

(19)



(11)

EP 2 550 891 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
12.04.2017 Bulletin 2017/15

(51) Int Cl.:
A45C 13/00 ^(2006.01) **A45C 7/00** ^(2006.01)
A45C 13/04 ^(2006.01)

(21) Application number: **11006153.8**

(22) Date of filing: **26.07.2011**

(54) **Foldable carrying device**

Zusammenklappbare Tragevorrichtung

Dispositif de support pliable

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(43) Date of publication of application:
30.01.2013 Bulletin 2013/05

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Description

[0001] The present invention relates to a carrying device which may be folded or flapped at a predetermined point and in a predetermined direction due to the fact that the carrying device comprises a mechanical flap means of the invention at predetermined parts thereof.

[0002] Many carrying devices like conventional shopping bags, (shopping) baskets, string bags or plastic bags, when used for carrying large and/or heavy items, have a disadvantage that they collapse as a result of being loaded with the large and/or heavy load of the item to be carried. Apparently, carrying such large/heavy items in a collapsed carrying device is cumbersome, and many attempts were made to prevent the carrying device from collapsing when loaded with large/heavy items.

[0003] One of the attempts of the prior art to prevent a carrying device from collapsing when loaded is described in the Applicant's prior German utility model No. DE-U 203 01 158, the content of which is included into the present application by reference. The carrying device described therein is a carrying basket and comprises a basket body preferably made of a flexible material, e. g. of a flexible cloth or plastics material. The basket body is connected to a rigid ring-shaped metal (e. g. aluminum) frame, for example by VELCRO[®] stripes attached to the upper rim of the basket body in a sufficient number and wound around the frame. The frame comprises attached a pivotable handle for carrying the whole carrying basket. The ring-shaped frame stabilizes the flexible material and thereby prevents the basket body from collapsing, when the basket is loaded with heavy items. The stabilizing effect of the frame is enhanced by additional enforcing stripes made, for example, from rigid cardboard or from wood or plastics materials, which enforcing stripes are inserted in pockets in the flexible material which are appropriately shaped to receive such enforcing stripes.

[0004] Although folding such a carrying device for a better (i. e. compact) storage of the carrying device is described in said document, such folding is possible only after removing the stripes from their corresponding pockets, which is a cumbersome action *per se*. Additionally, there is no place for storing the stripes removed, such situation resulting into losing the stripes, which were no longer available for exerting a stabilizing action in their pocket. Hence, a reliable and untroublesome folding of a carrying device was eagerly desired.

[0005] Foldable carrying devices were disclosed in the prior art in numerous embodiments, examples of such foldable carrying devices being those of the documents WO 2011/016,063 and of the document US-A 2011/0,142,374. However, the carrying devices of said former prior art either do not achieve a sufficiently compact storage format, while those of the latter allow a compact storage, but do not afford sufficient stability against collapsing when in use, due to missing stabilizers and a material which, *per se*, is pliable, without that stabilizing elements are included (see Figure 2 of the latter docu-

ment).

[0006] FR 1 403 891 A relates to a handbag or similar device which may be opened automatically upon releasing the blocking means due to the presence of a biased spiral spring in the hinge of its support branches.

[0007] US 2,730,153 A discloses a case in which the cover when unlatched will automatically open and hold its open position by including in the construction a torsional spring in the rear wall having leg members extending into the cover and also into the bottom of the case.

[0008] GB 2,121,768 A relates to a container for storing comprising a pair of identical frames, a shell secured to each frame to define a body member and a cover member for the container, protrusions on each frame which cooperate with the protrusions on the other frame to define a hinge and means for holding the protrusions together.

[0009] US 6,513,672 B1 discloses a case including a base having a bottom wall, a peripheral side wall connected to the bottom wall, and a first inwardly extending retaining ledge connected to the upper end of the peripheral wall. A top cover having a top wall, a peripheral side wall connected to the top wall such that a cavity is defined between the top wall and the peripheral side wall of the top cover and the bottom wall and the peripheral side wall of the base when the case is in a closed condition, and a second inwardly extending retaining ledge connected to the lower end of the peripheral wall of the top cover. A hinge, pivotally connects together the base and the top cover.

[0010] US 3,516,115 A relates to a plastic hinge for joining together members for a relative pivotally movement.

[0011] US 3,167,207 discloses a plastic container comprising a base section, a cover section and hinge assemblies, said hinge assemblies comprising anchoring means which are integral with the box, anchoring means which are integral with the cover and a plastic hinge comprising a flexible central section and integral terminal anchor members which are adapted to be inter-engaged and self-locking with the anchoring means of the base section and the cover section.

[0012] Thus, it was an object of the invention to provide a carrying device which may even be made of a flexible or even pliable material but which is stabilized against collapsing when being loaded with heavy items to carry and nevertheless can be folded to achieve a compact form for storage (e. g. in a shelf of a storage room) or for transporting in a restricted space environment (e. g. in the luggage space of a car).

[0013] It was another object of the invention to provide a carrying device made of a flexible or even pliable material which, after having been folded, may be restored in its functional structure easily and fully reversibly, i. e. without losing space needed for carrying.

[0014] The invention relates to a foldable carrying device comprising:

- a carrying device body made of a pliable material;

- a rigid frame to which the carrying device body is fixed and which is adapted to contributing to preventing the carrying device body from collapsing when being loaded with one or more heavy items; and
- a handle engaged to the rigid frame and adapted to being grasped when carrying the foldable carrying device;

said foldable carrying device further comprising:

- at least one mechanical flap means according to the following detailed description, comprising

a top support element comprising a support structure and a pocket integrally engaged to the support structure and adapted to receiving an element exerting a restoring force when received in said pocket;

a bottom support element comprising a support structure and a pocket integrally engaged to the support structure and adapted to receiving an element exerting a restoring force when received in said pocket;

at least one articulation function element providing the top support element and the bottom support element with an articulating function relative to each other, thereby allowing a reversible folding of the top support element towards the bottom support element or *vice versa*; and

at least one element capable of exerting a restoring force to the top and bottom support elements when received in at least one of the pockets of the top and bottom support elements;

wherein the at least one element capable of exerting a restoring force to the top and bottom support elements when received in at least one of the pockets of the top and bottom support elements is at least one element selected from the group consisting of a spring, a polymer band, a cambered polymer band, a polymer band with profile, a band steel, a cambered band steel and a band steel with profile; and

wherein the at least one element exerting a restoring force is received with its upper end in the pocket of the top support element and is simultaneously received with its lower end in the pocket of the bottom support element; and

- at least one means adapted to allowing the at least one mechanical flap means to be fixed to the carrying device body and/or to the rigid frame, and
- optionally a stabilizing bottom element strengthening the bottom of said foldable carrying device.

[0015] The invention also relates to a foldable carrying device comprising:

- a carrying device body made of a pliable material;

- a rigid frame to which the carrying device body is fixed and which is adapted to contributing to preventing the carrying device body from collapsing when being loaded with one or more heavy items; and
- a handle engaged to the rigid frame and adapted to being grasped when carrying the foldable carrying device;
- at least one mechanical flap means, comprising:

a top support element comprising a support structure and a pocket integrally engaged to the support structure and adapted to receiving an element exerting a restoring force when received in said pocket;

a bottom support element comprising a support structure and a pocket integrally engaged to the support structure and adapted to receiving an element exerting a restoring force when received in said pocket;

at least one articulation function element providing the top support element and the bottom support element with an articulating function relative to each other, thereby allowing a reversible folding of the top support element towards the bottom support element or *vice versa*; wherein the at least one articulation function element is an element capable of exerting a restoring force, when received in at least one of the pockets of the top and bottom support elements and is adapted to allowing a pivoting of the top and bottom support elements relative to each other under the influence of the at least one restoring force-exerting element's restoring force;

wherein the element capable of exerting a restoring force to the top and bottom support elements when received in at least one of the pockets of the top and bottom support elements is at least one element selected from the group consisting of a spring, a polymer band, a cambered polymer band, a polymer band with profile, a band steel, a cambered band steel and a band steel with profile; and

wherein the element exerting a restoring force is received with its upper end in the pocket of the top support element and is simultaneously received with its lower end in the pocket of the bottom support element; and

- at least one means adapted to allowing the at least one mechanical flap means to be fixed to the carrying device body and/or to the rigid frame, wherein the means adapted to allowing the at least one mechanical flap means to be fixed to the carrying device body and/or to the rigid frame is at least one pocket fixable or fixed to the carrying device body and adapted to receiving one mechanical flap means or is a plurality of material stripes or belts fixable or fixed to the carrying device body; and

optionally a stabilizing bottom element strengthening the bottom of said foldable carrying device.

[0016] Further embodiments are claimed in the dependent claims 3 to 12.

[0017] In the present description and claims, the term "carrying device" is understood to broadly mean a device by means of which items like shopping goods, food, bottled and/or canned drinks, books and printed matter, small electrical and/or electronic devices (like cell phones, electronic pads, music players etc.), clothing and other similar personal items may be carried and transported between two spots. In particular (but without restriction to those), the term "carrying device" is understood to mean a device for carrying and transporting shopping goods, food and drinks (either in bottles or in cans or other containers), clothing etc. from the shopping area home or from one spot to another (e. g. during travelling).

[0018] The present invention is not at all restricted to specific carrying devices, but exemplary examples of carrying devices allowing a better understanding of the present invention are shopping baskets, string bags, shopping bags, rucksacks, travelling bags, bags and boxes for carrying and/or storing cosmetics, bags and boxes for carrying and/or storing shoes, bags and boxes for carrying and/or storing hats; etc..

[0019] The terms "horizontal" and "vertical" as well as "top" and "bottom", when used in the present specification and claims, are understood to mean directions or points in the usual co-ordinate system, when the mechanical flap means and foldable carrying device of the invention are in engagement to each other in use. In other words: While "horizontal" means a direction substantially (not necessarily exactly) parallel to the ground, "vertical" means a direction substantially (not necessarily exactly) perpendicular to the ground. In a similar way, the term "top" means a point or part of a device being above other parts of the device, when in regular use, while "bottom" means a point or part of the device below other parts of the device, when in regular use.

[0020] In the present description and claims, the term "comprise", "comprises" or "comprising" as used, is defined to have the meaning that said apparatus or means or device of the invention may comprise (or include) (i) at least one component of the apparatus/means/device following said term "comprise" or "comprises" or "comprising" or may comprise (or include) (ii) two or more components of the apparatus/means/device following said term "comprise" or "comprises" or "comprising", or that (iii) further components (more specifically defined below) may also be comprised by the apparatus/means/device of the invention.

[0021] The term "comprise", "comprises" or "comprising" as used in the present specification and claims is, however, also defined for the present invention to optionally include cases where the apparatus or means or device of the invention mainly (or even exclusively) consists of (i) at least one component of the apparatus/means/de-

vice following said term "comprise" or "comprises" or "comprising" or mainly (or even exclusively) consists of (ii) two or more components of the apparatus/means/device following said term "comprise" or "comprises" or "comprising", optionally together with any necessary component a skilled person may optionally additionally include into such an apparatus/means/device in order to achieve the object of the invention, or may even include cases where the component of the apparatus/means/device following said term "comprise" or "comprises" or "comprising" exclusively consists of (i) at least one component named or exclusively consists of (ii) two or more components named, optionally together with any necessary component a skilled person may include into such an apparatus/means/device in order to achieve the object of the invention.

[0022] In other words: The term "comprise" or "comprises" or "comprising" may have, in the present specification and claims, the meanings of describing an exhaustive or, alternatively, a non-exhaustive enumeration of elements, without that, in the former case, embodiments are excluded which, for example in subclaims of the present application, claim further features, which are beneficial or advantageous but not essential for the present invention or for achieving the objects of the invention.

[0023] The present invention is further described by referring to Figures. These Figures show preferred embodiments of the invention and are given for allowing a better understanding of the invention. However, the invention is not restricted by these preferred embodiments shown in the Figures. In the Figures,

Figure 1 shows a perspective view of one exemplary embodiment of a mechanical flap means of the invention;

Figure 2 shows a side view of the mechanical flap means of Figure 1 in a bent position of the top and bottom support elements;

Figure 3 shows a perspective view of another exemplary embodiment of a mechanical flap means of the invention;

Figure 4 shows a perspective view of a further exemplary embodiment of a mechanical flap means of the invention;

Figure 5 shows a perspective view of the embodiment of the mechanical flap means as shown also in Figure 1, also showing the mirror plane MP of the two support elements being like image and mirror image;

Figures 6 A to 6 C show one embodiment of the mechanical flap means according to the invention (similarly to the one shown in Figure 1) in side views,

wherein the bending of the top and bottom support elements around the articulation function element against the restoring force of the element capable of exerting a restoring force is explained in three steps;

Figure 7 shows several exemplary embodiments of elements capable of exerting a restoring force to the top and bottom support elements of the mechanical flap means of the invention;

Figure 8 shows an exemplary embodiment of a carrying device of the invention with two mechanical flap means according to the invention each inserted into its pocket, said pockets being positioned at opposite walls of the carrying device;

Figure 9 shows an enlarged view of the top support element of the mechanical flap means according to the invention and its (releasable) fixation to the rigid frame of the carrying device to which the carrying device body is fixed;

Figures 10 A to 10 E exemplarily show the steps of folding the carrying device of the present invention;

Figures 11 A to 11 E show an exemplary embodiment of an isolated plastics element capable of exerting a restoring force to the top and bottom support elements, when received in their respective pockets (not shown); and

Figures 12 A to 12 C show an exemplary embodiment of an isolated metal element capable of exerting a restoring force to the top and bottom support elements, when received in their respective pockets (not shown).

[0024] Reference is now made to Figure 1. Figure 1 shows one exemplary (but not restrictive) mechanical flap means 1 of the invention.

[0025] The term "mechanical flap means", as used in the present specification and claims, is understood to mean a mechanically functioning means which allows, or even promotes, folding (and re-folding) of a foldable carrying device 100 of the invention, to which the mechanical flap means is "applied", at specific points (or lines) and, in preferred embodiments, and folding (and re-folding) even into a certain direction. As will be described below, the foldable carrying device 100 of the invention, when being "applied" with at least one mechanical flap means 1 (which preferably will be housed in close connection to the foldable carrying device body 101), may be folded in a foreseeable manner and at expected points (or along expected lines) due to the presence of the mechanical flap means 1 at certain locations at the carrying device body. Moreover, the step of folding the carrying device 100 in a predetermined manner may be reversed (i. e. re-folding) easily and in a predetermined

manner, too, in view of one or more elements exerting a restoring force to the elements of the mechanical flap means 1.

[0026] In the following, the steps of folding the carrying device and the reverse step of re-folding the carrying device (i. e. bringing the carrying device back to its erect, fully functional shape) will be discussed and explained below by simply referring to the common term "folding", unless specifically explained. Hence, the term "folding" may include both step sequences of folding the mechanical flap means and the carrying device of the invention from their fully erect functional shapes to a folded shape, and of re-folding the mechanical flap means and the carrying device of the invention from their folded shape back to their fully erect functional shapes. Reference is also made in this connection the Figures 10 A to 10 E (explained in detail below) which show the sequence of steps of folding the mechanical flap means and carrying device of the invention; a skilled person will easily understand that the sequence of steps of re-folding will similarly be shown by a reverse reading of Figures 10 E towards 10 A.

[0027] In accordance with the invention, the mechanical flap means, as shown in Figure 1, comprises a top support element 11, a bottom support element 12, at least one articulation function element 14 and at least one element 13 exerting a restoring force to the top and bottom elements 11, 12. These four elements of the mechanical flap means 1 are described in detail below.

