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(54) Trolley case

(57) The present invention relates to a luggage item, and more particularly to a trolley case (1) for carrying personal items during travel. The trolley case (1) of the invention comprises a frame (2); a flexible outer shell (3) which substantially covers the frame (2) to form a main body (4) of the case; roller means (11) attached to the main body and configured for rolling the case across a surface; and a handle mechanism (12) movable between a retracted position and an extended position for pulling the case on the roller means (11) when the handle mechanism (12) is in the extended position. In one aspect, the frame (2) comprises a plurality of elongate members (13) which are interconnected in an open framework that substantially defines a storage volume (V) within the main body (4) of the case. In another aspect, the case (1) further comprises an edge protector (32) having a guard member (33), that at least partially covers the outer shell (3) at an edge region of a base (8) of the case to protect the outer shell at the lower edge region, and at least one connector member (30, 35) that extends through the outer shell (3) for rigid attachment to the frame (2) of the case. The at least one connector member (30) of the edge protector (32) may be configured to receive and secure a lower end of an elongate support element (27) of the retractable handle mechanism (12) inside the outer shell (3).

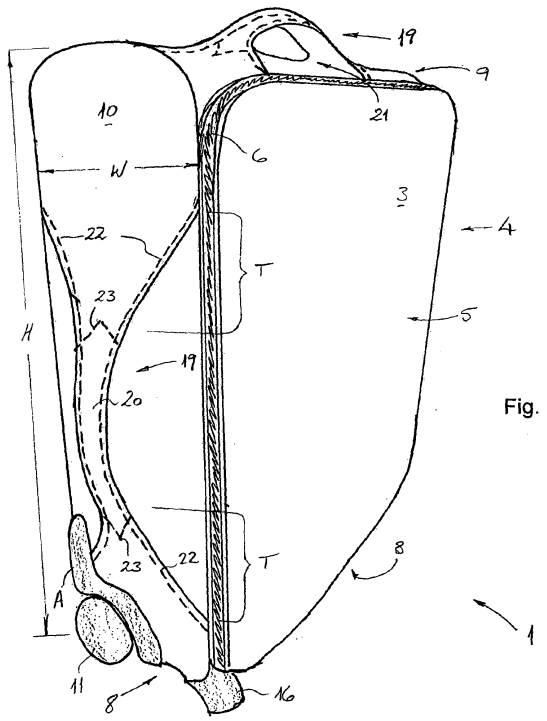

Fig. 1

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Description

Technical Field

[0001] The present invention relates to an item of luggage, and more particularly to a bag or case of the type typically employed for carrying personal items during travel.

[0002] The invention is especially applicable to a luggage bag or case that has wheels and an extendible or retractable handle with which the luggage may be manually drawn or pushed by a user. This type of luggage item is generally referred to as a trolley case or a trolley suitcase. Accordingly, it will be convenient to describe the invention in this particular context. It will be appreciated, however, that the various features of the present invention are not limited to application in trolley cases alone, but may find application in a variety of bags and cases.

Background of the Invention

[0003] In the course of the past of decade, trolley cases have become exceptionally popular with travellers because they can be relatively easily moved and manoeuvred on their wheels without the need for lifting. This is particularly advantageous for individuals, especially women, who are not physically capable of carrying heavy luggage items for any extended period of time. Furthermore, the simple convenience of the trolley cases — even for people who are physically capable of carrying their luggage — has been a major factor in their popularity and broad adoption. This has been reinforced by the fact that the basic trolley concept of providing the luggage with wheels and a retractable handle can be employed across a broad range of case sizes.

[0004] Because trolley cases typically include the structural elements of a retractable handle mechanism, the trolley cases are typically somewhat heavier for a given storage volume than cases without a retractable handle. Thus, it remains a constant challenge in luggage design to provide a trolley case which, for its size and volume, is especially light and yet sufficiently robust and stable in construction to withstand the rigours of handling experienced during its service life, e.g. during transport to, from, and within the baggage holds of aeroplanes. In this connection, a lower mass (or weight) per unit volume of the trolley case is also highly desirable because it enables a passenger to carry more in the case for the same final luggage mass. Aside from the convenience for the user in handling a lighter case, a lower case mass can also avoid or reduce the cost of excess luggage on flights.

[0005] It is therefore an object of the present invention to provide a trolley case having a new and improved configuration to provide an especially light-weight construction relative to its size and volume, without sacrificing strength and stability.

Summary of the Invention

[0006] Broadly, the present invention relates to an item of luggage, such as a bag or case, and particularly a trolley case, comprising: a frame; an outer shell that substantially covers the frame to form a main body of the case; roller means attached to the main body and configured for rolling the case over a surface; and a retractable handle mechanism attached to the main body and movable between a retracted position and an extended position for pulling the case on the roller means when the handle mechanism is in the extended position.

[0007] According to a first aspect of the invention, the case frame comprises a plurality of elongate members which are interconnected in an open framework that substantially defines a storage volume of the main body. Desirably, the elongate frame members are formed of a fibre-reinforced composite material, such as a glass-fibre or carbon-fibre composite, which provides relatively high-strength and low weight. In this way, the elongate frame members can be formed with relatively small dimensions, e.g. as rods or struts having diameters in the range of about 4 mm to 10 mm, preferably in the range of about 5 mm to 8 mm, and yet still produce a structurally stable and robust supporting framework for the case. The elongate frame members may, for example, have a circular cross-section, but other geometries (e.g. rectangular) are also contemplated. Thus, the frame members (e.g. rods or struts) may have a cross-sectional area in the range of about 10 mm^2 to 50 mm^2, and more preferably in the range of about 20 mm^2 to 30 mm^2. Preferably, each of the elongate frame members extends along or defines a respective edge of a generally prismatic open framework of the case. The frame members may be interconnected with one another within the open framework via a number of joint members, with each of the joint members preferably comprising one or more sockets for respectively receiving an end of one of the frame members. Thus, for example, the joint members may be provided to interconnect the frame members at vertices or corner regions of the framework, e.g. usually at right angles. In this way, the open framework or "space frame" creates a lightweight, yet robustly inter-connected structure that provides the case with strength and durability while keeping the overall mass of the case low. This design has led to a significant weight-saving for the case in the vicinity of 100 g to 200 g. Because most trolley cases are designed to have a generally prismatic (e.g. rectangular prismatic) shape, the open framework of elongate frame members is typically constructed to have a generally prismatic form that essentially delimits or defines a basic storage volume within the main body of the case. As understood by practitioners in this field, if the case includes an expandable gusset or panel (e.g. in the outer shell) for extending the storage volume of the case, then the case may have a total potential storage volume that substantially exceeds the volume defined or enclosed by the framework.

[0008] For the purposes of explanation, it will be noted

that the trolley case according to the invention may be configured to stand in a generally upright orientation, such that the handle mechanism is movable in a substantially vertical direction between the retracted position and the extended position. As will be understood by an ordinary practitioner, when the case has a generally rectangular prismatic shape, it may be considered to have six walls, which in the upright orientation, include: a front wall, which may also be constructed as a closable lid or "door" of the case through which the storage volume of the main body is accessed, a rear wall opposite the front wall, a lower wall or base at which the roller means are provided, a top wall spaced from the lower wall by an overall height dimension of the main body of the case, and a pair of laterally opposite side walls. The top and base walls and the side walls also extend between the front and rear walls of the case.

