TOOL-ELEMENT HOLDING CASE

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ABSTRACT

Tool trays (46, 48, 50, 52) are fitted into inner compartments (18, 20) in carrying case parts (12, 14). A plurality of lugs (L) on the side walls of inner compartments (18, 20) in the carrying case parts (12, 14) cooperate with a limited number of sockets (S) in wall portions of the tool trays (46, 48, 50, 52). The tool trays are snap-fitted downwardly into the inner compartments (18, 20). As the tool trays (46, 48, 50, 52) move downwardly, the lugs (L) move into the sockets (S). When the trays (46, 48, 50, 52) are within the compartments (18, 20) the upper end portions (44) of the lugs (L) will be above end wall portions (66) of the sockets (S). They will be positioned to block unwanted movement of the holders (46, 48, 50, 52) out from the inner compartments (18, 20). However, the trays (46, 48, 50, 52) can be easily pulled out from the compartments (18, 20). The lugs (L) and sockets (S) act as detents for removably securing the trays (46, 48, 50, 52) within the inner compartments (18, 20).
TOOL-ELEMENT HOLDING CASE

TECHNICAL FIELD

This invention relates to a tool case for holding small tool-elements such as drill bits, screwdriver tips, etc. More particularly, it relates to a holding case for holding a plurality of tool-element holding trays. Each holding tray fits within an inner compartment in the tool case. Each holding tray is removably secured to the holding case and when removed from the inner compartment in the holding case will continue to serve as a container for the tool-elements that it holds.

BACKGROUND OF THE INVENTION

It is common practice to house small tool-elements such as drill bits, screwdriver tips, etc. in plastic containers. The plastic containers are made in different sizes depending on the number and size of the tool-elements that each is to hold. There is a need for a tool-element holding system in which relatively small numbers of related tool-elements (e.g. drill bits) are contained in a tool-element holding tray and a plurality of the holding trays are removably contained in a larger tool case. A principal object of this invention is to fill this need.

BRIEF SUMMARY OF THE INVENTION

A tool-element holding case of the present invention is basically characterized by first and second outer case parts together forming at least one inner compartment having a bottom and side walls. At least one tool-element holding tray is fitable in said inner compartment. A plurality of lug-and-socket connectors are provided for releasably connecting the tool-element tray to side wall portions of the inner compartment when the tool-element tray is in the inner compartment. The lugs are on either the tool-element tray or the side wall portions of the compartment and the sockets are on the other. The tool-element tray is pushed down into the inner compartment to move the lugs into holding engagement with the sockets. The tool-element tray can be pulled out from the inner compartment. In response to a pull force applied to the tray, the lugs will move out from the sockets and allow the tool-element tray to move out from the compartment.

In preferred form, the first and second outer case parts are hinge connected together. They are moveable between an open position in which they are in coplanar parallelism and a closed position in which one of the case parts is positioned on the other.

In preferred form, the holding case includes a handle that is connected to at least one of the outer case parts. This handle may comprise two handle parts, one connected to the first outer case part and the second connected to the second outer case part. When the case parts are in their closed position, the two handle parts are together and together form a handle.

An aspect of the invention is to provide two or more tool-element holding trays for the compartment. Two tool-element trays may be hinged together so that they are moveable between a first position in which they are in coplanar parallelism within the compartment and a second closed position in which one of the holding trays is positioned on the other.

In the preferred embodiment, the lugs are on side wall portions of the compartment and the sockets are formed in outer side wall portions of the holding trays. Each lug has a rounded upper end portion that projects laterally inwardly from the side wall of the compartment into the compartment. The tray has a rounded lower portion that cooperates with the rounded end of the lug when the tray is being pushed downwardly. This allows the tray to be pushed downwardly past the lugs. The sockets have an end wall positioned below the rounded ends of the lugs when the tray is in the compartment. The engagement of the end walls of the sockets with the rounded end portions of the lugs functions to hold the tray in the compartment. However, when an upward force is applied to the tray, the end walls of the sockets will move along the curved surfaces of the end portions of the lugs, allowing the tray to move past the rounded end portion of the lugs and outwardly from the compartment.

Other objects, advantages and features of the invention will become apparent from the description of the best mode set forth below, from the drawings, from the claims and from the principles that are embodied in the specific structures that are illustrated and described.

DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

Like reference numerals are used to designate like parts throughout the several views of the drawing, and:

FIG. 1 is an exploded pictorial view showing a tool case in an open position, and exposing upwardly opening compartments, and four tool-element holding trays, two for each compartment, shown spaced above their positions in the compartments;

FIG. 2 is an end elevational view of one-half of the tool case, showing a tool-element holding tray spaced above its compartment in the tool case;

FIG. 3 is an enlarged scale fragmentary view of a side portion of a tool-element holding tray within its compartment, such view showing a lug-and-socket connector, for holding the tray in the compartment;

FIG. 4 is an enlarged scale fragmentary pictorial view of a lug portion of a lug-and-socket connection;

FIG. 5 is a pictorial view of a pair of tool-element holding trays that are hinged together, and including a single tool-element spaced above its position in its holding tray; and

FIG. 6 is a sectional view taken substantially along line 6-6 of FIG. 5.

DETAILED DESCRIPTION OF THE INVENTION

The embodiment shown by FIG. 1 comprises a tool-element holding case 10 having a first part 12 and a second part 14 that are hinged together at 16. The casing parts 12, 14 and the hinge 16 are preferably molded from a suitable structural plastic. Holding case part 12 is formed to include an inner compartment 18. Casing party 14 is formed to include an inner compartment 20. Inner compartment 18 is composed of a bottom wall 22, side walls 24, 26 and end walls 28, 30. In like fashion, inner compartment 20 has a
bottom wall 32, side walls 34, 36 and end walls 38, 40. The side walls 24, 26 and 34, 36 are each provided with a plurality of laterally spaced-apart lugs L. Referring to FIG. 3, each lug L has a lower ramp part 42 and an upper part 44 with a rounded end.

[0017] In the illustrated embodiment, four tool-element trays 46, 48, 50, 52 are provided. Trays 56, 48 are connected together by a hinge 54. Trays 50, 52 are connected together by a hinge 56.

[0018] FIG. 1 shows the holding case in an open position. In this position the two parts 12, 14 are in coplanar parallelism and the compartments 18, 20 open upwardly. The tray pairs 44, 48 and 50, 52 are in coplanar parallelism. They also open upwardly. The holding case 10 is closed by swinging the two parts 12, 14 together. Each part 12, 14 includes a handle part 58, 60. When the two parts 12, 14 are together, the two handle parts 58, 60 are also together. Together, the handle parts 58, 60 provide a handle for the case 10. This handle includes a grip portion 48, 60 and a hand receiving opening 62, 64. When the parts 12, 14 are in their closed position, each compartment 18, 20 confronts the other. A suitable connector or clasp (not shown) can be provided for holding the two case parts 12, 14 together when they are in their closed position.

[0019] One of the trays 46, 48 can be swung about the hinge 54 to place it in a position over the other tray 46, 48. In like fashion, one of tray 50, 52 can be swung over into contact with the other tray 50, 52. The tray pairs 46, 48 and 50, 52 can also include connectors or clasps for connecting the trays 46, 48 and 50, 52 together when they are in their closed position.

[0020] In the illustrated embodiment, the inner compartment 18 is sized to receive the trays 46, 48 when they are in their open position. The compartment 20 is sized to receive the trays 50, 52 when they are in their open position. The end walls of the trays 46, 48 include sockets S. Each socket S is sized and positioned to receive a related one of the lugs L. As best shown by FIG. 3, each socket has an end wall 66 that may extend substantially perpendicular to the tray wall of which it is a part. Trays 46, 48 and 50, 52 may include rounded bottom edges. See edges 68, 70 in FIG. 2. FIG. 2 shows tray 48 in the foreground. Tray 46 is in the background and cannot be seen. Trays 46, 48 are in the position shown by FIG. 1. In FIG. 2, the trays 46, 48 are shown positioned above inner compartment 18. The rounded corners 68, 70 are positioned above the two rows of lugs L.

[0021] Starting with the trays 46, 48 in the position shown by FIG. 2, the trays 46, 48 are pushed downwardly into the inner compartment 18. The rounded corners 68, 70 will contact the upper portions 44 of the lugs L. The rounded nature of the surfaces 60, 70 and the rounded nature of the upper portions 44 of lugs L will cause the trays 46, 48 to be cammed downwardly into the compartment 18. The plastic parts will move sufficiently to allow the trays 46, 48 to enter into the compartment 18. As the trays 46, 48 move downwardly, the socket bottoms 66 also move downwardly. Socket bottoms 66 will move downwardly until they move past the upper end portions 44 of the lugs L. When this happens, the lug upper end portions 44 snap into the sockets S. When the upper portions 44 of the lugs L are in the position shown by FIG. 3, the rounded end portion 44 of the lug L is positioned above the bottom 66 of the sockets S. In this position, the rounded end portions 44 of the lugs L function like a “detent” to hold the trays 46, 48 and 50, 52 within the compartments 18, 20.

