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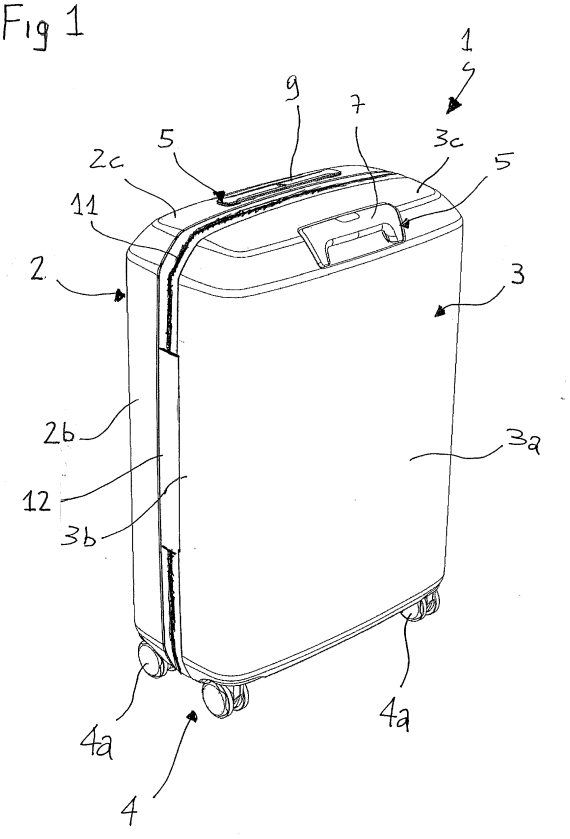
(54) SUITCASE OF RIGID TYPE AND METHOD FOR PRODUCING A SUITCASE OF RIGID TYPE

(57) A method of making a suitcase of rigid type comprises the steps of providing a mold for injection molding of a plastic shell, molding identical first shells (2) and second shells (3), applying a first plurality of accessories (4) comprising sets of identical accessories in identical portions of the first shells (2) and the second shells (3); applying a second plurality of different accessories (5) in identical portions of the first shells (3) and the second shells (4), such that the accessories applied to the first shells (2) are different from the accessories applied in identical positions to the second shells (3), mechanically connecting together a first shell (2) and a second shell (3) to obtain a suitcase (1).

Fig 1



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Description

[0001] The present invention relates to a method of manufacturing a suitcase of rigid type, and to a suitcase of rigid type.

[0002] As used in this disclosure and the claims annexed thereto, the term rigid suitcase is intended to designate transportable luggage, such as a carry-on case, a travel suitcase or the like, of the type composed of two mutually articulated plastic shells. Such suitcases differ from soft suitcases, which are made up of a frame covered by fabric sheets.

[0003] Rigid suitcases are usually composed of two mutually articulated shells such that the first shell defines a rear wall and four side walls and the second shell defines a front wall and four side walls. Two side walls of the first and second shells are mutually hinged to allow the suitcase to be opened like a book, and the remaining side walls are joined by closing means (such as zippers or shoulders mating with undercuts and the like), for the suitcase to be closed and opened.

[0004] Modem rigid suitcases are equipped with many accessories, such as wheels or casters, usually two or four, which are located on a side wall (the bottom wall) of the suitcase such that the suitcase may be carried without being necessarily lifted. A further accessory that is always provided in modem rigid suitcases is a telescopic handle, which is designed to be pulled out of a housing of the top wall and is mechanically connected to the rear wall, for easier transport and movement of the suitcase. Also, in many cases the suitcase also has a security system, such as a combination or key lock, operable between the shells to prevent unauthorized opening of the suitcase.

[0005] As a result of the above, in addition to their object-containing purpose, the two shells of the suitcase shall also serve structural functions, for mounting and operation of suitcase accessories.

[0006] For this reason, the greatest attention should be paid, during design and manufacture of suitcases, to the provision of recesses, projections, undercuts and indentations on each of the two shells.

[0007] Thus, a rigid suitcase is fabricated by first forming the two shells and then, at a later time, applying respective accessories to each of the two shells.

[0008] Particularly, the step of forming the two shells may be carried out in two different manners according to the price range at which the suitcase is designed to be sold. In suitcases sold at a higher price, the two shells are thermoformed from polycarbonate sheets.

[0009] Conversely, suitcases sold at a lower price are made of injection-molded polypropylene.

