United States Patent [19]

Szabo et al.

[11] **3,795,941**

[45] **Mar. 12, 1974**

[54] **FLAT COLLAPSIBLE HANDLE WITH CLOSED-CELL FOAM FINGER GRIP**

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[73] Assignee: **Philadelphia Handle Company, Inc.**, Camden, N.J.

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[21] Appl. No.: **320,941**

[52] **U.S. Cl.** **16/115**, 16/125, 190/58

[51] **Int. Cl.** **A47b 95/05**

[58] **Field of Search** 16/126, 115, 125; 190/58, 190/57

[56] **References Cited**

UNITED STATES PATENTS

3,438,467	4/1969	Milette et al.	16/115
2,277,739	3/1942	Worthington	16/115

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Assistant Examiner—Doris L. Troutman
Attorney, Agent, or Firm—Max R. Millman

[57] **ABSTRACT**

A collapsible flat-lying handle comprised of a substantially flat solid rigid elongated palm-engaging member having slotted portions adjacent its ends and depending from its lower surface, a softer resilient finger-engaging member preferably made of a closed-cell foam positioned between said slotted portions and secured to the lower surface of the rigid member by non-mechanical means which prevent movement of the softer resilient member relative to the rigid member.

5 Claims, 8 Drawing Figures

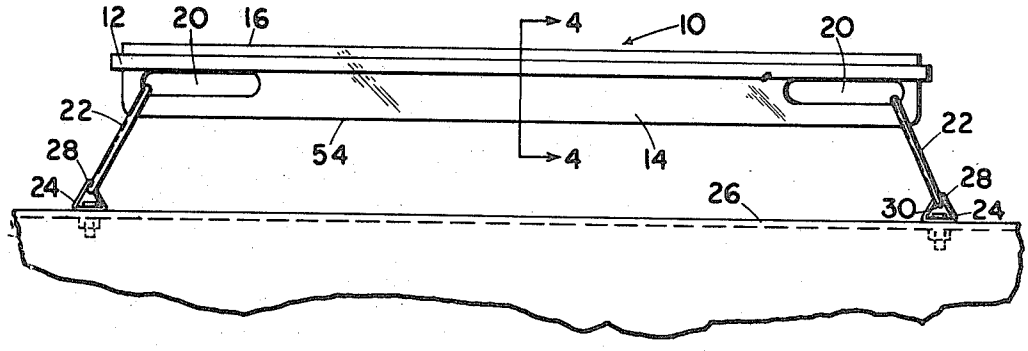


FIG. 1

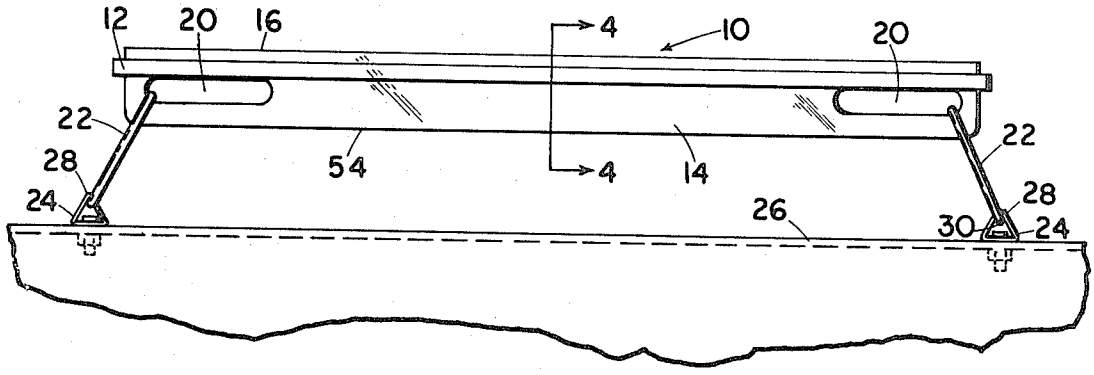


FIG. 2

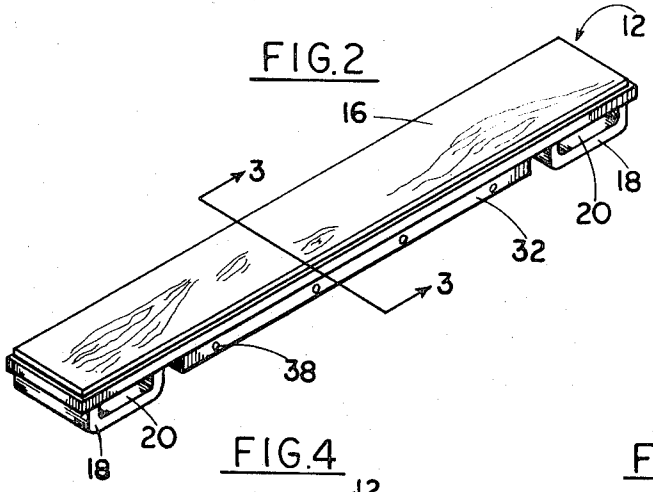


FIG. 3

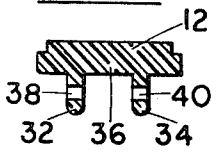


FIG. 4

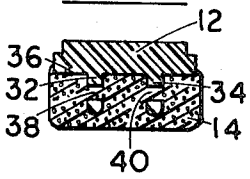


FIG. 5

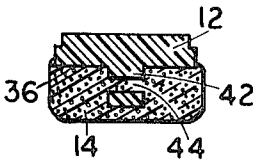


FIG. 6

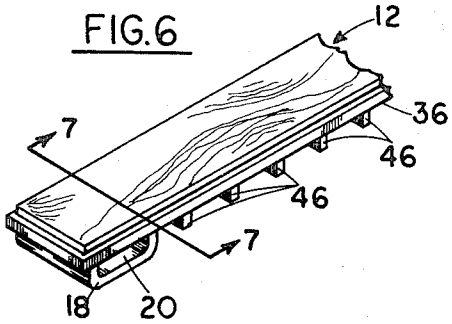


FIG. 7

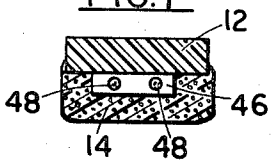
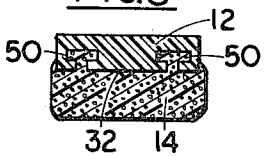


FIG. 8



FLAT COLLAPSIBLE HANDLE WITH CLOSED-CELL FOAM FINGER GRIP

This handle relates to a flat collapsible handle for attachment to a portable radio, television set, electronic test equipment, luggage, carrying cases and the like and constitutes an improvement over the handle shown in U.S. Pat. No. 3,479,702.

In the handle shown in that patent the handgrip is a flat rigid member whose undersurface at its ends is provided with longitudinal slots. Links are extended through the slots with portions pivotally attached to the carrying case wall so that the handle can be raised to the carrying position with the handgrip spaced above the wall and, when released, the handle will fall to its collapsed position substantially against the wall.

