

SEAT-BACK TABLE

Technical Field

[0001] Embodiments relate generally to a seat-back table, a seat-back and a
5 method of manufacturing of a seat-back table.

Background

[0002] Tray tables for aircraft seating systems are predominantly stowed in the
seat-back of a passenger seat. Typically, the In-Flight Entertainment (IFE) system is
10 also installed in the seat-back of the passenger seat. However, as technology
advances, the demand of the passengers for better IFE systems with bigger monitors
and better interface devices, as well as the demand for more interactive IFE systems
that allows hooking up or connecting with the passengers' personal electronic devices
are on the rise. This rising trend has put a strain on the airlines to find ways to
15 maximize the use of the limited space on the seat-back so as to satisfy the rising
demands of the passengers.

[0003] Accordingly, example embodiments seek to provide a seat-back table, a
seat-back and a method of manufacturing of a seat-back table that addresses at least
some of the issues identified above.

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Summary

[0004] According to various embodiments, there is provided a seat-back table.
The seat-back table may include a table top and a coupling member. The coupling
member may be configured to pivotably couple the table top to a back of a passenger
25 seat. The table top may be configured to be collapsible into a folded state and
expandable into an unfolded state. The table top may be further configured such that
an area of a greatest exposed surface of the table top in the folded state may be less
than half of an area of the table top in the unfolded state for increasing a disposable
space on the back of the passenger seat.

30 [0005] According to various embodiments, there is provided a seat-back including
a seat-back body and a seat-back table of the various embodiments. The seat-back
table may be pivotably coupled to the seat-back body.

[0006] According to various embodiments, there is provided a method of manufacturing a seat-back table. The method may include providing a table top. The method may further include providing a coupling member configured to pivotably couple the table top to a back of a passenger seat. The method may further include
 5 configuring the table top to be collapsible into a folded state and expandable into an unfolded state. The method may also include configuring the table top such that an area of a greatest exposed surface of the table top in the folded state may be less than half of an area of the table top in the unfolded state for increasing a disposable space on the back of the passenger seat.

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Brief description of the drawings

[0007] In the drawings, like reference characters generally refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead generally being placed upon illustrating the principles of the invention. In the
 15 following description, various embodiments are described with reference to the following drawings, in which:

FIG. 1A to FIG. 1F show a seat-back table according to various embodiments;

FIG. 2 shows a seat-back table according to various embodiments;

FIG. 3 shows a seat-back table according to various embodiments;

20 FIG. 4 shows a seat-back table according to various embodiments; and

FIG. 5 shows a seat-back according to various embodiments.

Detailed description

[0008] Embodiments described below in context of the apparatus are analogously
 25 valid for the respective methods, and vice versa. Furthermore, it will be understood that the embodiments described below may be combined, for example, a part of one embodiment may be combined with a part of another embodiment.

[0009] It should be understood that the terms “on”, “over”, “top”, “bottom”, “down”, “side”, “back”, “left”, “right”, “front”, “lateral”, “side”, “up”, “down” etc.,
 30 when used in the following description are used for convenience and to aid understanding of relative positions or directions, and not intended to limit the orientation of any device, or structure or any part of any device or structure. In addition, the singular terms “a”, “an”, and “the” include plural referents unless context

clearly indicates otherwise. Similarly, the word “or” is intended to include “and” unless the context clearly indicates otherwise.

5 [0010] In recent years, a bi-fold tray table that folds in half, when stowed, has been used by airlines, as such tray table may free up space on the seat-back of a passenger seat of an aircraft for installing a variety of accessories to meet the passengers’ demand.

[0011] However, with further increase in the demand from passengers to install more accessories, more space in the seat-back are required and the bi-fold tray table may no longer be sufficient to free up the required space.

10 [0012] PCT International Publication Number WO 2013/142235 A1 discloses a foldable lap table. The foldable lap table includes 4 leaves with living hinges. However, the lap table can only be double folded at only one side of the lap table making it wobbly and uneven when folded. Thus, the lap table is unsuitable for attaching to a back of a passenger seat or to be firmly stowed in a back of a passenger seat.

[0013] Various embodiments seek to provide a seat-back table that may free up space on the seat-back of the passenger seat and that may not further compromise on the rigidity and stability of the seat-back table.