[0010] In either case, shells are formed using molds. Suitcase shell thermoforming molds would cost tens of thousands of Euros each, whereas molds for injection molding would cost about a few hundreds of thousands of Euros each. In the thermoforming case, the original mold cost is largely repaid, especially because the molds are used to form shells that will make higher-cost suitcases. However, in the injection molding context, the cost of molds is of crucial importance.

[0011] In the light of the above described prior art, the technical purpose of the present invention is to provide a method of manufacturing a suitcase of rigid type and a rigid suitcases that can afford a reduction of the manufacturing costs.

[0012] Particularly, the object of the present invention is to provide a method of manufacturing a suitcase of rigid type and a rigid suitcase having low manufacturing costs.

[0013] According to the present invention, the technical purpose and the intended object are fulfilled by a rigid suitcase as defined by the features of one or more of the annexed claims.

[0014] The features and advantages of the invention will appear from the following detailed description of an embodiment, which is illustrated without limitation in the annexed drawings, in which:

- Figure 1 shows a perspective and schematic view of a rigid suitcase of the present invention,
- Figure 2 is a bottom view of the rigid suitcase of Figure 1,
- Figure 3 shows a top view of the rigid suitcase of Figure 1, and
- Figures 4a, 4b, 5a, 5b show certain details of the suitcase of Figure 1.

[0015] Referring to the annexed figures, numeral 1 generally designates a rigid suitcase of the present invention.

[0016] As used herein, the term "rigid" suitcase is intended to designate a suitcase whose shells are made of a plastic material that can resist impacts and compression without being significantly deformed, thereby protecting the suitcase contents. In other words, the term"rigid" suitcase designates a type of suitcases that differs from "soft" suitcases, i.e. those made of fabric or the like, which become deformed and lose their original shape when subjected to even light pressure.

[0017] The rigid suitcase 1 comprises a first shell 2 and a second shell 3 which are hinged to each other and a number of accessories applied to the two shells. The two shells 2, 3 are identical, as shown in Figures 4a, 4b and 5a, 5b.

[0018] Each shell 2, 3 delimits a housing compartment and comprises a bottom wall 2a, 3a and four side walls connected to the bottom wall, particularly two larger side walls 2b, 3b, a top wall 2c, 3c and a base wall 2d, 3d (defining two smaller side walls) situated between the larger side walls.

[0019] The accessories are composed of a first plurality of accessories 4, comprising sets of identical accessories applied to both shells, and a second plurality of accessories 5, comprising different accessories, applied to either the first or the second shell. Preferably, the ac-

cessories of the first plurality of accessories 4 are located in identical portions of the first shell 2 and the second shell 3.

[0020] As schematically shown in Figures 1, 2 and 3, an example of the first plurality of accessories 4, i.e. that consisting of sets of identical accessories, is given by the wheels 4a. In this example, there are four identical wheels 4a. Particularly, the base wall 2d, 3d of each shell 2, 3 comprises a pair of recesses 6 (Figures 2 and 5) projecting toward the housing compartment, each designed to receive a wheel 4a. A further example of the first plurality of accessories 4 is given by support feet (not shown) located at the sides of the suitcase, i.e. on the larger side wall of each shell, for the suitcase to be laid on one side. Preferably, four of such support feet are provided in pairs on each shell 2, 3.

[0021] The accessories of the second plurality of accessories 5 are different accessories applied to the same portions of both shells 2, 3 or accessories applied to one of the shells only. One example of different accessories 4 applied to the same portions of both shells 2, 3 is given by the hand grip 7 of a telescopic handle (for carrying the suitcase) and a decoration element 8 (e.g. bearing the manufacturer logo). One example of accessories 5 applied to one of the shells only is given by one or more lifting handles 9, located on the top wall 2c of the first shell 2 and/or on the larger side wall of the first shell 2 (see Figures 1 and 3).

[0022] As schematically shown in Figures 4a to 5b, a side portion of each shell, preferably the side wall that faces away from the side wall with the recesses 6 for the wheels 4a, comprises a recess 10 projecting toward the housing compartment. In the preferred embodiment of the invention, the recess 10 is placed on the top wall 2c, 3c of each shell. The recess 10 is configured as an indentation on the shell surface, creating a discontinuity in its shape. This recess 10 is designed to accommodate, on the side that faces away from the housing compartment, the hand grip 7 of the telescopic handle and is likewise designed to receive and retain a decoration element 8.

[0023] Thus, one suitcase shell may be used, during fabrication of the suitcase, to accommodate the telescopic carrying handle or to form the other half-portion of the suitcase.

