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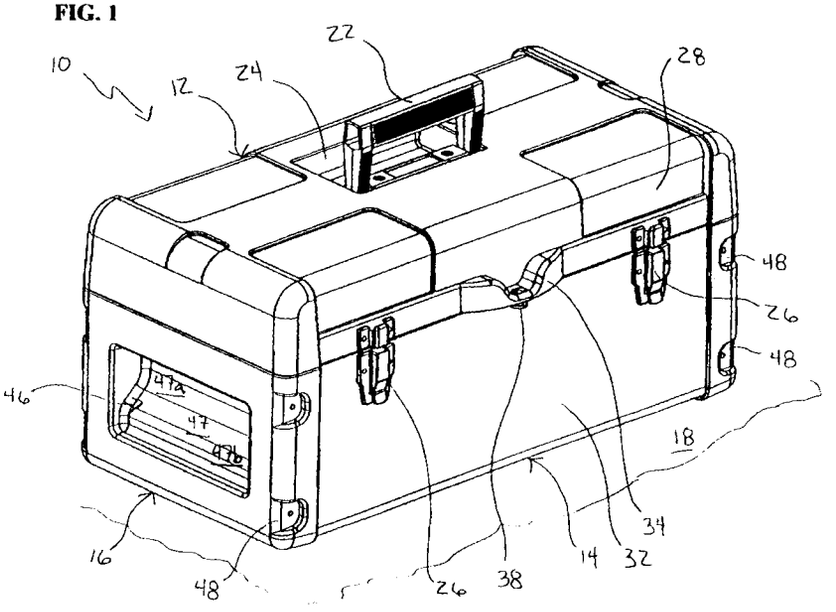
(54) Tool Box

(57) The present invention relates generally to a storage container, and specifically to a tool box having increased impact and wear resistance. A tool box (10) is provided having a lid (12) hingedly affixed to a body (14) having a bottom (54), front wall (32) and a rear wall (56). A pair of end caps (16) operably associated with the body recess the bottom of the body (14) from the resting surface. In the preferred embodiment, the body (14) is a unitary member and is constructed from a rigid metal such as steel, and the end caps (16) are manufactured from an impact resistant material such as a thermoplastic. The body (14), the lid (12) and end caps (16) define an interior region. A compartmentalized tray (104) is supported within the interior region by a first resting surface (78) and a second resting surface (82).

FIG. 1



EP 1 283 093 A1

Description

[0001] The present invention relates generally to a storage container, and specifically to a tool box having increased impact and wear resistance. Many types of storage containers have been devised for storing articles of various shapes and sizes. One common type of storage container is a "tool box". Most conventional tool boxes are typically used to store and/or transport tools such as hammers, screw drivers and the like.

[0002] Conventional tool boxes typically include a bottom portion pivotally attached to a lid, and are usually constructed from a plurality of steel parts which are secured together by any suitable means, such as welding. In particular, a bottom portion for such a conventional tool box may include as many as five pieces, depending upon the size of the tool box. Thus, the bottom portion may include a front wall, a rear wall, a bottom, and two side walls, each welded to the other at their adjoining edges. This construction is expensive and time consuming, because it requires a large number of parts and also requires a number of costly and time-consuming assembly steps.

[0003] Because conventional tool boxes are typically completely constructed from steel, they are often quite heavy. In addition, during normal use, the edges and side walls of a conventional tool box are frequently subject to forceful blows from tools, construction materials and the like, and are subject to collisions between the tool box and a stationary object (i.e., workbench or wall) during movement of the tool box from one location to another. Such forceful blows cause visible wear to the tool box (i.e., dents and the like), and also weaken the structural integrity of the tool box.

[0004] A conventional tool box is usually constructed so that the bottom directly contacts the resting surface. Such tool boxes are wholly inadequate for two reasons. First, direct contact between the bottom and resting surface causes wear to the bottom, therefore eventually reducing the structural integrity of the tool box. Second, moisture, chemical residues and the like which are present on the resting surface contact the bottom, causing the bottom to corrode over time. Such corrosion likewise eventually reduces the structural integrity of the tool box.

[0005] Therefore, it is a first object of the present invention to provide a tool box having a metal bottom recessed away from the resting surface.