20 [0014] According to various embodiments, the seat-back table may have a uniform thickness when folded so as to be stably and firmly stowed in the back of the passenger seat. The uniform thickness may also allow the folded seat-back table to be evenly fitted into a recess in the back of the passenger seat such that the seat-back table may be flush with the back of the passenger seat when stowed.

25 [0015] According to various embodiments, the seat-back table may be configured to have significantly less surface area when stowed. Thus, freeing up more space at the seat-back of the passenger seat.

[0016] According to various embodiments, the seat-back table may provide the same usable surface area as the standard tray table when deployed, but occupy less space on the seat-back surface when stowed.

30 [0017] According to various embodiments, the seat-back table may occupy much less seat-back space at stowed position, for example having a trapezoidal or similar shape when stowed. According to various embodiments, an area of the space occupied by the seat-back table when stowed may be customised depending on the functions

and arrangement of accessories required at the seat-back by varying a dimension of the seat-back table.

[0018] According to various embodiments, the seat-back table may be configured such that the seat-back table may be folded in a manner similar to folding an Origami.

5 **[0019]** According to various embodiments, the seat-back table may include, but not limited to, 6 leaves and 6 hinges and may provide extra space at the seat-back by double folding at both sides of the seat-back table. According to various embodiments, the extra space provided may be more than 1.25 times of the standard bi-fold tray table.

10 **[0020]** According to various embodiments, by having more leaves and more hinges, for example having 6 of each, the seat-back table may include 2 sets of 2 minor leaves that may be folded and be concealed by the major leaves in the stowed position, resulting in significantly smaller surface area of the seat-back table with uniform thickness when folded for greater space saving of the seat-back, thus
15 maximising available utility of the seat-back area. This may also provide the seat-back table a symmetric appearance and aesthetic appeal. The symmetry and uniformity in thickness when folded may allow the folded seat-back table to be stably and securely stowed in the back of the passenger seat. According to various embodiments, the seat-back table may include triangular minor leaves that may be projected to the corners of
20 the seat-back table.

[0021] According to various embodiments, the seat-back table may include mechanical hinges, which may be advantages over living hinges. This may allow the seat-back table when unfolded to securely maintain its planar integrity without bending or sagging. It may also allow for manufacturing of the seat-back table with
25 various thickness so as to provide freedom of choice for the thickness. The mechanical hinges may also allow locking of the table leaves into position so as to maintain planar integrity and flatness of the seat-back table when deployed. The mechanical hinge may also allow better durability of the seat-back table, whereas living hinge may be more susceptible to wear and tear from passengers usage.

30 **[0022]** According to various embodiments, the seat-back table may be attached directly to and may be part of the back of the passenger seat allowing it to be stowed directly into the back of the passenger seat. Accordingly, the seat-back table may be part of or attached to the seat structure of the passenger seat and may not be a separate

component that acts as a miscellaneous stand alone table tray. Thus, the seat-back table need not be supported at all times by the user. Rather, the seat-back table may be supported by the seat structure resulting in enhanced convenience and the ability to consistently hold objects horizontally. Further, since the seat-back table is not a
 5 separate stand alone table, the risk of dropping it during flight along with the items and posing safety concerns may be low.

[0023] According to various embodiments, the seat-back table may set out to maximise the disposable space on the back of a passenger seat by minimising the surface area occupied by the seat-back table when stably and firmly stowed, and
 10 preferably flush with the surface of the back of the passenger seat for improved safety and aesthetics. According to various embodiments, the seat-back table may be applied in a seat system to optimize the space utilization. It may perform tray table function when deployed and may be stowed compactly and securely in the seat system.

[0024] FIG. 1A to FIG. 1F show a seat-back table 100 according to various
 15 embodiments. The seat-back table 100 may include a table top 110 having a coupling member 150. The coupling member 150 may be configured to be pivotably coupled to a seat-back of a passenger seat. The coupling member 150 of the table top 110 may be pivotably coupled to an arm 160 of the seat-back of the passenger seat so as to couple the table top 110 to the seat-back of the passenger seat. As shown, the
 20 coupling member 150 of the table top 110 may be coupled to two arms of the seat-back of the passenger seat.