[0028] In accordance with the invention, and as also shown in Figures 1 and 2, the top support element 11 comprises a support structure 111 and a pocket 112 integrally engaged to, or included into, the support structure 111 and adapted to receiving an element 113 exerting a restoring force when received in said pocket 112. In accordance with the definition given above, the term "top support element" is applied to the support element which is located above other parts of the mechanical flap means 1.

[0029] Furthermore, in accordance with the invention, and as also shown in Figures 1 and 2, the bottom support element 12 comprises a support structure 121 and a pocket 122 integrally engaged to, or included into, the support structure 121 and adapted to receiving an element 123 exerting a restoring force when received in said pocket 122. In accordance with the definition given above, the term "bottom support element" is applied to the support element which is located below other parts of the mechanical flap means 1.

[0030] In both cases of the support elements 11 and 12 described, there is a pocket 112, 122 integrally engaged to, or included into, the support structures 11, 12. As shown in Figures 1 and 2, the respective pockets 112 and 122 may be located between two vertical stems 111b, 111c, 121b, 121c of the support structures 11, 12. In other embodiments (described below), the pockets 112, 122 may be located on one unitary vertical stem 111b, 121 b of the support structures. A person skilled in the present field will be aware of other possible loca-

tions for the pockets and may find those without departing from the present invention, as long as the function thereof is maintained as described below.

[0031] Other embodiments of the invention have a top support element 11 and a bottom support element 12 as shown in Figures 3 and 4: The top support element 11 comprises a support structure 111 and a pocket 112 integrally engaged to, or included into, the support structure 111. As seen exemplarily in Figures 3 and 4, the top support element 11 comprises one unitary vertical stem 111b. The pocket 112 adapted to receiving an element 113 exerting a restoring force when received in said pocket 112 is part of the vertical stem 111 b and may share one wall with the stem 111b at least partly.

[0032] Similarly, the bottom support element 12 comprises a support structure 121 and a pocket 122 integrally engaged to the support structure 12. As seen in Figures 3 and 4, the bottom support element 12 comprises one unitary vertical stem 121b. The pocket 122 adapted to receiving an element 123 exerting a restoring force when received in said pocket 122 is part of the vertical stem 121b and may share one wall with the stem 121b at least partly.

[0033] Similarly, the size of the top support element 11 and/or of the bottom support element 12 may be selected by a skilled person freely and may be adapted, in accordance with the skill of the person, to the requirements needed. Particularly, the site of the top and bottom support structures may be selected by a skilled person in accordance with the requirements of the size of the foldable carrying device 100 wherein the top and bottom support structures 11, 12 are used. Exemplary sizes are a length (top → bottom) of between 5 and 20 cm and a width of between 3 and 15 cm (without restriction), and preferred exemplary sizes may be a length of between 8 and 16 cm and a width of between 5 and 12 cm (without restriction), either for the top support structure 11 or for the bottom support structure 12.

[0034] A preferred embodiment of the invention, which may be realized separately or in combination with the other features of the invention, may also be derived from Figures 1, 3 and 4, namely an embodiment wherein the top support element 11 and the bottom support element 12 are at least closely similar either in size, or in structure or in both size and structure. An advantage of such an embodiment is that the supporting forces may be divided between the top and bottom support elements 11, 12 equally. Moreover, a manufacture of closely similar parts of the mechanical flap means 1 is easier and less costly. In a more preferred embodiment, the size, or the structure, or even both the size and the structure, of the top and bottom support elements 11, 12 are identical what makes the manufacture of these parts even easier.

[0035] According to another preferred embodiment of the invention, which may be realized separately or in combination with the other features of the invention, and which is shown in Figure 5, the top support element 11 and the bottom support element 12, when in function, are

arranged like image and mirror image, relative to each other, with the mirror plane being in a horizontal plane MP perpendicular to the top and bottom support elements 11, 12 and preferably substantially parallel to the ground.

[0036] An even further preferred embodiment of the invention, which may be realized separately or in combination with the other features of the invention, is directed to a mechanical flap means 1, wherein the top support element 11 or the bottom support element 12, and in an even more preferred embodiment of the invention the top support element 11 and the bottom support element 12, are structured like the vertical letter "I", as shown in Figure 3. In other words: In these preferred embodiments of the invention, the top support element 11 or the bottom support element 12, and even more preferred both support elements top support element 11 and bottom support element 12, comprise substantially only one vertical stem 111b or 121 b of the support structures 111 and 121. As seen from Figure 3, this is a simple and effective support element structure and, simultaneously, easy to manufacture.

[0037] Another further preferred embodiment of the invention, which may be realized separately or in combination with the other features of the invention, is directed to a mechanical flap means 1, wherein the top support element 11 or the bottom support element 12, and in an even more preferred embodiment of the invention the top support element 11 and the bottom support element 12, are structured like the letter "T", as shown in Figure 4. In other words: In these preferred embodiments of the invention, the top support element 11 or the bottom support element 12, and even more preferred both support elements top support element 11 and bottom support element 12, comprise substantially one vertical stem 114 or 124 of the support structures 111 and 121 the "feet" of which, in function, are located closely to each other, and the horizontal "stems" of parts thereof (115, 125) are located at the opposite ends of the vertical stems 114, 124. As seen from Figure 4, this is a simple and even more effective support element structure and, simultaneously, easy to manufacture.

[0038] According to the invention, the third component comprised by the mechanical flap means 1 may be the at least one articulation function element 14. The mechanical flap means may have one articulation function element 14 or may have several (preferably two or three) articulation function elements 14, 14', 14'', Preferred are mechanical flap means 1 having one or two articulation function element(s).

[0039] The term "articulation function element" 14, as used in the present specification and claims, is understood to mean a technical element adapted to allowing the two support elements 11, 12 to be engaged and connected to each other and to perform, when needed, an articulating or pivoting function relative to each other, as shown in the side view of Figure 2 schematically. By such an articulating or pivoting function, a reversible folding - i. e. folding and re-folding - of the top support element 11

towards the bottom support element 12 and *vice versa*, and of the top and bottom support elements 11, 12 away from each other, becomes possible. This articulating (or pivoting) function of the top support element 11 towards the bottom support element 12 (and *vice versa*), and of the top and bottom support elements 11, 12 away from each other, is the basis for the folding and re-folding of the foldable carrying device of the invention described in detail below.

[0040] In the above-described preferred embodiments of a shape of the top and bottom support elements 11, 12 resembling to a letter "I", the "feet" of the top and bottom support elements 11, 12 are engaged and connected to each other via the articulation function element 14, as shown in Figures 1 and 2. The resulting support element structure is simple and easy to manufacture, and the support given by such a structure is effective and has good results when applied to a foldable carrying device 100.

[0041] In the above-described preferred embodiments of the shape of the top and bottom support elements 11, 12 resembling to a letter "T" (see Figure 4), the "feet" of the vertical parts 114, 124 of the top and bottom elements 11, 12 are engaged and connected to each other via an articulation function element 14, and the horizontal parts 115, 125 of the top and bottom support elements 11, 12 are arranged furthest away from the articulation function element 14. Also such a support element structure is simple and easy to manufacture. The support given by such a structure is even better than the one given by the "I" structure elements, because the horizontal parts 115, 125 present a better support at the bottom and at the top of the mechanical flap means 1. In addition, the top support element 11, better: the most-upper support line 117 thereof, may be releasably connected or secured to a frame structure of a foldable carrying device (as shown in Figure 9), thereby presenting a better support against collapsing as long as the carrying device 100 is not folded, but loaded with heavy items.

[0042] In other words: In accordance with the preferred embodiment of the mechanical flap means 1 described above, which may be realized separately or in combination with the other features of the invention, the (at least one, preferably the one) articulation function element 14 may comprise an articulation connecting the top and bottom support elements 11, 12 in a manner adapted to allowing a pivoting of the top and bottom support elements 11, 12 relative to each other. This is shown, for example, in Figures 1 and 2. A top support element 11 having the support structure 111 and the pocket 112 integrally engaged to the support structure 111 and having received therein one end of an element 13 capable of exerting a restoring force is connected to a bottom support element 12 having the support structure 121 and the pocket 122 integrally engaged to the support structure 121 and having received therein the other end of the element 13 capable of exerting a restoring force. Once such a mechanical flap means 1 is pivoted against the

restoring force of the element 13, e. g. to a relative angle between top support element 11 and bottom support element 12 of, exemplarily, 20 ° or even 0 ° (meaning a parallel position of the top and bottom support elements 11, 12), the restoring force of the element 13 capable of exerting a restoring force to the top and bottom elements 11, 12 of the mechanical flap means 1 exerts such a restoring force to the top and bottom support elements, thereby bringing the top and bottom support elements 11, 12 back to an angle of about 180 °, where the material of the element 14 capable of exerting the restoring force is "relaxed".

[0043] In a preferred embodiment of the mechanical flap means 1, which may be realized separately or in combination with the other features of the invention, one articulation function element 14 comprises an articulation connecting the top and bottom support elements 11, 12 in a manner adapted to allowing a pivoting of the top and bottom support elements 11, 12 relative to each other, either against the restoring force of the element 14 capable of exerting a restoring force or driven by the restoring force exerted by said element 14 capable of exerting a restoring force to the top and bottom support elements 11, 12. A perspective view thereof is shown in Figure 1, and a side view thereof is shown in Figure 2.

[0044] In accordance with the invention, the fourth component comprised by the mechanical flap means 1 may be the at least one element 13, 113, 123 exerting a restoring force to the top and bottom support elements 11, 12 when received in at least one of the pockets 112, 122 of the top and bottom support elements 11, 12. There may be only one element 13 exerting a restoring force to the top and bottom support elements 11, 12, when received in, at least one of the pockets 112, 122 thereof. Alternatively, there may be two elements, three elements, four elements or even more elements 13 exerting a restoring force to the top and bottom support elements 11, 12, when received in at least one of the pockets 112, 122, thereof.

[0045] When the mechanical flap means 1 is inserted into a foldable carrying device 100 (as will be described in detail below), the folding of the carrying device 100 will be possible against the (restoring) force of the at least one element 13 of the mechanical flap means 1. Simultaneously with folding the mechanical flap means 1 of the invention against the restoring force of the element(s) 13 exerting said restoring force to the top and bottom support elements 11, 12, the foldable carrying device 100 is folded for easier storage thereof. The foldable carrying device 100 may be unfolded again (or re-folded) by allowing the element(s) 13 capable of exerting a restoring force to the top and bottom support elements 11, 12 to exert their restoring force to the top and bottom support elements 11, 12. As a result, the foldable carrying device 100 is unfolded and retrieved in its fully unfolded shape.

[0046] In a preferred embodiment of the invention, which may be realized separately or in combination with the other features of the invention, the at least one ele-

ment 13 (more preferably the one, two, three, four, five element(s) 13) exerting a restoring force to the top and bottom support elements 11, 12 are received in the pocket 112 of the top support element 11 and in the pocket 122 of the bottom support element 12 simultaneously. Even more preferably, the at least one element 13 exerting a restoring force, for example the one, two, three, four, five element(s) 13, most preferably the one element 13 or the two elements 13, 13 exerting a restoring force to the top and bottom support elements 11, 12 is/are received with its/their upper end(s) 131 in the pocket 112 of the top support element 11 and is/are simultaneously received with its/their lower end(s) 132 in the pocket 122 of the bottom support element 12. Such embodiments are particularly advantageous, because the element(s) 13 exerting a restoring force, when inserted with each of the ends 131, 132 into one of the pockets 112, 122 of the top and bottom support elements 11, 12, are capable of forcing the top and bottom support elements 11, 12, once pivoted into a position different from the straight (180 °) position (e. g. into a position relative to each other by only a few degrees (e. g. 20 ° or less), back to a straight (180 °) position, due to their materials' tendency to return to the straight, relaxed position. This is schematically shown in Figures 6 A and 6 B and 6 C.

[0047] In order to be capable of exerting the restoring force to the top and bottom support elements 11, 12 when received in their respective pockets 112, 122, the element or elements 13 exerting a restoring force must be of a material (which is, basically, known to a skilled person and may be selected from a number of alternative materials in accordance with the requirements of a single case) allowing exerting such a restoring force to the top and bottom support elements 11, 12. Such materials, and elements made of these materials, are known to a skilled person and may be found by tests in only a few orienting experiments.

[0048] In preferred embodiments of the mechanical flap means 1 of the invention, which may be realized separately or in combination with the other features of the invention, the at least one element 13, 113, 123 exerting a restoring force when received in at least one of the pockets 112, 122 of the top and bottom support elements 11, 12 is at least one element selected from the group consisting of a spring, a piece of band steel, and a piece of a polymer band or of a polymer profile; the invention is, however, not restricted to these specific materials.

[0049] More preferably, the at least one element 13, 113, 123 exerting a restoring force when received in at least one of the pockets 112, 122 of the top and bottom support elements 11, 12 is selected from a coil spring, a piece of flat band steel, a piece of cambered band steel, a piece of band steel with profile (e.g. V-profile), a piece of a cambered polymer band and a piece of a polymer band with profile (e.g. V-profile). Even more preferably, the at least one element 13, 113, 123 exerting a restoring force when received in at least one of the pockets 112,

122 of the top and bottom support elements 11, 12 is one element or are two elements selected from the group consisting of a coil spring, a piece of flat band steel, a piece of cambered band steel, a piece of band steel with V-profile, a piece of a cambered polymer band and a piece of polymer band with V-profile.

[0050] Specific examples of such element(s) 13, 113, 123 capable of exerting a restoring force when received in the pockets 112, 122 of the top and bottom support elements 11, 12 are shown in Figure 7, Figure 11 and Figure 12.

[0051] Figure 7 A shows a coil spring, where the windings are close to each other. If the ends of the coil spring are inserted into the respective pockets 112, 122 of the top and bottom support elements 11, 12, a strong restoring force is exerted to the top and bottom support elements 11, 12, once pivoted, by the elements 14 capable of exerting a restoring force to the top and bottom support elements 11, 12 so as to return them into their non-pivoted position, relative to each other.

[0052] Figure 7 B shows a flat band steel strip. Instead of one flat band steel strip, a plurality thereof may also be used, for example two, three or four flat band steel strips. If the ends of the band steel strip(s) are inserted into the respective pockets 112, 122 of the top and bottom support elements 11, 12, a strong restoring force is exerted to the top and bottom support elements 11, 12, once pivoted, by the elements 13 capable of exerting a restoring force to the top and bottom support elements 11, 12 so as to return them into their non-pivoted position, relative to each other.

[0053] Figures 7 C, 7 D, 7 E, 7 F; 7 G, 7 H and 7 I show cambered spring band steel strips which may be used, in distinguishing arrangements, as element(s) exerting a restoring force to the top and bottom support elements 11, 12. As shown in Figures 7 C to 7 I, there may be used one cambered spring band steel strip (Figure 7 C); two cambered spring band steel strips in parallel arrangement (not shown in a Figure); two cambered spring band steel strips in an opposite convex arrangement (Figure 7 D); two cambered spring band steel strips in an opposite concave arrangement (Figure 7 E); three cambered spring band steel strips in an opposite convex asymmetric arrangement (2 : 1) (Figure 7 F); the latter arrangement may also be extended to other asymmetric arrangements of more than 3 cambered spring band steel strips (3 : 2; 4 : 2; 4 : 3; 5 : 4; etc. (no Figure)); three cambered spring band steel strips in an opposite concave asymmetric arrangement (2 : 1) (Figure 7 G); the latter arrangement may also be extended to other asymmetric arrangements of more than 3 cambered spring band steel strips (3 : 2; 4 : 2; 4 : 3; 5 : 4; etc. (no Figure)); four or more cambered spring band steel strips in an opposite convex symmetric arrangement (2 : 2) (Figure 7 H); the latter arrangement may also be extended to other symmetric arrangements of four or more cambered spring band steel strips (3 : 3; 4 : 4; 5 : 5; etc. (no Figure)); four or more cambered spring band steel strips in an op-

posite concave symmetric arrangement (2 : 2) (Figure 7 I); the latter arrangement may also be extended to other asymmetric arrangements of four or more cambered spring band steel strips (3 : 3; 4 : 3; 5 : 5; etc. (no Figure)).