[0022] When an upward pull is applied to the tray pairs 46, 48 and 50, 52, the outer edge of the socket bottoms 66 will move against the rounded end portion 44 of the lugs L. As a result, the trays 46, 48 and 50, 52 will be moved upwardly past the rounded end portions 44 of the lugs L. The lower portions 44 of the lugs L are ramped shaped. That is, they have a surface facing into the compartments 18, 20 that slope inwardly of the compartments 18, 20 as they move upwardly. These sloping ramp surfaces on the lugs L will help cam the trays 46, 48 upwardly past the lug tops 44 and out from the inner compartments 18, 20.

[0023] FIGS. 5 and 6 show a typical construction of the trays 50, 52. Each tray 50, 52 is shown to have a bottom 80, 82 side walls 84, 86, 88, 90 and end walls 92, 94, 96, 98. A plurality of tool holders TH are located in an inner compartment in the tray 50. In similar fashion, tray 52 has tool holders TH in its inner compartment. The tools T are adapted to snap-fit into two tool sockets TS. These sockets TS are narrower at their top than at their bottom. Their side portions are adapted to move apart when the tool T is forced into the sockets TS. As shown by FIG. 5, one end portion of the tool T will fit in one tool socket TS below it and the opposite end portion of tool T will fit into an adjoining tool socket TS. The tools T can easily be pulled out from their held position. The pulling force will cause the side portions of the sockets TS to move apart and allow the tool T to move out from them.

[0024] The number of compartments in the case parts 12, 14, the number of the tool trays, the construction of the tool trays and the nature of the tool elements that are held within the tool trays can vary. Also, the sizes of the case parts 12, 14 and the tool holders can vary. The case parts may include other compartments or chambers for receiving other tools or objects.

[0025] The illustrated embodiments are only examples of the present invention and, therefore, are non-limitive. It is to be understood that many changes in the particular structure, materials and features of the invention may be made without departing from the spirit and scope of the invention. Therefore, it is my intention that my patent rights not be limited by the particular embodiments illustrated and described herein, but rather are to be determined by the following claims, interpreted according to accepted doctrines of patent claim interpretation, including use of the doctrine of equivalents and reversal of parts.

What is claimed is:

1. A tool-element holding case, comprising:
   - first and second outer case parts together forming at least one inner compartment having a bottom and side walls;
   - at least one tool-element holding tray fitting in said inner compartment;
   - a plurality of lug-and-socket connectors for releasably connecting the tool-element tray to sidewall portions of the inner compartment when the tool-element tray is in the compartment, said lugs being on one of said tool-element tray and said sidewall portions of the compartment, and said sockets being on the other; and
wherein the tool-element tray is pushed downwardly into the compartment to move the lugs into holding engagement with the sockets;

wherein the tool-element tray can be pulled out from the compartment and in response to such pulling the lugs will move out from the sockets and allow the tool-element tray to move out from the compartment.

2. A tool-element holding case of claim 1, wherein the first and second outer case parts are hinge-connected together and are moveable between an open position in which they are in coplanar parallelism and a closed position in which one of the case parts is positioned on the other.

3. The tool-element holding case of claim 1, comprising two tool-element holding trays fittable in a side-by-side position within the compartment.

4. The tool-element holding case of claim 3, wherein the tool-element holding trays are hinged together and are moveable between a first position in which they are side-by-side in coplanar parallelism within the compartment and a second closed position in which one of the tool-element holding trays is positioned on the other.

5. The tool-element holding case of claim 1, wherein said lugs are on said side wall portions of said compartment and said sockets are formed in outer side wall portions of the tool-element holding tray.

6. The tool-element holding case of claim 1, further including a handle that is connected to at least one of said outer case parts.

7. The tool-element holding case of claim 6, comprising two handle parts, one connected to the first outer case part and the second connected to the second outer case part, and a hinge connecting the first and second outer case parts together so that they are moveable between an open position in which they are in coplanar parallelism and a closed position in which one of the case parts is positioned on the other, and wherein where the case parts are in the closed position the two handle parts are together and together form a handle.

8. The tool-element holding case of claim 1, wherein each outer case part includes at least one inner compartment having a bottom and sidewalls.

9. The tool-element holding case of claim 8, wherein the first and second outer case parts are hinge-connected together and are moveable between an open position in which they are in coplanar parallelism and a closed position in which one of the case parts is positioned on the other and its inner compartment is directed towards the inner compartment of the other case part.

10. The tool-element holding case of claim 8, comprising two tool-element holding trays for each compartment, said trays being fittable in a side-by-side position within their compartment.

11. The tool-element holding case of claim 10, wherein the tool-element holding trays are hinged together and are moveable between a first position in which they are side-by-side in coplanar parallelism within their compartment and a second closed position in which one of the tool-element holding trays is positioned above the other.

12. The tool-element holding case of claim 11, wherein each outer case part includes a handle part and when the case parts are in a closed position the two handle parts come together to form a handle.

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