[0025] According to various embodiments, the coupling member 150 may be attached to the table top 110 or integrally formed with the table top 110. Accordingly, the coupling member 150 may include a rod or a shaft attached to the table top 110 or
 25 a rod-like portion integrally formed with the table top 110. According to various embodiments, the arm 160 of the seat-back of the passenger seat may include a hole 162 for receiving an end 152 of the coupling member 150 such that the coupling member 150 may be pivotable within the hole 162 to pivot the table top 110 relative to the arm 160. According to various embodiments, a bearing may be received in the
 30 hole 162 of the arm and the end 152 of the coupling member 150 may be received in the bearing.

[0026] According to various embodiments, the table top 110 may be configured to be collapsible into a folded state and expandable into an unfolded state. In the folded

state, an area of a greatest exposed surface of the folded table top 110 may be less than half of an area of the table top 110 in the unfolded state. Accordingly, the table top 110 may be transformable between the folded state and the unfolded state. In the folded state, the table top 110 may be brought into a compact form by stacking parts of the table top 110 to lay over each other. In the unfolded state, the table top 110 may be spread or opened out such that a full extent of the table top 110 may be exposed for receiving items to be placed on the table top 110. Accordingly, when the table top 110 is folded into the compact form, the area of the greatest exposed surface of the folded table top 110 may be less than 50% of the area of the full extent of the unfolded table top 110. According to various embodiments, the area of the greatest exposed surface of the folded table top 110 may be less than 45%, or less than 40%, or less than 35% of the area of the full extent of the unfolded table top 110.

[0027] According to various embodiments, the table top 110 in the folded state may have a substantially uniform thickness. Accordingly, the table top 110 in the folded state may have an even thickness throughout such that the table top 110 may be stable, firm and compact for securely stowed in the seat-back of the passenger seat. This may prevent the folded table top 110 from vibrating, or wobbling excessively or accidental dislodgement from the seat-back of the passenger seat when the aircraft is experiencing air turbulent etc.

[0028] According to various embodiments, the table top 110 may include a plurality of table leaves with one or more discontinuities at respective boundaries between adjacent sides of two of the table leaves. Accordingly, each of the plurality of table leaves may be a separate piece from each other. Further, each of the plurality of table leaves may be place adjacent to two other table leaves such the plurality of table leaves may be pieced together to form the table top 110. According to various embodiments, the plurality of table leaves may be placed in a loop arrangement such that each of the plurality of table leaves may be adjacent to two other table leaves.

[0029] According to various embodiments, the seat-back table 100 may further include one or more separately formed hinges interconnecting the adjacent sides of two of the table leaves across the one or more discontinuities. Accordingly, the seat-back table 100 may include a plurality of hinges, for example mechanical hinges. Each hinge may include two flaps pivotable relative to each other and may be pivotable between a closed (0°) position and an opened or flat (180°) position. One of

the two flaps may be attached to one table leaf and the other of the two flaps may be attached to an adjacent table leaf such that the hinge may arrest the two table leaves in the flat position.

[0030] According to various embodiments, the table top 110 may be foldable along the one or more discontinuities to stack the plurality of table leaves such that the table top 110 in the folded state has a substantially uniform thickness. Accordingly, the table top 110 may be foldable to arrange and lay the plurality of table leaves one on another to bring the table top 110 into the compact form in the folded state. The plurality of table leaves may be arranged and laid in such a way that the table top 110 in the folded state may have an even thickness and may be stable and firmly stack together. According to various embodiments, two of the plurality of table leaves may be arranged and laid on one of the plurality of table leaves, and vice versa.

[0031] As shown in FIG. 1A and FIG. 1B, the table top 110 of the seat-back table 100 may include six table leaves 112, 114, 116, 118, 120, 122. The six table leaves 112, 114, 116, 118, 120, 122 may be arranged and joined along at least six joints 124, 126, 128, 130, 132, 134. Each of the at least six joints may be along respective discontinuities between the respective two adjacent table leaves. The six table leaves may include two trapezoid shaped table leaves 112, 118 and four right angled triangle shaped table leaves 114, 116, 120, 122.

[0032] As shown in FIG. 1C and FIG. 1D, the four right angled triangle shaped table leaves 114, 116, 120, 122 may be sandwiched between the two trapezoid shaped table leaves 112, 118 in the folded state of the table top 110. As shown, two 114, 116 of the four right angled triangle shaped table leaves may be sandwiched between first portions 136, 138 of the two trapezoid shaped table leaves 112, 118. Another two 120, 122 of the four right angled triangle shaped table leaves may be sandwiched between second portions 140, 142 of the two trapezoid shaped table leaves 112, 118. Accordingly, by stacking the six table leaves 112, 114, 116, 118, 120, 122 in the manner as described, the table top 110 in the folded state may have a substantially uniform thickness.

