



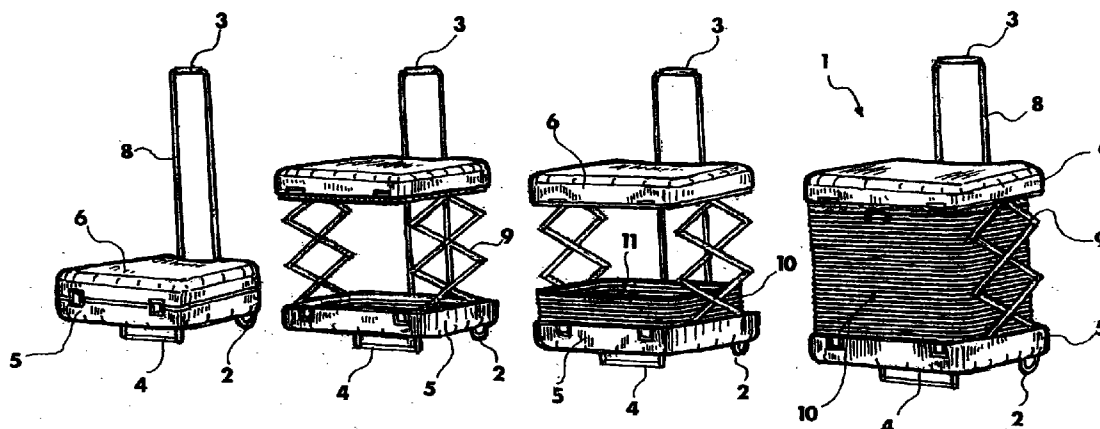
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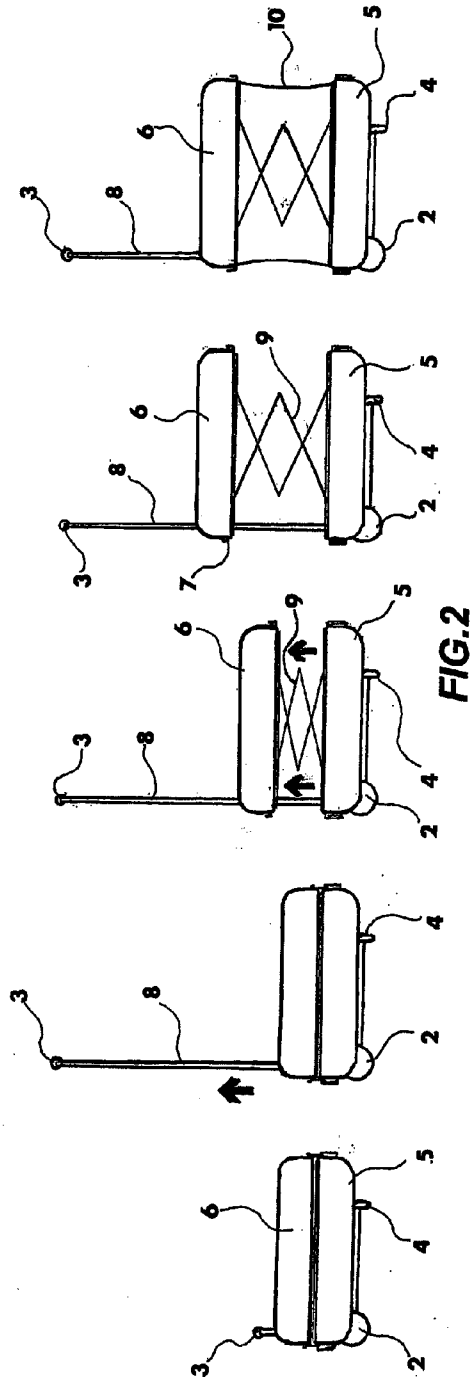
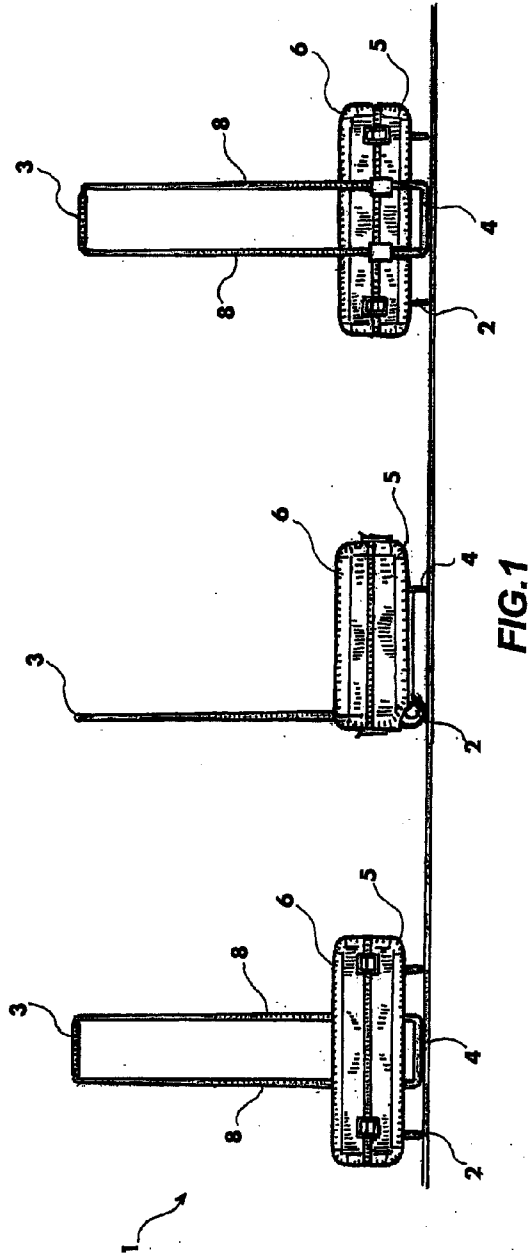
(19) **United States**(12) **Patent Application Publication**
Antonelli(10) **Pub. No.: US 2015/0327639 A1**(43) **Pub. Date: Nov. 19, 2015**(54) **EXPANSIBLE SUITCASE**(76) Inventor: **Marina Antonelli, Pescara (IT)**(21) Appl. No.: **14/345,802**(22) PCT Filed: **Dec. 22, 2011**(86) PCT No.: **PCT/IB2011/055916**§ 371 (c)(1),
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(2013.01)(57) **ABSTRACT**