[0009] According to a second aspect of the invention, the trolley case comprises an edge protector that at least partially covers the outer shell at an edge region of the base of the case. The edge protector comprises an external guard member, which may be formed as a substantially rigid body moulding, to protect the outer shell of the case at the lower edge region, where the case is particularly vulnerable to damage caused by inadvertent collision with obstacles, such as steps, curbs or stones, during rolled movement. The edge protector further includes at least one connector member that extends through the outer shell for rigid attachment to the frame of the case, and in particular to one of the elongate frame members. In one embodiment, the at least one connector member comprises one or more lug or bushing for direct fastening to one of the frame members, e.g. via a screw fastener. In a further advantageous embodiment, the at least one connector member may be configured to receive and secure an end of one or more elongate support element of the retractable handle mechanism inside the outer shell of the case. In this way, the edge protector can be designed to perform multiple functions, including protecting the lower edge of the case, rigidly securing the outer shell to the frame at the base, and securing the lower end of one or more elongate support element of the retractable handle mechanism to the frame. As a result, the inventors have developed a configuration that avoids the need for a previously required component for anchoring an ends of the support element(s) of the retractable handle mechanism. This, in turn, has led to a further significant weight-saving in the vicinity of 50 g to 100 g for the case.

[0010] Thus, according to this second aspect, the invention may provide a case having: a frame; a flexible outer shell that substantially covers the frame to form a main body of the case defining a storage volume; roller means provided on the main body for rolling the case across a surface; a handle mechanism provided on the main body for pulling the case on the roller means; and an edge protector, with the edge protector including an external guard member, which at least partially covers the outer shell at an edge region of a base of the case to protect the outer shell at said lower edge region, and at least one connector member that extends through the outer shell for attachment to the frame of the case and/or to the handle mechanism.

[0011] In a preferred form of the invention, the handle mechanism includes a hand-grip that is movable between a retracted position and an extended position, and at least one elongate support element which is configured to support the handle mechanism within the main body of the case and to guide the hand-grip between the retracted position and the extended position. The case is configured to stand in a generally upright orientation, such that the handle mechanism is movable in a substantially vertical direction between the retracted position and the extended position, the handle mechanism being designed for pulling the case when the hand-grip is in the extended position. The at least one support element preferably extends adjacent and substantially parallel to a rear wall of the case and is connected with the frame such that it forms an elongate strut to reinforce the frame. The at least one support element may be formed as a channel member or tubular member so that an axially hollow shape of each support element is configured to guide the movement of the hand-grip (e.g. vertically) between the retracted and the extended positions. The hand-grip itself may be provided on an elongate element that cooperates telescopically with the respective support element. In an advantageous embodiment, the handle mechanism includes two elongate support elements that extend in parallel and are spaced apart from one another adjacent the rear wall of the case.

[0012] In a preferred form of the invention, the roller means includes at least two wheels, with each provided in a respective wheel housing arranged at or adjacent the base of the case. That is, the wheels are preferably arranged with their rotational axes extending adjacent and parallel to an edge region of the base. Each of the wheel housings may have a deflector member in the form of an elongate protrusion which, when the case is in the upright orientation, extends substantially vertically and projects to the rear side of the case for deflecting any inadvertent contact with obstacles while a user manoeuvres the case on the wheels. The handle mechanism is typically provided at or adjacent a rear wall of the case, which may also correspond to the edge region of the base at which the wheels are located. In one embodiment of the invention, the wheels may be provided at laterally opposite sides of the main body of the case, where the wheel housings are typically open to the lateral sides of the case. In such an embodiment, each of the wheels is mounted on an end of a respective axle which is supported at only one side of the wheel (inwardly) along the rotational axis. In an alternative embodiment, however, the wheels may be provided spaced inwardly or set in from laterally opposite sides of the main body of the case, e.g. by a distance in the range of about 50 mm to about 100 mm. In such an embodiment, the wheels and the

wheel housings may be largely invisible from the sides of the case and each wheel is desirably mounted on a respective axle that is supported at both sides of the wheel along the rotational axis. As a result, the wheels are far less susceptible to splaying or deformation under excessive loads.

[0013] According to a third aspect of the invention, the main body of the case comprises at least one carry-handle for carrying and/or lifting the case, wherein the carry-handle is formed from the outer shell of the case. Thus, according to this third aspect, the invention provides a case comprising: a frame; a flexible outer shell that substantially covers the frame to form a main body of the case defining a storage volume; roller means provided on the main body for rolling the case across a surface; and at least one carry-handle for carrying and/or lifting the case by hand, the at least one carry-handle being formed from the flexible outer shell of the case. Although the at least one carry-handle may also be used for pulling the case on the roller means, the case preferably comprises a retractable handle mechanism for this purpose. Preferably, the at least one carry-handle comprises a web of flexible material that is integral with the outer shell and which separates from a respective wall of the case to enable a user's hand to grasp between the wall of the case and the web. That is, a section of the material which constitutes the flexible outer shell is shaped to form the web of the carry-handle. The web of the carry-handle preferably has a substantially constant width and is desirably formed by tapering the section of material of the outer shell, e.g. in a substantially constant taper, from a width of the respective wall of the case to the predetermined width of the web. The web of material may follow a relatively flat arc or curve where it separates from the wall of the case, to provide a low profile carry-handle.

[0014] By forming the carry-handle from the flexible outer shell of the case itself, it becomes possible to omit another component of conventional cases, namely, a moulded e.g. plastic carry-handle, which is typically fastened to the outer shell and/or to the frame of the case, thereby making a further significant weight saving without any loss of functionality. At the same time, the visual continuity achieved by a carry-handle that optically blends into the wall of the case creates an aesthetically enhanced end-product for the user, and because the material of the outer shell is typically a flexible and yieldable textile, the carry-handle also sits comfortably in the hand. In a preferred embodiment, the carry-handle includes a reinforcing member, e.g. in the form of an insert, which may be enclosed or encased in the flexible web of material to provide the carry-handle with greater stability and strength.

[0015] According to a fourth aspect of the invention, the trolley case is provided with a reinforcing panel which extends over at least one wall of the case. The reinforcing panel is a laminated structure formed from at least two polymer plastic films, which are laminated together to define a plurality of closed cells. The closed cells of the panel may be formed as an array of individual projections or ribs, and are preferably substantially uniform in size and substantially uniformly distributed over the surface of the panel. The closed cells serve to significantly increase the stiffness and rigidity of the panel, and hence the reinforcing effect, for a given mass per unit area. The projections or ribs may, for example, project out of the plane of the panel towards the storage volume of the case. By carefully selecting the design of the reinforcing panel, further significant weight-savings, e.g. in the vicinity of 200 g and more, can be achieved in the case compared with comparable conventional case designs.

[0016] In one form of the invention, the reinforcing panel may extend across or cover just one wall of the case. For example, the reinforcing panel is desirably provided to reinforce or stiffen at least the rear wall of the case. More preferably, however, the panel is arranged to extend across at least two, and very preferably, across three adjacent walls of the case, i.e. continuously. Thus, the reinforcing panel may extend across the rear wall of the case, as well as both the top and base walls of the case. A single panel that also extends to cover the lateral side walls of the case may also be contemplated, but because additional stability is generally not required in the side walls, the resulting additional weight may not be justified in this embodiment.

[0017] In a preferred form of the invention, the reinforcing panel has one or more openings or cut-outs through the plane of the panel, said openings or cut-outs encompassing an area in the range of about 10% to 60%, and more preferably in the range of about 20% to 40%, of the surface area of the wall of the casing over which the reinforcing panel extends. In this way, the panel may still provide high stiffness or rigidity across a particular wall of the case, and yet reduce still further the mass per unit area.

[0018] The reinforcing panel may be fastened to at least some of the elongate members of the frame along a longitudinal extent of those members. In this connection, fastening means can be provided for fastening the reinforcing panel to the elongate frame members, either at a number of discrete positions along the length of the frame members or along a length of the frame members. Preferably, the fastening means are configured for fastening the reinforcing panel to the plurality of frame members by hand and without the use of tools.

[0019] In a preferred form of the invention, the fastening means are configured to connect the elongate frame members and the reinforcing panel with the outer shell. The fastening means preferably include a plurality of flexible elements, such as straps or flaps, which are configured to be folded or wrapped around the frame members. The fastening means preferably also include engagement elements designed for fastening engagement with complementary parts of the flexible elements. In this regard, for example, fastening means may includes clips, studs or hook-and-loop (e.g. Velcro) type fasteners, the latter being particularly desirable for their versatility, flex-

ibility, and low weight. Desirably, either the flexible elements or the engagement elements are non-releasably anchored to the reinforcing panel.