[0024] The two shells 2, 3 are pivotally connected to each other along respective side walls, adjacent of the side walls with the recesses 10, to form a suitcase that can be opened like a book. In the preferred embodiment of the invention, the two shells are pivotally connected to each other along corresponding larger side walls 2b, 3b, to form a suitcase that can be opened and closed like a book along the longer side. For this purpose, a tape 12 (as schematically shown in Figure 1) is sewn or glued to at least one portion of the free peripheral edge of a larger side wall of each shell, to act as a hinge member and to permanently join the two shells 2, 3 together (while allowing the two shells to pivot relative to each other). The remaining free edges of each shell 2, 3 have respective portions of a zipper 11 (as schematically shown in Figure 1) sewn or glued thereto. Alternatively, the zipper 11 may extend all along the peripheral edges of the side walls of the shells. In this case, the above mentioned tape 12 is no longer needed.

[0025] Particularly, the method of manufacturing a rigid suitcase according to the present invention comprises the steps of providing a mold for injection molding of a plastic shell and molding a plurality of first shells 2 and a plurality of second shells 3, all being identical, using such mold. In other words, the first and second shells are made using a single mold (or a plurality of identical molds), with such mold being designed to form a single shell during each plastic (namely polypropylene) injection cycle. The first shells 2 and the second shells 3 are also symmetrical with respect to a plane perpendicular to the bottom plane 2a, 3a, substantially parallel to the larger side walls 2b, 3b and passing through the top and base walls. In other words, if a shell were longitudinally cut at the central portion, it would be divided into two perfectly symmetrical parts.

[0026] Once the first and second (identical and indistinguishable) shells are formed, first mechanical processing operations are performed on the first and second shells to allow them to receive at least part of the first plurality of accessories 4. These operations may be performed either before separating the molded shells into sets of first shells 2 and second shells 3 or after such separation into the above mentioned first and second shells.

[0027] Such first mechanical processing operations include, for instance, forming holes in predetermined portions of the shells 2, 3. One example of first mechanical processing operations is given by the holes formed in the two shells to mount the support feet. It shall be noted that part of the first plurality of accessories 4 may be applied to each shell without requiring any mechanical processing. For instance, the holes for receiving the axles of the wheels 4a may be provided in the recesses 6 directly during shell molding. Alternatively, these holes may be formed as part of the first mechanical processing operations.

[0028] Second mechanical processing operations are also performed on the first shells 2 and the second shells 3, to allow them to receive at least part of the second plurality of accessories 5. These second mechanical processing operations are different for the first shell 2 and the second shell 3. One example of such second mechanical processing operations is given by the holes formed in the shells to mount the lifting handles 9. A further example is given by the holes formed in the second shell 3 to mechanically connect the telescopic rods of the carrying handle to the bottom wall 3a of the second shell 3.

[0029] It shall be noted that part of the accessories of the second plurality of accessories 5 may be applied to each shell without requiring any mechanical processing.

For example, the holes for receiving the telescopic rods of the carrying handle may be provided in the recesses 10 directly during molding. Alternatively, these holes may be formed as part of the second mechanical processing operations.

[0030] The telescopic rods of the carrying handle are introduced into the holes of the recess 10 and are mechanically connected to the bottom wall 3a of the second shell on the side facing toward the interior of the suitcase. The mechanical connection of the telescopic rods to the bottom wall 3a of the second shell 3 is, as mentioned above, part of the second mechanical processing operations Then, the hand grip 7 is fitted onto the telescopic rods and is seated in the recess 10 when the telescopic rods are retracted. It shall be noted that the other recess 10 (the one of the first shell 2) does not undergo any mechanical processing. Such recess 10 receives the decoration element 8.

[0031] The two shells 2, 3 are mechanically connected to each other along two respective side walls, preferably the larger side walls 2b, 3b, to form a suitcase that can be opened and closed like a book, by sewing or gluing a tape 12 (as schematically shown in Figure 1) to at least one portion of the free peripheral edge of such side wall of each shell, such that it may act as a hinge member and permanently join the two shells 2, 3 together (while allowing the two shells to pivot relative to each other). The remaining free edges of each shell 2, 3 have respective portions of a zipper 11 (as schematically shown in Figure 1) sewn or glued thereto.

[0032] The above disclosure clearly shows that the invention fulfills the intended objects.

[0033] Indeed, a single mold is used to make both shells of the suitcase, such shells being accessorized and distinguished by the application of identical or different accessories to both shells. Therefore, due to the reduction of the investment to one half (one mold instead of two molds), the manufacturing costs for the rigid suitcase may be considerably reduced.