[0033] Referring back to FIG. 1A, there may be no mechanical hinge between the two main trapezoid shaped leaves, namely a first trapezoid shaped leaf 112 and a second trapezoid shaped leaf 118. Accordingly, the first trapezoid shaped leaf 112 and the second trapezoid shaped leaf 118 may be disconnected. Hence, there may be a

gap 115 between a first side 113 of a pair of parallel sides of the first trapezoid shaped leaf 112 and a first side 117 of a pair of parallel sides of the second trapezoid shaped leaf 118. The first side 113 of the pair of parallel sides of the first trapezoid shaped leaf 112 may be adjacent to the first side 117 of the pair of parallel sides of the second trapezoid shaped leaf 118. As shown in FIG. 1E, when the table top 110 is in the folded state, the gap 115 may be between the first trapezoid shaped leaf 112 and the second trapezoid shaped leaf 118.

[0034] Further, the first trapezoid shaped leaf 112 may be joined to a first right-angled triangle shaped leaf 114 along a first joint 124. The first joint 124 may be along the discontinuity between the first trapezoid shaped leaf 112 and the first right-angled triangle shaped leaf 114. The first right-angled triangle shaped leaf 114 may be joined to a second right-angled triangle shaped leaf 116 along a second joint 126. The second joint 126 may be along the discontinuity between first right-angled triangle shaped leaf 114 and the second right-angled triangle shaped leaf 116. The second right-angled triangle shaped leaf 116 may be joined to the second trapezoid shaped leaf 118 along a third joint 128. The third joint 128 may be along a discontinuity between the second right-angled triangle shaped leaf 116 and the second trapezoid shaped leaf 118. The second trapezoid shaped leaf 118 may be joined to a third right-angled triangle shaped leaf 120 along a fourth joint 130. The fourth joint 130 may be along the discontinuity between the second trapezoid shaped leaf 118 and the third right-angled triangle shaped leaf 120. The third right-angled triangle shaped leaf 120 may be joined to a fourth right-angled triangle shaped leaf 122 along a fifth joint 132. The fifth joint 132 may be along a discontinuity between the third right-angled triangle shaped leaf 120 and the fourth right-angled triangle shaped leaf 122. The fourth right-angled triangle shaped leaf 122 may be joined to the first trapezoid shaped leaf 112 along a sixth joint 134. The sixth joint 134 may be along a discontinuity between the fourth right-angled triangle shaped leaf 122 and the first trapezoid shaped leaf 112. Accordingly, each of the six table leaves 112, 114, 116, 118, 120, 122 may be joined to two other of the six table leaves 112, 114, 116, 118, 120, 122 such that the six table leaves 112, 114, 116, 118, 120, 122 may be joined into a loop arrangement.

[0035] As shown in FIG. 1A, a first lateral side 112a of a first trapezoid shaped table leaf 112 may be joined to a hypotenuse 114a of a first right-angled triangle

shaped table leaf 114 along a first joint 124. The first joint 124 may be pivotable such that the first trapezoid shaped table leaf 112 and the first right-angled triangle shaped table leaf 114 may be folded in a first direction to close respective top surfaces towards each other. A cathetus 114b of the first right-angled triangle shaped table leaf

5 114 may be joined to a cathetus 116a of a second right-angled triangle shaped table leaf 116 along a second joint 126. The second joint 126 may be pivotable such that the first right-angled triangle shaped table leaf and the second right-angled triangle shaped table leaf 116 may be folded in a second direction to close respective bottom surfaces towards each other. A hypotenuse 116b of the second right-angled triangle

10 shaped table leave 116 may be joined to a first lateral side 118a of a second trapezoid shaped table leaf 118 along a third joint 128. The third joint 128 may be pivotable such that second right-angled triangle shaped table leave 116 and the second trapezoid shaped table leaf 118 may be folded in the first direction to close respective top surfaces towards each other. A second lateral side 118b of the second trapezoid

15 shaped table leaf 118 may be joined to a hypotenuse 120a of a third right-angled triangle shaped table leaf 120 along a fourth joint 130. The fourth joint 130 may be pivotable such that the second trapezoid shaped table leaf 118 and the third right-angled triangle shaped table leaf 120 may be folded in the first direction to close respective top surfaces towards each other. A cathetus 120b of the third right-angled

