

Description

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a modular utility cart and, more particularly, to such a cart that is easy to manufacture, assemble, and use. While the present invention will be described in with specific reference to a medical utility cart usable in hospitals, doctors offices, and the like, it is to be understood that the teachings of this application, and the claims appended hereto, pertain to a modular utility cart that can be used for any purpose.

The field of carts is rather well-developed with various examples being used in medical, retail, manufacturing, and other environments. Generally, a cart comprises four sides and a top, and may be movable. However, most known carts consist of a large number of independent structures that must be welded, bolted, or connected together in some other way. Thus, manufacturing and assembling known carts requires a great number of steps that can be expensive and time consuming.

A further drawback to known carts is that they often require extensive modification for particular applications. That is, each cart user is required to modify his or her cart in order to adapt it to his or her particular requirements.

The above-described problems are particularly disadvantageous in the medical field where carts are required to hold a wide range of medical equipment and accessories such as electrical components, surgical tape dispensers, waste containers, and the like. Furthermore, medical carts should be light-weight, easy to maintain, and adaptable to fit a wide variety of uses such as in the emergency rooms, operating theaters, and patient rooms.

Therefore, what is needed is an inexpensive, easy-to-assemble, light-weight cart which can be readily adapted to a wide variety of applications.

Description of the Prior Art

Carts used in the medical field are well known. One consists of a design originally made for storing tools and is formed of sheet metal. This example has a fixed number of standard-sized drawers, generally of only one configuration, and a fixed top of standard height. Because of the design and materials used in its construction, this known cart cannot be easily adapted to specific applications, is heavy, and, therefore, is cumbersome to use.

Document GB 2 130 867 A discloses a cart for use in the baking industry. This cart comprises a pair of identical side members, each having an integral bottom portion, and a top member. The top

member is coupled to the pair of side members and both bottom portions are joined together by welding.

Furthermore, InterMetro Industries Corporation, assignee of the subject invention, also offers a Medical Emergency Crash Cart that is described in US Patent No. 4,790,610 and in pending US Patent Application Serial No. 243,212. This design represented a substantial improvement over known carts in the art. However, it was specifically conceived as a crash cart, that is, one equipped for medical emergencies. Therefore, its adaptability to other applications is somewhat limited. Accordingly, through extensive study the inventors of the present invention recognized that further improvement was still possible.

The present invention relates to a modular utility cart that overcomes the drawbacks outlined above. In particular, the cart according to the invention comprises a pair of identical, rigidly formed unitary side members, each having a generally upstanding side portion integrally formed with a generally laterally extending bottom portion, the bottom portion of each side member being formed with means for interengaging identical means formed with the bottom portion of the other side member, wherein the interengaging means on each side member comprise first and second fingers located assymmetrically and in side by side spaced relation in the longitudinal direction of the bottom portion and projecting laterally from the bottom portion, the first and second fingers of each one of the pair of bottom portions thereby being interlaceable with the first and second fingers of the other one of the bottom portions, whereby the bottom portions define a bottom of the cart.

Thus, two one-piece structures may be coupled together to form both the sides and the bottom of the cart. Preferably, each cart side panel comprises a one-piece molded plastic structure for ease of manufacture. That is, where one very large part forming both the sides and bottom of a cart may be difficult to mold of plastic, two identical smaller parts may be made more easily for simple assembly.

Each of the side panels preferably includes a number of structures adapted to offer flexibility in end use. In particular, each side panel may include a plurality of upwardly-angled drawer rails that accommodate one or more drawers within the cart. The spacing between adjacent drawer rails may be predetermined to allow different sized drawers to be inserted anywhere in the cart. Furthermore, the side panels may each include a coupling structure whereby cart tops having different configurations may be secured thereto. For example, a high-top or a low-top structure may be coupled to the side panels.

Alternatively, a modular cart system offering carts having different top heights may be provided by one top configuration mountable on different assembled side panels having respectively different heights.

Each side member also may include two corner portions and a recessed central panel. The central panel may be corrugated, and the corner portions may include holes or be equipped with pins adapted to hold accessories such as a foldable tray, pivotable bins, waste receptacles, oxygen tanks, or other devices.

The cart may also include a tubular support structure coupled to the side members and adapted for holding a wide variety of accessories. For example, one or more U-shaped channels may be coupled to the tubular support structure. The U-shaped channels may include a plurality of horizontal and vertical holes formed to hold accessories such as tape dispensers, storage bins, and the like. In addition, a two-piece coupler may be provided and has a first hole formed to embrace the tubular support structure, and a second hole adapted to hold accessories. Each hole in the coupler may be lined with a plastic collar.

A further feature of the present invention includes first and second back panels coupled to a back of the cart. The first panel may be removable and preferably includes a plurality of ventilation holes to allow electrical equipment within the cart to be properly ventilated. The second back panel may include a depressed portion shaped for receiving an electrical outlet bus, and having a hole in the depressed area for allowing wires to pass therethrough.

