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(54) **Mailbox with mechanical indication means**

(57) The present invention relates to a mailbox comprising sides spaced apart and at least two movable members for filling and emptying the box where said sides and said members define an enclosed space. The box also comprises one or more mechanical indication means including at least one sign visible from the outside. The said mechanical indication means further comprises at least two mechanical connections, where each of said movable members is connected to said at least one sign by means of one of said mechanical connections.

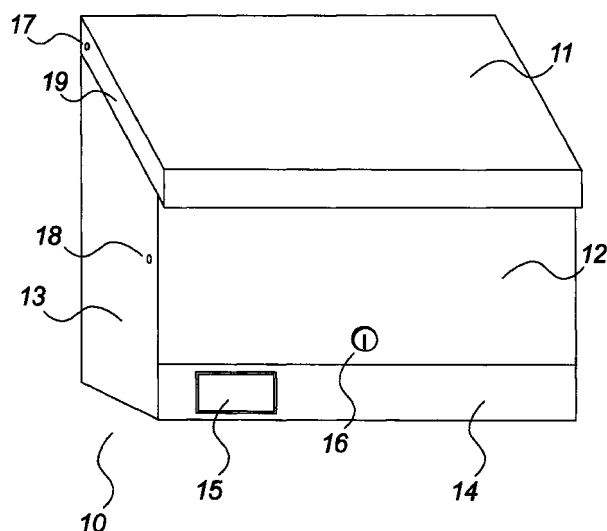


Fig. 1

Description

Background of the invention

[0001] The invention relates to a mailbox according to the preamble of claim 1.

[0002] Indication means for mailboxes have been known for decades in mechanical, electromechanical and electronic forms.

[0003] The mechanical indication means of a mailbox may comprise a separate and external spring actuated indication arm, which is coupled to the mailbox door. To obtain the function of the indication means, the arm has to be moved to a position where the spring is tightened. If the door is subsequently opened, the spring will be released and the arm moved to another more visible position. When the owner of the mailbox sees the arm in this position, he will know that somebody has opened the door and placed some kind of mail in the mailbox. After opening the door and removing the mail from the mailbox, the owner has to move the arm to its tightened position. The mailbox and the indication means are then ready to receive mail once again.

[0004] One of the problems with the known mechanical indication means is, however, that they require at least one active action from the owner of the mailbox, i.e. moving of the arm to its tightened position, to work properly. If the owner misses this action, the indication means will not change position once the mailbox receives mail and the indication means lose their justification.

[0005] Another problem is that the mechanical indication means are often positioned next to the mailbox, which normally offers little or no protection of the indication means against rain or snow. This may lead to poor functioning of the indication means or even failure due to corrosion or breakage of the arm or the spring.

[0006] The electric indication means used in connection with a mailbox may comprise some kind of switch directly or indirectly in touch with the door of the mailbox or a detector sensor placed somewhere inside the mailbox. When the door is moved to a position or the detector sensor detects mail, an electric circuit including the electric indication means is established. The indication means could be a lamp or a loudspeaker placed in connection with the mailbox or in another place. To power the electric indication means, electric batteries or connections to an electricity high-voltage grid are required.

[0007] A problem with the known electrical indication means is that the electrical circuits and components are vulnerable to malfunction or breakage due to the rather harsh environment to which a mailbox is exposed.

[0008] Another problem with the known electrical indication means is the need for electric power. The use of batteries means that the owner has to change batteries on a regular basis once the batteries in the mailbox

go dead. This, of course, means that storage of charged batteries is necessary if uninterrupted function of the electrical indication means is desired.

[0009] If the electricity grid is used as power supply, a connection from the nearest grid to the electrical indication means is required. This is usually a problem since a mailbox is often placed away from the grid which requires a connection to be established, i.e. from a house to the mailbox. Due to the outdoor conditions, this often requires a skilled electrician and makes the installation of a mailbox with electrical indication means quite expensive.

[0010] The above-mentioned problem with the electrical circuits and components being vulnerable to malfunction or breakage is also valid in connection with electric circuits having an electricity grid connection.

