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(54) **Releasable mailbox system**

(57) A delivery system for delivering goods at an address of an absent recipient, comprising a holding means being connected to a structural surface and extending in a main direction along the structural surface. The holding means comprising a groove provided with internal engagement means along an internal wall of the groove. The retainer element comprising a guiding element and a locking system. The locking systems comprises a locking means for allowing or blocking movement of the retainer element in the groove in a first direction or in a direction opposite to the first direction along the main direction. Method for using the delivery system comprising the steps of connecting the retainer element to the holding means, moving the retainer element in the first direction, and positioning the guiding element in the groove such that movement of the retainer element is blocked in the direction opposite to the first direction.

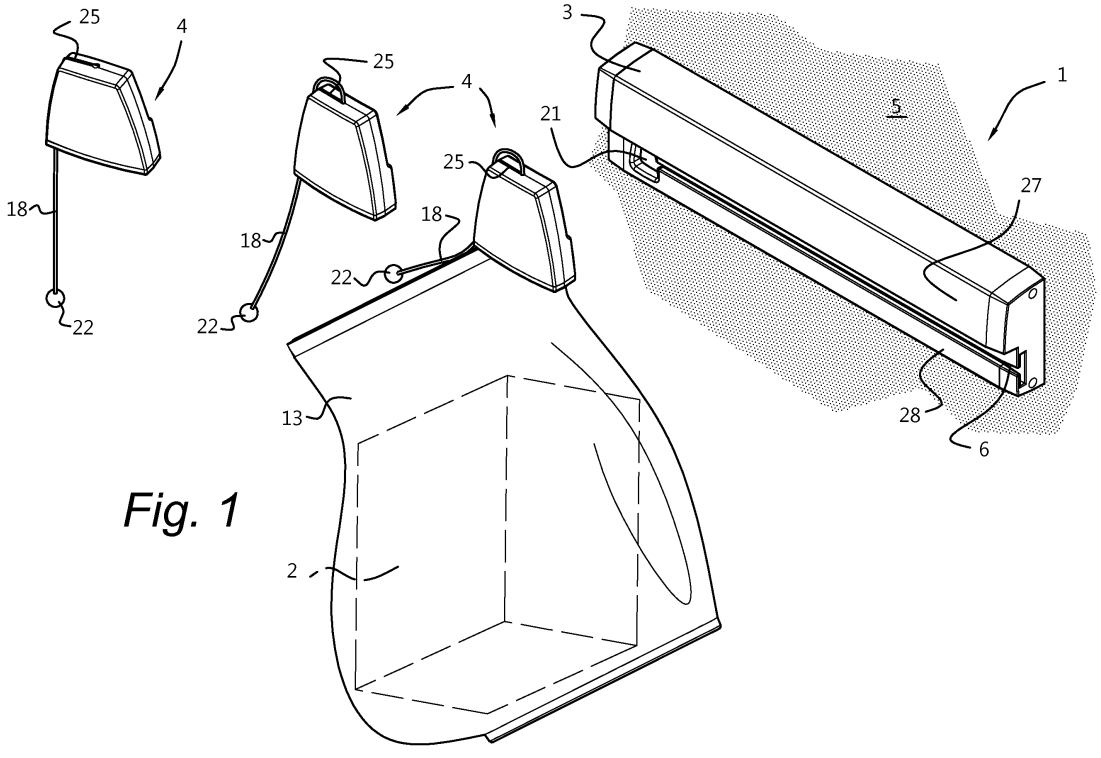

Fig. 1

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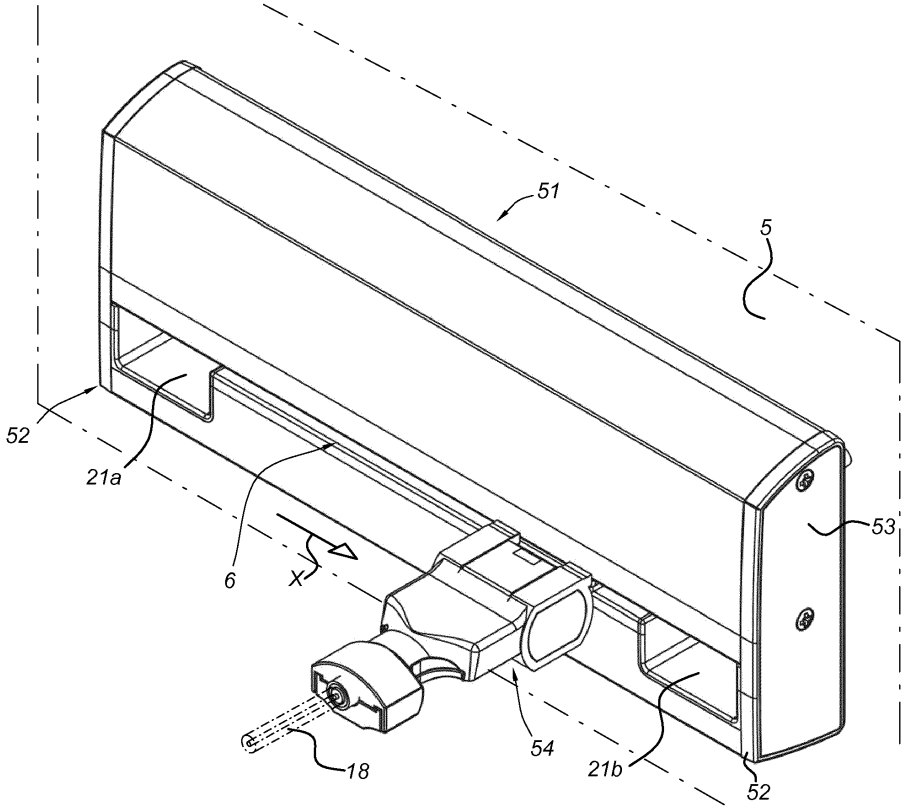
(Cont. next page)

Fig. 8


51
5
52
21a
6
X
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18
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21b
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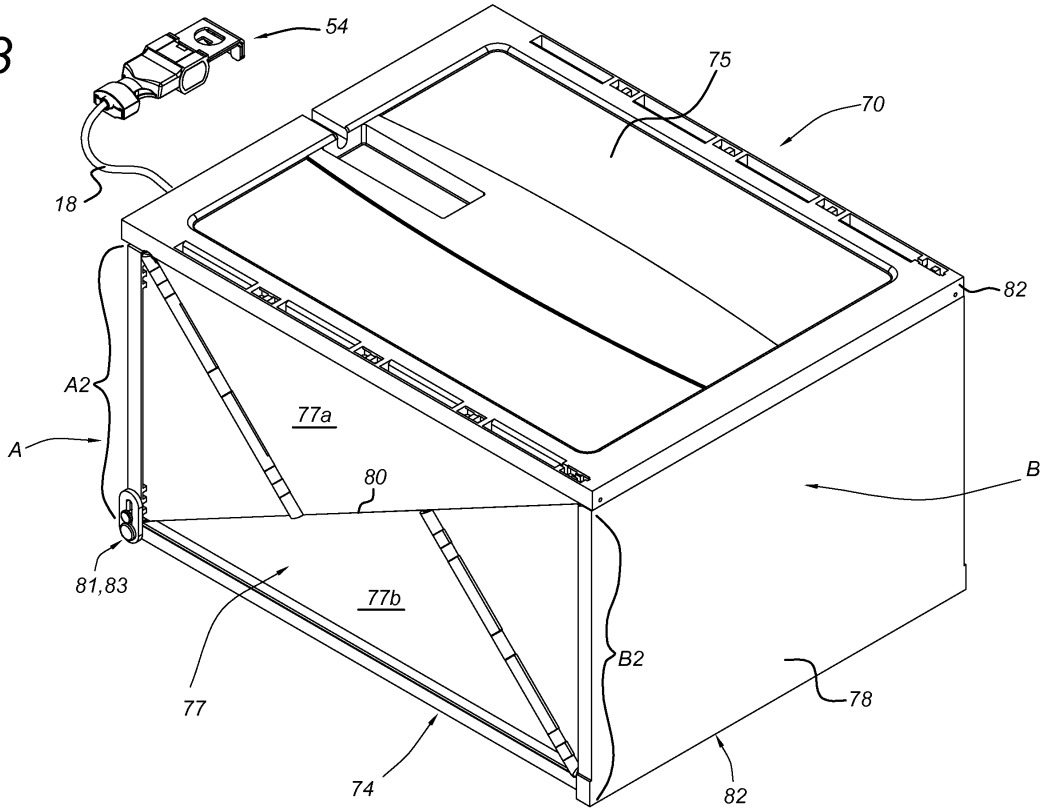
Fig. 13


54
75
70
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82
A2
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A
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B
81,83
77b
B2
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Description

Field of the invention

[0001] The present invention relates to a delivery system for offering a delivery service of goods at an address of an intended recipient when an intended recipient is absent from that address, comprising at least a retainer element a holding means for holding the retainer element in a position with respect to a structural surface, the holding means extending in a main direction and being connected to the structural surface.

Background of the invention

[0002] It is known to have a delivery system, which provides a safe storage for goods to be delivered when the intended recipient is not at home.

[0003] In GB 2360197, a secure storage system is provided comprising a combination of a bracket that can be permanently anchored to a wall, and a separate box containing goods to be delivered. The box is adapted to cooperate with the bracket, so the intended recipient can take the goods. The box is locked to the bracket by means of a locking mechanism, which comprises locking pins being configured to mechanically secure the box. The intended recipient needs to have a personal key for operating the locking mechanism and take the box containing the goods with him/her

[0004] With this type of systems, the key provided is only used by a single person or close circle of people, and it is not subject to be used by other persons, as it would not be secured to have a number of persons having the same key. This could be subject to serious inconvenience to the recipient, and also this does not seem to be a theft-proof delivery system, as the locking system can be prone to known practices of vandalism.

[0005] Additionally, other known solutions to provide a reasonably secure storage system involve the installation of a considerable large system wherein the number of boxes will be limited to the space available, without taking into consideration the increasing number of receptacles that can be installed for providing the service to the intended recipient when absent. That is to say, some of the above-mentioned solutions involve a large space, while limiting the storage possibilities.

[0006] It is an object of the present invention to provide a system for offering a delivery service of goods at an address of a recipient when the intended recipient is absent from that location at the time of delivery, which can overcome at least one of the above-mentioned drawbacks.

Summary of the invention

[0007] To this end, the object of the invention is achieved by a delivery system for offering a delivery service of goods at an address of an intended recipient when the intended recipient is absent from said address, comprising:

- a holding means for holding a retainer element in a position with respect to a structural surface, the holding means being connected to the structural surface and extending in a main direction along the structural surface,
- wherein the holding means comprises a groove extending along the main direction, the groove being provided with internal engagement means along an internal wall of the groove in a first direction along the main direction; and wherein the retainer element comprises a guiding element for positioning in the groove, and a locking system having a locking means for preventing movement of the retainer element in the groove, the locking means being arranged for interaction with the internal engagement means when the guiding element is positioned in the groove, and

wherein the locking means allows movement of the retainer element in the first direction along the groove and blocks movement of the retainer element in a direction opposite to the first direction.

[0008] In this manner, a number of retainer elements can be provided along the groove and being easily connected to the holding means in a secured manner. Additionally, by providing a movement of the retainer element in the first direction along the groove and blocking its movement in a direction opposite to the first direction, the retainer element can always be moved in the first direction to allow access to another retainer element, which will be moved along the groove, until the retainer elements are connected with the internal engagement means provided along the internal wall of the groove. Furthermore, this provides a fool-proof connection, as the movement of the retainer element will be blocked in one direction, which will make the user immediately realize that there is only one direction possible to move and retain the retainer element, unless the user can have access to unblock the locking system.

[0009] In an embodiment of the present invention, the retainer element comprises a connecting means for connecting goods to be delivered to the holding means, and wherein the connecting means can be linked to a theft-proof container, provided to protect the goods to be delivered.

[0010] Advantageously, by having the means for connecting goods, the possibility to connect any type of theft-proof container to the delivery system for protecting the goods to be delivered is provided. The container could be any means suitable for holding the goods in a manner that the goods are virtually not accessible while the container is closed and linked with the retainer element.

[0011] Moreover, the container is not being limited to any preferred size and/or shape and neither to any material, as a long list of suitable material being rigid or flex-

ible materials can be used for this application, as it will be described below.

[0012] According to an embodiment of the invention, the guiding element is a spring biased guiding element.

[0013] This provides a secure and simple locking element that in case of malfunction, can be replaced even by less skilful in a cost-effective manner. Additionally, the spring provides a steady retraction force for the locking element, which can withstand large amount of counter forces when a non-authorized user tries to unblock the locking element.

[0014] In an embodiment of the invention, the spring biased locking element comprises an internal notch in its outermost part, the internal notch sized to fit a pivoting element, such that the pivoting element can be pivotally moved in and out the internal notch as to fit into the internal engagement means of the groove.

[0015] In this manner, the locking member is prepared to rapidly block movement of the retainer element, while providing a precise amount of friction between the locking element and the internal wall of the groove to make the insertion and arrangement of the retainer element into the groove easy to be performed and perceived by the user. Additionally, this also provides an easy manner to run into the locking position of the retainer element, because the pivoting element will make a small noise when it engages the engagement means, while the user performing the operation manually, will certainly also notice the engagement movement of the mentioned parts.

[0016] In an embodiment, the outer dimensions of the pivoting element parallel to the engagement means are so chosen that the pivoting element can be arranged to fit at least partially into the internal engagement means for preventing movement of the retainer element along the groove in the direction opposite to the first direction. Thus, the pivoting element may act as an additional reinforcement for the system. Moreover, by having the chosen dimensions, the friction between the pivoting element and the internal wall, once the pivoting element is at least partially fit into the engagement means, is minimized.

[0017] Moreover, the locking system further comprises a cord element having an end member, the outer diameter of the end member being larger than the outer diameter of the cord element, and wherein the cord element is provided for connecting the goods to the retainer element.

[0018] It should be noted that the end member is provided as a handle for the user, and that the cord element allows the guiding element into an extending position relative to the sidewall of the retainer element, such that the guiding element can be inserted into the groove of the holding means.

[0019] By the guiding element blocking movement of the retainer element along the groove in the direction opposite to the first direction, the user and/or a delivery service person can release the retainer element only in the first direction as to be able to pick up the goods from the holding means. Also, the end member is provided with a diameter larger than the outer diameter of the cord element as to keep the cord element in assembled state with the locking system, providing multiple uses of the cord element without the need of replacing the cord element every time the system is used. Furthermore, the user can obtain the goods while all the parts of the delivery system can be re-used.

[0020] In an embodiment, the groove comprises an enlarged opening portion for allowing installation and removal of the retainer element.

[0021] Advantageously, the enlarged portion of the groove matches in shape with the guiding element of the locking system, making it clear to the recipient and/or the delivery service person how and where the retainer element can be installed or introduced for its assembly with the holding means.

[0022] Additionally, the groove in the holding means comprises a U-shaped cross section having a pair of facing rim edges closing the groove with an aperture along the main direction.

[0023] By having such a U-shaped cross section of the groove, the retainer element, and more particularly the guiding element are in engaged position with the groove, to securely operate the retainer element along the entire length of the groove in one direction, without the need to provide an extra part for holding the retainer element. This also allows the user to intuitively understand the interaction between the guiding element and the groove, as it can be easily distinguished how these two parts interact with each other, while providing a good support for the retainer element either when the container with the goods is connected or not.

[0024] In an embodiment of the present invention, the guiding element of the retainer element comprises a shackle, the shackle being arranged to cooperate with the groove of the delivery system, and comprising a pair of substantially right angle brackets, i.e., an upper bracket and a lower bracket that in closed state form a composite bracket with an angled end part.