[0006] It is a second object of the present invention to provide a tool box having a substantially impact resistant lid and ends.

[0007] It is a third object of the present invention to provide a tool box which is lightweight.

[0008] It is a further object of the present invention to provide a tool box which is easy and economical to manufacture.

[0009] It is another object of the present invention to provide a method of manufacturing a tool box.

[0010] The above-listed objects are met or exceeded by the present apparatus for storing objects such as tools and the like. A tool box is provided having a lid hingedly affixed to a body having a bottom, front wall and a rear wall. A pair of end caps are operably associated with the body and recess the bottom of the body from the resting surface. In the preferred embodiment, the body is a unitary member constructed from a rigid metal such as steel, and the end caps are manufactured from a substantially impact resistant material such as a thermoplastic. The body, the lid and end caps define an interior region. A compartmentalized tray is supported within the interior region by a first resting surface and a second resting surface.

[0011] Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings in which:

[0012] FIG. 1 is a perspective view of a tool box of the present invention showing a lid in a closed position.

[0013] FIG. 2 is an exploded perspective view showing an end cap and a body, and the assembly thereof.

[0014] FIG. 3 is a perspective view of a partially assembled tool box showing the end cap, body and hinge.

[0015] FIG. 4 is a perspective view of the tool box showing the lid in an open position.

[0016] While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail, one specific embodiment, with the understanding that the present disclosure is to be considered merely an exemplification of the principles of the invention and is not intended to limit the invention only to the embodiment illustrated.

[0017] As shown in FIG. 1 and as previously mentioned, a tool box 10 of the present invention includes a lid 12 pivotally attached to a body 14 by a hinge 15 (see FIGS. 3 and 4) or otherwise suitable means. A pair of substantially identical end caps 16 fixedly connected to the body 14 recess the bottom surface (not shown) of the body 14 from a resting surface 18, thereby substantially preventing contact between the resting surface 18 and the bottom surface of the body 14. It is preferred that the end caps 16 be manufactured from a substantially impact resistant material, preferably a thermoplastic, so as to reduce the weight of the tool box 10 and to increase the impact resistance of the tool box 10. For the same reasons, lid 12 can be formed of the same material as the end caps. Ribs 19 (see FIG. 4) can be formed into lid 12 for structural support or merely for appearance purposes.

[0018] A graspable handle 22 pivotally attached to the outer surface of the lid 12 provides a means for carrying the tool box 10, and for opening and closing the tool box 10. The handle 22 pivots downward into a handle recess region 24 when not in use.

[0019] To secure the lid 12 in a closed position, a pair of latching members 26 are fixedly secured to the front walls 28, 32 of the lid 12 and body 14, respectively. Other

types of locks or clasps can also be used. A locking subassembly 34 is also provided for lockingly securing the lid 12 in the closed position. In the preferred embodiment, the locking subassembly 32 includes a locking lip 34 extending from the lid front wall 28, and a locking tab 38 extending from the body front wall 32. The locking lip 34 and the locking tab 38 are each provided with corresponding apertures 42, 44 (see FIG. 4) for receiving a shank of a lock (not shown).

[0020] Each end cap 16 is provided with an end cap recessed region 46 in which the user can insert his or her fingers to facilitate lifting of the tool box 10. The surface 47 of the recessed region 46 is curved and the top portion 47a is deeper at the top than at the bottom portion 47b, when viewed as in FIG. 1. As will be further explained herein below, the end caps 16 are secured to the body 14 using attachment means such as screws, nut and bolt combinations, or rivets. A plurality of indented regions 48 are provided for recessing the attachment means. Recessing the attachment means substantially reduces the risk of collision between the attachment means and an object (such as a wall or workbench during movement of the tool box 10 from one location to another). While partially round indented regions 48 are shown, other shapes could be used.

[0021] Referring to FIG. 2, in addition to the front wall 32, the body 14 includes a bottom 54 and rear wall 56. In the preferred embodiment, the body 14 is a substantially U-shaped, unitary member formed from a single sheet of metal, preferably steel, such as sheet metal.