[0054] Furthermore, cambered spring band steel strips may be used, which have letter "S" shape (Figure 7 J) or which have letter "W" shape (Figure 7 K) of their camber.

[0055] In addition, flat spring band steel strips and cambered spring band steel strips may be used in combination in any conceivable number of flat and cambered spring band steel strips combined.

[0056] Of course, other preferred embodiments of the mechanical flap means 1 may be embodiments, where one or more flat spring band steel strip(s) are used in combination with one or more cambered spring band steel strips as the at least one element, or as the one element, or as the two or more elements capable of exerting a restoring force to the top and bottom support elements 11, 12, particularly when received in at least one of the pockets 112, 122, of the top and bottom support elements 11, 12, more preferably when received with their respective two ends in the respective two pockets 112, 122, of the top and bottom support elements 11, 12.

[0057] Figures 12 A to 12 C show further, in particular embodiments also preferred, examples of band steel stripes which are provided (and shown in Figure 12 A exemplarily, but not restricting, in a sectional view) in the shape of a V profile. The angle of the apex of the "V" may be freely selected by a skilled person in accordance with the specific case and the skill, and is, in a further preferred embodiment, without restricting the invention to these values in a range of 150 to 170 °. Figure 12 B shows the "erect" or unfolded stage of the V-shape band steel strip, while Figure 12 C shows the "fully" folded stage thereof.

[0058] In a further preferred embodiment of the invention, which is advantageous in view of the fact that the "point" or "area" of folding the V-shape band steel strip may be predetermined, the apex of the V-shape band steel strip may have a round or oval orifice. The folding will occur at the point (or in the area) of the orifice of the V-shape band steel strip's apex as shown in Figure 12 C.

[0059] Similarly, instead of band steel strips as described in the above preferred embodiment, there may be used, in other preferred embodiments, polymer stripes, more preferably profiled polymer stripes (more preferably one polymer stripe, two polymer stripes, even more preferably one profiled polymer stripe or two profiled polymer stripes, exemplarily, but not restricting: V-shape profiled polymer stripes, as the element(s) 13 capable of exerting a restoring force to the top and bottom support elements 11, 12. In examples of such polymer stripes, the profile of the polymer stripes may be an angled profile, for example (but not restricting) with an angle of 70 to 170 °, more preferably 90 to 150 °, or a rounded profile, to name only two exemplary embodiments.

[0060] Figures 11 A to 11 E show further, in particular embodiments also preferred, examples of polymer band stripes which are provided (in a similar manner as shown

in Figure 12 A in a sectional view for band steel stripes) in the shape of a V profile. The angle of the apex of the "V" may be freely selected by a skilled person in accordance with the specific case and the skill, and is, in a further preferred embodiment and without restriction to these values, in a range of 150 to 170 °. Figures 11 A, 11 B and 11 C show the "erect" or unfolded stages of the V-shape polymer band strip in a perspective view (Figure 11 A) and in two side views (Figures 11 B and 11 C), while Figure 11 D and 11 E show the almost "fully" folded stages thereof.

[0061] In a further preferred embodiment of the invention, which is advantageous in view of the fact that the "point" or "area" of folding the V-shape polymer band strip may be predetermined, the apex and/or the surfaces of the V-shape polymer band strip may be provided with one or two notches arranged perpendicular to the length of the apex and strip surfaces, as shown in Figures 11 B (one notch) and Figure 11 C (two notches) in a side view of the erect stage and in Figure 11 C (one notch) and Figure 11 E (two notches) in a perspective view of the folded stage. The folding will occur at the point (or in the area) of the notch(es) of the V-shape polymer band strip's apex and surfaces as shown in Figures 11 D and 11 E. The notches provided will allow a permanent folding and re-folding of the strips.

[0062] The above are exemplary embodiments, only, without that the invention should be understood to be restricted to those examples.

[0063] Another preferred embodiment of the mechanical flap means 1 of the invention, as claimed in claim 12, which may be realized separately or in combination with the other features of the invention, relates to a case where the at least one articulation function element 14 is the at least one element 13, 113, 123 exerting a restoring force; when received in at least one of the pockets 112, 122 of the top and bottom support elements 11, 12, preferably when received in the two pockets 112, 122 of the top and bottom support elements 11, 12, and is adapted to allowing a pivoting of the top and bottom support elements 11, 12 relative to each other under the influence of the at least one restoring force-exerting element's 13 restoring force. It was surprisingly found that the articulation function element 14 needs not to be an element having a true articulation, as shown in Figure 1, particularly (but not exclusively) in those cases where one or more flat or cambered spring band steel strips are used as the element(s) 13 capable of exerting a restoring force to the top and bottom support elements 11, 12. If such flat or cambered spring band steel strips are used as one flat and/or cambered spring band steel strip or as a plurality of flat and/or cambered spring band steel strips, they may assume the functionality as the articulation function element(s) 14, too, in addition to the function as the element(s) 13 capable of exerting a restoring force to the top and bottom support elements 11, 12. Particularly, those strips of flat or cambered spring band steel may be folded against the restoring force of the spring band

steel material, while they are retained as a connecting and articulation function element 14, and develop a strong restoring force after folding so as to secure the restoring movement of the connected top and bottom support elements 11, 12 around the folding area of said flat and/or cambered spring band steel material strip(s).

[0064] Such an embodiment is, for example, shown in Figures 3 and 4 and, in single steps, also in Figures 6 A, 6 B and 6 C. The exemplary letter "I"- or letter "T"-shaped top support element 11 and bottom support element 12 have their pockets 112, 122 adapted to receiving an element 13, 113, 123 exerting a restoring force when received in said pocket located at least partly on their vertical parts 114, 124. In the embodiment shown in Figures 3 and 4, said pockets 112, 122 each have an oblique lower end 112a, 122a allowing a pivoting motion of the top and bottom support elements 11, 12 relative to each other. Received in said pockets 112, 122 is one flat or cambered element 13 or are two or more flat and/or cambered elements 13, 13', 13" ... capable of exerting a restoring force, in such a manner that the one end 131 (or the one end(s) 131, 131', 131" ...) of the flat and/or cambered spring band steel element(s) is/are fully received in the pocket 112 of the top support element 11 and the other end 132 (or the other one end(s) 132, 132', 132", ...) of the flat and/or cambered spring band steel element(s) is/are fully received in the pocket 122 of the bottom support element 12.

[0065] As already described above, the material of the flat or cambered spring band steel elements is "relaxed" in its unbent state. It may start to exert a restoring force to the pockets 112, 122 (and, simultaneously, to the shape "I" or shape "T" top and bottom support elements 11, 12), as soon as the spring band steel strips are bent or folded against the restoring force (Figure 6 A → Figure 6 B), which restoring force may increase with a bending angle decreasing from 180 ° towards 20 °, 10 ° or even 0 °, the latter being the case where the top and bottom support elements 11, 12 connected via the element(s) 13, 13', 13", ... capable of exerting a restoring force so that these element(s) 13, 13', 13", ... together also have the function as the articulation function element(s) 14, 14', 14", ..., are brought to a parallel position (shown in Figure 6 C), and the restoring force exerted by the elements 13, 13', 13", ... has reached a large (if not the maximum) value. As soon as the force exerted by the bending function is released, the top and bottom support elements 11, 12 connected via the element(s) 13, 13', 13", ... capable of exerting a restoring force (which elements 13, 13', 13", ... simultaneously have the function as the articulation function elements) 14, 14', 14", ...) are returned to their original position (being in an angle of 180 ° relative to each other, as shown in Figure 6 C → Figure 6 B → Figure 6 A) by the restoring force exerted by the one, two, three or even more elements 13, 13', 13", ... to the pockets 112, 122 and, simultaneously, to the top and bottom support elements 11, 12 themselves.

[0066] The material of which the top and bottom sup-

port elements 11, 12 can be made are all materials known to a skilled person for this purpose, as long as they are light-weight and can withstand the forces applied as described above. Such materials may be selected by a skilled person in accordance with the requirements, and may also be tested for their suitability in a few orienting experiments before making the final selection.

[0067] Examples of such materials to be selected from are wood, metal, metal alloys, and plastics, i. e. one polymer and/or co-polymer or a blend of polymers and/or co-polymers. Due to the easy availability and advanced production methods, polymers and/or co-polymers are particularly preferred. In even more preferred embodiments of the invention, the materials of the top and bottom support elements 11, 12 are selected from the group consisting of polyolefins, e. g. (exemplarily, only) polyethylene, polypropylene, blends of polyethylene and polypropylene, copolymers of polyethylene and polypropylene, and mixtures thereof.

[0068] In further preferred embodiments of the mechanical flap means 1, which may be realized separately or in combination with the other features of the invention, it is advantageous to provide the top and bottom support elements with reinforcing ribs. Such reinforcing ribs, in further preferred embodiments of the invention, may extend vertically and/or horizontally along the support structures 111, 121 of the top and/or bottom support elements 11, 12. The strengthening function of the ribs may advantageously contribute to making the top and bottom support elements 11, 12 of the mechanical flap means 1 of the invention more stable and, hence, better suitable for being used with the foldable carrying device 100 of the invention, as described in detail below.

[0069] In addition, the top support element 11 and/or the bottom support element 12 may be provided with additional strengthening areas, for example at the upper horizontal part 117 of the top support element 11 or at the lower horizontal part 127 of the bottom support element 12. Strengthening these areas affords an additional stabilization of the top and bottom support elements 11, 12 when used in connection with the foldable carrying device 100, as will be described in detail below.

[0070] The invention relates to a foldable carrying device 100. Such a foldable carrying device 100 of the invention comprises a carrying device body 101.

[0071] In accordance with the invention, the foldable carrying device 100 may comprise a carrying device body 101 having any shape a person skilled in this technical field may know. The selection of the shape of the carrying device body 101 may be made by a skilled person in accordance with the requirements, particularly with the requirements requested by the materials to be carried or transported by the foldable carrying device 100 of the invention. A skilled person may even test available shapes of carrying device bodies in a few orienting experiments and may then select the appropriate shape for a specific task or series of tasks of using the carrying device 100.

[0072] Exemplary, albeit non-restricting examples of suitable shapes of the carrying device body 101 (and, hence, also for the resulting foldable carrying device 100) are bag-like shapes, which are, for example, used for string bags, shopping bags, travelling bags or even rucksacks, wherein the bag is more or less unstructured, its actual shape mainly being determined by the content to be carried or transported; more structured shapes, which are used, for example, in shopping baskets (which may be round, oval, rectangular (or at least almost rectangular, e. g. with rounded corners) or even square (or at least almost square, e. g. with rounded corners), to name only a few exemplary, non-restricting embodiments, the above shapes being determined by viewing the shopping baskets from the top thereof and may have a height according to the specific requirements of the case, or even rucksacks or travelling bags which, when used in a larger size, may have a structure allowing items to be carried to be stowed systematically. The shapes may also be the shape of a bag or a box for carrying and/or storing cosmetics, a bag or a box for carrying and/or storing shoes, a bag or a box for carrying and/or storing hats, to name only a few exemplary embodiments.

[0073] In order to be foldable, the carrying device body 101 of the foldable carrying device 100 must be made of a pliable or flexible material. Such materials are well known to a skilled person and may be selected from a large number of suitable and commonly available materials in accordance with specific requirements. Such materials also meet requirements of high tear strength, high temperature resistance, high durability, washability, easy processability and pleasing design, to name only a few further requirements.

[0074] In preferred embodiments of the foldable carrying device of the present invention, which may be realized separately or in combination with the other features of the invention, the carrying device body 101 is made of a material selected from textile woven sheet materials, polymer (woven sheet or film) materials, composite textile/polymer sheet materials. Particularly preferred are polymer woven sheet materials and composites of textiles and polymers. The materials of the carrying device body 101 are, however, not restricted to those exemplary and preferred materials.

[0075] In order to be best suitable for carrying heavy items, the foldable carrying device 100 of the present invention (partly as also in the prior art, for example in the Applicants' earlier registered German utility model DE-U 203 01 158) also comprises a rigid frame 102, to which the carrying device body 101 is fixed and which is adapted to contributing to preventing the carrying device body 101 from collapsing when being loaded with one or more heavy items. Such a rigid frame may have a plurality of appearances known to a skilled person very well and selectable in accordance with the requirements. Exemplary, albeit non-restricting examples of such rigid frames 102 to which the carrying device body 101 may be fixed are made of a rigid material, for example are made of a

metal (like aluminum, which has the advantage of being light in weight and resistant to shocks and impacts) and may be aluminum tubes or wires of a thickness known to a skilled person for the present purposes. The rigid frame 102 will have the shape desired for the shape of the foldable carrying device 100 and may be, for example, round, oval, rectangular or even square (the latter two shapes also with rounded corners). An example of an almost rectangular carrying device 1 is shown in Figure 8. In order to meet the requirement of contributing to preventing the carrying device 100 and its carrying device body 101 from collapsing when loaded with one or more heavy item(s), the rigid frame must be sufficiently stable and rigid to prevent such collapsing. In order to achieve this, the usual measures (sufficiently stable material, rigid structure of the material) are taken, as well known to a skilled person in general and also known from the prior art referred to above.

[0076] The foldable carrying device 100 of the invention further comprises at least one handle 103 which is engaged to the rigid frame 102 and is adapted to being grasped by the person carrying the foldable carrying device 100 of the invention. There may be one handle 103, or there may be two (or even more) handles 103: Preferred is a carrying device having applied one handle. Such handle(s) for carrying devices 100 is/are also well known to a skilled person and can be made useable with the carrying device of the invention by usual measures, e. g. by fixing or engaging the handle 103 to the rigid frame 102 so as to allow that the whole foldable carrying device 100 of the invention can be grasped and transported by a person conveniently, e. g. by an articulation element. As an example for such a construction, reference is made again to the Applicant's prior registered German utility model DE-U 203 01 158, which is incorporated into the disclosure of this application by reference.

[0077] In a preferred embodiment of the invention, which may be realized separately or in combination with the other features of the invention, the handle 103 is engaged to the rigid frame 102 in a pivotable manner. This is particularly advantageous in view of the fact that the pivotable handle 103 may be pivoted to a middle position, i. e. positioned above the centre of the foldable carrying device 100, when being grasped for carrying the carrying device, and may be pivoted to a side position (i. e. in alignment with the rigid frame 102 and the upper edge of the carrying device body 101 fixed to the rigid frame) so as to allow a better loading of the carrying device with items to be carried and also to allow a better storage of the carrying device when being folded. In even more preferred embodiments, the pivotable engagement of the pivotable handle 103 to the rigid frame 102 may be such that the handle may rest in five or even more positions, e. g. in two positions parallel to the rigid frame (for easy loading and easy storage), in one position in the middle above the carrying device body 101 (for convenient carrying) or in a "halfway" position between the above po-

sitions (for still convenient loading of middle-size items).

[0078] In accordance with the invention, the foldable carrying device 100 further comprises

(a) at least one mechanical flap means 1 as described above in detail; and

(b) at least one means 104 adapted to allowing the at least one mechanical flap means 1 to be fixed to the carrying device body 101 and/or to the rigid frame 102.