[0025] In an embodiment of the present invention, the composite bracket is configured for entering the groove through an entry opening, such that the angled end part can be moved along the groove in the main direction X.

[0026] In an embodiment of the present invention, the angled end part of the lower bracket has a locking recess for cooperation with the internal engagement means when the shackle is within the groove of the delivery system; the internal engagement means comprising an elongated strip which is provided with a series of ratchets that are configured for cooperation with the locking recess of the angled end of the lower bracket when the composite bracket is positioned in the groove.

[0027] In an embodiment of the present invention, the retainer element further comprises a cable tensioner that is interconnected with the shackle at a central connecting part; the cable tensioner being arranged to couple to a cord element consisting of an inner cable and an outer tubular shell in which the inner cable is slidably moveable

along its length; the cable tensioner being coupled to the central connection part, and comprising a guiding part for the cord element, and a clamping and tensioning element for tensioning the cord element.

[0028] In an embodiment of the present invention, the rotatable clamping and tensioning element is a substantially cylindrical body that is rotatively suspended in the central connection part for rotation round a cylindrical axis A of the central connecting part, and comprises an end part for receiving and holding an end of the cord element.

[0029] In an embodiment of the present invention the rotative clamping and tensioning element is connected to the lower bracket, and the upper bracket is connected to the central connection part, such that when the retainer element is detached from the delivery system, a rotation of the clamping and tensioning element, causes the inner cable to displace within the outer tubular shell for tensioning the inner cable or, when rotated in opposite sense, to displace for relaxation.

[0030] In an embodiment of the present invention, the rotation for tensioning the cord element involves rotating the lower bracket towards the upper bracket so as to form the composite bracket.

[0031] In an embodiment of the present invention, wherein the retainer element is connected to the container by means of the inner cable slidably arranged in the outer tubular shell; at one end the inner cable being connected to the end part of the rotative clamping and tensioning element of the retainer element, at the other end the inner cable being connected to container locking means of the container.

[0032] In an embodiment of the present invention, the container is arranged substantially as a box comprising a hinged cover, the container locking means being arranged to lock the cover in a position that the box is closed.

[0033] In an embodiment of the present invention, the container is arranged as a collapsible container which in unfolded position is substantially a rectangular cuboid, comprising four rectangular flat plates that in unfolded position form a bottom plate, a top plate, a first side plate and a second side plate; the bottom plate at a first end being coupled by a central hinge to a first end of the first side plate, and at a second end opposite to the first end the bottom plate being hingedly coupled to the second side plate, and a second end of the first side plate, opposite to its first end, being hingedly coupled to an end of the top plate.

[0034] In an embodiment of the present invention, the container further comprises four collapsible plates, each collapsible plate coupled to either an edge of the first side plate and an edge of the bottom plate or an edge of the second side plate and an edge of the top plate, wherein in the unfolded position, a pair of collapsible plates provides two parallel side walls at a right angle between the first side plate and the top plate, and a second pair of collapsible plates provides two parallel side wall at a right angle between the second side plate and the bottom plate; the first side plate, the top plate and two sidewalls forming a first shell part; the second side plate, the bottom plate and two sidewalls forming a second shell part; wherein in the first shell part between the top plate and the first side plate, the free edge of each unfolded collapsible plate forms a first diagonal edge between the central hinge and the free end of the top plate, and wherein in the second shell part between the second side plate and the bottom plate, the free edge of each unfolded collapsible plate forms a second diagonal edge between the central hinge and the free end of the second side plate.

[0035] In an embodiment of the present invention, the central hinge is arranged to let the first shell part pivot with respect to the second shell part, such that in a closed position a free end of the top plate is placed over a free end of the second side plate; and
the central hinge is arranged with the container locking means coupled to the cord element in such a way that in the closed position by tensioning or relaxation of the inner cable, the position of the first shell part with respect to the position of the second shell part is locked or unlocked, respectively.

[0036] In an embodiment of the present invention, the delivery system comprises a wireless service network device coupled to the locking system for operating the locking element.

[0037] The wireless network service device is configured to allow a connection for communication with a portable communication device such as a smart phone of a recipient or delivery service person.

[0038] In this manner, a delivery service person can set up data or releasing parameters for having the recipient introducing data e.g. a code or signal and transmitting the data via a portable digital device to the wireless service network device connected to the locking system for locking or unlocking the goods. Moreover, this provides the possibility to have personal and/or new and unique data for each time the system is used, making the unlocking of the locking system depending on the instructions provided to the wireless service network device. Furthermore, the same information can be stored in the wireless service network device to allow access (i.e., unlocking) to the recipient at any time required.

[0039] In an embodiment, the wireless service network device is provided with an predetermined personalized code entered by the recipient.

[0040] Optionally, the entered personalized code could be used as a password for the operation of the locking system.

[0041] In a further embodiment, the entered personalized code serves as a basis for a personal user unlocking code.

[0042] Such an unlocking code may be a code that is valid for a predetermined time interval. According to this aspect, the wireless service network device is equipped with internal clock means.

[0043] Various methods are known in the art for the generation of (time dependent) personal user unlocking codes.

[0044] Additionally, the locking system is actuated by a solenoid driving module functioning as an electronic lock which can be activated via the wireless service network system.

[0045] By having a solenoid driving module connected to the wireless service network system, the solenoid driving module can be operated by a wireless portable (digital) device such as a smart phone and be activated to bring the locking element to an opened position in order to unlock the goods. The recipient and/or the delivery service person can introduce data into the wireless service network system provided by e.g. a mobile application, for providing instructions as to release the locking system allowing to move the retainer element from the groove in order to provide or to have access to the goods.

[0046] The present invention also relates to an assembly of a delivery structure, having a structural surface and the delivery system according to any one of the embodiments described above, and wherein the delivery system is being arranged on the structural surface.

[0047] This provides various possibilities for installation of the assembly, as the assembly can be arranged in many possible structural surfaces. Moreover, this provides the possibility to adapt the delivery structure to any possible surface.

[0048] Another aspect of the present invention relates to a method for offering a delivery of goods at an address of an intended recipient when the intended recipient is absent from said address, the method comprising the following steps:

a) connecting a retainer element to a holding means of a delivery system, wherein the holding means is connected to a structural surface and extends along the structural surface in a main direction and comprises a groove extending along the main direction, the groove comprises at least an internal engagement means provided along an internal wall of the groove in a direction of the main direction,

b) moving the retainer element in a first direction along the main direction, wherein the retainer element is connected to a container holding the goods and the retainer element comprises a guiding element for positioning in the groove, and a locking system having a locking means for preventing movement of the retainer element in the groove; the locking means being arranged for interaction with the internal engagement means when the guiding element is positioned in the groove,

c) positioning the guiding element of the retainer element in the groove in such a manner that the locking means are at least partially in contact with the internal engagement means provided along the internal wall of the groove for blocking movement of the retainer element in a direction opposite to the first direction.

[0049] This method provides a simple and time-efficient way of offering a secure home delivery service of goods when an intended recipient is absent, while providing the possibility to a delivery service person to leave the goods in a safe place without the need to re-schedule a second attempt to deliver the goods. In this manner, the time the delivery service person spends per delivery is optimized at those delivery points wherein the delivery system as described above is provided.

[0050] Additionally, when the movement of the retainer element has been blocked in the direction opposite to the first direction after performing step c), the method further comprises: d) unlocking the goods from the retainer element by providing a unlocking code via a wireless network service device which can activate a solenoid driving module which allows movement of the retainer element along the first direction or by manually introducing an unlocking code for unlocking the retainer element from the holding means.

[0051] By having this additional step of unblocking the goods, the intended recipient can unlock the goods at a convenient time different from the time of delivery, and benefit from having the delivery system at a location where he/she does not need to be present when the delivery service person attempts to deliver the goods.

[0052] In an alternative embodiment, the delivery system could comprise an electronic lock controlled by a keypad and step d) comprises that unblocking is done by entering a code on the keypad.

[0053] The wireless network service device is configured to check if the code provided by the recipient matches the unlocking code. If the match is positive the wireless network service device activates the locking system to let the goods become unblocked.

[0054] Subsequent to the unlocking of the retainer element from the holding means the method comprises disconnecting the container from the retainer element.

[0055] Additionally, in an embodiment when performing the step d), the use of the code can only be for a limited period of time.

[0056] In this manner, fraudulent use of the system is prevented.

[0057] Moreover, the method may comprise a step e) after step c) but preceding step d) comprising the transmission of the unlocking code from the portable device of the delivery service person to the wireless network service device when the delivery service person has placed the goods in the delivery system and additionally transmitting the unlocking code to a predetermined location where the recipient can retrieve the unlocking code.

[0058] The wireless network service device stores the unlocking code received from the delivery service person.

[0059] The predetermined location for retrieval may be an electronic facility such as a web portal or a remote server address that is known to and can be accessed by both the portable devices of the delivery service person and the recipient.

[0060] Optionally, the unlocking code could be disclosed to the recipient by e-mail or electronic messaging service.

[0061] The unlocking code can be generated by the electronic facility or by an app on the portable device of the delivery service person, optionally the app is web-based.

[0062] The interaction through an electronic facility provides the possibility of controlling the system and also to improve the efficiency of the tracking of the goods by the sender, receiver and also by the system provider.

[0063] The skilled in the art will appreciate that the delivery system and method as described above may serve for delivery of goods at a location but also for the return of goods from that location.

[0064] In case of a return, the original recipient acts as delivery service person and the original delivery service person acts as a recipient.

[0065] The original recipient who wishes to return goods, carries out the steps to put the goods in a container, connect the container to the retainer element, and attach the retainer element to the groove of the delivery system.

[0066] Also the original recipient informs the original delivery service person to pick up the goods.

[0067] In accordance with the embodiment that an unlocking code is generated with validity for a limited time, the original recipient uses his portable device to obtain an unlocking code for the delivery system which unlocking code can be generated by the electronic facility or by an app on the portable device. The unlocking code is communicated to the original delivery service person through the electronic facility known to both parties.

[0068] The original delivery service person can use the unlocking code to unlock the delivery system and pick up the goods as were placed by the original recipient.

[0069] The delivery system according to the invention allows that the return of the goods can be done at any time convenient for the original recipient without the need that the original delivery service person is present at the same time.

Brief description of drawings

[0070] Further characteristics and advantages of the invention will become better apparent from the description of some embodiments of a delivery system for offering a delivery service of goods when an intended recipient is absent at the time of delivery, illustrated by way of non-limiting example in the accompanying schematic drawings, wherein:

Figure 1 is a schematic perspective view of the delivery system in disassembled state according to the invention;

Figure 2 is a schematic view of the delivery system according to the assembled state according to the invention;

Figure 3 is a schematic cross-section view of the delivery system when is assembled state according to the present invention;

Figure 3a is schematic detailed view of a portion of the delivery system of Figure 3;

Figure 4 is a schematic side view of the delivery system is assembled state according to the invention;

Figure 5 is a schematic perspective view of the rear side of the retainer element according to the invention;

Figure 6 is a schematic cross-section view of the retainer element according to the invention;

Figure 7 is a schematic cross-section view of the delivery assembly according to the present invention when in assembled state with a container;

Figure 8 shows a schematic front view of delivery system in accordance with an embodiment of the invention;

Figure 9 shows a schematic rear side internal view of the delivery system of Figure 8;

Figure 10 shows a schematic cross-section of the delivery system while holding a retainer element in the groove;

Figure 11 shows a schematic perspective view of a retainer element according to an embodiment of the invention;

Figure 12 shows another schematic perspective view of a retainer element as shown in Figure 11;

Figure 13 - 15 show schematically a container of the delivery system in accordance with an embodiment of the invention.

Figure 16 is a block diagram illustrating the present invention for a method for offering a home delivery service of goods when an intended recipient is absent;

Detailed description of the embodiments

[0071] Figure 1 shows a perspective view of the delivery system before the parts are being connected for its use. The delivery system 1 is specially designed to be connected by any type of connection means i.e. screws or the like, to a structural surface 5 i.e. an indoor or outdoor wall. In other words, it is designed to be preferably mounted on a flat vertical surface that could support the weight of the whole system. The delivery system 1 as illustrated comprises a holding means 3 in a form of a rail 3, hereafter refer to as the rail 3, being mounted on the wall 5. The rail 3 extends in a main direction with respect to the wall 5, and has been securely installed to said wall 5. The rail 3 comprises a groove 6 extending along the main direction and being arranged in such a way that one of its ends 6a which is open, is directly positioned adjacent to the respective end of the rail 3. At this open end a lock 20 is provided which in closed position blocks the open end 6a of the groove 6. At the opposite end of the groove 6 an enlarged portion 21 is provided, which serves as a lateral entrance into the

groove, for allowing installation of the retainer element 4. The groove 6 comprises a number of internal engaging means 7 along its internal wall. The retainer element 4 can be slided in a first direction X, for enabling movement of said retainer element 4 from a first position along the first direction, wherein the retainer element 4 is disengaged from an internal engagement means 7 in the internal wall of the groove 6, to a second position, wherein the retainer element 4 is moved in the first direction or in an engagement direction, over an engagement distance to engage with the internal engagement means 7, as best seen in figure 3, in such a way that, the retainer element 4 and the internal engagement means 7 in combination prevent movement of the retainer element 4 along the groove in a disengagement direction, being a direction opposite to the first direction.

[0072] Moreover, in figure 1, a number of retainer elements 4 are illustrated in a state disengaged from the holding means 3. Each of the retainer elements 4 comprise a main body 24 having a partially hollow internal space, as it will be best seen in figure 3, and a side channel 25 that runs from a middle top part of the main body 24 and extends all the way to the side wall of the retainer element 4 until the bottom edge of said retainer element 4.

[0073] One of the retainer elements 4 is shown in connection to a container 13 which holds goods 2 such as a parcel. As will be explained in more detail below, the container 13 is connected to the retainer element 4 by means of the cord element 18, in a manner that separation is possible only when the retainer element is disengaged from the holding means 3.

[0074] The side channel 25 comprises an enlarged portion 26 having a round opening from which a cord element 18 is routed. It should be noted that, the cord element 18 as illustrated is in a form of a cord, but it should not be limited to a cord, as the skilled person would understand that any other type of releasable connecting element could be also used in this application.

[0075] Additionally, the cord element 18 comprises an end member 22 in one of its end parts, being embodied as a ball shaped member 22. The end member 22 is assisting the manual operation for engagement of the cord element 18 and also prevents the cord element 18 from being disconnected from the retainer element 4 in case the opposite end of the cord element 18 is pulled out until the end of it.

[0076] Additional means to secure that the container 13 remains connected to the retainer element while the retainer element 4 is located in the groove 6 of the holding means 3 will be described in more detail with reference to Figure 6.

[0077] In Figure 1, each cord element 18, has connected at one of its ends a container 13 having goods 2 to be delivered in the interior of each of the containers 13. The container 13 can be made of any suitable and theft-proof material, comprising but not limited to, a waterproof cloth, steel netting material, steel wire mesh interwoven material, waterproof plastic, nonwoven materials, or any combination thereof.

[0078] As illustrated, the container 13 can be coupled to the retainer element and can have any size to adapt to the size of the goods 2, and also in order to optimize the volume and space used by the delivery system 1 when installed and fully in use.

[0079] Additionally, the container 13 can be hanging from the retainer element 4.

