ARMORED SPLIT HATCH

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ABSTRACT

A split hatch with armored hatch leaves that are positioned to shield occupants standings in the hatch opening when the hatch is opened. The hatch leaves can be fixed at different angles to provide improve protection from different threats. The armored hatch leafs are oversized to engage the hatch opening in an overlapping conformation to prevent passage of nuclear, biological or chemical contaminants from entering the vehicle between the leaves and the edge of the hatch opening. A seal assembly overlaps the edges of the leaves to prevent contaminants from entering the vehicle between the leaves themselves.
ARMORED SPLIT HATCH

RELATED APPLICATION

[0001] The present application claims the benefit of U.S. Provisional Application No. 61/664,366, entitled ARMORED SPLIT HATCH and filed Jun. 26, 2012, which is incorporated herein in its entirety by reference.

FIELD OF THE INVENTION

[0002] The present invention is generally directed to a split hatch having armored leaves that can be positioned to shield the hatch opening or occupants standing in the hatch opening. Specifically, the present invention is directed to an armored split hatch having armored leaves shaped to provide side protection for occupants and the hatch opening when open and sealable to prevent nuclear, biological or chemical (“NBC”) penetration through the hatch when closed.

BACKGROUND OF THE INVENTION

[0003] Armored vehicles often comprise armored hatches for accessing the interior of the vehicle through a hatch opening when the hatch door is open while preventing ballistic threats from entering through the hatch opening when the hatch door is closed. However, hatch doors typically comprise little or no armor to reduce the weight of the door for easier movement of the hatch doors. The minimally armored hatch doors provide less ballistic protection than the surrounding armor. Accordingly, hatches are often placed on the top of the armored vehicle rather than on the sides of the vehicle where most ballistic threats are directed. Placing hatches on the roof also provides the added benefit of allowing occupants of the vehicle to stand in the open hatch opening during operation of the hatch opening to provide greater visibility when operating the vehicle. As the view ports or cameras used by operators often provide a limited field of view, operating the vehicle while standing in the hatch opening is often preferred when not in direct combat as providing a significantly greater field of view. A top hatch also allows occupants to operate roof mounted equipment or weapons while standing within the hatch opening.

[0004] An inherent drawback of top hatches is that the greater visibility provided by standing in the top hatch exposes the portion of the occupant’s body protruding from the hatch opening to ballistic threats. In addition, the portion of the occupant’s body protruding from the hatch opening is often silhouetted presenting an easier target for attackers. When open, the hatch door is typically folded against the roof of the vehicle or otherwise positioned to prevent obstructing the operator’s vision or operation of roof mounted equipment or weapons. However, this positioning of the hatch door increases the potential directions from which the occupant can be targeted when standing the hatch opening. In particular, the occupant is particularly susceptible to threats directed at the occupant from the sides of the vehicle where attackers are likely positioned and have an ideal target due to the silhouetting of the occupant’s body.

[0005] A common hatch type is a single hinged sweep hatch in which the hatch door is elevated and rotated in a plane parallel to the hatch opening between a closed position in which the door is aligned with the hatch opening and an open position in which the door is rotated out of alignment with the hatch opening. While the sweep hatch allows the hatch door to be easily rotated out of the way for unobstructed ingress/egress through the hatch opening, the parallel position of the sweep hatch relative to the roof of the vehicle leaves an operator standing within the hatch opening completely exposed to ballistic threats. Another common hatch type is a single rear hinge hatch in which the hatch door rotates along an axis parallel to the plane of the hatch opening to open and close the hatch as shown in FIG. 1. When in the open position, the hatch door is often positioned in a generally vertical orientation providing limited protection from ballistic threats from a single direction. However, the hatch door provides no protection from threats travelling from other directions.

[0006] Similarly, split hatches have multiple door leaves that when opened can shield the operator from ballistic threats coming from multiple directions. However, an inherent tradeoff with split hatches is that the multiple leaves create additional gaps in the closed door through which NBC contaminants can enter the interior of the vehicle. Unlike single door hatches which present a continuous hatch surface with a gap along the periphery of the closed hatch, the interface between the leaves when rotated into the closed position provide potential gaps across the hatch increasing the likelihood that NBC contaminants will enter into the interior of the vehicle. Accordingly, the increased ballistic protection provided by the leaves of split hatches necessarily increases the risk of NBC contaminants penetrating the hatch.

