



(12) **EUROPEAN PATENT APPLICATION**  
published in accordance with Art. 153(4) EPC

(43) Date of publication:  
**23.08.2017 Bulletin 2017/34**

(51) Int Cl.:  
**A47G 29/16** (2006.01) **A47G 29/122** (2006.01)  
**E05B 65/44** (2006.01)

(21) Application number: **15850745.9**

(86) International application number:  
**PCT/KR2015/010702**

(22) Date of filing: **12.10.2015**

(87) International publication number:  
**WO 2016/060414 (21.04.2016 Gazette 2016/16)**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**  
Designated Validation States:  
**MA**

(72) Inventors:  
• **JUNG, Yeon Kwan**  
**Junggye-ro**  
**Nowon-gu, Seoul 01742 (KR)**  
• **KIM, Dae Young**  
**Goyang-si**  
**Gyeonggi-do 10423 (KR)**  
• **HEO, Yong Bum**  
**Paju-si**  
**Gyeonggi-do 10907 (KR)**

(30) Priority: **15.10.2014 KR 20140139230**

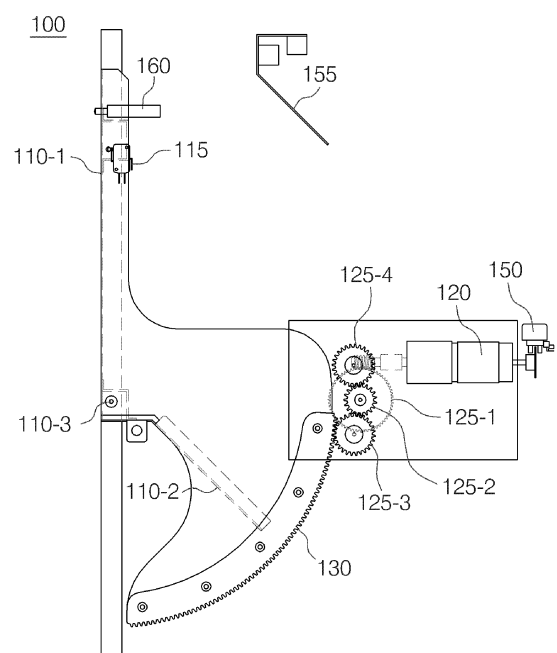
(74) Representative: **Gulde & Partner**  
**Patent- und Rechtsanwaltskanzlei mbB**  
**Wallstraße 58/59**  
**10179 Berlin (DE)**

(71) Applicant: **Welltec Co., Ltd**  
**Paju-si, Gyeonggi-do 10832 (KR)**

(54) **PUBLIC MAIL RECEPTION BOX**

(57) The present invention relates to a public mail reception box, and more particularly, to a public mail reception box that is capable of preventing a mail from being damaged or robbed by a third party when the mail drops. The public mail reception box includes a door member including a rotation shaft having a predetermined length, a first member extending in a flat plate shape to one side with respect to the rotation shaft, and a second member extending in a flat plate shape in a state of being spaced a predetermined angle from the first member with respect to the rotation shaft, a gear member coupled to the rotation shaft of the door member and on which a gear is disposed on an end thereof, a circular gear member gear-coupled to the gear member, a driving motor rotating the circular gear member, and a damper pushing the first member outward when pressing of the door member from the first member is stopped.

Fig. 1



**Description****Technical Field**

[0001] The present invention relates to a public mail reception box, and more particularly, to a public mail reception box that is capable of preventing a mail from being damaged or robbed by a third party when the mail drops.

**Background Art**

[0002] A mail service is one of representative national public services that are closely related to national life, and the public office or public enterprise of any country directly takes charge of the mail service.

[0003] In recent years, as E-mail technologies using Internet are being rapidly growth and extensively diffused into every area of society, businesslike mail sent from groups or institutions rather than personal mail sent from an individual usually feature in total mail amount. Among others, an occupied density of mass mails in which the same kinds of mails are sent to a large number of individuals is being rapidly expanded in mail amount. Also, although the total occupied density is not much, in case of individuals, special mail service in which mail such as registered mail is quickly and safely sent is increasing relative importance.

[0004] The related art related to a mail receipt device may be generally classified into an unmanned mail receipt system for receiving unit mail and a franking machine that is capable of treating a large amount of mail having a size similar to that of a letter or an envelope at once.

[0005] The unmanned mail receipt system provides an around-the-clock mail receipt service to personal users for use of receiving mail such as letters, document envelopes, small parcels, and the like by the piece. For this, the unmanned mail receipt system has a function of automatically measuring a weight and a size of the mail dropping by a user and calculating a postal charge in consideration of destination information inputted by the user through an interface and an option in kind of mail service, a function of printing and outputting a resulting postal charge stamp, a function of printing and outputting a bar code label in case of a special mail service, a function of receiving the mail such as a safe storage function of the mail, a function of receipting and paying a charge by bills, coins, and a card, and a function of outputting a receipt.

[0006] The mail received in an unmanned manner is stored in a public mail reception box. However, since the conventional public mail reception box has a structure in which the mail drops through a mail slot from the outside, it is apprehended that the mail is damaged by a weight or a dropping speed of the mail. In addition, when the mail slot is relatively large, the mail stored in the public mail reception box may be taken out from the outside.

As a result, the mail may be robbed.

**SUMMARY OF INVENTION****Technical Problem**

[0007] An aspect of the present invention is directed to provide a public mail reception box that is capable of preventing mail from being damaged by a weight or a dropping speed of the mail when the mail drops into the public mail reception box.

[0008] Another aspect of the present invention is directed to provide a public mail reception box that is capable of preventing mail stored in the public mail reception box from being robbed.

**Solution to Problem**

[0009] A public mail reception box according to the present invention includes: a door member including a rotation shaft having a predetermined length, a first member extending in a flat plate shape to one side with respect to the rotation shaft, and a second member extending in a flat plate shape in a state of being spaced a predetermined angle from the first member with respect to the rotation shaft; a gear member coupled to the rotation shaft of the door member and on which a gear is disposed on an end thereof; a circular gear member gear-coupled to the gear member; a driving motor rotating the circular gear member, and a damper pushing the first member outward when pressing of the door member from the first member is stopped.