20 triangle shaped table leaf 120 may be joined to a cathetus 122a of a fourth right-angled triangle shaped table leave 122 along a fifth joint 132. The fifth joint 132 may be pivotable such that the third right-angled triangle shaped table leaf 120 and the fourth right-angled triangle shaped table leave 122 may be folded in the second direction to close respective bottom surfaces towards each other. A hypotenuse 122b

25 of the fourth right-angled triangle table leaf 122 may joined to a second lateral side 112b of the first trapezoid shaped table leaf 112 along a sixth joint 134. The sixth joint 134 may be pivotable such that the fourth right-angled triangle table leaf 122 and the first trapezoid shaped table leaf 112 may be folded in the first direction to close respective top surfaces towards each other.

30 **[0036]** Advantageously, in the above arrangement, although there are six table leaves 112, 114, 116, 118, 120, 122, the planar integrity of the table top 110 may be maintained with minimal bending or sagging. This is because the shapes and the way of joining the first trapezoid shaped table leaf 112, the first right-angled triangle

shaped table leaf 114 and the fourth right-angled triangle shaped table leaf 122 may prevent bending or sagging with respect to each other. Similarly, the shapes and the way of joining the second trapezoid shaped table leaf 118, the second right-angled triangle shaped table leaf 116 and the third right-angled triangle shaped table leaf 120 may prevent bending or sagging with respect to each other. Thus, the planar integrity of the table top 110 may be maintained with minimal bending or sagging.

[0037] According to various embodiments, each joint 124, 126, 128, 130, 132, 134 may include at least one hinge 180. The at least one hinge 180 may be arranged to permit unison movement of the six table leaves 112, 114, 116, 118, 120, 122 when the table is folded and unfolded. According to various embodiments, the at least one hinge 180 may include a mechanical hinge. Each of the mechanical hinges may include two flaps pivotable relative to each other and may be pivotable between a closed (0°) position and an opened or flat (180°) position. One of the two flaps may be attached to one of the six table leaves 112, 114, 116, 118, 120, 122 and the other of the two flaps may be attached to another of the six table leaves 112, 114, 116, 118, 120, 122 that is adjacent to the one such that the hinge may arrest the two table leaves in the flat position. As shown in FIG. 1A and FIG. 1B, the mechanical hinges 180 of the first joint 124, the third joint 128, the fourth joint 130 and the sixth joint 134 may be on one surface of the table top 110 in the unfolded state, while the mechanical hinges 180 of the second joint 126 and the fifth joint 132 may be on an opposite surface of the table top 110 in the unfolded state. For example, the mechanical hinges 180 of the first joint 124, the third joint 128, the fourth joint 130 and the sixth joint 134 may be on a top surface of the table top 110 in the unfolded state, and the mechanical hinges 180 of the second joint 126 and the fifth joint 132 may be on a bottom surface of the table top 110 in the unfolded state.

[0038] As shown in FIG. 1C, to fold the table top 110 of the seat-back table 100, the top surface of the first trapezoid shaped table leaf 112 may be folded toward the top surface of the second trapezoid shaped table leaf 118. To close the respective top surfaces of the first trapezoid shaped table leaf 112 and the second trapezoid shaped table leaf 118 towards each other, the second joint 126 and the fifth joint 132 may be pushed up such that the respective bottom surfaces of the first right-angled triangle shaped table leaf 114 and the second right-angled triangle shaped table leaf 116 may be closed towards each other, as well as the respective bottom surfaces of the third

right-angled triangle shaped table leaf 120 and the fourth right-angled triangle shaped table leaf 122 may be closed towards each other. At the same time, the first joint 124 may cause the respective top surfaces of the first trapezoid shaped table leaf 112 and the first right-angled triangle shaped table leaf 114 to close towards each other. The
 5 third joint 128 may cause the respective top surfaces of the second right-angled triangle shaped table leaf 116 and the second trapezoid shaped table leaf 118 to close towards each other. The fourth joint 130 may cause the respective top surfaces of the third right-angled triangle shaped table leaf 120 and the second trapezoid shaped table leaf 118 to close towards each other. The sixth joint 134 may cause the respective top
 10 surfaces of the fourth right-angled triangle shaped table leaf 122 and the first trapezoid shaped table leaf 118 to close towards each other.