[0007] As such, there is a need for a means of providing effective ballistic protection for occupants operating the vehicle while standing in the hatch opening without substantially compromising the NBC protection of the hatch when the hatch is closed.

SUMMARY OF THE INVENTION

[0008] The present invention is directed to a split hatch assembly mountable to a hatch opening and having a plurality of armored door leaves each having an open/close assembly for rotating the corresponding leaf between a substantially upright open position and a generally horizontal closed position. Each open/close assembly can further comprise a hook element having a primary hook portion engageable to a latch pin to maintain the armored leaves in the open position. The hook element can lock the corresponding armored hatch leaf in the upright open position to prevent the armored hatch leaf from inadvertently rotating closed or forced closed from ballistic impacts. Each hook element further comprises a secondary hook portion that can be engaged to the latch pin instead of the primary hook portion, wherein the secondary hook portion maintains the armored hatch leaf in an intermediate position between the open position and the closed position. The hook element can be fully disengaged from the locking pin to allow the door leaf to rotate into the closed position.

[0009] In the open position, each door leaf can be oriented in a substantially upright orientation providing protection from threats directed at the occupants standing within the hatch opening. In certain embodiments, each door leaf can be oriented outward from the center of the hatch opening to maintain the side protection for the operator while providing clearance for the occupant to move within the hatch opening and operate roof mounted equipment or weapons. In the closed position, the plurality of door leaves can be positioned in a substantially horizontal orientation over the hatch opening and cooperate to cover the entire hatch opening. In the intermediate position, the plurality of leaves are angled inward toward the center of the hatch opening to shield occupants...
from ballistic threats directed at the sides of the vehicle as well as ballistic threats directed downwardly toward the hatch opening.

In certain embodiments, the plurality of leaves can comprise a pair of armored leaves positioned on opposing sides of the opening such that one leaf is positioned on either side of the occupant to protect the operator from ballistic threats directed at the sides of the vehicle. The leaves can be contoured to follow the shape of a circular or partially rounded hatch opening to minimize the footprint of the hatch when closed. The leaves can also comprise generally rectangular shapes increasing the effective area of the armored hatch leaf, thereby improving protection of the operator. In other embodiments, each leaf can comprise a substantially flat front edge and a contoured rear edge, wherein the flat edge can be oriented toward the front of the vehicle. In this configuration, the flat front edge of the leaf can maximize protection for occupants from threats directed from the front of the vehicle where threats are most likely to originate. Similarly, the rounded back edge of the leaf can minimize the foot print of the hatch assembly on the rear of the vehicle to provide more roof space for roof top mounted equipment or weapons.

In one aspect, the door leaves are sized to have a greater combined area than the size of the hatch opening such that the leaves extend beyond the edges of the hatch opening when rotated into the closed position. The overlap between the oversized leaves and the edges of the hatch opening to reduce the likelihood that the NBC contaminants can exploit gaps between the leaves and the hatch opening when the hatch is closed to enter the vehicle. In certain embodiments, a flexible seal can be positioned at the intersection of the leaves and edges of the hatch opening, wherein the seal is compressed between the leaves and edges of the hatch opening as the leaves are rotated into the closed position further prevent NBC contaminants from passing between the leaves and the edges of the hatch opening.

In one aspect, each leaf can comprise a seal portion engagable to an adjacent leaf. The seal portion overlaps with the adjacent leaf to reduce the likelihood that NBC contaminants can exploit the gap between the leaves and the edges of the hatch opening when the hatch is closed. In certain embodiments, the seal portion can also comprise a flexible seal positioned at the intersection of the leaves and edges of the hatch opening, wherein the seal is compressed between the seal portion and the adjacent leaf as the leaves are rotated into the closed position further prevent NBC contaminants from passing between the leaves.

A split hatch assembly for selectively sealing a hatch opening, according to an embodiment of the present invention, can comprise a plurality of armored hatch leaves each having a hinge receivable within a pivot portion of an open/close assembly for rotating each leaf between a generally horizontal closed position and a generally upright open position. Each open/close assembly further comprises a hook element operably engaged to the leaf and a fixed latch pin, wherein the hook portion is movable with the leaf as the leaf is rotated between the open position and the closed position. The hook element comprises a primary hook portion and a secondary hook portion, wherein the primary hook portion is engagable to the fixed latch pin when the leaf is positioned in the open position and the secondary hook portion is engagable to the fixed latch pin when the leaf is positioned in an intermediary position between the open position and the closed position. In certain embodiments, each open/close assembly further comprises a handle operably engaged to the hook element for rotating the hook element independently of the leaf to disengage the hook element from the latch pin.