The above-discussed and further advantages according to the preferred embodiment of the present invention may be readily understood from the following detailed description when taken in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the cart taken from the front and left side;

Figure 2 is a perspective view of the cart taken from the rear and right side;

Figure 3 is a side elevational view of the cart side member;

Figure 4 is a bottom view of a portion of a side member;

Figure 5 is a front elevational view of the cart side member;

Figure 6 is a perspective view of the tubular support structure, U-shaped channel, and two-piece coupler for supporting various accessories above the top of the cart according to the present invention;

Figure 7 is an exploded perspective view showing the constituent parts and assembly of the two-piece coupler depicted in Figure 6;

Figure 8 is a cross-sectional view of a caster insert designed to be coupled to the bottom portion of a cart side member; and

Figure 9 is a perspective view of a cart showing storage bins attached thereto.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENT

The present invention provides a light-weight modular utility cart which is easy to manufacture and assemble. Ease of manufacture and assembly is achieved through the structural design of the cart components. Preferably, the major cart components are made of molded plastic and comprise one-piece, unitary, and integral structures.

Figure 1 is a perspective view of a modular utility cart according to the present invention depicting cart side panels or members 11 and 13, and a cart top 15. Each side member includes corner portions 17 and 19 and a depressed panel portion 21. The depressed panel portion 21 may include a plurality of corrugations horizontally disposed therein. In addition, each side member may include holes, hole plugs, pins 23 and 25 for holding accessories in a manner to be described later.

The cart also may include a storage grate 33 that retains products within the cart structure.

The cart may also include a plurality of casters 35 coupled thereto for swiveling movement within caster adapters 183. These structures will be described in more detail below.

In Figure 1, the top 15 shown is a so-called low-top member in which the horizontal surface 15a is depressed from the uppermost portion or handle 15b by approximately 4 inches to 1 foot. This design permits large pieces of equipment to be carried on the cart top 15 and permits easy access to such equipment.

Figure 1 also depicts seams 39 which comprise the interface between the side members 11 and 13 and the top member 15.

Figure 2 is a rear perspective view of a cart which has been modified somewhat from that shown in Figure 1. In Figure 2, side member 13 has coupled thereto a folding tray 41 and accessory grate 43. As noted above, side member 13 may include holes, hole plugs, or pins 23 and 25 adapted to mount various components like the tray 41 or grate 43. For purposes of illustration, the holes 25 are shown on the outside of the corner portion 19 in Figure 1 and holes 23 are shown on the outside of corner portion 17 in Figure 2. In the preferred embodiment, however, these holes would only be present on the insides of the respective

corner portions to provide a clean appearance and to provide a stop for any pin received therein from the insides of the corner portions. In Figure 2, the folding tray 41 includes a pin 45 which is inserted through holes 23 and 25 and forms the hinge for the tray 41. In addition, the folding tray 41 includes a second horizontally-disposed pin 47 which holds a supporting strut 49 that supports the folding tray 41 in a horizontal position. Persons of ordinary skill in this field will quickly perceive that the supporting strut 49 may be adapted to allow the tray 41 to fold to a vertical position where it is substantially flush with the corner portions of side member 13. For example, the support strut 49 may be decoupled from the undersurface of folding tray 41 and then both the tray 41 and the strut 49 may be folded downwardly. Alternatively, the pin 47 can be detachable from the corner portions of the side member 13 in order to allow the folding tray 41 and supporting strut 49 to be lowered.

The accessory grate 43 may also be coupled to the side member 13 through a horizontal pin 50. Accessory grate 43 can be used to carry oxygen tanks, waste receptacles, and the like. Those having ordinary skill in this field can readily understand that by providing a plurality of holes, hole plugs, or pins in the side portions of side member 13, a wide variety of wires, pins, grates, and similar structures, may be coupled to the cart side. This offers optimum flexibility to the end user to design the cart for a specific purpose.

Also depicted in Figure 2 is top member 51 which has a different configuration from the top member 15 shown in Figure 1. Specifically, the top member 51 is a so-called high-top structure. Thus, horizontal surface 51a is proximate to the uppermost surface or handle 51b by approximately 3 to 6 inches. It should be emphasized that either top member 15 or 51 may be coupled to the side members 11 and 13. Again, flexibility of ultimate use of the cart is provided by this structure of the present invention. Note also that the horizontal surface 51a may include a plurality of corrugations 51c which, for example, may be used to hold tubes, hypodermic needles, or other small pieces of equipment. Then, when the cart is moved, such pieces of equipment will not roll on or from the horizontal surface 51a.

