

IMPROVED LUGGAGE CONSTRUCTION

This invention relates to the construction of luggage such as suitcases and/or trolley cases for use by travellers.

- 5 Such articles of luggage can conveniently be considered as comprising two major types, the first the so-called 'soft' suitcase and the second the so-called 'hard' suitcase.

Conventionally, 'hard' suitcases are constructed from two or more thermoformed panels. The panels being made from materials that have
10 enough inherent stiffness that can hold their intended shape in the absence of substantial framing, but whilst also being tough, resilient and hardwearing to knocks and bangs received in everyday useage. Furthermore, the term hard suitcase is often regarded as applying to those suitcases whose walls, top and bottom cannot be readily pierced by a blade or needle.

- 15 The term 'soft' can be conveniently regarded as being applied to suitcases that employ a soft outer covering that is supported by an internal framework of metal or appropriate plastics material extending around the total periphery of the top and bottom of the associated suitcase base section in such manner as to define the visual form of the suit case.

- 20 In addition, it is also known to provide both types of cases with a towing handle structure which is usually moveable between a stowed or retracted position and an extended user suitcase towing position. At least a pair of wheels is often provided for facilitating the movement of the suitcase by a user. However, soft case wheels are attached using additional extra plywood,
25 PE board or plastic board, which therefore adds weight to the case.

It is clearly apparent that with the provision of the towing handle facility in conjunction with wheels or rolls the user does not need to have to carry the suitcase. Furthermore in practice the use of the wheels /rolls greatly facilitates the general handling of a suitcase in locations such as in crowded airports.

Whatever the actual construction of the 'hard' or 'soft' suitcases the provision of the towing handle facility has historically involved the provision of at least one pair of tubular members that are additional to the actual structure of the framework of the base section of the suitcase and which are telescopically engageable by the limbs of a U-shaped assembly serving as the actual towing handle.

In practice, the provision of these additional tubes can add significantly to the overall weight of the empty suitcase since additional means has to be provided to mount such tubes to the suitcase framework.

Anything that increases the weight of a suitcase can be a inconvenient disadvantage bearing in mind that the major mode of present day travel on a world wide basis is by air, and that as is well known many airline operators are frequently imposing lower and lower limits to the overall weight of the luggage that a traveller is permitted to carry onto an aircraft. In fact, particularly in relation to the most intensively used group of flights, namely the so-called tourist grade whether on scheduled flights or charter flights the allowable weight permitted per passenger is being progressively reduced.

The present invention therefore seeks to provide a method of constructing an article of luggage, which overcomes, or at least reduces some of the above-mentioned problems of the prior art.

Accordingly, in a first aspect, the invention provides a shape defining framework structure, wherein the shape defining framework structure comprises two length defining members, wherein at one end of each length defining member a portion of a towing handle is telescopically incorporated and at the opposed end is located a wheel, wherein a substantial portion of the wheel is housed within the shape defining framework structure.

Preferably, wherein the shape defining framework structure may be formed from a plurality of elongate members, wherein each elongate member is interconnected at their end regions to two other elongate members.

Further preferably, wherein the plurality of elongate members further comprises four length, four width and four depth defining elongate members.

Also preferably, wherein the elongate members may be interconnected at their end regions by four sets of three-way connection pieces.

- 5 Preferably, wherein one set of the three-way connection pieces may be formed such that a substantial portion of the wheels is housed within the shape defining framework structure.

- Also preferably further comprising a shape defining portion, and/or wherein the shape defining portion defines the shape of the suitcase across its width
10 and/or wherein the shape defining portion is curved.

Further preferably, wherein the wheels may be located at corners of the suitcase.

- This construction means that the wheels are less likely to be damaged in use, are aesthetically more pleasing, and improve the stability of the case. With
15 reference to the latter benefit, this is because the case is much lower to the ground than prior art suitcase, and as such this lowers its centre of gravity, meaning it is less likely to topple over or spin around in use. Having the telescopic handle located in the same vertical plane as the wheel housing makes towing more stable. In conventional cases, the towing handle is more
20 central and this leads to lateral pull on one or more wheels causing imbalance at times.

- Accordingly, in a second aspect, the invention provides a shape defining framework structure, wherein the shape defining framework structure comprises a width defining elongate member; wherein the width defining
25 elongate members further comprises a shape defining portion.

Preferably wherein the shape defining framework structure may be formed from a plurality of elongate members, wherein each elongate member is interconnected at their end regions to two other elongate members.

Further preferably wherein the plurality of elongate members further comprises four length, four width and four depth defining elongate members.

Preferably, wherein the elongate members may be interconnected at their end regions by four sets of three-way connection pieces.

