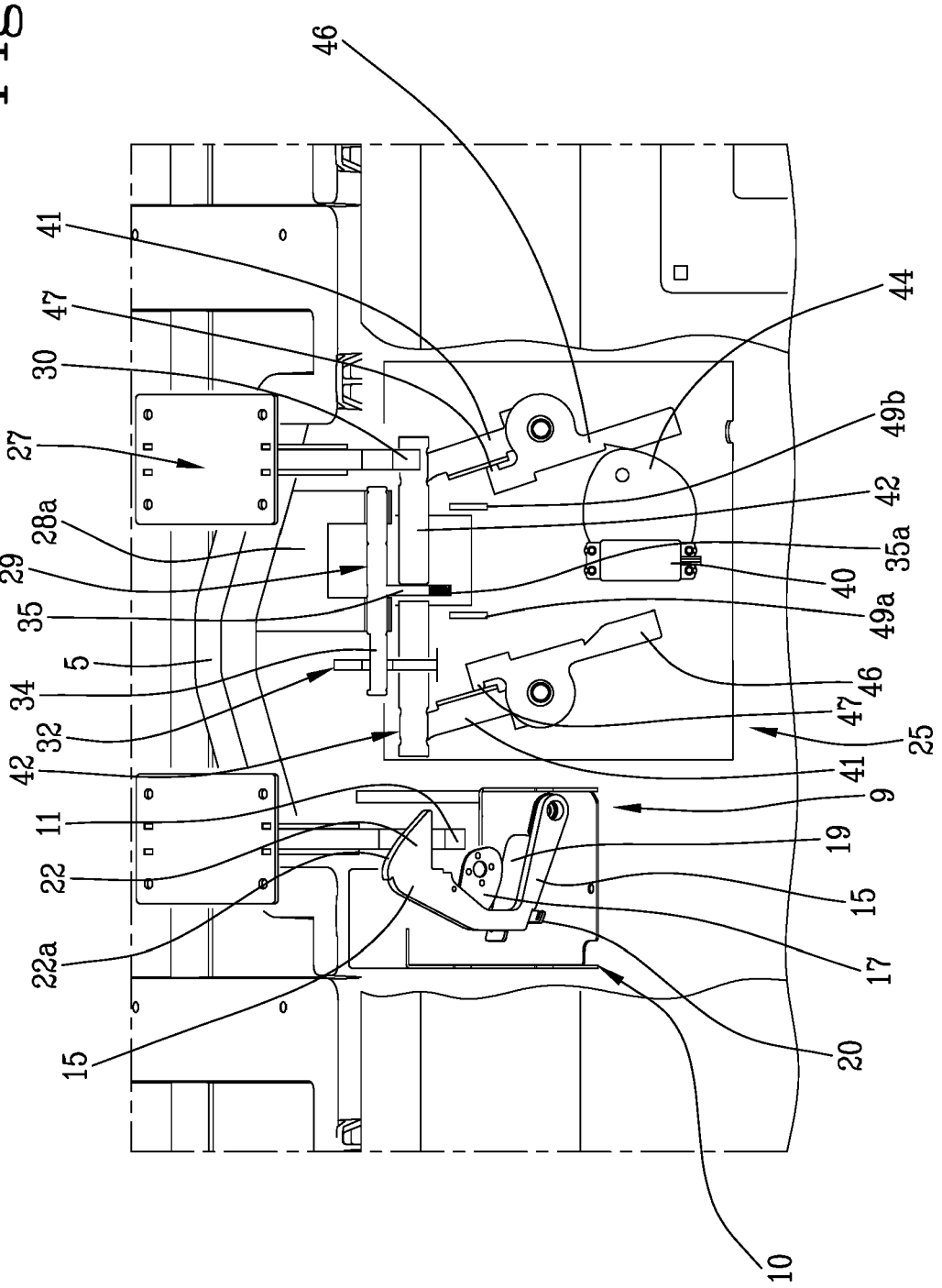
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Fig.8

