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(54) **EXPANDABLE AND ROTATABLE LUGGAGE**

(57) A piece of luggage is provided. A main body and an expandable body of the luggage are connected to each other by a collapsible portion. The luggage has a cover pivotably connected to the expandable body. A first half of a zipper is fixed to the expandable body and a second half of the zipper is fixed to the cover. The engagement of the first half and the second half closes the

cover to the expandable body, and thus a substantially enclosed space is defined by the main body, the expandable body and the cover. The luggage also has multiple rotational wheels mounted to the main body and/or the expandable body. The luggage stands on the rotational wheels and is rotatable with respect to one or more pre-determined axes through these wheels.

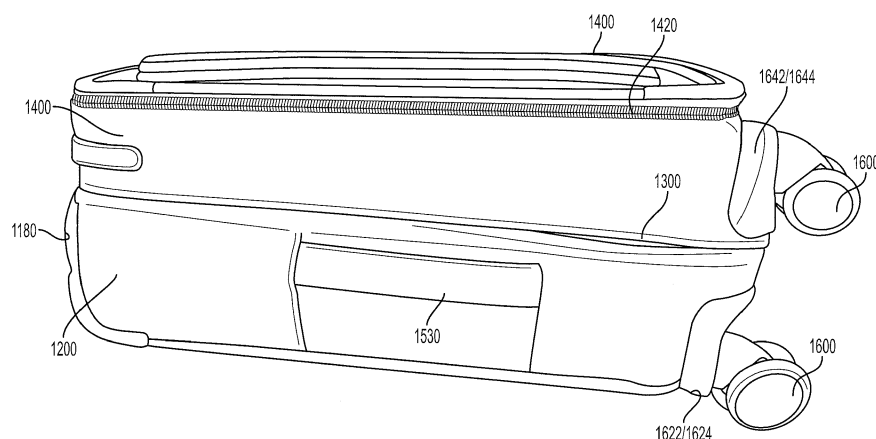


FIG. 5

Description

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is related to and claims the benefits of U.S. Patent Application No. 13/694,191 filed November 5, 2012 and U.S. Provisional Application No. 61/628,725 filed November 4, 2011, the entire contents of which are incorporated by reference herein.

FIELD

[0002] The present disclosures relates generally to luggage, and more particularly, to luggage which has expandable features for allowing a user to selectively increase or decrease the capacity of the luggage and rotatable features for allowing the user to rotate the luggage with respect to one or more predetermined axes of the luggage to freely move the luggage.

BACKGROUND

[0003] Expandable luggage is designed to accommodate user's need for adjusting the capacity of the luggage. Typically, the expandable luggage has sections that can be expanded by unzipping the sections. With the expandable sections unzipped, the user will have additional storage space within the luggage. However, the zipping and unzipping operation can be cumbersome and the zippers of the sections are prone to breakage due to repetitive zipping and unzipping operations. In addition, wheeled luggage has been developed rapidly over the recent decades. Particularly, luggage having rollable or rotational wheels becomes popular. However, luggage, which can be expandable and rotatable while standing, has not been envisioned.

BRIEF SUMMARY

[0004] As described herein, the exemplary embodiments of the current invention overcome one or more of the above and other disadvantages known in the art. An exemplary aspect of the present invention relates to a piece of luggage. The luggage includes a main body and an expandable body. The expandable body includes a collapsible portion, through which the expandable body is connected to the main body. The luggage further includes an expansion and locking device configured to allow free movement of the expandable body in a compression direction towards the main body and configured to enable locking of the expandable body in an expanding direction away from the main body. A cover is pivotably connected to the expandable body. The luggage also includes a zipper having a first half connected to the expandable body and a second half connected to the cover. The engagement of the first half and the second half closes the cover with respect to the expandable body, such that a substantially enclosed space is defined by the main

body, the expandable body and the cover. The luggage further includes a plurality of rotational wheels mounted to at least one of the main body and the expandable body. The luggage stands on the plurality of rotational wheels and is rotatable with respect to one or more predetermined axes through the plurality of rotational wheels.

[0005] These and other aspects and advantages of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. Moreover, the drawings are not necessarily drawn to scale and, unless otherwise indicated, the drawings are merely intended to conceptually illustrate the structures and procedures described herein.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0006]

Fig. 1 is a perspective view of a piece of luggage according to an exemplary embodiment of the present disclosure;

Fig. 2 is an exploded perspective view of the exemplary luggage;

Fig. 3 is front view of the exemplary luggage;

Fig. 4 is rear view of the exemplary luggage;

Fig. 5 is side view of the exemplary luggage;

Fig. 6 is top view of the exemplary luggage;

Fig. 7 is bottom view of the exemplary luggage;

Fig. 8 is an alternative perspective view of the exemplary luggage; and

Fig. 9 is an exploded perspective view of a piece of luggage according to another exemplary embodiment of the present disclosure.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0007] Figs. 1-8 illustrate a piece of luggage 1000 according to exemplary embodiment of the present disclosure. The luggage 1000 includes a main body 1100, an expandable body 1200 and a collapsible or foldable portion 1300 coupling the main body 1100 to the expandable body 1200. The luggage 1000 further includes an openable cover 1400 pivotably attached to the expandable body 1200 through, for example, a solid piece of flexible

plastic, fabric or one or more hinges.

[0008] The cover 1400 can be closed in a substantially sealed manner by engagement of two halves of a zipper 1420 provided on the edge of the expandable body 1200 and the cover 1400, respectively. Once the cover 1400 is closed, the main body 1100, expandable body 1200, collapsible portion 1300 and cover 1400 collectively define a substantially enclosed space or cavity for receiving various articles.

[0009] As shown in Fig. 2, the main body 1100 includes a frame 1120 made of a plurality of fiberglass rods or pipes that can be substantially parallel to one another. The main body 1100 also includes a pair of opposite top brackets 1130, which are connected to the top end of the frame 1120, respectively. A top panel 1140 is provided, extending between and connected to the opposite top brackets 1130. In a similar manner, the main body 1100 includes a pair of opposite bottom brackets 1150 and a bottom panel 1160. The top brackets 1130 and the bottom brackets 1150 provide corners of the luggage 1000, to which a wheel can be mounted. The top brackets 1130 and/or the bottom brackets 1150 can be provided with receiving mechanism (such as elevations with receiving holes) corresponding to the fiberglass rods; the receiving mechanism can be molded integrally with the brackets. In addition, the top brackets 1130 and bottom brackets 1150 can have different shape, profile or material.