[0079] In a further preferred embodiment of the foldable carrying device 100 of the invention, which may be realized separately or in combination with the other features of the invention, there is additionally provided an optional stabilizing bottom element 105 strengthening the bottom of said foldable carrying device 100. Such stabilizing bottom elements 105 are basically known to a skilled person and may be selected from a number of embodiments thereof in accordance with the requirements of a specific case. Exemplary (albeit not restricting) embodiments of such stabilizing bottom elements 105 are one or more additional layer(s) of the material of the carrying device body 101 at the bottom of the carrying device 100 (which may have the advantage of being connected integrally to the bottom part of the carrying device 100 and, due to the pliability of said material, may be folded and are of light weight); any inserted layer(s) of an additional strengthening material layer (e.g. of cardboard, of wood, of plastics, of metal or of composites of these materials); any rigid frame construction provided along the bottom rim of the carrying device body; and/or a mechanical flap means (including, as the case may be, also a mechanical flap means 1 as described above), for example a flap means having a restricted (or even no) foldability in the direction from the top to the bottom of the foldable carrying device. If any such stabilizing element 105 is provided in or on the bottom of the carrying device body 101, the foldable carrying device bottom element, and simultaneously the foldable carrying device 100 as such, are further stabilized against collapsing when loaded with one or more heavy items to be carried.

[0080] In accordance with the invention as described above, the foldable carrying device 100 comprises at least one mechanical flap means 1 as described above in detail. There may be provided one mechanical flap means 1, or there may be provided two, three, four or even more mechanical flap means 1. The number of mechanical flap means 1 provided may depend on the overall size of the foldable carrying device 100, on the relative size of the mechanical flap means 1 used in the foldable carrying device, and on other parameters known to a skilled person and used for a decision on the number of mechanical flap means 1 used actually routinely. It may even be possible that a varying number of mechanical flap means 1 may be provided, and means for a fixation of a varying number be installed at the foldable carrying

device 100 so as to leave the decision on the actual number of mechanical flap means 1 used to the user for each opportunity arising.

[0081] In preferred embodiments of the invention, which may be realized separately or in combination with the other features of the invention, an even number of mechanical flap means 1 may be used and affords advantageous effects in folding and stabilizing the foldable carrying device 100, and a number of at least two mechanical flap means, more preferably two mechanical flap means 1, and utmost preferably two or four mechanical flap means 1 may be provided and used. A desired foldability and stabilization of the foldable carrying device 100 of the invention can be achieved by a suitable number of mechanical flap means used. A number of two mechanical flap means 1 provided for one foldable carrying device is shown in Figure 8.

[0082] In accordance with the invention, the foldable carrying device 100 comprises, in addition to the mechanical flap means 1 according to the invention, at least one means 104 adapted to allowing the at least one mechanical flap means 1 to be fixed to the carrying device body 101 and/or to the rigid frame 102. Such means are advantageous for allowing the mechanical flap means being well connected/fixed to the carrying device body 101 (and, hence, also to the foldable carrying device 100 itself) so that its action may well be exerted to the foldable carrying device 100.

[0083] The number of means 104 adapted to allowing the at least one mechanical flap means 1 to be fixed to the carrying device body 101 and/or to the rigid frame 102 is not essential to the invention and may be selected by a skilled person in accordance with the requirements of a specific case; moreover, the number of these means may not be identical to, or may even exceed, the number of mechanical flap means 1 used or intended to be used, since the means 104 adapted to allowing the at least one mechanical flap means 1 to be fixed to the carrying device body 101 and/or to the rigid frame 102 may be present at the foldable carrying device 100 without being connected, or having fixed thereto, one mechanical flap means 1 of the invention. In preferred embodiments of the invention, there is present one means 104 adapted to allowing the at least one mechanical flap means 1 to be fixed to the carrying device body 101 and/or to the rigid frame 102, per mechanical flap means 1 used (or intended to be used). In even more preferred embodiments of the invention, there is present an even number of means 104, even more preferably a number of two or four, most preferably a number of two means 104 adapted to allowing the at least one mechanical flap means 1 to be fixed to the carrying device body 101 and/or to the rigid frame 102. In even more preferable embodiments of the foldable carrying device 100 of the invention, there is present a number of two or four, utmost preferably a number of two means 104 adapted to allowing the at least one mechanical flap means 1 to be fixed to the carrying device body 101. The latter example is shown in Figure 8.

[0084] In preferred embodiments of the foldable carrying device 100 of the invention, which may be realized separately or in combination with the other features of the invention, the means 104 adapted to allowing the at least one mechanical flap means 1 to be fixed to the carrying device body 101 and/or to the rigid frame 102 is at least one pocket 104a fixable or fixed to the carrying device body 101 and adapted to receiving one mechanical flap means 1. Such pockets 104a are preferred in view of the fact that they may house exactly one mechanical flap means 1 of the invention and allocate it to a specific position at the carrying device body 101, particularly to a specific position of one wall of the foldable carrying device body 101. Usually (but not restricting), there is available one pocket 104a per mechanical flap means 1 used or intended to be used. Such a pocket may be fixed to a specific position at the wall of the carrying device body 101 on the inner side of the foldable carrying device 100, although this is not restricting; the fixation on the inner side is preferred because of design and appearance (esthetical) reasons. Examples of a suitable location for a fixation of the pockets are the two or four sides of the carrying device body opposite to each other, in such a manner that the pockets 104a have a maximum distance to each other, either in a 1 : 1 or in a 1 : 1 : 1 : 1 situation. The case of two pockets 104a for the mechanical flap means 1 of the invention positioned on opposite sides of the carrying device body 101 in a 1 : 1 situation is shown in Figure 8.

[0085] The pocket may be made preferably (and for the same reasons as described above, i. e. design reasons) and also for the practical reason of having the same material used as for the carrying device body 101, of the same material as the carrying device body 101. The materials described above for the carrying device body 101 are exemplarily mentioned.

[0086] The fixation of the pocket to the carrying device body wall may be achieved by any means conceivable by a skilled person for the purposes of fixation of the pocket 104a. Exemplary examples are stitching or sticking by means of an adhesive, without restricting the fixation methods to those. For obvious reasons, stitching is preferred.

[0087] The pocket may also adhered to the suitable position at the wall of the carrying device body 101 by secondary means allowing releasing the pocket 104a and re-locating it when needed. Such a method of fixation is particularly preferred in cases where the number of pockets may be freely selected and/or adapted to the actual number of mechanical flap means 1 used or intended to be used. In such cases, the number of pockets 104a may be adapted easily to the number of mechanical flap means 1 by removing one or more pocket(s) 104a or adding one or more pocket(s) 104a, as the case may be.

[0088] A releasable fixation of the pockets 104a may, for example, be achieved by applying so-called VELCRO^R stripes to the wall of the carrying device body wall and

by applying the corresponding VELCRO^R stripes to the back side of the pocket 104a and attaching the pocket 104a to the VELCRO^R stripe arrangement releasably. If the pocket is to be removed (e. g. because it is not needed or it is to be cleaned), it may be removed by releasing pair of the VELCRO^R stripes. A similar attachment may be achieved by using a layer of adhesive on one or both surfaces to be attached to each other; permanent glue films (which may even be cleaned from dust and dirt by water treatment) are known to a skilled person in this field and may be applied, and maintained, by usual techniques known to a skilled person.

[0089] In cases of pockets applied in any of the modes disclosed above or known to a skilled person, it is possible to provide the pocket with a means allowing closing it. Such a means may be a foldable flap (preferably being of the same material as the pocket 104a itself and even more preferably being connected to the pocket 104a or fixed to the carrying device body wall in one of the modes described above, either permanently or removably), a zipper (preferably being connected to the pocket 104a or even making the connection between the pocket carrying device wall and the pocket 104a), or any means having the same effect and known to a skilled person for such a purpose. Having a closable pocket 104a for housing the mechanical flap means 1 of the invention when in action protects the mechanical flap means 1 from being contacted by the items carried in the carrying device 100 and, thereby, deteriorated in its function.

[0090] In a further, alternative, preferred embodiment of foldable carrying device 100 of the invention, which may be realized separately or in combination with the other features of the invention, the means 104 adapted to allowing the at least one mechanical flap means 1 of the invention to be fixed to the carrying device body 101 is a plurality of material stripes or belts 104b, 104b', 104b'' fixable or fixed to the carrying device body 101. Such belts or stripes 104b, 104b', 104b'' ... may be made of any suitable material a skilled person may conceive of. Exemplary materials are leather, plastics, rubber, rubber-on-textile composites, VELCRO^R stripes, without restricting the invention to those. Such belts or stripes may be attached to the carrying device body wall by press buttons, rivets or similar means known to a skilled person, which may be selected (and tested) in few orienting experiments. Such a way of fixation is advantageous in view of the fact that the stripes and belts may be applied permanently (or removably) to the carrying device body 101, e. g. to its wall, may remain there (without removing them, although they may be fixed to the carrying device body wall removably), and may be put into function as soon as needed, i. e. may be used for housing a mechanical flap means 1 of the invention.

[0091] In a further preferred embodiment of the foldable carrying device 100 which is realized separately or in combination with any one of the features of the invention described above, the top support element 11 of the mechanical flap means 1 is releasably connected to the

rigid frame 102 of the foldable carrying device 100 by a clamp 105 adapted to embracing the rigid frame 102 and being clamped to the support structure 111 of the top support element 11 of the mechanical flap means 1. This is shown in Figure 9. While the "other end" of the mechanical flap means 1, i. e. the top end of the bottom support element 12, is mechanically supported by the bottom of the pocket 104a, in which the mechanical flap means 1 is housed, or by any fixation stripe or belt 104b to which the mechanical flap means 1 is connected, the top end of the top support element 11 is engaged to the rigid frame 102 of the carrying device 100. As a consequence, on the one hand, a mechanical support against collapsing of the carrying device 100 is provided and, on the other hand, a controlled folding of the carrying device 100 (including a restoring of the functional structure) can be achieved.

[0092] In the following, the process of folding the foldable carrying device 100 in accordance with the invention is described in detail for the case where two mechanical flap means 1, 1' are housed each in a pocket 104a, 104a', which pockets 104a, 104a' are applied to the foldable carrying device body 101 on its inner side. The steps are exemplarily shown in Figures 10 A to 10 E.

[0093] Figure 10A shows a front view, and Figure 10 B shows a side view, of one embodiment of the mechanical flap means 1 of the invention, wherein a top support element 11 and a bottom support element 12 are connected via two articulation function elements 14 which are simultaneously two elements 13 adapted to exerting a restoring force to the top and bottom elements. The two elements adapted to exerting a restoring force are, in this example, a pair of cambered spring steel band stripes which are arranged, relative to each other, in a preferred opposite convex arrangement (see also Figure 7 D).

[0094] The two cambered spring steel band stripes, in their opposite convex arrangement, are inserted into the pockets 112, 122 of the top and bottom support elements 11, 12 each having the "T" shape. At the end, the configuration of Figure 10 B is resulting, i. e. the mechanical flap means 1 comprising the top and bottom support elements 11, 12 in an "image ↔ mirror image" configuration, said two elements 11, 12 being articulately connected via the two spring steel band stripes 113, 123 received fully with their respective two ends in the pockets 112, 122 of the top and bottom support elements.

[0095] As may be seen in Figure 10 C, the configuration of the top and bottom support elements 11, 12 articulately connected via the two spring steel band stripes 113, 123 may be bent/folded by moving the top and bottom support elements 11, 12 towards each other to make the two elements congruent, which bending movement is a step of pivoting the two elements, relative to each other, around the pivoting axis of the two spring band steel stripes 113, 123. The same movement of the two elements 11, 12 is the movement occurring when the mechanical flap means 1 is housed in the pocket of the car-

rying device body 101, and the foldable carrying device 100 is folded.

[0096] As seen in Figure 10 D, the mechanical flap means 1, with the top support element 11 upwards and the bottom support element 12 downwards, is inserted into the pocket 104a at the carrying device body, specifically at its wall. If the pocket 104a is provided with a closure flap, such a closure flap may be closed. Alternatively, or together with closing the closure flap of the pocket 104a, the top area of the top support element 11 is connected to the rigid frame 102 of the foldable carrying device 100 by means of one or two (or even more) clamps 105, 105', 105 " ..., while the lower part of the bottom support element 11 is standing at the bottom of the pocket 104a. By applying the clamp(s) 105, the mechanical flap means 1 can be secured to the pocket 104a and, hence, also to the foldable carrying device 100 of the invention.

[0097] A second mechanical flap means 1 is applied to the carrying device 100 in the same way as described above, preferably at a position opposite to the first mechanical flap means 1 (not shown in a Figure).

[0098] The foldable carrying device 100 may be folded, for example, by putting the foldable carrying device 100 on a flat surface and applying a pressure to the rigid frame 102, at a point above the mechanical flap means 1 housed in the pocket 104a, in a down ward direction. Against the restoring force applied by the (in this case:) two elements 113, 123 (of the mechanical flap means 1) exerting a restoring force to the top and bottom support elements 11, 12, the top and bottom elements 11, 12, and with them the wall of the carrying device body 101, is folded. It may be folded from an angle of 180 ° (angle between the top and bottom support elements 11, 12, identical to the angle of the wall material of the carrying device body 101) to an angle of close to or even equaling 0 °, as shown in Figure 10 E.

[0099] The foldable carrying device 100 of the invention is now folded and may be stored in the folded condition.

[0100] When desired to be unfolded, only a slight force has to be applied, since the two elements 113, 123 exerting a restoring force to the top and bottom support elements 11, 12 exert their restoring force to the top and bottom support elements 11, 12 housed in the pocket 104a. As a result, the carrying device 100 is restored to its fully erected configuration again, as shown in Figure 10 D.

[0101] As already described above, the foldable carrying device 100 of the invention may have a large number of different shapes which include, but are not restricted to shopping baskets, string bags, shopping bags, rucksacks, travelling bags, bags and boxes for carrying and/or storing cosmetics, bags and boxes for carrying and/or storing shoes, bags and boxes for carrying and/or storing hats, which are exemplary embodiments, only.

[0102] The invention was described above while referring to the Figures showing preferred embodiments,

which are intended to be presented to allow a better understanding of the invention.

Claims

1. A foldable carrying device (100) comprising:

- a carrying device body (101) made of a pliable material; 10
- a rigid frame (102) to which the carrying device body (101) is fixed and which is adapted to contributing to preventing the carrying device body (101) from collapsing when being loaded with one or more heavy items; and 15
- a handle (103) engaged to the rigid frame (102) and adapted to being grasped when carrying the foldable carrying device; 20
- at least one mechanical flap means (1), comprising:
 - a top support element (11) comprising a support structure (111) and a pocket (112) integrally engaged to the support structure (111) and adapted to receiving an element (113) exerting a restoring force when received in said pocket (112); 25
 - a bottom support element (12) comprising a support structure (121) and a pocket (122) integrally engaged to the support structure (121) and adapted to receiving an element (123) exerting a restoring force when received in said pocket (122); 30
 - at least one articulation function element (14) providing the top support element (11) and the bottom support element (12) with an articulating function relative to each other, thereby allowing a reversible folding of the top support element (11) towards the bottom support element (12) or *vice versa*; and 35
 - at least one element (113, 123, 13) capable of exerting a restoring force to the top and bottom support elements (11, 12) when received in at least one of the pockets (112, 122) of the top and bottom support elements (11, 12); 40
 - wherein the at least one element (113, 123, 13) capable of exerting a restoring force to the top and bottom support elements (11, 12) when received in at least one of the pockets (112, 122) of the top and bottom support elements (11, 12) is at least one element selected from the group consisting of a spring, a polymer band, a cambered polymer band, a polymer band with profile, a band steel, a cambered band steel and a band steel with profile; and 45

wherein the at least one element (13) exerting a restoring force is received with its upper end (131) in the pocket (112) of the top support element (11) and is simultaneously received with its lower end (132) in the pocket (122) of the bottom support element (12); and

- at least one means (104) adapted to allowing the at least one mechanical flap means (1) to be fixed to the carrying device body (101) and/or to the rigid frame (102), wherein the means (104) adapted to allowing the at least one mechanical flap means (1) to be fixed to the carrying device body (101) and/or to the rigid frame (102) is at least one pocket (104a) fixable or fixed to the carrying device body (101) and adapted to receiving one mechanical flap means (1) or is a plurality of material stripes or belts (104b, 104b', 104b'') fixable or fixed to the carrying device body (101); and
- optionally a stabilizing bottom element (105) strengthening the bottom of said foldable carrying device (100).