A suitcase (1) expansible on wheels comprising wheels (2), a handle (3) which can be lengthened and a pair of half-shells a first half-shell thereof (5) arranged substantially horizontally and perpendicularly to said handle (3) and a second half-shell (6), substantially horizontal and perpendicular to the handle (3) too, with its own cavity faced downwards; means (9; 12) for translating said second shell (6) vertically in the direction defined by the handle (3); at least a wall (10; 12) with variable extension apt to join the edges of said two half-shells (5, 6), the second half-shell (6) translating according to a direction defined by the telescopic extension of the handle (3), the upper half-shell (6) having on the rear side a slot (7) wherein the bars (8) of the telescopic handle (3) are inserted, the bars (8) acting as guides for the second half-shell (6) and said slot (7) being defined by a handle-like portion of the second half-shell (6) which can be used to raise or lower manually the half-shell itself.





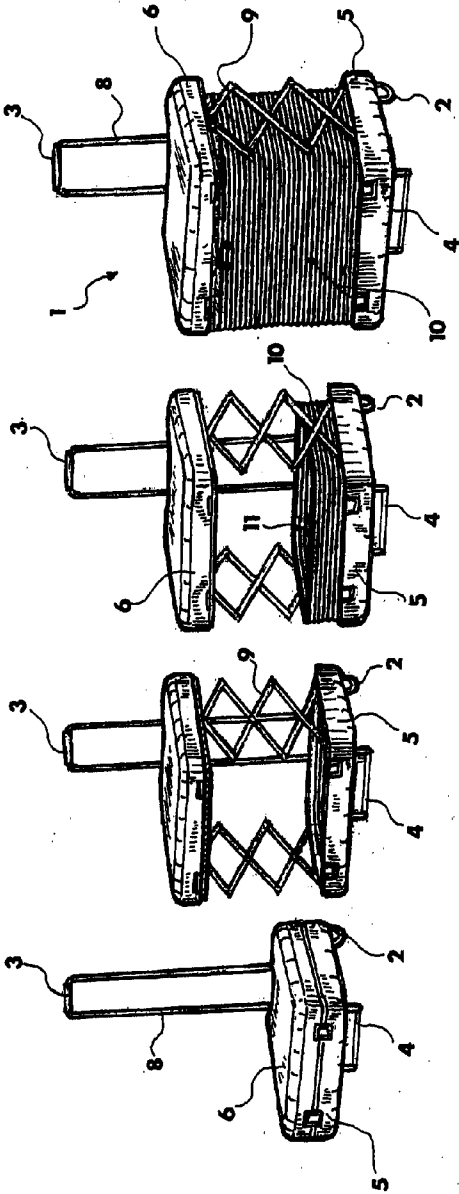


FIG.3

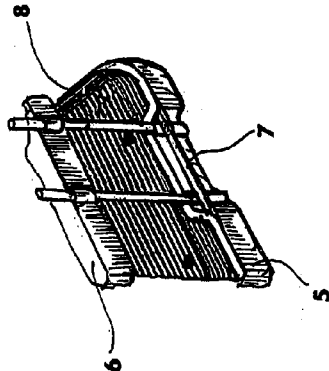


FIG.5

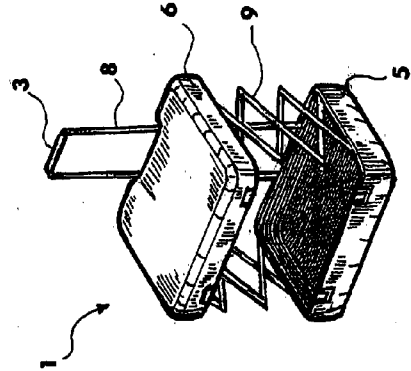
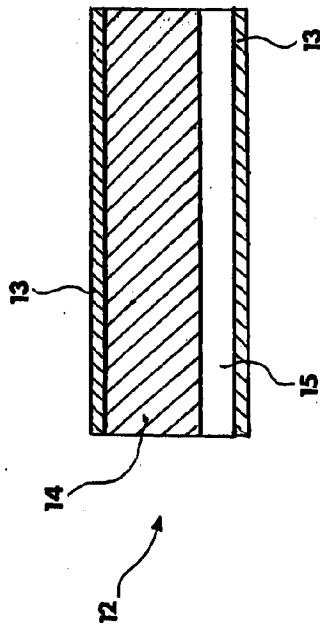
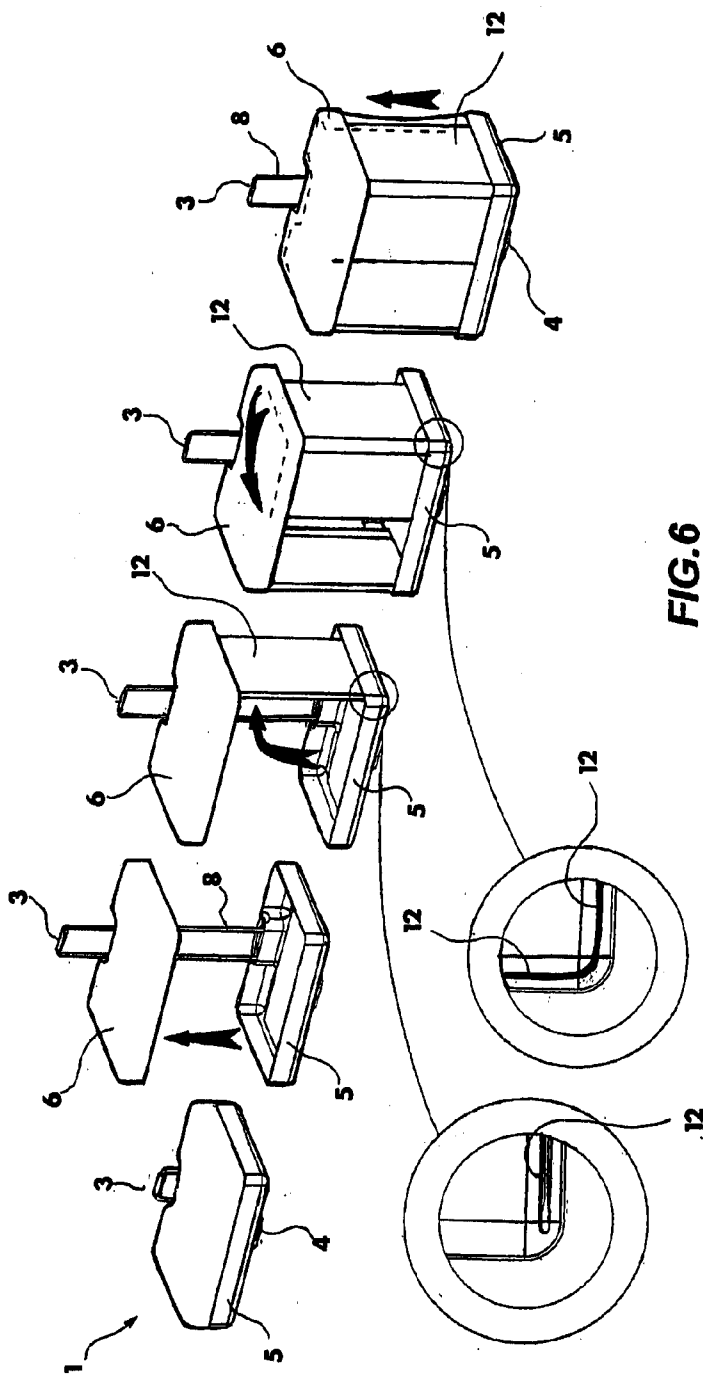


