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Pop-top Roof Assistance Accessory

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(71) Applicant(s)
Dallas Green

(72) Inventor(s)
Green, Dallas

(74) Agent / Attorney
Patentec Patent Attorneys, Ikon House L 11 65 York St, Sydney, NSW, 2000, AU

Abstract

A pop-top roof assistance accessory is disclosed, comprising a distal connector, a proximal handle, and an elongate bar extending between the distal connector and the proximal handle. The accessory is adapted for use with a pop-top roof lifting mechanism including a pivot bar interconnecting roof lifting arms and a handle bar pivotally engaged with the pivot bar. The distal connector is configured to releasably engage the pivot bar while the elongate bar is positioned beneath the handle bar, such that upward force applied to the proximal handle urges the handle bar upward to raise the lifting mechanism. In preferred forms, the distal connector defines one or more channels capturing the pivot bar on three sides to resist disengagement under load, and the elongate bar may be curved to allow the handle to be located beneath the handle bar during operation. The accessory provides improved leverage and ease of use for raising and lowering pop-top roofs without modification to the caravan structure.

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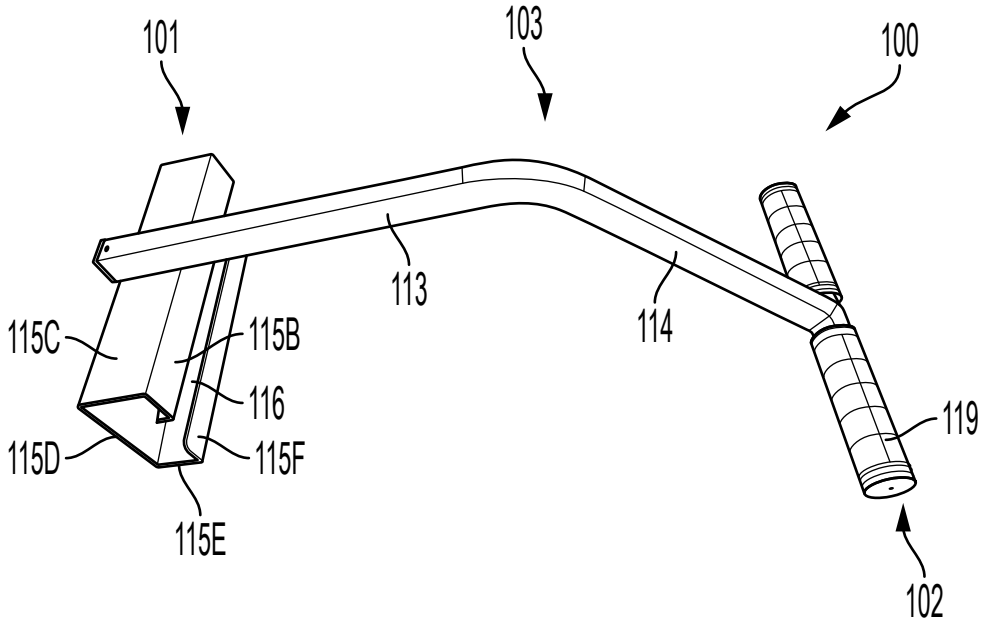

FIG. 1

Pop-top Roof Assistance Accessory

Field of the Invention

[0001] The present invention relates generally to lifting mechanisms for pop-top roofs of caravans and similar vehicles, and more particularly to an accessory configured to assist in raising and lowering such mechanisms.

Background of the Invention

[0002] Pop-top roofs are commonly employed in caravans and similar vehicles to provide additional headroom and ventilation when the vehicle is stationary. Conventional pop-top roof lifting mechanisms typically include a lower frame secured to an interior wall of the vehicle and an upper frame connected to the underside of the roof, with the two frames pivotally connected. The upper frame often includes a pivot bar, while the lower frame includes a handle bar that is manually lifted by the user to raise the roof.

[0003] Although such mechanisms provide a practical means of increasing interior space, they have certain limitations. In particular, a considerable amount of physical effort is often required to lift the roof, which can be difficult for users with limited strength or reach. The placement of the lifting mechanism within confined spaces of the caravan can further impede access and operation.

[0004] The manual nature of conventional mechanisms can therefore be cumbersome, and the available mechanical advantage may be insufficient, resulting in a more strenuous lifting process than desired. These challenges demonstrate a need for improvements to pop-top roof lifting systems that enhance usability and reduce the physical effort required during operation.