[0020] By employing various aspects of the present invention, the Applicant has been able to produce trolley cases in a range of sizes which have an overall mass that is significantly lower than competitor products of a corresponding size and quality. The trolley cases are typically offered in three sizes; namely, small (S), medium (M), and large (L), with the small cases having a body height of about 55 $\pm$ 2 cm and a volume (without use of an expansion panel) of about 35 litres; the medium cases having a body height of about 64 $\pm$ 2 cm and a volume of about 60 litres; and the large cases having a height of about 72 $\pm$ 2 cm and a volume of about 90 litres. The weight advantage achieved by the Applicant with the present invention compared to competitor products varies depending on the case size and the particular brand of the competitor. Nevertheless, the advantage is typically at least about 0.5 kg and can in some models be as much as almost 1 kg. Thus, the difference is so substantial that the user can readily feel it in the end-product. In this regard, it will be noted that the competitor products that are also specifically designed for low weight. For example, whereas competitor trolley cases in the M size category generally have a mass of approx. 3.0 kg, the Applicant has been able to produce a trolley case of corresponding size, strength, stability and finish having a mass of only 2.5 kg. Similarly, whereas competitor trolley cases in the L size category generally have a mass of approx. 3.6 kg, the Applicant has been able to produce a trolley case of corresponding size, strength, stability and finish having a mass of only 2.9 kg. Clearly, where a manufacturer can achieve such a significant improvement compared to conventional cases without compromising build quality, performance, or durability of the case, a major market advantage results.

[0021] It will be appreciated that the terms "front", "rear", "lateral", "top", "lower", and "side", as well as other similar terms used herein in respect of various parts of the case of the invention are intended to be given their ordinary meaning in view of the normal or in-use orientation of the case described herein. It will also be appreciated, however, that other interpretations of these terms may be appropriate depending on the particular orientation of the case at the time.

Brief Description of the Drawings

[0022] The above and further features and advantages of the invention will become more readily apparent from the following detailed description of preferred embodiments of the invention with reference to the accompanying drawings, in which like reference characters identify like features, and in which:

Fig. 1 is a sketch which shows a perspective view of a trolley case according to an embodiment of the invention in an upright orientation;

Fig. 2 is a sketch which shows a top view of the trolley case illustrated in Fig.1;

Fig. 3 shows a perspective view of the frame structure of a trolley case according to an embodiment of the invention in an upright orientation;

Figs. 4a to 4d respectively show a perspective view, a side view, a facing view, and a top view (in direction of arrows "4d" in Fig. 4a) of an edge protector for a trolley case according to an embodiment of the invention; and

Figs. 5a and 5b respectively show details of the frame of the trolley case according to an embodiment of the invention, and in particular, at the base of the case.

Detailed Description of the Preferred Embodiments

[0023] With reference firstly to Figs. 1 and 2 of the drawings, a trolley case 1 according to a preferred embodiment of the invention is schematically illustrated in perspective and top views, respectively. The trolley case 1 has an internal frame 2 (visible in Fig. 3) and an outer shell 3 formed from a durable fabric or textile material which covers the frame 2 to form a main body 4 enclosing a main storage volume V of the case. The main body of the case 1 has a generally rectangular prismatic shape essentially comprising six walls, namely a front wall 5, which in this embodiment is constructed as a hinged lid or "door" of the case and is open able via a closure device 6 (e.g. zip) to access the main storage volume V of the case, a rear wall 7 opposite the front wall, a lower wall or base 8 upon which the case stands in an up-right orientation, a top wall 9 which is spaced from the lower wall by an overall height dimension H of the main body 4 of the case, and a pair of laterally opposite side walls 10. As will be appreciated, the front wall 5 may optionally include an expansion gusset or panel as is known in the art for selectively expanding the storage volume of the case.

[0024] As is typical, the trolley case 1 includes roller means 11 in the form of wheels, each of which is configured for rolling the case 1 over a surface, and a retractable handle mechanism 12 which is attached to the main body 4 and is movable between a retracted position (i.e. as shown in Fig.2) and an extended position (i.e. as shown in Fig. 3). Each of the wheels 11 is mounted within a respective wheel housing A incorporated within the fame 2 at opposite sides of the case 1 and at an edge region of the base 8 of the main body 4. The wheel housings A open to the lateral sides 10 of the case such that the wheels 11 are visible from the sides of the main body 4, and each of the wheels 11 is mounted on a respective axle that extends to and is supported on only one side

of the wheel 11 along the rotational axis. As noted previously, however, the wheel housings may alternatively be set in from the lateral sides 10 of the main body 4 of the case, such that the wheels 11 are no longer visible at the sides of the case. In such an alternative, each of the wheels 11 is desirably mounted on an axle that extends to and is supported on both sides of that wheel 11 along the rotational axis. As is apparent from Fig. 1 and Fig. 3, the trolley case 1 of this embodiment is designed to stand in a generally upright orientation such that the handle mechanism 12 is movable in a substantially vertical direction between the retracted and extended positions. The handle mechanism 12, of course, is for use in pulling the case 1 on the wheels 11 when it is in the extended position.

[0025] With further reference now to Fig. 3 of the drawings, the internal frame 2 of the trolley case 1 has been illustrated by omitting the flexible outer shell 3 and any internal lining or reinforcing panels (to be described later) so that structural members of the frame 2 and the handle mechanism 12 can be clearly seen. Thus, it can be seen that, below the flexible outer shell 3, the trolley case 1 has a frame 2 that comprises a plurality of elongate members 13 in the form of rods and/or struts which are interconnected in an open framework to provide a supporting structure that substantially defines a storage volume V within the main body of the case. For the most part, the elongate frame members 13 in this embodiment comprise circular rods 13a formed of fibre-glass and having a diameter of about 6 mm. Adjacent the rear wall 7 of the trolley case, however, the frame 2 also carries the handle mechanism 12. Accordingly, the frame members 13 in this region are provided as flat struts 13b having a rectangular cross-section better suited to attachment of the handle mechanism 12. The rods or struts 13 are arranged so that they extend along respective edges of the generally prismatic open framework and are interconnected with one another via joint members 14 at respective vertices or corner regions of the frame 2. The joint members 14 in this embodiment are radius elements which interconnect the rods or struts 13 along three axes via sockets 15 for respectively receiving an end of one the rods or struts 13 forming the frame 2. The ends of the rods or struts 13 may, for example, be adhesively bonded within the sockets 15 of the joint members 14, or they may be held or clamped by a fastener, e.g. a screw. Referring briefly to Figs. 5a and 5b of the drawings, details of the frame 2 at a front edge of the base are illustrated, where the interconnection of the circular rods 13a via a joint member 14 is clearly shown. Further, the manner in which a footing 16 (upon which the trolley case 1 stands in the upright orientation of Fig. 1) is attached to a flange of the joint member 14 is also illustrated. The footing 16 includes lugs or bushings 17 for receiving a fastener (e.g. screw) and are positioned to align with corresponding holes provided in a flange plate P and/or washer provided on the joint member 14. A portion of a reinforcing panel 18 is also shown in Fig. 5a, as will be described in more detail later.