**Advantageous Effects of Invention**

[0010] The public mail reception box according to the present invention may reduce the dropping speed of the mail dropping into the mail box by using the door member constituted by the first member and the second member, which are spaced a predetermined angle from each other with respect to the central axis to prevent the mail from being damaged. Also, when the mail is jammed between the door member and the theftproof cover, the driving motor may be reversely rotated to prevent the mail from being damaged.

[0011] In particular, the receipt of the mail stored in the mail box by the third party without notice may be previously prevented by using the theftproof cover disposed on the upper end of the mail slot of the public mail reception box.

**Brief Description of Drawings**

[0012]

FIG. 1 is a view illustrating a structure of a public mail reception box according to an embodiment of the present invention.

FIG. 2 is a view illustrating a state in which a door member of the public mail reception box is opened according to an embodiment of the present invention.

FIG. 3 is a flowchart illustrating an operation performed in the public mail reception box according to an embodiment of the present invention.

FIG. 4 is a view illustrating a structure of a public mail reception box according to another embodiment of the present invention.

FIG. 5 is a view illustrating a state in which a door member of the public mail reception box is opened according to another embodiment of the present invention.

### Description of Embodiments

[0013] The foregoing and additional aspects of the present invention will be clearer through the preferred embodiments described with reference to the accompanying drawings. Hereinafter, the present invention will be described in detail so that a person skilled in the art would understand and realize the present invention through the preferred embodiments.

[0014] FIG. 1 is a view illustrating a structure of a public mail reception box according to an embodiment of the present invention. Hereinafter, a structure of a public mail reception box will be described in detail with reference to FIG. 1.

[0015] Referring to FIG. 1, the public mail reception box includes a door member, a door closing detection sensor, a driving motor, a gear member, safety sensor, a theftproof cover, and a damper. Of course, other constitutions expect for the above-described constitutions may be included in the public mail reception box proposed in the present invention.

[0016] The door member 110 includes a first member 110-1 having a rectangular shape and a second member 110-2 extending from one edge of the first member 110-1. An angle between the first member 110-1 and the second member 110-2 may range from about 90° to about 180°, preferably, about 120° to about 150°. That is, the first member 110-1 is disposed on one side of the door member 110, and the second member 110-2 is disposed on the other side of the door member 110 with respect to a rotation shaft 110-3.

[0017] FIG. 1 illustrates an ordinary state, i.e., a state in which the door member 110 is closed. Referring to FIG. 1, the first member 110-1 of the door member 110 is exposed to the outside. On the other hand, the second member 110-2 is inserted into the public mail reception box.

[0018] The gear member 130 is coupled to one side of the door member 110. That is, the door member 110 may also be driven by driving of the gear member 130.

[0019] The gear member 130 has a fan shape, and a gear is disposed on an end of the gear member 130. The gear member 130 is coupled to a rotation shaft 110-3

constituting the door member 110, and the rotation shaft 110-3 is rotated by rotation of the gear member 130. Also, the first member 110-1 and the second member 110-2, which constitute the door member 110, may also be rotated by the rotation of the rotation shaft 110-3.

[0020] The gear member 130 is connected to a circular gear member 125. The circular gear member 125 is coupled to the driving motor 120 and rotated by driving of the driving motor 120. The gear member 130 may also be rotated by the rotation of the circular gear member 125.

[0021] The safety sensor 150 is connected to the driving motor 120 to calculate revolutions per minute (RPM) of the driving motor. That is, the safety sensor 150 senses whether the driving motor 120 is rotated at a fixed RPM to confirm whether the driving motor 120 is driven according to the sensed result.

[0022] When the safety sensor 150 recognizes (senses) that the driving motor 120 is not rotated, a controller (a processor (not shown)) determines that the gear member 130 is not rotated also. When it is determined that the gear member 130 is not rotated, the controller controls the driving motor 120 so that the gear member 130 is rotated in a reverse direction. When the driving motor is not rotated in relation to the present invention, this occurs in a case in which a parcel is jammed in the theftproof cover 155.

[0023] When the door member 110 is closed, the door closing detection sensor 115 is closely attached to the first member 110-1. That is, when the door member 110 is closed, the first member 110-1 presses the door closing detection sensor 115 due to the closing of the door member 110. Thus, the door closing detection sensor 115 may recognize the closing of the door (or the first member).

[0024] In addition, the public mail reception box according to the present invention includes the theftproof cover 155. The theftproof cover 155 is disposed in the public mail reception box to prevent stored mail from being received by a third party without notice. For this, when the theftproof cover 155 is formed from an upper end to a lower end of a mail slot into the mail drops, the theftproof cover 155 is maintained to a state of extending backward at a predetermined angle. That is, the theftproof cover 155 is maintained to a state of extending by a predetermined length from an upper end to a rear side and a lower end of the mail slot. Since the theftproof cover 155 has the above-described structure, the theftproof cover 155 may prevent the stored mail from being received by the third party without notice.

[0025] The damper 160 is disposed on an upper end of the door closing detection sensor 115 to perform a function of buffering an impact occurring when the first member 110-1 is opened and closed. Also, when the damper 160 is pressed by the first member 110-1, the damper 160 pushes the first member 110-1 to the outside. That is, when the user presses the first member 110-1 to open the door member 110, the first member 110-1 presses the damper 160. Here, when the pressing

of the user is stopped, the damper 160 pushes the first member 110-1 so that the first member 110-1 is opened.

[0026] FIG. 2 is a view illustrating a state in which the door member is opened according to an embodiment of the present invention. Hereinafter, the state in which the door member is opened according to an embodiment of the present invention will be described in detail with reference to FIG. 2.

[0027] When the driving motor 120 is rotated to open the door member 110, the circular gear member 125 is rotated by the rotation of the driving motor 120. The gear member 130 is rotated by the rotation of the circular gear member 125, and the rotation shaft 110-3 constituting the door member 110 is rotated by the rotation of the gear member 130.

[0028] Here, the first member 110-1 and the second member 110-2, which constitute the door member 110, is rotated also by the rotation of the rotation shaft 110-3, and thus, the door member 110 is opened. When the door member 110 is opened, the rotation member 130 rotated in the same direction as the rotation shaft 110-3 comes into contact with a door opening detection sensor 140. As a result, it is determined that the door member 110 is fully opened.

