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(71) Applicant: **Dg International Holdings Limited**
London NW7 2HU (GB)

(72) Inventors:
- **Edwards, Barnaby Bevan**
  London, NW10 2RN (GB)
- **Denat, Jean-Philippe Henri**
  London, E5 9QH (GB)

(74) Representative: **Carpmael, Robert Maurice Charles**
Marks & Clerk LLP
90 Long Acre
London WC2E 9RA (GB)

(54) A case

(57) An expandable travelling case comprises a back panel, a flexible jacket, and a tensioner. The case can be expanded by moving the expansion arm to an expanded configuration. The expanded configuration involves the tensioner bracing or pushing against the flexible jacket in cooperation with the back panel of the case. The tensioner is therefore compressed between the jacket and the back panel in the expanded configuration. This provides a tension fit for the flexible jacket. There is also provided a retention means and suitable component to maintain the travelling case in an expanded state.

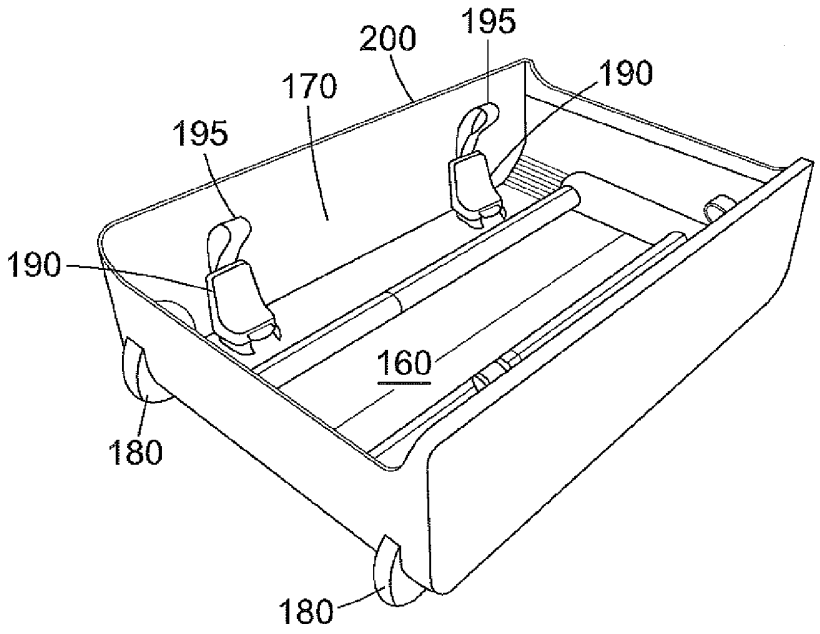

Fig. 2

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Description

[0001] The present invention relates to a case. In particular, the present invention relates to a travelling case, bag or suitcase that is expandable, i.e. it can be expanded to carry larger contents or additional contents, or to convert from a storage condition to an in-use condition.

[0002] Priority is claimed from PCT/2012/050886, the whole content of which is incorporated herein by way of reference.

[0003] Expandable travelling cases or bags are known in the prior art. They allow a user to expand the case in one or more dimension of the case for carrying his/her belongings, i.e. larger or additional belongings compared to those that can be carried in the case in an unexpanded configuration. Typical travelling items range from clothes to laptops, and include other accessories of various types.

[0004] Although expandable travelling cases nowadays are very popular with consumers, disadvantages can still be identified in the prior art.

[0005] Some expandable travelling cases simply use an additional zipped pocket, section or compartment that can be unzipped and unfolded when necessary. However, it is difficult to maintain the maximum space that can be so gained, since the folded out pocket or compartment can collapse on itself.

[0006] A large amount of additional items can be stored in these pockets or compartments such that internal pressure is applied to stretch the pockets/compartments to their maximum volume. However, when fully loaded, these expandable cases can result in an unpredictable shape or profile that is not only unsightly, but it can also cause problems where the expanded cases need to fall within predetermined maximum dimensions (this happens, for example, when a case needs to be stored in overhead storage compartments in airplanes), or during the handling of the case by automated luggage handling equipment, such as at airports.

[0007] Other types of expandable cases are known from the prior art. There are some which use complex or bulky expansion mechanisms comprising the likes of expansion frames, levers or arms. Some of these cases can obviate, at least partially, some of the problems associated with foldable zipped compartments or pockets. However, consumers may have to pay comparatively large premiums to purchase expandable travelling cases equipped with such complicated expansion devices.

[0008] It is also possible to find on the market relatively inexpensive expandable cases, although these cases typically have less robust or at least less practical expansion systems.

[0009] Certain consumers find expandable cases less aesthetically attractive than equivalent non-expandable cases, due to the presence of unsightly internal or external expansion features such as zips or mechanical arms or the like.

[0010] A further problem arises with the prior art cases, and that is that even in their collapsed state, the case is still of a substantial size, whereby the degree of expansion is only, perhaps, an increase in 25% of capacity, and, further, the storage of the case, when not in use, is still highly space dependant.

[0011] Further still, much of the prior art attempting to alleviate the above problems employs catches or retention mechanisms that take up a large amount of space inside the case, even when expanded, or are susceptible to opening unexpectedly due to handling of the case. Additionally, standard components are currently often ill-suited to solve the above problems, not being designed for such uses.

[0012] It could therefore be desirable to mitigate or obviate at least one of the above-discussed problems or disadvantages.

[0013] It could also be desirable to provide an expandable travelling case which is more practical or simple to use compared to the prior art.

[0014] It could also be desirable to provide an expandable travelling case which is relatively inexpensive to produce, while still being practical, reliable, simple and/or quick to expand.

[0015] It could also be desirable to provide components specifically designed and suited for use within an expanding case.

[0016] It could also be desirable to provide a new concept of expandable travelling case, in which expansion is performed in an alternative manner, or according to a different principle or mechanical mechanism compared to the prior art.

[0017] According to the present invention, there is provided an expandable travelling case comprising: a back panel; a flexible skirt or jacket, at least one tensioner connected to, or in contact with, said flexible skirt or jacket; one or more retention means for the tensioner or tensioners, the retention means comprising one or more of the following means: a buckle and clip, lip and catch, webbed strap and cam buckle, or a tie, wherein the case can be expanded by moving the tensioner to an expansion configuration, the tensioner is a tensioning panel and when the case is in its expanded configuration the tensioner exerts a force on the flexible skirt or jacket in cooperation with the back panel of the case to provide a tension fit for the flexible skirt or jacket.

[0018] By providing tensioning panels, and tension fitting the flexible skirt or jacket over the outside of the tensioning panel, the case can be given the appearance and handling characteristics of a fully rigid case - preferably the skirt or jacket is tension fitted in close conformance with the outside of the tensioning panel.

[0019] The tensioner may be made out of a wide range of materials but preferably one that is rigid and light weight, for example polyethylene or a similar polymer. A honeycombed or corrugated material is particularly suited since it is both rigid and lightweight.

[0020] The connection or contact with the flexible skirt facilitates deployment and folding (retraction) of the ten-

sioner. Preferably it is a pivotal connection. More preferably it is a webbed hinge. Preferably the hinge has a sufficient length for even load bearing, but not so large as to be restrictive when attempting to fold the tensioner and flexible skirt or jacket in an unexpanded state. It could thus have a length of between 60 and 90% of the length or width of the case, depending respectively upon whether it is extending along a length or width of the case.

[0021] The use of this expansion system allows very significant capacity changes for the case - perhaps as much as fourfold the capacity of the collapsed case, although typically the case will not be used as a case when collapsed.

[0022] Further, the collapsed case is much less space dependant during storage. The collapsed case can have an overall depth e.g. down to 75mm whereas for such a case the expanded case can have a depth in excess of 200mm, i.e. a greater than 2x depth change.