[0034] Obviously, the embodiments as disclosed and illustrated herein shall be only intended by way of example, and those skilled in the art will appreciate that a number of changes and variants may be made to the rigid suitcase of the invention as described hereinbefore, including for instance the provision of rubber feet on the first and/or the second shells, the application of additional decorative and/or functional elements on the first and/or the second shells, without departure from the scope of the invention, as defined in the following claims.

Claims

1. A method of making suitcases of rigid type, which comprises:

   providing a mold for plastic materials for molding a shell;

   molding identical first shells (2) and second shells (3), comprising respective bottom walls (2a, 3a) and side walls, using said mold;

   applying a first plurality of accessories (4) comprising sets of identical accessories in identical portions of the first shells (2) and the second shells (3);

   applying a second plurality of different accessories (5) in identical portions of the first shells (3) and the second shells (4), such that the accessories applied to the first shells (2) are different from the accessories applied in identical positions to the second shells (3), wherein this includes seating a hand grip (7) of a telescopic handle in a recess (10) of the second shells (3), located on a side wall thereof;

   hinging together respective side walls of the first and second shells (2, 3), adjacent to the wall with said recess (10), to allow the two shells to be closed like a book.

2. A method as claimed in claim 1, wherein the side wall of each shell 2, 3 that faces away from the side wall with said recess (10) comprises a pair of indents (6), each designed to receive a wheel (4a).

3. A method as claimed in claim 1 or 2, wherein said side walls of each shell comprise a larger side wall (2b, 3b), a top wall (2c, 3c) and a base wall (2d, 3d), which extend between the larger side walls (2b, 3b); said recess (10) being located on said top walls (2c, 3c).

4. A method as claimed in any of the preceding claims, wherein the first plurality of accessories (4) are applied to the shells by performing identical first mechanical operations on the first shells (2) and the second shells (3).

5. A method as claimed in any of the preceding claims, wherein the second plurality of accessories (5) are applied to the shells by performing different second mechanical operations on the first shells (2) and second shells (3).

6. A method as claimed in any of the preceding claims, wherein applying the accessories of the second plurality of accessories (5) comprises applying a decoration element (8) on the recess (10) of the first shells (2) to conceal it.

7. A method as claimed in any of the preceding claims, wherein applying the accessories of the second plurality of accessories (5) further comprises applying accessories on the first shells (2) or the second shells (3) only.

8. A method as claimed in claim 5, which comprises

carrying out second mechanical operations only on the shells that are designed to receive the accessories of the second set of accessories (5).

9. A suitcase of rigid type comprising first (2) and second (4) plastic shells, a first plurality of accessories (4) comprising sets of identical accessories applied to both shells (2, 3) in identical portions thereof and a second plurality of accessories (5) comprising at least partially different accessories applied in identical portions of the two shells (2, 3), the first and second shells (2, 3) being formed by injection molding, being identical, and being pivotally connected to each other along respective side walls, said suitcase also comprising a hand grip (7) connected to telescopic rods and seated in a recess (10) of the second shell, which is located on a side wall thereof, adjacent to the side wall that is pivotally connected to the first shell.

10. A suitcase as claimed in claim 9, wherein the side walls of the first and second shells that face away from the side walls with said recess (10) comprise a pair of recesses (6) for receiving accessories of the first plurality of accessories (4), particularly wheels (4a).

11. A suitcase as claimed in claim 9 or 10, wherein each shell (2, 3) delimits a housing compartment and comprises a bottom wall (2a, 3a), two larger side walls (2b, 3b) connected to said bottom wall (2a, 3a), a top wall (2c, 3c) and a base wall (2d, 3d) connected to the bottom wall (2a, 3a); the base wall (2d, 3d) of each shell (2, 3) comprising said pair of recesses (6) projecting toward said housing compartment, and said top wall (2c, 3c) of each shell (2, 3) comprising said recess (10) projecting toward said housing compartment and accommodating, on the side that faces away from said housing compartment, accessories of the second plurality of accessories (5), particularly said hand grip (7) and a decoration element (8).

12. A suitcase as claimed in claim 11, wherein each shell (2, 3) comprises a free peripheral edge surrounding said housing compartment; said free edge of both shells being at least partially engaged by a zipper (11).