[0010] A covering material 1170, such as a fabric, is applied to substantially surround the frame, top and bottom brackets and top and bottom panels, to thus provide a receptacle in the shape of a half shell. One or more corner or edge guards can be provided to the main body 1100 for protecting the piping, fabric, zippers and the like of the luggage. For example, a rear corner guard 1180 can be attached to an outer surface of the covering material 1170, at a rear corner of the main body 1100 for preventing the rear corner from cracking or abrading. The corner guard 1180 can be in the shape of a curved L, or of any suitable shape or profile. In addition, multiple corner or edge guards can be utilized to protect different parts of the luggage, including the corners of the luggage, the edge of the luggage, the sides of the luggage, the top portion of the luggage and/or the bottom portion of the luggage.

[0011] The luggage 1000 further includes an extendable or retractable handle 1500. The handle 1500 can be extended or retracted to allow a user to pull or push the luggage 1000. The extendable handle 1500 can be provided externally of the main body 1100. The external handle offers certain benefits. For example, the handle can be readily accessed externally to achieve easy maintenance or replacement of the handle; the internal surface of the main body, on which the articles (such as, clothes) are packed, are generally flat to avoid wrinkles on the articles; the external handle does not affect the integrity of the receiving space within the main body, which permits the space to be used more efficiently. Alternatively, the handle 1500 can be an internal handle.

[0012] In addition, a top handle 1520 and a side handle 1530 can also be provided to facilitate lifting the luggage 1000. Additional handles, hooks, straps and the like can be provided at various positions of the luggage as deemed necessary for lifting, carrying or otherwise manipulating the luggage.

[0013] The expandable body 1200 can have a wall 1220 that defines the circumference of the frame of the expandable body 1200. The dimensions of the wall 1220 can vary. For example, the wall 1220 can have a height H of 2 inches and a thickness T of 6mm, as shown in Fig. 2. The expandable body 1200 also includes one or more corner or edge guards 1230, which can be the same as or similar to the corner or edge guard(s) of the main body 1100 as described above. The expandable body 1200 further includes a pair of bottom corner receivers 1240, which are disposed at opposite bottom corners of the expandable body 1200.

[0014] The luggage 1000 further includes a plurality of rotational wheels 1600 mounted to the main body 1100 and/or the expandable body 1200, respectively. The rotational wheels 1600 include a first pair of wheels 1620 mounted to the main body 1100 and a second pair of wheels 1640 mounted to the expandable body 1200. For example, the first pair of wheels 1620 can be larger in size than the second pair of wheels 1640 or the wheels can be of the same size. Exemplary dimension of the rotational wheels 1600 includes but is not limited to 5" x 4" x 7" (12.7 x 10.2 x 17.8 cm) or 10" x 10" x 10" (25.4 x 25.4 x 25.4 cm); other suitable dimensions are within the scope of the disclosure. Optionally, at least one of the rotational wheels 1600 can have a brake mechanism, such that this rotational wheel can be fixed in one direction while the others can spin freely in any direction. Optionally, the rotational wheels 1600 comprise a single, swiveling wheel per corner of the main body which swiveling wheel can freely rotate 360 degrees or two, three or four wheels per corner of the main body and/or expandable body.

[0015] Referring back to Fig. 1, a three-dimensional coordinate system is defined in this figure. In this coordinate system, the X-axis and the Y-axis collectively defines a rolling surface, on which the rotational wheel 1600 can be rolled to move the luggage. The Z-axis is perpendicular to the rolling surface.

[0016] The rotational wheels 1600 are adapted to rotate individually or collectively along a rotational axis RA that is substantially parallel to the rolling surface. By means of the rotation of the wheels 1600 on the rolling surface with respect to the rotational axis RA, the luggage 1000 can be rolled or moved along opposite directions A and B within or parallel to the rolling surface. In addition, the rotational wheels 1600 are adapted to rotate individually or collectively along a spin axis SA that is substantially perpendicular to the rolling surfaces and parallel to the Z axis. The rotation of the rotational wheels 1600 with respect to the spin axis SA changes the orientation of the luggage 1000 and also the orientation of the rotational

axis RA. Thus, the luggage 1000 can be move in any direction along the rolling surface.

[0017] As shown in Fig. 2, the first pair of wheels 1620 each includes a first mount 1622, through which the wheels 1620 can be fixedly mounted to the bottom brackets 1150, respectively. For example, the first mount 1622 includes a plate 1624, which can be shaped to conform to the lower external profile of the bottom bracket 1150, such that the first mount 1622 can be snugly fitted and connected to the bottom bracket 1150.

[0018] Similarly, the second pair of wheels 1640 each includes a second mount 1642, through which the wheels 1640 can be fixedly mounted to the bottom corner receivers 1240 of the expandable body 1200, respectively. For example, the second mount 1642 can include an L-shaped plate 1644, which can be snugly fitted and connected to the bottom corner receiver 1240. Although not described in detail, the wheels 1620 and 1640 can include other structures necessary for implementing a rotational wheel.

[0019] As shown in Fig. 8, the luggage 1000 further includes an expansion and locking device 1700, which is a ratcheting assembly. The detailed description of the expansion and locking device 1700 is found in the co-pending and commonly owned U.S. Patent Application No. 13/694,191, the entire disclosure of which is incorporated herein for all purposes. The expansion and locking device is configured to allow free movement of the expandable body in a compression direction towards the main body. Thus, upon completion of packing by the user, the user can compress the expandable body of the luggage to take up any unused space within the luggage, which results in a tightly packed luggage. Subsequently, the tightly packed articles in the luggage may apply a pressure against the expandable body; in this case, the expansion and locking device is configured to enable locking of the expandable body with respect to the main body, which prevents movement of the expandable body away from the main body in an expanding direction away. Therefore, the expandable body is locked in place.

[0020] The locking of the expandable body can be disabled by operating a release mechanism (such as, by pressing a biased lever) to selectively allow incremental movements of the expandable body away from the main body in the expanding direction. Thus, the user has the option of selectively enlarging the capacity of the luggage to pack more articles in the luggage. Once the articles have been packed in the luggage, the compression and locking operation of the expandable body, as described above, can be repeated to compact the luggage.

[0021] The provision of the rotational wheels 1600 allows the luggage 1000 to be moved freely on a surface by means of the rolling and spinning operation of the wheels. The expansion and locking device 1700 allows the luggage 1000 to be selectively expanded.