In Figure 2, a back section 53 comprises a lower panel 55 and an upper panel 57. The lower panel 55 may be mounted on the side members through bolts 59 which also engage a tubular support structure 61, to be described later. Bottom panel 55 may also comprise a one-piece structure of molded plastic adapted to fit between side members 11 and 13. The bottom panel 55 includes a depressed portion 63 shaped to hold an electrical outlet bus 65 therein. The depressed portion 63

may also include a plurality of holes 67 which allow electrical wires to pass from inside the cart to the electrical outlet bus 65.

The top panel 57 of the back section 53 is configured to be removably mounted on side members 11 and 13. For example, the top panel 57 may include lips and/or edges designed to fit into corresponding structure on the side members. Persons of ordinary skill in this field will readily understand that many structures are available for removably attaching top panel 57 to the cart, and therefore, such structure will not be described in further detail. However, it is preferable that top panel 57 is also a one-piece structure comprising molded plastic. Note also that top panel 57 includes a plurality of ventilation holes 69 which allow ventilation of the top section of the cart. For example, in many applications, it is desirable to have electronic equipment carried at the top of the cart, and thus, such ventilation of the top portion of the cart is very useful.

Figure 2 also shows an accessory the support structure 61 that may comprise a U-shaped tubular support 71. Of course, the tubular support 71 may include two separate members, rather than one U-shaped structure. The tubular support 71 is bolted to the side members 11 and 13 with respective vertically extending lips 56 of the lower panel 55 of back section 53 sandwiched therebetween. Those of skill in this field will understand that any known and convenient method of attaching tubular support 71 to the cart may be used.

Accessory support structure 61 may also include one or more U-shaped accessory-holding channels 73. These channels 73 are designed to hold a wide variety of accessories and further accessory supports and will be described in greater detail later herein.

Figure 3 is a side elevational view of either side member 11 or 13, while Figure 4 is a bottom view thereof. As shown in Figure 3, each side member includes a depressed panel portion 21 and corner portions 17 and 19. The panel 21 extends to the top of the cart, while corner portions 17 and 19 extend only partway to the top. Thus, either a high-top member 15, or a low-top member 51, both provided with side sockets 58 (Figure 1), can be coupled to the side members 11 and 13 by being lowered over respective upper portions 76 of the panels 21. Note that each corner portion 17 and 19 terminates at seam 39 and includes intercoupling structures 75 which are configured to receive corresponding intercoupling structures on top member 15 or top member 51. Note also that depressed panel 21 includes coupling structures 77 which are configured to be received in corresponding coupling structures with the sockets 58 in top member 15 or top member 51.

It is to be understood that carts of different heights may be provided by the present invention by utilizing a single top configuration, like 51 shown in Figure 2, but by providing side members 11 and 13 of different heights.

Figure 3 also shows the horizontal corrugations in depressed panel 21. These corrugations may correspond to the location of the drawer rails on the other side of side member 11, to be discussed later herein.

Figure 4 shows the bottom portion 79 of side member 11. This bottom portion is preferably integral with corner portions 17 and 19 and depressed panel 21. Thus, each side member preferably comprises a one-piece structure which may be made of molded plastic. High-efficiency manufacturing and rapid assembly of carts may be achieved for reasons that will be apparent from the description provided below.

Bottom portion 79 of each side member 11 and 13 includes first and second inwardly projecting fingers 81 and 83. It will be appreciated that the fingers are evenly spaced and are separated by one channel 84. Another channel 86 is adjacent finger 81. Therefore, these fingers can be interlaced with corresponding projections from an identically formed side member 13 or 11 in order to complete a cart bottom. Thus, all that is necessary to form sides and a bottom for the cart are two, identical side members, assembled by pushing the fingers 81 and 83 of one side member into the corresponding channels 86 and 84 of the other side member in interlaced fashion. The two side members may be secured together by any suitable means like screws, bolts, or pop-rivets.

Figure 4 also shows a number of vertical structural supports 85 which provide the bottom portion 79 with increased load bearing capability.

Figure 4 still further shows caster sockets 87 and 89 which are preferably molded into bottom portion 79 when the side members are being molded. Caster sockets 87 and 89 are configured to receive caster adapters and casters as will be described below.

Figure 5 is a front view of side member 11 clearly showing integral bottom portion 79, projecting fingers 81, 83, holes 23, seam 39 and coupling structure 75. Drawer rails 31 are integral on the inside surface of side member 11. As can be seen, each drawer rail 31 is angled upwardly from a horizontal plane on the inside of the central portion 21. This upward angle presents a narrow edge 33 at the uppermost portion of each drawer rail. This uppermost edge is adapted to fit within a corresponding groove 105 in the drawer rollers shown in Figure 7 and to be described later herein. Each roller is also adapted to ride upon the uppermost edge of one drawer rail, while being guided by the

lower surface of the drawer rail immediately thereabove.

The drawer rails 31 are symmetrical with respect to a vertical center line of each side member so that each drawer can be inserted from either the front or back of the cart. Of course one or more modular back section 53 of the cart would be omitted if drawers were to be inserted from the back.