[0039] Accordingly, the first right-angled triangle shaped table leaf 114, the second right-angled triangle shaped table leaf 116, the third right-angled triangle table leaf 120 and the fourth right-angled triangle table leaf 122 may be folded in between
 15 the first trapezoid shaped table leaf 112 and the second trapezoid shaped table leaf 118.

[0040] FIG. 1D shows the table top 110 of the seat-back table 100 in the folded state. In the folded state, a greatest exposed surface 140 of the folded table top 110 may adopt the shape of the trapezoid shaped table leaf 112, 118. Accordingly, an area
 20 of the greatest exposed surface 140 of the folded table top 110 may be less than half of an area of the full extent of the table top 110 in the unfolded state as shown in FIG. 1A. The folded table top 110 may also have a substantially uniform thickness. Further, as shown in FIG. 1D, the folded table top 110 may be pivoted relative to the arm 160 of the seat-back table 100 such that the folded table top 110 may close
 25 towards the seat-back 102 of the passenger seat 104 such that the folded table may be stowed in the seat-back 102 of the passenger seat 104. According to various embodiments, the table top 110 in the folded state when stowed may free up disposable space 190 in the seat-back 102 of the passenger seat 104.

[0041] According to various embodiments, the space occupied by the folded table
 30 top 110 in the stowed position may be customized by selecting appropriate dimensions for the respective table leaves. For example, the cathetus of the respective right-angled triangle shaped table leaves 114, 116, 120, 122 may be customized according to the desired space to be occupied by the folded table top 110.

[0042] According to various embodiments, the seat-back table 100 may be installed onto a seating system through the use of table arms 160, as shown in FIG. 1A to FIG. 1F. Accordingly, the seat-back table may include an arm 160. The first end 164 of the arm 160 may be pivotably coupled to the coupling member 150 of the table top 110 of the seat-back table 100. The second end 166 of the arm 160 may be configured to be coupled to the seat-back 102 of the seat 104.

[0043] FIG. 2 shows a seat-back table 200 according to various embodiments. As shown, the seat-back table 200 may include an independent cup holder 270 for usage in the stowed position. Accordingly, the cup holder 270 may be coupled to an exposed surface 242 of the table top 210 in the folded state.

[0044] FIG. 3 shows a seat-back table 300 according to various embodiments. As shown, the seat-back table 300 may include an indentation 372 for cup placement on a surface 344 of the table top 310 in the unfolded state. Accordingly, the surface 344 of the table top 310 in the unfolded state may include the indentation 372 for receiving a base of a cup.

[0045] FIG. 4 shows a seat-back table 400 according to various embodiments. As shown, the seat-back table 400 may be configured with sliding capability. Accordingly, the table top 410 of the seat-back table 400 may include a slider mechanism 490 between the coupling member 450 and the table top 410. The slider mechanism 490 may allow the table top 410 to be slidable relative to the coupling member 450. Accordingly, the table top 410 may be slidable relative to the arm 460 as well as the seat-back.

[0046] FIG. 5 shows a seat-back 502 of a passenger seat according to various embodiments. FIG. 5 illustrates one possible configuration of the space of the seat-back 502 derived from using the seat-back table 500 according to various embodiments.

[0047] As shown, the seat-back 502 may include a seat-back body 506 and a seat-back table 500 pivotably coupled to the seat-back body 506. The seat-back body 506 may include a recess 508 configured to receive the seat-back table 500 in the folded state. Further, the seat-back 502 may include a locking mechanism 509 configured to lock the seat-back table 500 in the folded state received in the recess 508 of the seat-back body 506. According to various embodiments, functional components and

accessories 507 may be installed in the freed-up disposable space of the seat-back body 506.

[0048] According to various embodiments, there may be provided a seat-back table having a tray table with multiple leaves, which are connected by discrete hinges that allow for smooth folding. The tray table, when deployed, may provide functional surface as per normal tray table and the tray table may also occupy a small foot print when stowed. According to various embodiments, the tray table may be integrated into a seat system wherein the configuration of the tray table, such as the number and shape of table leaves, as well as the way of folding the tray table may achieve maximum space utilization objective and a harmonized integrated system. According to various embodiments, the hinges of the tray table may allow for different panel thickness and construction, as well as material to be used. Further, the tray table may be interchangeable with existing table support and means of stowage.