[0022] The ends of the front wall 32, bottom 54 and rear wall 56 have flanged edges 58, 62 and 64, respectively. Flanged edges 58, 62 and 64 are recessed inwardly from outer faces of front wall 32, bottom 54 and rear wall 56, due to ledges 59, 63, 65. Corresponding attachment means apertures 66, 68 are provided on the front and rear wall edges 58, 64 and end caps 16, respectively, for receiving attachment means. Apertures 66 and 68 pass through the indented regions 48. Indented regions 48 have inner surfaces 69, which provide a support region displaced inwardly from the outside of end cap 16, for support of edges 58, 62 and 64 so as to provide a tighter fit between the body 14 and end caps 16. In the preferred embodiment, the attachment means are rivets 72. However, alternate attachment means for attaching the end caps 16 to the body 14 could be employed, such as screws, nut and bolt combinations, screws and the like.

[0023] Referring to FIGS. 2 and 3 in combination, to facilitate alignment of the attachment means apertures 66, 68 during assembly, one or more locating tabs 74 extending from the end caps 16 are inserted into corresponding locking tab apertures 76 located on the ledges 59, 65 of the body front and rear wall edges 58, 64, respectively.

[0024] The interior surface of the end caps 16 include a first tray support 78 and a second tray support 82 for supporting a compartmentalized tray 104 (see FIG. 4) within the interior region of the tool box 10. The first tray support 78 is formed from the upper portion of the inside surface of the cap recessed region 46. The second tray support 82 is a lip extending from the inside surface of the end cap 16. Ribs 83 can also be formed into the interior of end caps 16 for support.

[0025] Pivot means for pivotally attaching the body 14 to the lid 12 is provided. In the preferred embodiment, the pivot means is a continuous hinge 15 fixedly attached to the rear wall upper edge 86 (see FIG. 3) by welding, riveting, nut and bolt combinations, screws, piano hinges, or the like, and to the inside surface of the lid 12 (see FIG. 4) using attachment means. It is preferred that pop rivets 72 be employed to fixedly attach the hinge 15 to the lid 12, and welding or pop rivets 72 be employed to fixedly attach the hinge 15 to the body 14, however alternate means may be employed (i.e., welding, nut and bolt combinations, piano hinges, screws and the like). A plurality of gussets 88 on the inside surface of the lid 12 are provided for substantially reducing stress to the hinge 15, lid 12 and attachment means when the lid 12 is in the open position, and for limiting the pivotal range of lid 12.

[0026] Referring to FIGS. 2 through 4 in combination, assembly of the tool box 10 will now be described. First, the body 14 is formed from a suitable material. In the preferred embodiment, the body 14 is formed from a single piece of metal, preferably stainless steel, into the shape shown in FIG. 2.

[0027] After the body 14 is formed to the shape shown in FIG. 2, the hinge 15 is fixedly secured to the rear wall upper edge 86. Where the body 14 is formed from a metal other than stainless steel, it is preferred that the hinge 15 be welded to the rear wall upper edge 86. Where the body 14 is formed from stainless steel, it is preferred that the hinge 15 be secured to the rear wall upper edge 86 using pop rivets 72. However, the invention is not so limited. In either case, the hinge 15 can be secured to the rear wall upper edge 86 using pop rivets 72, nut and bolt combinations, screws, piano hinges, or the like, and/or by welding the hinge 15 thereto.

[0028] The locking tab 38 is fixedly secured to the outside surface of the front wall 32 of the body 14. It is preferred that the locking tab 38 include a welding tab 92 (shown in FIG. 3) which extends substantially parallel to the front wall 32. Alternatively, the welding tab 92 is inserted into a welding tab aperture 94 (FIG. 2) located on the upper portion of the front wall 32, and then secured to the inside surface (not shown) of the front wall 32.

[0029] Where the body 14 is formed from a metal other than stainless steel, it is preferred that the locking tab 38 be welded to the outside or inside surface of the front wall 32. Where the body 14 is formed from stainless steel, it is preferred that the locking tab 38 be secured to the outside or inside surface of the front wall 32 using pop rivets 72. However, the invention is not so limited. In either case, the locking tab 38 can be secured to the

outside or inside surface of the front wall 32 using pop rivets 72, nut and bolt combinations, screws, or the like, and/or by welding the locking tab 38 thereto.