[0080] In case a plurality of containers is attached to the delivery system a different positioning of the container may be used, such as in case of parcels stacking the goods 2 contained in the containers adjacent or close to the delivery system 1. This can be achieved by providing the containers with a relatively long connection part for being connected to the cord element 18, and therefore to the retainer element 3. In this manner, goods 2 in big or medium size parcels can be delivered using the embodied delivery system 1. Moreover, this can contribute to have more that the embodied number of retainer elements 4 connected to the rail, optimizing like this the efficiency of the delivery system 1.

[0081] The skilled in the art will appreciate that the connection between retainer element 4 and container 13 can be modified in dependence of the goods 2 that are to be delivered. The delivery service person of the goods may select a container of size and shape best suited for the goods.

[0082] Figure 2 shows a view of the delivery system 1 of figure 1, after one of the retainer elements 4 has been connected to the rail 3. As illustrated, one of the retainer elements 4 is in its engaged positioned with the rail 3, and more specially with internal engagement means 7, as it will be later described in detail with respect to figure 3.

[0083] The rail 3 comprises a top part 27 having a total depth being at least 1'5 times larger than the total depth of a bottom part 28 of the rail 3 such that the top part protrudes over the bottom part. Moreover, the groove 6 of the rail 3 is positioned in the bottom part 28, which is being sized to fit the retainer element 4, at least partially, under the top part 27. This would complicate any attempt to remove the retainer element from the groove.

[0084] The groove 6 and the enlarge portion 21 may comprise a sealing element 29, preferably being made of plastic material, to minimize the wear of the connecting parts and moving parts of the retainer element 4 and locking system.

[0085] Depending on the dimensions and shape of the rail 3 a variable number of retainer elements 4 and therefore of goods 2 to be delivered can be connected to the rail 3. It should be noted that in accordance with the embodied delivery system 1 shown in the figures, three retainer elements 4 are illustrated.

[0086] Referring now to figure 3, the cross-section view of the delivery system 1 shows the retainer elements 4 being in blocked position with respect to the rail 3, as being locked for the intended recipient to obtain goods by first unlocking the retainer element 4 from its blocked

position, as it will be explained in detail below.

[0087] The groove 6 of the rail 3 is a U-shaped groove 6 having a pair of facing rim edges closing the groove 6 and having an aperture along the entire main direction. Each of the embodied retainer elements 4 comprises a locking system 9 with locking means 10 having a guiding element 11. The locking means comprise a T-shaped body being inserted and/or slided into a support structure 29 inside the main body 24 of the retainer element 4. Also, a spring 14 can be found inside a defined channel of the support structure 29, defining the locking means 10 comprising a spring biased guiding element 11 as to allow pressing and/or prompting of the locking means 10 when positioned in the groove 6 against the internal wall of the groove 6. The internal engaging means 7 are here embodied as recesses 7, having a rectangular shape. Moreover, the locking system 9 comprises a pivoting element 16 being embodied as a one-direction latch 16. The one connection latch 16 is connected to the main body 23 of the guiding element 11 by means of an internal notch 15 located at the most outer surface of the guiding element 11. The internal notch 15 serves as a connection point for the one-direction latch 16. The one-direction latch 16 comprises a blocking end part or arm 16', which is configured to bounce back and forth for engaging to the recess 7 to block movement of the retainer element 4 in one direction, i.e. the direction opposite to the above-mentioned first direction X, and a pivoting end part 16" being configured to pivot about a first axis of rotation. In this manner, interaction of the locking means 10 and the recess 7 can be performed in an easy and efficient way. It should be noted that the one-direction latch 16 is being configured to fit, at least partially, into the recess 7. In this manner, the recess 7 can block movement of the retainer element 4 in the direction opposite to the first direction X. Thus, retainer elements 4 located in the groove 6 can only be removed from the holding means 3 by movement in the first direction towards the lock 20 (shown schematically by an arrow) in combination with an opening of the lock 20.

[0088] It should be noted that the recesses 7 provided along the internal wall of the groove 6, are spaced apart from each other by an engagement distance, this distance being at least about 1-2 times the total width of one retainer element 4 along the first direction X. In this manner, the space between two consecutive blocked positions of the retainer elements 7 is optimized.

[0089] As illustrated, see also the detailed view of Figure 3a, the main body 23 of the guiding element 11 further comprises a through-hole 30 having an enlarged portion 31 and an engaging portion 32. As embodied, the cord element 18 is being routed through the enlarged portion 31 and then retained within the engaging portion 32, as the internal diameter of this portion is slightly bigger than the outer diameter of the cord element 18, allowing a small friction between them, for securely retaining the cord element 18 therein.

[0090] Additionally, the cord element 18 may comprise an additional blocking element (not illustrated) located preferably somewhere between opposing ends of the cord element 18, provided to assist the cord element 18 when it is securely retained and/or connected to the engaging portion 32. It should be noted that the additionally blocking member (not illustrated) can be fixedly connected to the cord element 18 as to limit the operating movement of said element 18 with respect to the locking system 9. The additional blocking element can be positioned somewhere between the main body 23 of the guiding element 11 and the internal wall of the retainer element. In this manner, the additional blocking element can be used as to block movement of the cord element 18 when the cord element 18 is in the engaging portion 32 of the through hole 30, as best seen in figure 3.

[0091] In each of the embodied retainer elements 4, the side channel 25 has the cord element 18 inserted therein, and extends throughout the lower edge of the main body 24 of the retainer element 4 as to be accessible to the user (recipient or delivery service person) of the delivery system. The cord element 18 comprises the end member 22 fixedly connected at one of its ends. This allows an easy manoeuvre of the cord element 18, and therefore of the retainer element 4. Although not illustrated in detail here, the cord element 18 is connected to the container 13, which is securely protecting the goods 2, preventing electronic and/or manual release of the container 13, and therefore of the goods 2 until the retainer element 4 is released from the holding means 3. The container can be designed for re-use.

[0092] In reference to figure 4, the delivery system 1 is being mounted on the structural surface 5. Moreover, it illustrates a side view of the delivery system 1 in assembled state. As seen in this figure, the one-direction latch 16 is in full engaging position with the recess 7. The main body 23 of the guiding element 11, which is protruding from the main body 24 of the retainer element 7, is partially inserted into the groove 6, while the guiding element 11 is in contact with the internal wall of the groove 6. The locking means 10 and the one-direction latch 16 are pressed against said internal wall by the spring 14, as described above. Additionally, a solenoid driving module 20 coupled to locking means such a latch 20a, is securely enclosed in the top part 27 of the rail 3, being provided for unlocking the open end side part of the groove 6 in the rail 3. The open side 6a of the rail 3, as best seen in figure 3, is open and the solenoid driving module 20 and latch 20a are positioned in such a way that the solenoid driving module controls the state of the latch to be in open or closed position to allow or block movement and release of the retainer element 4 at the open end side 6a of the groove 6. In this manner, the retainer element 4 can be moved until the open end side 6a of the groove 6, wherein the locking means (solenoid driving module 20 and latch 20a) are blocking the open end 6a of the groove 6.

[0093] The skilled in the art will appreciate that alternatively, a locking mechanism such a cylinder lock op-

erated by a key can be used for blocking the open end 6a of the groove 6.

[0094] The solenoid driving module 20 is connected to a wireless service network system (not illustrated) that is capable of transmitting data e.g. a code or a sign, to the solenoid driving module 20 from an outside source such a portable wireless communication device.

[0095] When unlocking the goods 2 to be delivered, the code or the sign is transmitted by the outside source to the wireless service network system. The wireless network system checks if the code or sign is valid and if so, actuates the solenoid driving module 20 to open the latch 20a at the open end 6a of the groove 6 and allow that in this manner the retainer element 4 can be moved out of the groove 6.

[0096] Figure 5 shows a perspective view of the rear side of the retainer element 4 comprising the locking system 9 and the cord element 18. The rear side of the retainer element is configured to be inserted in the enlarged part of the holding means and to enter the groove 6.

[0097] As illustrated, the guiding element 11 has the one-direction latch 16 protruding from its outer surface. Moreover, the retainer element 4 has a symmetric shape, and comprises the side channel 25 extending from the middle top part of the main body 24, to the side wall of the retainer element 4 up to the bottom edge of said retainer element 4, as best seen in figure 3. Additionally, the support structure 29 can be seen extending beyond the lowest edge of the retainer element 4. It should be understood that the support structure 29 provides extra strength to the retainer element 4 as well as a fitting support to the locking system 9 inside the main body 24 of the retainer element 4, as described above.

[0098] At the lower part of the retainer element 4 a container 13 is connected to the retainer element 4.

[0099] In figure 6, a cross-section view of the retainer element 4 is shown, wherein the cord element 18 can be seen as being routed through the retainer element 4. The cord element 18 comprises an intermediate member 33 being fixedly connected to the cord element in a position between an interior cam 38 defined by the interior surface of the support structure 29 and the interior surface of the retainer element 4. The intermediate element 33 comprises an outer diameter being larger than the outer diameter of the cord element 18 and also being larger than the through-hole 30 of the main body 23 of the guiding element 11. As illustrated, the outer diameter of the intermediate element 33 is larger than the diameter of the enlarged portion 31 and the engaging portion 32 of the through-hole 30. In this manner, when the main body of the guiding element is in an outward extending position, the opening in the main body is restricted to about the cord diameter size, so the intermediate element cannot pass. Thus, the intermediate element 33 prevents unauthorized release of the cord element 18, which is connected to the container having the goods 2 to be delivered. Additionally, by having the intermediate element 33 fixedly connected to cord element 18, the cord element 18 can be securely retained and/or connected to the engaging portion 32 as to limit the operating movement of said cord element 18 with respect to the locking system 9.

[0100] Figure 7 shows a cross-section view of the retainer element 4 being in engaged position with the rail 3, while a container 13 is connected to the retainer element.

[0101] The retainer element 4 comprises the cord element 18 partially inserted into the side channel 25. As illustrated, at the side of the cord element 18 being routed through the through-hole 30, the container 13 is connected to the cord element 18. The embodied container 13 comprises a zipper closure 34 comprising a pull tap 35 for hand operation that can be used as a connection point to the cord element 18. Additionally, the zipper closure of the embodied container 13 further comprises a slider body 37 for moving along the zipper closure 34 for opening or closing, depending on the direction of the slider's movement.

[0102] It should be noted, that the zipper closure 34 as embodied, is positioned at a relative close location with respect to the main body 23 of the guiding element 11, such that when the container 13 is in assembled position and is holding goods 2, the zipper closure 34 will stay in an non-accessible position due to the fact that the retainer element 4 will be housed in the zipper closure 34, making this theft-proof.

[0103] Figure 8 shows a front view of delivery system in accordance with an embodiment of the invention. In this embodiment the delivery system is very similar to the embodiment shown in Figure 1: The delivery system 51 illustrated comprises an elongated box-shaped holding structure 53, being mounted on the wall 5. The holding structure 53 extends in a main direction X with respect to the wall 5. The holding structure 53 comprises a groove 6 extending along the main direction X and at its ends 52 being provided with a respective enlarged opening 21A, 21B.

[0104] Within the groove 6, a removable retainer element 54 is shown which will be described in more detail below.

[0105] The retainer element 54 can be entered in one of the enlarged openings 21A, 21B which one enlarged opening 21A serves as an entry opening 21A of the groove.

[0106] At the other end of the groove 6 opposite to the entry opening 21 A, the other enlarged opening 21B serves as exit opening of the groove.

[0107] As explained in detail above, the groove 6 is provided with a number of internal engaging means (not shown) along its internal wall. The retainer element 54 can only be slided in the main direction X, allowing movement of the retainer element 54 from a first position in the entry opening 21A along the first direction X, since the engagement means 7 are provided with blocking means that prevent movement of the retainer element 54 in the opposite of the first direction X.

[0108] Adjacent to the exit opening 21B, the groove 6

is arranged with a locking means that comprises a solenoid driving module (not shown). The solenoid driving module is configured to block the groove 6 in such a manner that in the blocking position of the solenoid driving module, the retainer element 54 can not pass and can not reach the exit opening 21B. Thus, the retainer element 54 is locked in the path of the groove between the entry opening and the exit opening.

[0109] Figure 9 shows a perspective view of a retainer element 54 according to an embodiment of the invention.

[0110] The retainer element 54 comprises a shackle 55 and a cable tensioner 56 that are interconnected at a central connecting part 57.

[0111] The shackle 55 is arranged to cooperate with the groove 6 of the delivery system 51, and comprises a pair of substantially right angle brackets, i.e., an upper bracket 61 and a lower bracket 62 that in closed state form a composite bracket. The composite bracket is configured for entering the groove through the entry opening 21A, such that the angled end can be moved along the groove in the main direction X.

[0112] A main part of the upper bracket 61 adjacent to the central connecting part 57 is configured with a first opening 64 in its surface. Likewise, a main part of the lower bracket 62 adjacent to the central connecting part 57 is configured with a second opening 65 in its surface. The second opening 65 has a different shape as the first opening 64.

[0113] The cable tensioner 56 is arranged to couple to a cord element 18 that comprises a cable arrangement of an inner cable within an outer tubular shell. The inner cable can be slided with respect to the outer tubular shell. The cord element 18 is attached to a locking means of a container 13. The cable tensioner is arranged to tension/relax the cord element 18 to close and open the container, respectively by moving the inner cable relative to the outer tubular shell.

[0114] In an embodiment, the cord element 18 may be flattened or belt-shaped.

[0115] The cable tensioner 56 is also coupled to the central connection part 57 and comprises a guiding part 60 that guides the cord element 18, and a clamping and tensioning element 58. The clamping and tensioning element 58 is a substantially cylindrical body that is rotatively suspended in the central connection part 57 for rotation round the cylindrical axis A of the central connecting part 57. The rotatable clamping and tensioning element 58 comprises an end part 59 for receiving and holding an end of the cord element 18.

[0116] Further, the rotatable clamping and tensioning element 58 is connected to the lower bracket 62, while the upper bracket 61 is connected to the central connection part 57. In the closed state as shown when the lower and upper brackets 61, 62 form the composite bracket, the cord element 18 is tensioned by the rotatable clamping and tensioning element 58.

[0117] By rotation of the clamping and tensioning element 58, the inner cable is displaced within the outer tubular shell in a manner that the inner cable strains by pull on its connected ends (or in opposite rotation relaxes). By applying such pulling force on a locking mechanism, the cord element 18 can be used to lock/unlock the locking mechanism.

[0118] Figure 10 shows the retainer element of Figure 9 in opened state.

[0119] When the retainer element 54 is detached from the delivery system 1, more in particular the groove 6, the composite bracket 61, 62 of the shackle 55 can be opened by a rotation of the lower bracket 62 with respect to the upper bracket 61 around the cylindrical axis A of the central connecting part 57.

[0120] The clamping and tensioning element 58 that is coupled to the lower bracket 62 rotates in a corresponding manner. As a result, the cord element 18 becomes relaxed which allows to unlatch the lock of the container 13 that is attached to the cord element 18, and to open the container 13.

[0121] In figure 10, the shackle 55 is fully opened with the lower bracket 62 rotated R1 over substantially 180° and being in contact with the guiding part for the cord element 18.

[0122] In the angled end of the lower bracket 62 an opening 63 has been arranged that allows the cord element 18 to pass. The opening 63 in the angled end of the lower bracket 62 also has a function as a locking recess that cooperates with engagement means 57 (not shown here) when the shackle 55 is positioned within the groove 6 of the delivery system 51. This will be described in more detail with reference to Figure 11.

[0123] Figure 11 shows a cut-away view of the rear side of the delivery system of Figure 8.

