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(19) **United States**(12) **Patent Application Publication****Hanson et al.**(10) **Pub. No.: US 2007/0205649 A1**(43) **Pub. Date:****Sep. 6, 2007**(54) **LIGHT-WEIGHT UTILITY VEHICLE SEAT**(52) **U.S. CL.** **297/452.58**

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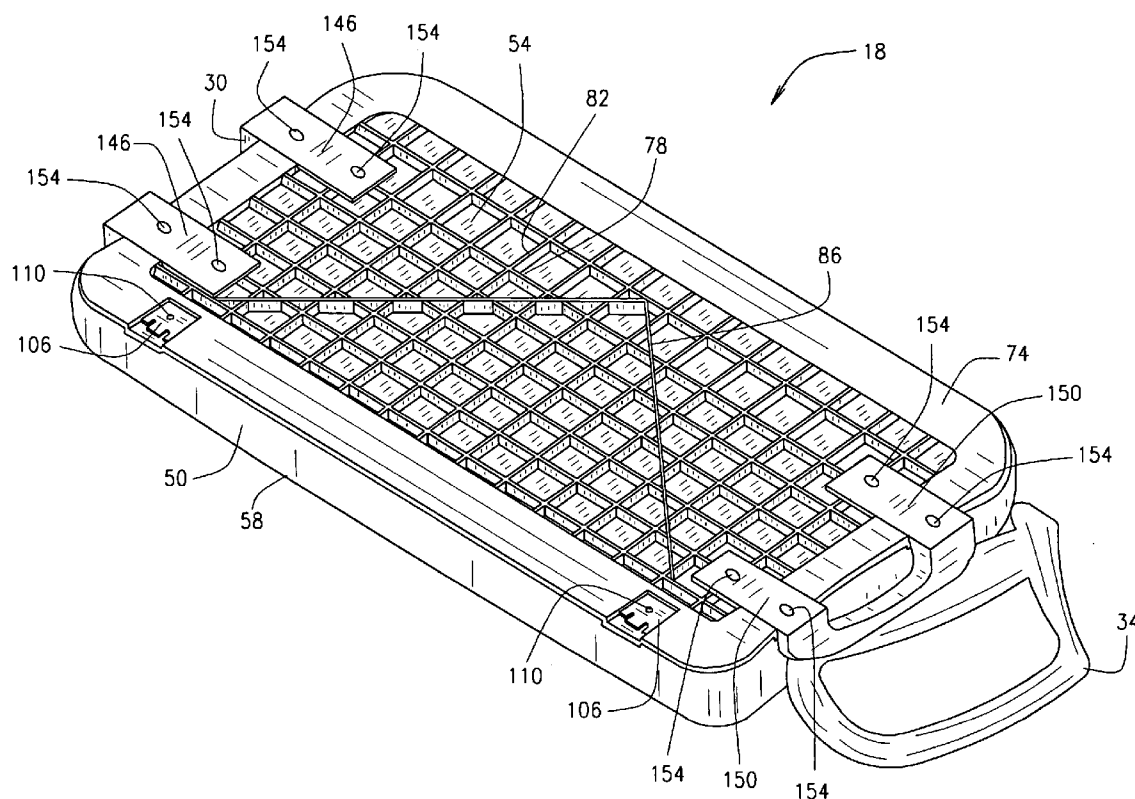
(57) **ABSTRACT**

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(73) Assignee: **Textron Inc.**, Providence, RI(21) Appl. No.: **11/368,072**(22) Filed: **Mar. 3, 2006****Publication Classification**(51) **Int. Cl.****A47C 7/02** (2006.01)

A utility vehicle seat assembly includes a seat cushion subassembly having a plastic base that includes a substantially flat or smooth perimeter portion on an underside of the plastic base. The substantially flat perimeter is suitable for accepting fasteners. The seat cushion subassembly additionally includes, a foam cushion that is positioned on a top surface of the plastic base and a seat cushion covering that is positioned over the foam cushion. The seat cushion covering is wrapped around a circumferential edge of the plastic base and fastened to the substantially flat perimeter portion of the underside of the plastic base using a plurality of fasteners. A fastener cover is positioned over the fasteners and connected to the underside of the plastic base to conceal the fasteners and the fastened portion of the seat cushion covering.