[0049] According to various embodiments, there is provided a seat-back table. The seat-back table may include a table top and a coupling member. The coupling member may be configured to pivotably couple the table top to a back of a passenger seat. The table top may be configured to be collapsible into a folded state and expandable into an unfolded state. The table top may be further configured such that an area of a greatest exposed surface of the table top in the folded state may be less than half of an area of the table top in the unfolded state for increasing a disposable space on the back of the passenger seat.

[0050] According to various embodiments, the table top in the folded state may have a substantially uniform thickness.

[0051] According to various embodiments, the table top may include a plurality of table leaves with one or more discontinuities at respective boundaries between adjacent sides of two of the table leaves. Further, the seat-back table may include one or more separately formed hinges interconnecting the adjacent sides of two of the table leaves across the one or more discontinuities. In addition, the table top may be foldable along the one or more discontinuities to stack the plurality of table leaves such that the table top in the folded state has a substantially uniform thickness.

[0052] According to various embodiments, the table top may include six table leaves. The six table leaves may be arranged and joined along at least six joints. The six table leaves may include two trapezoid shaped table leaves and four right angled

triangle shaped table leaves. The four right angled triangle shaped table leaves may be sandwiched between the two trapezoid shaped table leaves in the folded state of the table top. The two of the four right angled triangle shaped table leaves may be sandwiched between first portions of the two trapezoid shaped table leaves and another two of the four right angled triangle shaped table leaves may be sandwiched between second portions of the two trapezoid shaped table leaves.

[0053] According to various embodiments, a first lateral side of a first trapezoid shaped table leaf may be joined to a hypotenuse of a first right angled triangle shaped table leaf along a first joint. A cathetus of the first right-angled triangle shaped table leaf may be joined to a cathetus of a second right angled triangle shaped table leaf along a second joint. A hypotenuse of the second right angled triangle shaped table leaf may be joined to a first lateral side of a second trapezoid shaped table leaf along a third joint. A second lateral side of the second trapezoid shaped table leaf may be joined to a hypotenuse of a third right angled triangle shaped table leaf along a fourth joint. A cathetus of the third right angled triangle shaped table leaf may be joined to a cathetus of a fourth right angled triangle shaped table leaf along a fifth joint. A hypotenuse of the fourth right angled triangle shaped table leaf may be joined to a second lateral side of the first trapezoid shaped table leaf along a sixth joint.

[0054] According to various embodiments, each joint may include at least one hinge. The at least one hinge may include a mechanical hinge.

[0055] According to various embodiments, the seat-back table may further include a cup holder coupled to an exposed surface of the table top in the folded state.

[0056] According to various embodiments, a surface of the table top in the unfolded state may include an indentation for receiving a base of a cup.

[0057] According to various embodiments, the table top may further include a slider mechanism.

[0058] According to various embodiments, the seat-back table may further include an arm. A first end of the arm may be pivotably coupled to the coupling member of the table top. A second end of the arm may be configured to be coupled to the back of the passenger seat.

[0059] According to various embodiments, there may be provided a seat-back including a seat-back body and a seat-back table of the various embodiments. The seat-back table may be pivotably coupled to the seat-back body.

[0060] According to various embodiments, the seat-back body may include a recess configured to receive the seat-back table in the folded state.

[0061] According to various embodiments, the seat-back may further include a locking mechanism configured to lock the seat-back table in the folded state received
5 in the recess of the seat-back body.

[0062] According to various embodiments, there may be provided a method of manufacturing a seat-back table. The method may include providing a table top. The method may further include providing a coupling member configured to pivotably couple the table top to a back of a passenger seat. The method may further include
10 configuring the table top to be collapsible into a folded state and expandable into an unfolded state. The method may further include configuring the table top such that an area of a greatest exposed surface of the table top in the folded state may be less than half of an area of the table top in the unfolded state for increasing a disposable space on the back of the passenger seat.

[0063] According to various embodiments, the method may include configuring
15 the seat-back table according to the various embodiments.

[0064] Various embodiments have provided a seat-back table that may free up space on the seat-back of the passenger seat in the folded state. Various embodiments have also provided a seat-back table with planar integrity such that there is minimal
20 bending or sagging of the seat-back table. Various embodiments have also provided a seat-back table that may be stowed stably and securely in the folded state.

[0065] While the invention has been particularly shown and described with reference to specific embodiments, it should be understood by those skilled in the art that various changes in form and detail may be made therein without departing from
25 the scope of the invention as defined by the appended claims. The scope of the invention is thus indicated by the appended claims and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced.