[0124] In this view, at the right hand side the entry opening 21A (indicated by arrow 21A) is shown with the shackle 55 of the retainer element 54 inserted. On the left hand side the delivery system 51 comprises the exit opening 21B (indicated by arrow). Adjacent to the exit opening the delivery system 51 comprises the solenoid driving module 20 that controllably blocks and unblocks the path along the groove for the retainer element 54.

[0125] Along the main direction X engagement means 57 are arranged next to the groove 6. The engagement means 57 comprises an elongated strip which is provided with a series of ratchets 56 that are configured to cooperate with the opening 63 of the angled end of the lower bracket 62 in the groove 6.

[0126] The ratchets are arranged to allow passage of the retainer element 54 in only the main direction X, and to block movement of the retainer element 54 in the opposite direction.

[0127] In this manner, a retainer element 54 that has been connected to the delivery system 51 can not be removed by sliding the retainer element back to the entry opening 21A. Removal is only possible by movement in the main direction X until the exit opening 21 B is reached.

[0128] At the exit opening 21B, the solenoid driving module 20 is arranged to block/unblock the path of the

retainer element 54 in the groove by means of a latch 20A that is positioned in/out of said path. As described above with reference to Figure 4, the solenoid driving module 20 is connected to a wireless service network system that is capable of transmitting data, e.g., a code or a sign, to the solenoid driving module 20 from an outside source such a portable wireless communication device. In this manner the portable wireless communication device can control the position of the latch 20A and the locking of the retainer element 54.

[0129] Figure 12 shows a cross-section of the delivery system 51 while holding a retainer element 54 in the groove 6. In Figure 12 entities with the same reference number as shown in the preceding figures refer to corresponding entities.

[0130] The groove 6 of the delivery system 51 comprises a horizontal portion 6A and a vertical portion 6B. The width of the groove 6 is corresponding with the thickness of the composite bracket 61, 62 of the shackle 55, so as to allow minimal play of the retainer element 64 in the groove 6.

[0131] The latch 20A of the solenoid driving module 20 is arranged to move in a direction Y substantially perpendicular to the plane of the horizontal portion 6A of the groove 6 and to cooperate with the main part of the composite bracket adjacent to the central connecting part 57.

[0132] Normally, in closed position the latch 20A rests on a lower horizontal plane 66 of the horizontal part 6A of the groove 6 and blocks the path for the retainer element 54 to the exit opening 21B.

[0133] As described above with reference to Figure 9, the retainer element 54 has openings 64, 65 in the main part of the composite bracket. Should unexpectedly, the latch 20A be lifted externally and the retainer element 54 be moved under the latch 20A, the openings 64, 65 provide a recess in which the latch 20A enters and blocks further movement of the retainer element 54.

[0134] Figures 13 - 15 show a container of the delivery system in accordance with an embodiment of the invention.

[0135] Figure 13 shows a perspective view of the container.

[0136] The container 70 according to the invention has the shape of a substantially rectangular block. The container volume is defined by the walls of the container, and comprises a bottom plate 74, a top plate 75, and four side walls 76, 77, 78 (one side not visible).

[0137] The container comprises four rectangular flat plates that the bottom plate 74, a top plate 75 and two side plates 76, 78 that are each arranged on opposite sides between the bottom plate and the top plate.

[0138] The bottom plate at a first end 81 is coupled by a central hinge 83 to a first end of the first side plate 75 and at another second end 82 opposite to the first end the bottom plate is hingedly coupled to the second side plate 78.

[0139] A second end of the first side plate 76, opposite to its first end, is coupled to an end of the top plate 75.

[0140] On the two shorter sides (front and rear ends) of the container 70 the first and second side plates 76, 78 are simple rectangular plates. On the longitudinal sides the third and fourth side plates 77 are composite rectangular plates that each are collapsible and coupled to either an edge of the first side plate 76 and an edge of the bottom plate 74 or an edge of the second side plate 78 and an edge of the top plate 75.

[0141] In the third and fourth side plates 77 in the two parallel longitudinal sides of the container 70 a diagonal partition 80 is present in the walls 77. The diagonal partition 80 runs from a bottom edge or first edge 81 at one side of the container to a top edge or second edge 82 at the perpendicularly opposite side of the container. The diagonal partition 80 divides the wall 77 into two right-angled triangular side plates 77a, 77b.

[0142] When unfolded, the collapsible plates 77 provide a right angle between the first side plate 76 and the top plate 75 that together form a first shell part A and between the second side plate 78 and the bottom plate 74 that together form a second shell part B, respectively.

[0143] In addition, the bottom edge 81 is provided with a hinge element 83 that allows the simple side plate or first plate 76 to rotate around the bottom edge with respect to the bottom plate 74.

[0144] Further, at the top edge 82 the free end 75a of the top plate 75 and the free end 78a of the second simple side plate or second side plate 78 are releasably coupled.

[0145] As a result, the construction of the container 70 has two shell parts A, B that can opened at the top edge 82 and pivoted with respect to each other by means of the hinge element 83, as will be explained below in more detail.

[0146] The container 70 of the delivery system 51 is connected with the retainer element 54 by a cord element 18 that comprises a cable arrangement as mentioned above.

[0147] The cable arrangement provides a secure connection between the container 70 and the retainer element 54 which connection ensures that the container 70 can not be removed from the delivery system when the retainer element 54 is locked in the groove 6 of the delivery system 51.

[0148] In a further embodiment, the cable arrangement is a composite cable 18 comprising an inner cable and an outer tubular shell in which the inner cable is slidably accommodated. At one end the inner cable is connected to the end part 59 of the rotative clamping and tensioning element 58 of the retainer element 54, at the other end the inner cable is connected to a locking means (not shown) of the container 70. The locking means is arranged to lock the container 70 in a manner that access to the interior of the container is blocked.

[0149] Thus, in the situation that the retainer element 54 is locked in the groove 6 of the delivery system, the inner cable is in a position which locks the locking means and blocks access to the container, while at the same time the container 70 is secured to the delivery system

by means of the cable arrangement.

[0150] In an embodiment, the locking means is arranged as a latching element in or at the hinge 83. The latching element can be put in locked position by tensioning the inner cable of the cord element 18 and in unlocked position by relaxation the inner cable of the cord element as described above with reference to figure 9. The presence or absence of tension in the cable determines the state of the locking means, i.e., being locked or unlocked respectively.

[0151] Figure 14 shows a perspective view of the container of Figure 13 in an opened state. In the opened state the first shell part A is rotated (arrow R) with respect to the hinge element 83 at the first edge 81 of the bottom plate 74.

[0152] In the first shell part A, the top plate 75 is coupled to the first side plate 76 by means of the upper right-angle triangular plate 77a at the upper side of the container. In the second shell part B, the bottom plate 74 is coupled to the second side plate 78 by means of the lower right-angle triangular plate 77b at the lower side of the container.

[0153] In the opened state, the top plate 75 is oriented perpendicularly with respect to the bottom plate 74, and allows vertical access to the inner surface of the bottom plate of the container.

[0154] In the first shell part A between the top plate 75 and the first side plate 76, the free edge 80a of each unfolded collapsible triangular plate 77a forms a first diagonal edge between the central hinge 83 and the free end 75a of the top plate 75. In the second shell part B between the second side plate 78 and the bottom plate 74, the free edge 80b of each unfolded collapsible triangular plate 77b forms a second diagonal edge 80b between the central hinge 83 and the free end 78a of the second side plate 78.

[0155] The central hinge 83 allows to pivot the first shell part A with respect to the second shell part B, such that the free end 75a of the top plate 75 is placed over the free end 78a of the second side plate 78, the first and second diagonal edges 80a, 80b coincide and the first and second shell parts A, B form a closed volume in the form of the container 70.

[0156] The central hinge 83 is provided with the locking means coupled to the cord element 18 that by tensioning or relaxation of the inner cable, locks or unlocks the position of the first shell part A with respect to the position of the second shell part B.

[0157] In an embodiment, the central hinge 83 comprises a guide slot 84 for allowing a displacement of the first shell part A relative to the second shell part B at the location of the central hinge 83.

[0158] The tensioning of the inner cable causes the central hinge 83 to provide a sliding movement of the first shell part with respect to the second shell part B over the diagonal partition to minimize the distance of the first shell part A with respect to the second shell part B such that the first shell part A engages with the second shell part B (at the diagonal side edges 80a, 80b) to lock the volume of the container 70.

[0159] In an embodiment, the first diagonal edge 80a is provided with hook elements 90 and the second diagonal edge 80b is provided with undercut openings 91 at positions corresponding with positions of hook elements 90 on the first diagonal side edge 80a. When locked the sliding movement of the first shell part A relative to the second shell part provides that the hook elements 90 on the first diagonal edge 80a are displaced in the undercut openings 91 of the second diagonal edge 80b such that the first and second shell parts A, B are coupled at the first and second diagonal edges 80a, 80b. This engagement strengthens the side walls 77a, 77b and provides additional locking of the container 70.

[0160] Upon relaxation of the inner cable with respect to the outer tubular shell of the cord element, the first shell part A can be displaced in opposite direction with respect to the second shell part B to disengage the hook elements 90 from the undercut openings 91 and the container can be opened.

[0161] As shown in Figure 15, according to an embodiment, the container 70 is arranged as a collapsible container which in unfolded position is substantially a rectangular cuboid.

[0162] The first side plate 76 and the bottom plate 74 connected by the hinge element and first edge 83, 81 and guide slot 84 form a first layer L1 of the collapsed container while the top plate 75 and the second side plate 78 from a second layer L2 on top of the first layer L1. Each triangular plate portion 77a, 77b is folded over a respective folding hinge 95, 96 and along its edges that are respectively coupled to the top plate 75 and first side plate 76 or coupled to the bottom plate 74 and the second side plate 78. The folding direction of each triangular plate portion is towards the interior of the container, such that the triangular plate portions 77a, 77b are folded inbetween the first layer L1 and the second layer L2 of the collapsed container 70.

[0163] Figure 16 shows a block diagram illustrating the present invention for a method for offering a home delivery service of goods when an intended recipient is absent (100). As illustrated, in use, once the delivery service person attempts to deliver the goods and confirms that the intended recipient is absent, the delivery service person connects the goods 2, by firstly introducing them into the container 13, to the cord element 18 (110 i.e. connecting the container and goods). The cord element 18 is tightened to connect the container to the retainer element 4. In the embodiment of the composite bracket as retainer element, the closing of the lower and upper bracket tensions the inner cable of the cord element which locks the container. As the retainer element 4, 54 is connected to the container, it will be securely connected to the rail 3 by inserting the guiding element 11, 23 into the enlarged portion 21, 21A of the holding means 3, 53, moving the retainer element 4, 54 along the groove 6 in first direction X until the one direction latch 16 on the

guiding element 11, 23 drops in one of the recesses of the internal engaging means 7 thus blocking removal of the retainer element 4, 54 from the holding means in the direction opposite to the first direction X (120 i.e. locking the goods). Subsequently, the delivery service person sets-up unlocking code data for the intended recipient (130 i.e. setting-up unlocking data). The unlocking code data will allow the recipient to unlock the goods from the holding means 3. Right after the delivery service person has locked the goods and sent the data to the wireless service network device, said data is sent by the delivery service person's device to the intended recipient via an electronic facility such as a server. The intended recipient receives the unlocking code data (140 i.e. receiving unlocking data) on a personal electronic device such as mobile telephone and more especially via a mobile telephone application or an electronic message service or a short message service (sms) or an email, allowing the use of said data only once or during a predetermined time interval (150 i.e. introducing unlocking data for releasing the goods). In an embodiment, the received data can be used only once. This is done as a precaution measure to avoid fraudulent use of the system and for preventing theft. In other words, the data the user or intended recipient receives from the server for allowing release of the goods cannot be re-used. Alternatively, the unlocking code could be useable during a predetermined time interval in case the recipient would make a mistake during his attempt to unlock the holding means 3.

[0164] Also, the communication can include data for administration of the delivery on the server. The server may comprise a web portal for the user. The delivery service person may have an (temporal) unlocking code for returns of goods, issued by the sender for the particular delivery system.

[0165] After that, the intended recipient can use the data to unlock and release the goods by either inserting the code into the wireless service network device or by introducing the data into a mobile or computer application which will communicate with the wireless service network device of the delivery system 1 that will release the goods 2. It should be noted that the service provider and the intended recipient will receive a confirmation of proof of delivery (150 i.e. receiving proof of delivery), which will conclude the operation. Alternatively, the system may be set up to let each recipient have a personalized user code. This will allow each recipient to have personalized access to the delivery system to unlock or release the goods with their own personal user code.

[0166] Additionally, the system should be set up in such a way that the solenoid driving system 20 and the wireless service network device are connected for electronically cooperating with each other for locking and unlocking the delivery system 1. In other words, the wireless service network device should be able to control the solenoid driving system 20, which is connected to the locking system 9, for allowing the user and/or the delivery service person to operate the delivery system 1. Thus, the control over the locking system 9 by the user and/or the delivery service person should be done in a way wherein the user and/or the delivery service person communicate directly with the server, while the server provides information for operating of the delivery system to either, recipient, delivery service person or service provider.

[0167] In the above described communication protocol, the server communicates with the user and/or the delivery service person directly and each can use the communicated data to control the delivery system or locking system to enter or release the goods.

[0168] Moreover, data received from the server to lock or unlock the goods may have an expiration time, for security reasons. The wireless service network device may also comprise an electronic lock system having an internal clock, which will be able to set time limits that will expire after a certain period, for security reasons. The internal clock can be used to measure time between subsequent operations and more especially, it measures the time between instructions entered in the wireless service network device. Additionally, the internal clock can be used for checking the periods of time between the locking and unlocking of the goods.

[0169] The delivery system can also be used for returns done by the intended recipient or user. In case the user wants to return the received goods to the sender, the system can be use in reverse, wherein the original recipient acts as a delivery service person and the original delivery service person as recipient for the goods to be returned. In this case the original recipient needs to create a label or returning data. This data will be sent to the server via a communication device such as a mobile phone or a computer. The original recipient may receive instructions how to communicate with the wireless service network device of the delivery system 1 so as to attach the goods to be returned to the holding means 3 and how to set up unlocking code data for the original delivery service person to pick up the goods. Consequently, the delivery service person and/or the system supplier will receive the information or data from the server with instructions including data created by the original recipient, so that the delivery service person can go and pick up the goods for their return. In this case, the original recipient will need to lock the goods 2, by firstly introducing them into the container 13, and then locking the container to the releasing element 18, which will be securely connected as explained above. Subsequently, the delivery service person can come to pick-up the goods. The unlocking code data received by the delivery service person will allow the delivery service person to release the goods from the delivery system. At this point in time, the original recipient may receive data in a form of a receipt as a proof of return, informing him/her that the delivery service person has picked the goods. Additionally, by using that information, the original recipient will be able to track and trace the goods until they arrive at its destination i.e. the initial sender.

[0170] Thus, the invention has been described by reference to the embodiments discussed above. It will be recognized that these embodiments are susceptible to various modifications and alternative forms well known to those of skill in the art without departing from the spirit and scope of the invention. Accordingly, although specific embodiments have been described, these are examples only and are not limiting upon the scope of the invention.

[0171] The present invention can further be characterized by the following embodiments:

Embodiment 1. A delivery system for offering a delivery service of goods at an address of an intended recipient when the intended recipient is absent at said address, comprising:

- a holding means for holding a retainer element in a position with respect to a structural surface, the holding means being connected to the structural surface and extending in a main direction along the structural surface,
- wherein the holding means comprises a groove extending along the main direction, the groove being provided with internal engagement means along an internal wall of the groove in a first direction along of the main direction; and wherein the retainer element comprises a guiding element for positioning in the groove, and a locking system having a locking means for preventing movement of the retainer element in the groove, the locking means being arranged for interaction with the internal engagement means when the guiding element is positioned in the groove, and wherein the locking means allows movement of the retainer element in a first direction along the groove and blocks movement of the retainer element in a direction opposite to the first direction.

