MAILBOX DOOR RESTRAINT

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ABSTRACT
Door stop and impact absorber bracket for restraining mailbox doors from opening beyond a selected swing radius. The bracket can fit underneath the mailbox behind an existing lower hanging lip. The door stop bracket is positioned such that it limits the door from swinging beyond a desired point (e.g. approximately 90 degrees) when the door is opened. The bracket can have an elongated rectangular planar central portion, with bent ends, together forming a generally C-shape. The bracket can have cushion pad to protect both the door, hinges other components and even the body of the mail box from being damaged from excessive vibrations when the door reaches the maximum opening point. The pad can also reduce objectionable impact noise effects that are created when a mailbox door accelerates in a free fall to a stop.
MAILBOX DOOR RESTRAINT

[0001] This invention relates to mailboxes, in particular to apparatus, devices and methods of restraining a mailbox door from opening beyond a selected swing radius.

BACKGROUND AND PRIOR ART

[0002] Mailboxes have been around for many years, and come in many sizes and shapes. The most popular mailboxes have an elongated compartment such as a rectangular housing with a flat roof or curved roof, and an access door that swings open based on a hinge mechanism that attaches the door to the lower front edge of the mailbox. However, mailbox doors tend to open much further than is needed. A typical mailbox door swings freely up to approximately 180 to approximately 270 degrees or more from a vertical upright closed position. The loosely swinging door has resulted in many problems.

[0003] For example, a mailbox door that hangs down is more prone to be twisted and bent overtime rendering the door useless from closing the mailbox. A downwardly hanging door can also break off from the mailbox leaving the interior of the mailbox continuously open. A constantly open mailbox can allow for any mail type contents inside to become damaged by being exposed to weather elements, and/or allow for the mailbox contents to become dislodged and lost, and even stolen overtime.

[0004] Additionally, a downwardly hanging bent and/or twisted mailbox door or portions of a door that remain can also be a snag hazard to others such as a mailman.

[0005] Still furthermore, most mailboxes being metal are prone to additional problems. These mailbox doors typically swing open so that metal eventually impacts metal that can cause damage to either or both the door, the handle, hinges, floor, other components and even the mailbox itself overtime. Metal hitting metal has also been known to cause objectionable loud impact noises that are created when a mailbox door accelerates in a free fall to a dead impact stop.

[0006] The constant bouncing between components can stress mailbox door hinges, other rotating points, welds and other assembly components causing parts to warp and/or loosen and/or fall off and/or become damaged overtime reducing the life of the mailbox.

[0007] The inventor is not aware of apparatus, devices and methods that overcome all the problems listed above. Thus, the need exists for solutions to the above problems with the prior art.

SUMMARY OF THE INVENTION

[0008] A primary objective of the present invention is to provide a restraint apparatus, device and method for limiting the swinging opening radius of a mailbox door to stop at a generally horizontal orientation.

[0009] A secondary objective of the present invention is to provide a restraint apparatus, device and method for preventing a mailbox door from swinging to a position where the door hangs beneath the mailbox.

[0010] A third objective of the present invention is to provide a restraint apparatus, device and method for reducing the chances for the door to become twisted or bent overtime.

[0011] A fourth objective of the present invention is to provide a restraint apparatus, device and method for reducing the chances for the door and/or hinges and/or other components from becoming detached from the mailbox which reduces chances of mail type contents from becoming dislodged and lost, and stolen overtime.

[0012] A fifth objective of the present invention is to provide a restraint apparatus, device and method reducing the chances for the door to become a snag hazard to others.

[0013] A sixth objective of the present invention is to provide a restraint apparatus, device and method for reducing damage to both a mailbox door and the mailbox itself as the door is being swung open.

[0014] A seventh objective of the present invention is to provide a restraint apparatus, device and method for reducing objectionable impact and collision noises and reducing vibration damage effects to both a mailbox door, other components and the mailbox itself as the door is being swung open.

[0015] An eighth objective of the present invention is to provide a restraint apparatus, device and method for extending the operational life of the mailbox.

[0016] The invention covers a mailbox door restraint apparatus, device and method that stop a freefall of a mailbox door being opened by reducing the amount of force as compared to a freefalling door with no restraint. The novel restraint reduces wear and tear on the door, rotational components and other mailbox assembly parts thereby increasing the operational life of the mailbox.

[0017] A preferred embodiment of the invention can be a mailbox having a chamber having at least one open end, a door pivotally attached to the open end of the chamber, and a restraint member for stopping the door from swinging open from a vertical position beyond a generally horizontal position.