Fig 1

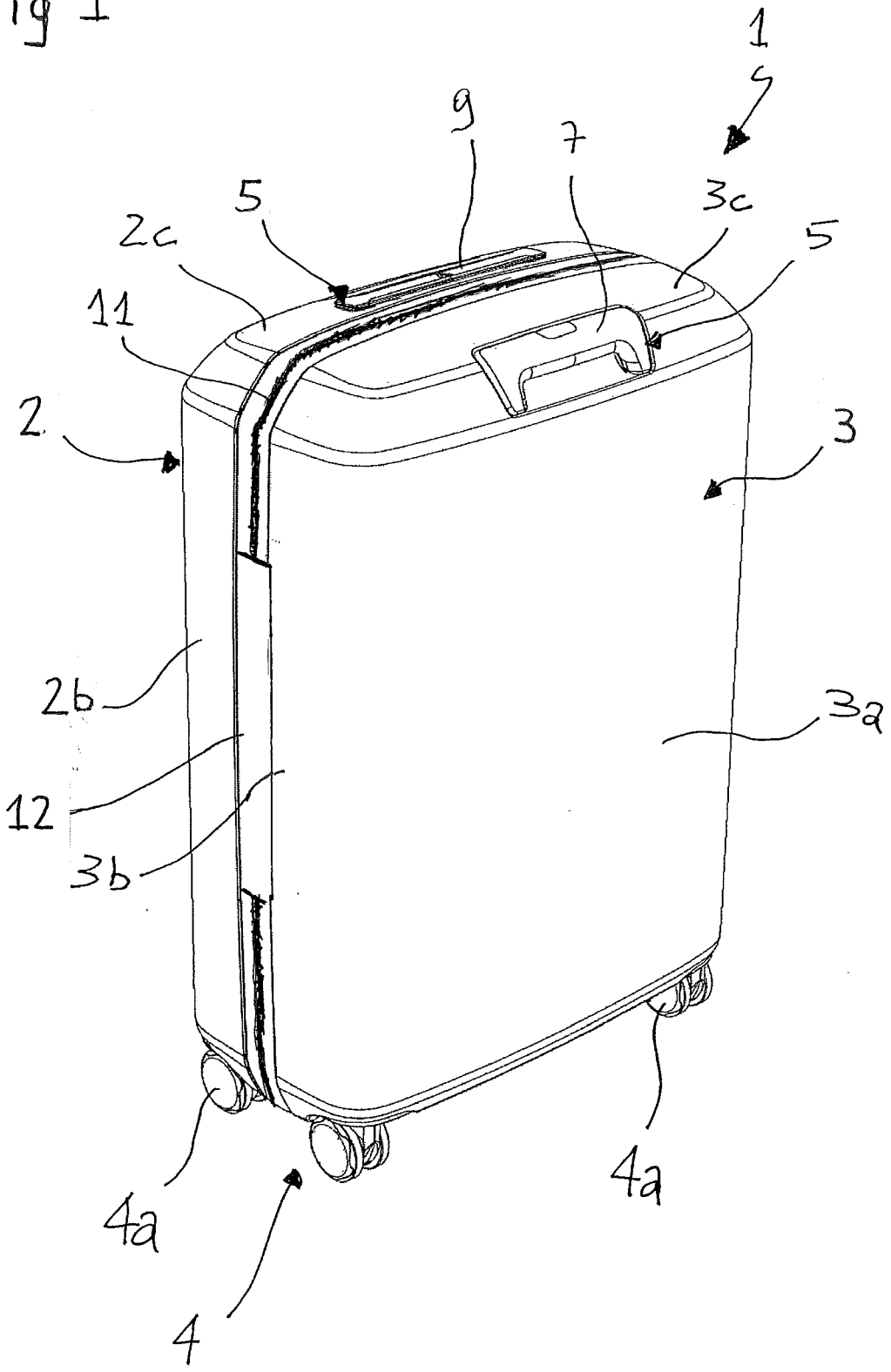
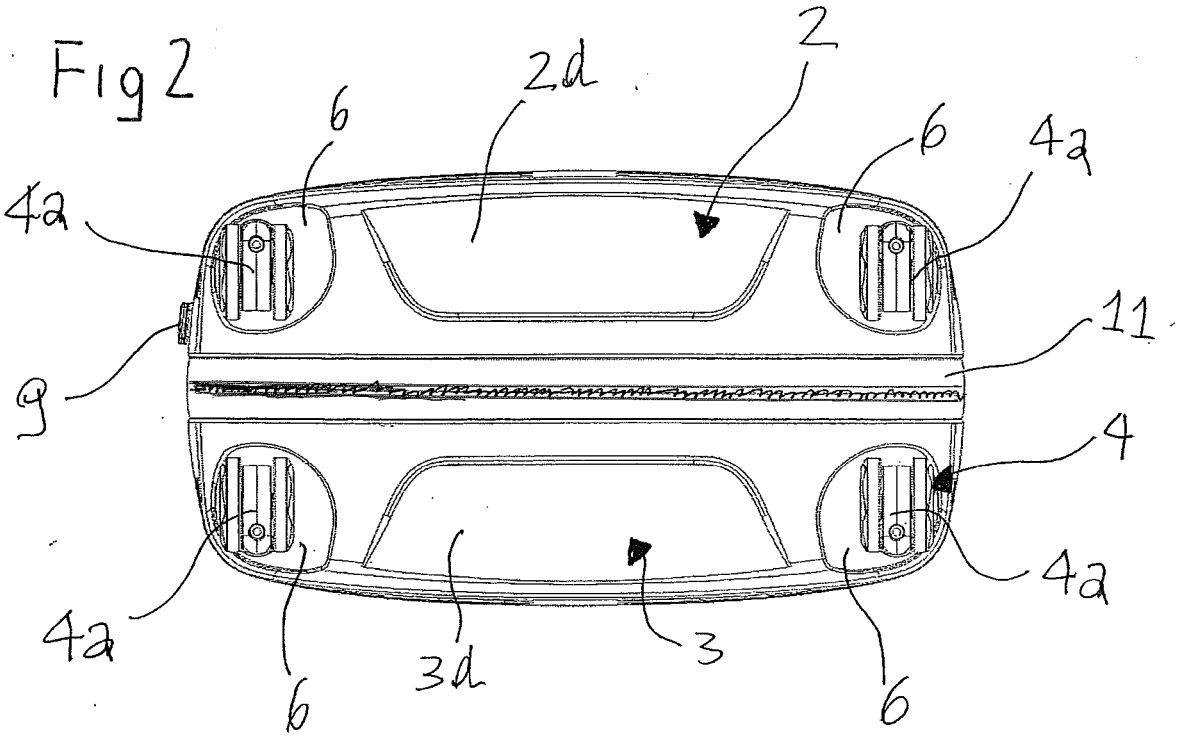


