LUGGAGE WITH A COLLAPSIBLE STRUCTURE

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ABSTRACT

Luggage with a folding structure that can take a compact form for storage and an expanded form of the usable volume including an access side and a bottom opposite the access side. The bottom is edged with four lateral sides. At least one of the two lateral sides is associated with at least one stiffening panel configured to turn towards the bottom of the luggage. A third lateral side has a folding structure and is configured to be locked by a lateral lock.
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RELATED APPLICATIONS


FIELD OF THE INVENTION

[0002] This invention relates to luggage with a folding structure that varies between a folded arrangement with a compact volume for storage and an expanded arrangement of the usage volume.

[0003] The invention is particularly useful in its application to the building of luggage with four wheels and a telescopic handle.

BACKGROUND OF THE INVENTION

[0004] Currently, there is no known luggage system with a folding structure that can satisfactorily vary the volume of luggage with four wheels and a telescopic handle.

[0005] Wheeled luggage with a telescopic handle is generally made up of a floor and lateral frames combined with a polypropylene sheet shaped to form a C.

[0006] If the material and the lateral frames are adjusted to maintain the floor's rigidity and co-planarity of the four wheels, while allowing effective guidance with the telescopic handle.

[0007] Document WO2013/028974 describes folding luggage comprising a lower surface with a rigid front part and a rigid rear part. Said rigid front and rear parts are connected so as to move from a configuration that is substantially co-planar to one that is substantially perpendicular. A locking mechanism is arranged to lock said rigid front and rear parts in said substantially co-planar configuration. The folding luggage comprises an upper surface comprising a front part and a rear part. Said front part and said rear part of the upper surface are arranged so as to move from a substantially co-planar configuration to a substantially perpendicular configuration. That folding luggage comprises a rear surface, a left-hand lateral surface, a right-hand lateral surface and a front surface. The luggage may be in an unfolded configuration while in use, and in a folded configuration for storage. In said unfolded configuration, said front and rear parts of the bottom surface are located in said substantially co-planar configuration and said front and rear parts of the upper surface are positioned in said substantially perpendicular configuration.

[0008] The luggage locking mechanism described in document WO2013/028974 is located at the middle of the lower surface, so that the transmission of forces on the sides, that is to say between the two front and rear left-hand wheels and the two front and rear right-hand wheels are unbalanced.

[0009] The locking system presented there is not satisfactory, as it does not allow adequate locking of the front and rear rigid parts in relation to each other under heavy loads.

[0010] The locking system presented there is also not satisfactory for withstanding a throwing test, because the rigid front and rear parts do no remain co-planar.

[0011] Lastly, the locking system is not satisfactory while rolling, because the rigid front and rear parts also do not remain co-planar, as a result of which the transmission of force from top to bottom of the product is imperfect, and rolling is imperfect.

OBJECT AND SUMMARY OF THE INVENTION

[0012] A first aim of the invention is to propose new luggage with a folding structure, the structure of which makes it applicable to wheeled luggage and luggage without wheels.

[0013] A second objective of the invention is to propose new luggage with a folding structure, where the structure is lightweight and offers high rolling quality and stability comparable to luggage with non-folding structure.

[0014] A third aim of the invention is to offer new luggage with a folding structure where the selected volume can be maintained, even while rolling.

[0015] The object of the invention is luggage with a folding structure that can take a compact form for storage and an expanded form of the usage volume, of the type with an access side and a bottom opposite said access side, wherein said bottom is edged with four lateral sides, characterized in combination by the fact that one lateral side has a folding structure and is suitable for being held rigidly using at least one lateral holding means.

[0016] Because the folding structure is suitable for being held rigidly by lateral holding means, rolling stability and the co-planarity of the wheels are achieved in an application of the invention for building wheeled luggage.

[0017] According to other alternative characteristics of the invention:

[0018] at least one of the two lateral sides is associated with at least one stiffening panel.

[0019] at least one stiffening panel is suitable for turning towards the bottom of the luggage.

[0020] the luggage with a folding structure has at least one front wheel and at least one rear wheel mounted on the lateral side with a folding structure and suitable for being held rigidly by at least one lateral holding means.

[0021] the lateral locking means comprise a rigid means for joining at least one front wheel and at least one rear wheel mounted on the lateral side with a folding structure and suitable for being held rigidly by at least one lateral holding means.