In one embodiment, each leaf can comprise at least one contoured edge along at least a portion of the periphery of the leaf, wherein the contoured portion of the leaf is shaped to follow the contours of the hatch opening to minimize the footprint of the leaf on the top of the vehicle when the leaf is rotated into the closed position. In another embodiment, each leaf may define at least one flat edge along at least a portion of the periphery of the leaf, wherein the flat edge is not shaped to follow the contours of the hatch opening and maximizes the effective area of the leaf increasing the protection provided by the leaf. In another embodiment, each leaf may comprise at least one contoured edge and at least one flat edge, wherein the flat edge is positioned on the leaf to maximize protection from directions from which the risk of ballistic threats is high and wherein the contoured edge is positioned on the leaf to minimize the footprint of the leaf on sides of the leaf corresponding to directions from which the risk of ballistic threats is low.

In one embodiment of the present invention, the leaves are sized such that the combined area of the plurality of the hatch opening is greater than the area of the hatch opening. In this configuration, a portion of each leaf overlaps with a corresponding portion of the edges of the hatch opening when the leaves are rotated into the closed position. The overlapping orientation eliminates any potential direct path between the leaves and the edge of the hatch opening perpendicular to the plane of the hatch opening. The circuitous path formed by the overlapping leaves and hatch opening reduces the likelihood that NBC contaminants will penetrate the vehicle through an imperfect seal between the hatch opening and the leaves.

In certain embodiments, each leaf can further comprise a seal portion positioned to overlap with an adjacent leaf such that the seal portion extends between the leaves to eliminate any potential direct path between the leaves perpendicular to the plane of the hatch opening. The overlapping portion is affixed to the first leaf such a portion of the overlapping portion extends outwardly from the edge of the first leaf such that overlapping portion covers the interface between the leaves. As with the oversized leaves, the circuitous path formed by the overlapping portion reduces the likelihood that NBC contaminants will penetrate the vehicle through an imperfect seal between the closed leaves.

In certain embodiments, each open/close mechanism can comprise a mechanical or motorized system for compensating for the weight of the armor paneling as the armored hatch leaf is rotated between the closed position and open position. In certain embodiments, each leaf further comprises at least one armor panel preventing ballistic threats from penetrating through the leaf such that the leaf can serve as a ballistic shield.

The above summary of the various representative embodiments of the invention is not intended to describe each illustrated embodiment or every implementation of the invention. Rather, the embodiments are chosen and described so that others skilled in the art can appreciate and understand the principles and practices of the invention. The figures in the detailed description that follow more particularly exemplify these embodiments.
BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The invention can be completely understood in consideration of the following detailed description of various embodiments of the invention in connection with the accompanying drawings, in which:

[0020] FIG. 1 is a perspective view of a representative rear hinge hatch.

[0021] FIG. 2 is a top view of a representative armored vehicle for use with the present invention.

[0022] FIG. 3 is a front perspective view of a split hatch according to an embodiment of the present invention, wherein the hatch is opened.

[0023] FIG. 4 is a rear perspective view of the split hatch depicted in FIG. 3.

[0024] FIG. 5 is a partially exploded front perspective view of a split hatch according to an embodiment of the present invention, wherein the hatch is closed.

[0025] FIG. 6 is an exploded front perspective view illustrating assembly of a split hatch according to an embodiment of the present invention to a representative hatch opening.

[0026] FIG. 7 is a partial cross-sectional perspective view of a lock assembly according to an embodiment of the present invention.

[0027] FIG. 8 is a side view of a hook for a lock assembly according to an embodiment of the present invention.

[0028] FIG. 9 is a partial cross-sectional side view of a lock assembly according to an embodiment of the present invention illustrating locking the leaf in the open position.

[0029] FIG. 10 is a partial cross-sectional side view of a lock assembly according to an embodiment of the present invention illustrating locking the leaf in the intermediate position.

[0030] FIG. 11 is a partial cross-sectional side view of a leaf according to an embodiment of the present invention.

[0031] While the invention is amenable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the invention to the particular embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE DRAWINGS

[0032] As shown in FIGS. 1-2, a vehicle 10 for use with the present invention comprises an exterior 12 having at least one hatch opening 14 on the top of the vehicle 10 for accessing the interior of the vehicle 10. As depicted, the exterior 12 comprises a plurality of armor paneling shielding the interior of the vehicle. The hatch opening 14 can comprise a circular opening, a contoured opening as depicted in FIG. 1, a rectangular opening or other conventional hatch opening shape. The description of the armor vehicle 10 is not intended to be limiting, but rather to aid in the description of the present invention.