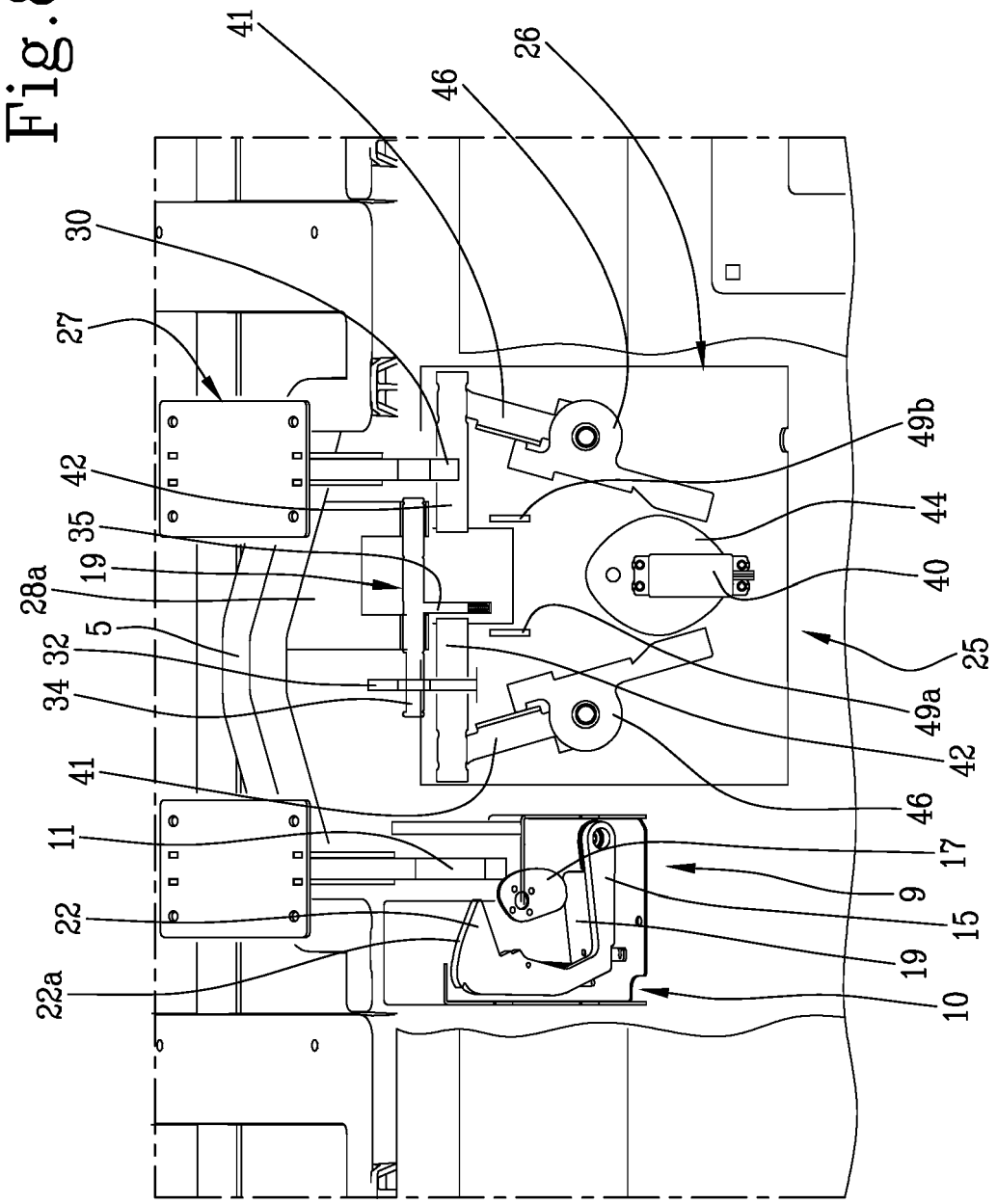
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Fig.9