[0030] Where the body 14 is formed from a metal other than stainless steel, the body 14/hinge 15/locking tab 38 combination is then painted. In either case, the end caps 16 are then matingly engaged with the body 14 by inserting the locating tabs 74 into the corresponding locking tab apertures 76, thereby aligning the attachment means apertures 66, 68. Attachment means, preferably pop rivets 72, are thereafter inserted into the attachment means apertures 66, 68, fixedly securing the end caps 16 to the body 14. Finally, the latching members 26 are fixedly attached to the front wall 32 and lid 12, preferably using pop rivets 72.

[0031] The foregoing description of an embodiment of the invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or to limit the invention to the precise form disclosed. The description was selected to best explain the principles of the invention and practical application of these principles to enable others skilled in the art to best utilize the invention in various embodiments and various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention not be limited by the specification, but be defined by the claims as set forth below.

Claims

1. A tool box capable of resting on a resting surface, comprising:

a lid pivotally attached to a body having a bottom; and
at least one end cap operably associated with said body and having an end cap bottom surface;

wherein said body, said lid and said at least one end cap define an interior region; and
wherein said at least one end cap is manufactured from a substantially impact resistant material.

2. The tool box of claim 1, wherein said body and said at least one end cap operably associate so as to recess said bottom of said body from the resting surface when said end cap bottom surface is placed thereon.

3. The tool box of claim 1 or 2, wherein said lid is manufactured from a substantially impact resistant material.

4. The tool box of claim 1, 2 or 3, further comprising a hinge interposed between said lid and said body for pivotally attaching said lid to said body; wherein said hinge is welded to said body.

5. The tool box of claim 1, 2 or 3, further comprising a hinge interposed between said lid and said body for pivotally attaching said lid to said body; wherein said hinge is riveted to said body.

6. A tool box, comprising:

a lid pivotally attached to a body having a bottom:

at least one end cap operably associated with said body and having an end cap bottom surface and a locating tab for facilitating mating of said at least one end cap with said body;
said body having at least one flanged end having a locating tab aperture corresponding to said locating tab;
said body, said lid and said at least one end cap defining an interior region;
said body and said at least one end cap operably associated so as to recess said bottom of said body from a resting surface when said end cap bottom surface is placed thereon.

7. The tool box of claim 6, wherein said at least one end cap is manufactured from a substantially impact resistant material.

8. The tool box of any one of claims 1 to 7, wherein said body is a unitary member.

9. The tool box of any one of claims 1 to 8, wherein said tool box comprises two end caps.

10. A tool box capable of resting on a surface, comprising:

unitary body means;
impact resistant end cap means operatively attached to the body means;
lid means pivotally attached by hinge means to said body means; and

wherein said body means and the end cap means cooperate to recess said body means from the surface when placed thereon.

11. The tool box of any one of claims 1 to 5 or claims 8 to 10, wherein said body includes flanged ends having at least one locating tab aperture, and said at least one end cap includes a corresponding locating tab for facilitating mating of said at least one end cap with said body.

12. The tool box of any one of claims 1 to 11, wherein said body is formed from a single sheet of metal.

13. The tool box of any one of claims 1 to 12, wherein said at least one end cap is manufactured from a thermoplastic.

14. The tool box of any one of claims 1 to 13, further comprising a tray supported within said interior portion.

15. The tool box of any one of claims 1 to 14, wherein said at least one end cap includes a recessed region on its exterior for facilitating lifting, and for providing on its interior a first support surface for said tray.

16. The tool box of any one of claims 1 to 15, wherein said at least one end cap includes a second support surface for said tray.

17. A method for assembling a tool box, comprising:

providing a body having a front wall, a rear wall, a bottom and an end having a locating tab aperture;
providing an end cap having a locating tab corresponding to said locating tab aperture for facilitating assembly;
inserting said locating tab into said locating tab aperture;
fixedly securing said end cap to said body; and
pivotally attaching a lid to said body.

18. A method for manufacturing a tool box, comprising the steps of:

forming a metal body having a front wall and a rear wall:

attaching a hinge to said rear wall of said metal body;
attaching a locking tab to said front wall of said metal body;
attaching at least one end cap to said metal body;
attaching a lid to said hinge; and
attaching at least one latch to said metal body.