[0026] Returning to Figs. 1 and 2 of the drawings, it can be seen that the main body 4 of the case 1 incorporates two carry-handles 19 for lifting and/or carrying the case, one of which is provided centrally at the top wall 9 and the other of which is provided centrally at one of the side walls 10. The provision of two carry-handles 19 enables the trolley case 1 to be carried in two different orientations. In this regard, it will be noted that the retractable handle mechanism 12 is typically not well-suited to lifting or carrying the trolley case 1. In the retracted position, for example, the handle mechanism 12 does not afford the user with a good grasp of the case, while in the extended position the handle mechanism 12 is also unduly cumbersome for lifting or carrying the case. The off-centre positioning of the retractable handle mechanism 12 also makes it unsuitable for comfortably lifting or carrying the case. A significant feature of the carry-handles 19 is that they are formed from the flexible outer shell 3 of the case itself. Accordingly, no additional inventory of components is needed for these parts, nor is any additional fastening mechanism needed to ensure robust and durable connection to the frame 2. Rather, each carry-handle 19 comprises a web 20 of flexible material that is integral and continuous with the outer shell 3, but which separates from the respective wall 9, 10 of the case to provide a gap 21 that enables a user to insert a hand between the wall 9, 10 of the case and the web 20, thereby allowing the user to grasp the carry-handle 19 reliably. In this regard, the web 20 of material preferably follows a flat arc or curve such that it has a relatively low-profile at the top wall 9 or side wall 10 of the case. The web 20 of material forming the carry-handle 19 has a substantially constant width and results from tapering a section of the material of the outer shell 3 in a region of taper T from a width W of the respective wall 9, 10 to a predetermined width at the position where the web 20 separates from the wall to form the gap 21. These taper regions T include lines of stitching 22 which securely bind the section of flexible outer shell material to the respective wall 9 of the case body. Further, an angled line (e.g. chevron) of stitching 23 is provided for additional stability to reinforce the connection of the carry-handle 19 with the respective wall 9, 10 in the region at which the web 20 of material separates from the wall. The web 20 that forms the carry-handle 19 desirably includes a reinforcing element or strip, around which that web of material may be folded and stitched for a stronger and more durable performance.

[0027] Focussing now on the retractable handle mechanism 12 of the trolley case 1 shown in Figs. 2 and 3, it will be noted that the handle mechanism 12 has a hand-grip 24 which, in the retracted position, is recessed within a handle housing 25 at an edge region of the top wall 9 adjacent the rear wall 7. As is clearer from Fig. 3, the handle mechanism 12 is arranged adjacent and parallel to the rear wall 7 of the case, with the hand-grip 24 able to be extended vertically to a convenient, ergonomic po-

sition for a user to tilt the case 1 from the footings 16 onto the wheels 11 and to roll the case over the floor surface. In this embodiment, the hand-grip 24 is shown in Fig. 3 mounted between the upper ends of two parallel, extended telescopic columns 26. The two lower-most portions of the telescopic columns 26 comprise tubular support elements 27, which are rigidly fixed to the frame 2 between the handle housing 25 and base 8, and which guide the movement of the hand-grip 24 (together with upper portions 28 of the telescopic columns 26) between the retracted position and the extended position. Thus, not only do the support elements 27 cooperate telescopically with the upper portions 28 of the handle columns 26 and guide movement of the hand-grip 24 during extension and retraction of the handle mechanism 12, but they also enhance the structural integrity of the suitcase frame 2.

[0028] A particular aspect of the present invention resides in the manner in which the lower ends of the two support elements 27 of the handle mechanism 12 are configured to be fastened to the frame 2 of the trolley case 1. As is apparent from Fig. 3, for example, one means for achieving this is via an internal mounting bracket 29, which may be formed (e.g. moulded) from a polymer plastic material, such as HDPE, PU or the like. The bracket member 29 has two cup- or socket-like connector members 30 which are spaced apart and designed to receive and hold a respective end of one of the support elements or tubes 27. That is, the connecter members 30 have recesses or cavities 31 into which the lower ends of the support tubes 27 can be inserted and securely fastened. Furthermore, the mounting bracket 29 in Fig. 3 is provided with connector elements, like clips or screw fasteners, for securely attaching the bracket 29 to the strut 13b of the framework extending between the wheels 11 of the case.

[0029] With reference to Figs. 4a to 4d of the drawings, this embodiment of the invention provides a significant departure from the internal mounting bracket 29 in Fig. 3. In this embodiment, the component for securing the lower ends of the support elements 27 of the handle mechanism 12 is provided in the form of an edge protector 32. The edge protector 32 comprises an external guard member 33 — here essentially in the form of a slotted or ribbed plate — which has a curved profile to match the curvature at an outer edge region of the case 1 where the lower wall or base 8 joins the rear wall 7. In this way, the guard plate 33 is designed to cover the flexible outer shell 3 of the case body 4 at the lower edge region between the wheels 11 of the trolley to protect the fabric of the outer shell from damage (e.g. scuffing and abrasion) that might otherwise be caused by inadvertent contact or collision with obstacles (e.g. curbs, steps, stones and the like) during wheeled movement of the case. The guard plate 33 has a breadth B which preferably covers at least about two thirds of the spacing between the wheels 11 of the case (e.g. B = approx. 200 mm), a height h on the rear wall 7 of the case in the range of about 50 mm to 80 mm (e.g. h = 65 mm), and a depth d at the base wall 8 in the range of about 50 mm to 80 mm, e.g. like h.

[0030] Further, the edge protector 32 includes connector members which configured are to extend through the outer shell 3 for rigid attachment with the internal frame 2 and for securing the lower ends of the support elements 27 of the handle mechanism 12. In this regard, the edge protector 32 includes two cup- or socket-like connector members 30 which project inwardly (e.g. radially) from the curved guard plate 33 and essentially correspond to the connector members 30 described for the bracket member 29 in the sense that they have recesses or cavities 31 into which the lower ends of the tubular support elements 27 are inserted and fastened. These cup- or socket-like connector members 30 are spaced apart by a distance S corresponding to the spacing of the parallel extending support elements 27 of the handle mechanism (e.g. S = approx. 135 mm) and may, for example, include a threaded hole 34 formed in a side thereof for receiving e.g. a retaining screw to hold the end of the respective tubular support element 27 in place. In addition, the edge protector 32 includes connector means 35 in the form of lugs or bushings which project inwardly towards the inside of the case (e.g. in a radial direction) from the curved guard plate 33 and extend through the outer shell 3 for rigid attachment with the internal frame 2. In particular, at least one lug 35a projects from a central region of the guard plate 33 and passes through the outer shell 3 (e.g. via an appropriately located hole or perforation) to be rigidly attached or fastened with the lower strut 13b. This attachment is typically achieved by a screw fastener, which may be screwed into an axial hollow of the lug. Also, two or more bushings 35b may be provided projecting inwardly across an upper edge region on the front wall side of the guard plate 33. Like the lug 35a, the bushings 35b extend through the outer shell for attachment (e.g. again by screws) to a reinforcing panel (not shown in Fig. 2) provided inside the rear wall 7 of the case body 4 and optionally also for attachment to an additional frame member or strut (not shown) which may be additionally provided extending between the wheel housings A to reinforce the frame 2 adjacent the base 8. Square holes 36 formed in the guard plate 33 along an edge region on the base side are also provided for interconnecting the edge protector 32 with the outer shell 3 and the internal reinforcing panel, e.g. by rivets or the like.

[0031] As noted above, the trolley case 1 may be provided with a reinforcing panel inside the outer shell 3. The reinforcing panel desirably extends over at least the rear wall 7 of the case, and preferably also over the top and lower walls 8, 9. It may also extend over the side walls 10, as alluded to by the portion of reinforcing panel 18 shown in Fig. 5a, which is connected via a plastic stud with a flange element that extends between the sockets 15 of the joint member 14. As such, the various connector members 30, 35 of the edge protector 32 may be configured to extend through the reinforcing panel for interconnecting and integrating the panel with the outer shell 3

and the frame 2 in a stable and robust structure.