[0022] Fig. 9 is an exploded perspective view showing luggage 2000 according to another exemplary embodiment of the present disclosure. The luggage 2000 has

substantially the same or similar structures and configurations as the luggage 1000, except an expandable body 2200. Description of the same or similar structures of the luggage 2000 is not provided for the purpose of conciseness. The expandable body 2200 has a wall 2220 that defines the circumference of the frame of the expandable body 2200. The expandable body 2200 also includes one or more corner or edge guards 2230, which can be the same as or similar to the guard(s) 1230. In this embodiment, the wall 2220 is continuous along the circumference of the frame to enhance the integrity of the expandable body 2200. The luggage 2000 further includes one or more rotational wheels 2640 mounted to the expandable body 2200. The size and dimension of the rotational wheels 2640 can be the same as or similar to the rotational wheels 1640 of the luggage 1000. The rotational wheels 2640 can each include a second mount 2642, through which the rotational wheels 2640 can be fixedly mounted to the bottom corners of the expandable body 2200, respectively. For example, the second mount 2642 can include an L-shaped plate 2644, which can be snugly fitted and connected to the bottom corners of the expandable body 2200.

[0023] As described above in connection with the exemplary luggage 1000 and 2000, the rotational wheels can be mounted to the main body and/or the expandable body of the luggage by using the recessed bottom brackets 1150 in combination with the shaped mount 1622, using the bottom corner receivers 1240 in combination with the L-shaped mount 1642, or using the rounded bottom corners of the continuous wall 2220 in combination with the L-shaped mount 2642. The above combinations can be used selectively depending on circumferences. For example, the main body of the luggage can have bottom corner receivers for mounting rotational wheels having an L-shaped mount; and the expandable body of the luggage can have a continuous wall with rounded bottom corners for mounting rotational wheels having an L-shaped mount.

[0024] The features of the present invention as applied to various specific embodiments thereof have been shown and described. It will also be understood that various omissions, substitutions and changes in the form and details of the devices illustrated and in their operation, may be made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

Claims**1.** A piece of luggage comprising:

a main body;
 an expandable body comprising a collapsible portion, the expandable body being connected to the main body through the collapsible portion;
 an expansion and locking device configured to allow free movement of the expandable body in a compression direction towards the main body and configured to enable locking of the expandable body in an expanding direction away from the main body;
 a cover pivotably connected to the expandable body;
 a zipper having a first half connected to the expandable body and a second half connected to the cover, wherein the first half and the second half are engageable to each other to close the cover with respect to the expandable body, such that a substantially enclosed space is defined by the main body, the expandable body and the cover; and
 a plurality of rotational wheels mounted to at least one of the main body and the expandable body, wherein the luggage stands on the plurality of rotational wheels and is rotatable with respect to one or more predetermined axes through the plurality of rotational wheels.

- 2.** The luggage according to Claim 1, wherein the plurality of rotational wheels comprises a first pair of rotational wheels mounted to the main body and a second pair of rotational wheels mounted to the expandable body.
- 3.** The luggage according to Claim 2, wherein the main body comprises: a pair of bottom brackets, to which the first pair of rotational wheels are mounted, respectively; and the expandable body comprises a pair of bottom corner receivers, to which the second pair of rotational wheels are mounted, respectively.
- 4.** The luggage according to Claim 3, wherein the first pair of rotational wheels each includes a plate adapted to conform to the shape of an external bottom surface of a respective bottom bracket, such that the first pair of rotational wheels can be snugly connected to the bottom brackets, respectively.
- 5.** The luggage according to Claim 3, wherein the second pair of rotational wheels each includes an L-shaped plate adapted to conform to the shape of an external bottom surface of a respective bottom corner receiver, such that the second pair of rotational wheels can be snugly connected to the bottom corner receiver, respectively.

- 6.** The luggage according to Claim 1, further comprising an extendable handle.
- 7.** The luggage according to Claim 1, further comprising at least one of a side handle and a top handle.
- 8.** The luggage according to Claim 1, further comprising at least one corner or edge guard mounted to the main body or the expandable body.

