A carrying case including a handle-receiving portion having a recess extending along at least one side of the handle-receiving portion, one or more first attachment mechanisms in the recess, a handle including an inner layer and an outer layer, the outer layer including a material having a durometer value less than a durometer value of the handle-receiving portion, wherein the handle is adapted to attach into the recess, and wherein the handle includes one or more second attachment mechanisms for engaging the first attachment mechanisms.
This invention relates generally to a blow-molded carrying case, and more specifically to a blow-molded carrying case with a low durometer handle to facilitate gripping and transport of the carrying case.

The use of blow molding as a method for manufacturing various sorts of articles is generally well known. Typically, this process involves the use of a mold consisting of two separate halves or portions having cavities of particularly desired shapes and sizes. Usually, one extrudes a large-diameter, sealed tube of molten material (commonly referred to as a "parison"), places the tube between the mold halves, and closes the mold around the tube. Fluid pressure is then introduced into the tube, forcing the molten tube against the walls of the cavities, conforming the tube to the shape thereof. The pressure is maintained until the molten material cools and solidifies. The pressure is then released, the mold halves are pulled apart, and the hardened article is ejected therefrom.

One such article that is commonly manufactured in this manner is carrying cases. By producing cases in this manner, one is able to produce a device that is capable of carrying and protecting tools placed inside the case that has a multitude of desirable physical characteristics — such as rigidity, scuff...
resistance, and impact absorption — yet that is relatively inexpensive to manufacture. Typically, these cases will be formed using the process described above, where one mold half forms the exterior of both the base and lid portions of the case, while the other mold half forms the interior of both base and lid portions. Usually, the mold half forming the exterior of the case forms a wall with a smooth, attractive shape, while the mold half that forms the interior of the case is often molded with compartments to hold specific contents, such as, for example, a pistol-type soldering iron and various tips therefore. In fact, a particular advantage of manufacturing cases in this way is that the walls formed by the two mold halves do not need to match, as the space between these walls is filled with air.

[0004] Though such cases are generally well known in the art, efforts have been made to increase the carrying capacity of such cases. Many carrying cases have handles to enable the user to more easily pick up, carry, and otherwise maneuver the carrying cases. Most of such cases include handles that are molded integrally with the body of the case. Such handles are usually manufactured of the same rigid material as the case, and thus are not comfortable for gripping and transporting the case, especially if such case is heavy.

[0005] Some attempts have been made to provide auxiliary handles. For example, U.S. Patent No. 4,890,355 to Schulten discloses a hand grip for handles. The handle grip includes an elongated tubular body made of plastic with a longitudinal opening extending along the length of the grip. The hand grip expands over an associated handle. The hand grip disclosed in Schulten, however, does not appear to contain means for a secure attachment to the handle, and does not provide a layer of soft material to facilitate gripping.
Moreover, the hand grip disclosed in Schulten merely surrounds and does not mount flush on the associated handle.

[0006] Therefore, there is a need for a handle for a blow-molded carrying case that is designed to facilitate comfortable gripping of the handle by a user and is adapted for an easy but secure attachment to the carrying case.

SUMMARY OF THE INVENTION

[0007] Accordingly, it is an objective of the present invention to provide an improved handle for blow molded carrying cases including a low durometer material to facilitate comfortable gripping of the handle by a user. It is a further object to provide a blow molded carrying case adaptable to receive such handle.

[0008] It is a further objection to provide a low durometer handle that mounts flush with the carrying case without any fasteners. It is a further object of the present invention to provide a removeable or replaceable handle for blow molded carrying cases.

[0009] These and other objectives are achieved by providing a handle for a carrying case including a first layer including an outer surface, a second layer fixedly attached to the outer surface of the first layer, at least one attachment mechanism on the first layer for attachment to a carrying case, wherein the second layer has a durometer value less than a durometer value of the first layer. The handle may be adapted to attach into a recess on the carrying case, wherein a thickness of the handle is substantially the same as a depth of the recess for flush mounting.
[00010] In some embodiments, the attachment mechanism includes at least two linear protrusions on an inner surface of the first layer, e.g., substantially opposite to one another extending along longitudinal edges of the first layer. In some embodiments, an outer surface of the second layer includes a plurality of ridges to facilitate gripping of the handle by a user.

[00011] Other objectives are achieved by providing a carrying case including a handle-receiving portion having a recess extending along at least one side of the handle-receiving portion, one or more first attachment mechanisms in the recess, a handle including an inner layer and an outer layer, the outer layer including a material having a durometer value less than a durometer value of the handle-receiving portion, wherein the handle is adapted to attach into the recess, and wherein the handle includes one or more second attachment mechanisms for engaging the first attachment mechanisms.