- 5 Preferably wherein the elongate members may be interconnected at their end regions to the two other elongate members by two three way connection pieces.

Further preferably, wherein the shape defining portion is curved.

- 10 Preferably, further comprising at least one wheel and/or wherein a substantial portion of the wheel is housed within the shape maintaining framework structure.

Preferably wherein one set of the three way connection pieces may be formed such that a substantial portion of the set of wheels is housed within the shape maintaining framework structure.

- 15 Also preferably, wherein the towing handle comprises a first pair of parallel limbs spaced apart by a cross piece to form a U-frame, the pair of parallel limbs being telescopically engagable with the two length defining tubular members.

- 20 Further preferably wherein the first pair of parallel limbs of the towing handle is telescopically displaceable from the two length defining tubular members between a retracted position and an expanded position.

Preferably, wherein the towing handle comprises a second pair of parallel limbs being telescopically engagable with the first pair of parallel limbs of the towing handle.

- 25 Preferably and in accordance with both the first and second aspects, comprising two supporting feet on the shape maintaining framework structure in a position that provide support for the case when the case is in a standing position.

The advantage being that the suitcase is protected from damage and abrasion at its most vulnerable corners. This is because a trolley pull case is usually orientated with its short side upwards. Therefore, the top and bottom edges of the case get more abuse in use and need the protection of a shaped portion at those areas to stop damage that would occur on a more angled edge.

Accordingly, in a third aspect, the invention provides a method of constructing an article of luggage comprising forming a shape defining framework structure comprising two length defining members, incorporating at one end of each length defining member a portion of a telescopic towing handle and at the opposed end locating a wheel, wherein a substantial portion of the wheel is housed within the shape defining structure.

Preferably, further comprising forming the shape defining framework structure from a plurality of elongate members, wherein each elongate member may be interconnected at their end regions to two other elongate members.

Preferably, wherein the plurality of elongate members further comprises four length, four width and four depth defining elongate members.

Also preferably, further comprising interconnecting the elongate members at their end regions by four sets of three-way connection pieces.

Further preferably, forming one set of the three-way connection pieces such that a substantial portion of the wheels is housed within the shape defining framework structure.

Preferably, further providing a shape defining portion and/or wherein the shape defining portion defines the shape of the suitcase across its width and/or wherein the shape defining portion is curved.

Also preferably, further comprising locating the wheels at corners of the suitcase.

Accordingly, in a fourth aspect, the invention provides a method of constructing article of luggage comprising forming a shape defining framework structure, wherein the shape defining framework structure comprises a width

defining elongate member; wherein the width defining elongate members further comprises a shape defining portion.

Preferably, further comprising forming the shape defining framework structure from a plurality of elongate members, wherein each elongate member is
5 interconnected at their end regions to two other elongate members.

Further preferably, wherein the plurality of elongate members further comprises four length, four width and four depth defining elongate members.

Also preferably, interconnecting the elongate members at their end regions by four sets of three-way connection pieces and/or interconnecting the elongate
10 members at their end regions to the two other elongate members by two three way connection pieces.

Preferably, wherein the shape defining portion is curved and/or further comprising at least one wheel. Wherein a substantial portion of the wheel is housed within the shape maintaining framework structure.

15 Preferably, further comprising forming one of the three way connection pieces such that a substantial portion of the set of wheels is housed within the shape maintaining framework structure.

Preferably further comprising providing two supporting feet on the shape defining framework structure in a position that provide support for the case
20 when the case is in a standing position.

One embodiment of the invention will now be more fully described, by way of example, with reference to the drawings, of which:

Figure 1 schematically illustrates a 'soft' suitcase; its supporting frame work construction and a towing handle assembly, of one embodiment of the present
25 invention;

Figure 2 schematically illustrates in a deconstructed state, the soft suitcase of Figure 1;

Figure 3 schematically illustrates the upper portion of the suitcase of Figure 1 in greater detail, specifically the construction of the two upper connection pieces; and

Figure 4 schematically illustrates the lower portion of the suitcase of Figure 1 in greater detail, specifically the construction of the two lower connection pieces and the wheel assembly.

In a brief overview of one embodiment of the present invention, there is shown in Figure 1 a soft suitcase in a vertical standing position, without its covering.

The suitcase framework 20 comprises a rectangular base/back frame portion 16, a corresponding rectangular upper/front frame portion 17 and a group of four elongate spacer members 18 for interconnecting the front and back portions 16, 17 in a spaced apart relationship that effectively defines the sides, ends and thus the depth of the suitcase.