Embodiment 2. The delivery system according to Embodiment 1, wherein the retainer element comprises a connecting means for connecting goods to be delivered to the holding means.

Embodiment 3. The delivery system according to Embodiment 2, wherein the connecting means can be associated to a theft-proof container, provided to protect the goods to be delivered.

Embodiment 4. The delivery system according to any one of the Embodiments 1-3, wherein the guiding element is a spring biased guiding element.

Embodiment 5. The delivery system according to Embodiment 4, wherein the spring biased guiding element comprises an internal notch in its outermost part, the internal notch adapted to fit a pivoting element, such that the pivoting element can be pivotally moved in and out the internal notch as to fit into the internal engagement means of the groove.

Embodiment 6. The delivery system according to Embodiment 5, wherein outer dimensions of the pivoting element parallel to the internal engagement means are so configured that the pivoting element can be arranged to fit at least partially into the internal engagement means for preventing movement of the retainer element along the opening in the direction opposite to the first direction.

Embodiment 7. The delivery system according to Embodiment 5 or Embodiment 6, wherein the locking system further comprises a cord element having an end member, being the outer diameter of the end member being larger than the outer diameter of the cord element, and wherein the cord element is provided for connecting the goods to the retainer element.

Embodiment 8. The delivery system according to any one of the preceding Embodiments, wherein the groove in the holding means comprises a U-shaped cross section and having facing rim edges along the main direction.

Embodiment 9. The delivery system according to embodiment 1 - 3, wherein the guiding element of the retainer element comprises a shackle, the shackle being arranged to cooperate with the groove of the delivery system, and comprising a pair of substantially right angle brackets, i.e., an upper bracket and a lower bracket that in closed state form a composite bracket with an angled end part.

Embodiment 10. The delivery system according to embodiment 9, wherein the composite bracket is configured for entering the groove through an entry opening, such that the angled end part can be moved along the groove in the main direction X.

Embodiment 11. The delivery system according to embodiment 9 or embodiment 10, wherein the angled end part of the lower bracket has a locking recess for cooperation with the internal engagement means when the shackle is within the groove of the delivery system; the internal engagement means comprising an elongated strip which is provided with a series of ratchets that are configured for cooperation with the locking recess of the angled end of the lower bracket when the composite bracket is positioned in the groove.

Embodiment 12. The delivery system according to embodiment 9, wherein the retainer element further comprises a cable tensioner that is interconnected with the shackle at a central connecting part; the cable tensioner being arranged to couple to a cord element consisting of an inner cable and an outer tubular shell in which the inner cable is slidably moveable along its length; the cable tensioner being coupled to the central connection part, and comprising a guiding part for the cord element, and a clamping and tensioning element for tensioning the cord element.

Embodiment 13. The delivery system according to embodiment 12, wherein the rotatable clamping and

tensioning element is a substantially cylindrical body that is rotatively suspended in the central connection part for rotation round a cylindrical axis A of the central connecting part, and comprises an end part for receiving and holding an end of the cord element.

Embodiment 14. The delivery system according to embodiment 13, wherein the rotatable clamping and tensioning element is connected to the lower bracket, and the upper bracket is connected to the central connection part, such that when the retainer element is detached from the delivery system, a rotation of the clamping and tensioning element, causes the inner cable to displace within the outer tubular shell for tensioning or, when rotated in opposite sense, is displaced for relaxation of the inner cable.

Embodiment 15. The delivery system according to embodiment 14, wherein the rotation for tensioning the cord element involves rotating the lower bracket towards the upper bracket so as to form the composite bracket.

Embodiment 16. The delivery system according to any one of the preceding embodiments 9 - 15, wherein the retainer element is connected to the container by means of the inner cable slidably arranged in the outer tubular shell; at one end the inner cable being connected to the end part of the rotatable clamping and tensioning element of the retainer element, at the other end the inner cable being connected to container locking means of the container.

Embodiment 17. The delivery system according to embodiment 16, wherein the container is arranged substantially as a box comprising a hinged cover, the container locking means being arranged to lock the cover in a position that the box is closed.

Embodiment 18. The delivery system according to embodiment 16, wherein the container is arranged as a collapsible container which in unfolded position is substantially a rectangular cuboid, comprising four rectangular flat plates that in unfolded position form a bottom plate, a top plate, a first side plate and a second side plate; the bottom plate at a first end being coupled by a central hinge to a first end of the first side plate, and at a second end opposite to the first end the bottom plate being hingeably coupled to the second side plate, and a second end of the first side plate, opposite to its first end, being hingedly coupled to an end of the top plate.

Embodiment 19. The delivery system according to embodiment 18, wherein the central hinge is arranged to let the first shell part pivot with respect to the second shell part, such that in a closed position a free end of the top plate is placed over a free end of the second side plate; and the central hinge is provided with the container locking means coupled to the cord element in such a way that in the closed position by tensioning or relaxation the inner cable, the position of the first shell part with respect to the position of the second shell part is locked or unlocked, respectively.

Embodiment 20. The delivery system according to embodiment 17 or embodiment 18, wherein the container further comprises four collapsible plates, each collapsible plate coupled to either an edge of the first side plate and an edge of the bottom plate or an edge of the second side plate and an edge of the top plate, wherein in the unfolded position, a pair of collapsible plates provides two parallel side walls at a right angle between the first side plate and the top plate, and a second pair of collapsible plates provides two parallel side wall at a right angle between the second side plate and the bottom plate; the first side plate, the top plate and two sidewalls forming a first shell part; the second side plate, the bottom plate and two sidewalls forming a second shell part; wherein in the first shell part between the top plate and the first side plate, the free edge of each unfolded collapsible plate forms a first diagonal edge between the central hinge and the free end of the top plate, and wherein in the second shell part between the second side plate and the bottom plate, the free edge of each unfolded collapsible plate forms a second diagonal edge between the central hinge and the free end of the second side plate.

Embodiment 21. The delivery system according to any one of the preceding Embodiments, wherein the locking system is connectable to a wireless service network device for actuating the locking means.

Embodiment 22. The delivery system according to any one of the preceding Embodiments, wherein the locking system is connected to a solenoid driving module which can be activated to operate the locking means via the wireless service network device.

Embodiment 23. The delivery system according to any one of the preceding Embodiments, wherein the groove comprises an enlarged portion for allowing insertion of the retainer element into the groove.

Embodiment 24. Method for offering a delivery of goods at an address of an intended recipient when the intended recipient is absent from said address, the method comprising the following steps:

a) connecting a retainer element to a holding means of a delivery system, wherein the holding means is connected to a structural surface and extends along the structural surface in a main direction and comprises a groove extending along the main direction, the groove comprises at least an internal engagement means provided along an internal wall of the groove in a direction of the main direction, b) moving the retainer element in a first direction along the main direction, wherein the retainer element is connected to a container holding the goods and the retainer element comprises a guiding element for positioning in the groove, and a locking system having a locking means for preventing movement

of the retainer element in the groove; the locking means being arranged for interaction with the internal engagement means when the guiding element is positioned in the groove,
c) positioning the guiding element of the retainer element in the groove in such a manner that the locking means are at least partially in contact with the internal engagement means provided along the internal wall of the groove for blocking movement of the retainer element in a direction opposite to the first direction. Embodiment 25. Method according to Embodiment 24, wherein the method further comprises: when the movement of the retainer element has been blocked in the direction opposite to the first direction after performing step c), d) unblocking the retainer element from the holding means by providing an unlocking code via a wireless communication system which can activate a latch which allows release of the retainer element along the first direction or by manually introducing an unlocking code for unlocking the retainer element from the holding means.

Embodiment 26. Method according to Embodiment 25, wherein when performing the step d), the use of the code is for a limited period of time.
Embodiment 27. Method according to any one of Embodiments 25 or 26, further comprising after step c) but preceding step d), a step e) of a transmission of the unlocking code to the wireless network service device when the goods have been placed in the delivery system and additionally a transmission of the unlocking code to a predetermined location where the intended recipient can retrieve the unlocking code.
Embodiment 28. Method according to any one of the preceding embodiments 24 - 27, wherein the steps a), b), c) and e) of method are carried out by a delivery service to deliver goods to a consumer as intended recipient when the intended recipient is absent and step d) is carried out by the consumer.
Embodiment 29. Method according to Embodiment 28 wherein the steps a), b), c) and e) of method are carried out by the consumer to return goods to the delivery service as intended recipient when the intended recipient is absent, and step d) is carried out by the delivery service.
Embodiment 30. Method according to Embodiment 25, wherein subsequent to the unlocking of the retainer element from the holding means, the method comprises disconnecting the container from the retainer element.

Claims

1. A delivery system for offering a delivery service of goods at an address of an intended recipient when the intended recipient is absent at said address, comprising:

- a holding means for holding a retainer element in a position with respect to a structural surface, the holding means being connected to the structural surface and extending in a main direction along the structural surface,
- wherein the holding means comprises a groove extending along the main direction, the groove being provided with internal engagement means along an internal wall of the groove in a first direction along of the main direction; and wherein the retainer element comprises a guiding element for positioning in the groove, and a locking system having a locking means for preventing movement of the retainer element in the groove, the locking means being arranged for interaction with the internal engagement means when the guiding element is positioned in the groove, and wherein the locking means allows movement of the retainer element in a first direction along the groove and blocks movement of the retainer element in a direction opposite to the first direction.

2. The delivery system according to claim 1, wherein the retainer element comprises a connecting means for connecting goods to be delivered to the holding means.

3. The delivery system according to claim 2, wherein the connecting means can be associated to a theft-proof container, provided to protect the goods to be delivered.

4. The delivery system according to any one of the preceding claims 1 - 3, wherein the guiding element of the retainer element comprises a shackle, the shackle being arranged to cooperate with the groove of the delivery system, and comprising a pair of substantially right angle brackets, i.e., an upper bracket and a lower bracket that in a closed state form a composite bracket with an angled end part.

5. The delivery system according to claim 4, wherein the composite bracket is configured for entering the groove through an entry opening, such that the angled end part can be moved along the groove in the main direction X.

6. The delivery system according to claim 4 or claim 5, wherein the angled end part of the lower bracket has a locking recess for cooperation with the internal engagement means when the shackle is within the groove of the delivery system; the internal engagement means comprising an elongated strip which is

provided with a series of ratchets that are configured for cooperation with the locking recess of the angled end of the lower bracket when the composite bracket is positioned in the groove.

7. The delivery system according to claim 4, wherein the retainer element further comprises a cable tensioner that is interconnected with the shackle at a central connecting part; the cable tensioner being arranged to couple to a cord element consisting of an inner cable and an outer tubular shell in which the inner cable is slidably moveable along its length; the cable tensioner being coupled to the central connection part, and comprising a guiding part for the cord element, and a clamping and tensioning element for tensioning the cord element.

8. The delivery system according to claim 7, wherein the rotatable clamping and tensioning element is a substantially cylindrical body that is rotatively suspended in the central connection part for rotation round a cylindrical axis A of the central connecting part, and comprises an end part for receiving and holding an end of the cord element, and wherein the rotative clamping and tensioning element is connected to the lower bracket, and the upper bracket is connected to the central connection part, such that when the retainer element is detached from the delivery system, a rotation of the clamping and tensioning element, causes the inner cable to displace within the outer tubular shell for tensioning the inner cable or, when rotated in opposite sense, to displace for relaxation of the inner cable.

9. The delivery system according to claim 8, wherein the rotation for tensioning the cord element involves rotating the lower bracket towards the upper bracket so as to form the composite bracket.

10. The delivery system according to any one of the preceding claims 4 - 9, wherein the retainer element is connected to the container by means of the inner cable slidably arranged in the outer tubular shell; at one end the inner cable being connected to the end part of the rotative clamping and tensioning element of the retainer element, at the other end the inner cable being connected to container locking means of the container.

11. The delivery system according to claim 10, wherein the container is arranged substantially as a box comprising a hinged cover, the container locking means being arranged to lock the cover in a position that the box is closed.

12. The delivery system according to claim 10 or claim 11, wherein the container is arranged as a collapsible container which in unfolded position is substantially a rectangular cuboid, comprising four rectangular flat plates that in unfolded position form a bottom plate, a top plate, a first side plate and a second side plate; the bottom plate at a first end being coupled by a central hinge to a first end of the first side plate, and at a second end opposite to the first end the bottom plate being hingedly coupled to the second side plate, and
a second end of the first side plate, opposite to its first end, being hingedly coupled to an end of the top plate.

13. The delivery system according to any one of the preceding claims, wherein the locking system is coupled to a wireless service network device for actuating the locking means.

14. The delivery system according to any one of the preceding claims, wherein the locking system is connected to a solenoid driving module which can be activated to operate the locking means via the wireless service network device.

15. Method for offering a delivery of goods at an address of an intended recipient when the intended recipient is absent from said address, the method comprising the following steps:

a) connecting a retainer element to a holding means of a delivery system, wherein the holding means is connected to a structural surface and extends along the structural surface in a main direction and comprises a groove extending along the main direction, the groove comprises at least an internal engagement means provided along an internal wall of the groove in a direction of the main direction, b) moving the retainer element in a first direction along the main direction, wherein the retainer element is connected to a container holding the goods and the retainer element comprises a guiding element for positioning in the groove, and a locking system having a locking means for preventing movement of the retainer element in the groove; the locking means being arranged for interaction with the internal engagement means when the guiding element is positioned in the groove,
c) positioning the guiding element of the retainer element in the groove in such a manner that the locking means are at least partially in contact with the internal engagement means provided along the internal wall of the groove for blocking movement of the retainer element in a direction opposite to the first direction wherein the method further comprises: when the movement of the retainer element has been blocked in the direction opposite to the first direction after performing step c),

d) unlocking the retainer element from the holding means by providing an unlocking code via a wireless communication system which is arranged to activate a latch which allows release of the retainer element along the first direction or by manually introducing an unlocking code for unlocking the retainer element from the holding means, and
subsequent to the unlocking of the retainer element from the holding means, the method comprises disconnecting the container from the retainer element..

16. Method according to claim 15, further comprising after step c) but preceding step d), a step e) of a transmission of the unlocking code to the wireless network service device when the goods have been placed in the delivery system and additionally a transmission of the unlocking code to a predetermined location where the intended recipient can retrieve the unlocking code.

17. Method according to any one of the preceding claims 15 - 16, wherein either the steps a), b), c) and e) of method are carried out by a delivery service to deliver goods to a consumer as intended recipient when the intended recipient is absent and step d) is carried out by the consumer,
or the steps a), b), c) and e) of the method are carried out by the consumer to return goods to the delivery service as intended recipient when the intended recipient is absent, and step d) is carried out by the delivery service.