[00012] In some embodiments, the handle has a thickness substantially the same as a depth of the recessed cavity. In further embodiments, the durometer value of the outer layer is also less than a durometer value of the inner layer.

[00013] In some embodiments, the first attachment mechanisms include at least two linear cavities extending along opposite edges of the recess. The second attachment mechanisms may also include at least two linear protrusions on an inner surface of the inner layer.

[00014] In further embodiments, the carrying case further includes a base portion, the base portion including a base cavity for enclosing at least a part of at least one object, a lid portion hingedly connected to the base portion and movable from an open position to a closed position, the lid portion including a lid cavity for enclosing at least a part of at least the object, wherein at least one of
the base portion and the lid portion includes the handle-receiving portion. Each of the base portion and the lid portion may be blow molded.

[00015] In some exemplary embodiments, the carrying case further includes at least one locking mechanism for retaining the lid portion in the closed position. In some such embodiments, the locking mechanism includes of the handle.

[00016] Other objects of the invention and its particular features and advantages will become more apparent from consideration of the following drawings and accompanying detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[00017] FIG. 1 is a perspective view of a blow molded carrying case with a handle in accordance with one exemplary embodiment of the present invention.

[00018] FIG. 2 is a perspective view of a portion of the carrying case of FIG. 1 without the attached handle.

[00019] FIG. 3 is a perspective view of the handle for the carrying case shown in FIG. 1.

[00020] FIG. 4 is a front view of the handle shown in FIG. 3.

[00021] FIGS. 5A - 5B illustrate the assembly of the handle and carrying case shown in FIG. 1.
DETAILED DESCRIPTION OF THE INVENTION

[00022] The basic components of one embodiment of a blow molded case in accordance with the invention are illustrated in Figures 1 - 2. As used in the description, the terms "top," "bottom," "above," "below," "over," "under," "above," "beneath," "on top," "underneath," "up," "down," "upper," "lower," "front," "rear," "back," "forward" and "backward" refer to the objects referenced when in the orientation illustrated in the drawings, which orientation is not necessary for achieving the objects of the invention.

[00023] FIG. 1 illustrates an exemplary carrying case 100. The case 100 includes a base portion 112 and a lid portion 114 connected thereto. The base portion 112 and lid portion 114 may be blow molded articles formed by single or separate blow molding processes. In some embodiments, the lid portion 114 is connected to the base portion 112 via a hinge mechanism 120.

[00024] The lid portion 114 is movable between open and closed positions, such that, when in a closed position, the lid portion 114 is adjacent to base portion 112 and at least partly covers any objects accommodated in the case 100. The lid portion 114 and/or base portion 112 may include at least one clasp (not shown) or other locking mechanism for keeping it in the closed position. For example, in some embodiments, the handle 150 functions as the locking mechanism. In some embodiments, the lid portion 114 may include a translucent section for viewing objects contained in the case 100.

[00025] Any of various configurations may be employed for the surface of the inner wall of base portion 112, including various recesses and/or holes therethrough in whatever shapes and sizes as may be appropriate to accommodate various tools, as well as any other accessories that it may be
desired to carry in the case 100. Various mold planes and punches can be used to create any variety of through-holes, blind holes, flanges, or sidewalls for accommodating, and providing support for, these various objects. Similarly, the lid portion 114 may also include an inner wall with recesses and/or holes for accommodating the top of the objects when the case 100 is closed.

[00026] In the exemplary embodiment, the base portion 112 includes a handle-receiving portion 130 formed integrally with the base portion 112. For example, the hand-receiving portion 130 may be blow molded as a single and/or continuous piece with the base portion 112. However, it should be understood that in certain embodiments the handle-receiving portion 130 may be formed integrally with the lid portion 114 instead of the base portion 112. Alternatively, the handle-receiving portion 130 may include two separate portions, one half being formed integrally with the base portion 112, and the other half being formed integrally with the lid portion 114. In such embodiments where the handle-receiving portion 130 includes two separate halves, the handle 150 may also function as a locking mechanism. For example, the handle 150 may be snapped into place about each of the two separate halves when the case 100 is closed to retain the case 100 in the closed position. To open the case, the handle 100 may be removed allowing the lid portion 114 and base portion 112 to separate. In further embodiments of the present invention, the handle-receiving portion 130 may be formed separate from the case 100 and then connected to the case 100.