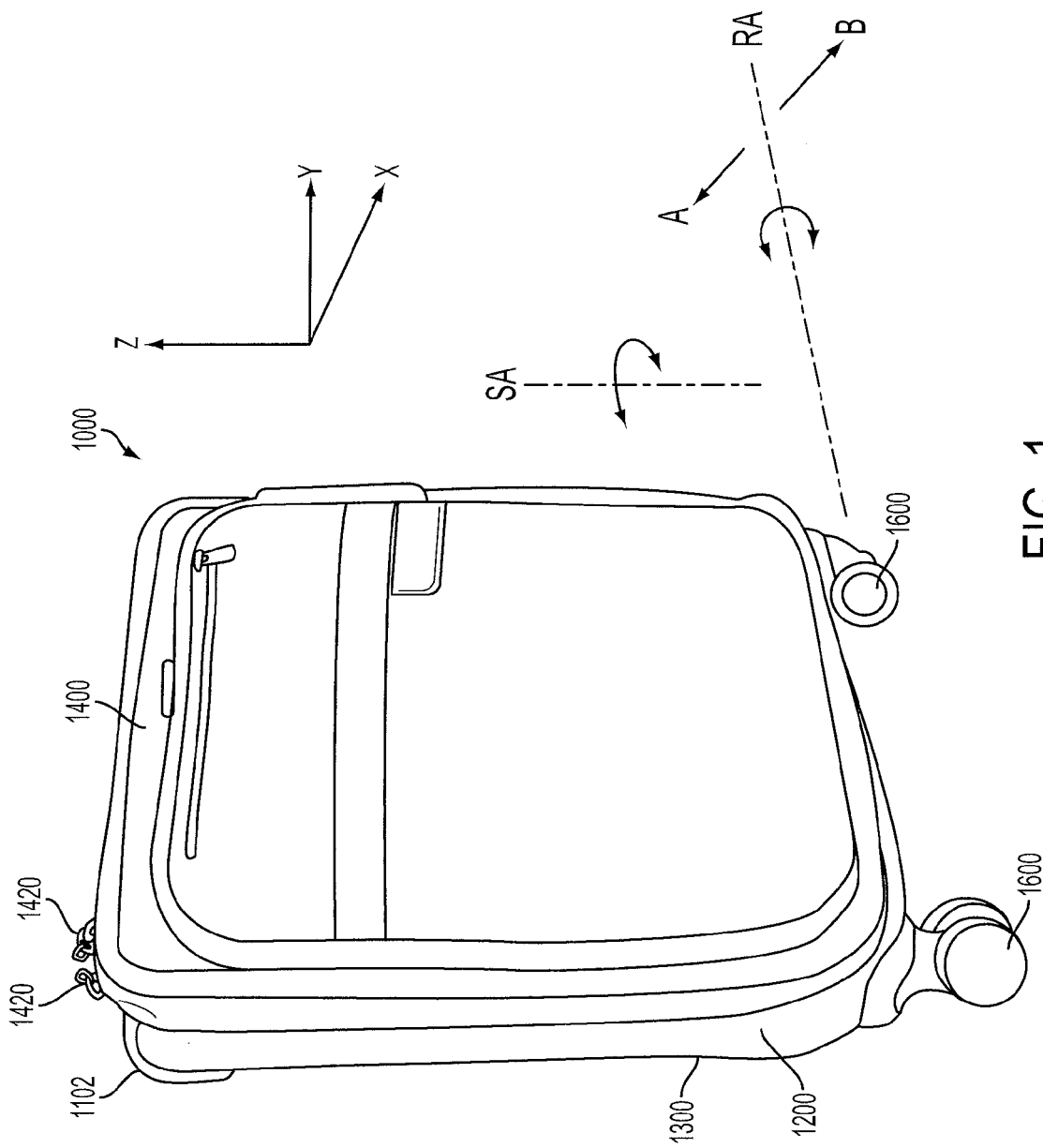


FIG. 1

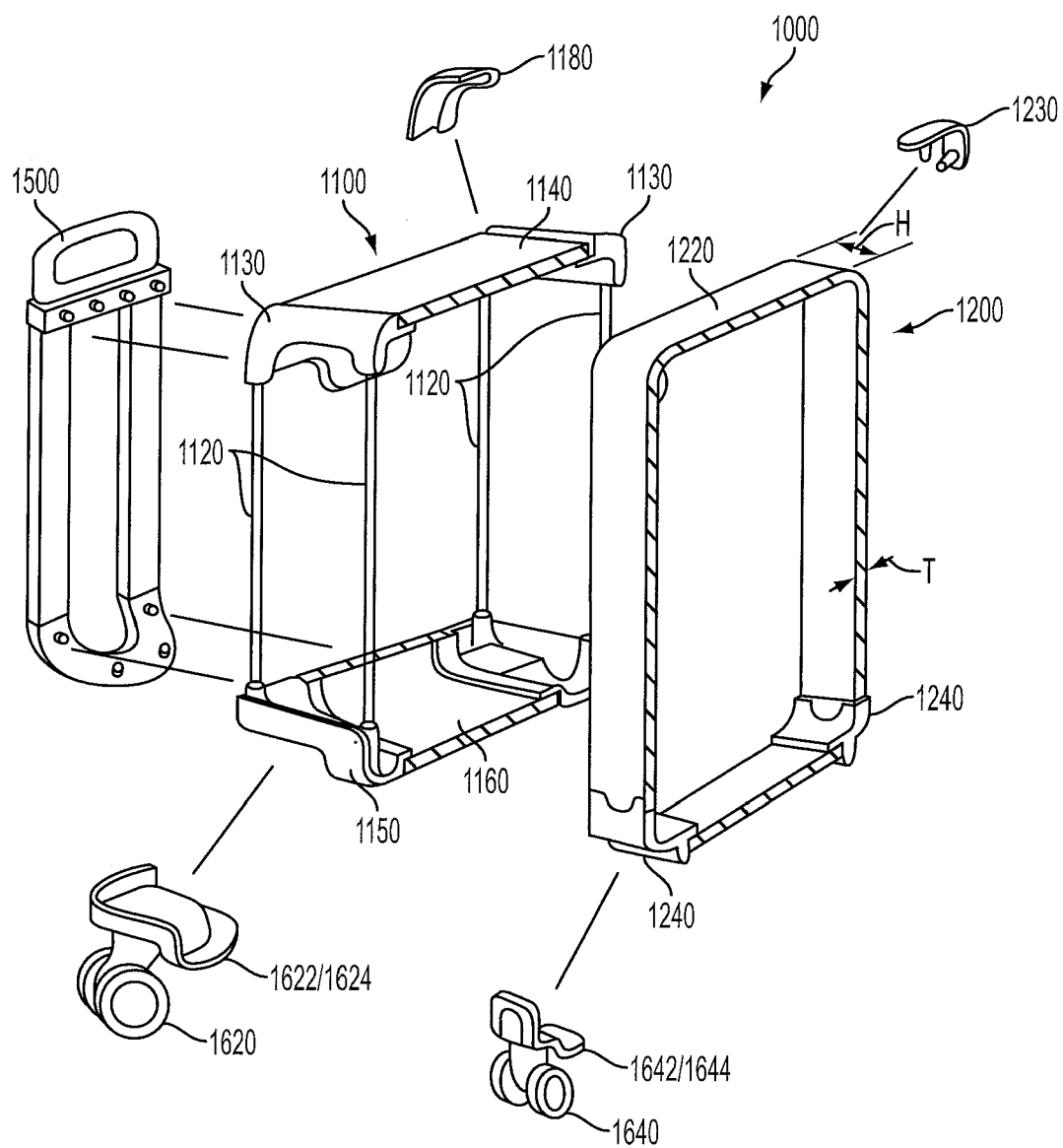


FIG. 2

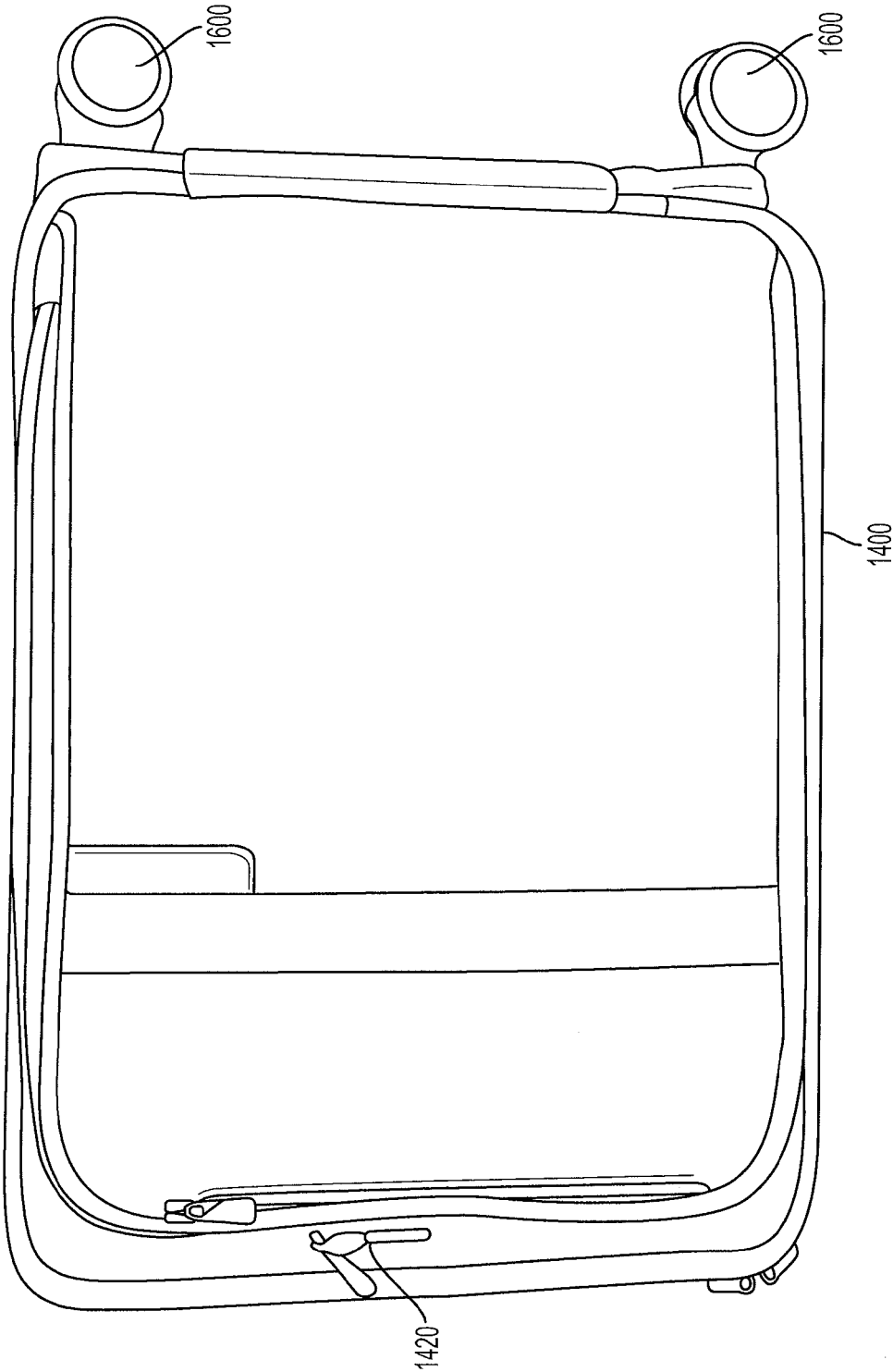


FIG. 3