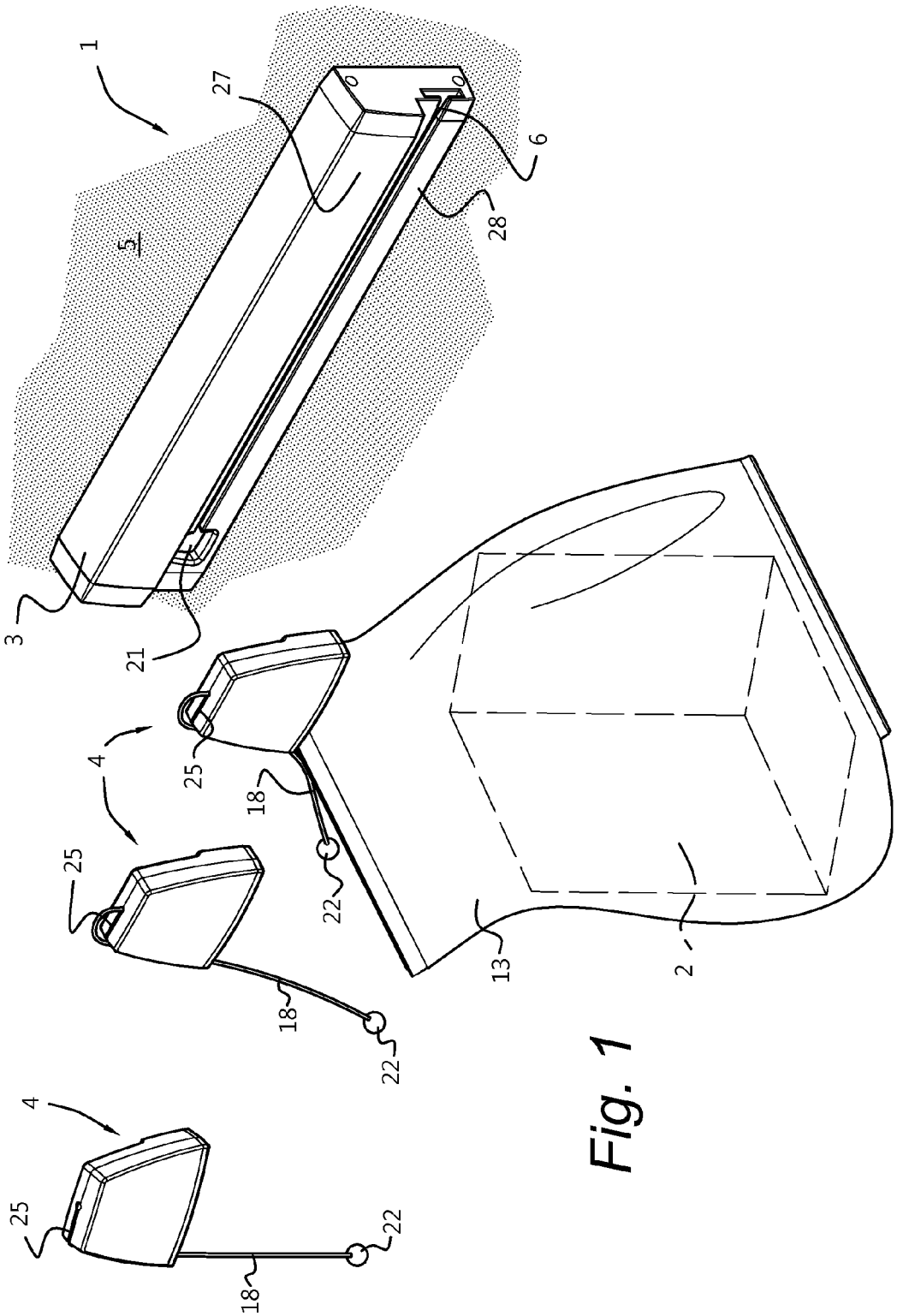

Fig. 1

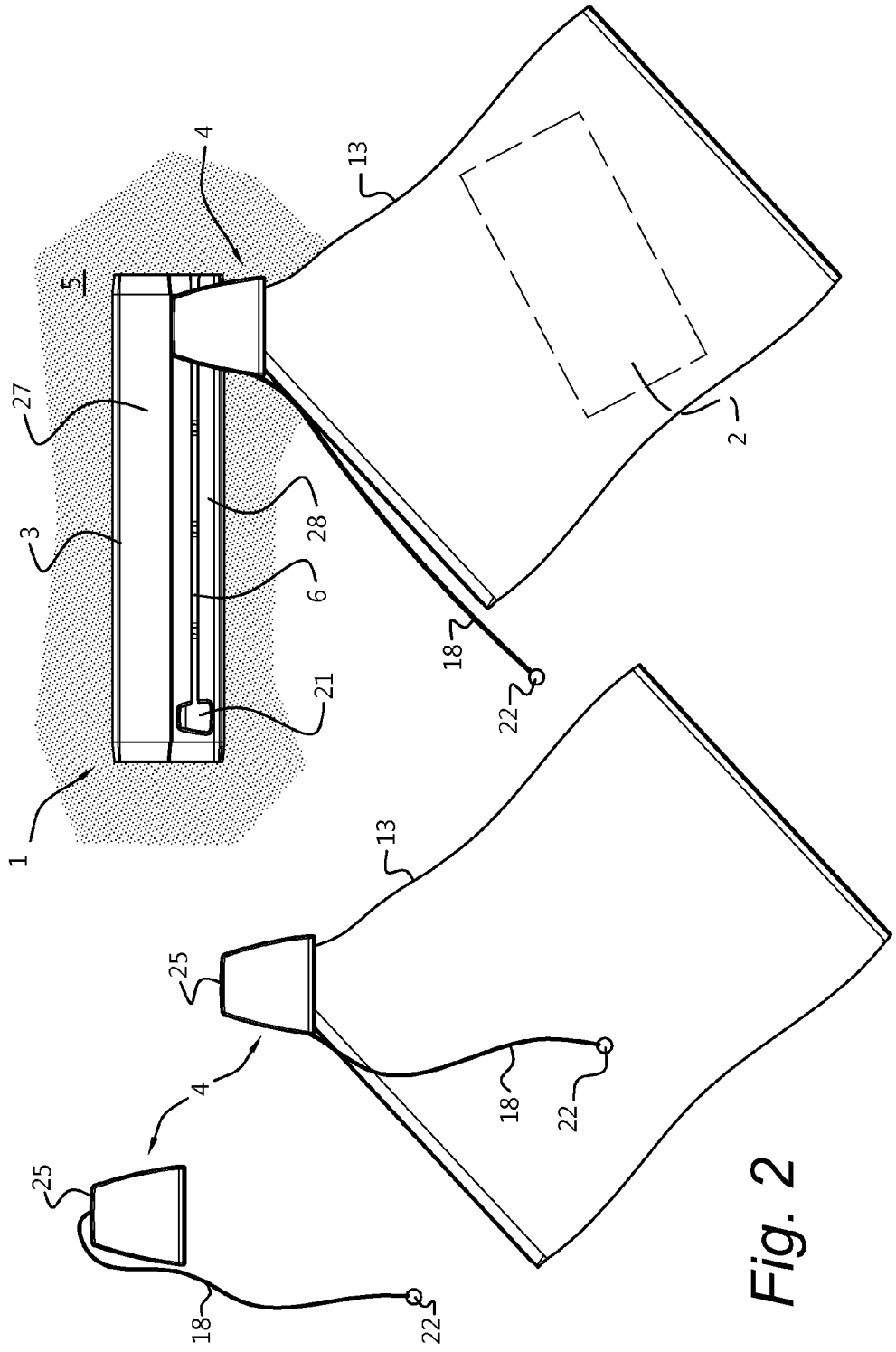

Fig. 2

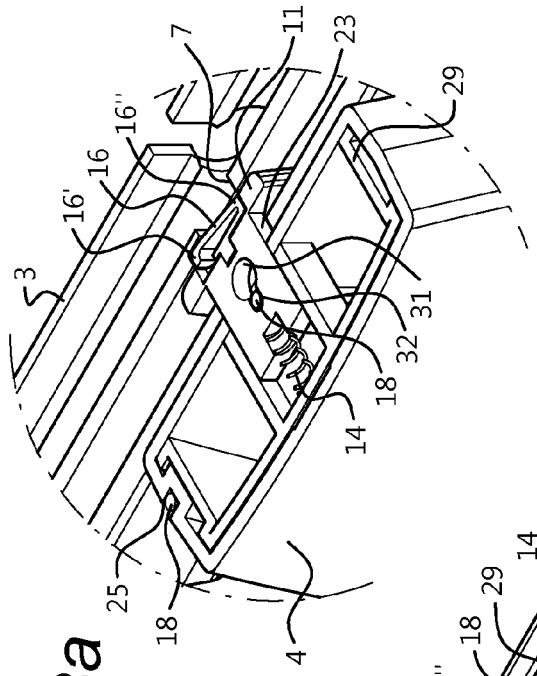
3
16'
16
16''
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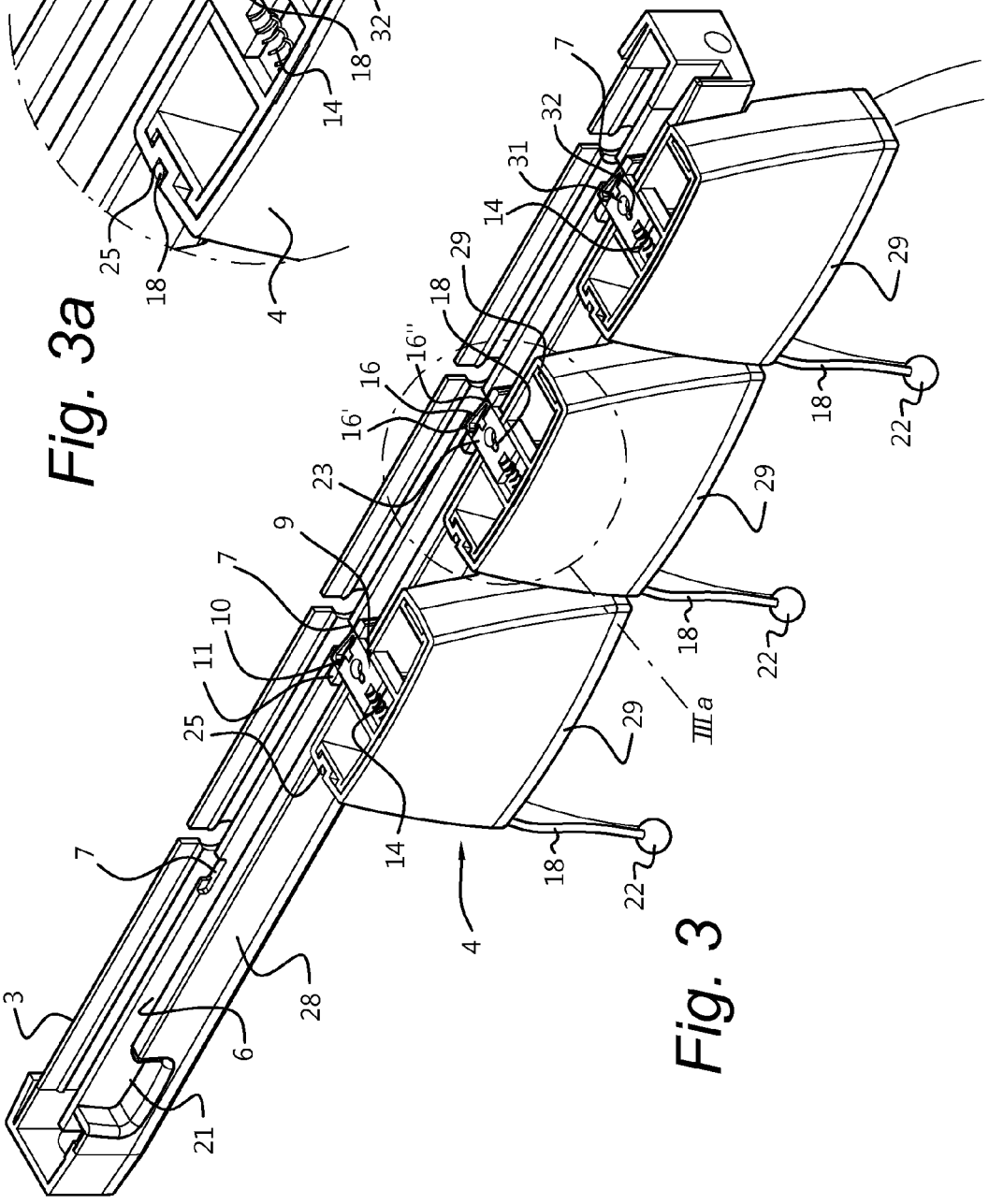
Fig. 3a


3
7
6
28
21
25
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9
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16'
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16''
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IIIa