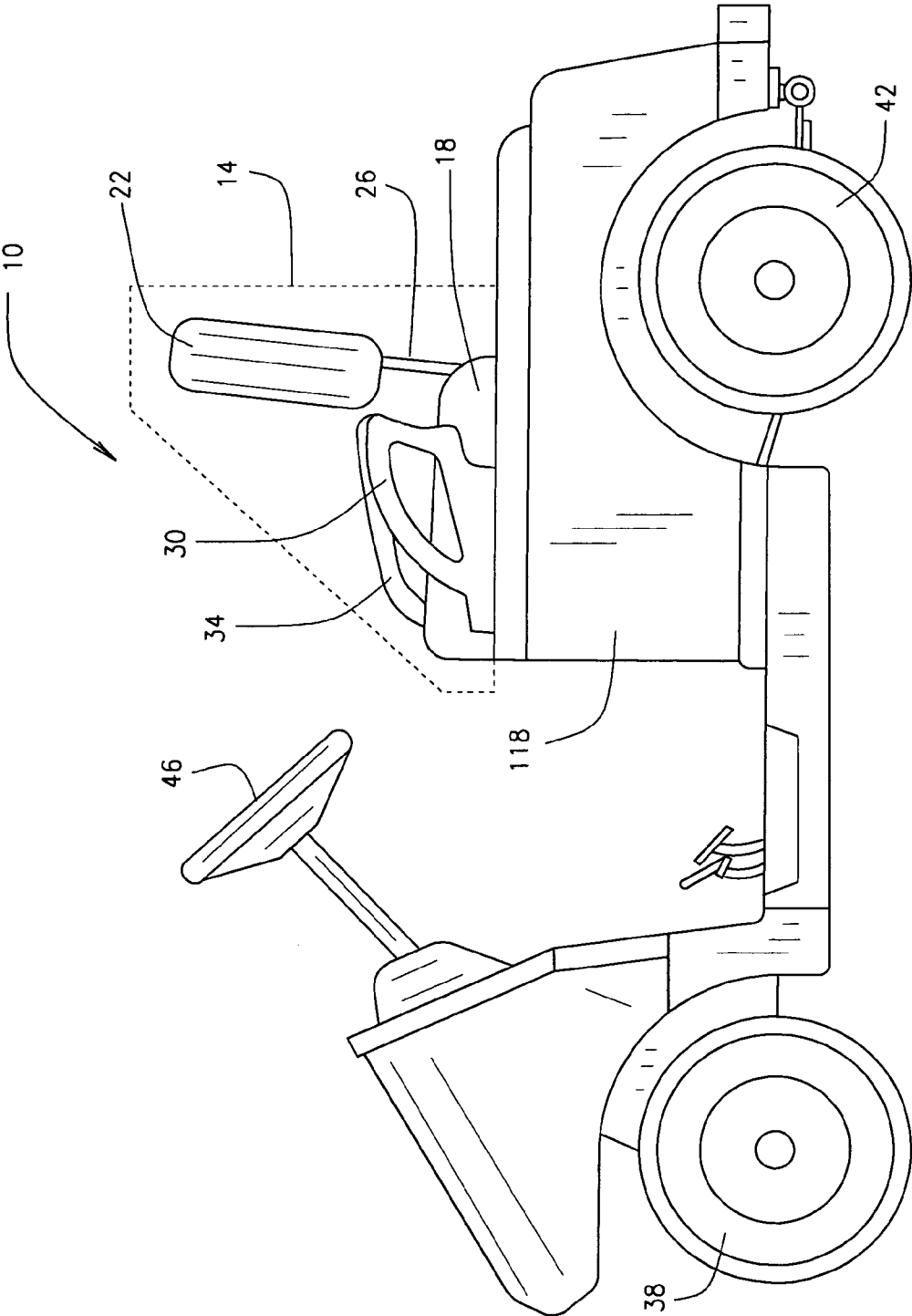


FIG. 1

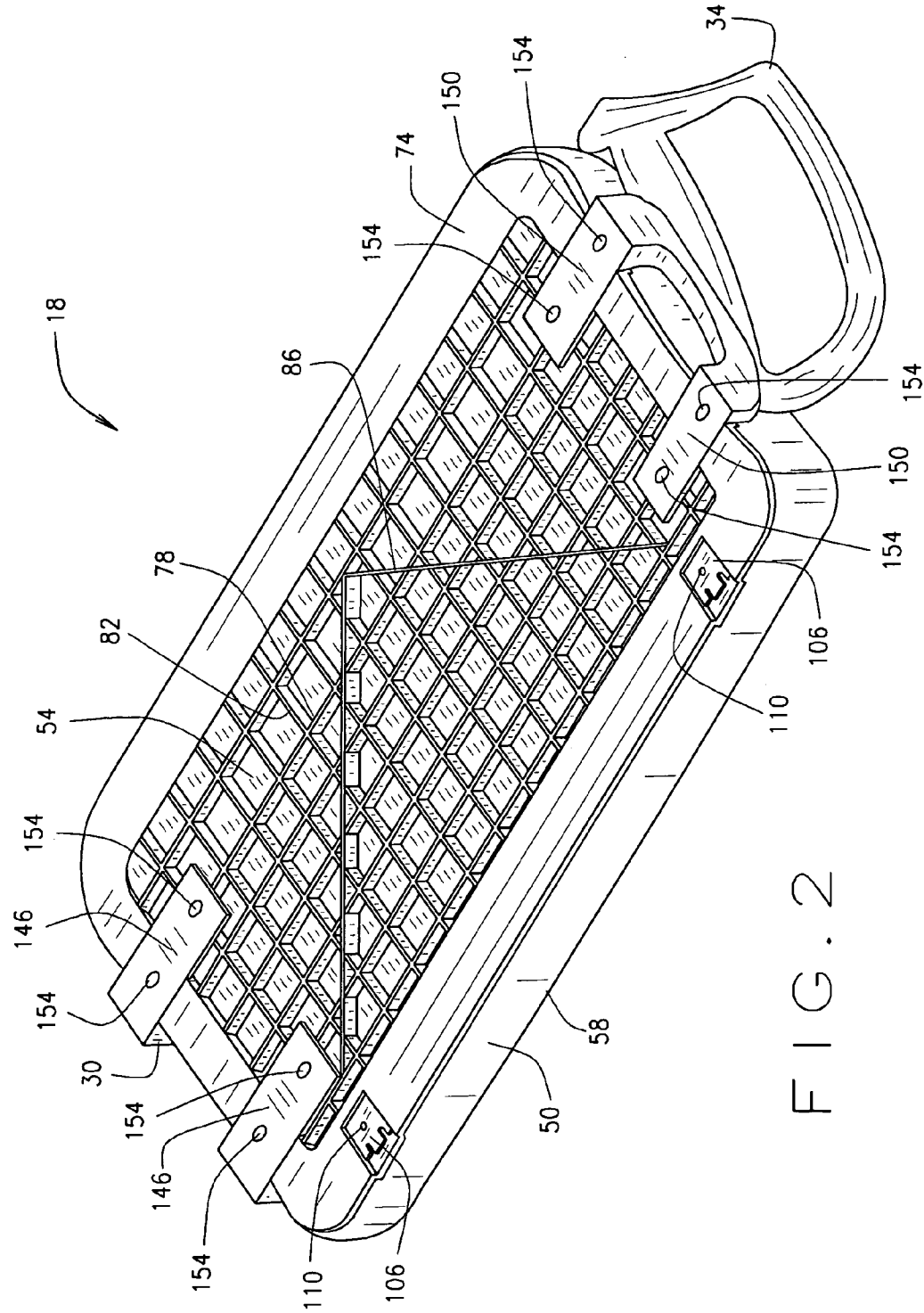