FIG.4



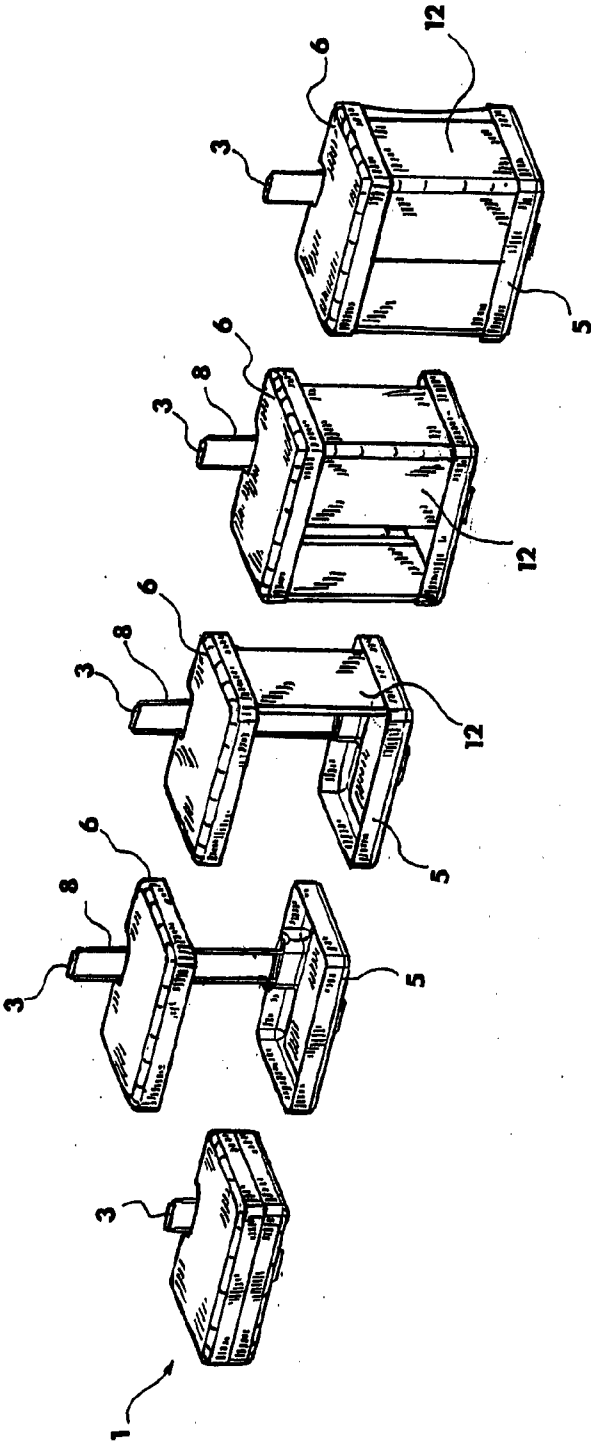


FIG. 8

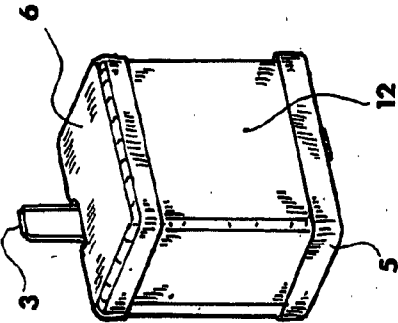


FIG. 9

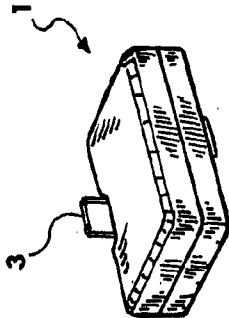


FIG. 10

EXPANSIBLE SUITCASE

[0001] The present invention relates to an expansible suitcase, of the type comprising wheels and a handle which can be lengthened for the dragging thereof, conventionally also called trolley. Generally, it comprises a pair of half-shells which form the suitcase casing and which can be separated for opening and expanding the suitcase itself.

[0002] Several types of suitcases on wheels or without wheels are known in the art, which can be expanded thanks to several systems determining the extension of the suitcase walls. However, they guarantee a poor stability when the suitcase is expanded, by making the dragging thereof uncomfortable.

[0003] Furthermore, in the expanded configuration the suitcases on wheels lose the stability which allow to let them rested onto the wheels themselves or onto the however provided supports, without their overturning, causing additional discomfort to the suitcase bearer and to adjacent people.

[0004] The German patent Nr. DE 10 2009 040 468 A1 and the German utility model Nr. DE 201 09 564 U1 describe expansible suitcases on wheels with horizontally arranged faced half-shells.

[0005] The technical problem underlying the present invention consists in providing a suitcase able to overcome the drawbacks mentioned with reference to the state of art.

[0006] Such problem is solved by a suitcase as defined in the appended claim 1.

[0007] The above-mentioned suitcase allows that its own centre of gravity, in particular in the both contracted and expanded rested configuration moves necessarily along a vertical line always parallelly to the handle which can be lengthened, with its own projection always falling back upon the resting base. Furthermore, the greater stability is allowed by said translating means defining the distance of the two half-shells.

[0008] Additional features and variants, together with additional invention advantages, will appear more clearly from the following description of two embodiment examples of the present expansible suitcase, provided by way of example only and not with limiting purposes by referring to the enclosed drawings wherein:

[0009] FIG. 1 shows respective front, rear and side views of a first embodiment of a suitcase according to the invention;

[0010] FIG. 2 shows a series of side views of the suitcase of FIG. 1, illustrating the expansion of the same;

[0011] FIG. 3 shows a series of front perspective views of the suitcase of FIG. 1, illustrating the operation of the same;

[0012] FIG. 4 shows a top front perspective view of the suitcase of FIG. 1;

[0013] FIG. 5 shows an enlarged rear perspective view of a detail of the suitcase of FIG. 1;