Fig. 3

Fig. 4

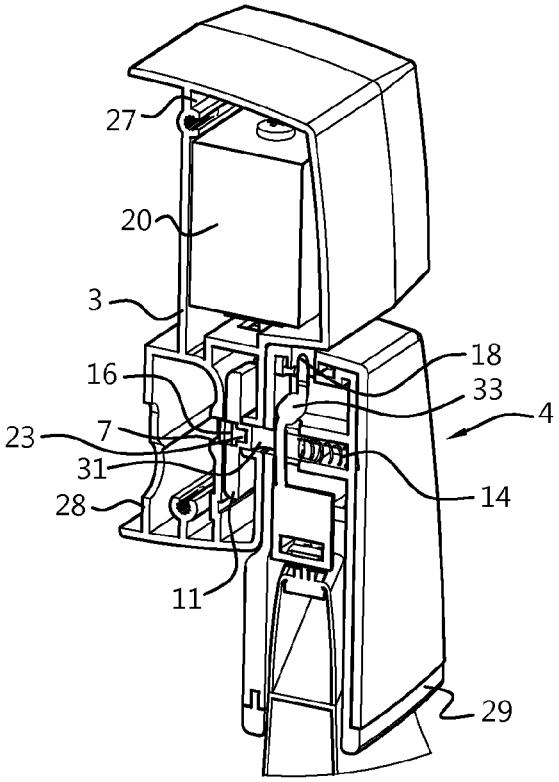


Fig. 5

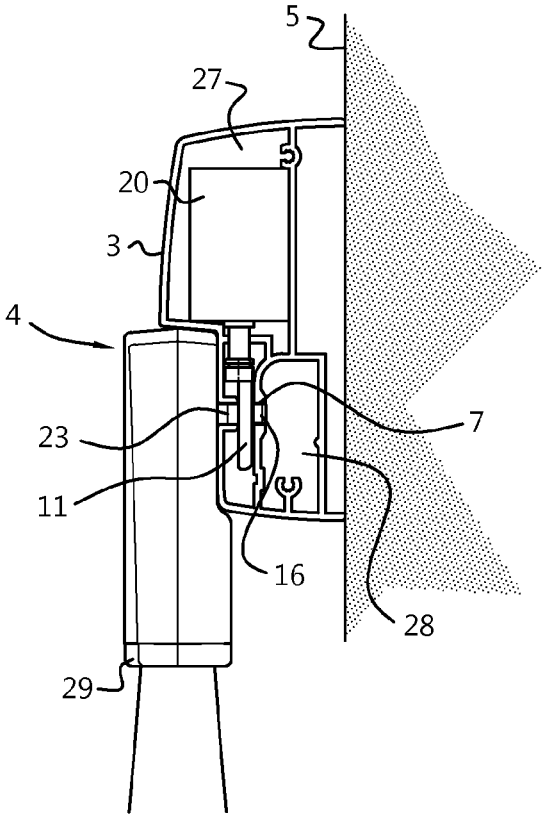


Fig. 6

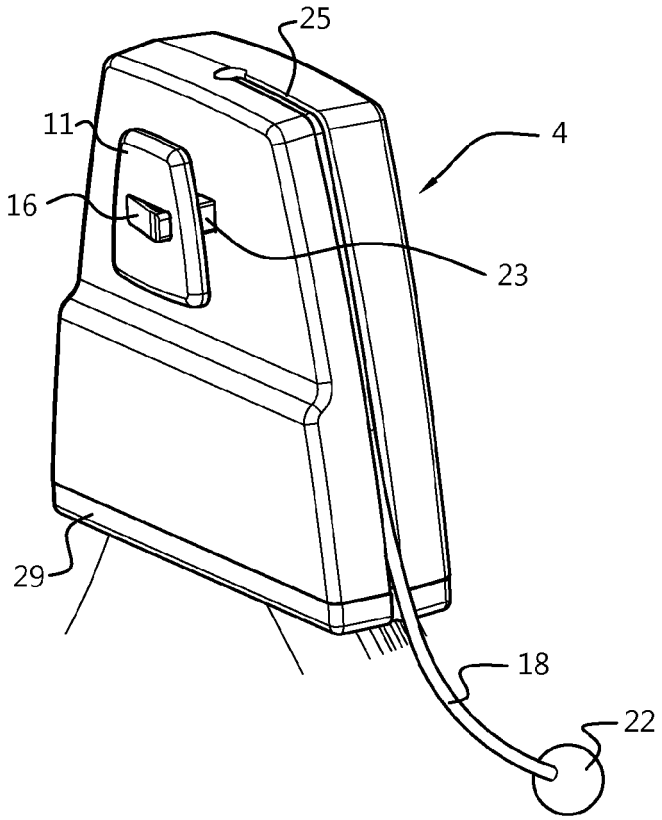
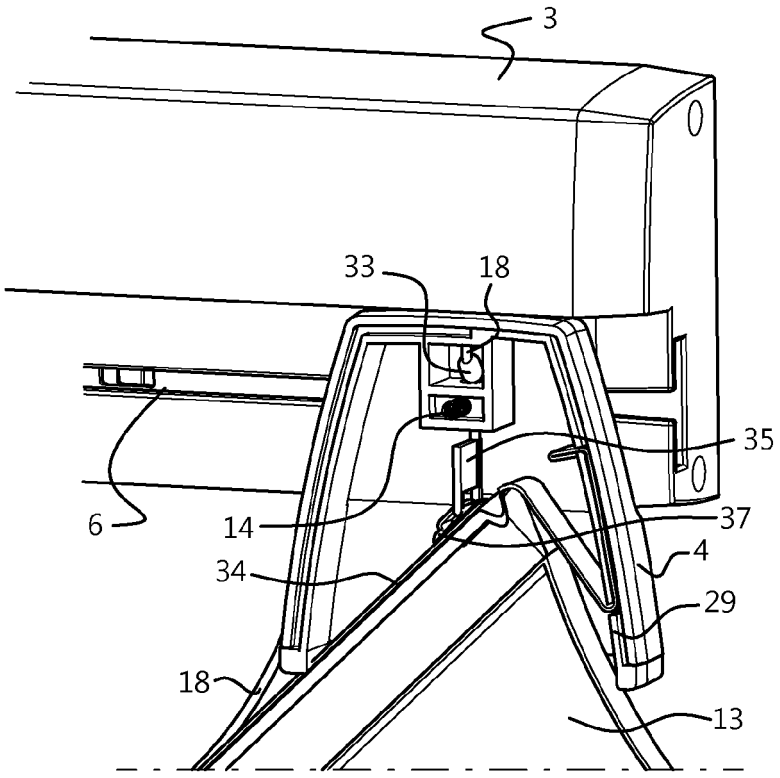


Fig. 7



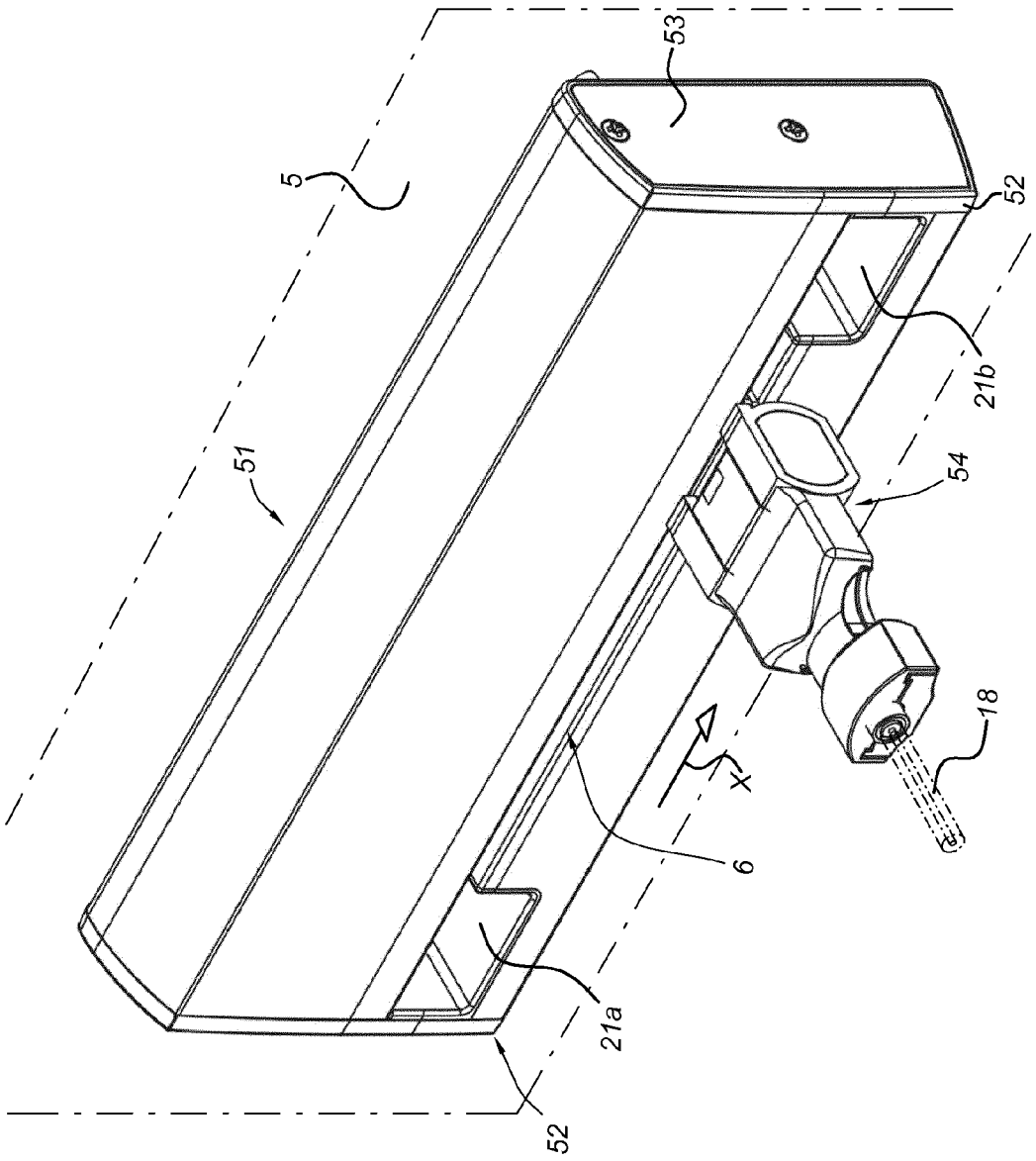


Fig. 8

Fig. 9

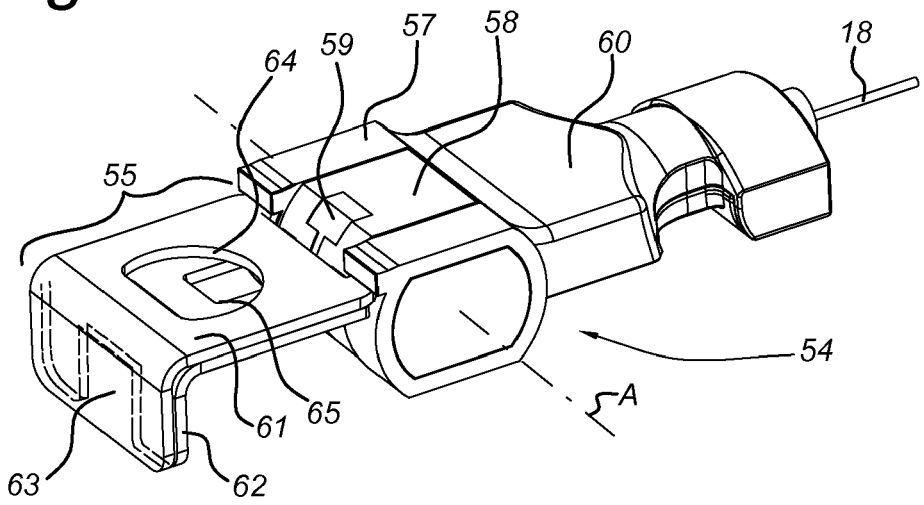
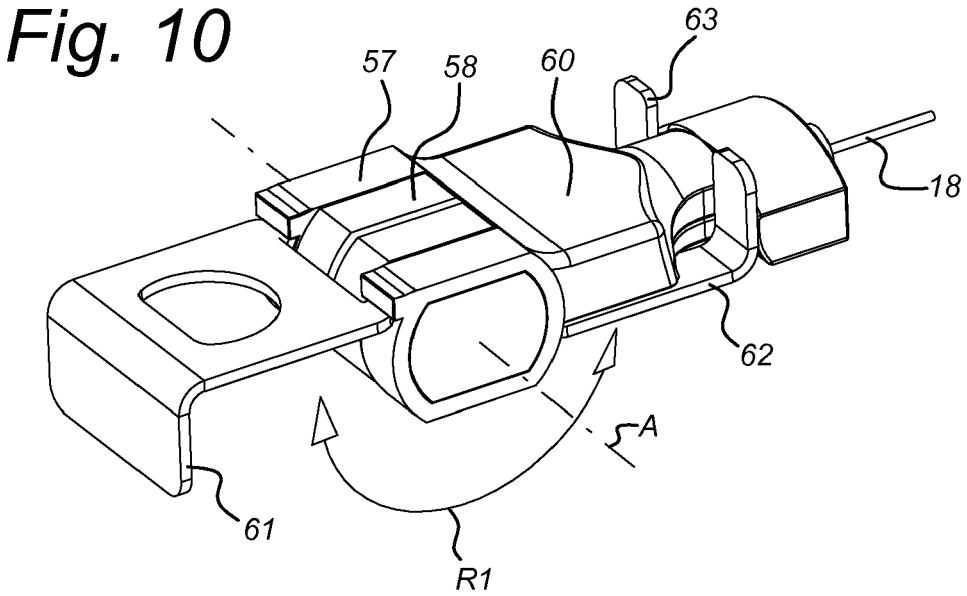


Fig. 10



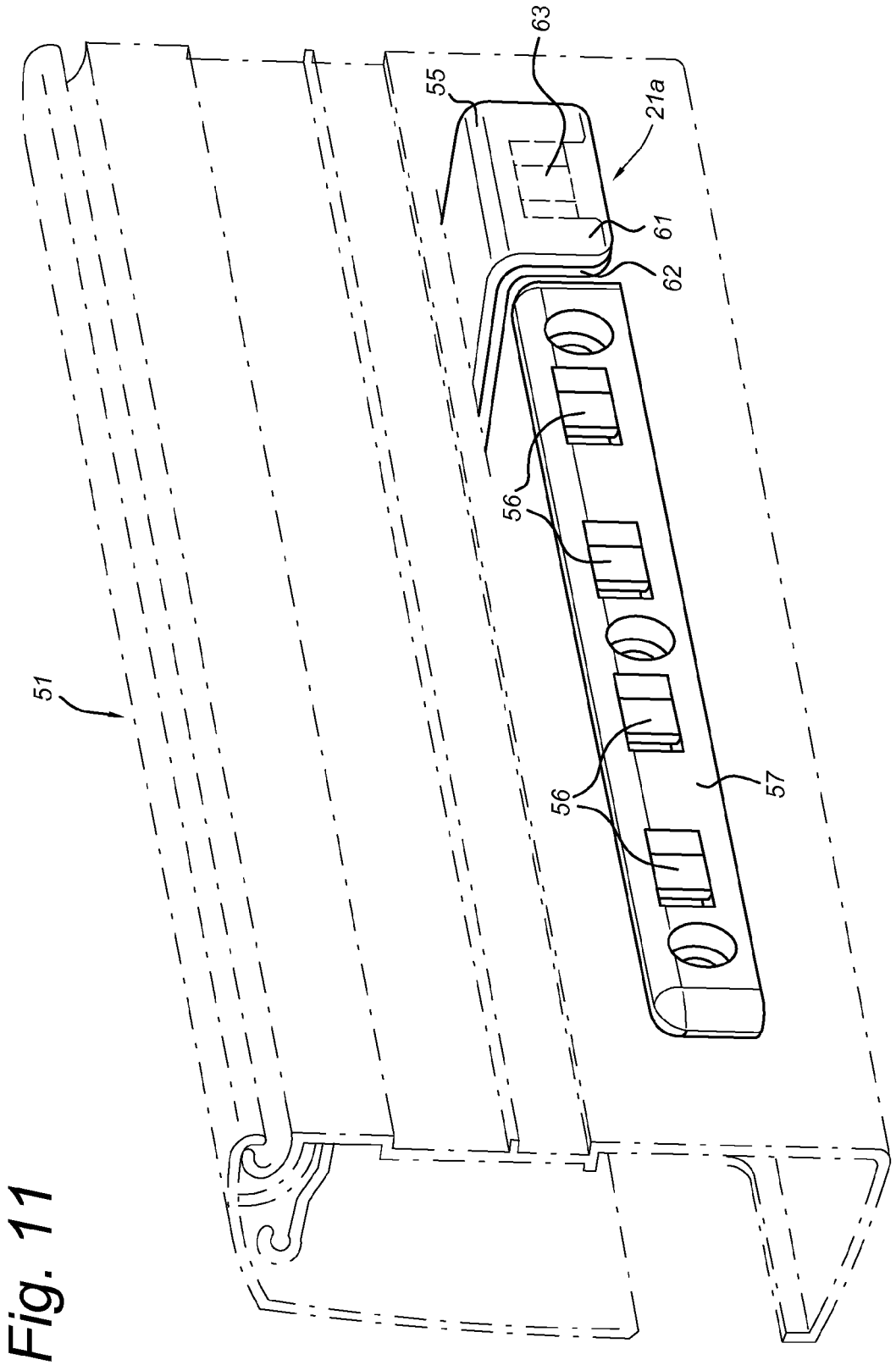
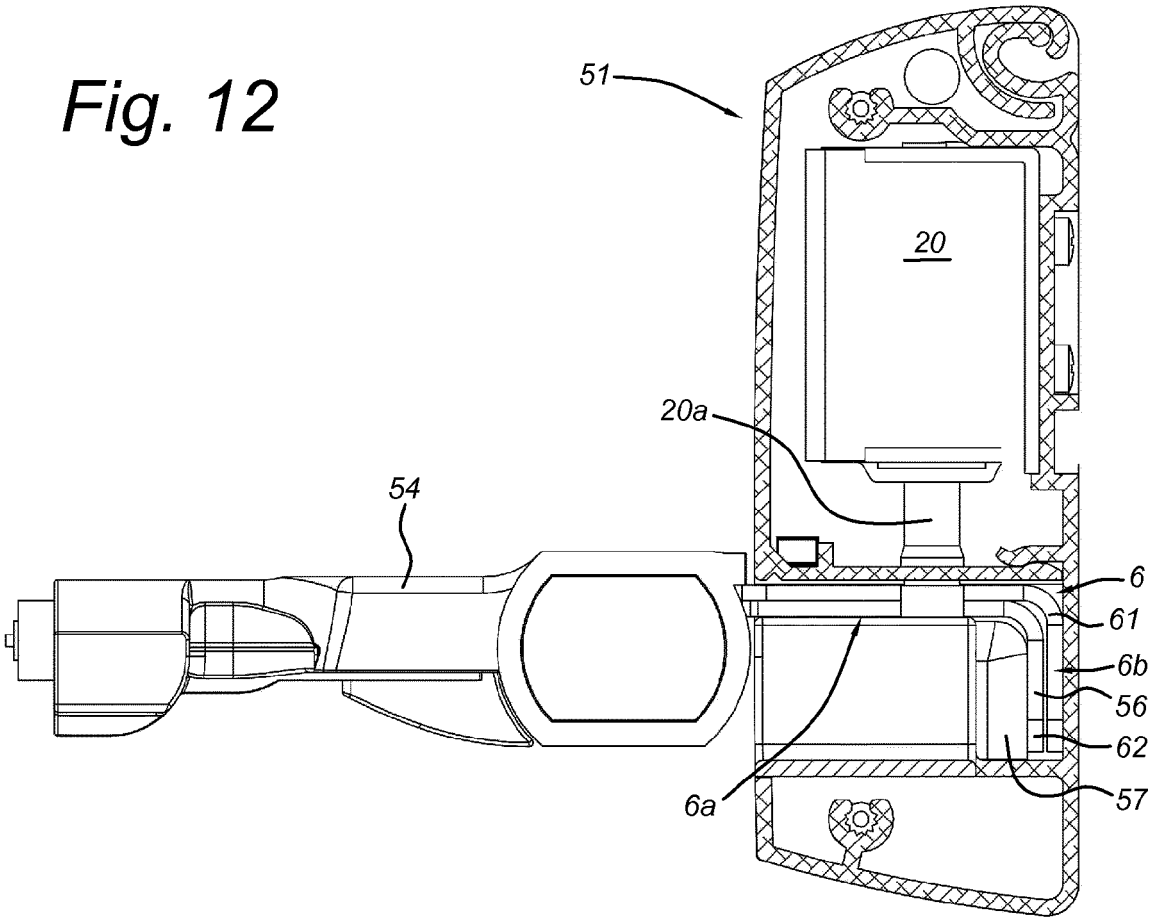