[0011] Also, the grid connection raises the problem with the possibility of electric short-circuiting or leakage of the mailbox and the possibility of injury to the owner or the mailman. To avoid this, it is necessary to take precautions by insulating high voltage so that it does not come into contact with any parts of the mailbox.

[0012] The object of the invention is to provide a simple, reliable and easy-to-use mailbox with indication means.

The invention

[0013] In accordance with the invention, claim 1 states that said mechanical indication means further comprises at least two mechanical connections, where each of said movable members is connected to said at least one sign by means of one of said mechanical connections.

[0014] Hereby, it is possible to design a mailbox with indication means operated in a way which does not include additional actions. The mere act of either placing or collecting mail from the mailbox ensures that the indication means are always in the correct position.

[0015] It is important to emphasise that by the word "mailbox" is understood any kind of box for receiving mail. Examples of this may be mailboxes standing freely on the ground or mounted on a mast or a similar mounting support, hanging on a wall or built into a wall.

[0016] The mailbox may be a standard mailbox. However, other types of mailboxes than the one illustrated on the accompanying figures are naturally also possible. The only requirement to the mailbox is that it has at least two separate movable parts such as a door to be opened when wanting to place mail in the mailbox and a door to be opened in connection with removing the mail from the mailbox.

[0017] At least two doors are required in connection with mailboxes offering the possibility of receiving different kinds of mail in different compartments such as letters in one compartment and newspapers in another or different persons each having a compartment in a mailbox. Each door will need a mechanical connection to

the indication means if it is desired to obtain an indication of mail for each compartment. To enhance the signal value of the indication means, more than one indication means can be used i.e. one for each compartment.

[0018] By the word "mail" is understood all kinds of material which may be delivered to a mailbox. Examples of this may be letters, packages, newspapers and magazines.

[0019] It is also understood that the mail does not need to be delivered by means of a post office but may be used to include any person delivering any kind of mail to the owner of the mailbox.

[0020] When, as stated in claim 2, at least one of said mechanical connections work by pushing said at least one sign, a preferred embodiment of the invention is obtained.

[0021] When, as stated in claim 3, said mechanical connections are shielded cables, it is possible to create connections, which are very reliable. In particular, the protection against dirt and water from getting to the inner cable ensures long and superior mechanical behaviour of the connection.

[0022] When, as stated in claim 4, said mechanical connections are Bowden cables, it is possible to create connections, which are both reliable and flexible. The connections will be very easy to mount and also inexpensive to use, especially because of the limited need for holding means.

[0023] It shall be understood that other types of mechanical connections are also possible, i.e. a wire and pulley connection or a rack and pinion connection. None of these are reliable, flexible or an economically rational solution compared to the Bowden cable, however.

[0024] When, as stated in claim 5, at least one and preferably both connections are spring-loaded, it is possible to protect the connection and the display against overstretching e.g. when pulling all cables at the same time. This is relevant not only during normal operation of the indication means but also when operating the indication means in an unusual manner. An example of this could be opening of more than one movable member at the same time, which would force the signal part to try to move in two directions at the same time. Without springs, the indication means would probably break down.

[0025] If dirt or ice should enter the mailbox and block the indication means, the springs will also protect the indication means against overstretching. The ice or dirt may easily be removed after discovering the blockage since the springs ensure that the doors can be opened partly or totally.

[0026] When, as stated in claim 6, said sign and mechanical connections are placed inside the mailbox, it is possible to protect the connections and the display against outside conditions such as rain and snow.

[0027] When, as stated in claim 7, said sign and a

part of said mechanical connections are placed in a separate compartment inside the mailbox, it is possible to protect the most vulnerable parts of the invention even further.

5 **[0028]** When, as stated in claim 8, said separate compartment is placed at the bottom of the box and with an inclined compartment roof, it is possible to include the invention without interfering with the primary function of the box.

10 **[0029]** Also, it is possible to diverge any rain, snow or condensed water from the roof to an outlet hole in the mailbox.