[0029] When the user places the mail on the upper end of the first member 110-1 constituting the door member 110 in the state in which the door member 110 is fully opened, the door member 110 is closed. The door member 110 may be automatically closed when a predetermined time elapses after the door member 110 is opened. In addition, the door may be closed by manipulating a button disposed on the public mail reception box.

[0030] When a closing command of the door member 110 is received, the driving motor 120 is rotated in the reverse direction, and the circular gear member 125 is rotated by the rotation of the driving motor 120. The gear member 130 is rotated by the rotation of the circular gear member 125, and the rotation shaft 110-3 constituting the door member 110 is rotated by the rotation of the gear member 130.

[0031] Here, the first member 110-1 and the second member 110-2, which constitute the door member 110, is rotated also by the rotation of the rotation shaft 110-3, and thus, the door member 110 is closed. When the door member 110 is closed, the first member 110-1 comes into contact with the door closing detection sensor 115. Thus, the controller recognizes the closed state of the door member 110.

[0032] In addition, the safety sensor 150 senses whether the driving motor 120 is rotated at a fixed RPM. When the driving motor 120 is not rotated at the fixed RPM, it is determined that the mail (or the parcel) is jammed between the door member 110 and the theftproof cover 155. Thus, the controller controls the driving motor 120 so that the driving motor 120 is rotated in the reverse direction. As described above, according to the present invention, the safety sensor 150 is provided to determine whether the mail is jammed between the door

member 110 and the theftproof cover 155 through the safety sensor 150.

[0033] As described above, according to the present invention, the receipt of the mail stored in the mail box by the third party without notice may be prevented by using the door member 110 and the theftproof cover 155. Also, when the door member 110 is rotated in the state in which the mail is placed on the upper end of the first member 110-1 of the door member 110, the mail is moved from the first member 110-1 to the second member 110-2 and then received in the mail box. As described above, since the mail drops into the mail box at a relatively low height, damage or deformation of the mail may be prevented.

[0034] Hereinafter, configurations and operations of the driving motor and the circular gear member will be described in detail.

[0035] The gear is disposed on an end of one side of the driving motor 120. Thus, the gear disposed on the end of the one side of the driving motor 120 is rotated by the rotation of the driving motor 120.

[0036] The circular gear member 125 is constituted by a first circular gear member 125-1 to a fourth circular gear member 125-4. Here, the first and second circular gear members 125-1 and 125-2 are integrated with each other. The first circular gear member 125-1 is engaged with the gear disposed on the one side of the driving motor 120 and thus rotated by the rotation of the gear disposed on the one side of the driving motor 120.

[0037] The second circular gear member 125-2 is integrated with the first circular gear member 125-1 and disposed on a lower end of the first circular gear member 125-1. The second circular gear member 125-2 is rotated by the rotation of the first circular gear member 125-1.

[0038] The third circular gear member 125-3 is engaged with a gear disposed on the second circular gear member 125-2 and thus rotated by the rotation of the second circular gear member 125-2. The fourth circular gear member 125-4 is also engaged with the gear disposed on the second circular gear member 125-2 and thus rotated by the rotation of the second circular gear member 125-2. The gear member 130 is engaged with the gear disposed on the third or fourth circular gear member 125-3 to 125-4 and thus rotated by the rotation of the third or fourth circular gear member 125-3 to 125-4. Referring to FIGS. 1 and 2, the third circular gear member 125-3 and the gear member 130 are gear-coupled to each other at an initial point at which the closed door is opened. Thereafter, the gear member 130 is gear-coupled to the fourth circular gear member 125-4.

[0039] Hereinafter, a series of operation performed in the public mail reception box according to an embodiment of the present invention will be described in detail.

[0040] FIG. 3 is a flowchart illustrating an operation performed in the public mail reception box according to an embodiment of the present invention. Hereinafter, a series of operation performed in the public mail reception box according to an embodiment of the present invention

will be described in detail with reference to FIG. 3.

**[0041]** In operation S300, opening of the door member is instructed.

**[0042]** In operation S305, the driving motor is rotated by the opening instruction of the door member, and thus, the door member is opened.

**[0043]** In operation S310, when the door member is opened, mail is placed on the upper end of the first member of the door member.

**[0044]** In operation S315, closing of the door member is instructed in the state in which the mail is placed on the upper end of the first member of the door member.

**[0045]** In operation S320, the driving motor is rotated by the closing instruction of the door member, and thus, the door member is closed. Whether the door member is closed is determined through whether the first member is detected by the detection sensor.

**[0046]** As described above, when it is determined that the door member is not rotated through the safety sensor while the driving motor is rotated in the reverse direction (in the state in which the door is being closed), the controller controls the driving motor so that the reverse rotation of the driving motor is stopped, and the driving motor is rotated by a predetermined angle. Here, the controller may control the rotation of the driving member until the door member is fully opened.

**[0047]** As described above, according to the present invention, the receipt of the mail stored in the mail box by the third party without notice may be prevented by using the door member and the theftproof cover. Also, when the door member is rotated in the state in which the mail is placed on the upper end of the first member of the door member, the mail is moved from the first member to the second member and then received in the mail box. As described above, since the mail drops into the mail box at a relatively low height, the damage or deformation of the mail may be prevented.

**[0048]** Also, when the door member is not normally rotated, the driving motor is reversely rotated to prevent the mail from being damaged or deformed.

**[0049]** FIG. 4 is a view illustrating a structure of a public mail reception box according to another embodiment of the present invention. Hereinafter, a structure of the public mail reception box will be described in detail with reference to FIG. 4.

**[0050]** Referring to FIG. 4, the public mail reception box includes a door member, a door closing detection sensor, a door opening detection sensor, a driving motor, a gear member, safety sensor, and a theftproof cover. Of course, other constitutions expect for the above-described constitutions may be included in the public mail reception box proposed in the present invention.

**[0051]** The door member 110 includes a first member 110-1 having a rectangular shape and a second member 110-2 extending from one edge of the first member 110-1. An angle between the first member 110-1 and the second member 110-2 may range from about 90° to about 180°, preferably, about 120° to about 150°. That is, the first

member 110-1 is disposed on one side of the door member 110, and the second member 110-2 is disposed on the other side of the door member 110 with respect to a rotation shaft 110-3.