[0014] FIG. 6 shows a series of front perspective views of a second embodiment example of expansible suitcase according to the invention, which illustrate the operation and some enlarged details thereof;

[0015] FIG. 7 shows an additional detail of the suitcase of FIG. 6 in section;

[0016] FIG. 8 shows a series of front perspective views of the suitcase of FIG. 6, illustrating the operation of the same;

[0017] FIG. 9 shows a perspective view of the suitcase of FIG. 6 in contracted configuration; and

[0018] FIG. 10 shows a perspective view of the suitcase of FIG. 6 in expanded and wholly closed configuration.

[0019] By referring to FIGS. 1 a 5, a first embodiment example of expanded suitcase is designated as a whole with 1.

[0020] It is of the trolley type comprising wheels 2 arranged on a frame, and a handle 3 which can be telescopically lengthened for the dragging thereof.

[0021] The frame forms even a resting foot 4, positioned on the front side that is on the opposite side of the suitcase 1 with respect to the handle 3.

[0022] It further comprises a pair of half-shells forming the casing of the suitcase and which can be separated for opening and expanding the suitcase itself.

[0023] In particular, in said pair of half-shells a first half-shell 5 or lower half-shell can be found, which is connected to said frame. Therefore, said wheels 2 and said handle 3 are associated thereto.

[0024] Said half-shell 5 has substantially a squared and flattened basin-like shape, with a cavity and edges apt to cooperate with respective edges of the other half-shell.

[0025] Considering that, in a normal rested configuration, the wheels 2 rest upon the ground and the handle assumes a vertical position, the first half-shell 5 assumes a substantially horizontal configuration, perpendicular to said handle 3, with its own cavity faced upwards when the suitcase 1 is resting.

[0026] Furthermore, the suitcase 1 comprises a second half-shell 6 or upper half-shell, which is apt to be connected to the first half-shell 5 on the respective edges, thereat the suitcase 1 comprises a seal, for example of polyurethane tubular type.

[0027] Still in the above-described configuration, the second half-shell 6 assumes a substantially horizontal configuration, perpendicular to said handle 3, that is with its own cavity faced downwards when the suitcase 1 is resting.

[0028] The above-described half-shells are conveniently manufactured in a stiff or half-stiff material, possibly with shock-proof, scratch-resistant and burglar-resistant features. The second half-shell 6, differently from what usually takes place in the suitcases, is not articulated to the lower half-shell 5, but it is able to translate according to a direction which is parallel and it is defined by the telescopic extension of the handle 3.

[0029] To this purpose, the upper half-shell 6 on the rear side has a slot 7 (FIG. 5) wherein the bars 8 of the telescopic handle 3 are inserted. The bars 8 then act as guides for the second half-shell 6.

[0030] Said slot 7 is defined by a handle-like portion of the second half-shell 6, which can be used to raise or lower manually the half-shell itself.

[0031] On the front side, the two half-shells 5, 6 have a conventional closing system, for example of the type with snap hooks and levers.

[0032] The suitcase 1 further comprises means for translating said second shell 6 vertically with respect to said first shell 5, in the direction defined by the extension of said handle 3.

[0033] In the present embodiment, such means comprises a pantograph-like system having a pair of articulated pantographs 9 arranged on the inner side of the suitcase 1 between said half-shells 5, 6. The arrangement of the pantographs 9 is so as not to obstruct the inner portion of the suitcase 1 and it is so as to raise and lower the upper half-shell 6 by keeping it parallel to the first half-shell 5.

[0034] At last, the suitcase 1 comprises at least one, i.e. possibly a single continuous wall 10 with variable extension which is apt to join the edges of said two half-shells when the second half-shell 6 is translated upwards.

[0035] In the present embodiment, such continuous wall is substantially tubular with rectangular section and extends elastically from the inner edges of the first half-shell 5 upwards, until coupling with the second half-shell 6.

[0036] The coupling can be of the hinge-like type 11 of the divisible type, joined to a wall portion connected inside the second half-shell 6.