Fig 2



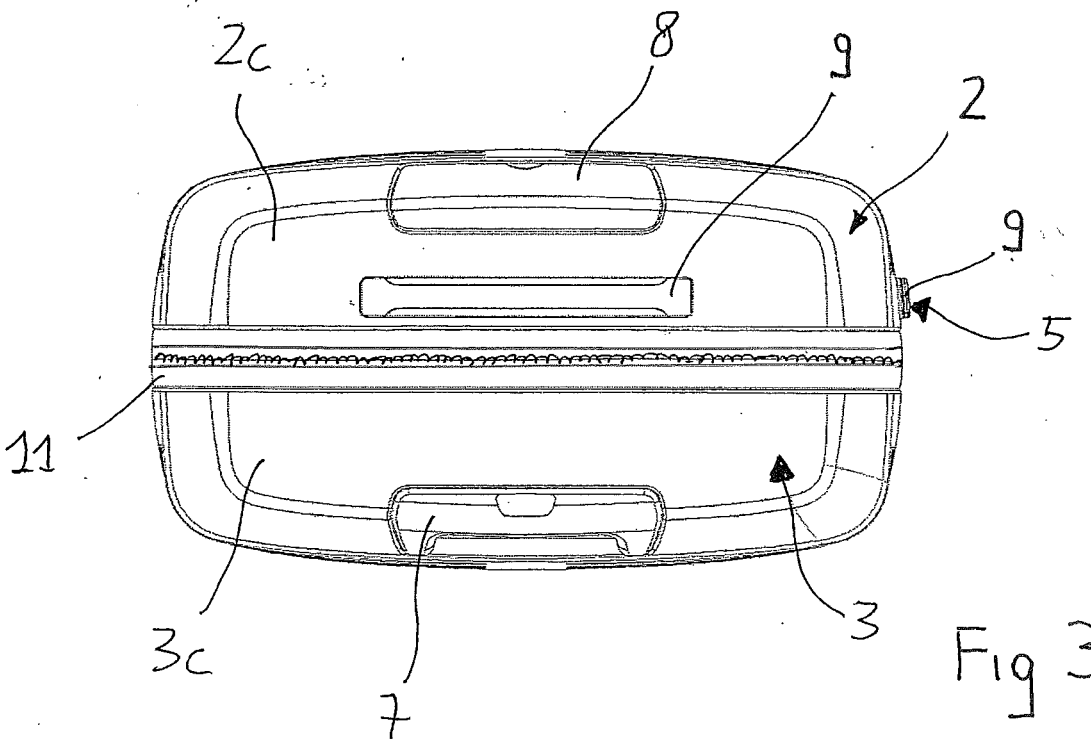
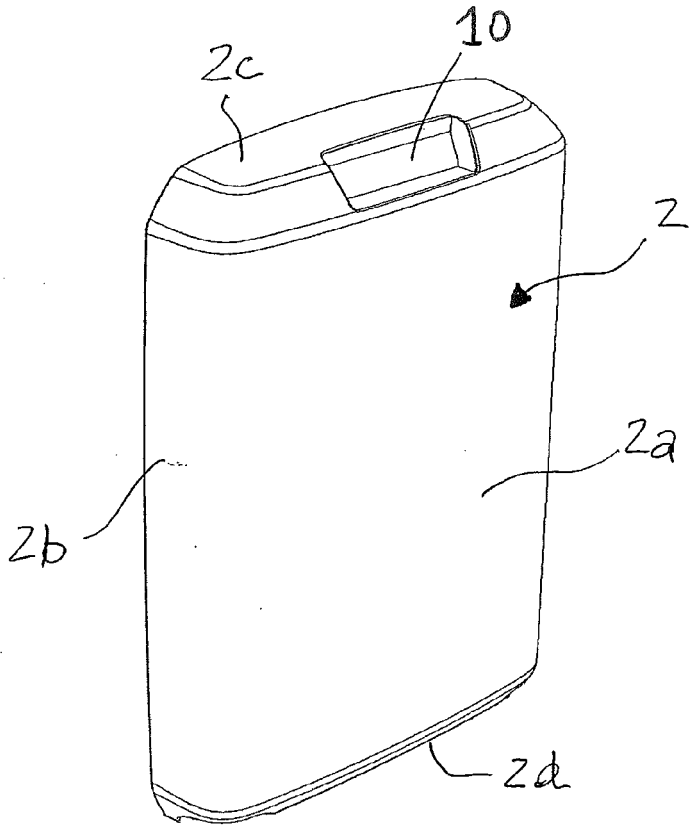