It should be stressed that the entire structure shown in Figure 5 preferably comprises a one-piece structure of molded plastic. Thus, the manufacturing operation is inexpensive and assembly of such a cart is very rapid.

Figure 6 is a close-up view of the tubular support 71 and U-shaped channel 73 shown in Figure 2. The U-shaped channel 73 comprises a base 111, two legs 113 and 115, and flanges 117 and 119. The base 111 is generally vertically disposed so that the flange 119 presents an upward-extending lip which may be used for coupling an accessory lip 121 thereto. Flanges 117 and 119 are coupled to screw taps 123 in the tubular support 71 with a plurality of screws 125 and 127.

The base 111 also includes a plurality of inverted L-shaped slots 129 which are adapted for holding accessories. Each slot 129 has at least five sides, preferably six, thereby to define a blank portion 130 for securely engaging accessories that may be attached thereto. For example, a surgical tape dispenser (to be described below) can be attached to L-shaped slots 129 in a secure fashion so that medical personnel can rapidly and safely extract tape without the dispenser becoming dislodged from the U-shaped channel 73.

Furthermore, the U-shaped channel 73 includes a plurality of oblong-shaped holes 131 in both the legs 113 and 115. Preferably, the holes 131 in each leg 113 are vertically aligned with corresponding holes in the other leg 115. Thus, vertical accessory support structures, like a twin-wire structure 133, may be inserted into holes 131. The twin wire structure may be formed by bending a single wire to create bottom loop 134 and parallel side wires 136. Such twin-wire support structure 133 may be used to hold a wide variety of accessories such as waste receptacles, lights, plasma bags, and the like. The oblong shape of holes 131 and the twin-wire support structure 133 combine to prevent the wire structure 133 from twisting or turning in the hole 131. Thus, a stable support is provided for accessories.

A plastic collar 135 may be inserted between vertically-aligned oblong holes 131 to add further support to the twin-wire structure 133, and to prevent wire structure 133 from marring or disfiguring the U-shaped channel 73. Those of skill in this field can readily understand that the tubular support 71



and U-shaped channel 73, together offer a wide variety of coupling structures adapted to hold an almost infinite variety of accessories. Thus, each user can configure the cart to serve a wide variety of uses.

Also depicted in Figure 6 is a two-piece coupler 137. This coupler basically comprises coupler sides 139 and 141, collars 143, 145, and three-wing knob 147. The two-piece coupler 137 defines two different-size holes therein. One hole is adapted to fit around tubular support 71, while the other hole is adapted to carry an accessory. The accessory may be a different smaller diameter tube, like an IV-pole, or may be a two-wire structure 133 adapted to fit inside collar 143.

Figure 7 is an exploded view of the two-piece coupler 137. As shown there, a carriage bolt 149 extends through bracket sides 139, 141, through a washer 151, and is threaded into the three-wing knob 147. Different size holes 153 and 155 defined by the assembled coupler sides 139 and 145, respectively hold collars 143 and 145. Each collar can comprise two identical plastic pieces which are linked together through coupling structures such as tabs 157 and holes 159.

The coupler side 141 can include nubs 161 therein. These nubs may be adapted to fit into recesses 163 located in each collar 143 and 145. This will prevent the collars 143 and 145 from being rotated within the holes 153 and 155 and hold the collar halves in the respective coupler sides. However, the nub and recess configuration can be omitted if it is desired that the collars be rotatable in the respective holes to provide flexibility in positioning accessories. It is noted that for purposes of illustration, the collars shown in Figure 9 are rotated 90 degrees from their positions in which they are assembled with the coupler sides. That is, in the preferred embodiment each collar half is received in one half of an associated hole in the coupler sides.

The collar 143 may include diametrically opposing, axially extending grooves 165 in each collar half. These grooves are dimensioned to securely grip a twin-wire support structure 133. This configuration provides yet another point at which accessories can be attached to the cart of the present invention with modular components.

Figure 8 is a cross-section view of caster adapter 183 which is designed to fit securely within caster sockets 87 and 89 of the cart side members, (Figure 4). Preferably, caster adapter 183 comprises an integral piece of molded plastic having a cylindrical steel liner 184 therein. In assembly, the vertical shaft of a known wheel and caster assembly (35 of Figure 1) is first inserted into the steel liner 184 of the caster adapter 183 and then the entire assembly is inserted into a caster socket.

The provision of a caster adapter allows the mass manufacturing of side members 11 and 13, and the later assembly of the casters and wheels. Caster adapter 183 also permits easy replacement and repair of the casters without defacing or marring side members 11 and 13. These structure also provides the necessary structural integrity for supporting the cart on the casters.