[0033] As shown in FIGS. 3-6, a hatch assembly 20, according to an embodiment of the present invention, comprises a first hatch leaf 22 having a hinge 23 receivable within a pivot portion 25 of a corresponding first open/close assembly 24 and also comprises a second hatch leaf 26 having a hinge 27 receivable within a pivot portion 29 of a corresponding second open/close assembly 28. In other embodiments, the hatch assembly 20 can comprise additional hatch leaves each with a corresponding open/close assembly. In certain embodiments, each hatch leaf 22, 26 comprises an armored panel 29. Generally, the open/close assemblies 24, 28 rotate the corresponding hatch leaf 22, 26 between a substantially horizontal closed position and a generally upright open position. As depicted in FIGS. 5 and 6, in the closed position, the hatch leaf 22, 26 is positioned over the hatch opening 14, wherein the first hatch leaf 22 and the second hatch leaf 26 cooperate to cover the entire hatch opening 14. As depicted in FIGS. 5 and 6, in the open position, the first hatch leaf 22 and the second hatch leaf 26 extend vertically and positioned in substantially parallel orientation. In certain embodiments, the first hatch leaf 22 and the second hatch leaf 26 are angled outward from the hatch opening 14 when positioned in the open position.

[0034] As shown in FIGS. 3-4, in certain embodiments, each leaf 22, 26 further comprises a counteredge 36 shaped to follow the contours of the hatch opening 14. The counteredge 36 minimizes the footprint of the leaves 22, 26 when rotated into the closed position. In another aspect, each leaf 22, 26 further comprises a flat edge 38 that does not follow the contours of the hatch opening 14. The flat edge 38 maximizes the protection provided by the leaf 22, 26 when rotated into the open position. In certain embodiments, each leaf 22, 26 further comprises a counteredge 36 and a flat edge 38 to maximize protection in directions where threats are most likely while minimizing the footprint of the vehicle in areas where protection is less critical.

[0035] As shown in FIGS. 3-4, each hatch leaf 22, 26 can be sized such that the combined area of the hatch leaves 22, 26 is greater than the area of the hatch opening 14. In this configuration, the hatch leaves 22, 26 overlap with the edges of the hatch opening 14 when the hatch leaves 22, 26 are rotated into the closed position. Similarly, in certain embodiments, the hatch assembly 20 can further comprise a seal portion 32. The seal portion 32 comprises an overlapping portion 34 affixed to the first hatch leaf 22, wherein a portion of the overlapping portion 34 extends from the first hatch leaf 22. In operation, when the hatch leaves 22, 26 are rotated into the closed position the extending portion of the overlapping portion 34 extends over the corresponding edge of the second hatch leaf 22 as depicted in FIGS. 5-6. In certain embodiments, each hatch leaf 22, 26 can comprise a seal portion 32 engageable to a corresponding edge of the adjacent hatch leaf 22. The oversized leaves 22, 26 and the overlapping portion 34 of the first hatch leaf 22, 26 eliminate direct linear paths through the hatch assembly 20 between the leaves 22, 26 themselves and the leaves 22, 26 and edge of the hatch opening 14. The circuitous routes formed by the overlapping configuration minimize the potential for gaps that could form between the components as the leaves 22, 26 are closed. In one aspect, the seal assembly 32 can further comprise a secondary protrusion 48 positioned on the second leaf 26 engageable to a corresponding detent 50 in the overlapping portion 34 to further prevent NBC contaminants from entering between the leaves 22, 26.

[0036] Each open/close assembly 24, 28 comprises mechanical or motorized systems for positioning the corresponding hatch leaf 22, 26. The mechanical or motorized systems offset the weight of the armored hatch leaf 22, 26 and the armor panel 29 allowing for easier manual positioning of the leaf 22, 26. The leaves 22, 26 can each further comprise at least one handle 30 for manually positioning the leaves 22,
26. In certain embodiments, each open/close assembly 24, 28 comprises a spring 31 biasing the hinge 23, 27 toward the open position to reduce the perceive weight of the leaves 22, 26 as the leaves 22, 26 are rotated into the open position.