[0030] When, as stated in claim 9, a sign includes a frame part and a signal part movable relative to said frame portion from at least one position to another, said signal part including one or more connection means, wherein each of said mechanical connections is connected to said one or more connections means, it is possible to achieve a very reliable indication means in a mailbox.

20 **[0031]** When, as stated in claim 10, said movable part of the indication means has a luminous layer, it is possible enhance the visibility of the indication means.

25 Figures

[0032] The invention will be described in the subsequent text with reference to the figures, where

30 fig. 1 shows an preferred embodiment of a mailbox with mechanical indication means,

fig. 2a shows the indication means in one position,

35 fig. 2b shows the indication means in another position,

fig. 3a shows an embodiment of the indication means, and

40 fig. 3b shows the above-mentioned embodiment from another angle.

Detailed description

45 **[0033]** Figure 1 shows a mailbox with indication means according to a preferred embodiment of the invention. The indication means includes a sign and mechanical connections.

50 **[0034]** The mailbox 10 includes a number of walls together with a bottom and topside defining the enclosed area of the mailbox.

[0035] The topside comprises a first door 11 of the mailbox 10 where the door 11 can rotate around a first axle (not shown in the figures). The axle goes through both sidewalls 13, 26 of the mailbox and both borders 19, 27 of the door 11 before the door 11 is fixed to the axle by use of a first holding part 17 at each end of the

axle. The holding part is preferably an end nut or a similar holding part mounted at the end of the axle.

[0036] The front side comprises a non-movable wall 14 shown as the lower part of the side and a second door 12 as the higher part of the side.

[0037] A square opening in a part of the non-movable wall is occupied by the front part of a sign 15. The front part preferably has a glass or transparent plastic window below which a signal part 32 is moved from one position to another. The signal part 32 is described in detail in connection with figs. 3a-b.

[0038] The second door 12 can rotate around a second axle (not shown in the figure). The door 12 is fixed to the axle by use of a second holding part 18 at each end of the axle on the outside of the sidewalls 13, 19. The holding part is preferably an end nut or a similar part to be mounted at the end of the axle.

[0039] The second door 12 also has locking means 16 to ensure that only a person with a key may empty the mailbox.

[0040] Also, other embodiments than those using axles in connection with constructing the first and second door 11, 12 movable are possible. In particular, it is possible to use a bolt, a nut and bolt or a rivet in each side of the mailbox 10.

[0041] Figure 2a illustrates part of the inside of the mailbox after the second door 12 has been removed.

[0042] The sign 15 is connected with a first mechanical connection 20 and a second mechanical connection 21 to the first 11 and the second door 12, respectively.

[0043] In a preferred embodiment of the invention, the connections are shielded cables and especially Bowden cables where an inner cable 22, 23 moves within a shielding. The shielding is fastened to the non-movable walls of the mailbox with a number of holding means 24, such as pieces of tape, glue or holding means including rivets, nuts or screws.

[0044] The inner cable is connected to the first or second door on the inside in a position displaced from the center of rotation of the door. The connection to the doors may be established by using glue, welding, soldering, tape or holding means including rivets, nuts or screws. Also, a connection where the inner cable is fastened to a holding part by rolling the cable around that part is possible. At the opposite end, the inner cable is connected to the sign 15 by a connection.

[0045] When the door is moved around the center of rotation, the inner cable will perform a certain movement and this movement is subsequently transferred to the sign 15 switching from one position to another.

[0046] An example of this movement is illustrated in figs. 2a and 2b. In the first figure, the first door is closed and the sign 15 are blank. In the second figure, the door is turned around its center of rotation (the center illustrated in the figures by the axle holding means 17) and the sign 15 shift to display the word "MAIL".

[0047] If the second door (removed on figs. 2a and

2b) is turned around its center of rotation (the center illustrated in the figures by the openings for the axle 25), the sign 15 will move back and make the sign 15 go blank again.

[0048] The moving of the two doors illustrates the mailbox performing two of its possible functions. The moving of the first door relates to the placing of mail in the mailbox and the moving of the second door relates to the emptying of the mailbox.