Fig 3

Fig 4a



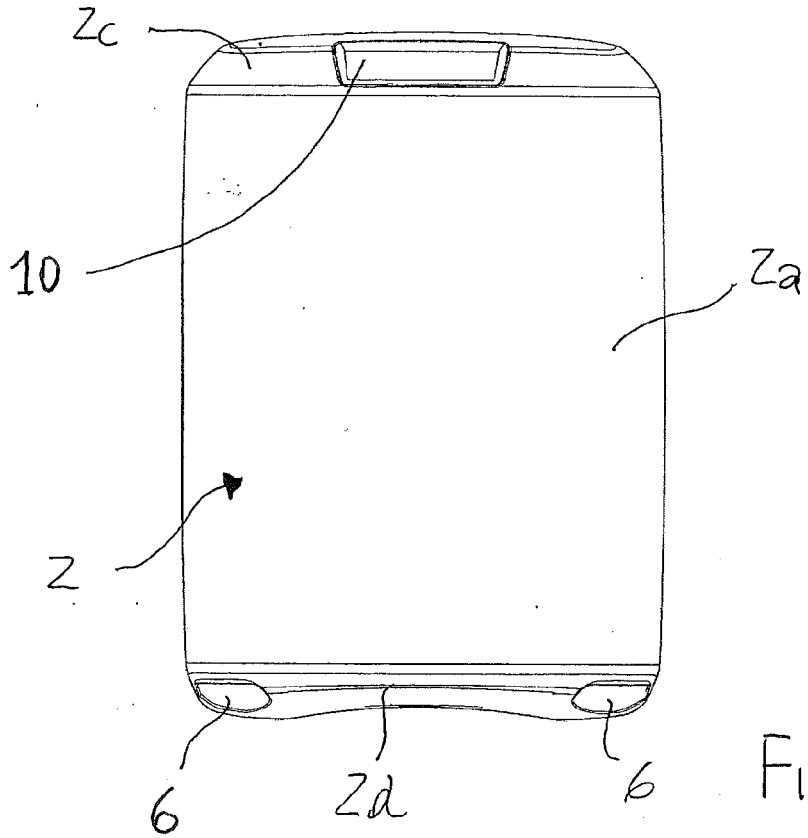
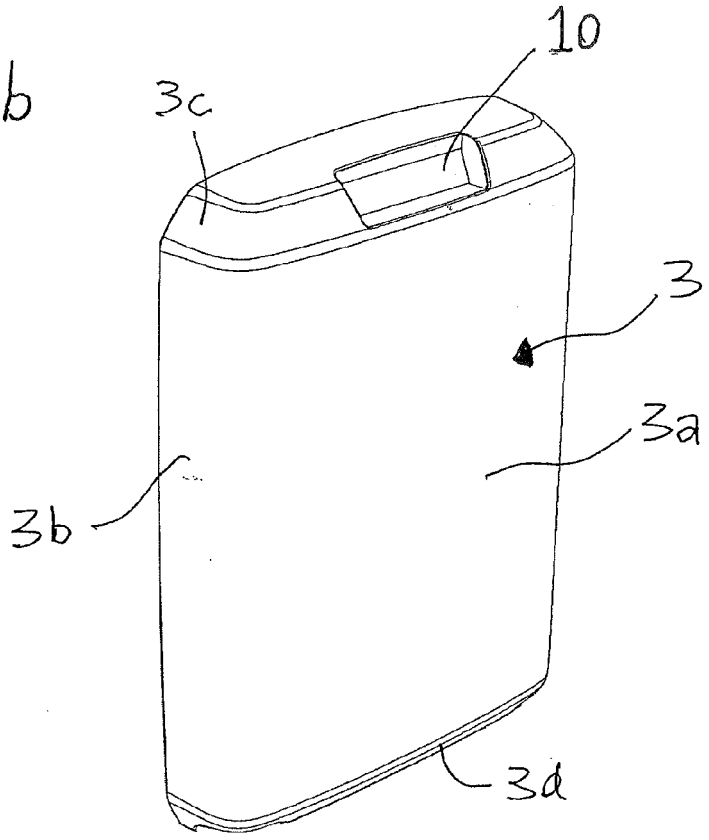