Claims

1. A seat-back table comprising:
a table top,
a coupling member, the coupling member configured to pivotably couple the table top to a back of a passenger seat,
wherein the table top is configured to be collapsible into a folded state and expandable into an unfolded state,
wherein an area of a greatest exposed surface of the table top in the folded state is less than half of an area of the table top in the unfolded state for increasing a disposable space on the back of the passenger seat;
wherein the table top comprises six table leaves, wherein the six table leaves are arranged and joined along at least six joints; and
wherein the six table leaves comprise two trapezoid shaped table leaves and four right angled triangle shaped table leaves.
2. The seat-back table as claimed in claim 1, wherein the table top in the folded state has a substantially uniform thickness.
3. The seat-back table as claimed in claim 1, wherein the table top comprises a plurality of table leaves with one or more discontinuities at respective boundaries between adjacent sides of two of the table leaves.
4. The seat-back table as claimed in claim 3, further comprising one or more separately formed hinges interconnecting the adjacent sides of two of the table leaves across the one or more discontinuities.
5. The seat-back table as claimed in claim 3 or 4, wherein the table top is foldable along the one or more discontinuities to stack the plurality of table leaves such that the table top in the folded state has a substantially uniform thickness.
6. The seat-back table as claimed in any one of claims 1 to 5, wherein, the four right angled triangle shaped table leaves are sandwiched between the two trapezoid shaped table leaves in the folded state of the table top.

7. The seat-back table as claimed in claim 6, wherein two of the four right angled triangle shaped table leaves are sandwiched between first portions of the two trapezoid shaped table leaves and another two of the four right angled triangle shaped table leaves are sandwiched between second portions of the two trapezoid shaped table leaves.

8. The seat-back table as claimed in any one of claims claim 1 to 7, wherein a first lateral side of a first trapezoid shaped table leaf is joined to a hypotenuse of a first right angled triangle shaped table leaf along a first joint, a cathetus of the first right-angled triangle shaped table leaf is joined to a cathetus of a second right angled triangle shaped table leaf along a second joint, a hypotenuse of the second right angled triangle shaped table leaf is joined to a first lateral side of a second trapezoid shaped table leaf along a third joint, a second lateral side of the second trapezoid shaped table leaf is joined to a hypotenuse of a third right angled triangle shaped table leaf along a fourth joint, a cathetus of the third right angled triangle shaped table leaf is joined to a cathetus of a fourth right angled triangle shaped table leaf along a fifth joint, and a hypotenuse of the fourth right angled triangle shaped table leaf is joined to a second lateral side of the first trapezoid shaped table leaf along a sixth joint.

9. The seat-back table as claimed in any one of claims 1 to 8, wherein each joint comprises at least one hinge.

10. The seat-back table as claimed in claim 9, wherein the at least one hinge comprises a mechanical hinge.

11. The seat-back table as claimed in any one of claims 1 to 10, further comprising a cup holder coupled to an exposed surface of the table top in the folded state.

12. The seat-back table as claimed in any one of claims 1 to 11, wherein a surface of the table top in the unfolded state comprises an indentation for receiving a base of a cup.

13. The seat-back table as claimed in any one of claims 1 to 12, wherein the table top further comprises a slider mechanism.

14. The seat-back table as claimed in any one of claims 1 to 13, further comprising an arm, wherein a first end of the arm is pivotably coupled to the coupling member of the table top, and wherein a second end of the arm is configured to be coupled to the back of the passenger seat.

15. A seat-back comprising:
a seat-back body; and
a seat-back table, according to any one of claims 1 to 14, pivotably coupled to the seat-back body.

16. The seat-back according to claim 15, wherein the seat-back body comprises a recess configured to receive the seat-back table in the folded state.

17. The seat-back according to claim 16, further comprising a locking mechanism configured to lock the seat-back table in the folded state received in the recess of the seat-back body.

18. A method of manufacturing a seat-back table according to any one of claims 1 to 14, the method comprising:
providing a table top,
providing a coupling member configured to pivotably couple the table top to a back of a passenger seat, and
configuring the table top to be collapsible into a folded state and expandable into an unfolded state,
wherein an area of a greatest exposed surface of the table top in the folded state is less than half of an area of the table top in the unfolded state for increasing a disposable space on the back of the passenger seat.