[0049] In fig. 3a, a preferred embodiment of the indication means is shown. The indication means are seen from the inside of the mailbox and comprise two non-movable parts 30, 31 together with a movable signal part 32, where the movable part 32 slides in between the two non-movable parts, forming the first and second frame parts 30, 31 of the sign 15.

[0050] The movable part includes two end stops 35, 36. The first and second end stops 35, 36 each have a wall which restricts the movable signal part 32 from moving outside an area by meeting the first and second edges of the first frame part 30.

[0051] In fig. 3a the first end stop 35 is illustrated by a separate wall placed on the movable signal part 32 and pointing in a vertical direction relative to the movable signal part. The second end stop 36 is illustrated by a part of the movable signal part 32 bending upwards.

[0052] The first end stop 35 also functions as guidance wall for the inner wires of the mechanical connections, each penetrating through an opening in the wall.

[0053] The inner wire 22 of the first mechanical connection has a spring 33 attached at the end by means of locking means 37. The spring is situated on the one side of the wall and the rest of the mechanical connection, including the outer screen of the mechanical connections, is situated on the other side. The outer screen is secured by holding means 24 to the non-movable side-wall of the mailbox.

[0054] The inner wire 23 of the second mechanical connection has a spring 34 attached close to the beginning of the outer screen by means of locking means 38. The spring 34 is placed at the opposite side of the wall in relation to the other spring 33 and the outer screen is secured by holding means 24 to the non-movable side-wall of the mailbox.

[0055] Fig. 3b illustrates the function of the indication means according to the invention. If the first door is opened, the first mechanical connection transfers the movement to a pull on the inner wire and the signal part 32 is moved until the end stop 36 meets the edge of the non-movable frame part 30. If the movement continues, the spring 33 will be forced together against the end stop and the guidance wall 35 without the signal part 32 making any further movement.

[0056] If the second door is opened, the second mechanical connection transfers the movement to a push on the inner wire and the signal part 32 is moved in the opposite direction until the end stop and the guidance wall 35 meet the edge of the non-movable frame

part 30. If the movement continues, the spring 33 will be forced together against the end stop and the guidance wall 35 without the signal part 32 making any further movement.

[0057] With small modifications, this push/pull operation could be converted to a pull/pull or push/push operation.

List of reference numbers in the figures

[0058]

- | | | |
|-----|--|----|
| 10. | mailbox | |
| 11. | first movable member i.e. a first door | |
| 12. | second movable member i.e. a second door | |
| 13. | first sidewall of a mailbox | |
| 14. | lower non-movable part of the front side | |
| 15. | Sign | |
| 16. | locking means | |
| 17. | axle-holding part for the first door | 20 |
| 18. | axle-holding part for the second door | |
| 19. | border of the first door | |
| 20. | first connection means | |
| 21. | second connection means | |
| 22. | first inner wire | 25 |
| 23. | second inner wire | |
| 24. | holding means | |
| 25. | mounting hole for axle | |
| 26. | second sidewall of a mailbox | |
| 27. | border of the first door | 30 |
| 30. | front frame part | |
| 31. | back frame part | |
| 32. | signal part | |
| 33. | first spring | |
| 34. | second spring | 35 |
| 35. | guiding wall and end stop | |
| 36. | end stop | |
| 37. | locking means | |
| 38. | locking means | 40 |

Claims

1. Mailbox (10) comprising

sides spaced apart and at least two movable members (11, 12) for filling and emptying the box where said sides and said members define an enclosed space,

one or more mechanical indication means including at least one sign (15) visible from the outside,
characterised in that

said mechanical indication means further comprises at least two mechanical connections (20, 21), and
where each of said movable members (11, 12)

is connected to said at least one sign (15) by means of one of said mechanical connections (20, 21).