[0037] In operation, the open/close assemblies 24, 28 each rotate the corresponding leaf 22, 26 around an axis parallel to the plane defined by the hatch opening 14 between a closed position and an open position. In the closed position, the leaves 22, 26 are aligned in a plane parallel to the plane of the hatch opening 14. In the open position, the leaves 22, 26 are positioned generally perpendicular to the plane of the hatch opening 14. The axis of rotation for each leaf 22, 26 is opposite sides of the hatch opening 14 such that the leaves 22, 26 are positioned in parallel on both sides of hatch opening 14 when rotated into open position to provide ballistic protection from at least two opposing directions. In one aspect, the axes of rotation can be aligned with roof mounted equipment or weapon such that an occupant can operate the equipment or weapon will protected on either side by the leaves 22, 26.

[0038] As shown in FIGS. 3-6, in certain embodiments of the present invention, the hatch assembly 20 can further comprise a mounting plate 40 for affixing the hatch assembly 20 to the vehicle 10. In this configuration, the open/close assemblies 24, 28 are affixed to the mounting plate 40 such that the entire hatch assembly 20 can be affixed as an integrated assembly. The mounting plate 40 defines a hatch opening 42 aligned with the hatch opening 14. The hatch opening 42 can be of the same size and shape as the hatch opening 14 or comprise a different size or shape than the hatch opening 14. In one aspect, the hatch assembly 20 can further comprise at least one pass through interface 44 for allowing electrical systems or mount points to be accessed through the mounting plate 40. In one aspect, the hatch assembly 20 can further comprise an armored cover 52 for protecting the pass through interface 44.

[0039] As shown in FIG. 7, each open/close mechanism 24, 28 can each further comprise a lock assembly 54 for maintaining corresponding leaf 22, 26 in the open position or at an intermediate position as the leaf 22, 26 between the open position and the closed position. As shown in FIG. 10, the intermediate position corresponds to an angled position in which the leaves 22, 26 are oriented inward toward the center of the hatch opening 14. The lock assembly 54 can further comprise a fixed latch pin 56, a hook element 58, and a handle 60. The latch pin 56 is affixed to the open/close mechanism 24, 28 such that the latch pin 56 remains in a fixed position regardless of the rotation of the leaf 22, 26. As shown in FIG. 8, the hook 58 can further comprise a primary hook portion 62 and a secondary hook portion 64. The primary hook portion 62 is positioned to engage the latch pin 56 when the leaf 22, 26 is positioned in the open position. The secondary hook portion 64 is positioned to engage the latch pin 56 when the leaf 22, 26 is positioned in the intermediate position. In certain embodiments, the latch pin 56 is movable to alter the intermediate position of the hatch leaf 22, 26.

[0040] As shown in FIGS. 8-11, the hook element 58 is rotatably mounted to the leaf 22, 26 such that the hook 58 can be rotated independently of the leaf 22, 26 by the handle 60. As the leaf 22, 26 is rotated into the open position, the primary hook portion 62 engages the latch pin 56 to prevent the leaf 22, 26 from rotating toward the closed position. The weight of the leaf 22, 26 maintains the latch pin 56 within the primary hook portion 62. Rotating the leaf 22, 26 past the open position disengages the latch pin 56 from the open position slot 62 at which point the hook 58 is rotated by the handle 60 such that the primary hook portion 62 is rotated out of alignment from the latch pin 56. In one aspect, the lock assembly 54 can further comprise a spring 66 for biasing the hook 58 such that the primary hook portion 62 and secondary hook portion 64 are in alignment with the latch pin 56. The leaf 22, 26 can then be rotated toward the closed position until the latch pin 56 is engaged by the secondary hook portion 64. The secondary hook portion 64 is positioned on the hook 58 such that the hook 58 engages the latch pin 56 when the leaf 22, 26 has rotated a predetermined distance. In one aspect, the secondary hook portion 64 is positioned such that the leaf 22, 26 is engaged when the leaf 22, 26 has travelled about 35 degrees.

[0041] While the invention is amenable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and described in detail. It is understood, however, that the intention is not to limit the invention to the particular embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

1. An armored split hatch for selectively sealing a hatch opening of a vehicle, comprising:
a plurality of armored hatch leaves, each hatch leaf further comprising a hinge and a hook element having a primary hook portion and a secondary hook portion, wherein each hatch leaf is rotatable around the corresponding hinge between a generally horizontal closed position and a generally upright open position; and
a plurality of open/close assemblies positioned proximate the hatch opening, each open/close assembly further comprising a fixed latch pin and a pivot portion for rotatably receiving the hinge of the corresponding armored hatch leaf;
wherein each hook element is positioned on the corresponding hatch leaf to releasably engage the latch pin with the primary hook portion when the hatch leaf is rotated into the open position to prevent rotation of the hatch leaf into the closed position.