The base/back frame portion 16 comprises two rear length defining elongate members 6 defining the length of the suitcase, and two shorter width defining members 21, 22 defining the width of the suitcase (the upper width defining elongate member 22 can only be fully seen with reference to Figure 2).

The upper/front frame portion 17 similarly includes two length defining elongate members 13 and two further shorter width defining members 21, 22.

Four different types of connection piece connect the length, width and depth defining members, as will thus be herein described. With reference to the back/base portion 16, the two length defining elongate members 6 are attached to the upper width defining elongate member 22 by a first connection piece 4. The two rear length defining elongate members 6 are attached to the lower width defining elongate member 21 by a second connection piece 9.

With reference to the front/upper portion 17, the two front length defining elongate members 13 defining the length of the suitcase are attached to the upper width defining elongate member 22 by a third connection piece 5. The

two length defining elongate members 13 are attached to the lower width defining elongate member 21 by a fourth connection piece 12.

Thus all connection pieces 4, 5, 9 & 12 connect with three different types of elongate member and are described in further detail with reference to Figures

5 3 and 4.

The suitcase further comprises a towing handle assembly 19 that makes use of the structure of the base section 16, in that the longer members 6 are utilised in the formation of the towing handle assembly 19 at the top of the suitcase.

10 The towing handle assembly 19 includes a U frame having parallel limbs 8 spaced by a cross piece 7, which could also be formed as a single integral unit. The limbs 8 are telescopically engageable with the longer tubular members 6 of the base section 16.

The operational lengths of the limbs 8 are such that the handle assembly 19
15 can be retracted/stowed so that the crossbar 7 bears against the adjacent top covering of the suitcase.

The suitcase also comprises a cover portion 3 which is formed from plastic and through which the limbs 8 project. The cover portion 3 is attached in part to upper connection pieces 4 and which is shown in more detail with reference
20 to Figures 2 and 3. This cover portion 3 strengthens this particular area of the suitcase.

In practice the limbs 8 can comprise a single length of a tube or bar of such length as to enable the cross bar 7 to be positioned at a comfortable user towing setting. This single length limb formation can be particularly used with
25 smaller length suitcases.

Furthermore, the limbs 8 can comprise a double, or even triple telescopic arrangement (not shown in the Figures) as known in the art.

It will be understood that means (not shown) would be provided for ensuring that the handle assembly 19 does not, when in use, disengage from the rear length defining elongate members 6.

5 The suitcase is provided with wheels 10 and support feet 14. The wheels 10 are located in wheel housings 11, which are attached to the second connection piece 9. The wheels 10 are also connected to these wheel housings 11. The support feet 14 are connected to the fourth type of connection piece 12.

10 Curved shape defining members 1, 2 & 15 are also provided in order to "round off" the sharp edges are the top and bottom of the suitcase. As previously explained, the suitcase is then protected from damage and abrasion at its most vulnerable corners. This is because a trolley pull case is usually orientated with its short side upwards. Therefore, the top and bottom edges of the case get more abuse in use and need the protection of a shaped portion
15 at those areas to stop damage that would occur with a more angled edge. The shape defining members 1, 2 & 15 are formed from PE board, but could be made from molded plastic or any other suitable material.

A first shape defining member 15 is provided between the two wheels 10 and may be connected at each of its ends to the second type of connection piece
20 9.

Two further shape defining members 1, 2 are provided between and may be connected at each end to the upper connection pieces 4 & 5, if required. The shape defining members 1, 2 & 15 may be fixed to their relative connection pieces 4, 5 by glue, heat sealing or bolts, although in this embodiment they
25 are not. It should be clear to someone skilled in the art that the shape defining members 1,2 & 15 could be also be molded as one integral piece and formed as a part of the relative connection pieces themselves.

Figure 2 schematically illustrates in a deconstructed state, the soft suitcase of Figure 1. There is shown a suitcase framework 20 which two front length
30 defining elongate members 13 and two rear, length defining elongate

members 6 and a group of four elongate spacer members 18 for interconnecting the front and rear length defining elongate members 13, 6 in a spaced apart relationship that effectively defines the sides, ends and thus the depth of the suitcase.

- 5 The two longer defining elongate members 6 connect to one of two shorter width defining members 21, 22 defining the width of the suitcase.

The front length defining elongate members 13 connect to the other of the two further shorter width defining members 21, 22, (as can be seen in Figures 1 and 2).

- 10 Four different types of connection piece connect the length, width and depth defining elongate members, as will thus be described. The two rear length defining elongate members 6 are attached to the upper width defining elongate member 22 by a first connection piece 4. The two rear length defining elongate members 6 are attached to the lower width defining
15 elongate member 21 by a second connection piece 9.