FIG. 2

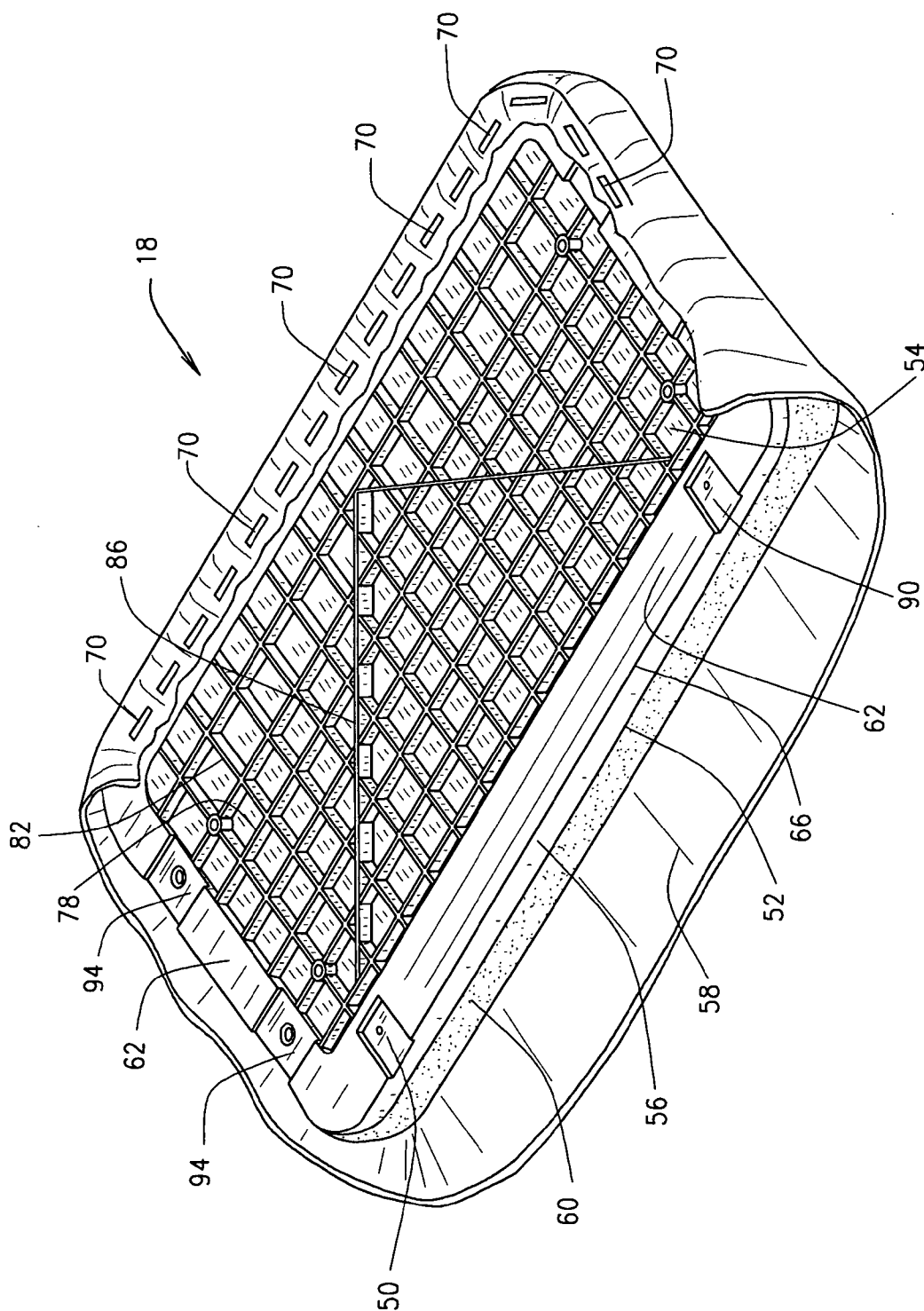
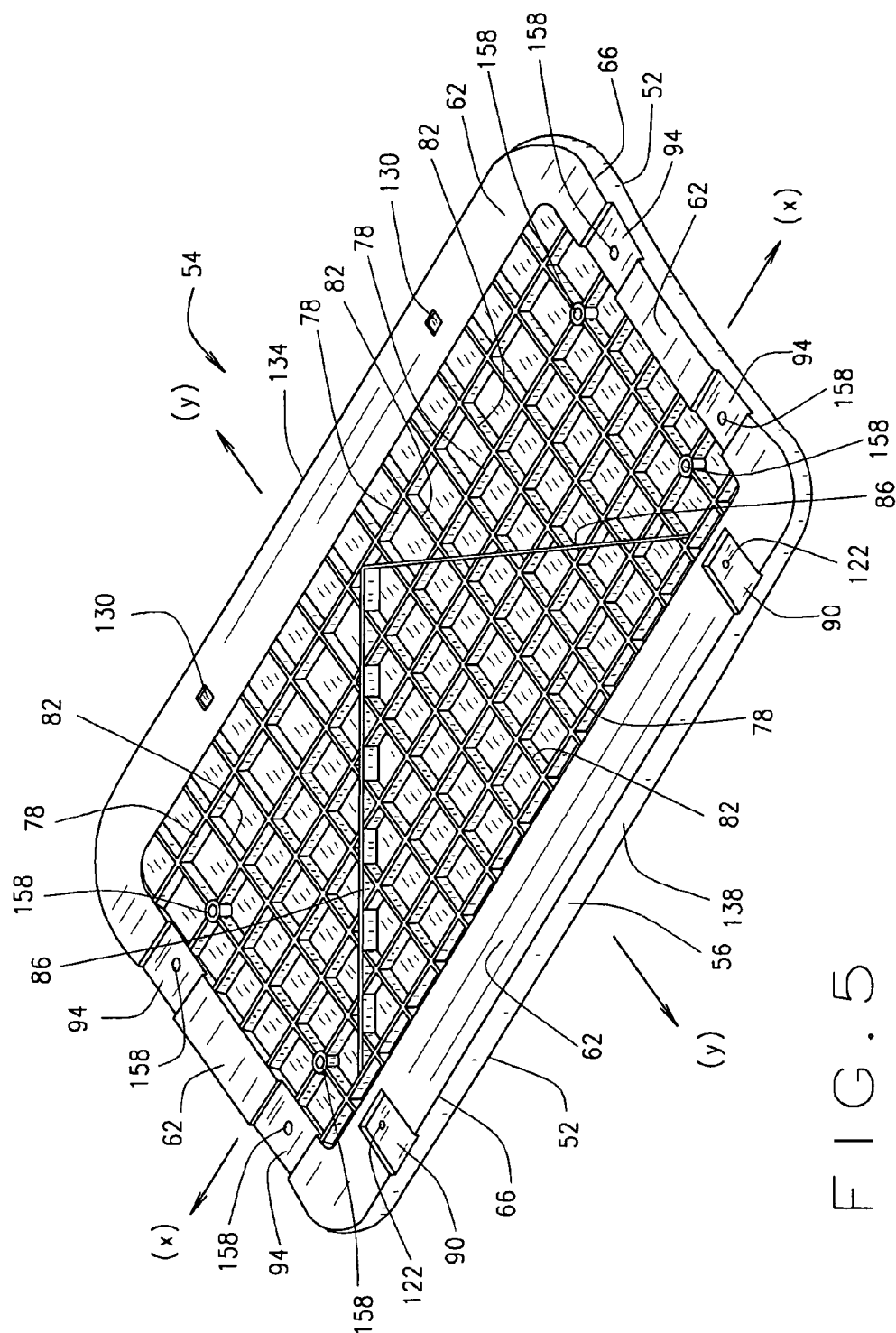