**[0052]** FIG. 1 illustrates an ordinary state, i.e., a state in which the door member 110 is closed. Referring to FIG. 1, the first member 110-1 of the door member 110 is exposed to the outside. On the other hand, the second member 110-2 is inserted into the public mail reception box.

**[0053]** The gear member 130 is coupled to one side of the door member 110. That is, the door member 110 may also be driven by driving of the gear member 130.

**[0054]** The gear member 130 has a fan shape, and a gear is disposed on an end of the gear member 130. The gear member 130 is coupled to a rotation shaft 110-3 constituting the door member 110, and the rotation shaft 110-3 is rotated by rotation of the gear member 130. Also, the first member 110-1 and the second member 110-2, which constitute the door member 110, may also be rotated by the rotation of the rotation shaft 110-3.

**[0055]** The gear member 130 has at least a plurality of grooves 130-1 at a predetermined distance with respect to a shaft coupled to a rotation shaft 110-3. That is, referring to FIG. 1, the gear member 130 has a plurality of grooves 130-1 at a predetermined distance.

**[0056]** The gear member 130 is connected to a circular gear member 125. The circular gear member 125 is coupled to the driving motor 120 and rotated by driving of the driving motor 120. The gear member 130 may also be rotated by the rotation of the circular gear member 125.

**[0057]** The safety sensor 150 is disposed in an extending line of the grooves 130-1 formed in the gear member 130. That is, the safety sensor 150 determines whether the gear member 130 is rotated at a fixed speed. For this, it is confirmed whether the grooves 130-1 formed in the gear member 130 of the safety sensor 150 are recognized at a predetermined distance. That is, since the grooves 130-1 are formed in the gear member 130 at a predetermined distance, the safety sensor 150 recognizes the grooves 130-1 at a predetermined time interval when the gear member 130 is rotated at a fixed speed. However, when only the groove 130-1 is continuously recognized for a predetermined time, or the groove 130-1 is not continuously recognized for a predetermined time, the safety sensor senses this state.

**[0058]** When the safety sensor 150 recognizes the above-described information, a controller (a processor (not shown)) determines that the gear member 130 is not rotated. When it is determined that the gear member 130 is not rotated, the controller controls the driving motor 120 so that the gear member 130 is rotated in a reverse direction.

**[0059]** When the door member 110 is closed, the door closing detection sensor 115 is closely attached to the first member 110-1. That is, when the door member 110 is closed, the first member 110-1 presses the door closing

detection sensor 115 due to the closing of the door member 110. Thus, the door closing detection sensor 115 may recognize the closing of the door (or the first member).

**[0060]** The rotation member 145 is spaced a predetermined distance from the rotation shaft 110-3 and rotated about the rotation shaft 110-3 in the same direction by the rotation of the rotation shaft 110-3. When the door member 110 is fully opened by the rotation of the rotation shaft 110-3, the rotation member 145 also comes into contact with the door opening detection sensor 140. That is, the door opening detection sensor 140 confirms whether the door is opened through whether the rotation member 145 comes into contact with the door opening detection sensor 140. In addition, the rotation member 145 is rotated from one side to the other side and from the other side to one side, and the door opening detection sensor 140 is attached to the other side.

**[0061]** In addition, the public mail reception box according to the present invention includes the theftproof cover 155. The theftproof cover 155 is disposed in the public mail reception box to prevent stored mail from being received by a third party without notice. For this, when the theftproof cover 155 is formed from an upper end to a lower end of a mail slot into the mail drops, the theftproof cover 155 is maintained to a state of extending backward at a predetermined angle. That is, the theftproof cover 155 is maintained to a state of extending by a predetermined length from an upper end to a rear side and a lower end of the mail slot. Since the theftproof cover 155 has the above-described structure, the theftproof cover 155 may prevent the stored mail from being received by the third party without notice.

**[0062]** FIG. 5 is a view illustrating a state in which the door member is opened according to another embodiment of the present invention. Hereinafter, the state in which the door member is opened according to another embodiment of the present invention will be described in detail with reference to FIG. 5.

**[0063]** When the driving motor 120 is rotated to open the door member 110, the circular gear member 125 is rotated by the rotation of the driving motor 120. The gear member 130 is rotated by the rotation of the circular gear member 125, and the rotation shaft 110-3 constituting the door member 110 is rotated by the rotation of the gear member 130.

**[0064]** Here, the first member 110-1 and the second member 110-2, which constitute the door member 110, is rotated also by the rotation of the rotation shaft 110-3, and thus, the door member 110 is opened. When the door member 110 is opened, the rotation member 130 rotated in the same direction as the rotation shaft 110-3 comes into contact with a door opening detection sensor 140. As a result, it is determined that the door member 110 is fully opened.

**[0065]** When the user places the mail on the upper end of the first member 110-1 constituting the door member 110 in the state in which the door member 110 is fully opened, the door member 110 is closed. The door mem-

ber 110 may be automatically closed when a predetermined time elapses after the door member 110 is opened. In addition, the door may be closed by manipulating a button disposed on the public mail reception box.

**[0066]** When a closing command of the door member 110 is received, the driving motor 120 is rotated in the reverse direction, and the circular gear member 125 is rotated by the rotation of the driving motor 120. The gear member 130 is rotated by the rotation of the circular gear member 125, and the rotation shaft 110-3 constituting the door member 110 is rotated by the rotation of the gear member 130.

**[0067]** Here, the first member 110-1 and the second member 110-2, which constitute the door member 110, is rotated also by the rotation of the rotation shaft 110-3, and thus, the door member 110 is closed. When the door member 110 is closed, the first member 110-1 comes into contact with the door closing detection sensor 115. Thus, the controller recognizes the closed state of the door member 110.

**[0068]** In addition, the safety sensor 150 senses whether the grooves 130-1 is recognized at a predetermined distance. When the grooves 130-1 is not recognized at the predetermined distance, it is determined that the mail (or the parcel) is jammed between the door member 110 and the theftproof cover 155. Thus, the controller controls the driving motor 120 so that the driving motor 120 is rotated in the reverse direction. As described above, according to the present invention, the safety sensor 150 is provided to determine whether the mail is jammed between the door member 110 and the theftproof cover 155 through the safety sensor 150.