- | | | |
|----|-----|---|
| 5 | 2. | Mailbox according to claim 1 characterised in that at least one of said mechanical connections (20, 21) works by pushing said at least one sign (15). |
| 10 | 3. | Mailbox according to claim 1 characterised in that said mechanical connections (20, 21) are shielded cables. |
| 15 | 4. | Mailbox according to claim 3 characterised in that said mechanical connections (20, 21) are Bowden cables. |
| 20 | 5. | Mailbox according to any of claims 1-4 characterised in that at least one and preferably both of said mechanical connections (20, 21) are spring-loaded. |
| 25 | 6. | Mailbox according to any of claims 1-5 characterised in that said at least one sign (15) and said mechanical connections (20, 21) are placed inside the box (10). |
| 30 | 7. | Mailbox according to any of claims 1-6 characterised in that said sign and a part of said mechanical connections are placed in a separate compartment inside the box (10). |
| 35 | 8. | Mailbox according to claim 7 characterised in that said separate compartment is placed at the bottom of the box (10) and with an inclined compartment roof. |
| 40 | 9. | Mailbox according to claim 1 characterised in that said sign (15) includes a frame part (30, 31) and a signal part (32) movable relative to said frame portion from at least one position to another, said signal part including one or more connection means (35), where each of said mechanical connections (20, 21) is connected to said one or more connection means (35). |
| 45 | 10. | Mailbox according to claim 9 characterised in that said signal part (32) has a luminous layer. |