2. The armored split hatch of claim 1, wherein the hook element is rotatable between an engaging position in which the hook element is engageable to the latch pin and a disengaged position in which the hook element is rotated out of alignment with the hook element.

3. The armored split hatch of claim 2, wherein the hook element further comprises a handle for manually rotating the hook element

4. The armored split hatch of claim 1, wherein the secondary hook portion is engageable to the hatch pin to retain the hatch leaf in an intermediate position between the open position and the closed position.

5. The armored split hatch of claim 1, wherein each open/close assembly comprises a spring biasing the hatch leaf to the open position assisting the rotation of the hatch leaf from the closed position to the open position.

6. The armored split hatch of claim 1, wherein each hatch leaf comprises at least one armored panel.

7. The armored split hatch of claim 1, wherein each hatch leaf comprises a semicircle shape comprising a circular edge and a flat edge, wherein the flat edge of the hatch leaf engages the flat edge of an opposing hatch leaf when the hatch leaves are rotated into the closed position.
8. The armored split hatch of claim 1, wherein each hatch leaf comprises a contoured edge and at least two flat edges, wherein one of the flat edges of the hatch leaf engages one of the flat edges of an opposing hatch leaf when the hatch leaves are rotated into the closed position.

9. The armored split hatch of claim 1, wherein each hatch leaf engages adjacent hatch leaves to define a continuous surface having a surface area greater than the area of the hatch opening.

10. The armored split hatch of claim 1, wherein at least one hatch leaf comprises a sealing portion positioned to overlap with an adjacent hatch leaf when the hatch leaves are rotated into the closed position.

11. An armored split hatch for selectively sealing a hatch opening of a vehicle, comprising:

a first hatch leaf and a second hatch leaf, each hatch leaf further comprising a hinge and a hook element having a primary hook portion and a secondary hook portion, wherein each hatch leaf is rotatable around the corresponding hinge between a generally horizontal closed position and a generally upright open position; and

a first open/close assembly corresponding to the first hatch leaf and a first open/close assembly corresponding to the second hatch leaf, wherein the first and second open/close assemblies are positioned on opposite sides of the hatch opening such that the first hatch leaf and second hatch leaf are generally parallel when rotated into the open position, each open/close assembly further comprising a fixed latch pin and a pivot portion for rotatably receiving the hinge of the corresponding armored hatch leaf;

wherein each hook element is positioned on the corresponding hatch leaf to releasably engage the latch pin with the primary hook portion when the hatch leaf is rotated into the open position to prevent rotation of the hatch leaf into the closed position.

12. The armored split hatch of claim 11, wherein each hook element is rotatable between an engaging position in which the hook element is engageable to the corresponding latch pin and a disengaged position in which the hook element is rotated out of alignment with the hook element.

13. The armored split hatch of claim 12, wherein each hook element further comprises a handle for manually rotating the hook element.

14. The armored split hatch of claim 11, wherein the secondary hook portion is engageable to the latch pin to retain the hatch leaf at an intermediate position between the open position and the closed position.

15. The armored split hatch of claim 11, wherein each open/close assembly comprises a spring biasing the hatch leaf to the open position assisting the rotation of the hatch leaf from the closed position to the open position.

16. The armored split hatch of claim 11, wherein each hatch leaf comprises at least one armored panel.

17. The armored split hatch of claim 11, wherein each hatch leaf comprises a semicircle shape comprising a circular edge and a flat edge, wherein the flat edge of the hatch leaf engages the flat edge of an opposing hatch leaf when the hatch leaves are rotated into the closed position.

18. The armored split hatch of claim 11, wherein each hatch leaf comprises a contoured edge and at least two flat edges, wherein one of the flat edges of the hatch leaf engages one of the flat edges of an opposing hatch leaf when the hatch leaves are rotated into the closed position.

19. The armored split hatch of claim 11, wherein the first hatch leaf engages the second hatch leaf to define a continuous surface having a surface area greater than the area of the hatch opening.

20. The armored split hatch of claim 11, wherein the first hatch leaf comprises a sealing portion positioned to overlap with the second hatch leaf when the hatch leaves are rotated into the closed position.