[00027] FIG. 2 illustrates the handle-receiving portion 130 of the case 100. The handle-receiving portion 130 includes a recess or cavity 132 for accommodating the handle 150. In the exemplary embodiment, the recess 132 includes a convex face 134. The handle-receiving portion 130 preferably has a depth (e.g., between an outer surface of the handle-receiving portion and the...
face 134) approximately equal to a thickness of the handle 150 such that the
handle 150 is flush with the handle-receiving portion 130 when in place.

[00028] The handle-receiving portion 130 further includes one or more
attachment mechanisms to secure the handle 150 to the case 100. In the
exemplary embodiment, the handle-receiving portion 150 includes two linear
cavities 136 extending longitudinally along the face 134 of the handle-receiving
portion 130. The face 134 and the linear cavities 136 receive the handle 150 to
facilitate gripping of the carrying case 100, as shown in FIG. 1. As described in
more detail below, the handle 150 is adapted to slide over the face 134 and snap
into place in the recess. In the exemplary embodiment, the handle 150 is
retained at least in part by engagement with the linear cavities 136. However, in
other embodiments, other attachment mechanisms may be employed including
but not limited to circumferential protrusions and cavities, shaped (e.g., square,
circular, etc.) protrusions and cavities, or any other suitable attachment or
retention mechanisms. In some other embodiments, an adhesive is used
between the face 134 and the handle 150.

[00029] As shown in FIG. 3, the handle 150 includes a first layer 152
consisting of a semi-rigid material and having an outer surface 154 and an inner
surface 156. The handle 150 further includes a second layer 160 including a low
durometer material securely attached to the outer surface 154 of the first layer
152. In some embodiments, the outer surface 154 of first layer 152 also includes
a raised edge (not shown) that circumscribes and is flush with the second layer
160.

[00030] The low durometer material of the second layer 160 provides for a
soft grip on the handle 150. Durometer may be determined by any number of
scales including but not limited to the American Society for Testing and Materials
("ASTM") D2240 type A scale. In preferred embodiments, the second layer 160 has a durometer value less than a durometer value of the first layer 152 and/or less than a durometer value of the case 100. In some embodiments, the second layer 160 has a durometer value less than 100. In some other embodiments, the second layer 160 has a durometer value less than 70 or less than 50.

[00031] In the exemplary embodiment, the first layer 152 and the second layer 14 have a concave or semicircular shape to fit about the receiving face 134 of the handle-receiving portion 130. In the exemplary embodiment, the inner surface 156 of the first layer 152 has at least two linear protrusions 158 (as shown in FIGS. 3 and 4) opposite in location to each other and extending along longitudinal edges of the handle 150, e.g., in the same plane.

[00032] The first layer 152 may be made from any type of semi-rigid material, such as a polypropylene and/or plastic, that is sufficiently flexible to extend around the handle-receiving portion 130. The rigidity of the first layer 152 may be varied depending on whether it is desired for the handle to be readily removable, semi-permanent, or permanent. In some embodiments, the handle 150 is removable from the carrying case 100 by pulling it off the handle-receiving portion 130, causing the protrusions 158 to disengage from the linear cavities 132. In other embodiments, the handle 150 is permanently or semi-permanently attached to the case 100 by means of the protrusions 158 and/or other attachment means such as adhesive. The first layer 152 generally includes a constant thickness of material. However, in some embodiments, the first layer 152 includes a portion of reduced thickness (e.g., extending longitudinally down the center of the first layer 152) to create or add to the flexibility of the first layer 152.
FIGS. 5A - 5B illustrate assembly of the case 100 and handle 150 according to the exemplary embodiment. When the handle 150 is pressed into the handle-receiving portion 130, the handle 150 expands about the face 134. The distance between the linear protrusions 158 increases as the handle 150 is pressed onto the handle-receiving portion 130. The linear protrusions 158 then snap into the corresponding linear cavities 136 on the handle-receiving portion 130. The protrusions 158 interlock with the linear cavities 136 and secure the handle 150 to the carrying case 100.

Once in place on the carrying case, the handle 150 is substantially flush with the outer surface of the handle-receiving portion 130. The thickness of the handle 150 is preferably substantially equal to the depth of the recessed cavity 132 in the handle-receiving portion 130. Thus, the handle 150 has an appearance of being formed together with the carrying case 100. Moreover, the flush mounting of the handle 150 provides a significant improvement in comfort of the handle 150. The handle 150 is securely mounted such that the handle 150 does not move or rotate during use. In some embodiments, the second layer 160 may have a plurality of ridges 162 that are circumferential and/or contoured to a shape of a hand to facilitate gripping of the handle by a user. In the exemplary embodiment, the second layer 160 includes three substantially parallel ridges 162.