**[0069]** As described above, according to the present invention, the receipt of the mail stored in the mail box by the third party without notice may be prevented by using the door member 110 and the theftproof cover 155. Also, when the door member 110 is rotated in the state in which the mail is placed on the upper end of the first member 110-1 of the door member 110, the mail is moved from the first member 110-1 to the second member 110-2 and then received in the mail box. As described above, since the mail drops into the mail box at a relatively low height, the damage or deformation of the mail may be prevented.

**[0070]** Hereinafter, configurations and operations of the driving motor and the circular gear member will be described in detail.

**[0071]** The gear is disposed on an end of one side of the driving motor 120. Thus, the gear disposed on the end of the one side of the driving motor 120 is rotated by the rotation of the driving motor 120.

**[0072]** The circular gear member 125 is constituted by a first circular gear member 125-1 and a second circular gear member 125-2. Here, the first and second circular gear members 125-1 and 125-2 are gear-coupled to each other. The first circular gear member 125-1 is rotated by the rotation of the gear disposed on the driving motor 120, and the second circular gear member 125-2 is ro-

tated by the rotation of the first circular gear member 125-1.

[0073] The second circular gear member 125-2 is gear-coupled to the gear member 130, and the gear member 130 is rotated by the rotation of the second circular gear member 125-2. As described above, according to the present invention, driving force of the driving motor 120 is provided to the gear member 130 by using the plurality of gears.

[0074] While the embodiments of the present invention have been described with reference to the specific embodiments, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the following claims.

### Industrial Applicability

[0075] The present invention relates to a public mail reception box, and more particularly, to a public mail reception box that is capable of preventing a mail from being damaged or robbed by a third party when the mail drops.

[0076] The public mail reception box according to the present invention may reduce the dropping speed of the mail dropping into the mail box by using the door member constituted by the first member and the second member, which are spaced a predetermined angle from each other with respect to the central axis to prevent the mail from being damaged. Also, when the mail is jammed between the door member and the theftproof cover, the driving motor may be reversely rotated to prevent the mail from being damaged.

### Claims

1. A public mail reception box comprising:

a door member comprising a rotation shaft having a predetermined length, a first member extending in a flat plate shape to one side with respect to the rotation shaft, and a second member extending in a flat plate shape in a state of being spaced a predetermined angle from the first member with respect to the rotation shaft; a gear member coupled to the rotation shaft of the door member and on which a gear is disposed on an end thereof; a circular gear member gear-coupled to the gear member; and a damper pushing the first member outward when pressing of the door member from the first member is stopped.

2. The public mail reception box of claim 1, further comprising:

a driving motor rotating the circular gear member; and

a safety sensor detecting revolutions per minute (RPM) or rotation of the driving motor, wherein, when it is determined that the driving motor is not rotated, the driving motor is controlled so that the driving motor is rotated in a reverse direction.

3. The public mail reception box of claim 1, wherein the gear member has at least two grooves at a predetermined distance in a radius set by using the rotation shaft as a center.

4. The public mail reception box of claim 3, further comprising a safety sensor sensing the grooves defined in the gear member, wherein, when the grooves are not recognized for a predetermined time interval while the driving motor is driven, the driving motor is rotated in a reverse direction.

5. The public mail reception box of claim 4, further comprising a rotation member disposed on the gear member, wherein the rotation member is rotated from one side to the other side by the rotation of the gear member, and the rotation member comes into contact with an opening detection sensor disposed on the other side by the rotation thereof.

6. The public mail reception box of claim 2, wherein the first member constituting the door member is exposed to the outside by the rotation of the driving motor, and mail is placed on an upper end of the exposed first member.

7. The public mail reception box of claim 6, further comprising a theftproof cover disposed on an upper end of the mail box, which is spaced a predetermined distance from the door member, wherein the theftproof cover comprises:

a first constitution extending downward by a predetermined length in a flat plate shape; and a second constitution extending by a predetermined length from the first constitution and maintained to a state that is bent at a preset angle from the first constitution, wherein the bent angle ranges from about 90° to about 180°.