[0032] The reinforcing panel preferably has a laminated structure formed from at least two plastic films laminated together to define a plurality of closed cells therebetween. The closed cells are formed as a substantially uniform array of discrete projections or ribs. The reinforcing panel is desirably arranged in the trolley case 1 such that the projections or ribs project out of the main plane of the panel inwardly towards the storage volume V of the main body 4 of the case. In this way the projections or ribs are not felt when a hand is placed on the external textile surface of the outer shell 3. That is, the outwardly facing surface of the reinforcing panel is desirably smooth. The reinforcing panel may be connected to the elongate frame members 13 via a plurality of fastening straps or flaps. For example, a plurality of straps or flaps may be attached to the inside of the outer shell 3 and configured to be folded or wrapped around the frame members 13 for fastening engagement with engagement elements anchored to the reinforcing panel.

[0033] It will be appreciated that the above description of the preferred embodiments of the invention with reference to the drawings has been made by way of example only. A person skilled in the art will therefore appreciate that various changes, modifications and/or additions may be made to the parts particularly described and illustrated without departing from the scope of the invention as defined in the claims.

[0034] For example, with regard to the wheels 11 of the trolley case 1, the ordinary skilled practitioner will appreciate that, in an alternative embodiment, the trolley case 1 of the invention could have wheels in an entirely different configuration. That is, an underside of the base 8 of the main body 4 could be provided with e.g. four wheels externally mounted through the outer shell 3 (i.e. similar to, and replacing the footings 16) at four corner regions of the lower wall 8. Furthermore, although the frame 2 of the case 1 shown in the drawings includes six elongate members 13 provided along the respective edges of the rectangular prismatic main body 4, it will be understood that, in alternative embodiments, the frame 2 could have additional or even fewer frame members 13. For example, as alluded to above, for enhanced stability of the case structure it may be desirable to have a further elongate frame member 13 extending parallel to, and spaced from, the lower strut 13b — e.g. between wheel housings A.

Claims

1. Trolley case (1) comprising:

a frame (2);
a flexible outer shell (3) which substantially covers the frame (2) to form a main body (4) of the case;
roller means (11) attached to the main body (4) and configured for rolling the case across a surface; and
a handle mechanism (12) movable between a retracted position and an extended position for pulling the case on the roller means (11) when the handle mechanism (12) is in the extended position;
wherein the frame (2) comprises a plurality of elongate members (13) which are interconnected in an open framework that substantially defines a storage volume (V) within the main body (4) of the case.

2. Trolley case (1) according to claim 1, wherein each of the elongate frame members (13) defines an edge of a generally prismatic open framework, and wherein each of the frame members (13) comprises a rod or strut formed of a fibre-reinforced composite material having a diameter in the range of about 5 mm to 8 mm.

3. Trolley case (1) according to claim 2, wherein the elongate frame members (13) are interconnected with one another within the open framework via a number of joint members (14), with each of the joint members comprising one or more sockets (15) for respectively receiving an end of one of the fame members (13) at a respective vertex or corner region of the open framework.

4. Trolley case (1) according to any of the preceding claims, further comprising an edge protector (32) having a guard member (33), e.g. formed as a body moulding, that at least partially covers the outer shell (3) at an edge region of a base (8) of the case to protect the outer shell at said lower edge region, and at least one connector member (30, 35) that extends through the outer shell (3) for rigid attachment to the frame (2) of the case or the handle mechanism.

5. Trolley case (1) according to claim 4, wherein the at least one connector member (35) comprises a lug (35a) or bushing (35b) for direct fastening to one of the frame members (13); and/or
wherein the retractable handle mechanism (12) includes a hand-grip (24) that is movable between the retracted position and the extended position, and at least one elongate support element (27) configured to guide the hand-grip (24) between the retracted position and the extended position, and wherein the at least one connector member (30) of the edge protector (32) is integrally formed with the external guard member (33) and is configured to receive and secure a lower end of the at least one elongate support element (27) of the retractable handle mechanism (12) inside the outer shell (3).

6. Trolley case (1) according to any of the preceding

claims, wherein the main body (4) of the case comprises at least one carry-handle (19) for lifting the case, wherein the at least one carry-handle (19) is formed from the flexible outer shell (3) of the case.

7. Trolley case (1) according to claim 6, wherein the carry-handle (19) comprises a web (20) of material that is integral with the outer shell (3) and which separates from a respective wall of the case (1) to enable a user's hand to grasp the carry-handle (19) between the wall of the case and the web,
wherein the web (20) of material preferably follows a relatively flat arc or curve where it separates from the wall of the case.

8. Trolley case (1) according to claim 6 or claim 7, wherein the web (20) of the carry-handle (19) has a substantially constant width and is formed by tapering the material of the outer shell, e.g. in a substantially constant taper, from a width of the respective wall of the case to the predetermined width of the web, the taper preferably reaching the predetermined width where the web separates from the respective wall of the case.

9. Trolley case (1) according to any of the preceding claims, further comprising a reinforcing panel which extends over at least one wall of the case, the panel being fastened to at least some of the elongate members of the frame along a longitudinal extent of those members.

10. Trolley case (1) according to claim 9, wherein the reinforcing panel is fastened to at least one of the elongate members the frame via the at least one connector member of the edge protector.

11. Trolley case (1) according to claim 9 or claim 10, wherein the reinforcing panel is a laminated structure formed from at least two films laminated together to define a plurality of closed cells,
wherein the closed cells are preferably formed as an array of discrete projections or ribs, which are preferably substantially uniform in size and preferably substantially uniformly distributed over the surface of the panel, wherein the projections or ribs preferably project out of the main plane of the panel inwards towards the storage volume of the main body of the case.

12. Trolley case (1) according to any of claims 9 to 11, wherein the fastening means are provided to interconnect the elongate frame members and the reinforcing panel with the outer shell,
wherein the fastening means preferably include a plurality of flexible elements, such as straps or flaps, configured to be folded or wrapped around the frame members, and engagement elements configured for fastening engagement with complementary parts of the flexible elements, wherein at least the flexible elements or the engagement elements are securely and non-releasably anchored to the reinforcing panel.

13. Trolley case (1) according to any of claims 9 to 12, wherein the reinforcing panel extends continuously across at least two and preferably across at least three adjacent sides of the case; and/or
wherein the reinforcing panel includes one or more openings or cut-outs in the main plane of the panel, the openings or cut-outs encompassing a planar area in the range of about 10% to 60%, and preferably in the range of about 20% to 40%, of the surface area of the at least one side of the side of the casing over which the panel extends.

14. Trolley case (1) comprising:

a frame (2);
a flexible outer shell (3) that substantially covers the frame to form a main body (4) of the case defining a storage volume (V);
roller means (11) provided on the main body (4) for rolling the case across a surface; and
at least one carry-handle (19) for carrying and/or lifting the case, wherein the carry-handle (19) is formed from and is integral with the flexible outer shell (3) of the case.

15. Trolley case (1) comprising:

a frame (2);
a flexible outer shell (3) that substantially covers the frame to form a main body (4) of the case defining a storage volume (V);
roller means (11) provided on the main body for rolling the case across a surface;
a handle mechanism (12) provided on the main body for pulling the case on the roller means (11); and
an edge protector (32) comprising an external guard member (33), which at least partially covers the outer shell (3) at an edge region of a base (8) of the case to protect the outer shell (3) at said lower edge region, and at least one connector member (30, 35) that extends through the outer shell (3) for attachment to the frame (2) of the case and/or to the handle mechanism.

Amended claims in accordance with Rule 137(2) EPC.

1. Trolley case (1) comprising:

a frame (2);

a flexible outer shell (3) which substantially covers the frame (2) to form a main body (4) of the case;
roller means (11) attached to the main body (4) and configured for rolling the case across a surface;
a handle mechanism (12) movable between a retracted position and an extended position for pulling the case on the roller means (11) when the handle mechanism (12) is in the extended position;
wherein the frame (2) comprises a plurality of elongate members (13) which are interconnected in an open framework that substantially defines a storage volume (V) within the main body (4) of the case, the trolley case (1) further comprising:

an edge protector (32) having a guard member (33), that at least partially covers the outer shell (3) at an edge region of a base (8) of the case to protect the outer shell at said lower edge region, and at least one connector member (30, 35) that extends through the outer shell (3) for rigid attachment to the frame (2) of the case or the handle mechanism,
a reinforcing panel which extends over at least one wall of the case, the panel being fastened to at least some of the elongate members of the frame along a longitudinal extent of those members,
wherein the reinforcing panel is fastened to at least one of the elongate members of the frame via at least one connector member (30, 35) of the edge protector.