Figure 9 depicts the attachment of further accessories to the cart side. Specifically, storage bins 185 may be attached with horizontal pins 187 between corner projections 17 and 19 of a side member 11. Preferably, the storage bins each comprise a one-piece plastic material. As can be seen, the storage bins 185 have a storage position wherein an outer surface of the storage bin is substantially flush with corner portions 17 and 19. Storage bins 185 also have an open position wherein the storage bin is rotated out and downward in order to expose the inside of the bin. Such storage bins are readily accessible, yet quickly fold out of the way to provide a compact and versatile structure.

Thus, what has been described is a lightweight, flexible, and compact modular utility cart which is easy to manufacture and assemble. The design features of this cart permit the operator to configure it for a wide variety of uses. The end result is an inexpensive cart capable of being adapted to a broad range of uses, particularly in the medical field.

Claims

1. A modular cart comprising a pair of identical, rigidly formed, unitary side members (11, 13), each having a generally upstanding side portion integrally formed with a generally laterally extending bottom portion (79), said bottom portion (79) of each side member (11, 13) being formed with means (81, 83, 84, 86) for interengaging identical means formed with the bottom portion (79) of the other side member (11, 13), **characterized in that** said interengaging means (81, 83, 84, 86) on each said side member (11, 13) comprise first and second finers (81, 83) located asymmetrically and in side by side spaced relation in the longitudinal direction of said bottom portion (79) and projecting laterally from said bottom portion (79), said first and second fingers (81, 83) of each one of the pair of bottom portions (79) thereby being interlaceable with said first and second fingers (81, 83) of the other one of said bottom portions (79), whereby said bottom portions (79) define a bottom of said cart.
2. A cart according to claim 1, **characterized in that**



and U-shaped channel 73, together offer a wide variety of coupling structures adapted to hold an almost infinite variety of accessories. Thus, each user can configure the cart to serve a wide variety of uses.

Also depicted in Figure 6 is a two-piece coupler 137. This coupler basically comprises coupler sides 139 and 141, collars 143, 145, and three-wing knob 147. The two-piece coupler 137 defines two different-size holes therein. One hole is adapted to fit around tubular support 71, while the other hole is adapted to carry an accessory. The accessory may be a different smaller diameter tube, like an IV-pole, or may be a two-wire structure 133 adapted to fit inside collar 143.

Figure 7 is an exploded view of the two-piece coupler 137. As shown there, a carriage bolt 149 extends through bracket sides 139, 141, through a washer 151, and is threaded into the three-wing knob 147. Different size holes 153 and 155 defined by the assembled coupler sides 139 and 145, respectively hold collars 143 and 145. Each collar can comprise two identical plastic pieces which are linked together through coupling structures such as tabs 157 and holes 159.

The coupler side 141 can include nubs 161 therein. These nubs may be adapted to fit into recesses 163 located in each collar 143 and 145. This will prevent the collars 143 and 145 from being rotated within the holes 153 and 155 and hold the collar halves in the respective coupler sides. However, the nub and recess configuration can be omitted if it is desired that the collars be rotatable in the respective holes to provide flexibility in positioning accessories. It is noted that for purposes of illustration, the collars shown in Figure 9 are rotated 90 degrees from their positions in which they are assembled with the coupler sides. That is, in the preferred embodiment each collar half is received in one half of an associated hole in the coupler sides.

The collar 143 may include diametrically opposing, axially extending grooves 165 in each collar half. These grooves are dimensioned to securely grip a twin-wire support structure 133. This configuration provides yet another point at which accessories can be attached to the cart of the present invention with modular components.

Figure 8 is a cross-section view of caster adapter 183 which is designed to fit securely within caster sockets 87 and 89 of the cart side members, (Figure 4). Preferably, caster adapter 183 comprises an integral piece of molded plastic having a cylindrical steel liner 184 therein. In assembly, the vertical shaft of a known wheel and caster assembly (35 of Figure 1) is first inserted into the steel liner 184 of the caster adapter 183 and then the entire assembly is inserted into a caster socket.

The provision of a caster adapter allows the mass manufacturing of side members 11 and 13, and the later assembly of the casters and wheels. Caster adapter 183 also permits easy replacement and repair of the casters without defacing or marring side members 11 and 13. These structure also provides the necessary structural integrity for supporting the cart on the casters.

Figure 9 depicts the attachment of further accessories to the cart side. Specifically, storage bins 185 may be attached with horizontal pins 187 between corner projections 17 and 19 of a side member 11. Preferably, the storage bins each comprise a one-piece plastic material. As can be seen, the storage bins 185 have a storage position wherein an outer surface of the storage bin is substantially flush with corner portions 17 and 19. Storage bins 185 also have an open position wherein the storage bin is rotated out and downward in order to expose the inside of the bin. Such storage bins are readily accessible, yet quickly fold out of the way to provide a compact and versatile structure.