FIG. 4



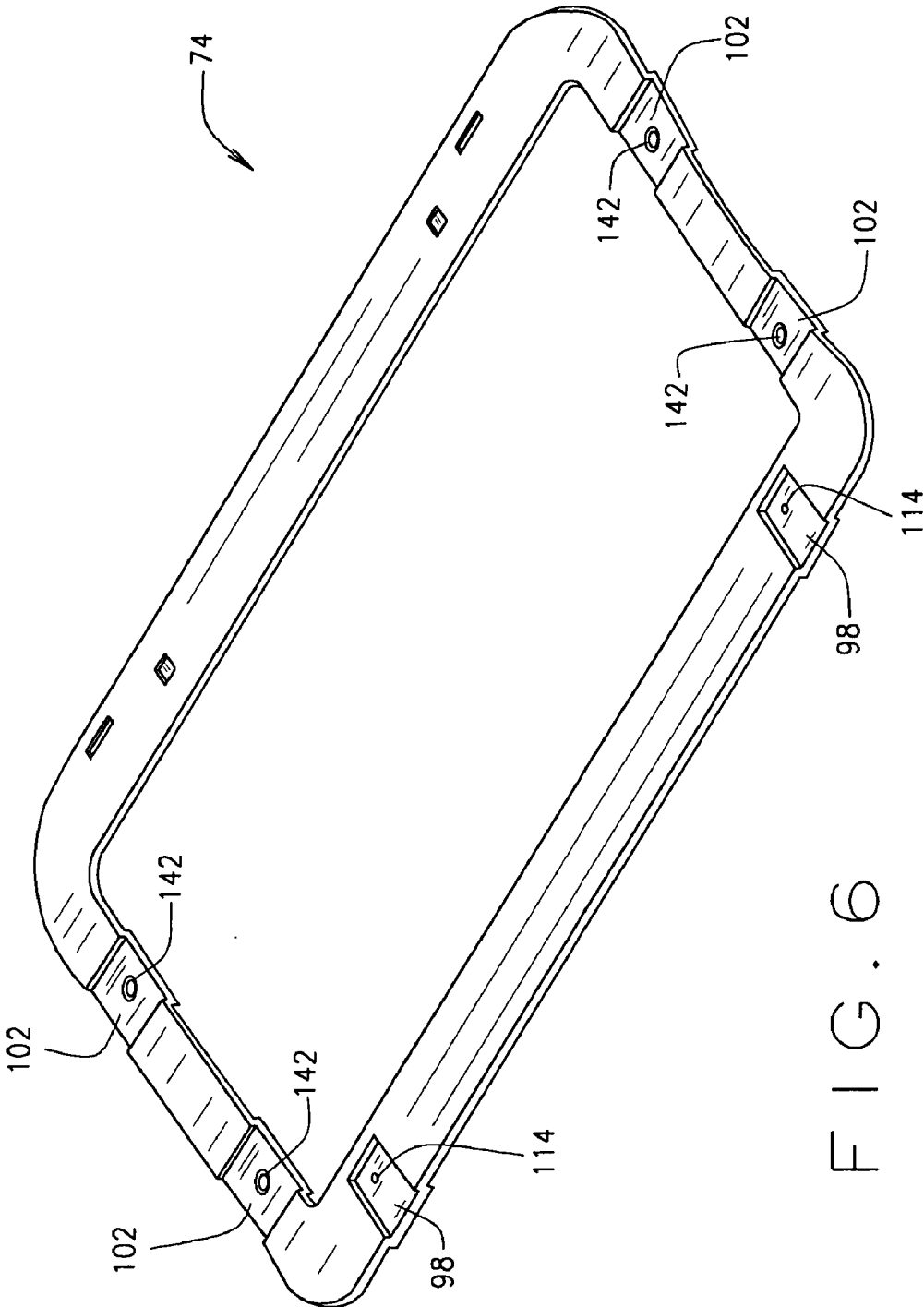


FIG. 6

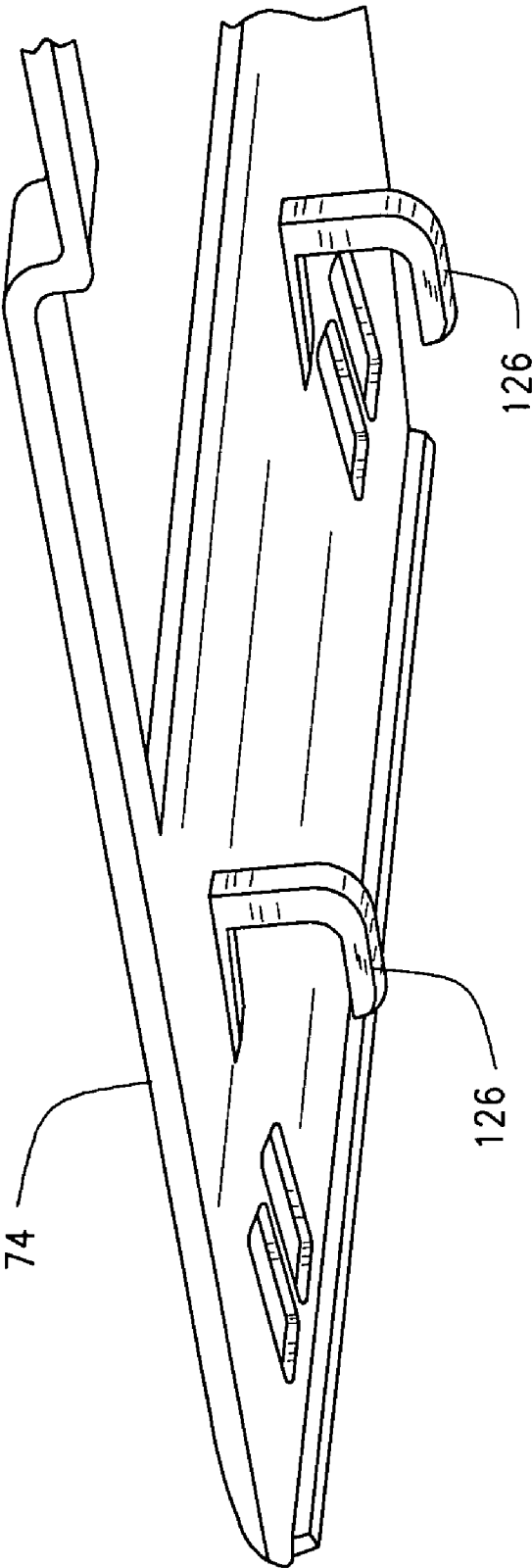


FIG. 7

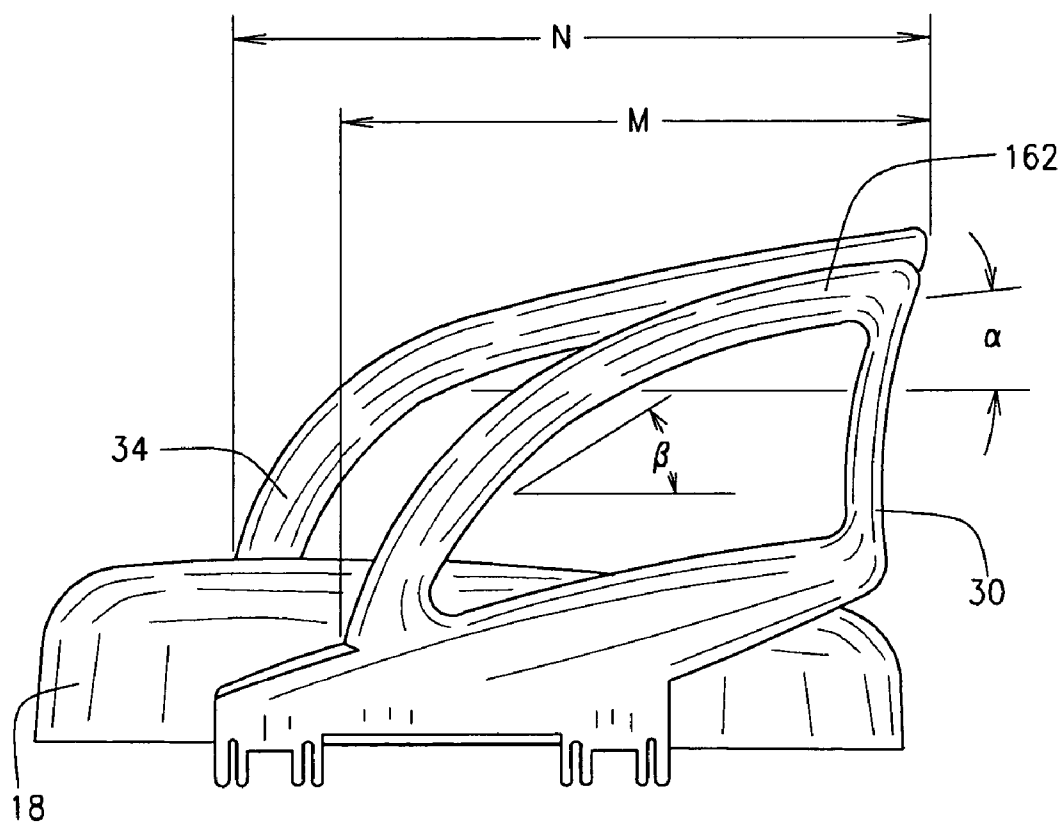


FIG. 8

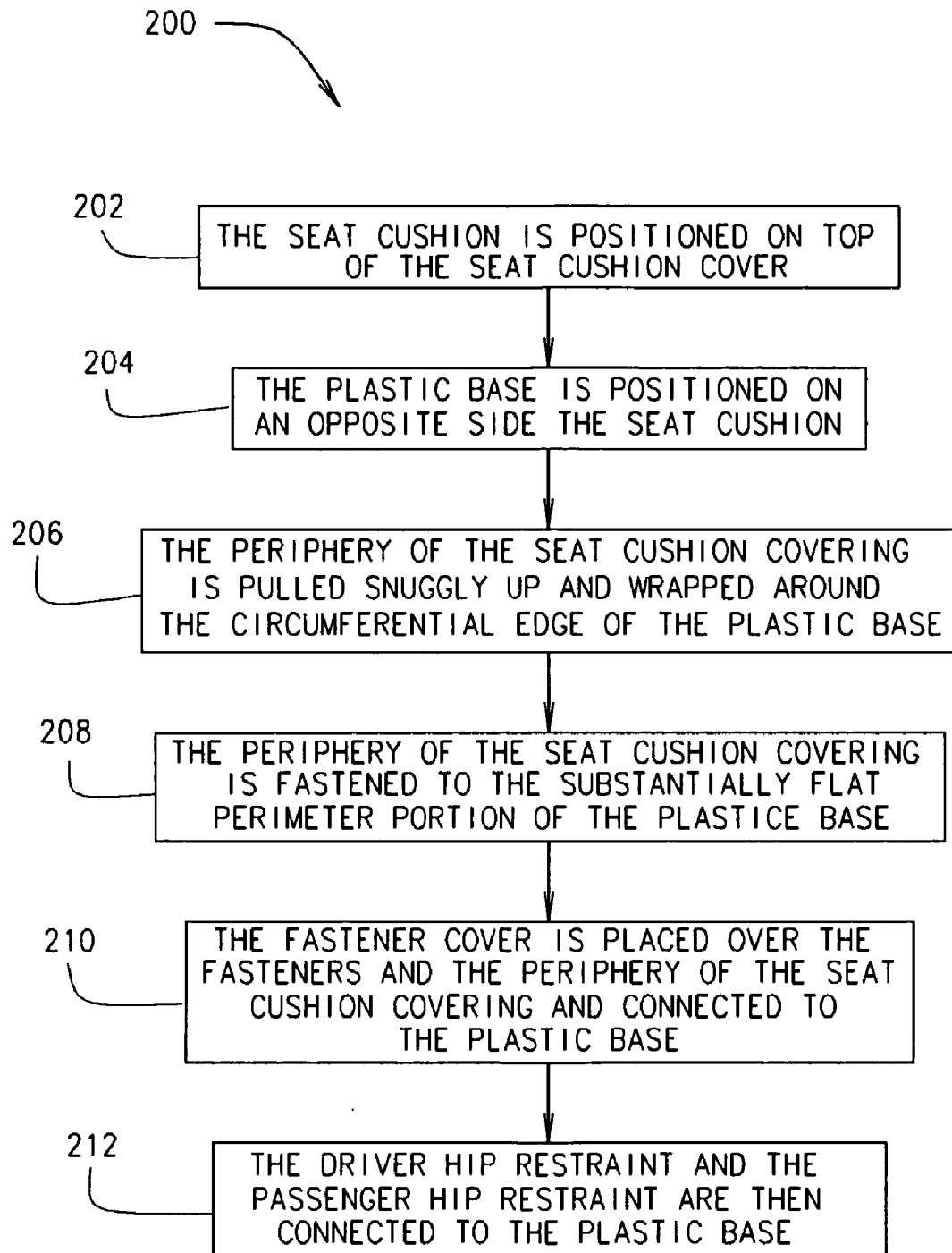


FIG. 9

LIGHT-WEIGHT UTILITY VEHICLE SEAT

FIELD

[0001] The present disclosure relates to light-weight utility vehicles such as small maintenance and cargo vehicles and golf cars and to a utility vehicle seat having a seat bottom and back that incorporate a molded plastic base.

BACKGROUND

[0002] The statements in this section merely provide background information related to the present disclosure and may not constitute prior art.

[0003] Generally, the bottoms and backs of known light-weight utility vehicle seats are constructed of a piece of molded vinyl cover placed over a molded foam cushion that is placed on a top surface of a machine cut wood base, e.g., a machine cut plywood base. The edges of the vinyl cover are pulled over and around the edges of the wood base and stapled to a bottom surface of the wood base. The seat bottoms are then typically hingedly connected to a portion of the vehicle body that provides a housing or compartment for such things as batteries, tools, engine components or various other vehicle components that are accessible by lifting the seat bottom. The wood base, staples and vinyl cover edges of the seat bottom are usually left exposed, i.e., uncovered, and are unsightly when the seat bottom is lifted.

[0004] Furthermore, the uncovered wood base, staples and vinyl cover edges of the seat bottom are exposed to water from washing the vehicle and to other environmental conditions that exist within the compartment below the seat. For example, when the seat bottom is down, the wood base, staples and vinyl cover edges are exposed to such environmental conditions as exhaust heat, fuel emissions, battery acid and/or battery gases. Exposure to the water and other environmental conditions can cause unsightly damage and discoloration to the wood base, staples and/or vinyl cover edges. Additionally, such exposure can deteriorate or warp the wood base causing structural damage such that the seat bottom must be replaced. The exposed staples are also subject to rust and cause a potential snagging hazard to a person lifting the seat or accessing the compartment below the seat.