2. Trolley case (1) according to claim 1, wherein each of the elongate frame members (13) defines an edge of a generally prismatic open framework, and wherein each of the frame members (13) comprises a rod or strut formed of a fibre-reinforced composite material having a diameter in the range of about 5 mm to 8 mm.

3. Trolley case (1) according to claim 2, wherein the elongate frame members (13) are interconnected with one another within the open framework via a number of joint members (14), with each of the joint members comprising one or more sockets (15) for respectively receiving an end of one of the fame members (13) at a respective vertex or corner region of the open framework.

4. Trolley case (1) according to any of the preceding claims, wherein the at least one connector member (35) comprises a lug (35a) or bushing (35b) for direct fastening to one of the frame members (13); and/or wherein the retractable handle mechanism (12) includes a hand-grip (24) that is movable between the retracted position and the extended position, and at least one elongate support element (27) configured to guide the hand-grip (24) between the retracted position and the extended position, and wherein the at least one connector member (30) of the edge protector (32) is integrally formed with the external guard member (33) and is configured to receive and secure a lower end of the at least one elongate support element (27) of the retractable handle mechanism (12) inside the outer shell (3).

5. Trolley case (1) according to any of the preceding claims, wherein the main body (4) of the case comprises at least one carry-handle (19) for lifting the case, wherein the at least one carry-handle (19) is formed from the flexible outer shell (3) of the case.

6. Trolley case (1) according to claim 5, wherein the carry-handle (19) comprises a web (20) of material that is integral with the outer shell (3) and which separates from a respective wall of the case (1) to enable a user's hand to grasp the carry-handle (19) between the wall of the case and the web,
wherein the web (20) of material preferably follows a relatively flat arc or curve where it separates from the wall of the case.

7. Trolley case (1) according to claim 5 or claim 6, wherein the web (20) of the carry-handle (19) has a substantially constant width and is formed by tapering the material of the outer shell, e.g. in a substantially constant taper, from a width of the respective wall of the case to the predetermined width of the web, the taper preferably reaching the predetermined width where the web separates from the respective wall of the case.

8. Trolley case (1) according to any of the preceding claims, wherein the reinforcing panel is a laminated structure formed from at least two films laminated together to define a plurality of closed cells,
wherein the closed cells are preferably formed as an array of discrete projections or ribs, which are preferably substantially uniform in size and preferably substantially uniformly distributed over the surface of the panel, wherein the projections or ribs preferably project out of the main plane of the panel inwards towards the storage volume of the main body of the case.

9. Trolley case (1) according to any of the preceding claims, wherein fastening means are provided to interconnect the elongate frame members and the reinforcing panel with the outer shell,
wherein the fastening means preferably include a plurality of flexible elements, such as straps or flaps,

configured to be folded or wrapped around the frame members, and engagement elements configured for fastening engagement with complementary parts of the flexible elements, wherein at least the flexible elements or the engagement elements are securely and non-releasably anchored to the reinforcing panel.

10. Trolley case according to anyone of the preceding claims, wherein the reinforcing panel is fastened to at least one of the elongate members of the frame via at least one connector member (35) of the edge protector, wherein the connector member (35) comprises a lug (35a) or bushing (35b).

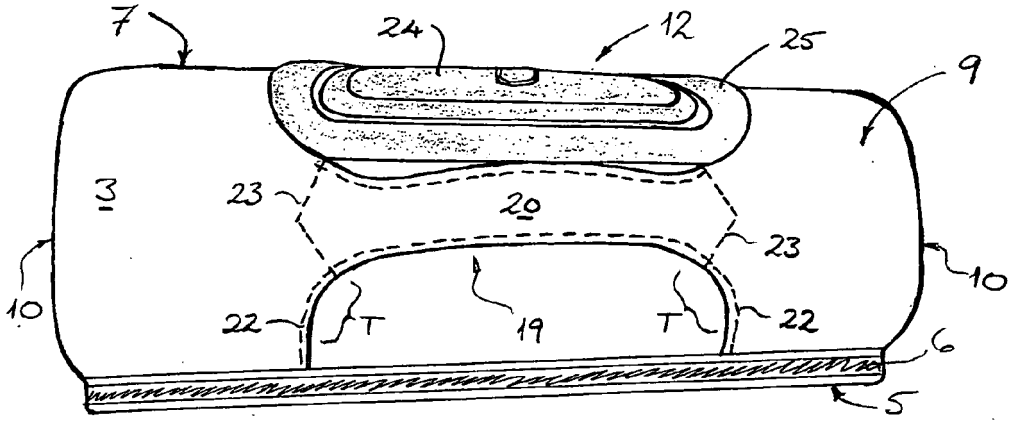
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Fig. 2

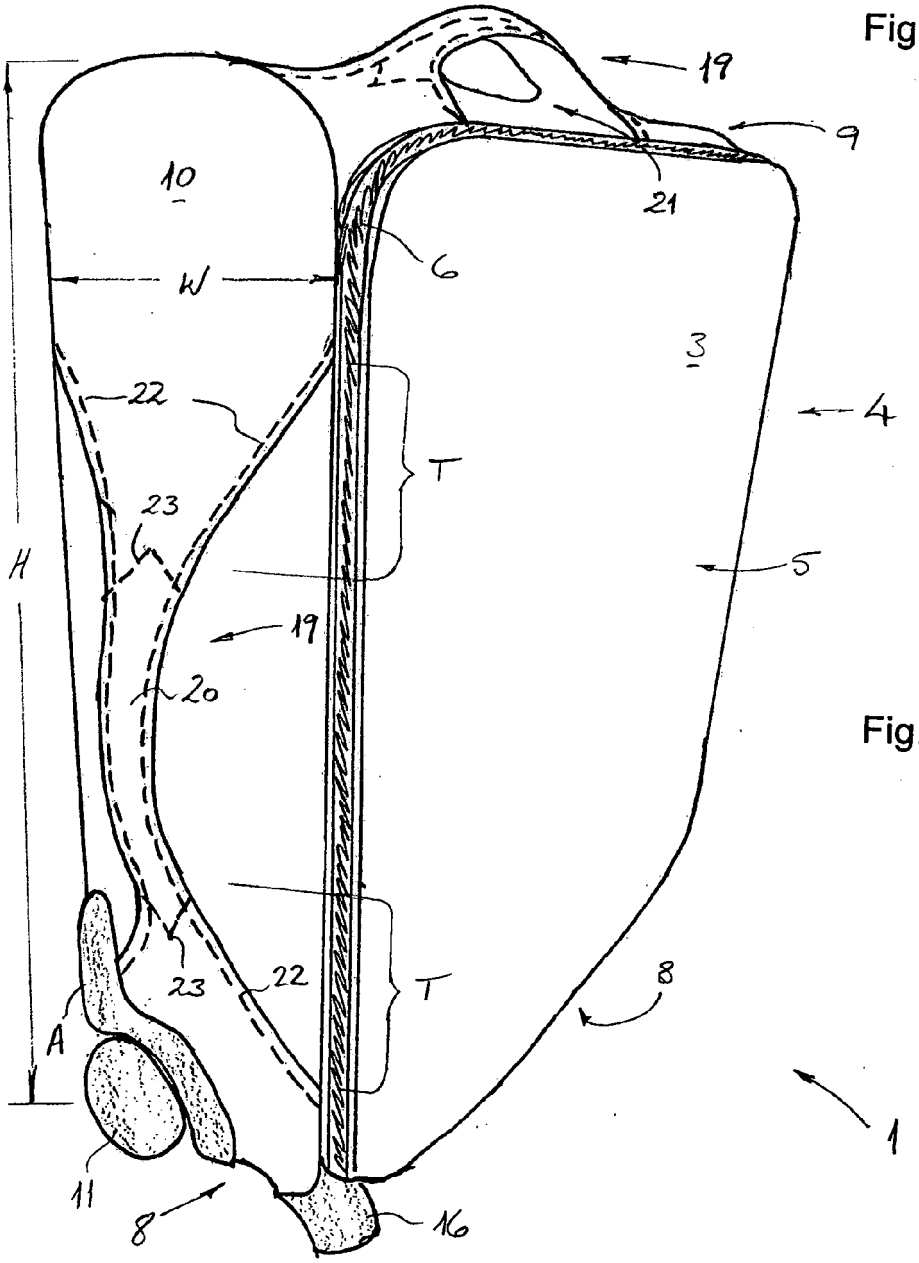
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Fig. 1