[0023] Preferably, the expanded case can be collapsed to a store- away configuration by moving the tensioner to a folded configuration. The folded configuration can- be characterised by the tensioner laying generally parallel with respect to the back panel, in order to reduce the height or depth, or other dimension, of the case.

[0024] It is preferable that the tensioner(s) is(are) located around the inside of the perimeter of the case, thus occupying little of the available space inside the case when in the expanded configuration. However, embodiments may equally include tensioners not located around the perimeter.

[0025] As the capacity of the case is rarely of importance when in a collapsed-for-stowage state, the tensioners preferably are designed to fold such that they will be within the central space of the case when in an unexpanded state. It is more desireable to achieve a minimised overall external volume or depth when collapsed.

[0026] Preferably, the tensioner in the expanded configuration is in generally out- of- plane relation with respect to the back panel, and preferably it is perpendicular thereto. This provides the expansion of the case by increasing the depth. It is however foreseen that other dimensions or indeed multiple dimensions of a case could be subject to expansion according to this invention, i.e the height or the width thereof.

[0027] Preferably, the case comprises two tensioners located on opposite sides of the case. Such a design is desirable from a structural view, allowing loads to be split between the tensioners. Designs are not limited to two tensioners, and while even numbers- allowing convenient load sharing within rectangular cases- are preferable, any number of tensioners could be used according to this invention.

[0028] Preferably, where two tensioners are present in the design, the two tensioners are symmetrically positioned with respect to a median plane of the travelling case. The median plane is preferably located through the centreline of the case and is preferably aligned with either the length or width dimension of the case. A symmetric design not only allows tension forces to be shared more evenly, but is also more aesthetically pleasing and straightforward to manufacture.

[0029] In preferred embodiments of the invention, the flexible skirt or jacket is made of a fabric, or flexible fabric, such as a flexible synthetic fabric or cloth.

[0030] In some embodiments, the flexible skirt or jacket is made of an elastic or stretchable fabric or cloth that can recover its original shape after it has been stretched out in the expanded configuration. This is beneficial as it allows the case to maintain a clean or uniform appearance even after it has been expanded and collapsed a large number of times. It also makes storage of the flexible skirt or jacket when in a collapsed state easier.

[0031] In preferred embodiments, the back panel is generally rectangular, in order to give the expandable travelling case a generally rectangular profile or projection, which is particularly practical, common and popular among consumers.

[0032] Preferably, the back panel comprises a plastics sheet. The plastics sheet can be a polyethylene sheet, which is light and yet durable and resistant. Polyethylene is also a standard material used for this part in the industry, thus it is easy to source and manufacture in the required shape. It might alternatively be aluminium or a polycarbonate. Other known materials used in the art might likewise be used.

[0033] Preferably, the expandable case comprises a flexible jacket rather than a skirt, wherein the back panel comprises a rigid portion and the flexible jacket surrounds substantially all of the case, and is arranged for a tight fit on at least the rigid portion of the back panel.

[0034] Preferably, the flexible skirt or jacket is connected to an edge of the back panel. It is desirable the connection and seal is absolute, preventing the ingress of dirt or water.

[0035] Preferably, the travelling case comprises a length, a width and a depth, and the tensioner (s) is (are) configured for expanding the depth of the case.

[0036] In some embodiments, the back panel has an internally concave shape, in which any tensioner can fold. The flexible skirt or jacket could also be stored in the concave back panel in the collapsed, unexpanded configuration of the case.

[0037] To provide stability to the case in the expanded configuration, the back panel can be equipped with one or more inner retention means to hold the back end(s) of the tensioner(s) on the back panel while tension is applied by the tensioner(s) to the flexible jacket. Preferably, the retention means comprise locking means, so that the tensioner(s) can be locked, if required, in the required position on the back panel.

[0038] Preferably each retention means comprises one or more respective locking means. It is desired such locking means prevent undesired release of the retention means and hence movement resulting in collapse or retraction of the tensioner(s) during transit.

[0039] A multitude of different locking means could per-

form such a function including, but not limited to, a webbed strap and cam buckle, a standard buckle and clip, a lip and catch or simply a tie. It is desirable that the locking means take up as little luggage space as possible, are robust and do not damage the luggage with, for example, sharp edges.

[0040] Preferably, the flexible jacket surrounds or encapsulates a rigid back panel, and is located substantially all around the case.

[0041] Alternatively, the flexible jacket might be connected to a rigid back panel in a different manner, along the perimeter or edge of the rigid back panel.

[0042] The above two jacket (or skirt) arrangements provide for a case comprising a rigid base portion (given by the rigid back panel), and for a flexible or semi-rigid expandable portion (flexible in the collapsed configuration, and semi-rigid in the expanded configuration, where the jacket - or skirt - is under tension).

[0043] The flexible skirt or jacket can surround substantially all of the case, and can also be arranged as a tight fit on at least a side of the back panel. This arrangement is especially advantageous with a rigid back panel. As a skirt, however, it might not extend around the sides of the case. It might instead be joined at an edge to front and back panels. The joint may be with a zip to facilitate opening of the case.

[0044] The skirt or jacket might have a zip provided elsewhere on it - e.g. around the sides - usually 3 sides - of the case, also to facilitate the opening of the case.

[0045] The travelling case can comprise a length, a width and a depth, and the expansion mechanism may be configured for expanding the depth of the case.

[0046] Preferably, each tensioner is configured for folding inwardly with respect to the back panel. Preferably, the or each tensioner are located internally of an internal volume defined by the case.

[0047] The above results in a compact design whereby when empty, the case can be collapsed or contracted by folding the tensioner(s) in. When folded and retracted, the tensioner(s) is(are) located entirely within the case, thus the unexpanded case is compact, making it more easily stowed.

[0048] Preferably, the flexible skirt or jacket is configured to fold on or over the back panel.

[0049] Preferably, the flexible skirt or jacket comprises fold lines, to help with the folding of the skirt or jacket when the case is re- configured in the store- away configuration.

[0050] Preferably the tensioning panel, once deployed into its tensioning condition, supports the flexible skirt or jacket at the sidewall of the case and defines the shape of that sidewall, save for any region thereof accommodating a wheel housing.

[0051] Preferably, the or each tensioner is a tensioning panel. The panels can be made of any suitable rigid or semi rigid material capable of withstanding the required tensioning forces. Preferably, a honeycomb structure is used for such panels.

[0052] Preferably, the or each tensioning panel extends along a side of the case.

[0053] Preferably, each tensioning panel extends substantially over the length of the case in the expanded or unexpanded configurations of the case, and extends substantially over the depth of the case in the expanded configuration of the case. This is a preferred configuration because the encumbrance of the expansion system is minimised, while the tensioning forces are conveniently applied.

[0054] Preferably, two corresponding parts of a retention means are mounted respectively one on the back panel and the other on one of the tensioning panels.

[0055] As discussed above, suitable retention and locking means include, but are not limited to, a buckle and clip and, a lip and catch or a tie. The retention and locking means should avoid unintentional release. Depending on the type of means chosen, such a release could be triggered by pressure from the contents or due to an external impact to the case. If possible, the means should thus be robust to minimise this possiblility.

[0056] Preferably, the retention means comprises a webbed strap and a cam buckle. Such a system prevents unintentional release and is compact, cheap and will not damage the case's contents with sharp edges.

[0057] The cam buckle can be operated to allow relative movement between itself and the webbed strap to facilitate the expansion or collapse of the case. Then when the case is in use it can be engaged with the strap to prevent relative sliding in the direction that would correspond to the tensioning panel rotating into a folded position.

[0058] The cam buckle can be manufactured out of a large number of materials, the two most suitable types being metals such as steel or aluminium and rigid plastics such as high density polyethylene or fibre-reinforced plastics. Other suitable materials would be apparent to one skilled in the art.

[0059] Preferably, the cam buckle is firmly, and preferably rigidly, attached to said tensioning panel. Alternatively, the cam buckle could be pivotally or slidably attached to the tensioning panel.