2. A foldable carrying device (100) comprising:

- a carrying device body (101) made of a pliable material;
- a rigid frame (102) to which the carrying device body (101) is fixed and which is adapted to contributing to preventing the carrying device body (101) from collapsing when being loaded with one or more heavy items; and
- a handle (103) engaged to the rigid frame (102) and adapted to being grasped when carrying the foldable carrying device;
- at least one mechanical flap means (1), comprising:
 - a top support element (11) comprising a support structure (111) and a pocket (112) integrally engaged to the support structure (111) and adapted to receiving an element (113) exerting a restoring force when received in said pocket (112);
 - a bottom support element (12) comprising a support structure (121) and a pocket (122) integrally engaged to the support structure (121) and adapted to receiving an element (123) exerting a restoring force when received in said pocket (122);
 - at least one articulation function element (14) providing the top support element (11) and the bottom support element (12) with an articulating function relative to each other, thereby allowing a reversible folding of the top support element (11) towards the

- bottom support element (12) or *vice versa*; wherein the at least one articulation function element (14) is an element capable of exerting a restoring force, when received in at least one of the pockets (112, 122) of the top and bottom support elements (11, 12) and is adapted to allowing a pivoting of the top and bottom support elements (11, 12) relative to each other under the influence of the at least one restoring force-exerting element's (14) restoring force; wherein the element (113, 123, 13) capable of exerting a restoring force to the top and bottom support elements (11, 12) when received in at least one of the pockets (112, 122) of the top and bottom support elements (11, 12) is at least one element selected from the group consisting of a spring, a polymer band, a cambered polymer band, a polymer band with profile, a band steel, a cambered band steel and a band steel with profile; and wherein the element (13) exerting a restoring force is received with its upper end (131) in the pocket (112) of the top support element (11) and is simultaneously received with its lower end (132) in the pocket (122) of the bottom support element (12); and
- at least one means (104) adapted to allowing the at least one mechanical flap means (1) to be fixed to the carrying device body (101) and/or to the rigid frame (102), wherein the means (104) adapted to allowing the at least one mechanical flap means (1) to be fixed to the carrying device body (101) and/or to the rigid frame (102) is at least one pocket (104a) fixable or fixed to the carrying device body (101) and adapted to receiving one mechanical flap means (1) or is a plurality of material stripes or belts (104b, 104b', 104b'') fixable or fixed to the carrying device body (101); and
 - optionally a stabilizing bottom element (105) strengthening the bottom of said foldable carrying device (100).
3. The foldable carrying device (100) as claimed in claim 1 or claim 2, comprising an even number, preferably at least two, more preferably two or four, and utmost preferably two mechanical flap means (1).
 4. The foldable carrying device (100) as claimed in claims 1 or 2 or claim 3, wherein the top support element (11) is releasably connected to the rigid frame (102) by a clamp (105) adapted to embracing the rigid frame (102) and being clamped to the support structure (111) of the top support element (11).
 5. The foldable carrying device (100) as claimed in any of the claims 1 to 4, wherein the top support element (11) and the bottom support element (12) are at least closely similar in size and/or in structure, and/or wherein the top support element (11) and the bottom support element (12), when in function, are arranged like image and mirror image, relative to each other, with the mirror plane being in a horizontal plane (MP) perpendicular to the top and bottom support elements (11, 12); preferably wherein the top support element (11) and the bottom support element (12) are identical in size and/or in structure, and wherein the top support element (11) and the bottom support element (12), when in function, are arranged like image and mirror image, relative to each other, with the mirror plane being in a horizontal plane (MP) perpendicular to the top and bottom support elements (11, 12).
 6. The foldable carrying device (100) as claimed in any of the claims 1 to 5, wherein the top support element (11) and/or the bottom support element (12) are structured like the vertical letter "I" and are engaged to each other via the at least one articulation function element (14), or wherein the top support element (11) and/or the bottom support element (12) are structured like the letter "T", wherein the vertical parts (114, 124) of the top and bottom support elements (11, 12) are engaged to each other via the at least one articulation function element (14) and the horizontal parts (115, 125) of the top and bottom support elements (11, 12) are arranged furthest away from the at least one articulation function element (14).
 7. The foldable carrying device (100) as claimed in any of the claims 1 to 6, wherein the at least one element (13, 113, 123) exerting a restoring force when received in at least one of the pockets (112, 122) of the top and bottom support elements (11, 12) is one element or are two elements selected from the group consisting of a piece of flat band steel, a piece of cambered band steel and a piece of a cambered polymer band; and/or wherein the one or two element(s) (13, 13), exerting a restoring force is/are received with its/their upper end(s) (131) in the pocket (112) of the top support element (11) and is/are simultaneously received with its/their lower end(s) (132) in the pocket (122) of the bottom support element (12).
 8. The foldable carrying device (100) as claimed in any of the claims 1 and 3 to 7, wherein the at least one articulation function element (14) comprises an articulation connecting the top and bottom support elements (11, 12) in a manner adapted to allowing a pivoting of the top and bottom support elements (11, 12) relative to each other, preferably wherein one articulation function element (14) comprises an ar-

articulation connecting the top and bottom support elements (11, 12) in a manner adapted to allowing a pivoting of the top and bottom support elements (11, 12) relative to each other.

9. The foldable carrying device (100) as claimed in any of the claims 1 to 8, wherein the top and bottom support elements (11, 12) are made of a material selected from the group consisting of wood, metal and plastics, preferably are made of a material selected from plastics selected from the group consisting of polyolefins like homopolymers, co-polymers, blends of polyethylene and/or polypropylene, and mixtures thereof.
10. The foldable carrying device (100) as claimed in any of the claims 1 to 9, wherein the top and bottom support elements (11, 12) are strengthened by reinforcing ribs extending vertically and/or horizontally along the support structures (111, 121) thereof.
11. The foldable carrying device (100) as claimed in any of the claims 1 to 10, wherein the handle (103) is pivotably engaged to the rigid frame (102).
12. The foldable carrying device (100) as claimed in any of the claims 1 to 11, which foldable carrying device (100) has the shape of a shopping basket, a string bag, a shopping bag, a rucksack, a travelling bag, a bag or a box for carrying and/or storing cosmetics, a bag or a box for carrying and/or storing shoes, a bag or a box for carrying and/or storing hats.

Patentansprüche

1. Zusammenfaltbare Tragevorrichtung (100), umfassend:

- einen Tragevorrichtungs-Körper (101), hergestellt aus einem biegsamen Material;
- einen starren Rahmen (102), an dem der Tragevorrichtungs-Körper (101) befestigt ist und der dafür angepasst ist, dazu beizutragen, zu verhindern, dass der Tragevorrichtungs-Körper (101) kollabiert, wenn er mit einem oder mehreren schweren Gegenständen beladen wird; und
- einen Handgriff (103), der mit dem starren Rahmen (102) in Eingriff ist und dafür angepasst ist, ergriffen zu werden, wenn man die zusammenklappbare Tragevorrichtung trägt;
- wenigstens eine mechanische Klapp-Einrichtung (1), umfassend:

ein oberes Stütz-Element (11), umfassend eine Stütz-Struktur (111) und eine Tasche (112), die integral mit der Stütz-Struktur (111) in Eingriff ist und dafür angepasst ist,

ein Element (113) aufzunehmen, das eine Rückstellkraft ausübt, wenn es in der Tasche (112) aufgenommen ist;

ein unteres Stütz-Element (12), umfassend eine Stütz-Struktur (121) und eine Tasche (122), die integral mit der Stütz-Struktur (121) in Eingriff ist und dafür angepasst ist, ein Element (123) aufzunehmen, das eine Rückstellkraft ausübt, wenn es in der Tasche (122) aufgenommen ist;

wenigstens ein Gelenk-Funktions-Element (14), das das obere Stütz-Element (11) und das untere Stütz-Element (12) mit einer Gelenk-Funktion in Bezug aufeinander versieht und dadurch ein reversibles Zusammenfallen des oberen Stütz-Elements (11) in Richtung auf das untere Stütz-Element (12) oder umgekehrt erlaubt; und

wenigstens ein Element (113, 123, 13), das befähigt ist, eine Rückstellkraft auf das obere und das untere Stützelement (11, 12) auszuüben, wenn es in wenigstens eine der Taschen (112, 122) des oberen und des unteren Stütz-Elements (11, 12) aufgenommen wird;

wobei das wenigstens eine Element (113, 123, 13), das befähigt ist, eine Rückstellkraft auf das obere und das untere Stützelement (11, 12) auszuüben, wenn es in wenigstens eine der Taschen (112, 122) des oberen und des unteren Stütz-Elements (11, 12) aufgenommen wird, wenigstens ein Element ist, das gewählt ist aus der Gruppe, die besteht aus einer Feder, einem Polymerband, einem gekrümmten Polymerband, einem Polymerband mit Profil, einem Stück Bandstahl, einem gekrümmten Stück Bandstahl und einem Stück Bandstahl mit Profil; und

wobei das wenigstens eine eine Rückstellkraft ausübende Element (13) mit seinem oberen Ende (131) in der Tasche (112) des oberen Stütz-Elements (11) aufgenommen ist und gleichzeitig mit seinem unteren Ende (132) in der Tasche (122) des unteren Stütz-Elements (12) aufgenommen ist; und

- wenigstens eine Einrichtung (104), die dafür angepasst ist, dass sie ermöglicht, dass die wenigstens eine mechanische Klapp-Einrichtung (1) an dem Tragevorrichtungs-Körper (101) und/oder an dem starren Rahmen (102) befestigt wird, wobei die Einrichtung (104), die dafür angepasst ist, dass sie ermöglicht, dass die wenigstens eine mechanische Klapp-Einrichtung (1) an dem Tragevorrichtungs-Körper (101) und/oder an dem starren Rahmen (102) befestigt wird, wenigstens eine Tasche (104a) ist, die

an dem Tragevorrichtungskörper (101) befestigbar oder befestigt ist und dafür angepasst ist, eine mechanische Klapp-Einrichtung (1) aufzunehmen, oder eine Mehrzahl von Material-Streifen oder Riemen (104b, 104b', 104b'') ist, die an dem Tragevorrichtungskörper (101) befestigbar oder befestigt ist; und
 - gegebenenfalls ein stabilisierendes Unter-Element (105), das die Unterseite der zusammenfaltbaren Tragevorrichtung (100) verstärkt.

2. Zusammenfaltbare Tragevorrichtung (100), umfassend:

- einen Tragevorrichtungskörper (101), hergestellt aus einem biegsamen Material;
 - einen starren Rahmen (102), an dem der Tragevorrichtungskörper (101) befestigt ist und der dafür angepasst ist, dazu beizutragen, zu verhindern, dass der Tragevorrichtungskörper (101) kollabiert, wenn er mit einem oder mehreren schweren Gegenständen beladen wird; und
 - einen Handgriff (103), der mit dem starren Rahmen (102) in Eingriff ist und dafür angepasst ist, ergriffen zu werden, wenn man die zusammenklappbare Tragevorrichtung trägt;
 - wenigstens eine mechanische Klapp-Einrichtung (1), umfassend:

ein oberes Stütz-Element (11), umfassend eine Stütz-Struktur (111) und eine Tasche (112), die integral mit der Stütz-Struktur (111) in Eingriff ist und dafür angepasst ist, ein Element (113) aufzunehmen, das eine Rückstellkraft ausübt, wenn es in der Tasche (112) aufgenommen ist;
 ein unteres Stütz-Element (12), umfassend eine Stütz-Struktur (121) und eine Tasche (122), die integral mit der Stütz-Struktur (121) in Eingriff ist und dafür angepasst ist, ein Element (123) aufzunehmen, das eine Rückstellkraft ausübt, wenn es in der Tasche (122) aufgenommen ist;
 wenigstens ein Gelenk-Funktions-Element (14), das das obere Stütz-Element (11) und das untere Stütz-Element (12) mit einer GelenkFunktion in Bezug aufeinander versieht und dadurch ein reversibles Zusammenfallen des oberen Stütz-Elements (11) in Richtung auf das untere Stütz-Element (12) oder umgekehrt erlaubt; wobei das wenigstens eine Gelenk-Funktions-Element (14) ein Element ist, das befähigt ist, eine Rückstellkraft auszuüben, wenn es in wenigstens einer der Taschen (112, 122) des oberen und des unteren Stütz-Elements (11, 12) aufgenommen wird, und das befähigt ist, ein Schwenken der oberen und unteren Stütz-

Elemente (11, 12) relativ zueinander unter dem Einfluss der Rückstellkraft des wenigstens einen, eine Rückstellkraft ausübenden Elements (14) zu erlauben;
 wobei das Element (113, 123, 13), das befähigt ist, eine Rückstellkraft auf das obere und das untere Stützelement (11, 12) auszuüben, wenn es in wenigstens einer der Taschen (112, 122) des oberen und des unteren Stütz-Elements (11, 12) aufgenommen wird, wenigstens ein Element ist, das gewählt ist aus der Gruppe, die besteht aus einer Feder, einem Polymerband, einem gekrümmten Polymerband, einem Polymerband mit Profil, einem Stück Bandstahl, einem gekrümmten Stück Bandstahl und einem Stück Bandstahl mit Profil; und
 wobei das eine Rückstellkraft ausübende Element (13) mit seinem oberen Ende (131) in der Tasche (112) des oberen Stütz-Elements (11) aufgenommen ist und gleichzeitig mit seinem unteren Ende (132) in der Tasche (122) des unteren Stütz-Elements (12) aufgenommen ist; und

- wenigstens eine Einrichtung (104), die dafür angepasst ist, dass sie ermöglicht, dass die wenigstens eine mechanische Klapp-Einrichtung (1) an dem Tragevorrichtungskörper (101) und/oder an dem starren Rahmen (102) befestigt wird, wobei die Einrichtung (104), die dafür angepasst ist, dass sie ermöglicht, dass die wenigstens eine mechanische Klapp-Einrichtung (1) an dem Tragevorrichtungskörper (101) und/oder an dem starren Rahmen (102) befestigt wird, wenigstens eine Tasche (104a) ist, die an dem Tragevorrichtungskörper (101) befestigbar oder befestigt ist und dafür angepasst ist, eine mechanische Klapp-Einrichtung (1) aufzunehmen, oder eine Mehrzahl von Material-Streifen oder Riemen (104b, 104b', 104b'') ist, die an dem Tragevorrichtungskörper (101) befestigbar oder befestigt ist; und
 - gegebenenfalls ein stabilisierendes Unter-Element (105), das die Unterseite der zusammenfaltbaren Tragevorrichtung (100) verstärkt.

- 3. Zusammenfaltbare Tragevorrichtung (100) nach Anspruch 1 oder Anspruch 2, umfassend eine gerade Zahl, vorzugsweise wenigstens zwei, noch mehr bevorzugt zwei oder vier und am meisten bevorzugt zwei mechanische Klapp-Einrichtungen (1).**
- 4. Zusammenfaltbare Tragevorrichtung (100) nach den Ansprüchen 1 oder 2 oder Anspruch 3, wobei das obere Stütz-Element (11) lösbar mit dem starren Rahmen (102) durch eine Klammer (105) verbunden ist, die dafür angepasst ist, dass sie den starren Rah-**

men umfasst und an der Stütz-Struktur (111) des oberen Stütz-Elements (11) angeklammert ist.