Fig 5a

Fig 4b



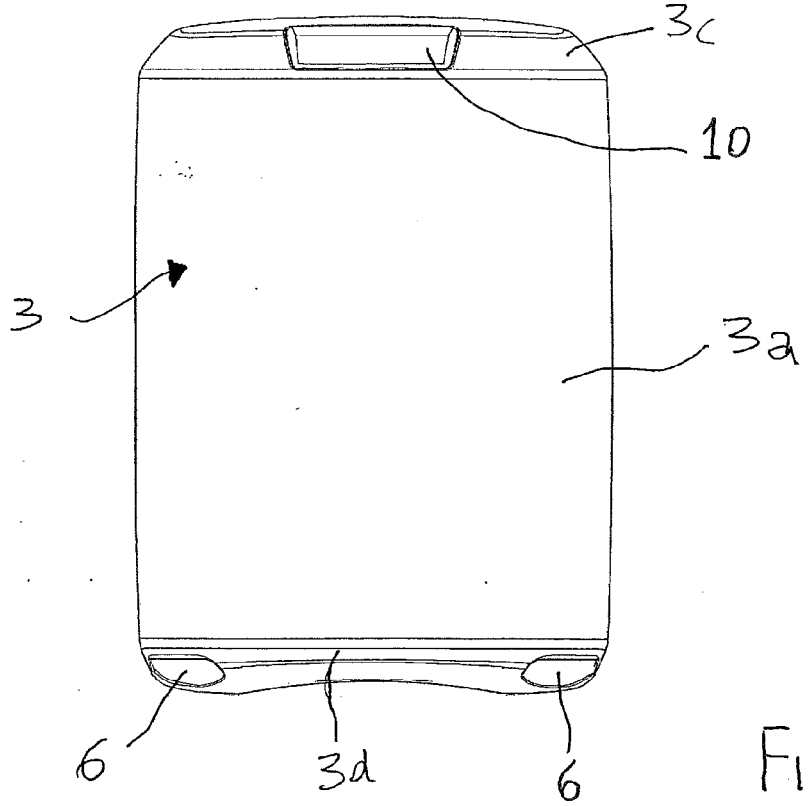


Fig 5b

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EUROPEAN SEARCH REPORT

Application Number
EP 15 18 0052

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 6 367 603 B1 (TIRAMANI PAOLO ET AL) 9 April 2002 (2002-04-09) * column 1, lines 38-43 * * column 4, line 5 - column 5, line 53 * * figures 1-13 * -----	1-12	INV. A45C5/14 A45C5/03 A45C5/02

TECHNICAL FIELDS SEARCHED (IPC)

A45C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 December 2015	Witkowska-Piela, A

CATEGORY OF CITED DOCUMENTS

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