19. The method of claim 18, wherein said hinge is attached to said rear wall of said metal body by an attachment means selected from the group consisting of welding, nut and bolt combinations, screws, piano hinges, and rivets.

20. The method of claims 18 or 19, wherein said locking tab is attached to said metal body by an attachment means selected from the group consisting of welding, nut and bolt combinations, screws, and rivets.

21. The method of claims 18, 19 or 20, further comprising the step of painting said metal body, said locking tab and said hinge, in combination.

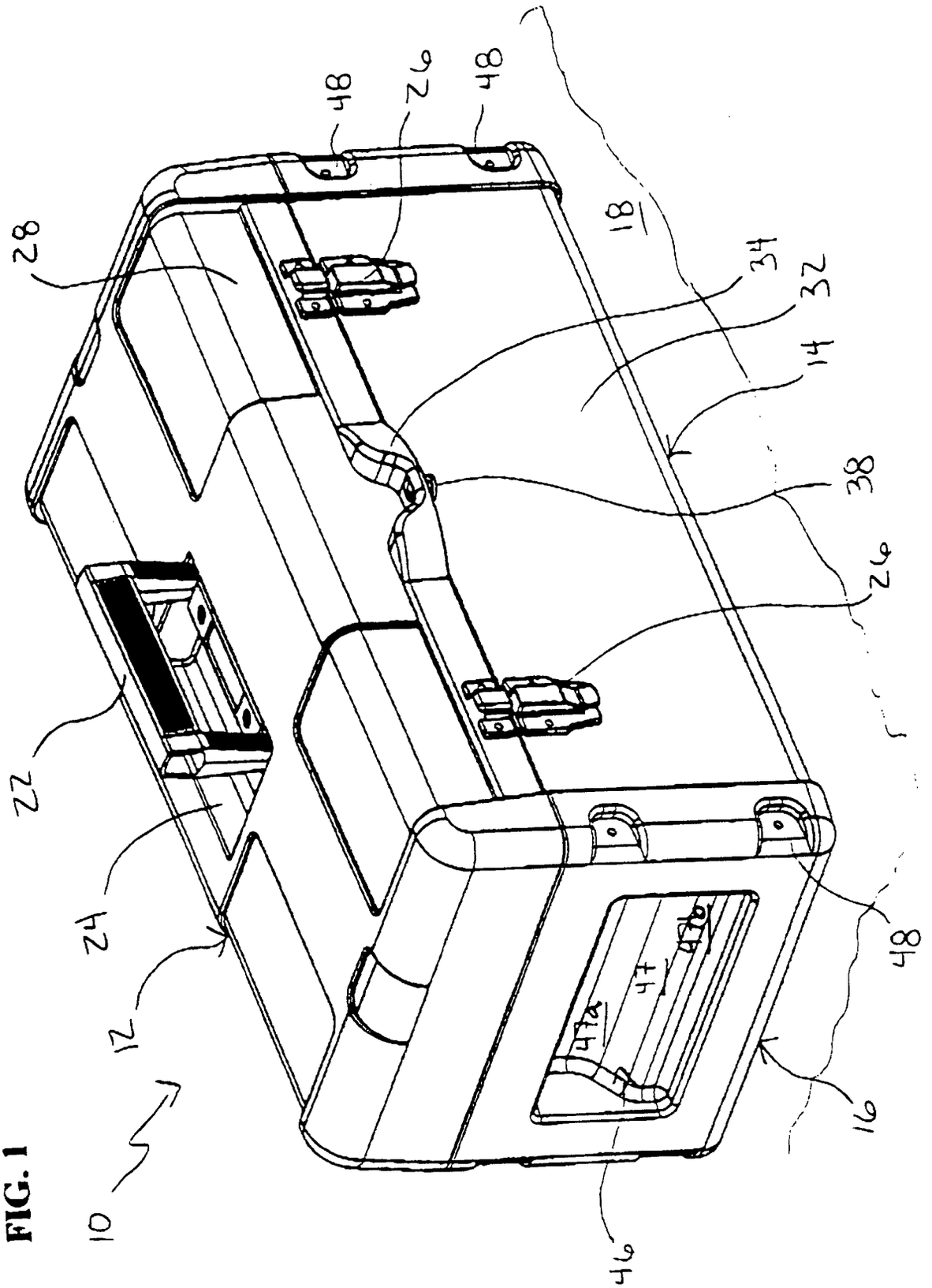


FIG. 1

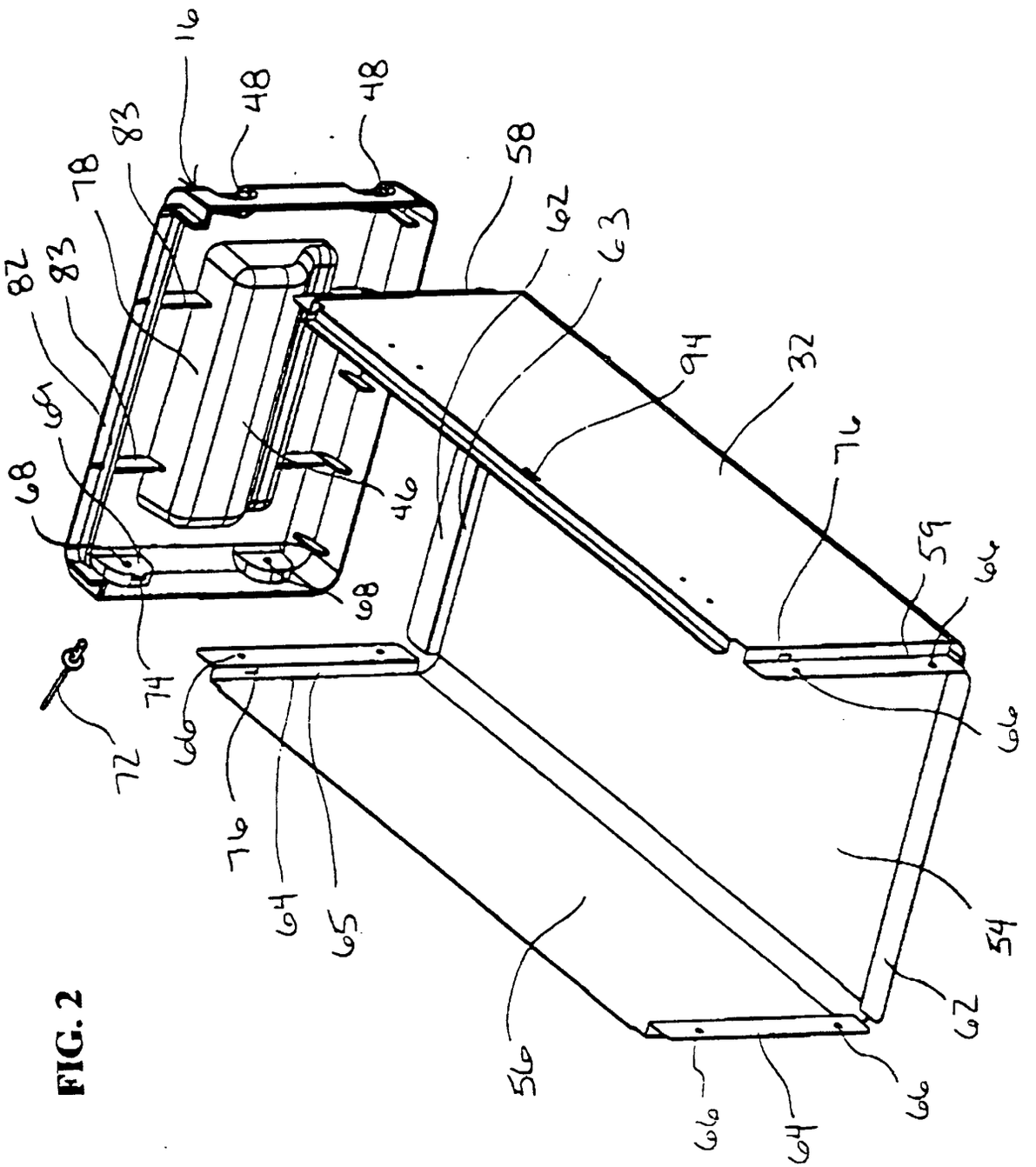

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FIG. 2