[0060] The webbed strap can be attached to the back panel in a position so as to engage with the cam buckle with minimal transverse bending.

[0061] A number of fixings are suitable for these attachments. Suitable fixing types include, but are not limited to, screws, glue and rivets. Preferably the buckle is riveted to the tensioning panel, as rivets provide a cheap yet robust solution.

[0062] Preferably, one or multiple retention means are disposed symmetrically on opposing sides of the case. Each retention means then has a corresponding retention means opposite it across a median plane of the case.

[0063] Preferably, the webbed strap from one retention means cooperates with the webbed strap of a second, preferably opposite, retention means and thus the cooprtating straps act to restrain clothes stored in the case,

much like traditional straps found within prior art suitcases. The straps are thus not just luggage straps, but also retention straps for the tensioning panels- thus having a new dual function. Cooperation could be facilitated by a number of means including, but not limited to, Velcro, buttons, fasteners, buckles or a tie. Preferably, as with many prior art designs, each of the two webbed straps comprises one of two complementary parts of a buckle.

[0064] By providing the straps with a dual purpose: firstly as a means to retain the tensioning panels in an extended state, and secondly to provide a strap to restrain the contents of the case, little additional weight is added to the suitcase by implementing the present invention thereon.

[0065] In order for both strap features to be able to function effectively, a degree of control over the exit angle from the cam buckle of the webbed strap is desirable. For this reason, the strap will be appropriately attached to the case relative to its respective cam buckle so as to minimise transverse bending of the strap by the cam buckle.

[0066] The only loss of space due to such a retention means over a non-extendable case is that taken up by the cam buckle itself, which is deminimis. It is preferably fixed to the tensioning panel, so the space is at the sidewall, and usually towards the bottom of the case, where some space is inevitably lost anyway by any wheel or tow-handle mechanisms.

[0067] Preferably, two opposed reinforcement panels or strips extend across the width of the case on opposing sides, said reinforcement panels being deployable for reinforcement when the case is expanded. This improves the strength of the case in its expanded configuration.

[0068] Preferably, the reinforcement panels can be retracted or folded away when the case is collapsed to a store- away configuration.

[0069] Preferably, at least one of the reinforcement panels or strips is locked into its deployed configuration by at least one of the tensioning panels when the case is expanded. This avoids the need of retention or locking means for the reinforcement plates.

[0070] Preferably, a top cover is provided which can be operated by a user to open and access the case, or to close the case and prevent access thereto.

[0071] Preferably, the top cover is hingedly attached to the flexible skirt or jacket.

[0072] Preferably, the cam buckle comprises: a housing portion comprising first and second ends suitable for receiving a webbed strap; and a retention member pivotally attached to the housing portion above the first end, comprising: a cam face disposed from the pivot point, the cam face controlling the height of an access slot formed at the first end; and a lever arm extending substantially perpendicularly from the cam face, the lever arm being operable to rotate the retention member, **characterised in that** the housing portion comprises a cross member above the second end, the cross member aiding in controlling the exit angle of the webbed strap.

[0073] By controlling the exit angle of the webbed strap, the likelihood of accidental release of the lever arm due to use of the webbed strap as a luggage strap within the suitcase is minimised.

[0074] The cross member is preferably of a rectangular cross section so as to provide an elongated, flat surface with which to control the exit projection of the strap from the cam buckle. Although a rectangular cross section is preferable, other suitable cross sections may include among others: square, circular and elliptical sections.

[0075] The cross member is preferably integral to the cam buckle housing portion although is optionally separate and separable. Preferably the cross member is made of the same material as the cam buckle housing portion. Suitable materials include, but are not limited to, aluminium and polyethylene.

[0076] Preferably the housing portion comprises a hole to allow attachment of the cam buckle to a surface. The diameter of the hole depends on the attachment method used, preferably the hole is sized to accommodate a rivet. It may be rebated or countersunk to allow the rivet to be recessed below the line of the strap as it passes from the cam and under the cross member.

[0077] As such, the present invention preferably comprises an expandable case with displaceable, wall-tensioning, sidewalls, and having at least one cam buckle and webbing strap for securing the sidewalls in a case expanding configuration. Preferably the case and/or cam buckles are as described above.

[0078] Preferably the webbed strap is used in an expandable case as both a tensioning panel retention means, and clothes restraining means.

[0079] These and other features of the present invention will now be described, purely by way of example, with reference to the accompanying drawings in which:

Figure 1 is a front perspective view of an expandable case according to the present invention in an expanded state.

Figure 2 is a rear perspective view of the inside of an expandable case in an expanded state.

Figure 3 is a rear perspective view of the inside of the expandable case of figure 2 with the tensioning panels half way lifted out of their expansion configuration.

Figure 4 is a rear perspective view of the inside of the expandable case of figure 2 with the tensioning panels in their lifted configuration.

Figure 5 is a rear perspective view of an expandable case in an expanded state.

Figure 6 is a rear perspective view of an expandable case in a fully collapsed state.

Figure 7 is a partial front perspective view of a reinforcement panel in the case when the case is in its expanded state.

Figure 8 is a close up view of the reinforcement panel of Figure 7.

Figure 9 is a partial perspective view of a further embodiment of the present invention, showing a cam buckle and webbed strap retention means, in its locked state.

Figure 10 is a further partial perspective view of the cam buckle and webbed strap retention means of Figure 9, in its locked state.

Figure 11 shows the inside of an expandable case according to one potential embodiment of the present invention, illustrating possible retention means numbers and positioning.

Figure 12 is a perspective view of two cam buckles which are preferably used with the present invention, one in an opened state and the other in a locked state.

[0080] Certain aspects of the present invention will now be described in further detail with reference to the figures.

[0081] Figure 1 shows an expandable case 100 in a closed but expanded state. Like most of the currently popular cases there is provided a substantially rectangular case with top and side handles 110 and 130, and a telescopic handle 120, to allow the user to easily carry or trundle the case 100 respectively. The illustrated telescopic handle 120 is a standard handle used on such cases, with two telescopic arms attached to a cross member handle portion.

[0082] The cover lid 140 is rigid and can be zipped around the case 100. The cover lid 140 preferably comprises a polyethylene side-board structure 140a to help the panel hold its shape. In this particular embodiment the cover lid 140 zips together with the flexible skirt or jacket 150. The cover lid 140 is attached via a pivoting hinge or material joint to the flexible skirt or jacket 150 on one side, while being attachable via a zip on the other three, allowing it to rotate or lift between open and closed positions, just like many currently popular cases.

[0083] In this embodiment the back panel 160 has raised side walls 160a which, when the case is in an unexpanded or retracted state, house the tensioning panels 170 (see Fig 2). These raised side walls 160a preferably comprise polyethylene boards.

[0084] The flexible skirt or jacket 150 extends around the perimeter of the case 100 and is at one end attached to the side walls of the back panel 160a, while the other is attached to, or engages with the cover lid 140 and tensioning panels 170. The flexible skirt or jacket 150 is made of a flexible fabric, such as a flexible synthetic fabric or cloth, and comprises fold lines 150a. The fold lines 150a allow the top, bottom and sides to fold in an easy and space efficient manner when the case 100 is in its unexpanded state.

[0085] Figure 2 depicts a rear perspective view of the case 100 in its expanded state with the cover lid 140 removed for clarity. This view shows that, again like most current cases, this invention houses two wheels 180 in the base of the back panel 160.

[0086] As can be seen, the arms of the telescopic handle 120 retract in to channels in the back panel 160 of the case, again like most equivalent cases on the market today.

[0087] A tensioning panel 170 is located on either side of the case 100. In figure 2, the tensioning panels 170 are in their extended state, locked in position by two retention means 190. The tensioning panels 170 exert an upwards force on the flexible skirt and jacket 150, and when locked in place by the two retention means 190, together form two rigid side walls of the case 100.