[0022] the lateral side with a folding structure that is suitable for being held rigidly by at least one lateral holding means makes up a floor with two rigid parts joined to each other by a hinge, wherein each of them bears at least one front wheel and at least one rear wheel.

[0023] the lateral side that makes up the floor has two rigid parts and at least one joining rod that makes it possible to stiffen the folding floor.

[0024] each joining rod that stiffens the folding floor joins the wheel casings to create a rigid link between the two wheels and to keep them co-planar.

[0025] at least one joining rod rotates around a fixed point located close to one of the wheels between two
main positions: a first folded position that does not join the wheels and an unfolded position that creates the link with another wheel.

[0026] Each joining rod may be mounted inside the folding suitcase.

[0027] The assembly for the fastening, movement, and holding of a joining rod can be mounted directly inside the suitcase on an interior wheel casing.

[0028] At least one stiffening panel suitable for turning towards the bottom of the luggage can be articulated at the bottom of the luggage.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The invention will be better understood thanks to the following description provided as a non-limitative example, by reference to the accompanying drawings wherein:

[0030] FIG. 1 is a schematic representation of a perspective view of luggage with a folding structure according to the invention in the folded arrangement with a compact volume for storage.

[0031] FIG. 2 is a schematic representation of a perspective view of luggage with a folding structure according to the invention in the expanded arrangement of the usage volume.

[0032] FIG. 3 is a schematic representation of a partial perspective view illustrating a locking means of luggage with a folding structure according to the invention in the folded arrangement with a compact volume for storage.

[0033] FIG. 4 is a schematic representation of a partial perspective view illustrating a locking means of luggage with a folding structure according to the invention in the expanded arrangement of the usage volume.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0034] By reference to FIGS. 1 to 4, identical or functionally equivalent elements are given identical reference numbers.

[0035] The structure of the luggage with a folding structure according to the invention described by reference to FIGS. 1 to 4 is particularly advantageous for the construction of luggage with four wheels, so as to ensure smooth rolling in all the arrangements corresponding to a given volume, while retaining the properties of resistance to impacts, the use and the carrying of the wheeled luggage with a non-folding structure according to the prior art.

[0036] The invention makes it possible to vary the volume of wheeled luggage in a simple and ergonomic manner, with no disassembly or particular manipulation, to fold the floor for storage and provide a rigid and continuous floor for rolling. That volume variation makes it possible to reduce the thickness of the luggage for the purpose of storage when it is not in use.

[0037] In usage mode, the folding floor does not collapse under the weight of the load, particularly at the folding line: the invention thus makes it possible to assemble a system with four wheels on the floor and ensure perfect rolling in the four-wheeled mode.

[0038] In FIG. 1, luggage with a folding structure according to the invention is luggage with wheels R and a telescopic handle t comprising a bottom 1, a floor 2 and a top 3.

[0039] Two lateral sides 4 extend from the bottom 1, between the floor 2 and the top 3.

[0040] An access side 5 with a zip fastener is opposite the bottom 1 and edges the lateral sides 4, the floor 2 and the top 3.

[0041] The floor 2 is a floor that folds between an arrangement with a compact volume for storing the luggage represented in FIG. 1 and an arrangement with a large volume represented in FIG. 2.

[0042] The floor 2 comprises two parts: a rigid front part 2a and a rigid rear part 2b articulated by a hinge 2c.

[0043] The hinge 2c may be made by stitching textile enclosures made integral with the rigid parts 2a and 2b of the floor 2, so that the front part can rotate towards the inside of the product.

[0044] The rigid parts 2a and 2b of the floor 2 are folded substantially at right angles in the arrangement with a compact storage volume, to reduce the thickness of the floor 2.

[0045] The rigid parts 2a and 2b of the floor 2 each have two wheels R placed laterally in the vicinity of the lateral sides 4.

[0046] The front part 2a of the floor 2 is thus a rigid part, which carries two casings 6 that support the wheels R.

[0047] The rear part 2b of the floor 2 is also a rigid part, which carries two other casings 6 that support the wheels R.

[0048] The top 3 of the luggage with wheels R and a telescopic handle T is generally made of a polypropylene sheet with a C-shaped arrangement that extends the bottom 1 and makes up a return. The top 3 has an opening that makes it possible to mount the telescopic handle T.