Fig. 1

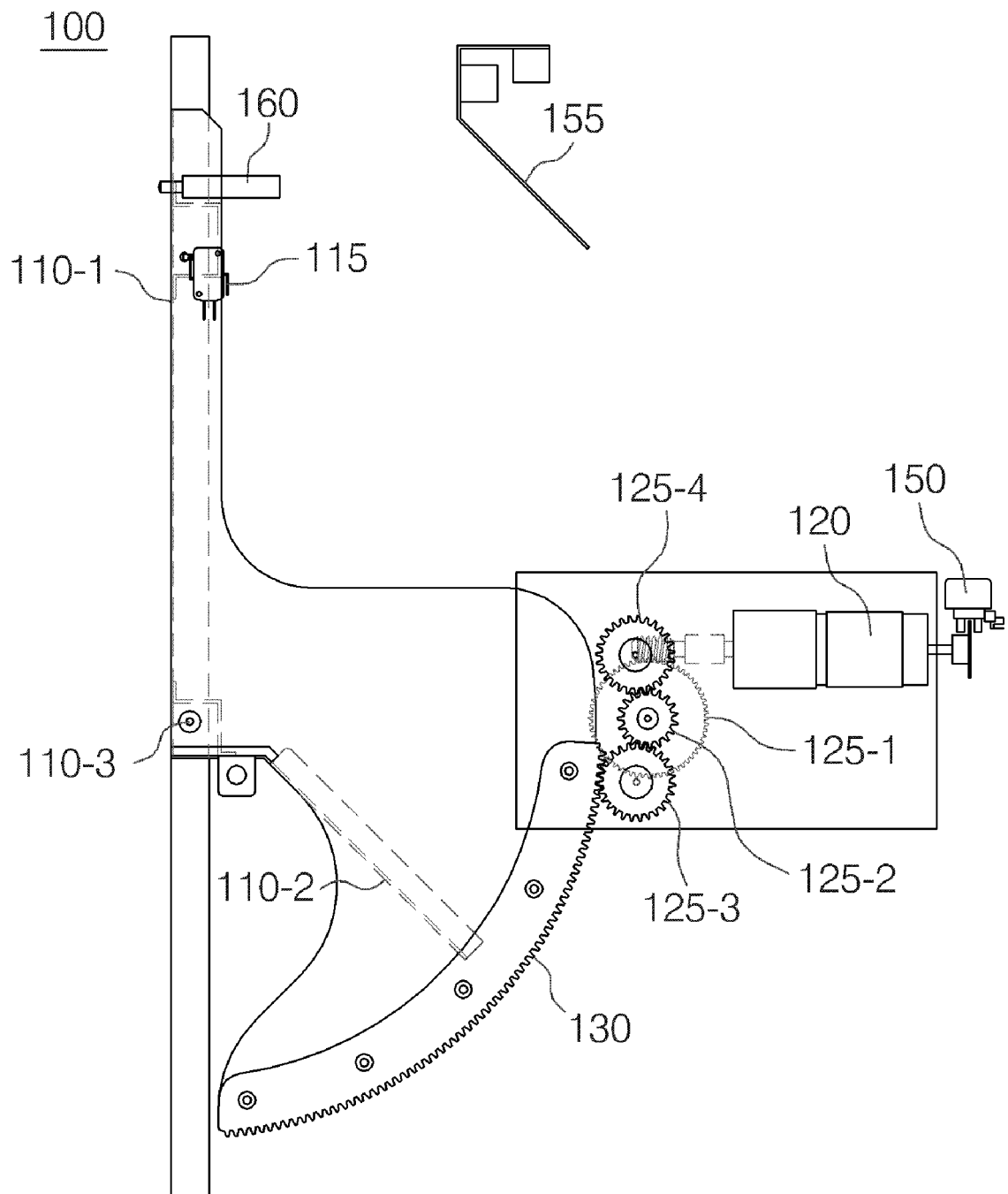




Fig. 2

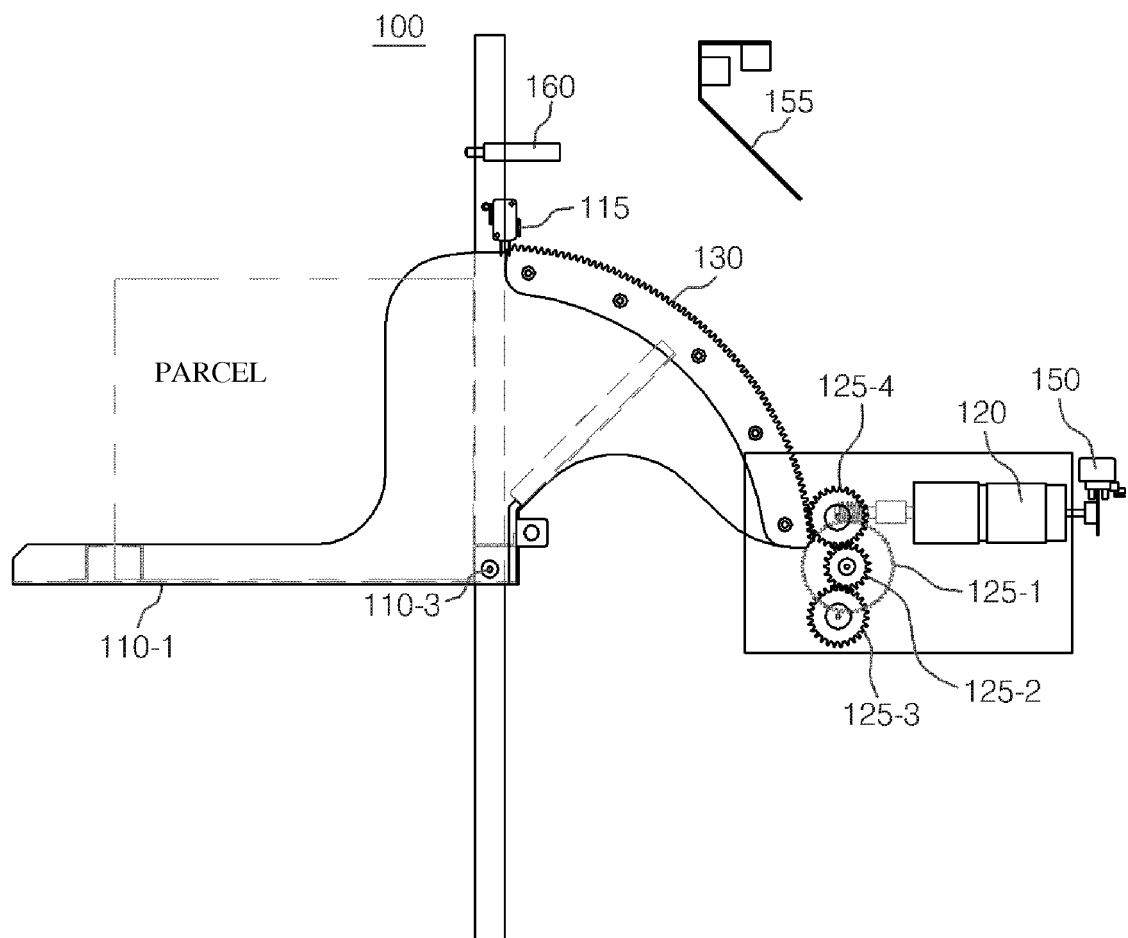


Fig. 3