[0088] In the preferred embodiment the tensioning panels 170 are made of a rigid polyethylene honeycomb structure.

[0089] The tensioning panels can be coated in a fabric on the inside to give a more pleasing appearance, in line with most case designs popular today.

[0090] The size of the tensioning panels 170 and corresponding flexible skirt or jacket 150 determine the depth of the case 100 when expanded. In the present embodiment the height of the tensioning panels 170 and hence depth of the expanded case 100 is of the order of 200mm. The largest dimension of the tensioning panels 170 is, in this embodiment, substantially equal to the length of the case, but slightly less than that length to allow them to be stowed within the case.

[0091] Four retention means 190 are present in this specific embodiment, two for each tensioning panel 170. The retention means 190 are presented in figures 2-4 and 7 as being a lip and catch mechanism although, as described above and subsequently, this is not the preferred embodiment of the present invention due to their bulk.

[0092] The retention means 190 depicted in figures 2-4 and 7 comprise two components, one 190b fixed to the back panel 160, and one 190a attached to the tensioning panel 170. Upon extension of the tensioning panels 170, the retention means component 190a located on the tensioning panel 170 adjoins and locks with the component 190b located on the back panel 160, maintaining the tensioning panels 170 in an extended state.

[0093] To retract the tensioning panels 170 the retention means 190 must first be disengaged. In this embodiment this is achieved by compressing a small catch at the base of the retention means 190b which then disengages with a corresponding lip of the retention means 190a. This allows the component located on the tensioning panel 190a and the tensioning panel itself 170, to rotate inwards about its connection to the flexible skirt or

jacket 150.

[0094] A pulling tab 195 is present on the top of the retention means 190 as a handle to ease actuation during retraction.

[0095] Although not explicitly shown in figure 2, the connection 200 between the tensioning panels 170 and flexible skirt or jacket 150, enables the rotation of the tensioning panels 170 and the collapse of the flexible skirt or jacket 150 for allowing the adoption of the stowage condition for the case - for this the tensioning panels and a part of the flexible skirt is folded down towards the base 160 of the case.

[0096] Figure 3 depicts the same embodiment as figure 2, but here the tensioning panels 170 are in a half lifted state, half-way between extended and fully folded for stowage. The two separate components 190a and 190b that form the retention means 190 are visible in an uncoupled state. When the case 100 needs to be collapsed for stowage the retention means 190 are disconnected allowing the two tensioning panels 170 to rotate inwards with respect to the flexible skirt or jacket 150 about the pivotal connection 200.

[0097] Figure 4 shows the same embodiment as figures 2 and 3 with the tensioning panels 170 fully rotated upwardly from the base, but prior to dropping them down into the case to collapse the case. Once the tensioning panels 170 are fully rotated into a substantially horizontal position, the flexible skirt or jacket 150 is able to fold up or collapse towards the back panel 160a as the tensioning panels 170 are brought down towards the back panel 160.

[0098] Once fully collapsed, the tensioning panels 170 lie substantially horizontally within the space defined by the back panel 160 and side walls 160a.

[0099] Figure 5 depicts an expandable case 100 according to the present invention in an expanded state, and figure 6 depicts the same expandable case 100 in an unexpanded/collapsed state. These figures illustrate the extent of the change in volume of the case, from an expanded to unexpanded state, although not all elements are drawn to scale. See, for example, the wheel size compared to the length and width of the case. Nevertheless, from the wall details, especially the lines 260, it can be seen that in figure 6 the depth of the contracted case 100 is mostly dependent on the height of the back panel side walls 160a, rather than the height of that plus the height of the extended sidewall provided by the additional width of the tensioning panels, i.e. the extension part 270 shown in Figure 5. As shown in Figure 5, when those tensioning panels are in place, the sidewalls extend the full size of those panels, rather than just the lower half thereof.

[0100] The position of the panels in the expanded configuration are represented on one of the sides by the trace-line 280 in Figure 5. When the panels are folded away, however, the lower half is just the flexible fabric, and as such is not hard-walled. Structural regidity to the case is thus then provided only by the lid 140 and the base 160, with its curving u-ends 300.

[0101] In the present embodiment the depth of the collapsed case is of the order of 75mm. The flexible skirt or jacket 150 and two end (top and bottom) reinforcement panels 210 - present to increase the rigidity of the expanded case 100 - have been collapsed and are no longer outwardly visible when the case 100 is in its unexpanded or retracted state. Additionally, part of the cover lid 140, and in particular the side-board structure 140a are located within the area defined by the back panel side walls 160a, further decreasing the case's volume when collapsed.

[0102] The lower reinforcement panel 210 is shown in more detail in figures 7 and 8. Figure 7 illustrates the location of the reinforcement panel 210 and its abutment with the tensioning panel 170 when in an extended position. Figure 8 is a close up view of figure 7, further detailing the abutment. In this position the reinforcement panels 210 act to strengthen and increase the rigidity of the case 100.

[0103] Such reinforcement panels 210 can be made of numerous materials including both plastics and metals. In the present embodiment a polyethylene honeycomb board is used to provide strength while minimising cost and weight.

[0104] Both reinforcement panels 210 are pivotally connected to the back panel 160 along a lower edge 220, e.g. with a fabric hinge. They may also be individually be two-part ot otherwise collapsible to allow them to be folded into the volume of the case. See, for example, hinge line 280 in Figure 5.

[0105] The reinforcement panels 210 are preferred to have a restricted rotation so as to allow inwards rotation towards the centre of the case 100, but when in an expanded state, as illustrated in figure 2, the tensioning panels 170, should resist further outward rotation. For that purpose, they can abut the inner side of the reinforcement panels 210, thus preventing them from rotating further and keeping them upright. The fabric coating can also help to restrain them from outward displacement.

[0106] Once the tensioning panels 170 are rotated into their uppermost folded position as shown in figure 4, the reinforcement panels 210 are no longer blocked from rotating and are therefore permitted to collapse inside the case towards the back panel 160.

[0107] The reinforcement panels 210 are not constrained to be a specific size, and therefore their dimensions generally depend upon other factors such as the height and width of the case 100 as a whole. In the preferred embodiment the reinforcement panels 210 effectively define the depth of the case 100, and have a length approximating the distance between the top of the back panel side walls 160a and the zipped connection to the cover lid 140.

[0108] As stated above, a number of different retention means are included within the scope of the present invention. Figures 9 and 10 depict the preferred embodiment.

[0109] The retention means comprises a housing portion 230a and locking member 230b which together comprise a cam buckle 230, and a webbed strap 240.

[0110] The cam buckle 230 is rigidly fixed to the lower end (that which is in the vicinity of the back panel 160 when in an extended position) of the tensioning panel 170. One end of a webbed strap 240 is attached to the back panel 160, the other end is passed through the cam buckle 230 and is free. The cam buckle 230 is oriented so that when engaged, it is biased against the webbed strap 240 if the strap is moving in the direction towards the back panel 160, through the cam buckle 230. It thus resists release with its camming action.

[0111] The buckle also enables the user to disengage the cam buckle 230, as explained below.

[0112] With the buckle disengaged, or even when part engaged, the user can rotate and extend the tensioning panel 170 from a horizontal, folded position, into an extended position so the base of the tensioning panel 170 and cam buckle 230 are against the back panel 160, and the flexible skirt or jacket 150 is in tension. This can be done by sliding the buckle aong the strap towards the base - i.e. against the camming direction of the cam. Then, the cam buckle 230 can be firmly engaged with the webbed strap 240 by depressing on the locking member 230b. This then prevents the base of the tensioning panel 170 from moving away from the back panel 160 and moving to or towards, a horizontal, or non-tensioning, position.