5. Zusammenfaltbare Tragevorrichtung (100) nach irgendeinem der Ansprüche 1 bis 4, wobei das obere Stütz-Element (11) und das untere Stütz-Element (12) wenigstens nahe ähnlich in Größe und/oder Struktur sind und/oder wobei das obere Stütz-Element (11) und das untere Stütz-Element (12) dann, wenn sie in Funktion sind, wie Bild und Spiegelbild zueinander angeordnet sind, wobei die Spiegelebene eine horizontale Ebene (MP) ist, die senkrecht zu den oberen und unteren Stützelementen (11, 12) ist; vorzugsweise wobei das obere Stütz-Element (11) und das untere Stütz-Element (12) identisch in Größe und/oder Struktur sind und wobei das obere Stütz-Element (11) und das untere Stütz-Element (12) dann, wenn sie in Funktion sind, wie Bild und Spiegelbild zueinander angeordnet sind, wobei die Spiegelebene eine horizontale Ebene (MP) ist, die senkrecht zu den oberen und unteren Stützelementen (11, 12) ist.
6. Zusammenfaltbare Tragevorrichtung (100) nach irgendeinem der Ansprüche 1 bis 5, wobei das obere Stütz-Element (11) und/oder das untere Stütz-Element (12) wie der vertikale Buchstabe "I" aufgebaut sind und miteinander in Eingriff sind über das wenigstens eine Gelenk-Funktions-Element (14), oder wobei das obere Stütz-Element (11) und/oder das untere Stütz-Element (12) wie der Buchstabe "T" aufgebaut sind, wobei die vertikalen Teile (114, 124) der oberen und unteren Stütz-Elemente (11, 12) miteinander in Eingriff sind über das wenigstens eine Gelenk-Funktions-Element (14) und die horizontalen Teile (115, 125) der oberen und unteren Stütz-Elemente (11, 12) am weitesten weg von dem wenigstens einen Gelenk-Funktions-Element (14) angeordnet sind.
7. Zusammenfaltbare Tragevorrichtung (100) nach irgendeinem der Ansprüche 1 bis 6, wobei das wenigstens eine Element (13, 113, 123), das eine Rückstellkraft ausübt, wenn es in wenigstens einer der Taschen (112, 122) der oberen und unteren Stütz-Elemente (11, 12) aufgenommen ist, ein Element ist oder zwei Elemente sind, das/die gewählt ist/sind aus der Gruppe, die besteht aus einem Stück flachen Bandstahl, einem Stück gebogenen Bandstahl und einem Stück gebogenen Polymerband; und/oder wobei das eine oder die beiden Element(e) (13, 13), das/die eine Rückstellkraft ausübt/ausüben, mit seinem/ihren oberen Ende(n) (131) in der Tasche (112) des oberen Stütz-Elements (11) aufgenommen ist/sind und gleichzeitig mit seinem/ihren unteren Ende(n) (132) in der Tasche (122) des unteren Stütz-Elements (12) aufgenommen ist/sind.

8. Zusammenfaltbare Tragevorrichtung (100) nach irgendeinem der Ansprüche 1 und 3 bis 7, wobei das wenigstens eine Gelenk-Funktions-Element (14) ein Gelenk umfasst, das die oberen und unteren Stütz-Elemente (11, 12) in einer Weise verbindet, die dafür angepasst ist, ein Schwenken der oberen und unteren Stütz-Elemente (11, 12) relativ zueinander zu erlauben; vorzugsweise wobei ein Gelenk-Funktions-Element (14) ein Gelenk umfasst, das die oberen und unteren Stütz-Elemente (11, 12) in einer Weise verbindet, die dafür angepasst ist, ein Schwenken der oberen und unteren Stütz-Elemente (11, 12) relativ zueinander zu erlauben.
9. Zusammenfaltbare Tragevorrichtung (100) nach irgendeinem der Ansprüche 1 bis 8, wobei die oberen und unteren Stütz-Elemente (11, 12) hergestellt sind aus einem Material, das gewählt ist aus der Gruppe, die besteht aus Holz, Metall und Kunststoffen, vorzugsweise hergestellt sind aus einem Material, das gewählt ist aus Kunststoffen, die gewählt sind aus der Gruppe, die besteht aus Polyolefinen wie Homopolymeren, Copolymeren, Mischungen aus Polyethylen und/oder Polypropylen, und Mischungen daraus.
10. Zusammenfaltbare Tragevorrichtung (100) nach irgendeinem der Ansprüche 1 bis 9, wobei die oberen und unteren Stütz-Elemente (11, 12) verstärkt sind durch verstärkende Rippen, die sich vertikal und/oder horizontal entlang ihren Stütz-Strukturen (111, 121) erstrecken.
11. Zusammenfaltbare Tragevorrichtung (100) nach irgendeinem der Ansprüche 1 bis 10, wobei der Handgriff (103) schwenkbar mit dem starren Rahmen (102) in Eingriff ist.
12. Zusammenfaltbare Tragevorrichtung (100) nach irgendeinem der Ansprüche 1 bis 11, wobei die zusammenfaltbare Tragevorrichtung (100) die Form eines Einkaufskorbs, eines Einkaufsnetzes, einer Einkaufstasche, eines Rucksacks, einer Reisetasche, einer Tasche oder eines Behältnisses zum Tragen und/oder Verstauen von Kosmetika, einer Tasche oder eines Behältnisses zum Tragen und/oder Verstauen von Schuhen, einer Tasche oder eines Behältnisses zum Tragen und/oder Verstauen von Hüten hat.

Revendications

1. Un dispositif de transport pliable (100) comprenant :
 - un corps du dispositif de transport (101) en matériau souple ;
 - un cadre rigide (102) auquel est fixé le corps

du dispositif de transport (101) et qui est conçu pour aider à empêcher un affaissement du corps du dispositif de transport (101), lorsqu'il est chargé d'un ou plusieurs objets lourds ;

- une poignée (103) fixée au cadre rigide (102) et conçue pour être saisie par la main lors du transport du dispositif de transport pliable ;
- au moins un élément de rabat mécanique (1) comprenant :

- un élément support supérieur (11) ayant une structure support (111) et une poche (112) complètement en prise dans la structure support (111) et apte à recevoir d'un élément (113) exerçant une force de rappel lorsqu'il est reçu dans ladite poche (112) ;
- un élément support inférieur (12) ayant une structure support (121) et une poche (122) complètement en prise dans la structure support (121) et apte à recevoir un élément (123) exerçant une force de rappel lorsqu'il est reçu dans ladite poche (122) ;
- au moins un élément d'articulation (14) mettant à disposition des éléments supports supérieur (11) et inférieur (12) une fonction d'articulation réciproque, permettant ainsi un repliement réversible de l'élément support supérieur (11) vers l'élément support inférieur (12) ou vice versa ; et
- au moins un élément (113, 123, 13) susceptible d'exercer une force de rappel sur les éléments supports supérieur et inférieur (11, 12) lorsqu'il est reçu dans l'une au moins des poches (112, 122) des éléments supports supérieur et inférieur (11, 12) ;
- où au moins un élément (113, 123, 13) susceptible d'exercer une force de rappel sur les éléments supports supérieur et inférieur (11, 12) lorsqu'il est reçu dans l'une au moins des poches (112, 122) des éléments supports supérieur et inférieur (11, 12) est au moins un des éléments d'un groupe comprenant un ressort, une bande en polymère, une bande en polymère cintrée, une bande en polymère profilée, une bande d'acier, une bande d'acier cintrée et une bande d'acier profilée ; et
- où l'au moins un élément (13) exerçant une force de rappel est reçu par son extrémité supérieure (131) dans la poche (112) de l'élément support supérieur (11) et simultanément par son extrémité inférieure (132) dans la poche (122) de l'élément support inférieur (12) ; et

- au moins un moyen (104) conçu pour permettre la fixation de l'au moins un élément de rabat mécanique (1) au corps du dispositif de trans-

port (101) et/ou au cadre rigide (102), où le moyen (104) conçu pour permettre la fixation de l'au moins un élément de rabat mécanique (1) au corps du dispositif de transport (101) et/ou au cadre rigide (102) est au moins une poche (104a) fixable ou fixée au corps du dispositif de transport (101) et apte à recevoir un élément de rabat mécanique (1) ou bien est un ensemble de bandes ou de sangles de matériaux (104b, 104b', 104b'') fixables ou fixées au corps du dispositif de transport (101) ; et
- éventuellement, un élément de stabilisation de la base (105) pour renforcer la base dudit dispositif de transport pliable (100).

2. Dispositif de transport pliable (100) comprenant:

- un corps du dispositif de transport (101) en matériau souple ;
- un cadre rigide (102) auquel est fixé le corps du dispositif de transport (101) qui est conçu pour aider à empêcher un affaissement du corps du dispositif de transport (101), lorsqu'il est chargé d'un ou plusieurs objets lourds ;
- une poignée (103) fixée au cadre rigide (102) et conçue pour être saisie par la main lors du transport du dispositif de transport pliable ;
- au moins un élément de rabat mécanique (1) comprenant :

- un élément support supérieur (11) ayant une structure support (111) et une poche (112) complètement en prise dans la structure support (111) et apte à recevoir un élément (113) exerçant une force de rappel lorsqu'il est reçu dans ladite poche (112) ;
- un élément support inférieur (12) ayant une structure support (121) et une poche (122) complètement en prise dans la structure support (121) et apte à recevoir un élément (123) exerçant une force de rappel lorsqu'il est reçu dans ladite poche (122) ;
- au moins un élément d'articulation (14) mettant à disposition des éléments supports supérieur (11) et inférieur (12) une fonction d'articulation réciproque, permettant ainsi un repliement réversible de l'élément support supérieur (11) vers l'élément support inférieur (12) ou *vice versa* ; où l'au moins un élément d'articulation (14) est un élément apte à exercer une force de rappel lorsqu'il est reçu dans au moins une des poches (112, 122) des éléments supports supérieur et inférieur (11, 12), et est conçu de manière à laisser pivoter les éléments supports supérieur et inférieur (11, 12) l'un par rapport à l'autre sous l'effet de l'au moins un des éléments (14) exerçant la for-

- ce de rappel ;
- où l'élément (113, 123, 13) susceptible d'exercer une force de rappel sur les éléments supports supérieur et inférieur (11, 12) lorsqu'il est reçu dans l'une au moins des poches (112, 122) des éléments supports supérieur et inférieur (11, 12) est au moins un des éléments d'un groupe comprenant un ressort, une bande en polymère, une bande en polymère cintrée, une bande en polymère profilée, une bande d'acier, une bande d'acier cintrée et une bande d'acier profilée ; et
 - où l'élément (13) exerçant une force de rappel est reçu par son extrémité supérieure (131) dans la poche (112) de l'élément support supérieur (11) et simultanément par son extrémité inférieure (132) dans la poche (122) de l'élément support inférieur (12) ; et
- au moins un moyen (104) conçu pour permettre la fixation de l'au moins un élément de rabat mécanique (1) au corps du dispositif de transport (101) et/ou au cadre rigide (102), où le moyen (104) conçu pour permettre la fixation de l'au moins un élément de rabat mécanique (1) au corps du dispositif de transport (101) et/ou au cadre rigide (102) est au moins une poche (104a) fixable ou fixée au corps du dispositif de transport (101) et apte à recevoir un élément de rabat mécanique (1), ou bien est un ensemble de bandes ou de sangles de matériaux (104b, 104b', 104b'') fixables ou fixées au corps du dispositif de transport (101) ; et
- éventuellement, un élément de stabilisation de la base (105) pour renforcer la base dudit dispositif de transport pliable (100).
3. Dispositif de transport pliable (100) selon la revendication 1 ou la revendication 2, comportant un nombre pair, de préférence au moins deux, ou plus préférentiellement deux ou quatre, et idéalement deux d'éléments de rabat mécaniques (1).
 4. Dispositif de transport pliable (100) selon la revendication 1 ou 2 ou selon la revendication 3, où l'élément support (11) est fixé de manière détachable au cadre rigide (102) par une pince (105) destinée à saisir le cadre rigide (102), et accrochée à la structure support (111) de l'élément support supérieur (11).
 5. Dispositif de transport pliable (100) selon l'une quelconque des revendications 1 à 4, où les éléments supports supérieur (11) et inférieur (12) ont au moins sensiblement les mêmes taille et/ou structure, et/ou où les éléments supports supérieur (11) et inférieur (12), en fonctionnement, sont disposés, l'un par rap-

port à l'autre, comme un objet et son image dans un miroir, suivant un plan de symétrie horizontal (MP) et perpendiculaire aux éléments supports supérieur et inférieur (11, 12); de préférence où les éléments supports supérieur (11) et inférieur (12) sont de taille et/ou de structure identiques, et dans lequel les éléments supports supérieur (11) et inférieur (12), en fonctionnement, sont disposés, l'un par rapport à l'autre, comme un objet et son image dans un miroir, suivant un plan de symétrie horizontal (MP) et perpendiculaire aux éléments supports supérieur et inférieur (11, 12).

6. Le dispositif de transport pliable (100) selon l'une quelconque des revendications 1 à 5, où l'élément support supérieur (11) et/ou l'élément support inférieur (12) ont la forme d'un « I » et sont reliés par au moins un élément d'articulation (14), ou bien où l'élément support supérieur (11) et/ou l'élément support inférieur (12) ont la forme d'un « T », où les sections verticales (114, 124) des éléments supports supérieur et inférieur (11, 12) sont reliées par ledit élément d'articulation (14) au moins et les sections horizontales (115, 125) des éléments supports supérieur et inférieur (11, 12) sont plus éloignées dudit élément d'articulation (14) au moins.
7. Dispositif de transport pliable (100) selon l'une quelconque des revendications 1 à 6, où l'un au moins des éléments (13, 113, 123) exerçant une force de rappel lorsqu'il est reçu dans au moins une des poches (112, 122) des éléments supports supérieur et inférieur (11, 12) est un ou deux éléments parmi le groupe comprenant une pièce de bande d'acier plate, d'une pièce de bande d'acier cintrée et d'une pièce de bande en polymère cintrée, et/ou bien où les un ou deux élément(s) (13, 13) exerçant une force de rappel est/sont reçu(s) par leur(s) extrémité(s) supérieure(s) (131) dans la poche (112) de l'élément support supérieur (11) et simultanément par leur(s) extrémité(s) inférieure(s) (132) dans la poche (122) de l'élément support inférieur (12).
8. Dispositif de transport pliable (100) selon l'une quelconque des revendications 1 et 3 à 7, où l'au moins un des éléments d'articulation (14) comporte une articulation reliant les éléments supports supérieur et inférieur (11, 12) de manière à laisser pivoter lesdits éléments supports supérieur et inférieur (11, 12) l'un par rapport à l'autre, de préférence où un élément d'articulation (14) comporte une articulation reliant les éléments supports supérieur et inférieur (11, 12) de manière à laisser pivoter lesdits éléments supports supérieur et inférieur (11, 12) l'un par rapport à l'autre.
9. Dispositif de transport pliable (100) selon l'une quelconque des revendications 1 à 8, où les éléments

supports supérieur et inférieur (11, 12) sont en l'une des matières suivantes : bois, métal et plastique, et de préférence en l'une des matières plastiques suivantes : polyoléfinés telles que homopolymères, copolymères, mélanges de polyéthylène et/ou de polypropylène, et mélanges de ceux-ci. 5