[0049] The invention also extends to an unrepresented alternative of luggage with a top 3 that can be folded between an arrangement with a compact volume for storing the luggage represented in FIG. 1 and an arrangement with a large volume represented in FIG. 2. The top 3 of this unrepresented alternative luggage with a folding structure according to the invention may to that end comprise a front part and a rear part that can be folded substantially at right angles in the arrangement with the compact volume for storage. The front and rear parts of the top 3 may be complementary near the lateral sides 4, to make up a substantially rigid top 3.

[0050] The lateral sides 4 extend from the bottom 1, between the floor 2 and the top 3, and are associated with stiffening panels 4a suitable for turning towards the bottom of the luggage.

[0051] Those rigid pivoting panels 4a are mounted inside the structure of the luggage with a folding structure, to make up stiffening frames in the arrangement with a large volume represented in FIG. 2.

[0052] The stiffening panels 4a are fixed to the rear or bottom 1 of the luggage with a folding structure and are not fixed on their other sides, in order to be able to rotate so as to be folded inside the structure of the luggage with a folding structure.

[0053] These stiffening panels 4a thus turn inside the structure of the luggage with a folding structure, in the arrangement with a compact volume for storing the luggage represented in FIG. 1.

[0054] The pair of rigid turning panels 4a are thus folded on top of each other in the arrangement with the compact volume for storing the luggage 1 represented in FIG. 1.
[0055] The stiffening panels 4a are made by means of a textile enclosure and are preferably edged by continuous rigid frames that hold them and keep them from being deformed inside the luggage with a folding structure.

[0056] The invention described by reference to luggage with a folding structure and four wheels R and a telescopic handle T also extends to suitcases with two wheels, with or without lateral frames, and luggage with soft folding structures such as duffle bags. The stiffening panels 4a may comprise elements other than lateral frames, such as glass fiber rods, which may or may not be removable.

[0057] In FIG. 2, the luggage with a folding structure 1 according to the invention is represented in its arrangement with a large usage volume.

[0058] In that arrangement with a large usage volume, the front part 2a is co-planar with the rear part 2b of the floor 2.

[0059] The front part 2a and rear part 2b are joined by the articulation 2c.

[0060] Lateral locking means 2d are mounted alternatively on the front part 2a or the rear part 2b, near the casings 6 that support the wheels R.

[0061] The locations of the lateral locking means 2d are preferably made in the internal parts 6a of the support casings 6 of wheels R.

[0062] The lateral locking means 2d may be made of any rigid material, such as glass fiber, steel or rigid plastic.

[0063] The spacing between the lateral locking means 2d of the front part 2a and the rear part 2b of the floor 2 avoids the concentration of stresses in the middle of floor 2. Thus, that avoids building up diverted flexion at the middle of the floor 2 and deforming the rolling plane at the locations of the support housings 6 of the wheels R, as the forces are distributed over a greater width, corresponding to the interior edges of the floor 2.

[0064] In the arrangement with the large usage volume, the front of each stiffening panel 4a is fixed and held at a front edge of the lateral side 4 by a Velcro (registered trademark) tape or press studs.

[0065] The rear of each stiffening panel 4a is fixed and held at the rear of each lateral side 4 by a hinge 4c which may be made by stitching a textile enclosure made integral at the rear of each lateral side 4.

[0066] In the movement towards the arrangement with a large volume, each stiffening panel 4a is guided by the hinge 4c made integral at the rear of each lateral side 4. The rigid turning panels 4a thus open outward and are articulated on the rear side of the luggage, so that the rigid turning panels 4a take up positions that are substantially parallel in the arrangement with a large volume.

[0067] Because at least one of the two lateral sides is associated with at least one stiffening panel that is adapted to turn towards the bottom of the folding luggage, the force is transmitted evenly from the top of the luggage to the bottom and rolling is improved.

[0068] Thus, thanks to the invention, the luggage with a folding structure has a stable and rigid structure in the arrangement with a large volume: the lateral parts 4 are stabilized by rigid turning panels 4a in the arrangement with a large volume.

[0069] In FIG. 3, a locking means for luggage with a folding structure according to the invention in the folded arrangement with a compact volume for storage is represented.

[0070] The front part 2a and rear part 2b are joined by the articulation 2c.

[0071] Lateral locking means 2d are mounted in this example on the rear part 2b, near the support casings 6 of the wheels R.

[0072] The locations of the lateral locking means 2d are made and directly incorporated into the internal parts 6a of the support casings 6 of wheels R.