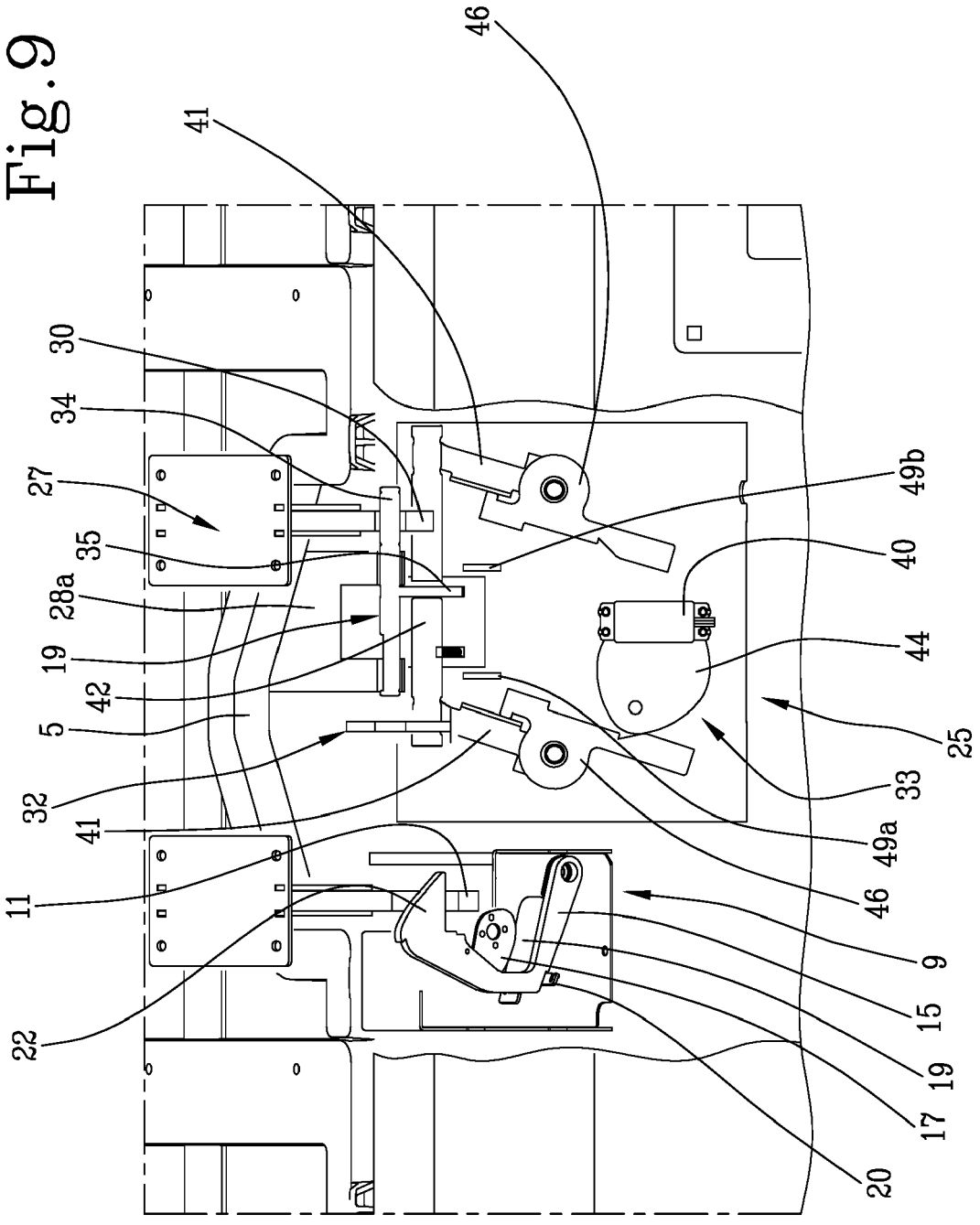
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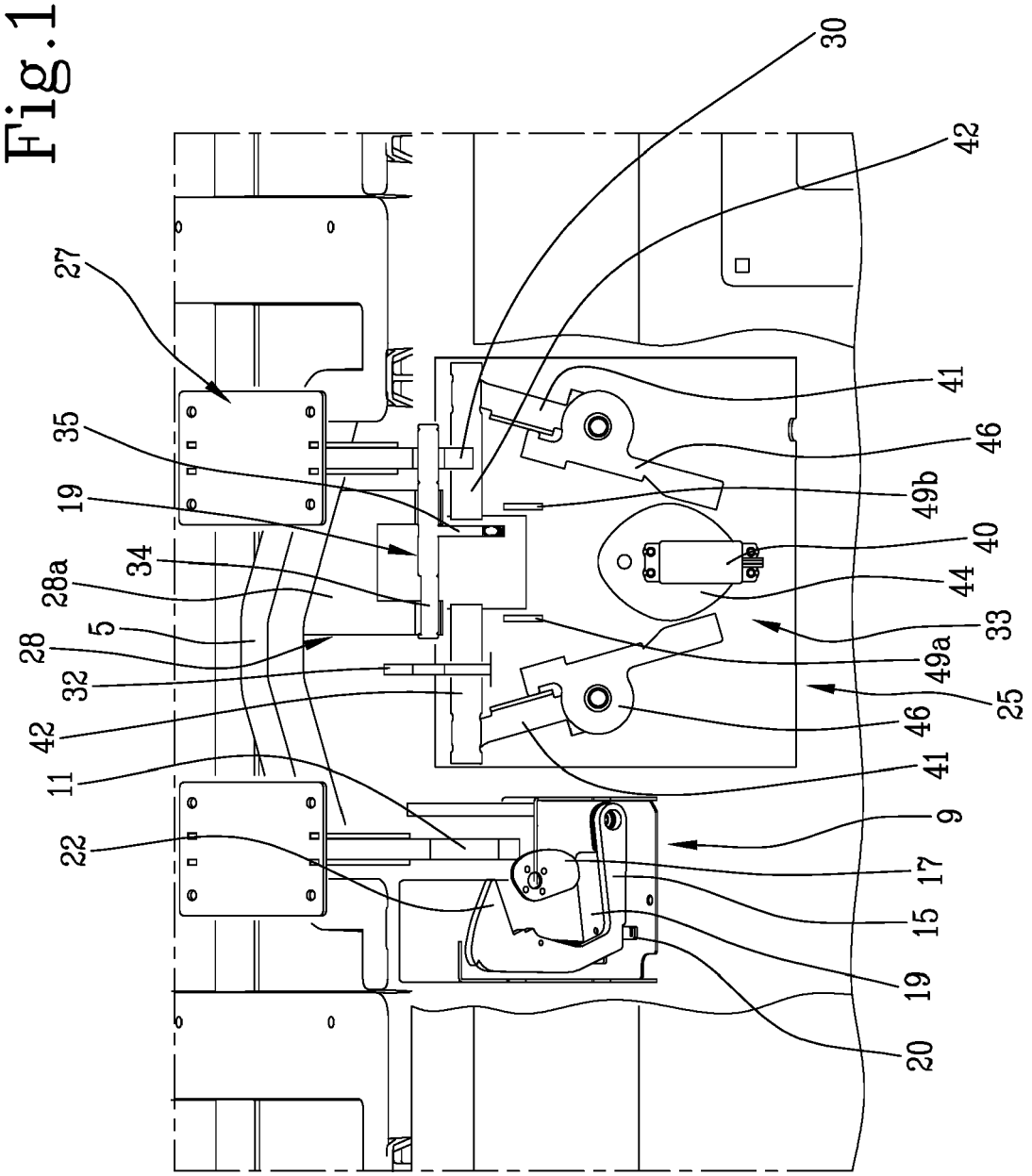
Fig.10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EUROPEAN SEARCH REPORT

Application Number
EP 21 18 5998

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	IT MI20 100 826 A1 (STUDIO LIFE DI LUCIANO FABBRI) 11 November 2011 (2011-11-11) * see machine translation of the relevant passages provided at the end of the Search Opinion; figures 1-4 *	1-15	INV. B65F1/00 B65F1/16
A	ES 2 253 079 A1 (PLASTIKEN S L U [ES]) 16 May 2006 (2006-05-16) * figures 2-5, 8 *	1	

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	29 November 2021	Nicolas, Pascal

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29-11-2021

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