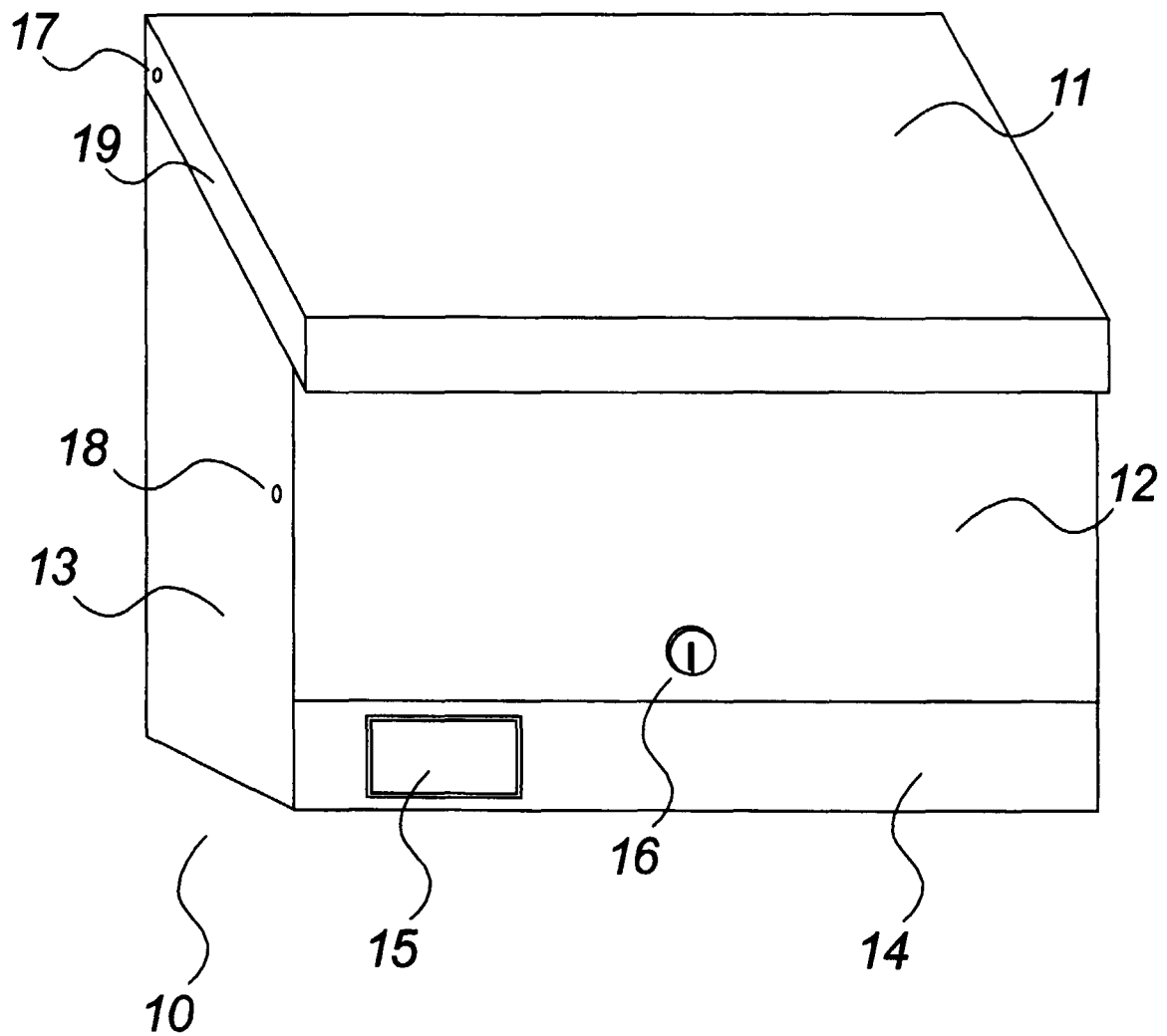


Fig. 1

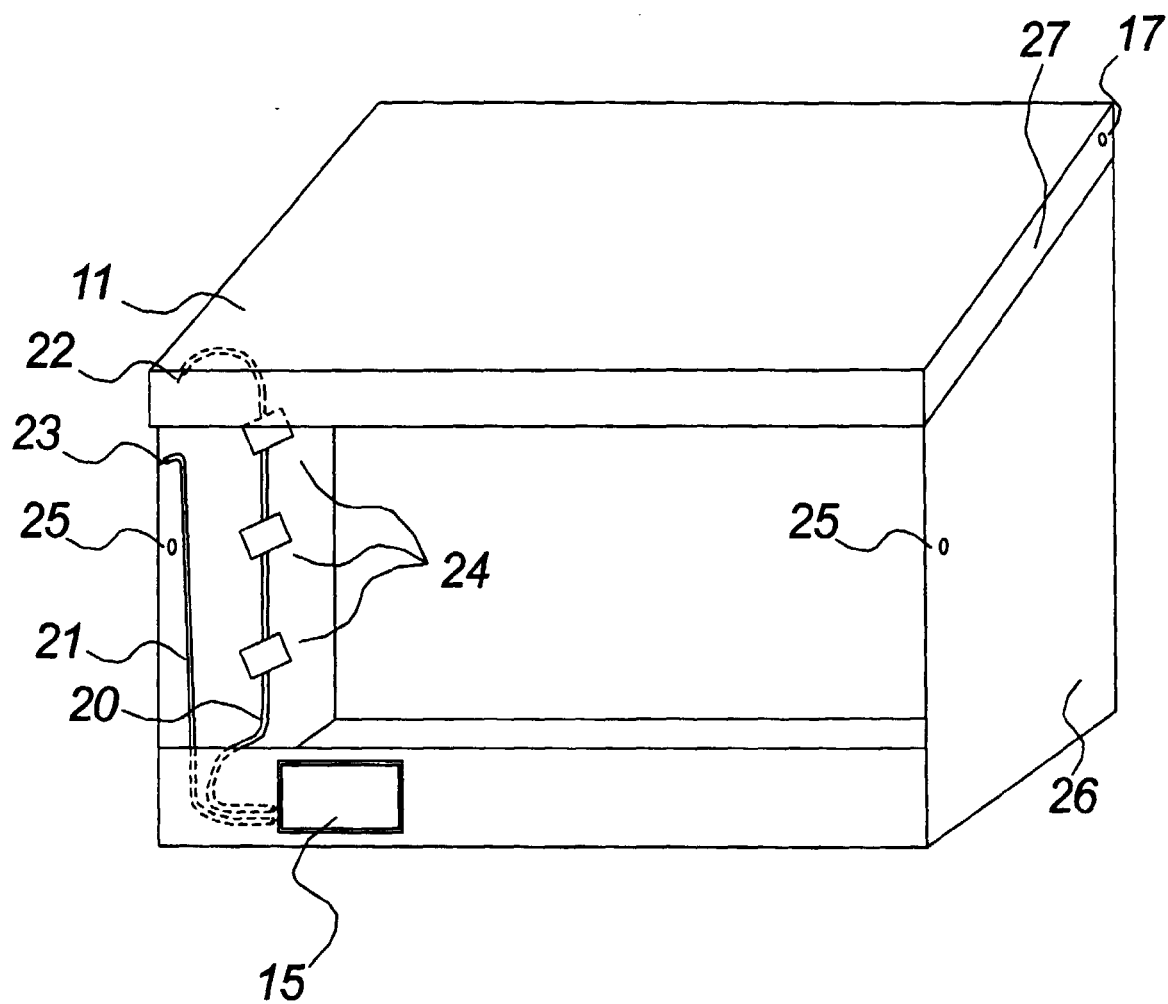