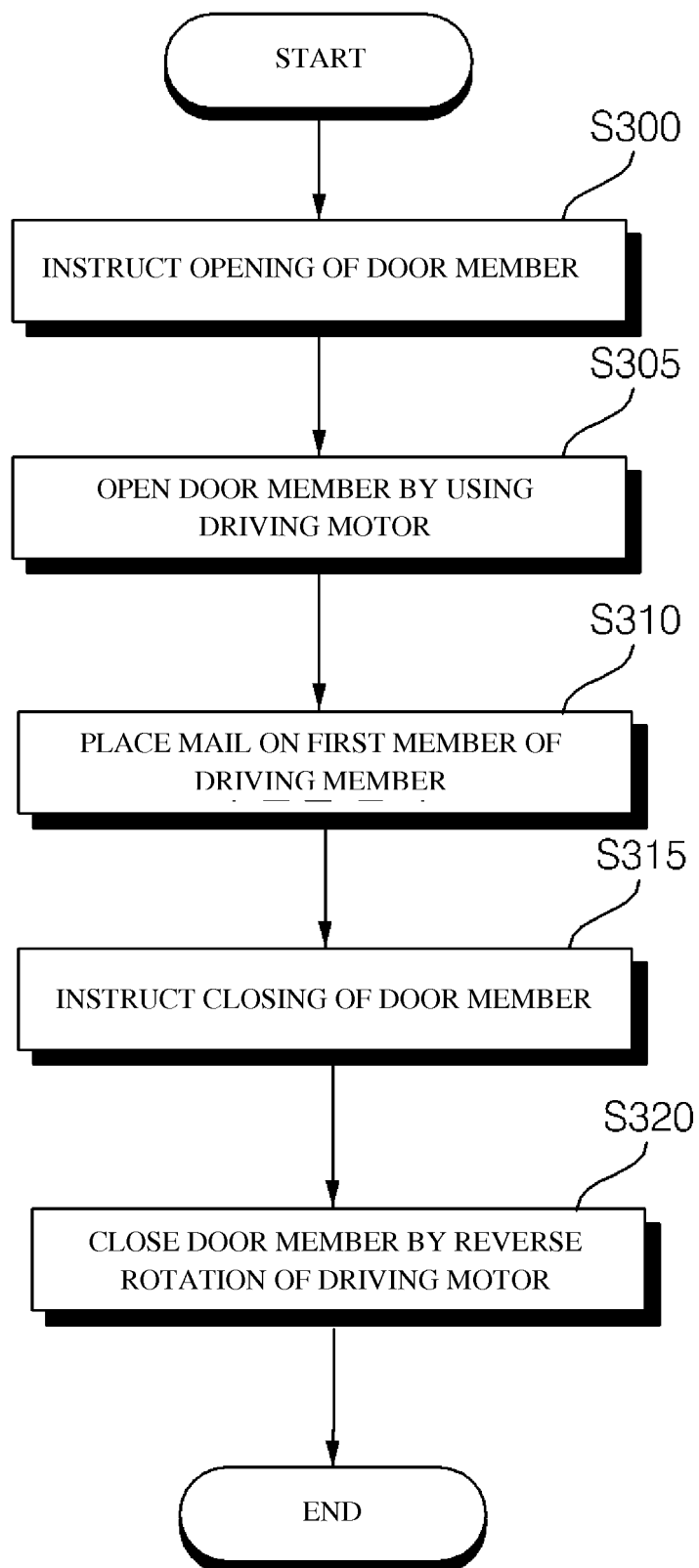


Fig. 4

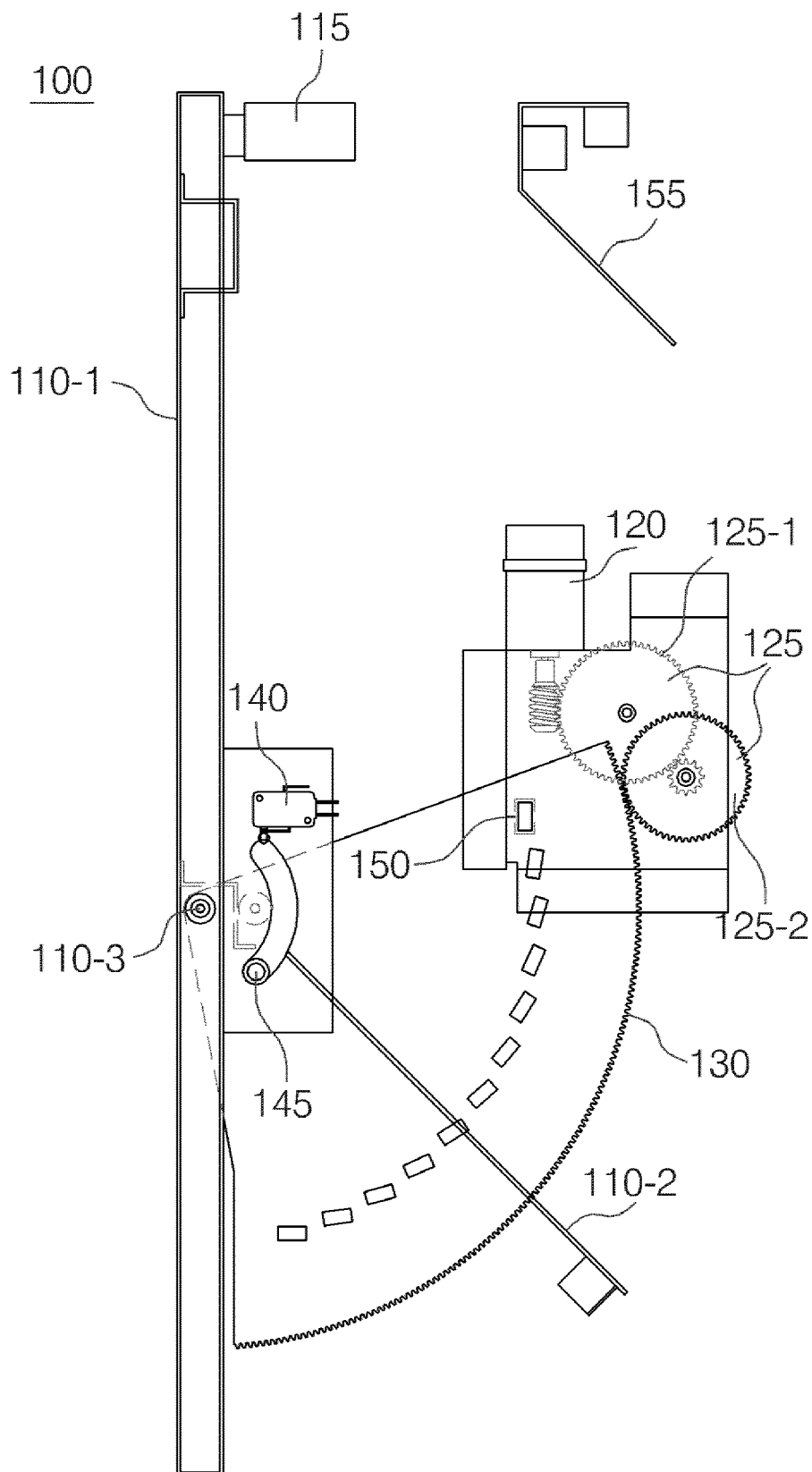
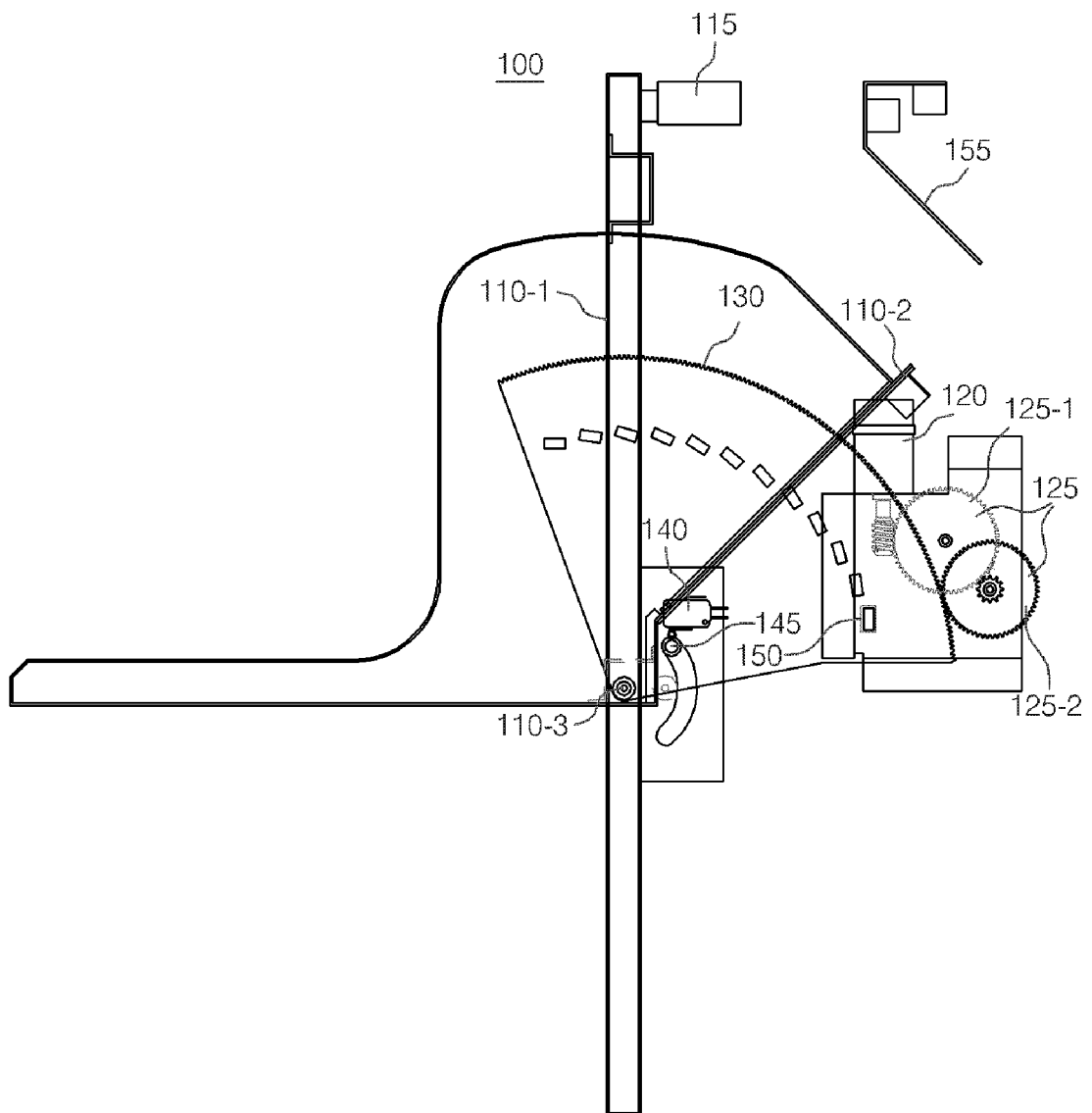