Thus, what has been described is a lightweight, flexible, and compact modular utility cart which is easy to manufacture and assemble. The design features of this cart permit the operator to configure it for a wide variety of uses. The end result is an inexpensive cart capable of being adapted to a broad range of uses, particularly in the medical field.

Claims

1. A modular cart comprising a pair of identical, rigidly formed, unitary side members (11, 13), each having a generally upstanding side portion integrally formed with a generally laterally extending bottom portion (79), said bottom portion (79) of each side member (11, 13) being formed with means (81, 83, 84, 86) for interengaging identical means formed with the bottom portion (79) of the other side member (11, 13), characterized in that said interengaging means (81, 83, 84, 86) on each said side member (11, 13) comprise first and second finers (81, 83) located asymmetrically and in side by side spaced relation in the longitudinal direction of said bottom portion (79) and projecting laterally from said bottom portion (79), said first and second finers (81, 83) of each one of the pair of bottom portions (79) thereby being interlaceable with said first and second finers (81, 83) of the other one of said bottom portions (79), whereby said bottom portions (79) define a bottom of said cart.
2. A cart according to claim 1, characterized in that



each side member (11, 13) includes a plurality of upwardly-angled rails (31).

3. A cart according to claim 1 or 2,
characterized in that
each side member (11, 13) has a corrugated outer surface (21).

4. A cart according to claim 3,
characterized in that
at least one of said side member outer surfaces (31) includes a pair of horizontally directed holes.

5. A cart according to anyone of claims 1 to 4,
characterized in that
each of said side members (11, 13) comprises a one-piece, molded plastic structure.

6. A cart according to anyone of claims 1 to 5,
characterized by
a top portion (15; 51) coupled to each of said side members (11, 13).

7. A cart according to claim 6,
characterized in that
said top portion is either a) a top portion (51) having a horizontal surface (51a) proximate the tops of said side members (11, 13), or b) a top portion (15) having a horizontal surface (15a) depressed from the tops of said side members (11, 13), wherein each of said side members (11, 13) is formed to be coupled to said top portion (15, 51).

8. A cart according to claim 6 or 7,
characterized by
a back section (53) coupled to said first and second side members (11, 13), said back section (53) comprising a fixed lower panel (55) and a removable upper panel (57).

9. A cart according to claim 8,
characterized in that
each of said upper and lower panels (55, 57) comprises a one-piece molded plastic structure.

10. A cart according to claim 8 or 9,
characterized in that
said upper panel (57) includes a plurality of ventilation holes (69).

11. A cart according to anyone of claims 8 to 10,
characterized in that
said lower panel (55) is formed with a) a depressed portion (63) adapted to contain an electrical outlet bus (65), and b) a hole in said

depressed portion adapted to pass electrical wires (67) therethrough.

12. A cart according to anyone of claims 8 to 11,
characterized in that
said back section (53) is bolted to said first and second side members (11, 13).

13. A cart according to claim 12,
characterized by
first and second vertical support tubes respectively coupled to left and right sides of said back section (53), said tubes having coupling structures adapted to couple accessories to said tubes.

14. A cart according to anyone of claims claim 6 to 13,
characterized in that
each bottom portion (79) includes first and second caster sockets (89) each adapted to hold a caster assembly (35, 37).

15. A cart according to claim 5 and 14,
characterized in that
each of said side members (11, 13) has the first and second caster sockets (89) molded therein.

16. A cart according to claim 14 or 15,
characterized by
first and second caster adapters (183) respectively inserted into said first and second caster sockets (89).

17. A cart according to claim 16,
characterized in that
each of said first and second caster adapters (183) comprises a one-piece molded plastic structure and a cylindrical metallic liner (184) therein.

18. A cart according to claim 16 or 17,
characterized by
first and second casters (35, 37) respectively inserted into said first and second caster adapters (183).

Patentansprüche

1. Modularer Wagen mit einem Paar identischer, stabil ausgebildeter, einheitlicher Seitenteile (11, 13), deren jedes einen generell aufwärts stehenden und ein Stück mit einem generell seitlich sich erstreckenden Bodenabschnitt (79) bildenden Seitenabschnitt aufweist, wobei am Bodenabschnitt (79) eines Seitenteils (11, 13) eine Einrichtung (81, 83, 84, 86) und am