10. Dispositif de transport pliable (100) selon l'une quelconque des revendications de 1 à 9, où les éléments supports supérieur et inférieur (11, 12) sont consolidés par des nervures de renfort qui s'étendent verticalement et/ou horizontalement le long de leurs structures supports (111, 121). 10
11. Dispositif de transport pliable (100) selon l'une quelconque des revendications 1 à 10, où la poignée (103) est en prise de manière pivotante dans le cadre rigide (102). 15
12. Dispositif de transport pliable (100) selon l'une quelconque des revendications 1 à 11, où le dispositif de transport pliable (100) a la forme d'un panier de course, d'un filet à provisions, d'un sac-cabas, d'un sac à dos, d'un sac de voyage, d'un sac ou d'une boîte de transport et/ou de rangement de produits cosmétiques, d'un sac ou d'une boîte de transport et/ou de rangement de chaussures, d'un sac ou d'une boîte de transport et/ou de rangement de chapeaux. 20 25

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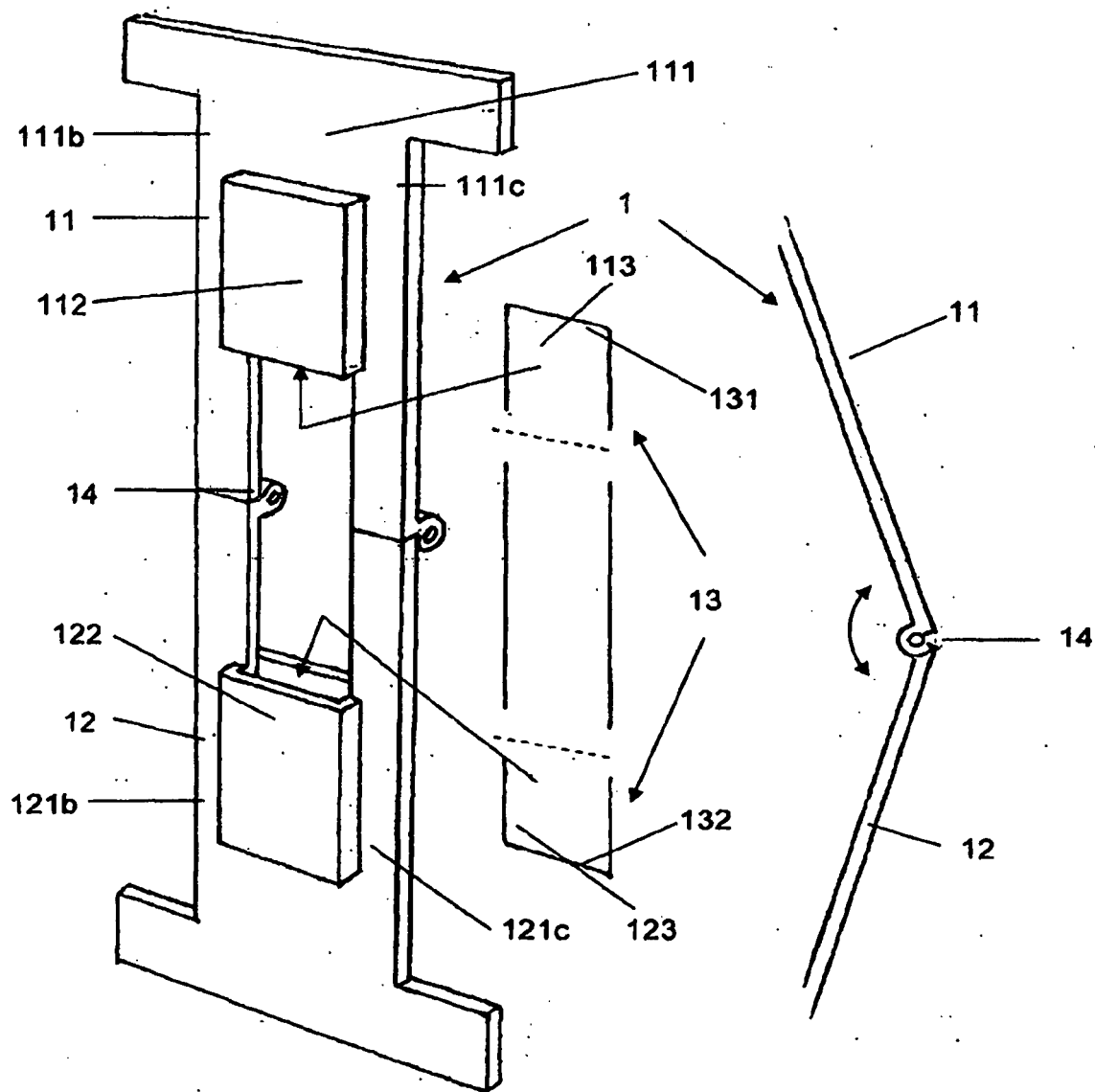


Figure 1

Figure 2

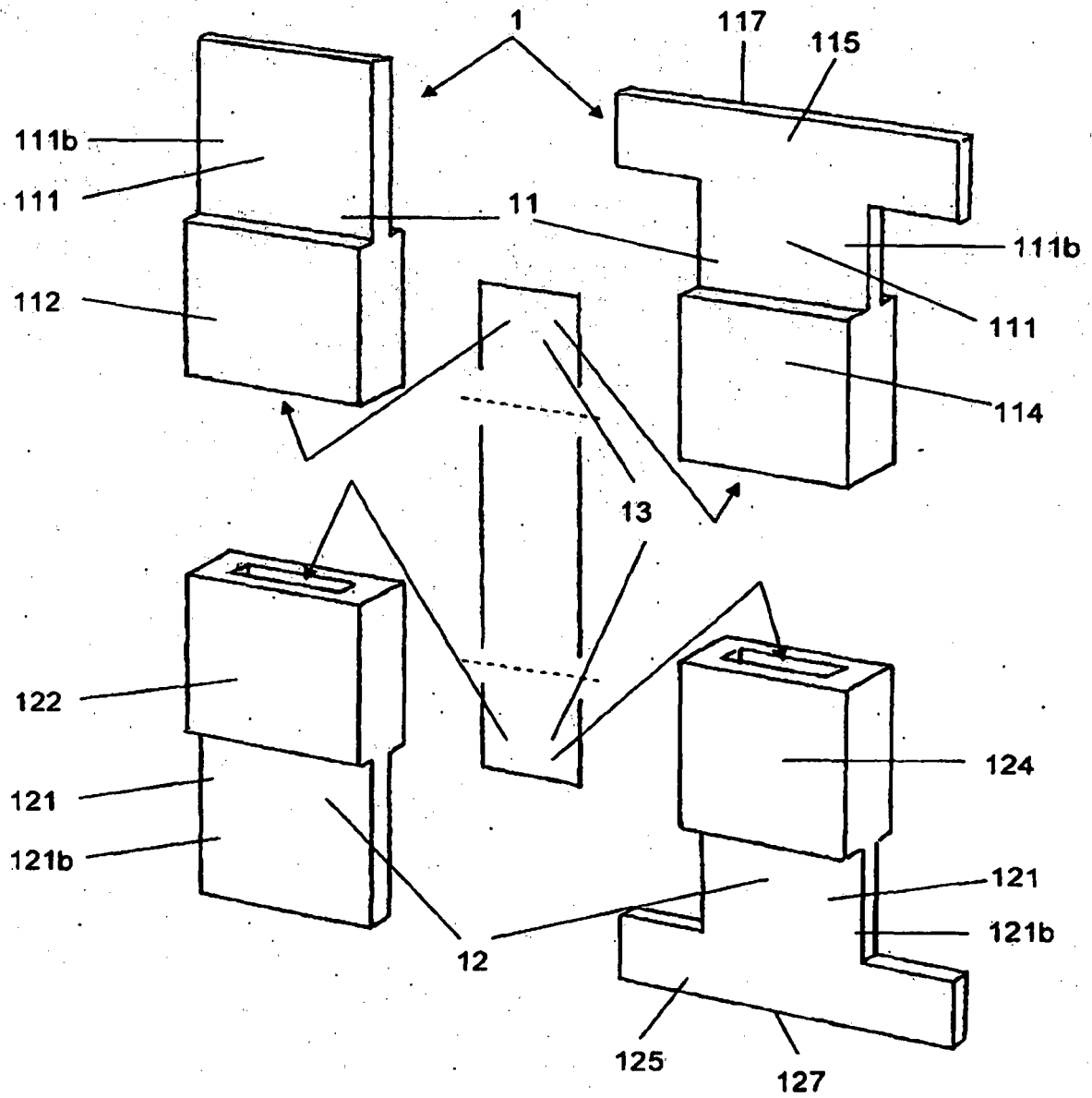


Figure 3

Figure 4

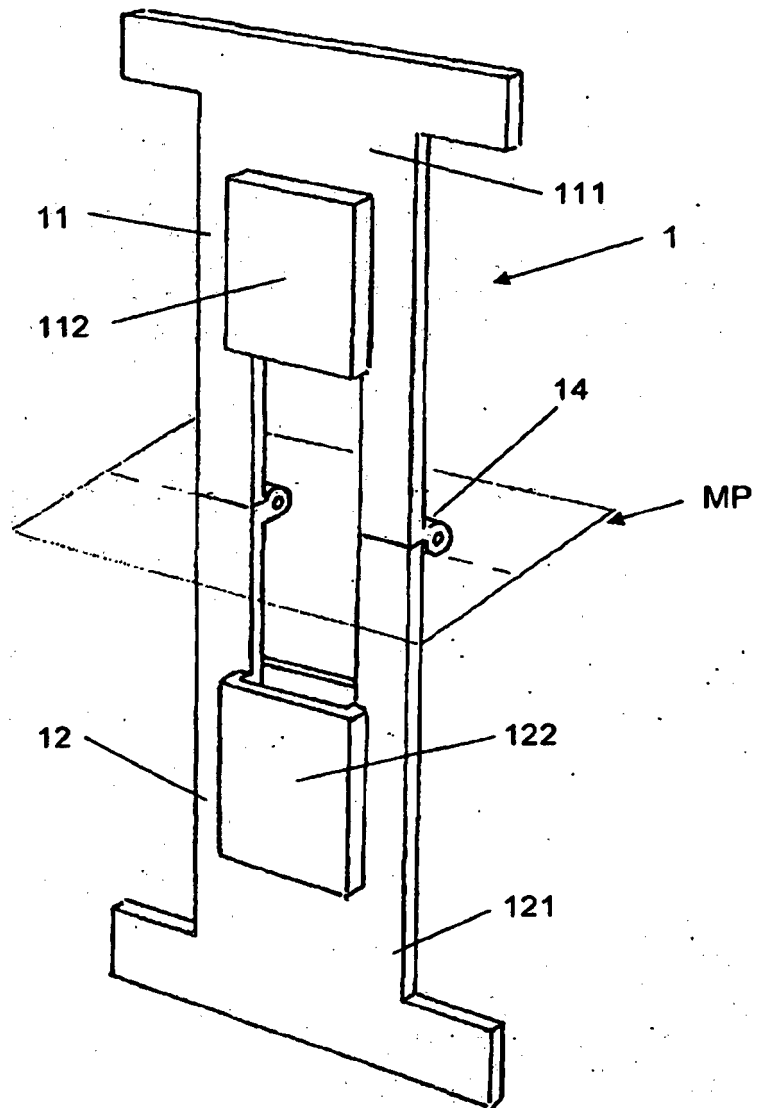
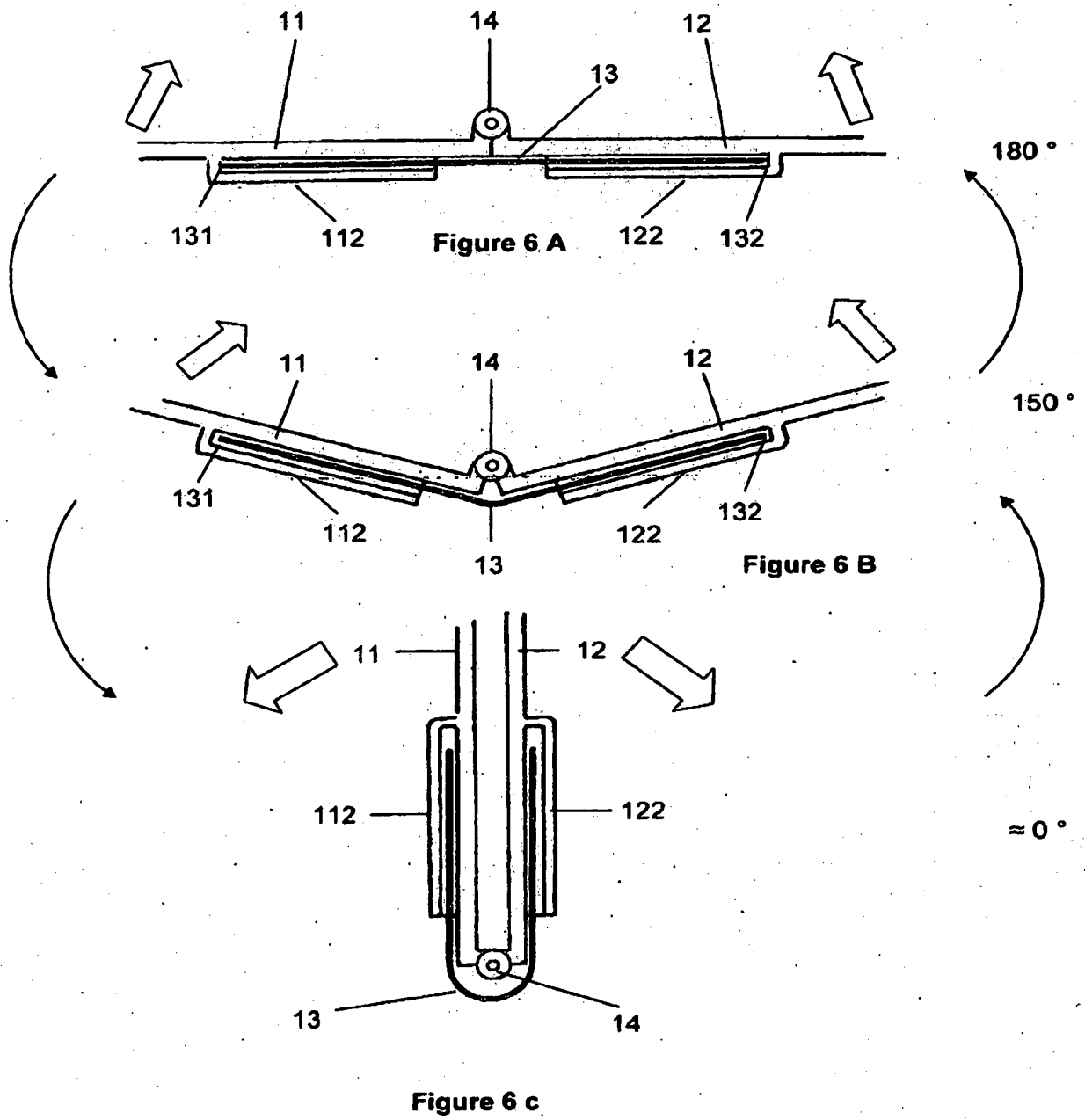