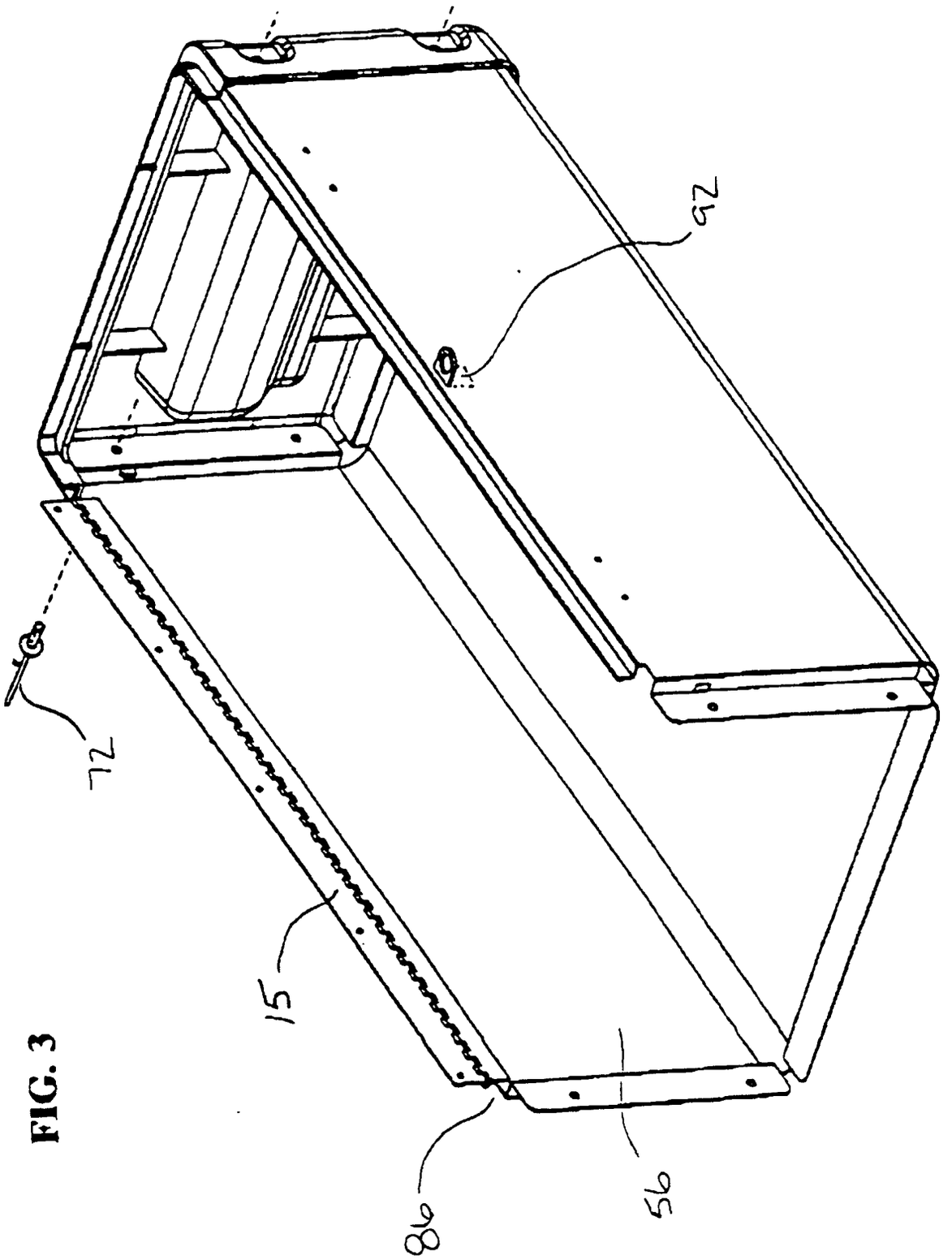
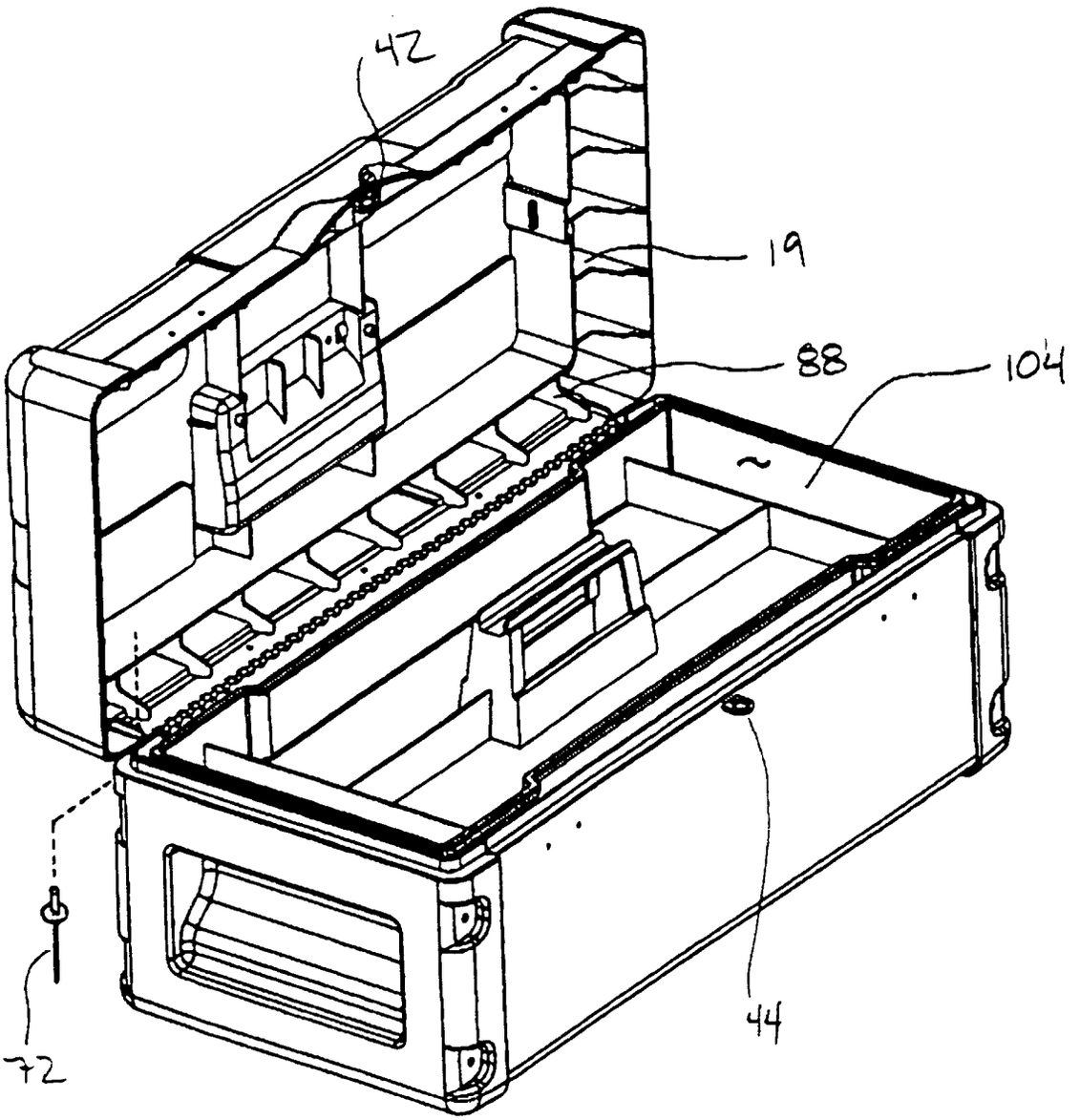


FIG. 3

FIG. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 02 25 5568

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 101 574 A (HU) 23 May 2001 (2001-05-23) * column 3, line 35-43 * * column 3, line 51-55 * * column 4, line 36-44; figures *	1-3, 8-10,12, 13	B25H3/02
A		6,7,11, 17	
X	US 3 746 210 A (EVANS) 17 July 1973 (1973-07-17) * abstract * * column 2, line 6-17; figures *	1-3,10, 12	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21 November 2002	Matzdorf, U

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 25 5568

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