Fig. 2a

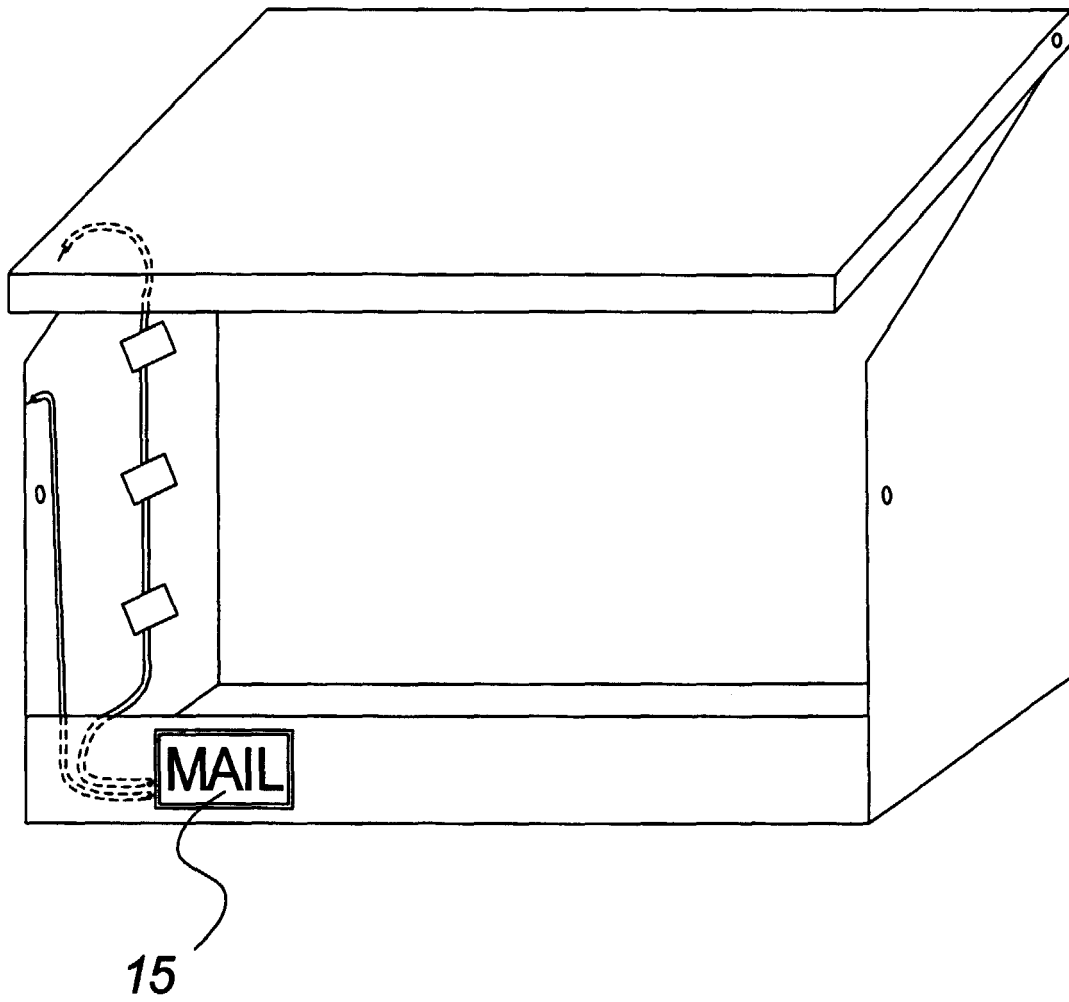


Fig. 2b