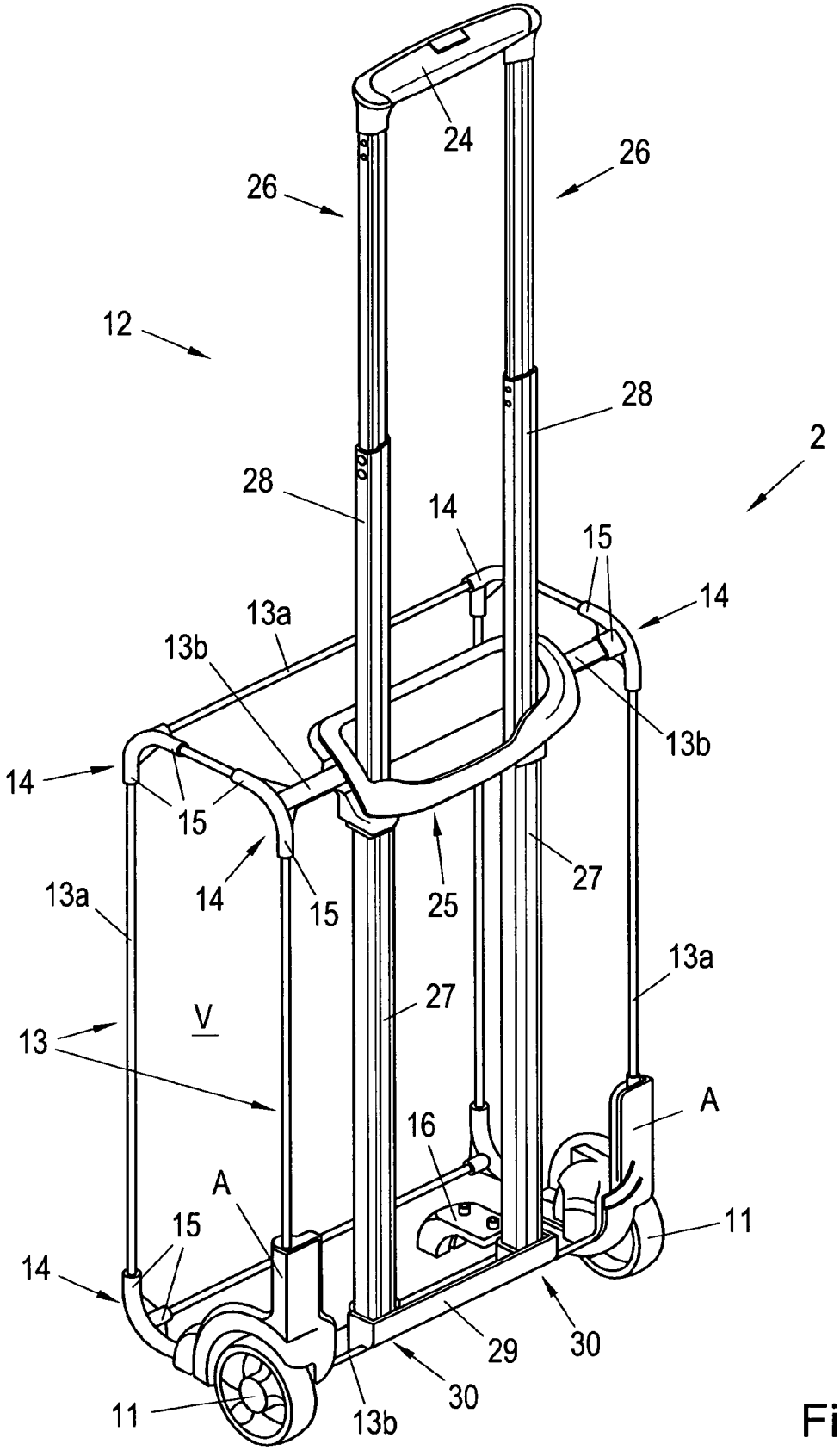
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Fig. 3

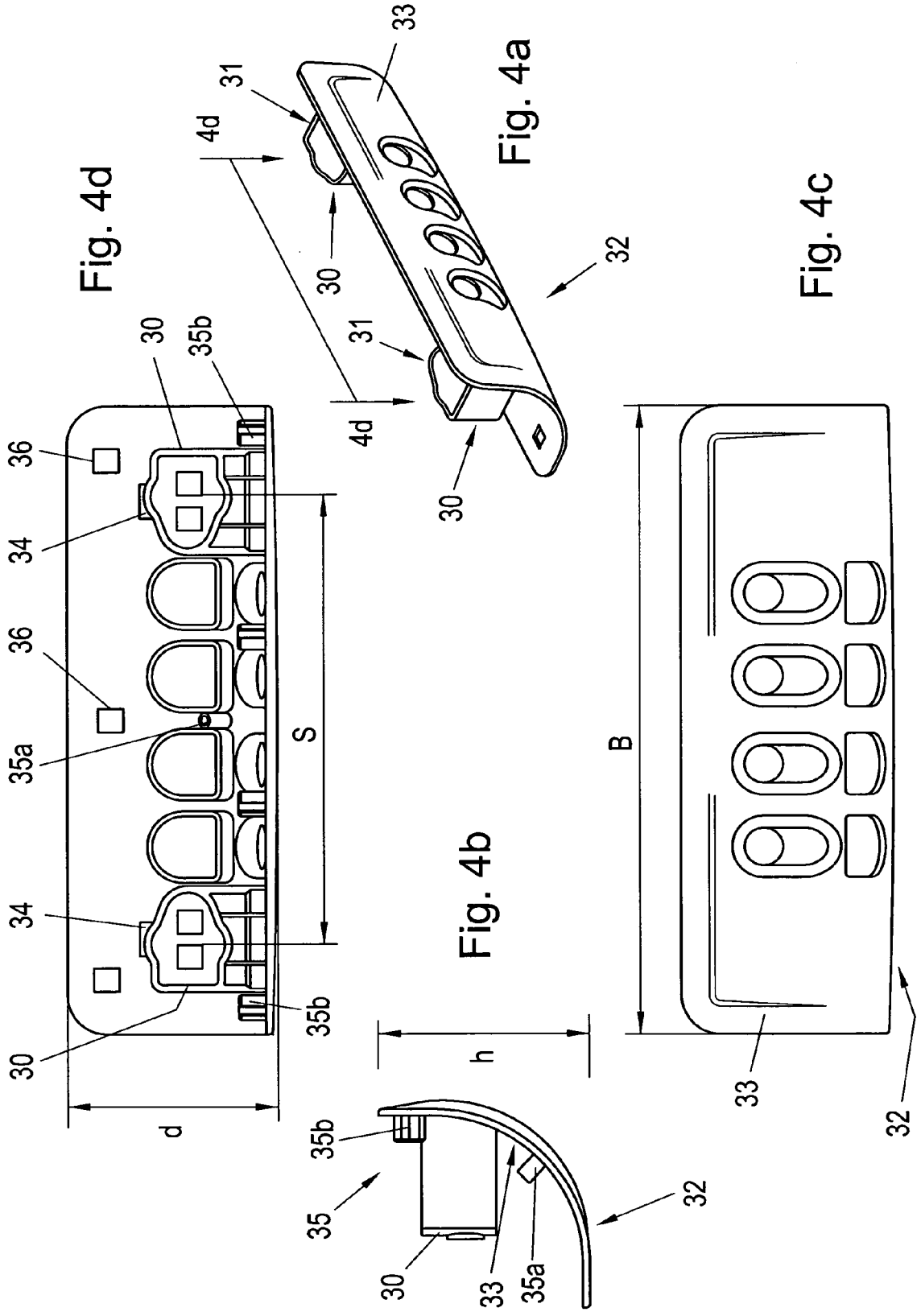
Fig. 4d
Fig. 4a
Fig. 4c
Fig. 4b
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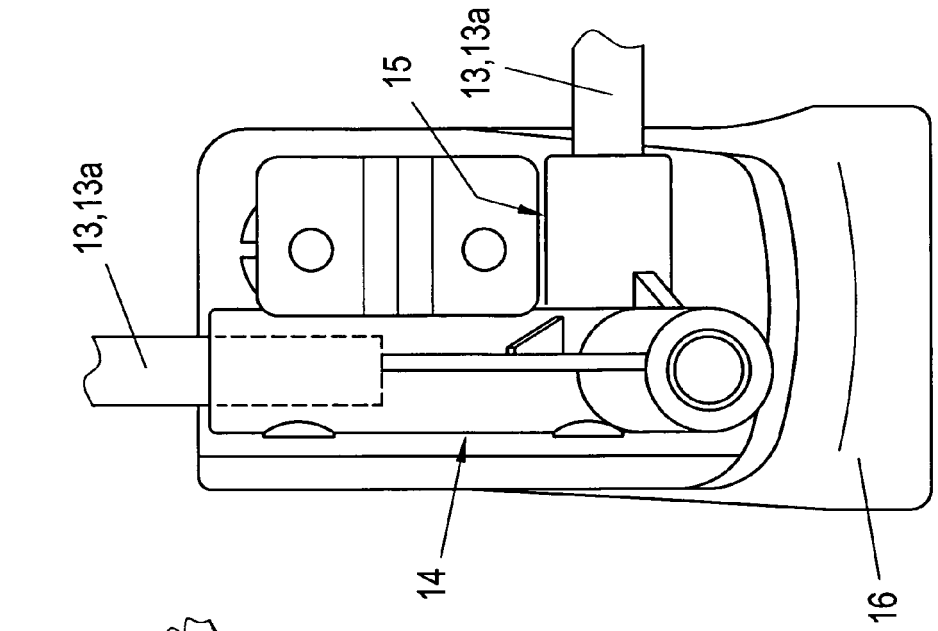