[0073] The lateral locking means 2d comprise elongated elements 7 in rigid material, such as glass fiber, steel or rigid plastic.

[0074] The elongated elements 7 in rigid material are mounted to rotate between a free position that is substantially parallel to the bottom 1 and a forced position that is substantially perpendicular to the bottom 1.

[0075] In the free position substantially parallel to the bottom 1, the elongated elements 7 in rigid material do not exceed the articulation line 2c.

[0076] If there are several elongated elements 7 in rigid material, the elongated elements 7 in rigid material may be articulated on the front or the rear of the floor 2 of luggage with a folding structure according to the invention.

[0077] When the elongated elements 7 in rigid material are articulated on the rear as shown, the rigid turning panels 4a have downward-turned indents to allow them to pass above the internal parts 6a of the support casings 6 of the wheel R of the luggage with a folding structure.

[0078] When the elongated elements 7 of the rigid material are articulated at the front of the luggage with a folding structure, near the access opening 6, the rigid turning panels 4a may not have backward-turned indents.

[0079] In FIG. 4, each elongated element 7 in rigid material is locked in two housings 8a, 8b, so as to thus make up a rigid co-planar holding link for the front part 2a and rear part 2b joined by the articulation 2c.

[0080] The locations of the housings 8a, 8b are preferably located on the internal parts 6a of the support casings 6 of wheels R.

[0081] That co-planar rigid holding link thus allows the smooth rolling of the luggage with a folding structure, four wheels R and a telescopic handle T.

[0082] Each elongated element 7 in rigid material is embedded in the housings 8a, 8b integral with the front half floor 2a and rear half floor 2b, so that no force is applied on the axis of rotation of the elongated element 7 in rigid material.

[0083] The invention also covers the unreported alternative in which at least one elongated element 7 in rigid material is mounted to rotate between a free position that is substantially parallel to the bottom 1 and a forced position that is substantially perpendicular to the bottom 1.

[0084] The invention also covers the unreported alternative comprising only one elongated element 7 in rigid material that is mounted to rotate between a free position that is substantially parallel to the bottom 1 and a forced position that is substantially perpendicular to the bottom 1.

[0085] The invention also covers the unreported alternative comprising more than two elongated elements 7 in rigid material mounted differently, to make up a rigid holding link that is co-planar with the front part 2a and rear part 2b of the floor 2.

[0086] The essential feature is that the invention provides a lateral rigid linking means between a front wheel R and a
rear wheel R on the same side. That rigid link is provided by the two rods 7 that link the interior wheel casings 6a and stiffen the folding floor 2. In the unfolded position, the invention makes it possible to link the front wheel R with the corresponding rear wheel R, in order to create a rigid link between the two wheels R and make them co-planar.

[0087] The invention simply provides for two rods or rigid links 7 which link, in the unfolded position, directly and rigidly a zone near the front wheel R to a zone near the corresponding rear wheel R.

[0088] Thus, at least one rod 7 rotates around a fixed point located close to one of the wheels R, and can thus occupy two main positions: one folded position that does not link the wheel casings and is parallel to the bottom 1 of the suitcase, and an unfolded position that creates a link with another wheel on the other half floor and is perpendicular to the bottom 1 of the suitcase.

[0089] The invention thus makes it possible, in the unfolded position, to ensure the perfect transmission of force between the front and rear of the luggage, and hold the front and rear wheels on the same plane, to allow perfect rolling in the four-wheel mode.

[0090] In the preferred embodiment of the invention, the rod system 7 is placed inside the folding suitcase, and the system for fastening, rotating and holding the rods 7 is integrated directly on the interior wheel casings 6a inside the suitcase.

[0091] A first housing 6a for the wheel R, for example the rear housing at the back of the suitcase, bears the rod 7 mounted around an axis of rotation.

[0092] An additional housing 8a that catches the rod 7 in the unfolded position is provided to prevent the transmission of forces to the point of fastening and the axis of rotation of the rod 7.

[0093] A second housing 6a for the wheel R, for example the front housing of the suitcase, bears a housing 8b that holds and locks the rod 7 on the other half floor in the unfolded position.

[0094] The invention also covers the unrepresented alternative in which at least one elongated element 7 in rigid material is integrated into an exterior housing 6b of the wheel R.