The two front length defining elongate members 13 are attached to the upper width defining elongate member 22 by a third connection piece 5. The two front length defining elongate members 13 are attached to the lower width defining elongate member 21 by a fourth connection piece 12.

- 20 All connection pieces 4,5,9 &12 connect with three different types of elongate member and are described in further detail with reference to Figures 3 and 4.

- The suitcase further comprises a towing handle assembly 19 that makes use of the structure of the suitcase framework 20 in that the two rear length defining elongate members 6 are utilised in the formation of the towing handle
25 assembly 19 at the top of the suitcase.

The towing handle assembly 19 includes a U frame having parallel limbs 8 spaced by a cross piece 7, which may be formed as a single integral unit. The limbs 8 are telescopically engageable with the longer tubular members 6 of the base section 16. The limbs 8 may be made from aluminum or any other

suitable material. A soft cover portion may also be provided on the cross piece 7.

Also shown is a cover portion 3, which is formed from plastic and through which the limbs 8 project.

- 5 The suitcase is provided with wheels 10 and support feet 14. The wheels 10 are located in wheel housings 11, which are attached to the second connection piece 9. The wheels 10 are also connected to these wheel housings 11. The support feet 14 are connected to the fourth type of connection piece 12.
- 10 Curved shape defining members 1, 2 & 15 are also provided in order to round the edges of specific areas of the suitcase, as explained previously with reference to Figure 1. Again, the shape defining members 1, 2 & 15 are formed from PE board, but could be made from molded plastic or any other suitable material.
- 15 A first shape defining member 15 is provided between the two wheels 10 and may be connected at each of its ends to the second type of connection piece 9.

- Two further shape defining members 1, 2 are provided between and may be connected at each end to the upper connection pieces 4 & 5, if required. The
- 20 shape defining members 1, 2 & 15 may be fixed to their relative connection pieces 4, 5 by glue, heat sealing or bolts, for example. It should be clear to someone skilled in the art that the shape defining members 1,2 & 15 could be also be molded as one integral piece and formed as a part of the relative connection pieces themselves.

- 25 The construction of the suitcase framework will now be considered in detail with reference to Figures 3 and 4 that illustrate the upper and lower portions of the suitcase framework in the absence of the suitcase body covering.

Figure 3 schematically illustrates the upper portion of the suitcase of Figure 1 in greater detail, specifically the construction of the two upper connection pieces.

As has been mentioned, the framework 20 includes the rear length defining elongate members 6 and the depth defining elongate members 18 that are connected to the front length defining elongate members 13 by two types of connection pieces 4, 5.

Thus as may be seen from Figure 3 said upper rear connection pieces 4 includes a tubular central part 25 that is a firm close fit upon the associated upper end region of the rear length defining elongate member 6 and two smaller diameter tubular elements 23 and 24 that extend at right angles to each other and also perpendicular to the axial direction of the main body of the suitcase.

Since the upper rear connection pieces 4 are required to connect with opposite sides of the framework base portion (not shown) the angular relationships between the main bodies 25 and their associated tubular elements 23 and 24 it is necessary to provide a left hand fitting connection piece and a right hand fitting connection piece.

In the Figure 3 it will be noted that the elements 25 are parallel to each other whilst the elements 23 & 24 point towards each other. Each smaller diameter elements 23 is intended telescopically to receive an end of a cross bar, 18 whilst the smaller diameter element 24 is intended telescopically to connect with an end of the width defining elongate member 22.

The upper rear connection pieces 4 (as shown in the Figures 2 and 3) after mounting to the members 6 is open to receive the limbs 8 of the towing assembly 19.

It will be understood that the internal diameters of the main body 25, and of the members 23 and 24 will be such as to enable the requisite firmness of secure fit with the elongate members with which they engage.

Accordingly, the upper front connection piece 5 is a three way connection piece and operates in exactly the same way as the upper rear connection piece 4, except this connection piece does not receive the limbs 8 of the towing handle assembly 19. However it does engage with each of its
5 respective three elongate members 22, 18 & 13.

Both upper connection pieces 4, 5 are made from molded plastic, but could be constructed from any suitable material. The upper front and rear shape defining members 1 & 2 can also be seen in Figure 3.

Figure 4 schematically illustrates the lower portion of the suitcase of Figure 1
10 in greater detail, specifically the construction of the two lower connection pieces and the wheel assembly.

The lower rear connection piece 9 is utilised to provide at the lower end of the main body of the suitcase thereof, a connection between the wheels 10 and the base of the suitcase.