Summary of the Disclosure

[0005] According to one aspect, there is provided a pop-top roof assistance accessory comprising a distal connector, a proximal handle, and an elongate bar extending between the distal connector and the proximal handle. The accessory is adapted for use with a pop-top roof lifting mechanism, the lifting mechanism including a pivot bar interconnecting roof lifting arms and a handle bar pivotally engaged with the pivot

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bar. The distal connector is configured to releasably engage the pivot bar while the elongate bar is positioned beneath the handle bar, such that application of an upward force to the proximal handle urges the handle bar upwardly to raise the lifting mechanism.

[0006] The arrangement allows the accessory to be quickly attached and detached from the lifting mechanism without modification to the caravan structure. Engagement of the distal connector with the pivot bar provides a secure connection that resists accidental disengagement during use, while still allowing deliberate removal.

[0007] By enabling the user to apply force at a distance from the lifting mechanism, operation can be performed from a lower and more comfortable stance, reducing the need to reach overhead or manoeuvre within confined interior spaces. The elongate bar transmits force directly to the handle bar of the lifting mechanism, providing improved leverage and reducing the effort required to raise the roof.

[0008] The accessory can be conveniently carried and stored when not in use, and offers a practical means of enhancing the usability of existing pop-top roof lifting mechanisms without the need for permanent alteration.

[0009] In certain preferred arrangements, the elongate bar may be shaped with a curvature between a distal portion and a proximal portion. Such shaping enables the distal portion to engage the handle bar in a generally horizontal orientation, while the proximal handle is positioned beneath the handle bar, allowing the user to apply force from a lower stance.

[0010] Optionally, the distal connector may be formed as an elongate member that transversely engages an end of the elongate bar. This construction assists in resisting lateral twisting during use and helps to maintain straight alignment of the elongate bar under load.

[0011] In one form, the distal connector may define a channel arranged to capture the pivot bar on three sides. By providing such partial enclosure, the connector may securely seat around the pivot bar during operation while still permitting deliberate removal when required. The channel may be arranged to resist movement under lever

force, under counter-lever force, under pushing force applied longitudinally, or under pulling force applied along the elongate bar.

[0012] In further embodiments, the distal connector may comprise a sequence of interconnected walls that together form multiple channels. A first, second, and third wall may cooperate to define a channel configured to retain the pivot bar under pushing force. A fourth wall may then combine with adjacent walls to form a channel that resists lever force. A fifth wall may define a further channel for retaining the pivot bar under pulling force, while a sixth wall may complete a channel arranged to capture the pivot bar against counter-lever force. An entrance may be defined between the first and sixth walls to permit insertion and withdrawal of the pivot bar. This configuration enables the pivot bar to remain engaged with the connector in a range of operational positions and under different directional loads.

[0013] In some examples, the proximal handle may comprise a straight bar extending orthogonally from the proximal end of the elongate bar defining side handle portions extending outwardly from opposite sides of the elongate bar allowing the user to achieve a secure grip, and may optionally include foam or rubberised coverings for comfort.

[0014] In an embodiment, the accessory may include a separate attachment for use in lowering the roof lifting mechanism. The attachment may comprise a channel for engaging the handle bar, a further channel for engaging the elongate bar, and a stem joining the two channels. The channels may each capture their respective elements on three sides to prevent slippage. The stem may hold the handle bar channel orthogonally with respect to the elongate bar channel and at an angular orientation. This arrangement allows downward force applied to the proximal handle to be transmitted through the attachment to the handle bar, thereby lowering the lifting mechanism in a controlled manner.

[0015] Other aspects of the invention are also disclosed.

Brief Description of the Drawings

[0016] Notwithstanding any other forms which may fall within the scope of the present invention, preferred embodiments of the disclosure will now be described, by way of example only, with reference to the accompanying drawings in which:

[0017] Figure 1 shows a perspective view of a pop-top roof assistance accessory according to a preferred embodiment.

[0018] Figure 2 shows the accessory of Figure 1 in use with a pop-top roof lifting mechanism.

[0019] Figure 3 shows a side view of a distal connector of the accessory, illustrating channels formed therein.

[0020] Figure 4 shows an embodiment of the accessory including an attachment configured for lowering the pop-top roof lifting mechanism.

Description of Embodiments

[0021] Figure 1 shows a pop-top roof assistance accessory 100 comprising a distal connector 101, a proximal handle 102, and an elongate bar 103 extending between the distal connector 101 and the proximal handle 102.