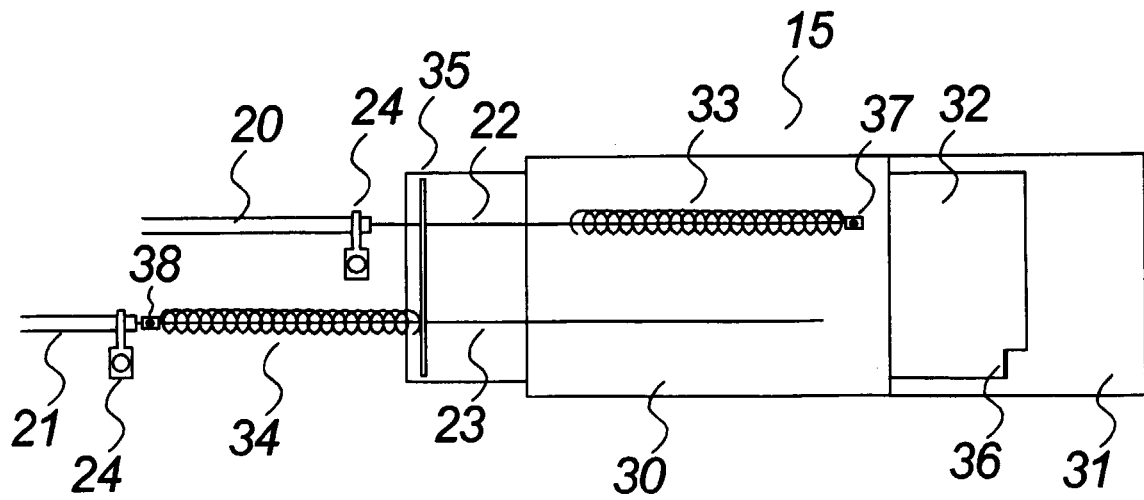


Fig. 3a

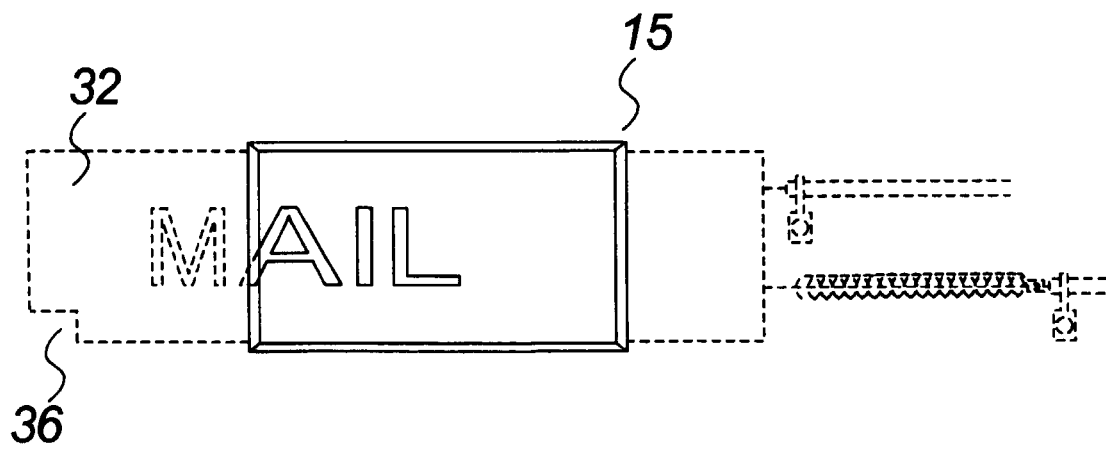


Fig. 3b