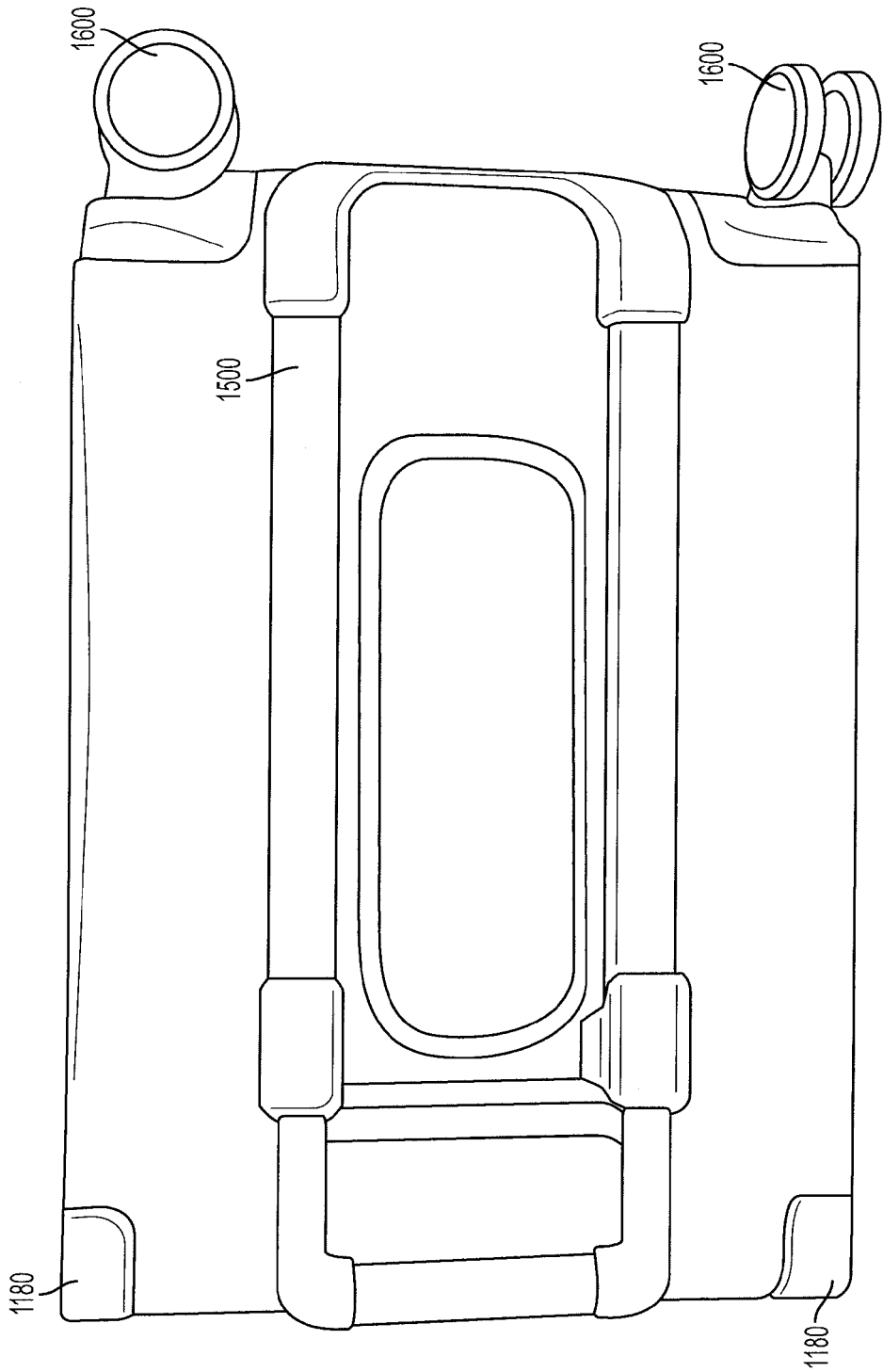


FIG. 4

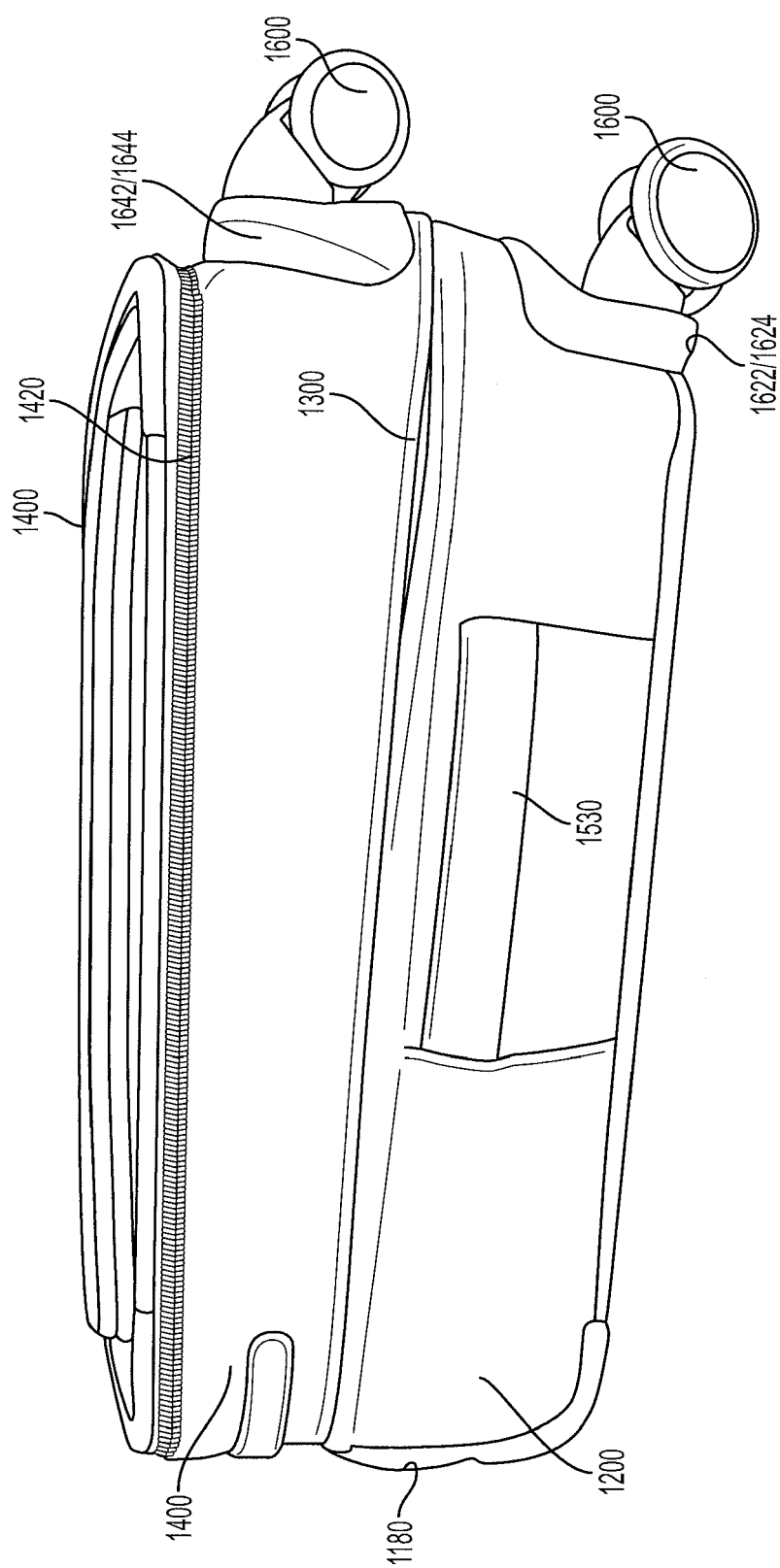


FIG. 5

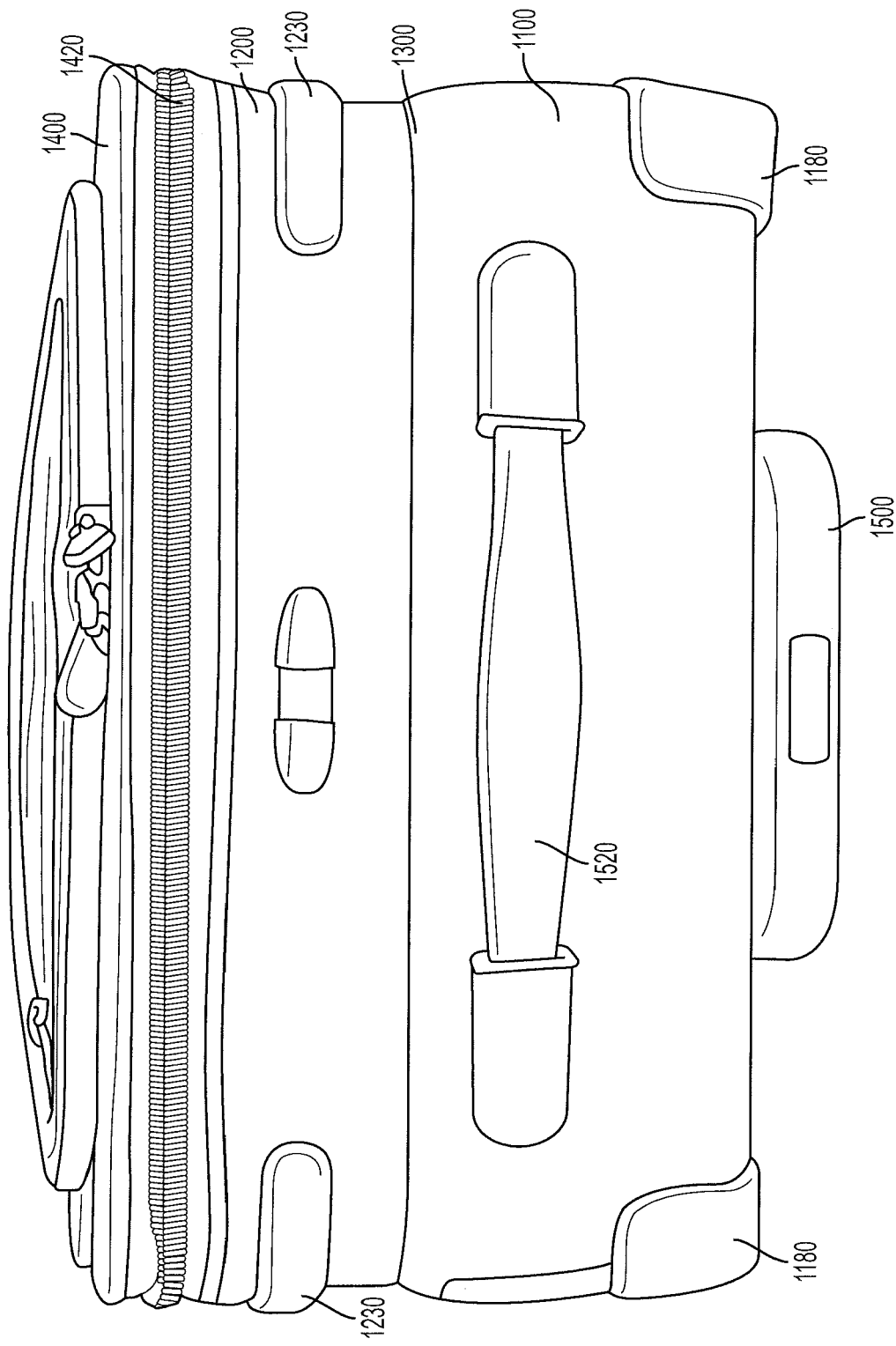


FIG. 6

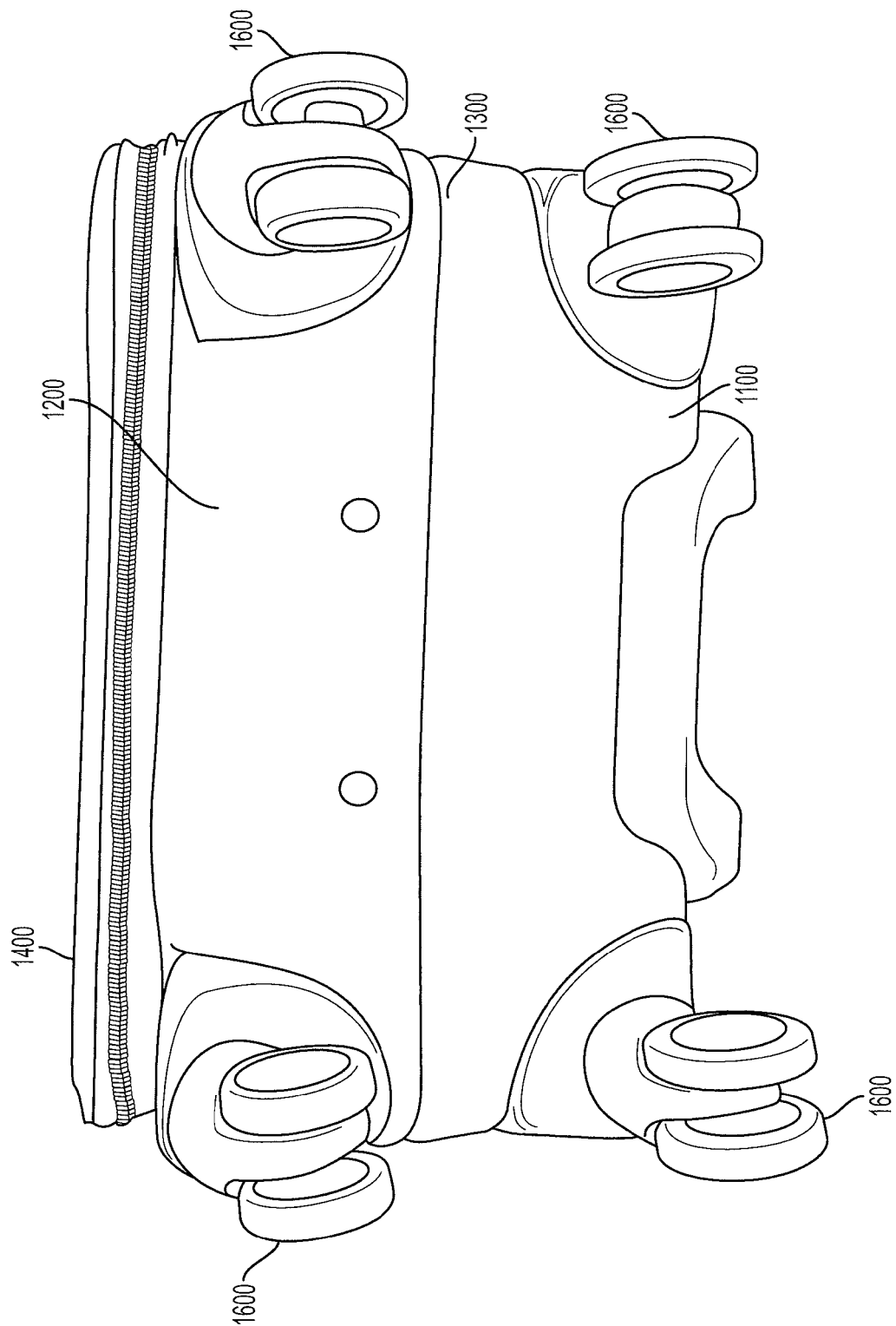