[0113] In order to collapse the case 100, the cam buckles 230 are undone, using the locking members 230b - disengaging them by pushing them outwardly away from the straps, thus allowing the webbed straps 240 to slide relative to the cam buckles 230 and thus allowing the tensioning panels 170 to rotate inwardly to their folded or non-tensioning positions.

[0114] In the present embodiment the free end of the webbed strap 240 comprises one half of a two piece buckle 250. The other half of the two piece buckle 250 can be attached to the end of a webbed strap 240 of a retention means 230 located symmetrically opposite, across the back panel 160, or all four straps can work together to provide a crossed clothes strap arrangement.

[0115] The straps may have elasticated ends, or adjustable two-piece buckles, to provide corresponding functionality to conventional clothes straps as found in prior art suitcases, although non elasticated parts, at least where the cam buckle engages, is certainly preferred to ensure a secure retention of the tensioning panels in their tensioning orientation relative to the base.

[0116] Although an off-the-shelf cam buckle is illustrated in figures 9 through 11, and such a buckle can work perfectly adequately for retaining the tightness on the straps, figure 12 shows an alternative, novel, cam buckle 240 according to the present invention. The majority of the features of the housing portion 230a and locking member 230b are similar to the standard forms used within cam-buckle industry, and thus will not be described in detail here. However, in this cam buckle, in the base of the housing portion 230a is a hole 270 suitable for a screw, rivet or other fixing. The hole 270 is used to locate and attach the cam buckle 230 to the inside of the tensioning panel 170. Further, there is provided a cross member 260 that comprises a rectangular-section member connecting the two side walls of the housing portion 230a. The cross member 260 is located above the end opposite the locking member 230b pivot point, and defines a slot suitable for a webbed strap 240 to slide through without significant resistance.

[0117] The cross member 260 acts to guide the projection of the webbed strap 240 extending from the cam buckle 230, up the sides of the tensioning panels 170. This therefore aids the webbed strap 240 in being passed around the sides of the contents of the case in order to be fastened above with the buckle 250. It also prevents inadvertant release of the strap by holding it away from the the release flange 230b.

[0118] It will be appreciated that it is not intended to limit the present invention to the above specific embodiments only. Many variants will be readily apparent to one of ordinary skill in the art without departing from the scope of the appended claims.

[0119] Further statements of invention:

1 An expandable travelling case comprising:

a back panel;
a flexible skirt or jacket; and
at least one tensioner connected to, or in contact with, said flexible skirt or jacket,
wherein the case can be expanded by moving the tensioner to an expansion configuration, the tensioner is a tensioning panel and when the case is in its expanded configuration the tensioner exerts a force on the flexible skirt or jacket in cooperation with the back panel of the case to provide a tension fit for the flexible skirt or jacket.

2 An expandable travelling case according to statement 1, wherein the expanded case can be collapsed to a store-away configuration by moving the tensioner to a folded configuration, thereby slackening tension in the skirt or jacket.

3 An expandable travelling case according to statement 2, wherein the collapsed case further comprises the tensioner laying generally parallel with respect to the back panel.

4 An expandable travelling case according to any one of the preceding statements, wherein the tensioner in the expanded configuration is in generally out-of-plane relation with respect to the back panel.

5 An expandable travelling case according to any

one of the preceding statements, wherein the case comprises two tensioners located on opposite sides of the case.

6 An expandable travelling case according to statement 5, wherein the two tensioners are symmetrically positioned with respect to a median plane of the travelling case.

7 An expandable travelling case according to any one of the preceding statements, wherein the flexible skirt or jacket is made of a fabric material.

8 An expandable travelling case according to any one of the preceding statements, having a flexible jacket rather than a skirt, wherein the back panel comprises a rigid portion and the flexible jacket surrounds substantially all of the case, and is arranged for a tight fit on at least the rigid portion of the back panel.

9 An expandable travelling case according to any one of statements 1 to 7, wherein the flexible skirt or jacket is connected to an edge of the back panel.

10 An expandable travelling case according to any one of the above statements, the travelling case comprising a length, a width and a depth, and wherein the at least one tensioner is configured for expanding the depth of the case.

11 An expandable travelling case according to any one of the preceding statements, wherein the back panel has an internally concave shape in which one or more of the tensioners can be folded when the case is collapsed.

12 An expandable travelling case according to statement 1, wherein the back panel comprises one or more inner retention means, each retention means being configured for engagement with a tensioner.

13 An expandable travelling case according to statement 12, wherein the one or more retention means comprises one or more respective locking means.

14 An expandable travelling case according to statement 12 or 13, wherein each tensioner is configured for folding inwardly with respect to the back panel.

15 An expandable travelling case according to any one of the preceding statements, wherein the or each tensioner are located internally of an internal volume defined by the case.

16 An expandable travelling case according to any one of the preceding statements, wherein the flexible skirt or jacket is configured to fold on or over the back panel.

17 An expandable travelling case according to any one of the preceding statements, wherein the flexible skirt or jacket comprises fold lines.

18 An expandable case according to any one of the preceding statements, wherein the tensioning panel, once deployed into its tensioning condition, supports the flexible skirt or jacket at the sidewall of the case and defines the shape of that sidewall, save for any region thereof accomodating a wheel housing.

19 An expandable case according to any one of the preceding statements, wherein the or each tensioning panel, when in the tensioning condition, extends along a side of the case.

20 An expandable case according to statements 5, 10 and 19, each tensioning panel extending substantially over the length of the case in the expanded or unexpanded configurations of the case, and extending substantially over the depth of the case in the expanded configuration of the case.

21 An expandable case according to statement 20, two mating parts of a retention means being mounted thereon, one on the back panel and the other on one of the tensioning panels.

22 An expandable case according to any one of the preceding statements comprising a retention means for the tensioning panel, the retention means comprising a webbed strap and a cam buckle.

23 An expandable case according to statement 22, wherein said cam buckle is rigidly attached to said tensioning panel.

24 An expandable case according to statement 22, wherein said cam buckle is pivotally attached to said tensioning panel.

25 An expandable case according to any of statements 22 to 24, wherein said cam buckle is riveted to said tensioning panel.

26 An expandable case according to any one of the preceding statements wherein retention means for opposing tensioning panels are disposed symmetrically on opposite sides of said case.

27 An expandable case according to statement 26 when dependent on statement 22, wherein said webbed strap cooperates with a webbed strap of a further retention means on an opposite side of the case to provide a strap to restrain clothes stored in said case.

28 An expandable case according to any one of the preceding statements comprising two opposed reinforcement panels each extending across the width of the case on opposing sides thereof, other than the side or sides having the tensioning panel or panels, said reinforcement panels being deployable for expanding those additional sides and for providing side reinforcement for the case on those additional sides when the case is expanded.

29 An expandable case according to statement 28, wherein both reinforcement panels can be retracted or folded away when the case is collapsed to a store-away configuration.

30 An expandable case according to statement 28 or statement 29, wherein at least one of the reinforcement panels is able to be secured in its deployed configuration by the or each tensioning panel when the case is expanded.

31 An expandable case according to any one of the preceding statements, further comprising a top cover which can be operated by a user to open and access the inside of the case, or to close the case to prevent access thereto.

32 An expandable case according to statement 31, wherein the top cover is hingedly attached to the flexible skirt or jacket.

33 A cam buckle comprising:

a housing portion comprising first and second ends suitable for receiving a webbed strap; and a locking member pivotally attached to the housing portion above the first end, comprising:

a cam face disposed from the pivot point, the cam face controlling the height of an access slot formed at the first end; and
a lever arm extending substantially perpendicularly from said cam face, said lever arm being operable to rotate said locking member,

characterised in that the housing portion comprises a cross member above the second end, the cross member aiding in controlling the exit angle of the webbed strap.

34 A cam buckle according to statement 33, wherein the housing portion comprises a hole to allow attachment of said cam buckle to a surface.