- Bodenabschnitt (79) des anderen Seitenteils (13, 11) eine identische Einrichtung zum Ineinandergreifen ausgebildet sind, **dadurch gekennzeichnet, daß** die zum Ineinandergreifen vorgesehene Einrichtung (81, 83, 84, 86) jedes Seitenteils (11, 13) einen ersten und zweiten Finger (81, 83) aufweist, die asymmetrisch und in Längsrichtung des Bodenabschnitts (79) mit räumlichem Abstand nebeneinander angeordnet sind und seitlich vom Bodenabschnitt (79) vorstehen, wobei der erste und zweite Finger (81, 83) eines der beiden Bodenabschnitte (79) und der erste und zweite Finger (81, 83) des anderen Bodenabschnitts (79) ineinandergreifen können, so daß die Bodenabschnitte (79) einen Boden des Wagens definieren.
2. Wagen nach Anspruch 1, **dadurch gekennzeichnet,** daß jedes Seitenteil (11, 13) mehrere aufwärts gewinkelte Schienen (31) aufweist.
 3. Wagen nach Anspruch 1 oder 2, **dadurch gekennzeichnet,** daß jedes Seitenteil (11, 13) eine gewellte Außenfläche (21) aufweist.
 4. Wagen nach Anspruch 3, **dadurch gekennzeichnet,** daß wenigstens eine der Seitenteil-Außenflächen (21) ein Paar horizontal ausgerichteter Löcher aufweist.
 5. Wagen nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet,** daß jedes der Seitenteile (11, 13) eine einstückige, gegossene Kunststoffstruktur aufweist.
 6. Wagen nach einem der Ansprüche 1 bis 5, **gekennzeichnet durch,** ein an jedes der Seitenteile (11, 13) gekoppeltes oberes Teil (15, 51).
 7. Wagen nach Anspruch 6, **dadurch gekennzeichnet,** daß das obere Teil entweder
 - a) ein oberes Teil (51) mit einer dem oberen Ende der Seitenteile (11, 13) benachbarten horizontalen Fläche (51a) oder
 - b) ein oberes Teil (15) mit einer gegenüber dem oberen Ende der Seitenteile (11, 13) tieferliegenden horizontalen Fläche (25a) ist, wobei jedes der Seitenteile (11, 13) so ausgebildet ist, daß es an das obere Teil (15, 51) kuppelbar ist.
 8. Wagen nach Anspruch 6 oder 7, **gekennzeichnet durch,** einen an das erste und zweite Seitenteil (11, 13) gekoppelten Rückabschnitt (53) mit einer fixierten unteren Platte (55) und einer abnehmbaren oberen Platte (57).
 9. Wagen nach Anspruch 8, **dadurch gekennzeichnet,** daß jede der beiden Platten (55, 57) eine einstückige gegossene Kunststoffstruktur aufweist.
 10. Wagen nach Anspruch 8, **dadurch gekennzeichnet,** daß die obere Platte (57) mehrere Belüftungslöcher (69) aufweist.
 11. Wagen nach einem der Ansprüche 8 bis 10, **dadurch gekennzeichnet,** daß die untere Platte (55)
 - a) einen vertieften Abschnitt (63), der einen elektrischen Ausgabebus (65) enthält, aufweist, und daß
 - b) in dem vertieften Abschnitt eine Öffnung derart ausgebildet ist, daß elektrische Drähte (67) hindurchpassen.
 12. Wagen nach einem der Ansprüche 8 bis 11, **dadurch gekennzeichnet,** daß der Rückabschnitt (53) an das erste und zweite Seitenteil (11, 13) geschraubt ist.
 13. Wagen nach Anspruch 12, **dadurch gekennzeichnet,** daß an die linke und rechte Seite des Rückabschnittes (53) jeweils ein vertikales Stützrohr gekoppelt ist, wobei die Rohre eine Koppereinrichtung zum Ankoppeln von Zubehör an die Rohre aufweist.
 14. Wagen nach einem der Ansprüche 6 bis 13, **dadurch gekennzeichnet,** daß jeder Bodenabschnitt (79) einen ersten und zweiten Rollhalter (89) aufweist, deren jeder zum Halten einer Rolleneinrichtung (35, 37) vorgesehen ist.
 15. Wagen nach Anspruch 5 und 14, **dadurch gekennzeichnet,** daß die beiden Rollhalter (89) in jeweils ein Seitenteil (11, 13) gegossen sind.
 16. Wagen nach Anspruch 14 oder 15, **dadurch gekennzeichnet,** daß in den ersten und zweiten Rollhalter (89) jeweils ein Rollenaufnehmer (183) eingesetzt ist.



17. Wagen nach Anspruch 16, dadurch gekennzeichnet, daß die beiden Rollenaufnehmer (183) jeweils eine einstückige gegossene Kunststoffstruktur und einen zylindrischen metallischen Einsatz (184) aufweisen.

18. Wagen nach Anspruch 16 oder 17, gekennzeichnet durch, eine in den ersten und zweiten Rollenaufnehmer (183) eingesetzte erste und zweite Rolle (35, 37).