FIG. 7

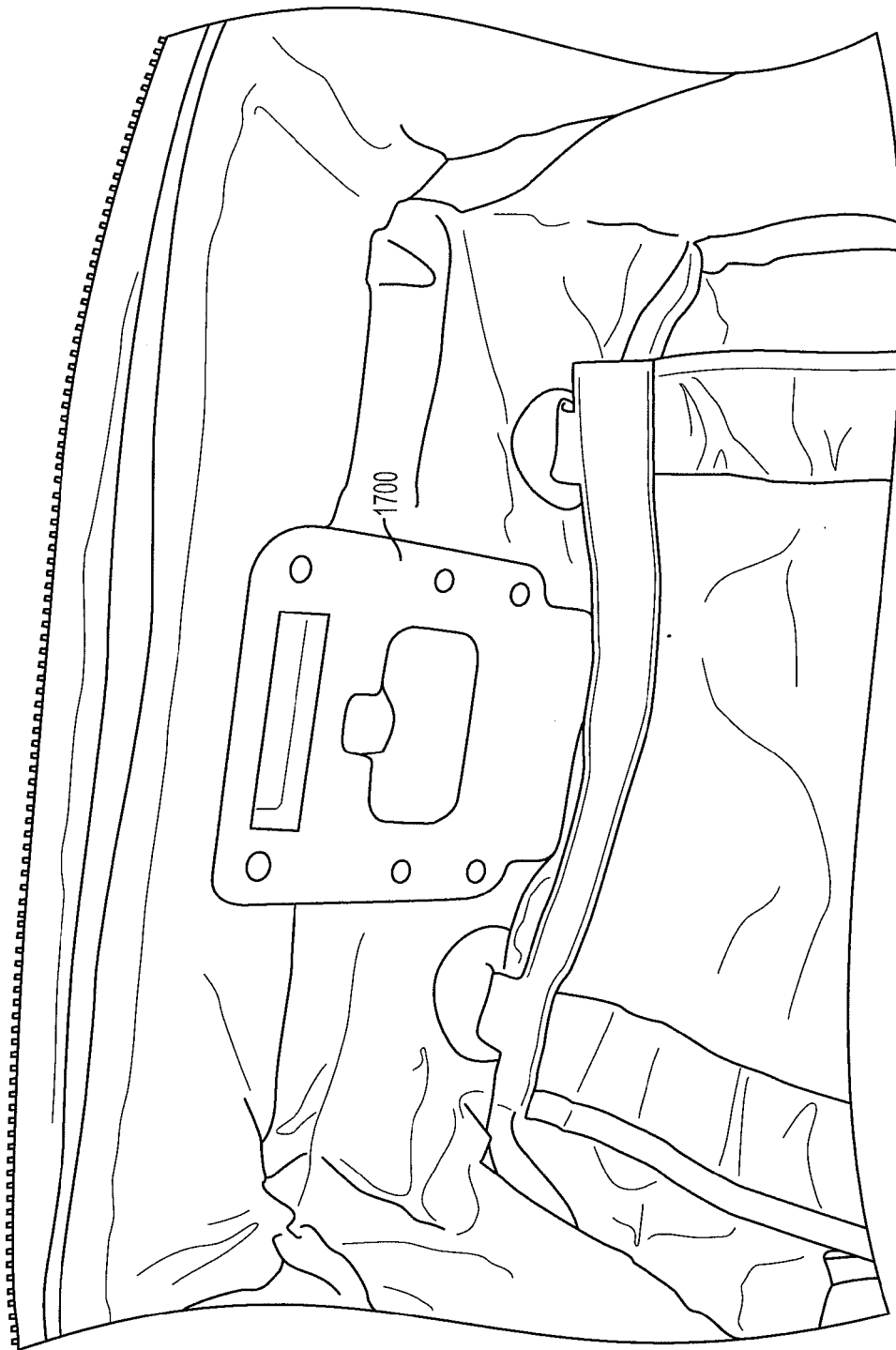


FIG. 8

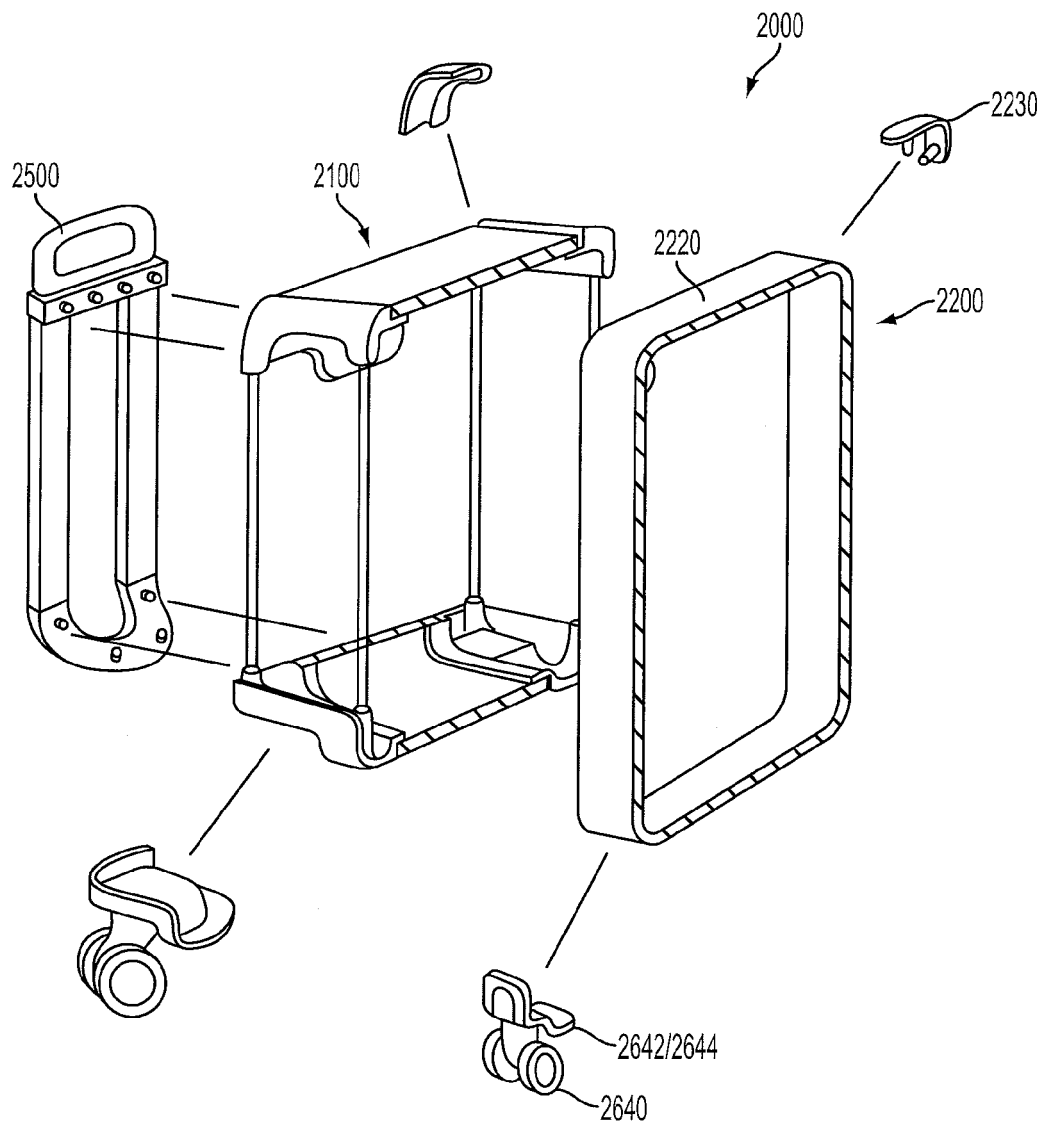


FIG. 9



EUROPEAN SEARCH REPORT

Application Number
EP 15 02 0067

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			A45C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 November 2015	Examiner Oliveras, Mariana
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EP 15 02 0067

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25-11-2015

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