[0018] The restraint member can include a bracket attached to both a lower front edge of the open end of the chamber, and to a lower edge of the door, the bracket having a portion which prevents the door from opening beyond the generally horizontal position. The bracket can have an elongated rectangular midportion and bent ends on opposite ends of the elongated rectangular midportion. The bent ends can include openings for allowing fasteners pass therethrough in order to fasten the bracket to the lower front edge of the open end of the chamber.

[0019] A pad can be attached to a face portion of the bracket and be used for dampening vibration and sound impact between the door and the bracket when the door reaches the generally horizontal position.

[0020] The restraint member can also include a lip portion which is attached to and hangs down beneath a lower front edge portion of the open end of the chamber behind a front lower hanging edge of the mailbox, wherein a portion of the door abuts against the lip portion which prevents the door from opening beyond the generally horizontal position.

[0021] The restraint can be a bumper portion attached to a lower portion of the chamber for preventing the door from opening beyond the generally horizontal position.

[0022] The invention can include a novel method of stopping a mailbox door from opening beyond a generally horizontal position, and can include steps of providing a mailbox having at least one open end, pivotally attaching a door to the open end of the mail box, and preventing the mailbox door from opening beyond a generally horizontal position.

[0023] The preventing step can include the step of attaching a lip portion to hang beneath the open end of the mailbox.
The preventing step can include the step of attaching a bracket having bent ends to a lower front edge of the open end of the mailbox.

The novel method can also include the step of cushioning impact between the door and the mailbox when the door opens to the generally horizontal position.

Further objects and advantages of this invention will be apparent from the following detailed description of the presently preferred embodiments which are illustrated schematically in the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a perspective side view of a prior art mailbox.
FIG. 2 is another perspective view of the mailbox of FIG. 1 with the door open.
FIG. 3 is a front end view of the mailbox of FIG. 2 along arrow X.
FIG. 4 is a side cross-sectional view of FIG. 3 along arrows 4X.
FIG. 4A is an enlarged view of a portion of the door hinge of FIG. 4.
FIG. 5 is a perspective side view of a mailbox with door closed using the novel invention.
FIG. 6 is another perspective side view of the mailbox of FIG. 5 with the door open.
FIG. 7 is a perspective lower view of the mailbox with door closed of FIG. 5.
FIG. 7A is an enlarged view of a lower front portion of the mailbox of FIG. 7.
FIG. 8 is a perspective view of the mailbox with door open of FIG. 6.
FIG. 8A is an enlarged view of the lower front portion of the mailbox of FIG. 8.
FIG. 9 is an exploded perspective side view of the mailbox, door and stop bracket.
FIG. 10 is an exploded view underneath the mailbox, door, and stop bracket of FIG. 9.
FIG. 11 is a front end view of the closed door of the mailbox using the novel stop bracket.
FIG. 12 is a cross-sectional view of closed door mailbox of FIG. 11 along arrows 12X.
FIG. 12A is an enlarged view of the door hinge portion and stop bracket of FIG. 12.
FIG. 13 is a front end view of the mailbox with an open door using the novel stop bracket.
FIG. 14 is a cross-sectional view of the open door mailbox of FIG. 13 along arrows 14X.
FIG. 14A is an enlarged view of the door hinge portion and stop bracket of FIG. 14.
FIG. 15 is a front end view of the mailbox with open door using the stop bracket and pad.
FIG. 16 is a cross-sectional view of the door hinge, stop bracket and pad of FIG. 15.
FIG. 16A is an enlarged view of the door hinge, stop bracket and pad of FIG. 16.
FIG. 17 is an upper perspective view of the novel stop bracket used in the invention.
FIG. 18 is a left end view of the stop bracket of FIG. 17 along arrow 18X.
FIG. 19 is a top view of the stop bracket of FIG. 17 along arrow 19Y.
FIG. 20 is a front side view of the stop bracket of FIG. 17 along arrow 20X.

FIG. 21 is a bottom view of the stop bracket of FIG. 17 along arrow 21Y.
FIG. 22 is a right end view of the stop bracket of FIG. 17 along arrow 22X.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Before explaining the disclosed embodiments of the present invention in detail it is to be understood that the invention is not limited in its applications to the details of the particular arrangements shown since the invention is capable of other embodiments. Also, the terminology used herein is for the purpose of description and not of limitation.