[0022] Figure 2 shows the accessory 100 in use with a pop-top roof lifting mechanism 104, which includes a pivot bar 105 interconnecting roof lifting arms 106 that are attached to a roof 107 via hinges 108. The pivot bar 105 is surrounded and pivotally engaged by a handle bar 109. The handle bar 109 comprises a front portion 110 manipulated by the user and side portions 111 extending rearwardly from the front portion 110 and attached to a frame, wall, or the like by rear hinges 112.

[0023] Application of upward lifting force to the front portion 110 provides mechanical advantage on account of the side portions 111 pivotally engaging the pivot bar 105 between the front portion 110 and the rear hinges 112.

[0024] As further shown in Figure 2, the distal connector 101 is configured to releasably engage the pivot bar 105 while the elongate bar 103 is positioned beneath the handle bar 109 with the proximal handle 102 extending forward of the front portion 110.

[0025] The embodiment of Figure 2 shows the pop-top roof lifting mechanism 104 in the raised position. In use, the mechanism 104 would initially be in the lowered position, in which the front portion 110 of the handle bar 109 lies beneath the pivot bar 105 with the roof 107 lowered. In this configuration, the accessory 100 is inserted behind the front portion 110 of the handle bar 109 and lifted upwardly so that the distal connector 101 hooks onto the pivot bar 105.

[0026] Preferably, the distal connector 101 defines a downwardly orientated channel, as described in further detail below, allowing the accessory 100 to hang freely from the pivot bar 105 without risk of falling and to be disengaged only by manually lifting it from the pivot bar 105.

[0027] When the accessory 100 is attached to the mechanism 104 in its lowered configuration, the user can stand back, grip the proximal handle 102, and apply upward force, thereby urging the handle bar 109 upward to raise the lifting mechanism 104 and the roof 107 with mechanical advantage.

[0028] The distal connector 101 retains the elongate bar 103 on the lifting mechanism 104, preventing the accessory 100 from slipping dangerously from the mechanism, which might otherwise cause the roof 107 to fall suddenly or the elongate bar 103 to strike an adjacent wall.

[0029] Figure 1 further shows a preferred embodiment in which the elongate bar 103 is curved between a distal portion 113 and a proximal portion 114. The relative lengths of the distal portion 113 and proximal portion 114 are such that the distal portion 113 engages the front portion 110 of the handle bar 109. As such, when the distal portion 113 engages the handle bar 109 in a generally horizontal orientation, the proximal handle 102 is located beneath the handle bar 109.

[0030] This arrangement allows the user to raise the mechanism 104 from a relatively low position without the need to stand on a stepladder, stool, or the like, and is particularly beneficial for shorter users or those with limited ability to raise their arms above head height.

[0031] In the preferred embodiment shown, the distal connector 101 is elongate and transversely engages an end of the elongate bar 103. This elongate profile resists sideways force, keeping the elongate bar 103 straight during lifting operations.

[0032] As indicated above, the distal connector 101 preferably captures the pivot bar 105 on three sides. With reference to Figure 3, the distal connector 101 preferably comprises a series of walls 115 defining a series of channels 117 that capture the pivot bar 105 on three sides in various positions.

[0033] Specifically, the distal connector 101 may comprise a first wall 115A, a second wall 115B orthogonally connected to the first wall 115A, and a third wall 115C orthogonally connected to the second wall 115B.

[0034] The first, second, and third walls 115A–C may define a first channel 117A configured to capture the pivot bar 105 on three sides in position 105D against pushing force 118C applied along the elongate bar 103. In particular, when an obstruction such as a light fitting prevents the proximal handle 102 from being lifted fully to open the mechanism 104, the proximal handle 102 can be pushed forward, causing the pivot bar 105 to be retained in position 105D within the first channel 117A without risk of the distal connector 101 slipping.

[0035] The distal connector 101 may further comprise a fourth wall 115D orthogonally connected to the third wall 115C, thereby defining a second channel 117B. The second channel 117B captures the pivot bar 105 on three sides in position 105B against lever force 118A applied by the elongate bar 103. The distal connector 101 may be configured to allow the pivot bar 105 to slide from position 105B during levering to position 105D when the elongate bar 103 is pushed longitudinally.