SUMMARY

[0005] A utility vehicle seat assembly is provided. The seat assembly includes a seat cushion subassembly having a plastic base that includes a substantially flat perimeter portion on an underside that is suitable for accepting fasteners. The seat cushion subassembly additionally includes a foam cushion that is positioned on a top surface of the plastic base. The seat cushion subassembly further includes a seat cushion covering that is positioned over the foam cushion. The seat cushion covering is wrapped around a circumferential edge of the plastic base and fastened to the substantially flat perimeter portion of the underside of the plastic base using a plurality of fasteners. A fastener cover is positioned over the fasteners and connected to the underside of the plastic base to conceal the fasteners and the fastened portion of the seat cushion covering.

[0006] In other embodiments, a method for assembling a utility vehicle seat cushion assembly is provided. The

method includes positioning a foam cushion on a top surface of a plastic base. The plastic base has a substantially flat perimeter portion on an underside suitable for accepting fasteners. A seat cushion covering is placed over the foam cushion and a periphery, or fringe of the seat cushion covering is wrapped around a circumferential edge of the plastic base. The method additionally includes fastening the periphery, or fringe, of the seat cushion covering to the substantially flat perimeter portion of the underside of the plastic base using a plurality of fasteners. The method further includes positioning a fastener cover over the fasteners and the fastened periphery portion of the seat cushion covering. The fastener cover is then connected to the underside of the plastic base, thereby concealing the fasteners and fastened seat cushion covering periphery.

[0007] Further areas of applicability will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples, while indicating various embodiments, are intended for purposes of illustration only and are not intended to limit the scope of the disclosure.

DRAWINGS

[0008] The drawings described herein are for illustration purposes only and are not intended to limit the scope of the present disclosure in any way.

[0009] FIG. 1 is a side view of a light-weight utility vehicle including a seat assembly, in accordance with various embodiments;

[0010] FIG. 2 is a bottom isometric view of a seat bottom subassembly of the vehicle seat assembly shown in FIG. 1;

[0011] FIG. 3 is a partially exploded back isometric view of a seat back subassembly of the vehicle seat assembly shown in FIG. 1, having a seat cushion covering removed to illustrate the components of the seat back subassembly;

[0012] FIG. 4 is a bottom isometric view of the seat bottom subassembly shown in FIG. 2 absent a fastener cover and having a seat covering partially installed;

[0013] FIG. 5 is an isometric view of a plastic base of the seat bottom subassembly shown in FIG. 2;

[0014] FIG. 6 is a isometric view of a fastener cover of the seat bottom subassembly shown in FIG. 2;

[0015] FIG. 7 is a bottom section view of a fastener cover included in the seat assembly shown in FIG. 1;

[0016] FIG. 8 is side view of a seat bottom subassembly of the seat assembly shown in FIG. 1, including a driver hip restraint and a passenger hip restraint; and

[0017] FIG. 9 is a flow chart generally describing the process of assembling a seat bottom subassembly and a seat back subassembly of the seat assembly shown in FIG. 1, in accordance with various embodiments.

DETAILED DESCRIPTION

[0018] The following description of the various embodiments is merely exemplary in nature and is in no way intended to limit the present disclosure, its application, or uses. Throughout this specification, like reference numerals will be used to refer to like elements.

[0019] FIG. 1 illustrates a light-weight utility vehicle 10, such as a small cargo/maintenance vehicle or a golf car, that includes a seat assembly 14, in accordance with various embodiments. The seat assembly 14 includes a seat bottom subassembly 18 and a seat back subassembly 22 connected to the seat bottom subassembly 18 via at least one seat back support strut 26. The seat assembly 14 additionally includes a driver hip restraint 30 and a passenger hip restraint 34 coupled to the seat bottom subassembly 18. The vehicle 10 also generally includes a pair of front wheels 38 that operate to steer the vehicle 10, a pair of rear wheels 42, wherein at least one of the rear wheels 42 functions as a drive wheel for propelling vehicle 10, and a steering wheel 46 used to control a steering angle of the front wheels 38. Although the seat assembly 14 will be described and illustrated in the various figures herein as a 'bench' seat assembly adapted to simultaneously accommodate a vehicle driver and at least one vehicle passenger, it should be understood that the seat assembly 14 can also be a 'single' seat assembly adapted to accommodate only a single driver or passenger, and remain within the scope of the disclosure.

[0020] Referring now to FIGS. 2 through 6, the seat bottom subassembly 18 and the seat back subassembly 22 each include a seat cushion 50 positioned on a top surface 52 of a plastic base 54. Each of the seat bottom and seat back subassemblies 18 and 22 additionally include a seat cushion covering 58 that is positioned over the seat cushion 50 and wrapped around a circumferential edge 56. Once wrapped around the circumferential edge 56, the seat cushion covering 58 is fastened to a substantially flat, or smooth, perimeter portion 62 of an underside 66 of the plastic base 54 using a plurality of fasteners 70. In various embodiments, the fasteners are staples such that seat cushion covering 58 is stapled to the plastic base 54 using a plurality of staples. However, the seat cushion covering can be fastened to the substantially flat perimeter portion 62 of the plastic base 54 using any suitable fastening means, e.g., riveting, screwing, gluing, hooking, tacking or nailing. A fastener cover 74 is positioned over the fasteners 70 and the periphery portion of the seat cushion covering 58 that is fastened to the plastic base 54. The fastener cover 74 is coupled to the plastic base 54 to thereby conceal the fasteners 70 and the periphery portion of the seat cushion covering 58 that is fastened to, in various embodiments, the polymer or plastic base 54. In various embodiments, the seat cushion covering 58 is a vinyl material. However, alternatively, the seat cushion covering 58 can be leather, nylon, polyester, or any other suitable seat cushion covering material or fabric.

[0021] Referring now to FIGS. 3 and 5, the plastic base 54 includes a plurality of first structural ridges or ribs 78 that crisscross with a plurality of second structural ridges 82 formed in the underside 66. The first structural ridges 78 provide longitudinal support to the respective seat subassembly 18 and/or 22 along a plane in a longitudinal direction X. The second structural ridges 82 provide lateral support along a plane in a lateral direction Y. Additionally, in various embodiments the plastic base 54 includes at least one diagonal structural ridge or rib 86 formed in the underside 66 to provide stability diagonal to the X and Y directions for the respective seat subassembly 18 and/or 22. More particularly, the diagonal structural ridge 86 provides diagonal stability to resist twisting of the plastic base, and hence, the respective seat subassembly 18 and/or 22. Although the diagonal structural ridge 86 is only shown throughout the figures with

respect to the seat bottom subassembly 18, it should be understood that the seat back subassembly 22 can also include at least one diagonal structural ridge 86 to provide needed diagonal stability to the seat back subassembly 22. A depth or height of the first, second and diagonal structural ridges 76, 82 and 86 can be any dimension suitable to provide a desired stability in the X, Y and diagonal directions. For example, finite element analysis can be employed to determine the depth of the first, second and diagonal structural ridges 76, 82 and 86 needed to provide a desired amount of rigidity, stability and support for the respective seat subassembly 18 and/or 22.