[0095] The invention also covers the unrepresented alternative in which at least one elongated element 7 in rigid material, which is not directly integrated in an interior or exterior wheel casing, is mounted nearby, directly or by means of an added part, particularly in the case of manufacturing by injection in several pieces.

[0096] In order to implement the invention, the user starts by unfolding the floor 2, then fastens the rods 7 to the casings 6a. Lastly, the user makes the rigid turning panels 4 rotate from the inside to the outside and the front of the luggage with a folding structure.

[0097] During that movement of rotation, the bottom of the rigid turning panels 4a could hit or be blocked by the wheel casings 6a, on the surfaces of housings 8a, 8b, protruding from the floor 2.

[0098] If the presence of the housings 8a, 8b that hold the rod 7 on the interior casings 6a raises volumetric problems during manipulation, rigid turning panels 4a that are slightly shorter than the internal height of the suitcase are provided.

[0099] The bottom parts of the rigid turning panels 4a do not touch the bottom of the product and are indented so as to pass above the housings 8a, 8b of the interior casings 6a of the wheels R during rotation.

[0100] In that case, each interior casing 6a of a wheel R comprises a raised edge 9, which is set against the rigid frame of the turning panel 4a. That edge 9 does not merely hold a rigid frame of a mobile turning frame 4a correctly, but it also makes up for the shorter height of the rigid frame of the turning panel 4a and supports it at the proper height.

[0101] In order to reinforce the rigidity and stability of the luggage with a folding structure according to the invention in all the arrangements corresponding to a selected volume, it is advantageous to provide additional means for locking the rigid frames of the turning panels 4a for stiffening, so as to hold the stiffening frames in position in their arrangement for the transmission of vertical and lateral forces.

[0102] The invention described by reference to several particular embodiments is not limited in any way to those embodiments, but covers all modifications of shape and all alternative embodiments, such as the attached claims.

[0103] Thus, the luggage according to the invention may comprise at least one stiffening panel (4a) that is mobile in another manner, for example at least one stiffening panel (4a) that is suitable for pivoting to the front or towards the access side of the luggage.

[0104] Thus, the luggage according to the invention may comprise at least one lateral holding means (2d) that may be articulated in another manner, for example at least one folding means such as a second floor, the axis of articulation of which is transversal to the axis of the hinge of the lateral side (2) with a folding structure that makes up a floor (2) with two rigid parts (2a, 2b) joined to each other by a hinge.

1-12. (canceled)

13. A luggage with a folding structure that can take a compact form for storage, and an expanded form of the usage volume, of the type with an access side and a bottom opposite said access side; wherein said bottom is edged with four lateral sides; and wherein one lateral side has a folding structure and is configured to be rigidly held using at least one lateral lock.

14. The luggage according to claim 13, wherein at least one of the two lateral sides is associated with at least one stiffening panel.

15. The luggage according to claim 14, wherein at least one stiffening panel is configured to turn towards the bottom of the luggage.

16. The luggage according to claim 13, further comprising at least one front wheel and at least one rear wheel mounted on the lateral side with the folding structure and configured to be rigidly held using at least one lateral lock.

17. The luggage according to claim 16, wherein at least one lateral lock comprises a rigid component configured to join at least one front wheel and at least one rear wheel mounted on the lateral side with the folding structure and configured to be rigidly held using at least one lateral lock.

18. The luggage according to claim 17, wherein the lateral side with the folding structure and configured to be rigidly held using at least one lateral lock makes up a folding floor with two rigid parts joined to each other by a hinge, wherein each of the rigid parts bears at least one front wheel and at least one rear wheel.
19. The luggage according to claim 17, wherein the lateral side that makes up the folding floor has the two rigid parts and at least one joining rod configured to stiffen the folding floor.

20. The luggage according to claim 19, wherein each joining rod joins wheel casings to create a rigid link between said at least one front wheel and said at least one rear wheel and to keep them co-planar.

21. The luggage according to claim 20, wherein at least one joining rod rotates around a fixed point located close to one of the wheels, between two positions: a first folded position that does not join the wheels and an unfolded position that creates the link between with another wheel.

22. The luggage according to claim 19, wherein each joining rod is mounted inside the luggage.

23. The luggage according to claim 22, wherein an assembly to fasten, move and hold a joining rod is mounted directly inside the luggage on an interior casing of a wheel.

24. The luggage according to claim 15, wherein said at least one stiffening panel configured to turn towards the bottom of the luggage is articulated at the bottom of the luggage.

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