[0036] The distal connector 101 may further comprise a fifth wall 115E orthogonally connected to the fourth wall 115D, thereby defining a third channel 117C configured to capture the pivot bar 105 on three sides between the second position 105B and a third position 105C. The second channel 117B and/or third channel 117C may allow the accessory 100 to hang freely from the pivot bar 105 against pulling or hanging force 118D without risk of disconnection, until manually lifted off the pivot bar 105.

[0037] The distal connector 101 may further comprise a sixth wall 115F orthogonally connected to the fifth wall 115E, thereby defining a fourth channel 117D configured to capture the pivot bar 105 on three sides in position 105C against counter-lever force 118B (opposite in direction to lever force 118A).

[0038] The first wall 115A and the sixth wall 115F may define an entrance 116 therebetween sized to allow the pivot bar 105 to enter position 105A. Once the pivot bar 105 is captured within the distal connector 101, the various channels 117 retain it away from the entrance 116 despite omnidirectional forces, thereby reducing the likelihood of accidental disconnection during operation.

[0039] The interior of the distal connector 101 may be padded with felt or other suitable material to prevent damage to the pivot bar 105.

[0040] The proximal handle 102 preferably comprises a straight bar 119 having handle portions extending from both sides of the elongate bar 103. These handle portions may be foam-padded or rubberised to provide improved grip and comfort during operation.

[0041] Figure 4 shows a further embodiment in which the accessory 100 comprises a separate attachment 120 configured for lowering the roof lifting mechanism 104. The attachment 120 comprises a handle bar engaging channel 121 configured to attach to the front portion 110 of the handle bar 109, and an elongate bar engaging channel 122 configured to attach to the elongate bar 103. The attachment 120 further comprises a stem 123 connecting the handle bar engaging channel 121 and the elongate bar engaging channel 122.

[0042] Preferably, the handle bar engaging channel 121 is configured to capture the handle bar 109 on three sides, and the elongate bar engaging channel 122 is configured to capture the elongate bar 103 on three sides. More preferably, the stem 123 holds the handle bar engaging channel 121 orthogonally with respect to the elongate bar engaging channel 122, and at an angle relative to the elongate bar engaging channel 122. This arrangement allows the attachment 120 to be secured between the handle bar 109 and the elongate bar 103 when the mechanism 104 is in

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the raised position and the distal connector 101 is engaged with the pivot bar 105 within the fourth channel 117D.

[0043] Downward force may then be applied to the proximal handle 102, causing the attachment 120 to pull down the handle bar 109 relative to the pivot bar 105, thereby lowering the mechanism 104. This action does not result in uncontrolled release of the mechanism 104, because the distal portion 113 of the elongate bar 103 can bear upwardly against the handle bar 109 as the mechanism 104 is gradually lowered.

[0044] In an exemplary and non-limiting method of use according to the preferred embodiment shown, the accessory 100 is employed as follows.

[0045] Initially, the pop-top roof lifting mechanism 104 is in a lowered configuration with the roof 107 closed. In this position, the front portion 110 of the handle bar 109 lies beneath the pivot bar 105. The user positions the accessory 100 by inserting the distal connector 101 behind the front portion 110 of the handle bar 109 and lifting the accessory 100 upwardly such that the distal connector 101 hooks onto and releasably engages the pivot bar 105 within one of the channels 117.

[0046] Once the distal connector 101 is securely engaged with the pivot bar 105, the elongate bar 103 extends downwardly with the proximal handle 102 positioned forward of the front portion 110 of the handle bar 109. The user then grips the proximal handle 102 with both hands and applies an upward lifting force. This force is transmitted through the elongate bar 103 to the handle bar 109, urging the handle bar 109 upwardly. As the handle bar 109 pivots about the rear hinges 112, the pivot bar 105 is displaced upwardly, thereby raising the roof 107 through the interconnected roof lifting arms 106.

[0047] During this lifting operation, the distal connector 101 retains the pivot bar 105 within the selected channel 117, preventing accidental disengagement and ensuring that the accessory 100 remains securely attached to the lifting mechanism 104. The preferable curved configuration of the elongate bar 103, defined between the distal portion 113 and proximal portion 114, positions the proximal handle 102 beneath the handle bar 109, enabling the user to achieve the required lifting movement from a

lower and more ergonomic stance. This arrangement minimises the need for overhead lifting and reduces strain, particularly for users of shorter stature.