Figure 5



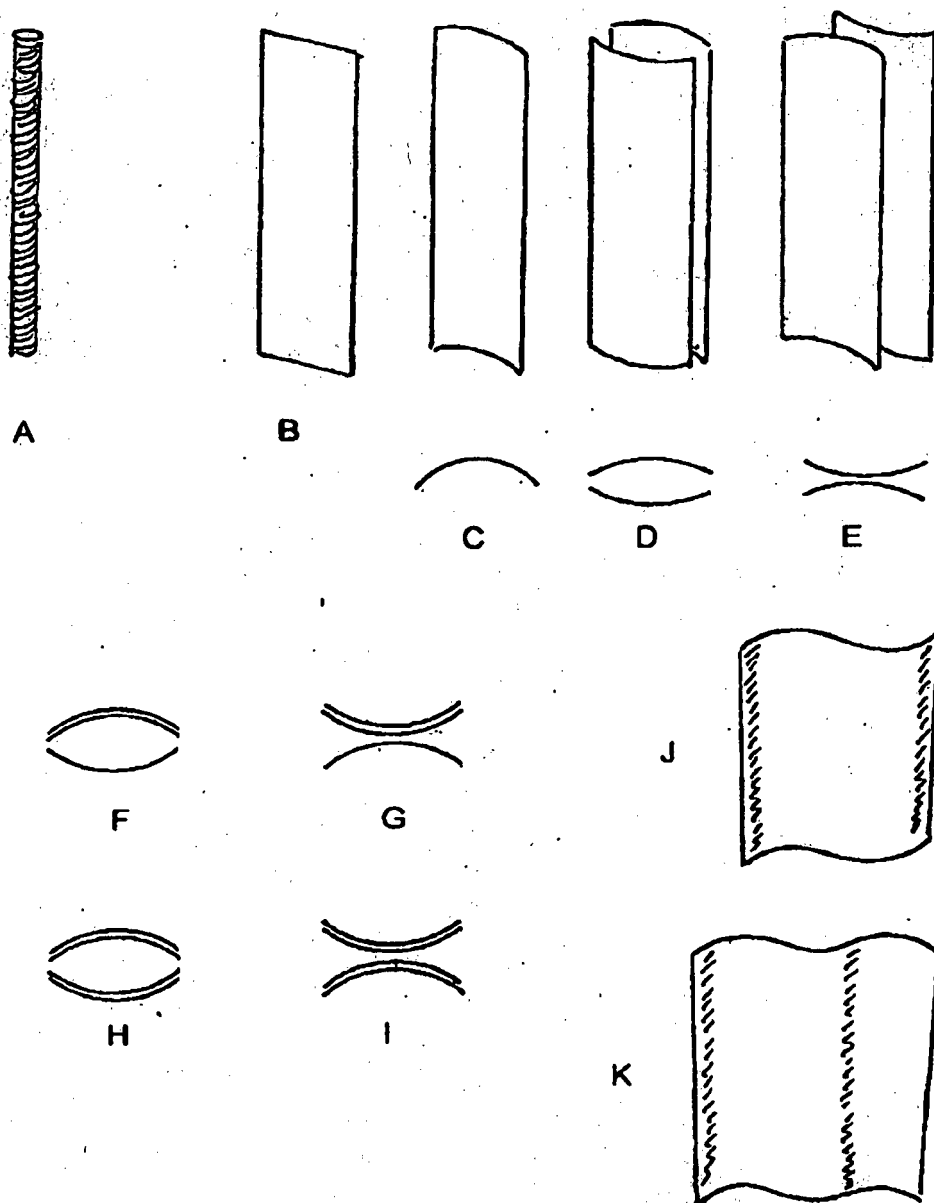


Figure 7

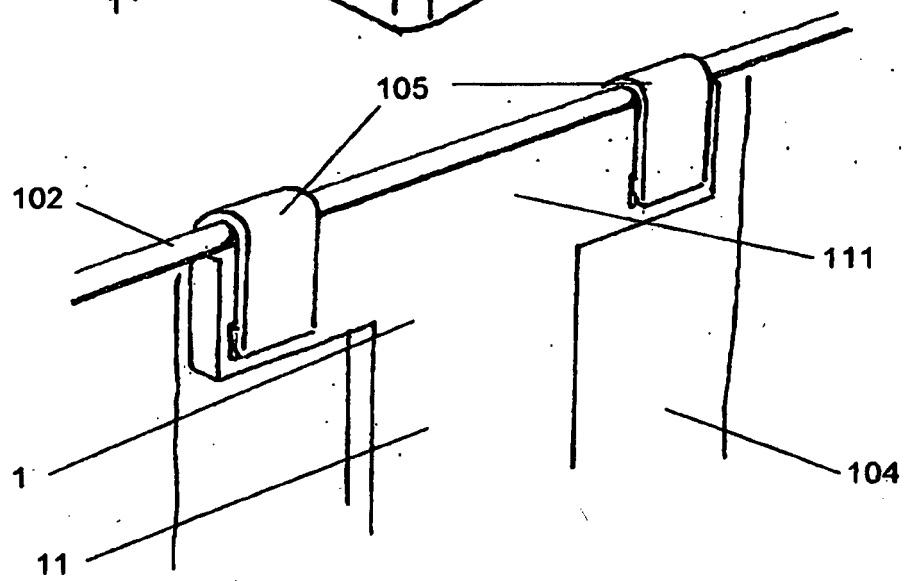
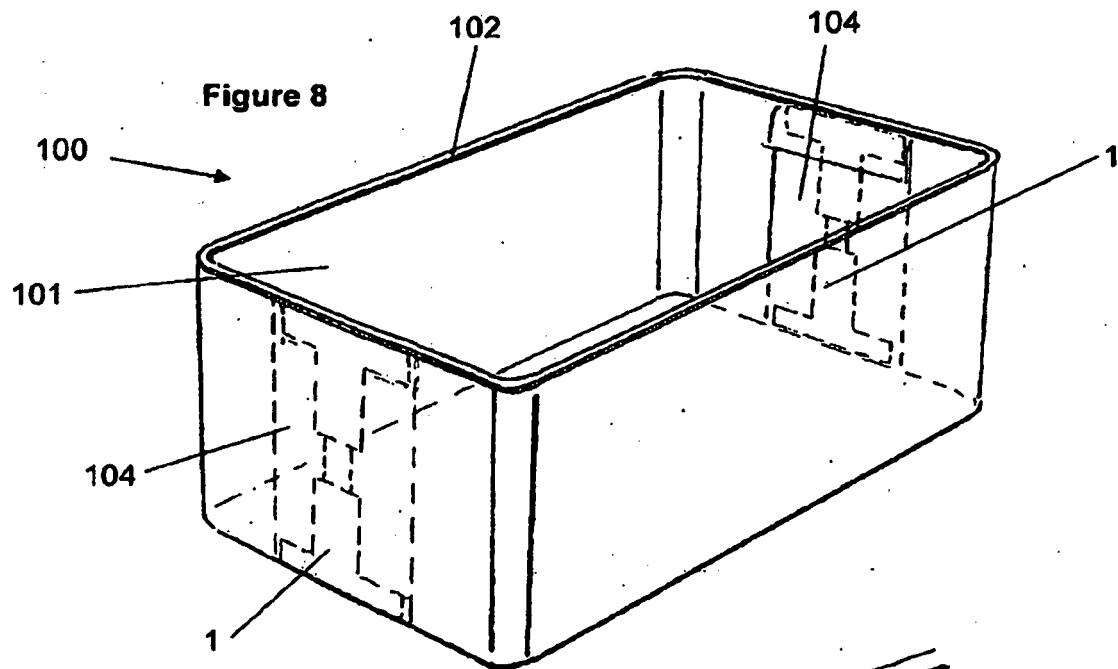


Figure 9

Figure 10 A

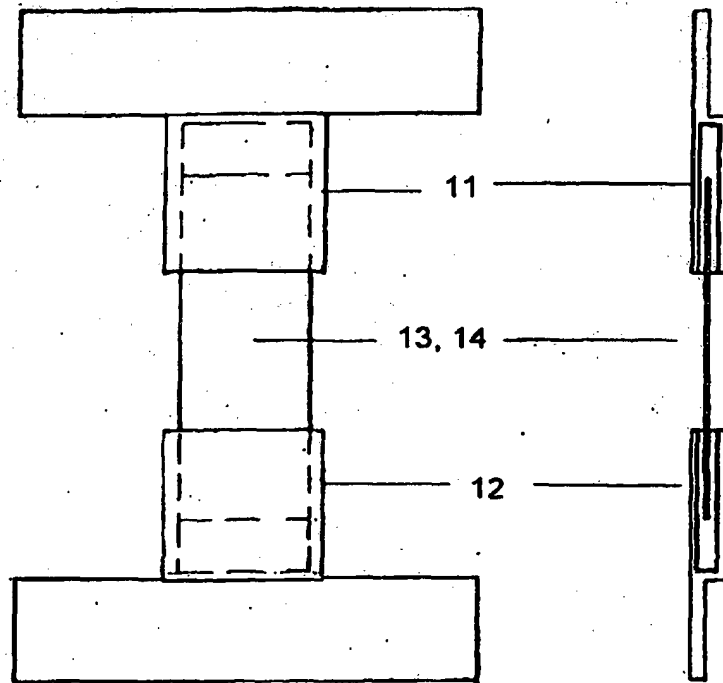


Figure 10 b

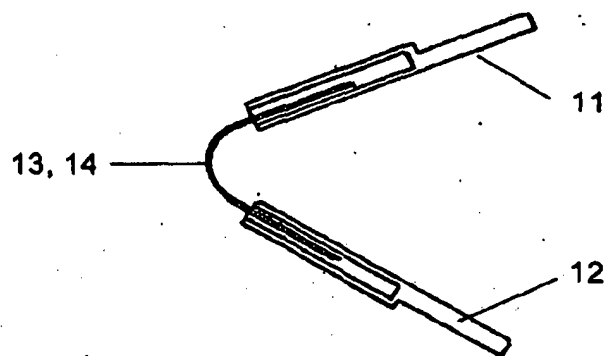


Figure 10 C

Figure 10 D

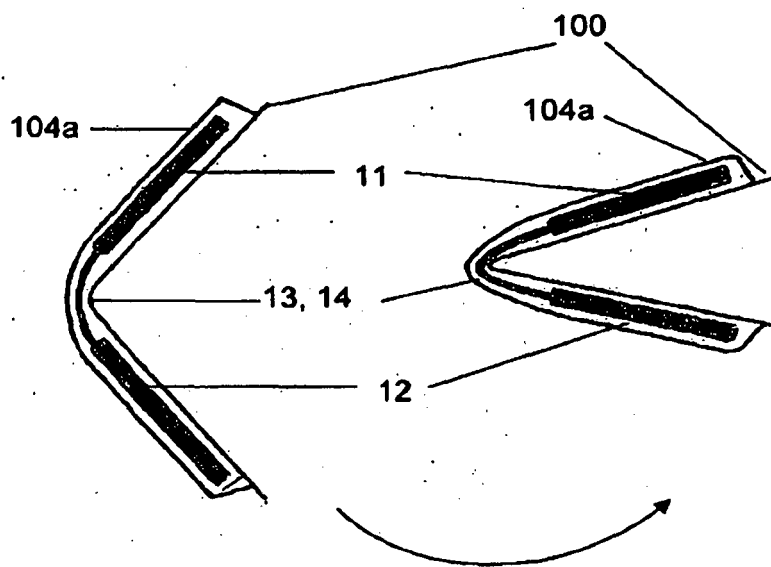
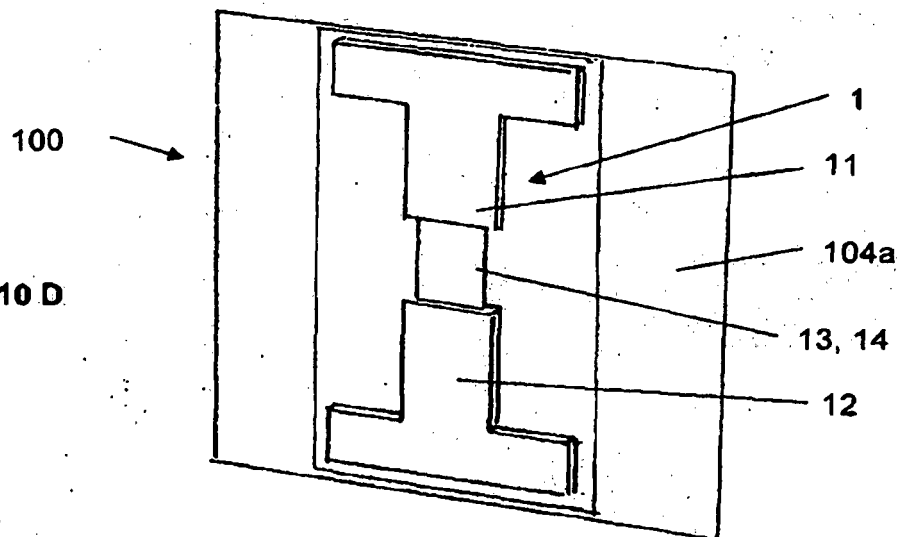


Figure 10 E

Figure 11 A

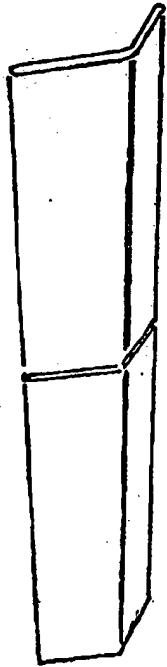


Figure 11 B



Figure 11 C

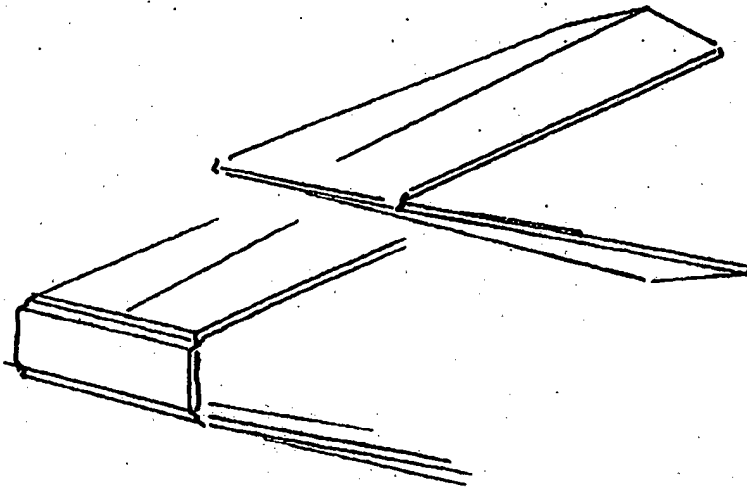
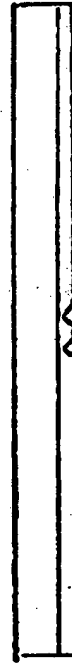


Figure 11 E

Figure 11 D

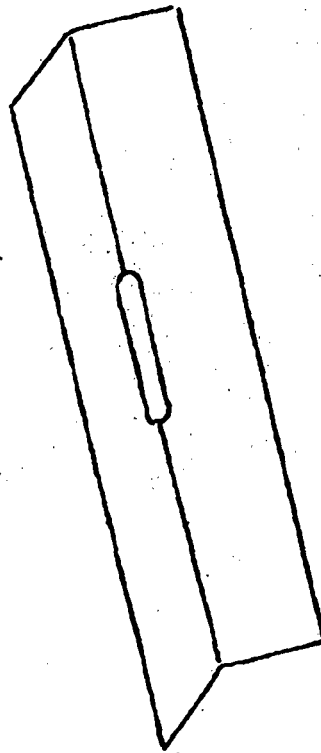


Figure 12 A

Figure 12 B

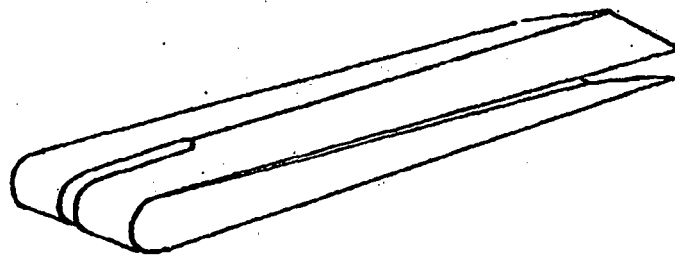


Figure 12 C

REFERENCES CITED IN THE DESCRIPTION

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