Fig. 11

Fig. 12



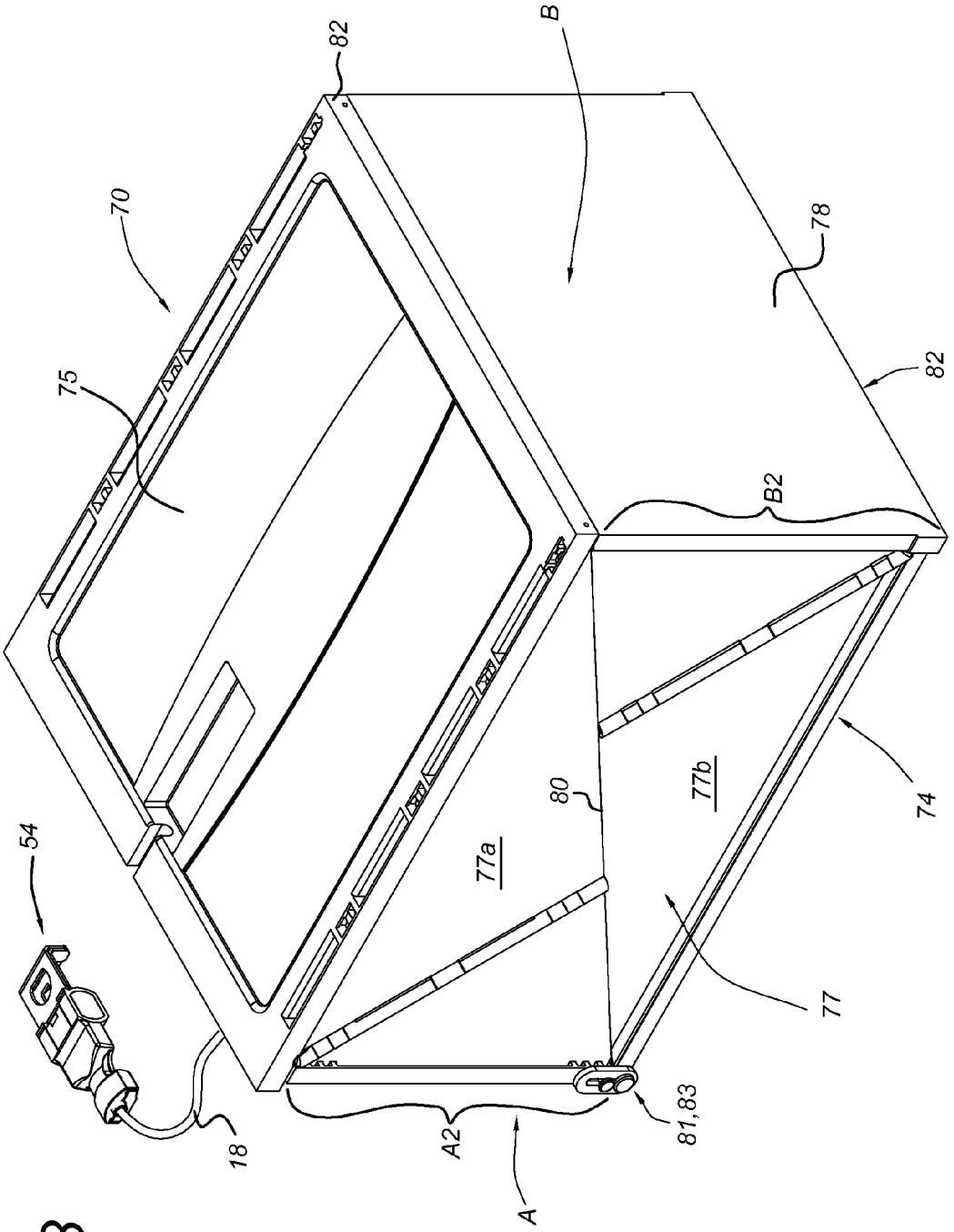


Fig. 13

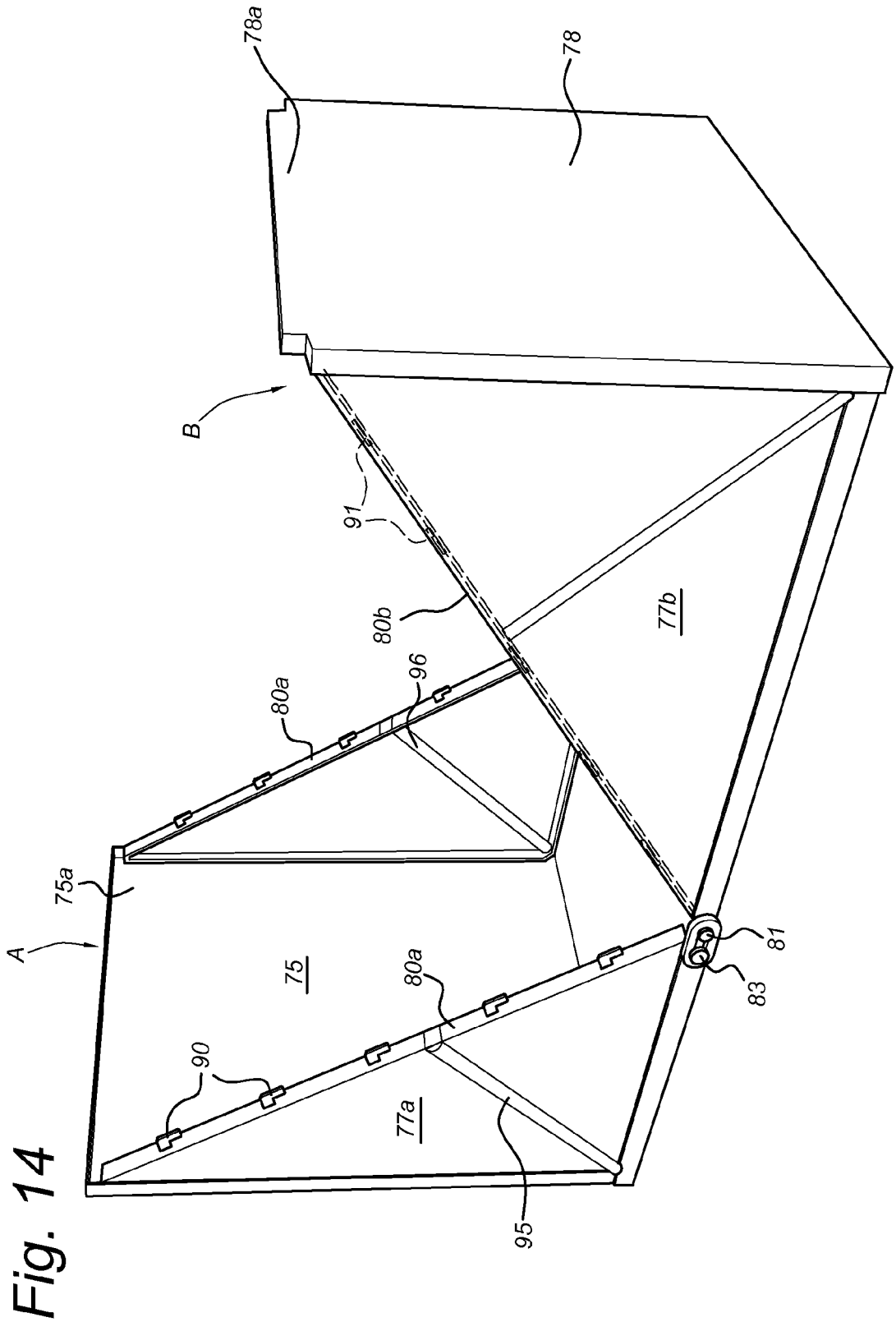


Fig. 14

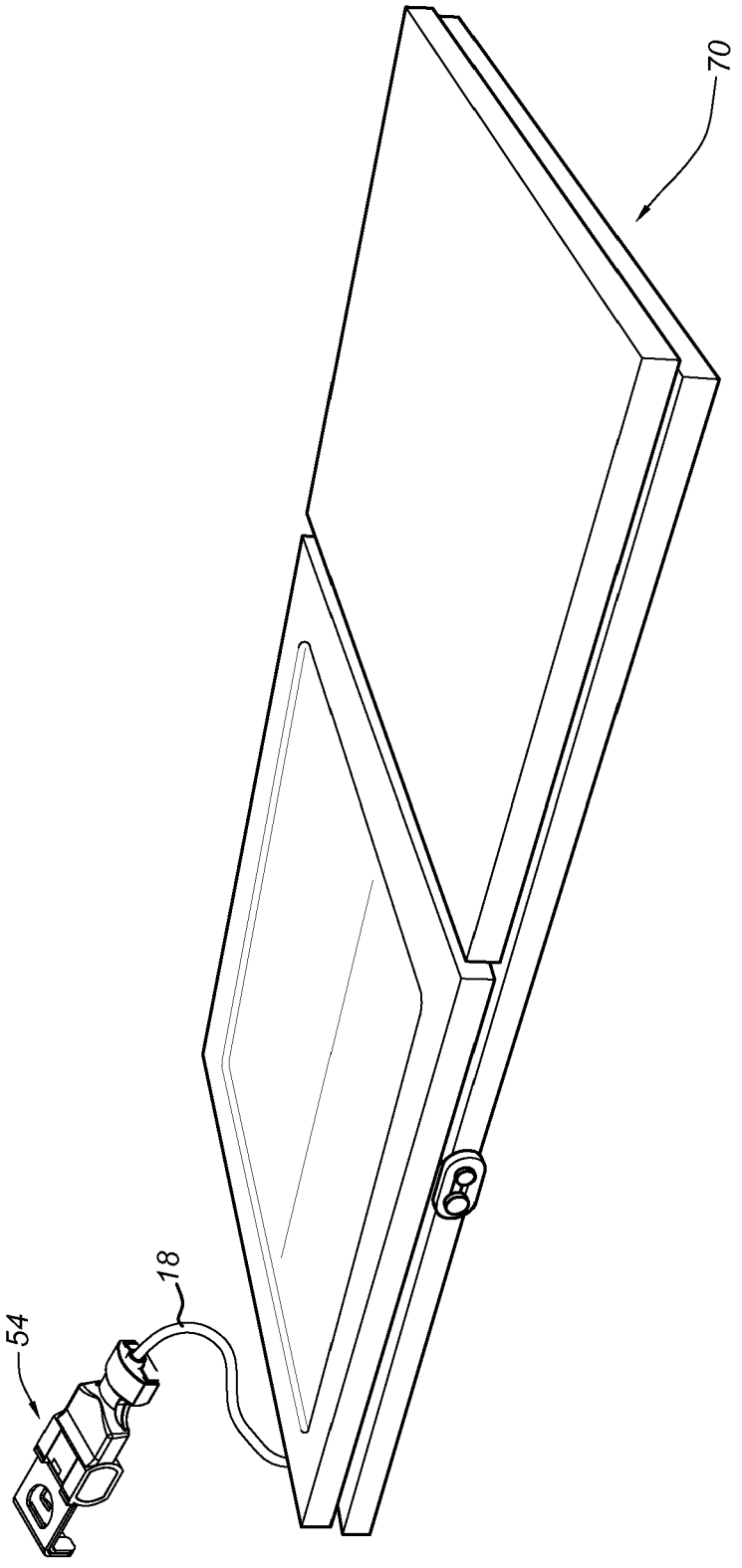
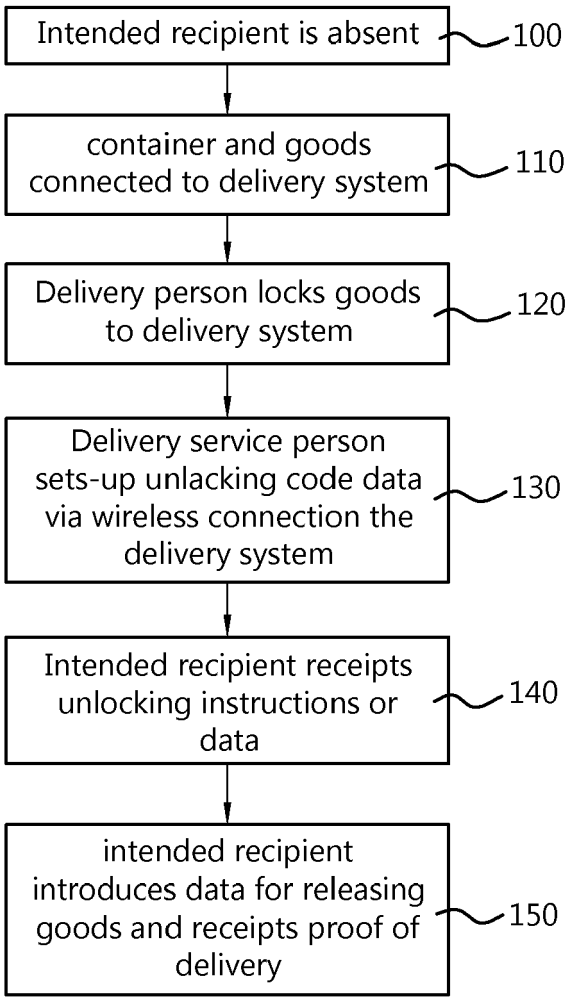


Fig. 15

Fig. 16


Intended recipient is absent
100
container and goods connected to delivery system
110
Delivery person locks goods to delivery system
120
Delivery service person sets-up unlacking code data via wireless connection the delivery system
130
Intended recipient receipts unlocking instructions or data
140
intended recipient introduces data for releasing goods and receipts proof of delivery
150

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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 1830

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	27 March 2015	van Overbeek, Kajsa

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 15 1830

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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27-03-2015

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