[0048] If an obstruction prevents full upward travel of the proximal handle 102, the user may instead push the proximal handle 102 forward. In this mode of use, the pivot bar 105 is captured within the first channel 117A in position 105D, allowing the accessory 100 to transmit forward pushing force 118C to the pivot bar 105 without the risk of the distal connector 101 slipping free. In this way, the user is able to fully open the lifting mechanism 104 and raise the roof 107 despite spatial limitations.

[0049] Once the roof 107 is raised, the accessory 100 may remain freely suspended from the pivot bar 105 within the channels 117, with the elongate bar 103 retained against lever force 118A, counter-lever force 118B, pulling force 118D, and pushing force 118C. This secure engagement ensures that the accessory 100 does not disengage accidentally during operation.

[0050] To lower the roof 107, the accessory 100 may be fitted with the separate attachment 120. The attachment 120 is secured by engaging the handle bar engaging channel 121 over the front portion 110 of the handle bar 109, and the elongate bar engaging channel 122 over the elongate bar 103, with the stem 123 interconnecting the two channels at the required orthogonal and angled orientation. Downward force is then applied to the proximal handle 102, which causes the attachment 120 to pull the handle bar 109 downward relative to the pivot bar 105. This coordinated action gradually lowers the lifting mechanism 104 and roof 107. Importantly, throughout this lowering operation, the distal portion 113 of the elongate bar 103 remains positioned beneath the handle bar 109 to provide continued upward bearing support, thereby preventing uncontrolled descent of the roof 107.

[0051] Upon completion of the raising or lowering operation, the accessory 100 may be disengaged by manually lifting the distal connector 101 from the pivot bar 105 through the entrance 116, allowing the accessory 100 to be removed and stored.

[0052] The foregoing description, for purposes of explanation, used specific nomenclature to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that specific details are not required in order to

practise the invention. Thus, the foregoing descriptions of specific embodiments of the invention are presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed as obviously many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, thereby enabling others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the following claims and their equivalents define the scope of the invention.

Claims

1. A pop-top roof assistance accessory comprising:

a distal connector;

a proximal handle; and

an elongate bar extending between the distal connector and the proximal handle;

wherein the accessory is adapted for use with a pop-top roof lifting mechanism, the lifting mechanism including a pivot bar interconnecting roof lifting arms and a handle bar pivotally engaged with the pivot bar;

wherein the distal connector is configured to releasably engage the pivot bar while the elongate bar is positioned beneath the handle bar, such that application of an upward force to the proximal handle urges the handle bar upwardly to raise the lifting mechanism.

2. The pop-top roof assistance accessory of claim 1, wherein the elongate bar is curved between a distal portion and a proximal portion such that, when the distal portion engages the handle bar in a generally horizontal orientation, the proximal handle is located beneath the handle bar.

3. The pop-top roof assistance accessory of claim 2, wherein the distal connector is elongate and transversely engages an end of the elongate bar.

4. The pop-top roof assistance accessory of claim 3, wherein the distal connector defines a channel configured to capture the pivot bar on three sides.

5. The pop-top roof assistance accessory of claim 4, wherein the channel is configured to capture the pivot bar on three sides with respect to lever force applied by the elongate bar.

6. The pop-top roof assistance accessory of claim 4, wherein the channel is configured to capture the pivot bar on three sides with respect to counter-lever force applied by the elongate bar.

7. The pop-top roof assistance accessory of claim 4, wherein the channel is configured to capture the pivot bar on three sides with respect to pushing force applied along the elongate bar.

8. The pop-top roof assistance accessory of claim 4, wherein the channel is configured to capture the pivot bar on three sides with respect to pulling force applied along the elongate bar.

9. The pop-top roof assistance accessory of claim 4, wherein the distal connector comprises:

a first wall, a second wall orthogonally connected to the first wall, and a third wall orthogonally connected to the second wall, the first, second and third walls defining a first channel configured to capture the pivot bar on three sides with respect to pushing force applied along the elongate bar;

a fourth wall orthogonally connected to the third wall, the second, third and fourth walls defining a second channel configured to capture the pivot bar on three sides with respect to lever force applied by the elongate bar;

a fifth wall orthogonally connected to the fourth wall, the third, fourth and fifth walls defining a third channel configured to capture the pivot bar on three sides with respect to pushing force applied along the elongate bar; and

a sixth wall orthogonally connected to the fifth wall, the first and sixth walls defining an entrance for the pivot bar, and the fourth, fifth and sixth walls defining a fourth channel configured to capture the pivot bar on three sides with respect to counter-lever force applied by the elongate bar.