[0022] In the illustrated embodiments, the crisscrossing first and second structural ridges 78 and 82 are formed in the underside 66 to have a substantially or orthogonal relationship that results in a square waffle pattern. However, the first and second structural ridges 78 and 82 can crisscross having any angular relationship suitable to provide sufficient longitudinal and lateral support to the respective seat subassemblies 18 and 22 to support the weight, loads and forces generated by a driver and/or passenger utilizing the seat assembly 14.

[0023] Referring to FIGS. 2, 4 and 5, the plastic base 54 of the seat bottom subassembly 18 includes a pair of base hinge recesses 90 formed in the substantially flat, or smooth, periphery portion 62. The plastic base 54 of the seat bottom subassembly 18 further includes a plurality of base hip restraint recesses 94 formed in the substantially flat, or smooth, periphery portion 62.

[0024] Referring now to FIGS. 2, 3 and 6, the fastener cover 74 of the seat bottom subassembly 18 is formed as a fastener cover rim, as shown in FIGS. 2 and 6. Alternatively, since the fastener cover 74 of the seat back subassembly 22 is generally visible when the seat assembly 14 is installed in the vehicle 10, the fastener cover 74 of the seat back subassembly 22 is formed as a concealing panel, as illustrated in FIG. 3. Thus, the concealing panel 74 of the seat back subassembly 22 covers and conceals the entire underside 66 of the plastic base 54, including the fasteners 70, the portion of the cushion covering 58 fastened to the substantially flat portion 62 and the structural ridges 78, 82 and 86.

[0025] As illustrated in FIGS. 2, 5 and 6, the fastener cover 74 of the seat bottom subassembly 18 includes a pair of cover hinge recesses 98 and a plurality of cover hip restraint recesses 102. A backside of the cover hinge recesses 98 and the cover hip restraint recesses 102 mate with the base hinge recesses 90 and base hip restraint recesses 94, respectively, to properly align the fastener cover 74 with plastic base 54 when connecting the fastener cover 74 to the plastic base 54. The seat bottom subassembly 18 additionally includes a pair of hinge legs 106 that are seated within the cover hinge recesses and connected to plastic base 54. The hinge legs 106 pivotally interlock with mating hinge legs (not shown) that are coupled to a portion 118 of the vehicle body that provides a housing or compartment for such things as batteries, tools, engine components or various other vehicle 10 components that are accessible by lifting the seat bottom subassembly 18. Each hinge leg 106 is coupled to the plastic base 54 using a single hinge fastener 110 that extends through a respective cover hinge aperture 114 and couples with the plastic base 54, thereby retaining the fastener cover 74 between the hinge legs 106 and the plastic base 54.

[0026] The hinge fasteners 110 can be any fastener suitable for securing the hinge legs 106 to the plastic base 54 within the cover hinge recesses 98. For example, the hinge fasteners 110 can be 'self-threading' or 'self-tapping' screws that extend through the cover hinge apertures 114 and self-thread or self-tap into base hinge apertures 122. The hinge legs 106 are seated within the cover hinge recesses 98 such that the hinge legs 106 will not pivot or rotate about the hinge fasteners 110 when the hinge fasteners 110 are coupled to the plastic base 54. Therefore, only a single hinge fastener 110 is utilized to mount the hinge legs 106 to the plastic base 54.

[0027] Referring now to FIGS. 5 and 7, the fastener cover 74 can be connected to the plastic base 54 in any suitable manner. In various embodiments, the fastener cover 74 includes a pair of locking fingers 126. The locking fingers 126 are adapted to interlock with locking apertures 130 in the plastic base 54 located proximate a front edge 134 of the plastic base 54 opposite the base hinge recesses 90. Therefore, to connect the fastener cover 74 to the plastic base 54, the locking fingers 126 are interlocked with the locking apertures 130 and the hinge legs 106 are connected to the plastic base 54 with the hinge fasteners 110, as described above. Thus, the locking fingers 126 connect the fastener cover 74 to the plastic base 54 along the front edge 134 and the hinge fasteners 110 connect the fastener cover 74 to the plastic base 54 along an opposing back edge 138 having the base hinge recesses 90 therein. The fastener cover 74 is further connected to the plastic base 54 when the driver and passenger hip restraints 30 and 34 are connected to the seat bottom subassembly, as described below. When the fastener cover 74 is connected to the plastic base 54, the fasteners 70 and the periphery of the cushion covering 58 that is fastened to the plastic base 54 are effectively completely concealed from view.

[0028] Referring now to FIGS. 2, 5, 6 and 8, the driver hip restraint 30 includes connecting legs 146 for connecting the driver hip restraint 30 to the plastic base 54. Similarly, the passenger hip restraint 34 includes connecting legs 150 for connecting the passenger hip restraint 34 to the plastic base 54. The fastener cover 74 includes a plurality of hip restraint connecting holes 142. One hip restraint connected hole 142 is located within each of the cover hip restraint recesses 102. The connecting legs 146 and 150 are seated within the cover hip restraint recesses 102 and connected to the plastic base 54 using hip restraint fasteners 154. When the hip restraints 30 and 34 are connected to the plastic base 54, the fastener cover 74 is retained between the hip restraint legs 146 and 150 and the plastic base 54 such that the fastener cover 74 is further secured to the plastic base 54.

[0029] The hip restraint fasteners 154 can be any fastener suitable for securing the hip restraints 30 and 34 to the plastic base 54 within the cover hip restraint recesses 102. For example, the hip restraint fasteners 154 can be 'self-threading' or 'self-tapping' screws that extend through the cover hip restraint connecting holes 142 and self-thread or self-tap into base hip restraint apertures 158 that align with the cover hip restraint connecting holes 142. Additionally, hip restraint fasteners 154 can be self-threaded or self-tapped into additional base hip restraint apertures 158 that are located within the crisscrossed structural ridge portion of the plastic base 54.

[0030] Referring particularly to FIG. 8, in various embodiments, the driver hip restraint 30 has a different profile than the passenger hip restraint 34. Specifically, the driver hip

restraint 30 has a longitudinal length M that is shorter than a longitudinal length N of the passenger hip restraint 34. The shorter longitudinal length M of the driver hip restraint 30 provides minimally impaired ingress and egress to the seat assembly 14 by vehicle driver. That is, the longitudinal length M is adapted to provide more room, or space, for the vehicle driver to maneuver around, or avoid, the steering wheel 46 when embarking and disembarking the vehicle 10. Because a passenger embarking and disembarking the vehicle 10 does not have to contend with maneuvering around a steering wheel, the longitudinal length N can be longer than the longitudinal length M without impairing the ingress and egress of the passenger to the seat assembly 14. Additionally, an angle of slope P of a top rail 162 of the driver hip restraint 30 is greater than an angle of slope a of a top rail 166 of the passenger hip restraint 34. The driver hip restraint top rail angle of slope P further provides minimally impaired ingress and egress to the seat assembly 14 by vehicle driver, thereby improving the driver's ease to embark and disembark the vehicle 10.