Fig. 5



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2015/010702

## A. CLASSIFICATION OF SUBJECT MATTER

A47G 29/16(2006.01)i, A47G 29/122(2006.01)i, E05B 65/44(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47G 29/16; A47G 29/124; A47G 29/122; A47G 29/12; E05F 15/00; A47G 29/126; E05B 65/44

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models: IPC as above

Japanese Utility models and applications for Utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) &amp; Keywords: postal matter, storage box, door member, rotary shaft, even plate, first member, second member, gear, circular gear member, damper, safety sensor, groove part

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2009-172249 A (PANASONIC ELECTRIC WORKS CO., LTD.) 06 August 2009 See abstract, paragraphs [0017]-[0019], [0035]-[0037] and figures 1, 3.	1,3
A		2,4-7
Y	KR 10-1091559 B1 (LEE, Ki - Sub) 13 December 2011 See abstract, paragraphs [0037]-[0043] and figure 5.	1,3
Y	KR 10-0746258 B1 (YOON, Mun Seok) 03 August 2007 See abstract, paragraph [0060] and figures 2-3.	1,3
A	KR 10-0187856 B1 (KIA MOTORS CORPORATION) 01 June 1999 See abstract, claims 2-3 and figures 3-4.	1-7
A	JP 2008-142262 A (YOSHIKAZU, Katayanagi) 26 June 2008 See abstract, paragraphs [0026]-[0028] and figure 1.	1-7

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family


Date of the actual completion of the international search

06 DECEMBER 2015 (06.12.2015)

Date of mailing of the international search report

07 DECEMBER 2015 (07.12.2015)

Name and mailing address of the ISA/KR


 Korean Intellectual Property Office  
 Government Complex-Daejeon, 189 Soonsa-ro, Daejeon 302-701,  
 Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

Telephone No.

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.

**PCT/KR2015/010702**

Patent document cited in search report	Publication date	Patent family member	Publication date
JP 2009-172249 A	06/08/2009	JP 5270923 B2	21/08/2013
KR 10-1091559 B1	13/12/2011	KR 10-2011-0100336 A	14/09/2011
KR 10-0746258 B1	03/08/2007	NONE	
KR 10-0187856 B1	01/06/1999	KR 10-1997-0075198 A	10/12/1997
JP 2008-142262 A	26/06/2008	JP 4939913 B2	30/05/2012

Form PCT/ISA/210 (patent family annex) (January 2015)