10. The pop-top roof assistance accessory of claim 2, wherein the proximal handle comprises a straight bar orthogonally connected to a proximal end of the elongate bar.

11. The pop-top roof assistance accessory of claim 2, wherein the proximal handle comprises side handle portions extending from opposite sides of the elongate bar.

12. The pop-top roof assistance accessory of claim 1, further comprising a separate attachment configured for lowering the pop-top roof lifting mechanism, the attachment comprising:

a handle bar engaging channel configured to attach to the handle bar;

an elongate bar engaging channel configured to attach to the elongate bar; and

a stem connecting the handle bar engaging channel and the elongate bar engaging channel.

13. The pop-top roof assistance accessory of claim 12, wherein the handle bar engaging channel is configured to capture the handle bar on three sides and the elongate bar engaging channel is configured to capture the elongate bar on three sides.

14. The pop-top roof assistance accessory of claim 13, wherein the stem holds the handle bar engaging channel orthogonally with respect to the elongate bar engaging channel and at an angle with respect to the elongate bar engaging channel.

15. A method of raising a pop-top roof of a caravan or similar vehicle, the roof being associated with a pop-top roof lifting mechanism including a pivot bar interconnecting roof lifting arms and a handle bar pivotally engaged with the pivot bar, the method comprising:

attaching the distal connector of the accessory of claim 1 to the pivot bar;

positioning the elongate bar beneath the handle bar; and

applying an upward force to the proximal handle to urge the handle bar upwardly, thereby raising the lifting mechanism and the roof.

16. The method of claim 15, wherein attaching the distal connector comprises inserting the distal connector behind a front portion of the handle bar and lifting the distal connector into engagement with the pivot bar.

17. The method of claim 15, wherein the distal connector engages the pivot bar within a channel defined by walls of the distal connector, the channel capturing the pivot bar on three sides during raising of the roof.

18. The method of claim 15, wherein the elongate bar is curved between a distal portion and a proximal portion, and applying the upward force to the proximal handle is performed from beneath the handle bar to provide improved mechanical advantage.

19. The method of claim 15, further comprising pushing the proximal handle forward when an obstruction prevents full upward travel of the proximal handle, wherein the distal connector transmits a pushing force along the elongate bar to fully open the lifting mechanism.

20. A method of lowering a pop-top roof of a caravan or similar vehicle, the roof being associated with a pop-top roof lifting mechanism including a pivot bar and a handle bar pivotally engaged with the pivot bar, the method comprising:

attaching the attachment of claim 12 between the handle bar and the elongate bar of the accessory of claim 1; and

applying a downward force to the proximal handle to urge the handle bar downward relative to the pivot bar, thereby lowering the lifting mechanism and the roof in a controlled manner.

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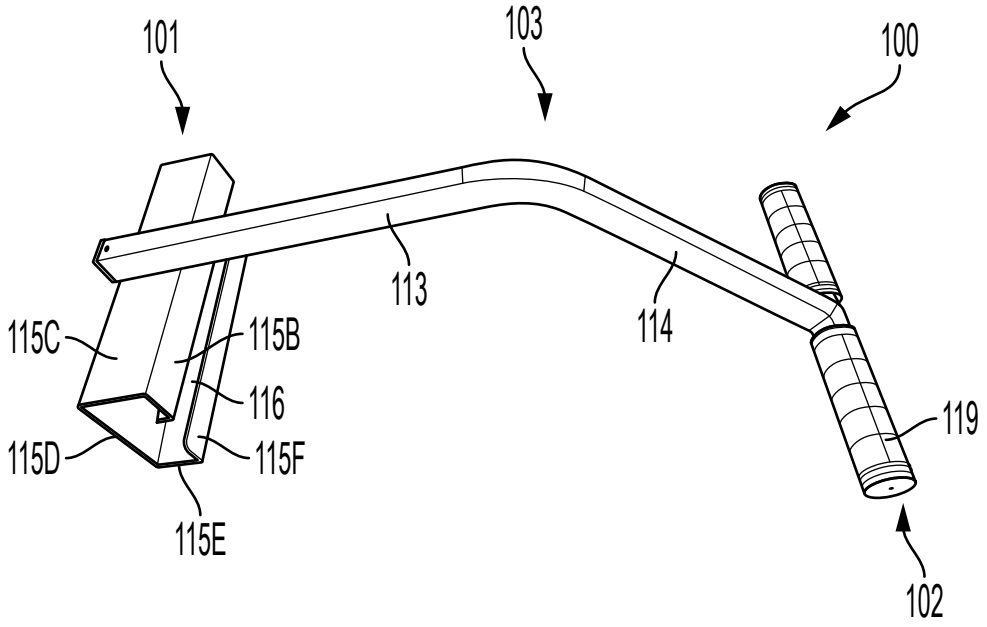