15 Referring now to Figure 4 this schematically illustrates one of the two wheels 10 which is secured to one of the wheel housings 11, which is turn connected to one of the two lower rear connection pieces 9 by any convenient means such as by pinning, or by using screws. Both the wheel housing 11 and the wheel connection piece 9 are curved such that a substantial portion of the
20 wheel is effectively housed within the body of the suitcase itself. Alternatively it could be said that the centre of the wheel is in line both with the rear and base of the suitcase, as well as the telescopic towing handle.

As explained previously, this construction means that the wheels are less likely to be damaged in use, are aesthetically more pleasing, and improve the
25 stability of the case. With reference to the latter benefit, this is because the case is much lower to the ground than prior art suitcase, and as such this lowers its centre of gravity, meaning it is less likely to topple over or spin around in use. Having the telescopic handle located in the same vertical plane as the wheel housing 11 makes towing more stable. In conventional cases,

the towing handle is more central and this leads to lateral pull on one or more wheels causing imbalance at times.

As in Figure 3, each lower rear connection piece 9 has three varying aperture tubular portions that connect to each of the three elongate members 6, 18 & 21 and which form the framework of the suitcase. The shape defining member 15 also connects to the lower rear connection piece 9 at each of its ends.

Each lower front connection piece 12 is also formed with three varying aperture tubular portions that each engage with one of three elongate members 13, 18, 21. It will be noted from the Figures 1 and 2 that the front framework portion 17 has rounded/curved corner regions with the result that the connection pieces 12 that interconnect the elongate members 13, 18, 21 include left hand and right hand arrangements. In addition since such front lower connection pieces 12 are utilised to mount support feet 14 for the suitcase case, the lower connection pieces 12 are additionally formed so as to be able to mount the feet 14. The feet 14 can be secured to the associated connection piece 12 in any convenient manner such as by using rivets or screws.

The various components of the framework structure 20, the towing assembly 19, the wheel assemblies and the feet 14 can be formed from any material(s) considered appropriate namely materials that are of adequate strength in conjunction with lightness of weight. For example the components may be formed from a composite material such as fibre glass/carbon fibre or a plastics material such as Nylon™

Whilst the above discussion has been specifically concerned with a so-called 'soft' type of suitcase, the principles of the invention can be utilised in other forms of luggage construction.

For example, the proposals for the back frame portion in conjunction with the towing handle assembly and the associated wheels could be associated with a 'fold flat' trolley construction.

It will be appreciated that although only one particular embodiment of the invention has been described in detail, various modifications and improvements can be made by a person skilled in the art without departing from the scope of the present invention.

Claims

1. An article of luggage comprising a shape defining framework structure, wherein the shape defining framework structure comprises four length, four width and four depth defining elongate members, wherein at one end of each of two length defining members a portion of a towing handle is telescopically incorporated and at the opposed end is located a wheel, wherein a centre of the wheel is housed within a side of the shape defining framework structure or in line with a lower edge of a side of the shape defining framework structure.
2. An article of luggage according to claim 1, wherein each member of the framework structure is interconnected at their end regions to two other members of the framework structure.
3. An article of luggage according to claim 1 or 2, wherein the members of the framework structure are interconnected at their end regions by four sets of three-way connection pieces.
4. An article of luggage according to claim 3, wherein one set of the three-way connection pieces is formed such that a substantial portion of the wheels is housed within the shape defining framework structure.
5. An article of luggage as claimed in any preceding claim, further comprising a shape defining portion.
6. An article of luggage as claimed in claim 5, wherein the shape defining portion defines the shape of the article of luggage across its width.
7. An article of luggage as claimed in either claim 5 or claim 6, wherein the shape defining portion is curved.
8. A method of constructing an article of luggage comprising: forming a shape defining framework structure comprising four length, four width and four depth defining members, incorporating at one end of each of two of

the length defining members a portion of a telescopic towing handle and at the opposed end locating a wheel, such that a centre of the wheel is housed within a side of the shape defining framework structure or in line with a lower edge of a side of the shape defining framework structure.

9. A method according to claim 8, wherein each of the framework members is interconnected at their end regions to two other framework members.
10. A method according to claim 8 or 9, further comprising interconnecting the framework members at their end regions by four sets of three-way connection pieces.
11. A method according to claim 10, further comprising forming one set of the three-way connection pieces such that a substantial portion of the wheels is housed within the shape defining framework structure.
12. A method according to any of claim 8 to 11, further comprising providing a shape defining portion.
13. A method as claimed in claim 12, wherein the shape defining portion defines the shape of the article of luggage across its width.
14. A method as claimed in either claim 12 or claim 13, wherein the shape defining portion is curved.