[0037] The extensible wall 10 can be implemented with a bellows-like structure or made of stretchy material, with possible circumferential reinforcement wires made of metal, and of a tear-resistant tissue.

[0038] Upon use, the suitcase can assume any extended volume comprised between the coupling positions of the two half-shells 5, 6 and maximum extension of the two pantographs 9, for example 65 cm.

[0039] In the contracted position, it could be opened by raising the upper half-shell 6 by making it to slide along the handle 3. The same operation will serve to expand the suitcase 1, which will be closed by using the extensible wall 10.

[0040] By referring to FIGS. 6 a 10 a second embodiment of extensible suitcase 1 is described.

[0041] It is of trolley type too and it comprises wheels 2 arranged on a frame and a handle 3 which can be lengthened telescopically for the dragging thereof.

[0042] The frame forms even a resting foot 4, positioned on the front side, that is on the opposite side of the suitcase 1 with respect to the handle 3.

[0043] It is meant that in this embodiment and in the previous embodiment, the frame can be constituted by the structure itself of the lower half-shell.

[0044] The suitcase 1 then comprises a first half-shell 5 or lower half-shell, said wheels 2 and said handle 3 being associated thereto.

[0045] Said half-shell 5 substantially has a squared and flattened basin-like shape, with a cavity and edges apt to cooperate with respective edges of the other half-shell.

[0046] By considering that, in a normal rested configuration, the wheels 2 rest onto the ground and the handle assumes a vertical position, the first half-shell 5 assumes a substantially horizontal configuration, perpendicular to said handle 3, with its own cavity faced upwards when the suitcase 1 is resting.

[0047] Furthermore, the suitcase 1 comprises a second half-shell 6 or upper half-shell, which is apt to be connected to the first half-shell 5 on the respective edges.

[0048] Still in the above-described configuration, the second half-shell 6 assumes a substantially horizontal configuration, perpendicular to said handle 3, that is with its own cavity faced downwards when the suitcase 1 is resting.

[0049] The above-described half-shells are conveniently manufactured in a stiff or half-stiff material, possibly with shock-proof, scratch-resistant and burglar-resistant features. The second half-shell 6, differently from what usually takes place in the suitcase, is not articulated to the lower half-shell 5, but it is able to translate according to a direction which is parallel and it is defined by the telescopic extension of the handle 3.

[0050] On this matter, the upper half-shell 6 on the rear side has a slot, as in the previous example, wherein the bars 8 of the telescopic handle 3 are inserted. The bars 8 then act as guides for the second half-shell 6.

[0051] Said slot 6 is defined by a handle-like portion of the second half-shell 6, which can be used to raise or lower manually the half-shell itself.

[0052] On the front side, the two half-shells 5, 6 have a conventional closing system, for example of the type with snap hooks and levers, herein not represented.

[0053] The suitcase 1 further comprises means for translating said second shell 6 vertically with respect to said first shell 5, in the direction defined by the extension of said handle 3.

[0054] In the present embodiment, such means comprises half-stiff panels 12 folded-back inside the first half-shell 5, placed onto the bottom thereof.

[0055] The half-stiff panels 2 are two, constrained to the inner sides of the half-shell, and they can be raised and opened, by forming both front and front and rear walls.

[0056] On this matter, each one of said panels is folded back in three portions which can be opened.

[0057] The edges of said panels can be constrained to the top wall of the second half-shell 6 and therebetween by means of specific hinges, represented with dotted lines in FIG. 7, illustrating the motions to deploy said panels 12.

[0058] The panels 12 are of the type with multiple layers, with two outer layers 13, on opposite faces of the panel 12, made of a burglar-resistant tissue.

[0059] Among thereof a stiff layer 14 is comprised, coupled with coupled to an air gap 15 containing a fluid which is able to lessen shocks, coming back then to an extended configuration.

[0060] A fluid suitable to this purpose is a not Newtonian fluid, for example a polymeric fluid.

[0061] In the present suitcase embodiment, said panels 12 constitute even another embodiment of the extensible wall described previously by referring to the first embodiment.