FIG. 1

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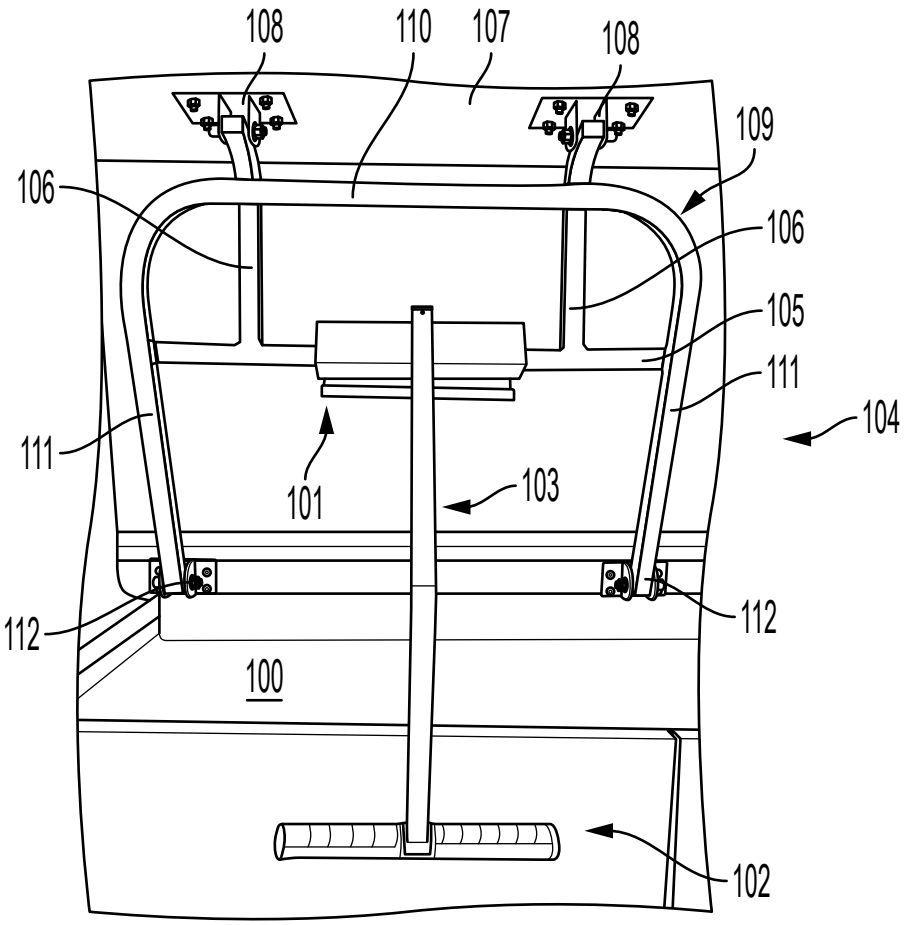