35 An expandable case with displaceable, wall-tensioning, sidewalls, and having at least one cam buckle and webbing strap for securing the sidewalls in a case expanding configuration.

36 The expandable case according to statement 35, wherein the cam buckle is in accordance with statement 33 or statement 34.

37 The expandable case of statement 35, the case being in accordance with any one of statements 1 to 32.

38 The use of a webbed strap in an expandable case according to any one of statements 1 to 32 or 35 to 37, as both a tensioning panel retention means, and a clothes restraining means.

Claims

1. An expandable travelling case comprising:

a back panel;
a flexible skirt or jacket;
at least one tensioner connected to, or in contact with, said flexible skirt or jacket; and
one or more retention means for the tensioner or tensioners, the retention means comprising one or more of the following means: a buckle and clip, lip and catch, webbed strap and cam buckle, or a tie,
wherein the case can be expanded by moving the tensioner to an expansion configuration, the tensioner is a tensioning panel and when the case is in its expanded configuration the tensioner exerts a force on the flexible skirt or jacket in cooperation with the back panel of the case to provide a tension fit for the flexible skirt or jacket and the retention means retains the tensioner in the expansion configuration.

2. An expandable travelling case according to claim 1, wherein the expanded case can be collapsed to a store-away configuration by moving the tensioner to a folded configuration, thereby slackening tension in the skirt or jacket.

3. An expandable travelling case according to claim 2, wherein the collapsed case further comprises the tensioner laying generally parallel with respect to the back panel.

4. An expandable travelling case according to any one of the preceding claims, wherein the case comprises two tensioners located on opposite sides of the case.

5. An expandable travelling case according to any one of the above claims, the travelling case comprising a length, a width and a depth, and wherein the at least one tensioner is configured for expanding the

depth of the case.

6. An expandable travelling case according to any one of the preceding claims, wherein the back panel has an internally concave shape in which one or more of the tensioners can be folded when the case is collapsed.

7. An expandable travelling case according to any of the preceding claims, wherein the one or more retention means comprises one or more respective locking means.

8. An expandable travelling case according to any of the preceding claims, wherein each tensioner is configured for folding inwardly with respect to the back panel.

9. An expandable case according to any one of the preceding claims, wherein the or each tensioning panel, when in the tensioning condition, extends along a side of the case.

10. An expandable case according to any one of the preceding claims wherein retention means for opposing tensioning panels are disposed symmetrically on opposite sides of said case.

11. An expandable case according to claim 10, the retention means comprising a webbed strap and a cam buckle, wherein said webbed strap cooperates with a webbed strap of a further retention means on an opposite side of the case to provide a strap to restrain clothes stored in said case.

12. An expandable case according to any one of the preceding claims comprising two opposed reinforcement panels each extending across the width of the case on opposing sides thereof, other than the side or sides having the tensioning panel or panels, said reinforcement panels being deployable for expanding those additional sides and for providing side reinforcement for the case on those additional sides when the case is expanded.

13. An expandable case according to claim 12, wherein both reinforcement panels can be retracted or folded away when the case is collapsed to a store-away configuration.

14. An expandable case according to claim 12 or claim 13, wherein at least one of the reinforcement panels is able to be secured in its deployed configuration by the or each tensioning panel when the case is expanded.

15. An expandable case according to any of the preceding claims, the retention means comprising a webbed strap and a cam buckle, wherein the cam buckle comprises:

a housing portion comprising first and second ends suitable for receiving a webbed strap; and a locking member pivotally attached to the housing portion above the first end, comprising:

a cam face disposed from the pivot point, the cam face controlling the height of an access slot formed at the first end; and
a lever arm extending substantially perpendicularly from said cam face, said lever arm being operable to rotate said locking member,

characterised in that the housing portion comprises a cross member above the second end, the cross member aiding in controlling the exit angle of the webbed strap.

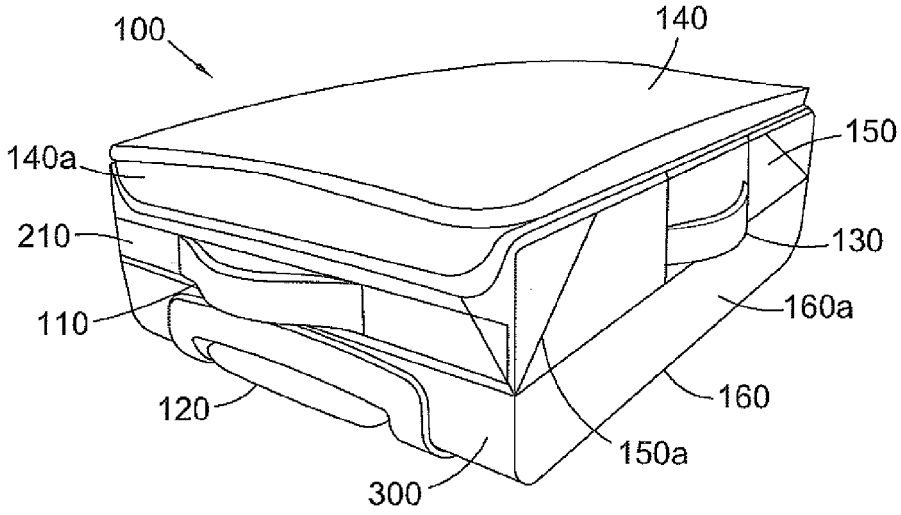
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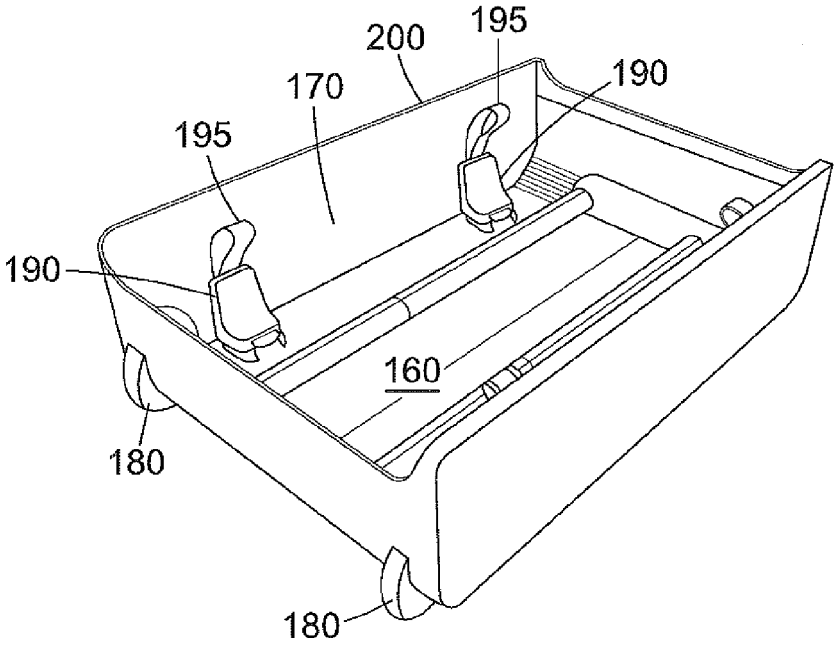
Fig. 1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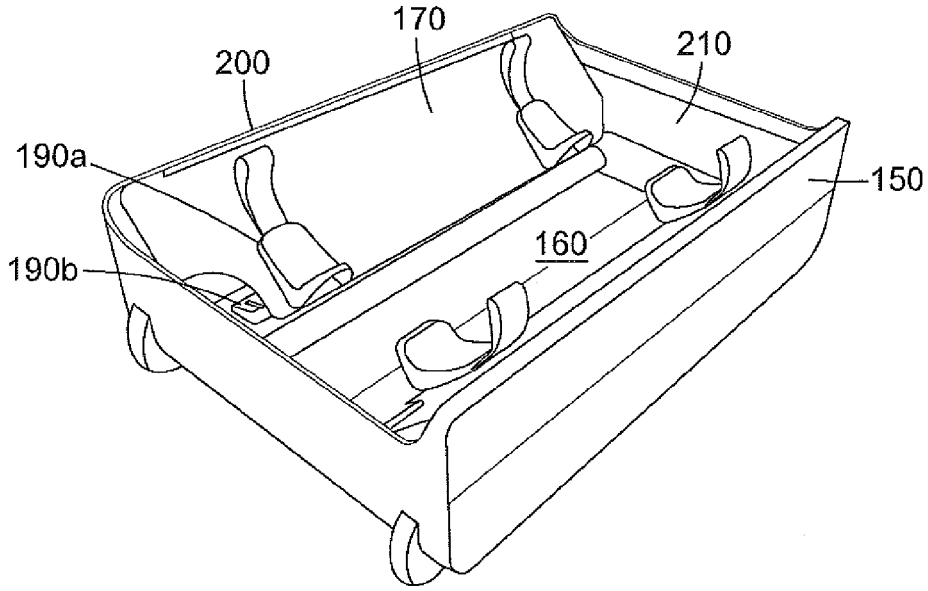