Revendications

1. Chariot modulaire comportant une paire d'éléments latéraux (11, 13) en une seule pièce, identiques, formés de manière rigide, ayant chacun une partie latérale dirigée de manière générale vers le haut formée en une seule pièce avec une partie de fond (79) s'étendant de manière générale latéralement, ladite partie de fond (79) de chaque élément latéral (11, 13) étant formée de moyens (81, 83, 84, 86) de coopération mutuelle avec des moyens identiques formés par la partie de fond (79) de l'autre élément latéral (11, 13),
caractérisé en ce que
lesdits moyens de coopération mutuelle (81, 83, 84, 86) situés sur chacun desdits éléments latéraux (11, 13) comportent des premier et second doigts (81, 83) situés de manière asymétrique et côte à côte en étant écartés dans la direction longitudinale de ladite partie de fond (79) et faisant saillie latéralement à partir de ladite partie de fond (79), lesdits premier et second doigts (81, 83) de chaque partie de la paire de parties de fond (79) pouvant par conséquent être entrelacés avec lesdits premier et second doigts (81, 83) de l'autre partie desdites parties de fond (79), de sorte que lesdites parties de fond (79) définissent un fond dudit chariot.
2. Chariot selon la revendication 1, caractérisé en ce que chaque élément latéral (11, 13) comporte plusieurs rails (31) inclinés vers le haut.
3. Chariot selon la revendication 1 ou 2, caractérisé en ce que chaque élément latéral (11, 13) a une surface extérieure (21) nervurée.
4. Chariot selon la revendication 3, caractérisé en ce qu'au moins une surface parmi lesdites surfaces extérieures (21) d'élément latéral comporte une paire de trous dirigés horizontalement.
5. Chariot selon l'une quelconque des revendications 1 à 4, caractérisé en ce que chacun desdits éléments latéraux (11, 13) comprend une structure en une seule pièce en matière plastique moulée.
6. Chariot selon l'une quelconque des revendications 1 à 5, caractérisé en ce qu'il comporte une partie supérieure (15; 51) reliée à chacun desdits éléments latéraux (11, 13).
7. Chariot selon la revendication 6, caractérisé en ce que ladite partie supérieure est a) une partie supérieure (51) ayant une surface horizontale (51a) située à proximité des parties supérieures desdits éléments latéraux (11, 13) ou b) une partie supérieure (15) ayant une surface horizontale (15a) en creux à partir des extrémités supérieures desdits éléments latéraux (11, 13), chacun desdits éléments latéraux (11, 13) étant formé pour être relié à ladite partie supérieure (15, 51).
8. Chariot selon l'une quelconque des revendications 6 ou 7, caractérisé en ce qu'un tronçon arrière (53) est relié auxdits premier et second éléments latéraux (11, 13), ledit tronçon arrière (53) comportant un panneau inférieur fixe (55) et un panneau supérieur amovible (57).
9. Chariot selon la revendication 8, caractérisé en ce que chacun desdits panneaux supérieur et inférieur (55, 57) est constitué d'une structure en une seule pièce de matière plastique moulée.
10. Chariot selon la revendication 8 ou 9, caractérisé en ce que ledit panneau supérieur (57) comporte plusieurs trous de ventilation (69).
11. Chariot selon l'une quelconque des revendications 8 à 10, caractérisé en ce que ledit panneau inférieur (55) est formé a) d'une partie en creux (63) adaptée pour contenir un bus de sortie électrique (65) et b) d'un trou situé dans ladite partie en creux, adapté pour laisser passer des fils électriques (67) traversants.
12. Chariot selon l'une quelconque des revendications 8 à 11, caractérisé en ce que ledit tronçon arrière (53) est boulonné sur lesdits premier et second éléments latéraux (11, 13).
13. Chariot selon la revendication 12, caractérisé en ce qu'un premier et un second tubes de support verticaux sont reliés respectivement aux côtés gauche et droit dudit tronçon arrière (53), lesdits tubes ayant des structures d'ac-



couplement adaptées pour accoupler des accessoires sur lesdits tubes.

14. Chariot sel on l'une quelconque des revendications 6 à 13, caractérisé en ce que chaque partie de fond (79) comporte une première et une seconde douilles pour roulette (89), chacune étant adaptée pour retenir un ensemble formant roulette (35, 37). 5
15. Chariot selon les revendications 5 et 14, caractérisé en ce chacun desdits éléments latéraux (11, 13) comporte une première et une seconde douilles pour roulette (89) moulées dans ceux-ci. 10 15
16. Chariot sel on la revendication 14 ou 15, caractérisé en ce qu'un premier et un second adaptateurs de roulette (183) sont insérés respectivement dans lesdites première et seconde douilles pour roulette (89). 20
17. Chariot selon la revendication 16, caractérisé en ce que chacun desdits premier et seconds adaptateurs de roulette (183) comprend une structure en une seule pièce de matière plastique moulée et un revêtement métallique cylindrique (184) agencé dans celle-ci. 25
18. Chariot selon la revendication 16 ou 17, caractérisé en ce qu'une première et une seconde roulettes (35, 37) sont insérées respectivement à l'intérieur desdits premier et second adaptateurs de roulette (183). 30

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