Fig. 5b

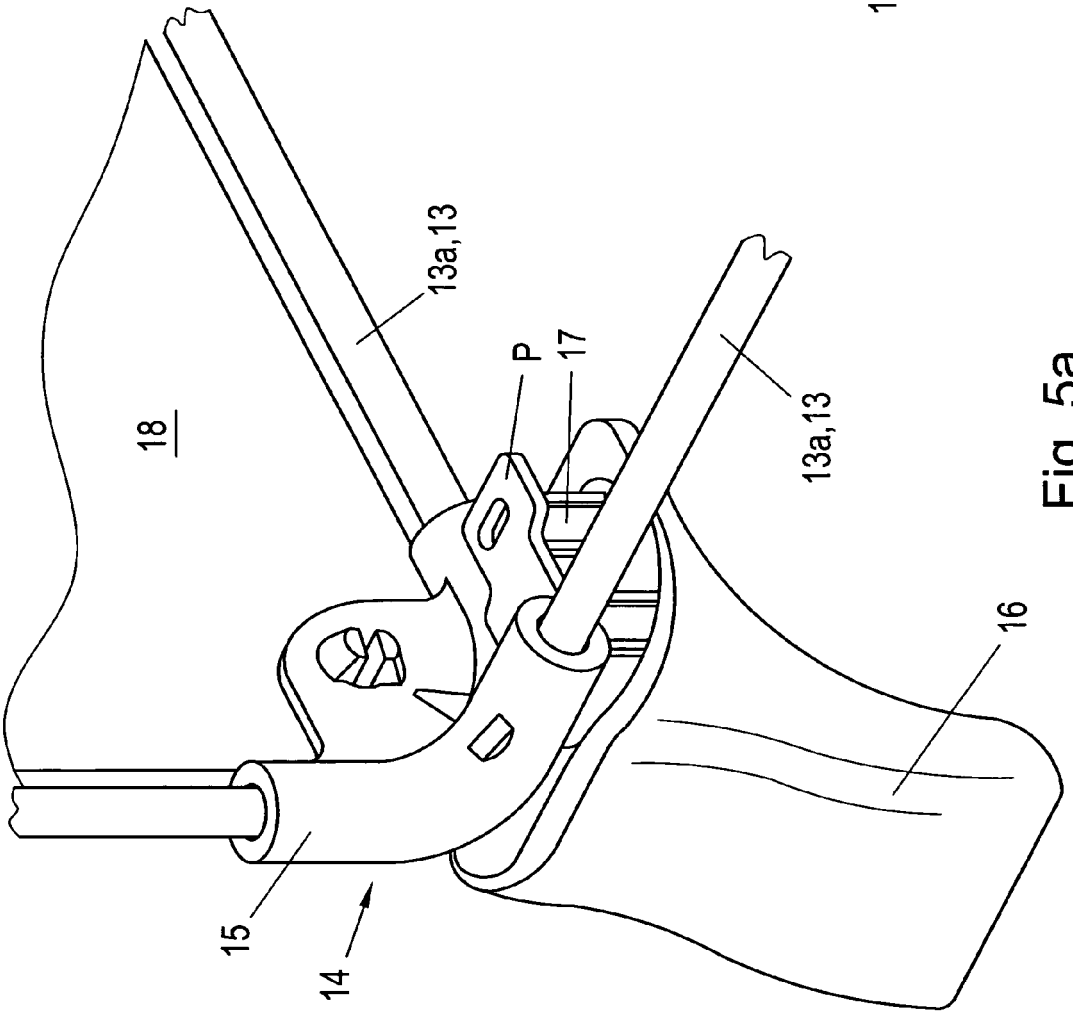

Fig. 5a

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EUROPEAN SEARCH REPORT

Application Number
EP 10 00 2140

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X Y	US 6 360 400 B1 (CHANG FU-JUNG [TW]) 26 March 2002 (2002-03-26) * column 3, line 14 - line 35; figure 2 * -----	15 4,5,10, 12	
Y	WO 2005/011430 A2 (500 GROUP INC [US]; TIRAMANI PAOLO M B [US] CISCO TECH IND [US]; TIRAM) 10 February 2005 (2005-02-10) * page 9, line 4 - line 23 * -----	11	
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X	GB 2 361 692 A (SHER YUH YI [TW]) 31 October 2001 (2001-10-31) * figure 4 * -----	1,3,9	
X	US 6 176 357 B1 (KUO CHUNG-HSIE [TW]) 23 January 2001 (2001-01-23) * the whole document * -----	15	

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
The Hague	25 October 2010	Bengtsson, Johan

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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

3

EPO FORM 1503 03.82 (P04C01)

Europäisches Patentamt
European Patent Office
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Application Number
EP 10 00 2140

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

1-5, 9-13, 15

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 10 00 2140

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3, 9

   Light-weight frame structure for trolley case.

   ---

2. claims: 4, 5, 15

   Protection against external damage for trolley case.

   ---

3. claims: 6-8, 14

   Improved carry-handle for trolley case.

   ---

4. claims: 10-13

   Improved reinforcing panel for a trolley case.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 00 2140

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-10-2010

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EPO FORM P0459

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