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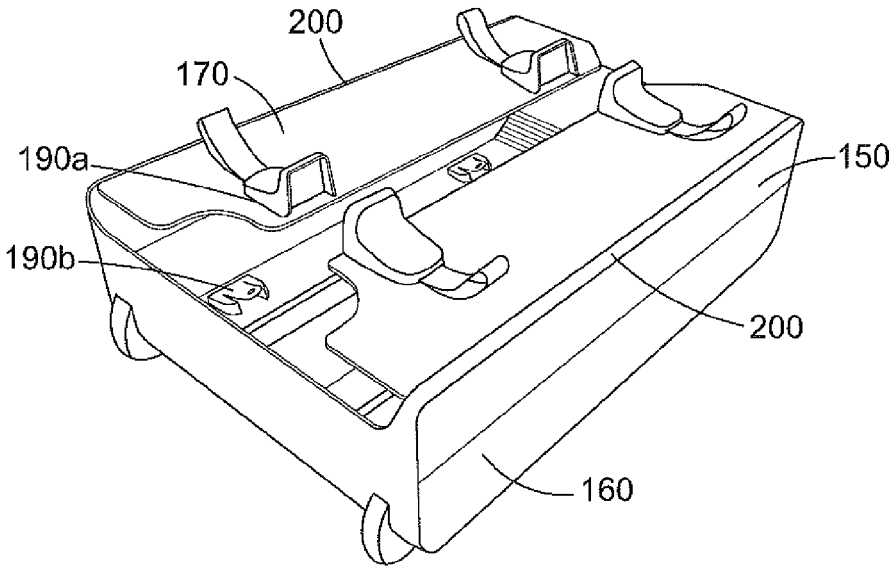

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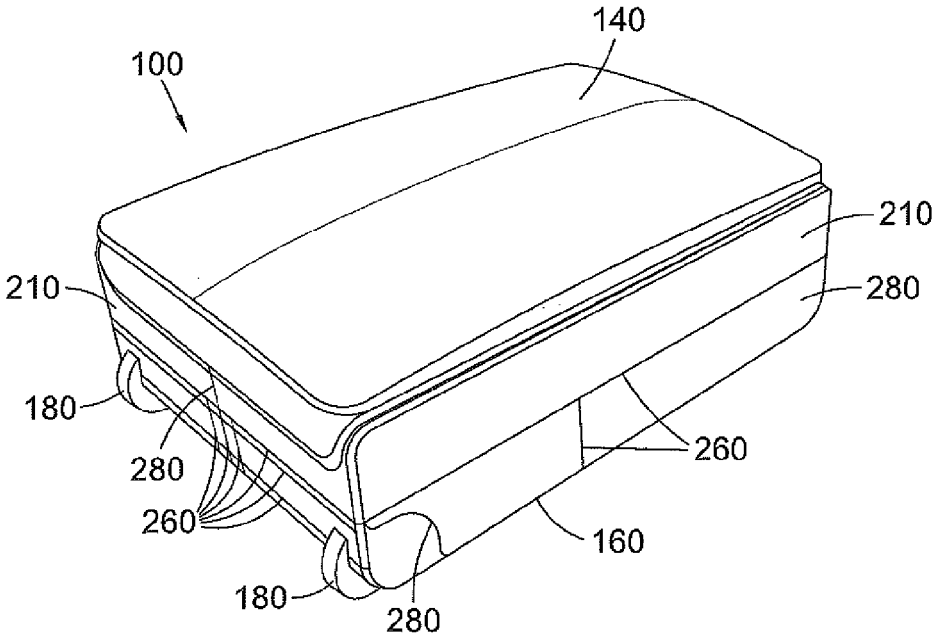
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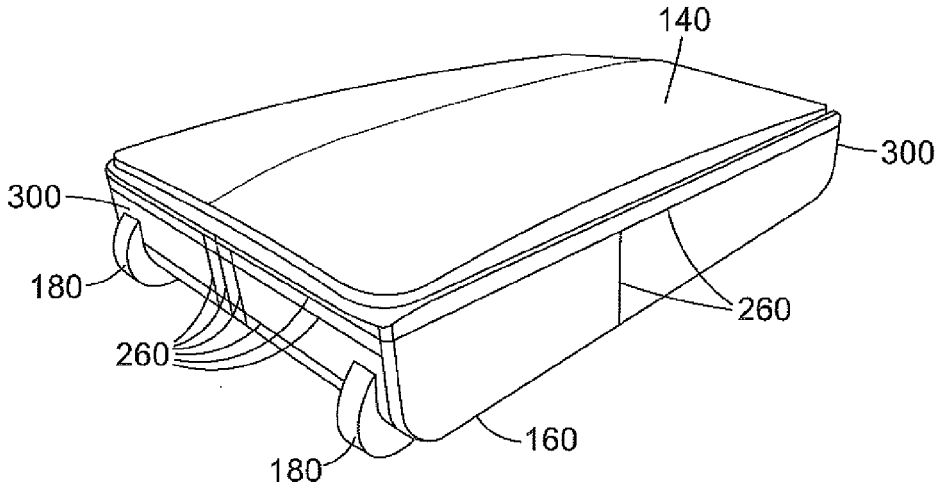
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Fig. 6