[0062] Upon use, the suitcase can assume a minimum volume, corresponding to the contracted configuration of the two half-shells 5, 6, and a maximum volume, corresponding to the deployment of said panels which keep the upper half-shell 6 translated on the upper portion and provide the suitcase the walls necessary for the closing thereof.

[0063] To the above-described expansible suitcase a person skilled in the art, with the purpose of satisfying additional and contingent needs, can introduce several additional modifications and variants, however all within the protection scope of the present invention, as defined by the enclosed claims.

1. An expansible suitcase (1), comprising wheels (2), a handle (3) which can be lengthened for the dragging thereof and a pair of half-shells forming the casing of the suitcase and which can be separated for opening and expanding the suitcase itself, comprising:

- a first half-shell (5) thereto said wheels (2) are associated and connected to said handle (3), apt to assume a substantially horizontal configuration, perpendicular to said handle (3), with its own cavity faced upwards when the suitcase is resting;

- a second half-shell (6) apt to be connected to the first half-shell (5) on the respective edges and apt to assume a substantially horizontal configuration, perpendicular to said handle (3), with its own cavity faced downwards when the suitcase (1) is resting;

- means (9; 12) for translating said second shell (6) vertically with respect to said first shell, in the direction defined by the extension of said handle (3); and

- at least a wall (10; 12) with variable extension apt to join the edges of said two half-shells (5, 6) when the second half-shell (6) is translated,

wherein the second half-shell (6) translates according to a direction which is parallel and it is defined by the telescopic

extension of the handle (3), the upper half-shell (6) having on the rear side a slot (7) wherein the bars (8) of the telescopic handle (3) are inserted, the bars (8) acting as guides for the second half-shell (6) and said slot (7) being defined by a handle-like portion of the second half-shell (6) which can be used to raise or lower manually the half-shell itself.

2. The suitcase (1) according to claim 1, wherein said half-shells (5, 6) substantially have a squared and flattened basin-like shape, with a cavity and edges configured to cooperate with respective edges of the other half-shell the edges being manufactured with a stiff or half-stiff material, with shock-proof, scratch-resistant and burglar-resistant features.

3. The suitcase (1) according to claim 1, further comprising a seal between said half-shells (5, 6).

4. The suitcase (1) according to claim 1, wherein said translating means comprises a pantograph-like system having a pair of articulated pantographs (9) arranged inside the suitcase (1) between said half-shells (5, 6), the arrangement of the pantographs (9) being so as to not to obstruct the inner portion of the suitcase (1) and so as to raise and lower the upper half-shell (6) by keeping it parallel to the first half-shell (5).

5. The suitcase (1) according to claim 1, wherein said extensible wall comprises a continuous and tubular single wall (10) with variable extension, configured to join the edges of said two half-shells when the second half-shell (6) is translated upwards.

6. The suitcase (1) according to claim 5, wherein said continuous wall (10) extends elastically from the inner corners of the first half-shell (5) being implemented with at least one of: a bellows-like structure, a stretch material, or a tear-resistant elastic tissue.

7. The suitcase (1) according to claim 5, wherein said continuous wall (10) comprises a hinge (11) of the divisible type, joined to a wall portion connected inside the second half-shell (6).

8. The suitcase (1) according to claim 1, wherein said means for translating and said extensible wall comprise a pair of half-stiff panels (12) folded-back inside the first half-shell (5), placed down on the bottom thereof, constrained on the inner sides of the lower half-shell (5) and divided into three re-foldable portions to form both the side walls and the front and rear ones, the edges of said panels (12) being able to be constrained to the top wall of the second half-shell (6) and therebetween by means of special hinges.

9. The suitcase (1) according to claim 8, wherein the panels (12) are comprised of multiple layers, with two outer layers (13), on opposite faces of the panel (12), implemented in a burglar-resistant tissue, therebetween being comprised a stiff layer (14) coupled to an air gap (15) containing a fluid to reduce shocks, coming back then to an extended configuration.

* * * * *