FIG. 2

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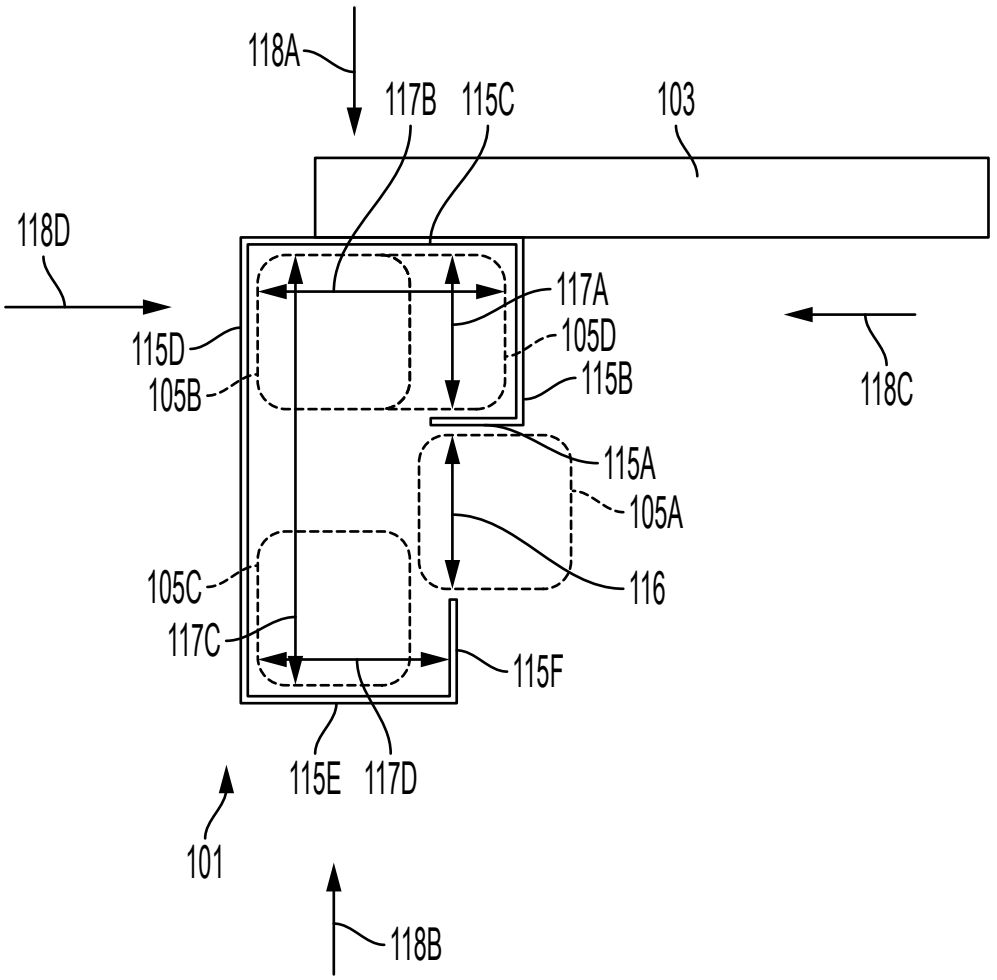

FIG. 3

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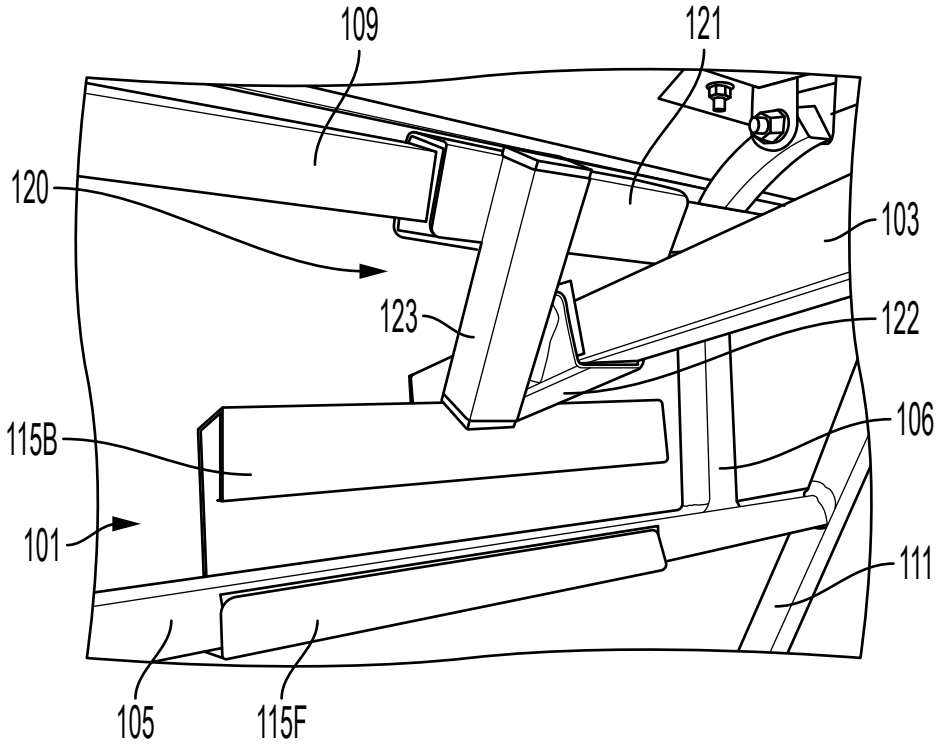

FIG. 4