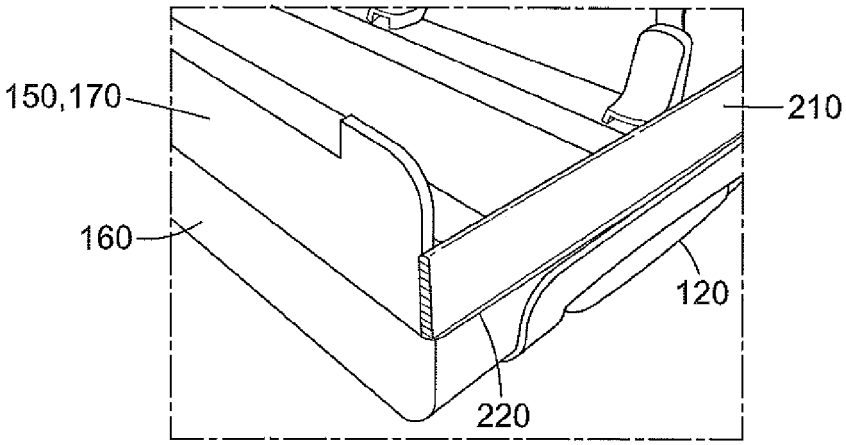

Fig. 7

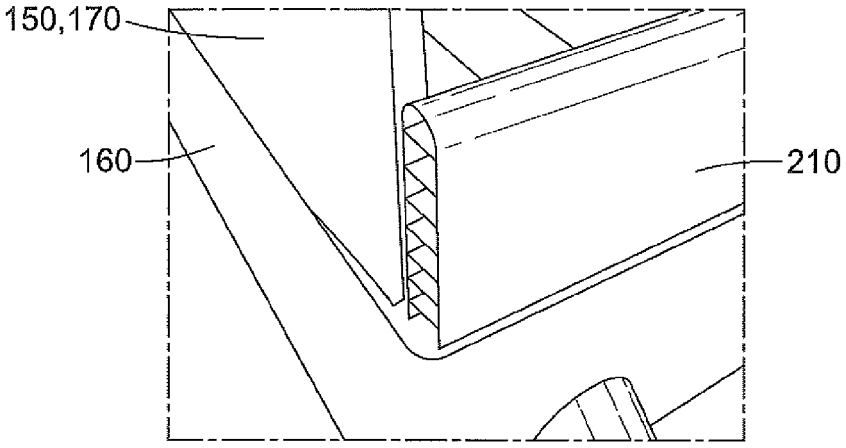

Fig. 8

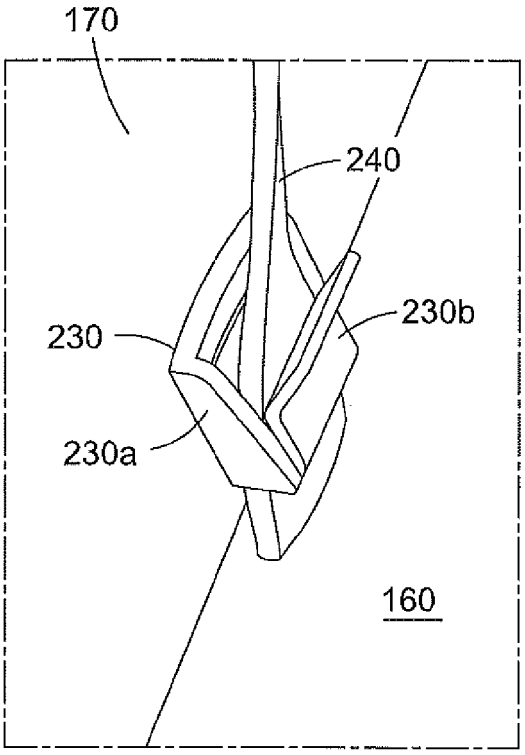

Fig. 9

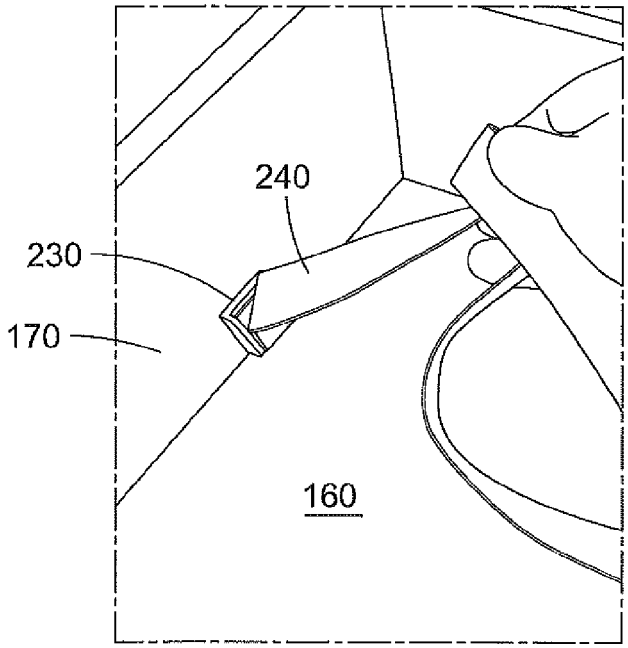

Fig. 10

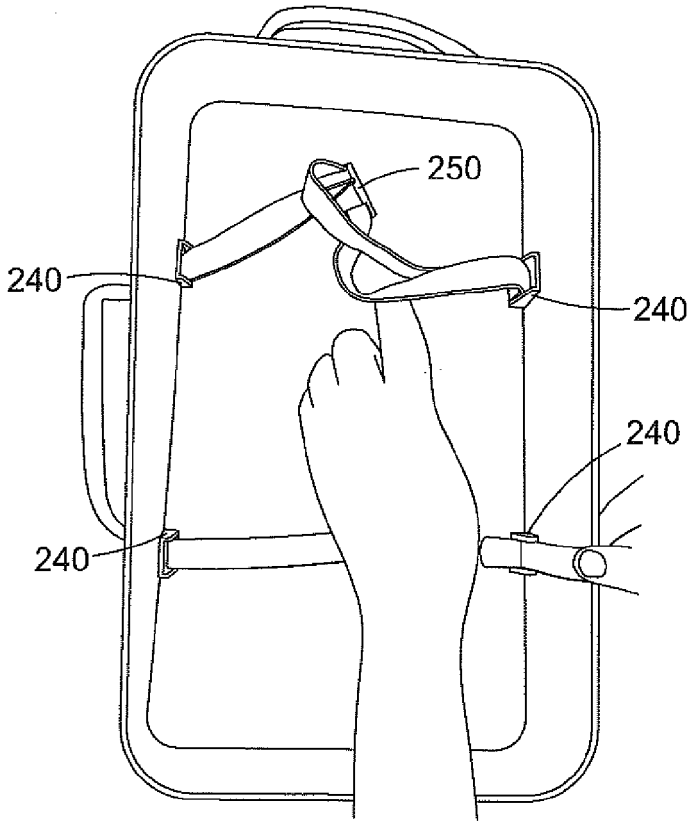

Fig. 11

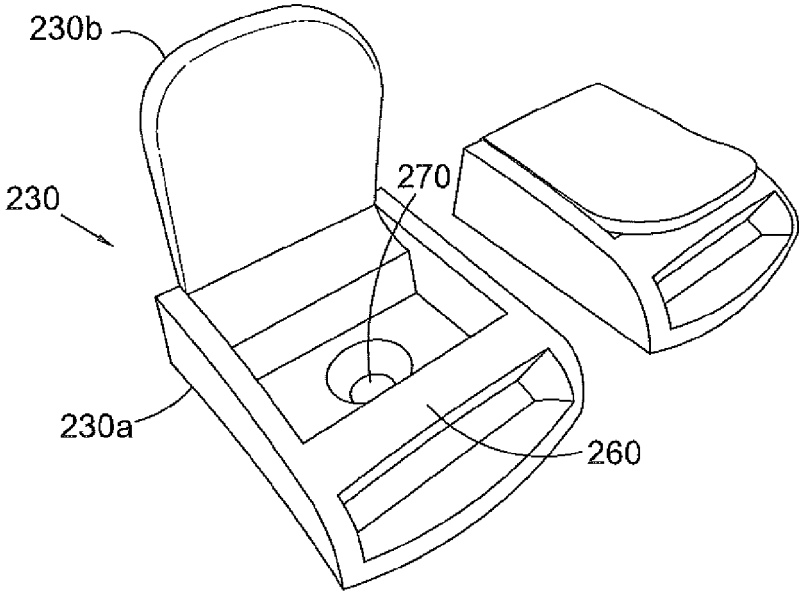

Fig. 12

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EUROPEAN SEARCH REPORT

Application Number
EP 13 16 3747

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	US 4 588 056 A (BERNBAUM L HARRISON [US]) 13 May 1986 (1986-05-13) * abstract * * figures *	1-5,7-10	
X	US 2002/084159 A1 (HAMLIN BRIAN [US]) 4 July 2002 (2002-07-04) * abstract * * figures *	1-5,7-10	
X	US 2010/282555 A1 (TSENG TZU-WEI [TW] ET AL) 11 November 2010 (2010-11-11) * abstract * * figures *	1-5,7-10	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	31 May 2013	Zetzsche, Brigitta

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 16 3747

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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