A listing of components will now be described.
Prior Art Mailbox
Main chamber of mailbox
Open access ends of mailbox
Existing lower hanging front edge of mailbox
Existing floor of mailbox
Existing lower hanging side edges of mailbox
Mailbox door
Inwardly bent side edges of door
Tab hinges pre-attached to door
Rear edge portion of tab hinges
Fasteners attaching tab hinges to lower hanging side edges
Invention Mailbox
Restraining Bracket
Rectangular Elongated Mid-portion
Angled Face of elongated mid-portion
First bent end
Fastener mounting holes
Second bent end
Fastener mounting holes
Fasteners (screws/nuts)
Vibration and Sound absorbing and dampening pads

FIG. 1 is a perspective side view of a prior art mailbox. FIG. 2 is another perspective view of the mailbox of FIG. 1 with the door 20 being opened exposing an open access end 12 for the mailbox. FIG. 3 is a front end view of the mailbox of FIG. 2 along arrow X. FIG. 4 is a side cross-sectional view of FIG. 3 along arrows 4X. FIG. 4A is an enlarged view of a portion of the door hinge 32 of FIG. 4.

Referring to FIGS. 1-4A, a typical mailbox 1 can include a main chamber 1 having an open access end 12. Across a bottom floor 15 of the mailbox 1 can be lower hanging side edges 14, 18, and an existing lower hanging front edge 16. A mailbox door 20 can include inwardly bent side edges 22 which help seal the door 20 over the open end 12 when the door 20 is in a closed position. Pre-attached to lower corners of the door 20 can be tab type hinges 32, 38 which extend perpendicular in from a planar face of the door 20. Fasteners such as rivets 33 can attach the tab hinges 32, 38 into front portions of the lower hanging mailbox side edges 14, 18 behind the lower hanging mailbox front edge 16 in order to allow the door 20 to pivot relative to the mailbox open end 12. As can be seen in FIGS. 4 and 4A; the tab hinges 32, 38 allow the door 20 to move up to approximately 180 degrees or more from an initial closed position shown in FIG. 1.

FIG. 5 is a perspective side view 100 of a mailbox 10 with door 20 closed using the novel invention. FIG. 6 is another perspective view of the mailbox 10 of FIG. 5 with the door 20 opened along arrow R to no more than approximately
90 degrees from the access end 12 of the mailbox 100. As can be readily seen, the novel invention does not change the general outside appearance of prior art mailboxes previously described.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.

When the door 20 of the mailbox is being opened, and pivots by way of tab hinges 32, 38, the door can move in the direction of arrow R until the rear edges 33, 39 of the tab hinges 32, 38 abut against front portions of the elongated rectangular mid portion 110 of the stop restraining bracket 101. The position of the elongated rectangular mid portion 110 prevents the tab hinges 32, 38 from opening the door 20 beyond an approximate 90 degree swing opening, which puts the door 20 approximately perpendicular to the open access end 12 of the main chamber 10 of the mailbox 100. A preferred application would allow for the door 20 to end up approximately horizontal, and in a similar plane to the floor 15 of the mailbox 100.
or tab that can be fastened into one lower hanging side of the mailbox by screws, and the like.

[0096] The invention can be retrofitted into existing mailboxes and/or made to be part of newly manufactured mailboxes.

[0097] While the invention has been described, disclosed, illustrated and shown in various terms of certain embodiments or modifications which it has presumed in practice, the scope of the invention is not intended to be, nor should it be deemed to be, limited thereby and such other modifications or embodiments as may be suggested by the teachings herein are particularly reserved especially as they fall within the breadth and scope of the claims here appended.

1-9. (canceled)

10. A stop bracket for preventing mailbox doors from opening beyond a generally horizontal orientation, comprising:
   a first bent end on the planar member for attaching the bracket to a left lower protruding edge of a mailbox;
   a second bent end on the planar member for attaching the bracket to a right lower protruding edge of the mailbox, wherein a portion of the planar member functions as a bumper to prevent the mailbox door from opening beyond a generally horizontal position.

11. The stop bracket of claim 10, further comprising:
   a first opening in the first bent end for allowing a fastener to fasten the bracket to the left lower protruding edge of the mailbox; and
   a second opening in the second bent end for allowing another fastener to fasten the bracket to the right lower protruding edge of the mailbox.

12-15. (canceled)

16. A mailbox, comprising:
   a chamber having at least one open end with a front edge and lower hanging side edges which extend beneath a floor of the chamber;
   a door pivotally attached to the open end of the chamber,
   a stop located beneath the floor of the chamber and between the lower hanging side edges, so that the stop is adjacent to and behind the front edge of the chamber, wherein the stop provides for limiting a swing opening radius of the door by a portion of the lower edge of the door abutting against a portion of the bracket.

17. A mailbox for receiving mail, comprising:
   a chamber having at least one open end with a front edge, and lower hanging side edges which extend beneath a floor of the chamber;
   a door pivotally attached to the open end of the chamber; and
   an elongated member located beneath the floor of the chamber and between the lower hanging side edges such that the elongated member is adjacent to and behind the front edge of the open end of the chamber, wherein the elongated member provides for limiting a swing opening radius of the door by a portion of the lower edge of the door abutting against a portion of the elongated member.