[0031] FIG. 9 is a flow chart 200 generally describing the process of assembling the seat subassemblies, i.e., the seat bottom subassembly 18 and the seat back subassembly 22, in accordance with the various embodiments. Initially, the seat cushion 50 is positioned on top of the seat cushion covering 58, as indicated at 202. The plastic base 54 is positioned on the seat cushion 50 such that the top surface 52 of the plastic base 54 contacts a side of the seat cushion 50 opposite the seat cushion covering 58, as indicated at 204. The periphery of the seat cushion covering 58 is pulled snugly up and wrapped around the circumferential edge 56 of the plastic base 54, as indicated at 206. The periphery of the seat cushion covering 58 is then fastened to the substantially flat perimeter portion of the plastic base 54 using fasteners 70, as indicated at 208. For example, the periphery of the seat cushion covering 58 is then stapled to the substantially flat perimeter portion of the plastic base 54 using a plurality of staples.

[0032] Finally, the fastener cover is placed over the fasteners and the periphery of the seat cushion covering 58 and connected to the plastic base 54, as indicated at 210. Thus, the fasteners 70 and the periphery of the cushion covering 58 that is fastened to the plastic base 54 are effectively completely concealed from view.

[0033] For example, with respect to the seat bottom subassembly 18, the fastener cover 74 is placed over the fasteners 70 and the periphery of the seat cushion covering 58 and the fastener cover locking fingers 126 are interlocked with the plastic base locking apertures 130. The back side of the cover hinge recesses 98 are mated with the base hinge recesses 90 to properly align the fastener cover 74 on the underside 66 of the plastic base 54. The hinge legs 106 are then connected to the plastic base 54 using a single hinge fastener 110, as described above, such that the fastener cover 74 is firmly connected to the plastic base 54. The driver hip restraint 30 and the passenger hip restraint 34 are then connected to the plastic base 54, as described above.

[0034] The description herein is merely exemplary in nature and, thus, variations that do not depart from the gist of that which is described herein are intended to be within the scope of the disclosure. Such variations are not to be regarded as a departure from the spirit and scope of the disclosure.

What is claimed is:

1. A utility vehicle seat cushion assembly comprising:
 - a plastic base;
 - a foam cushion positioned on a top surface of the plastic base; and
 - a covering positioned over the cushion and fastened to an underside of the plastic base using a plurality of fasteners.
2. The assembly of claim 1 further comprising a concealing rim positioned over the fasteners and connected to the underside of the plastic base.
3. The assembly of claim 2, wherein the concealing rim comprises a pair of cover hinge recesses.
4. The assembly of claim 1, wherein the plastic base comprises a substantially flat portion around a perimeter of the plastic base underside.
5. The assembly of claim 1, wherein the plastic base comprises a pair of base hinge recesses in a perimeter portion of the plastic base underside.
6. The assembly of claim 1, wherein the plastic base comprises a plurality of intersecting structural ribs formed in the underside.
7. The assembly of claim 1 further comprising a driver hip restraint and a passenger hip restraint coupled to the plastic base underside, wherein the driver hip restraint has a shorter longitudinal length to provide minimally impaired ingress and egress of the seat cushion assembly.
8. The assembly of claim 1, wherein the seat cushion assembly comprises at least one of a utility vehicle seat bottom and a utility vehicle seat back.
9. The assembly of claim 1, wherein the fasteners comprise staples and the covering is stapled to the plastic base.
10. A method for assembling a utility vehicle seat cushion assembly, said method comprising:
 - positioning a foam cushion on a top surface of a plastic base having a substantially flat perimeter portion on an underside thereof suitable for accepting fasteners;
 - placing a seat cushion covering over the foam cushion;
 - wrapping the seat cushion covering around a circumferential edge of the plastic base; and
 - fastening the seat cushion covering to the substantially flat perimeter portion of the underside of the plastic base using a plurality of fasteners.
11. The method of claim 10 further comprising:
 - positioning a fastener cover over the fasteners and the fastened portion of the seat cushion covering; and
 - connecting the fastener cover to the underside of the plastic base to conceal the fasteners and the fastened portion of the seat cushion covering.
12. The method of claim 11, wherein positioning a fastener cover over the fasteners comprises positioning the fastener cover over the fasteners such that a backside of a pair of cover hinge recesses formed in the fastener cover mate with a pair of base hinge recesses in the underside of the plastic base to properly align the fastener cover on the underside of the plastic base.
13. The method of claim 12 further comprising:
 - placing one leg of a pair of hinges in each of the cover hinge recesses; and

coupling the leg of each hinge to the plastic base using a single fastener such that the cover hinge recesses prevent the hinge legs from rotating about the respective fasteners.

14. The method of claim 10 further comprising coupling a driver hip restraint and a passenger hip restraint to the plastic base underside, wherein the driver hip restraint has a shorter longitudinal length to provide minimally impaired ingress and egress of the seat cushion assembly.

15. The method of claim 10, wherein fastening the seat cushion covering comprises stapling the seat cushion covering to the substantially flat perimeter portion of the underside of the plastic base using a plurality of staples.

16. A utility vehicle seat assembly comprising:

a seat cushion subassembly including:

a plastic base including a substantially smooth perimeter portion on an underside of the plastic base suitable for accepting fasteners;

a foam cushion positioned on a top surface of the plastic base;

a seat cushion covering positioned over the foam cushion, wrapped around a circumferential edge of the plastic base and fastened to the substantially smooth perimeter portion of the underside of the plastic base using a plurality of fasteners; and

a fastener cover positioned over the fasteners and connected to the underside of the plastic base for concealing the fasteners and the fastened portion of the seat cushion covering.

17. The assembly of claim 16, wherein the plastic base includes a pair of base hinge recesses.

18. The assembly of claim 17, wherein the fastener cover includes a pair of cover hinge recesses for retaining one leg of a pair of hinges and preventing the leg from rotating about a fastener used to connect the leg to the plastic base, wherein a backside of the cover hinge recesses mate with the base hinge recesses to properly align the fastener cover on the underside of the plastic base.

19. The assembly of claim 16, wherein the plastic base includes a plurality of crisscrossing structural ridges formed in the underside for providing longitudinal and lateral stability and strength to the plastic base.

20. The assembly of claim 19, wherein the plastic base further includes at least one diagonal structure ridge intersecting the crisscrossing structural ridges to provide diagonal stability and strength to the plastic base.

21. The assembly of claim 16 further comprising a driver hip restraint and a passenger hip restraint coupled to the plastic base underside, wherein the driver hip restraint has a shorter longitudinal length to provide minimally impaired ingress and egress of the seat cushion subassembly.

22. The assembly of claim 16, wherein the seat cushion subassembly comprises a utility vehicle seat bottom and the fastener cover comprises a concealing rim.

23. The assembly of claim 16, wherein the seat cushion subassembly comprises a utility vehicle seat back and the fastener cover comprises a concealing panel.