In certain embodiments, the first and the second layers of the handle 150 may have a substantially circular shape to extend around a handle-receiving portion 130 including a circumferential recess 132. The handle 150 may have a circumference slightly larger than a circumference of the recess 132 to enable the handle 150 to fit around the handle-receiving portion 130. In such embodiment, the protrusions 158 may be located adjacent to each other such as
to substantially enclose the handle-receiving portion 130 of the case 100 when the handle is pressed into the case 100.

[00036] It should be understood that the foregoing is illustrative and not limiting, and that obvious modifications may be made by those skilled in the art without departing from the spirit of the invention. Accordingly, reference should be made primarily to the accompanying claims, rather than the foregoing specification, to determine the scope of the invention.
What is claimed is:

1. A handle for a carrying case, comprising:
   a first layer comprising an outer surface;
   a second layer fixedly attached to the outer surface of said first layer;
   at least one attachment mechanism on said first layer for attachment to a carrying case;
   wherein the second layer has a durometer value less than a durometer value of the first layer.

2. The handle according to claim 1, wherein said handle is adapted to attach into a recess on the carrying case, wherein a thickness of said handle is substantially the same as a depth of the recess.

3. The handle according to claim 1, wherein said attachment mechanism comprises at least two linear protrusions on an inner surface of said first layer.

4. The handle according to claim 3, wherein the two linear protrusions are substantially opposite to one another extending along longitudinal edges of said first layer.

5. The handle according to claim 1, wherein said first layer comprises a plastic material.

6. The handle according to claim 1, wherein an outer surface of said second layer includes a plurality of ridges to facilitate gripping of the handle by a user.
7. The handle according to claim 1, wherein each of said first and second layers has a substantially concave shape.

8. The handle according to claim 1, wherein each of said first and second layers is substantially semicircular.

9. A carrying case, comprising:
   a handle-receiving portion having a recess extending along at least one side of said handle-receiving portion;
   one or more first attachment mechanisms in the recess;
   a handle including an inner layer and an outer layer, the outer layer including a material having a durometer value less than a durometer value of said handle-receiving portion;
   wherein said handle is adapted to attach into the recess; and
   wherein the handle includes one or more second attachment mechanisms for engaging the first attachment mechanisms.

10. The carrying case according to claim 9, wherein said handle has a thickness substantially the same as a depth of the recess.

11. The carrying case according to claim 9, wherein the durometer value of the outer layer is less than a durometer value of the inner layer.

12. The carrying case according to claim 9, wherein said first attachment mechanisms comprise at least two linear cavities extending along opposite edges of the recess.
13. The carrying case according to claim 12, wherein said second attachment mechanisms comprise at least two linear protrusions on an inner surface of the inner layer.

14. The carrying case according to claim 9, wherein said handle-receiving portion is blow molded.

15. The carrying case according to claim 9, further comprising:
   a base portion, said base portion comprising a base cavity for enclosing at least a part of at least one object;
   a lid portion hingedly connected to said base portion and movable from an open position to a closed position, said lid portion comprising a lid cavity for enclosing at least a part of at least said object;
   wherein at least one of said base portion and said lid portion comprises said handle-receiving portion.

16. The carrying case according to claim 15, wherein each of said base portion and said lid portion are blow molded.

17. The carrying case according to claim 16, wherein said handle-receiving portion is formed integrally with at least one of said base portion and said lid portion.

18. The carrying case according to claim 16, wherein a first portion of said handle-receiving portion is formed integrally with said base portion and a second portion of said handle-receiving portion is formed integrally with said lid portion.
19. The carrying case according to claim 15, further comprising at least one locking mechanism for retaining said lid portion in the closed position.

20. The carrying case according to claim 19, wherein said locking mechanism consists of said handle.

21. The carrying case according to claim 9, wherein said handle-receiving portion includes a substantially cylindrical portion, wherein the recess extends along at least one side of the substantially cylindrical portion.

22. The carrying case according to claim 9, wherein said inner layer of said handle comprises a plastic material.

23. The carrying case according to claim 9, wherein said outer layer comprises a plurality of ridges to facilitate gripping of said handle by a user.

24. The carrying case according to claim 9, wherein said inner layer and said outer layer comprise a substantially circular shape having a circumference greater than a circumference of said handle-receiving portion such as to enclose said handle-receiving portion when said handle is received in the recess.
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A CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A45F 5/10 (2009.01)
USPC - 16/111
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
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