The primary object of the invention is to provide a handle of the character described with a finger-engaging member made of a resilient material softer than the rigid handgrip portion which extends between the ends thereof and non-mechanical means to anchor the softer resilient member to the handgrip to minimize or entirely eliminate relative movement between the softer resilient finger-engaging member and the solid rigid handgrip.

Another object of the invention is to provide a collapsible handle with a flat handgrip made of a solid rigid member and means adjacent its ends whereby it will be hingedly attached to a carrying case wall, ribs depending from the handgrip between said means and a closed-cell foam finger-engaging member extending between said means and non-mechanically anchored to said ribs.

Another object is to provide a flat collapsible handle made of a palm-engaging solid rigid member with spaced T-shaped or equivalent slots opening through its undersurface and a closed-cell foam finger-engaging member secured to the undersurface of said rigid member through said slots.

Another object is to provide a handle of the character described with a soft feel to the fingers which is attractive, economical and easy to make using injection molding techniques.

These and other objects of the invention will become more apparent as the description proceeds in conjunction with the accompanying drawings wherein:

FIG. 1 is a side elevation of the collapsible handle shown attached to a wall of a carrying case;

FIG. 2 is a perspective view of the handle per se minus the closed-cell finger-engaging foam;

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 1;

FIG. 5 is a sectional view similar to FIG. 4 of a modified form of the invention;

FIG. 6 is a partial perspective view of the rigid portion of the handle minus the finger-engaging foam and generally similar to FIG. 2 but of a modified form;

FIG. 7 is a cross-sectional view taken on the line 7—7 of FIG. 6; and

FIG. 8 is another view similar to FIG. 4 of yet another modification of the invention.

Specific reference will now be made to the drawings in which similar reference characters are used for corresponding elements throughout.

The complete handle is shown at 10 and consists essentially of an upper solid rigid palm-engaging member 12 and a lower finger-engaging resilient softer member 14.

The upper member 12 as seen in U.S. Pat. No. 3,479,702 is essentially an elongated, flat, preferably rectangular member made of a rigid material having a tensile strength of at least 3,000 psi and preferably injection molded of such thermoplastic resins as polypropylene, high density polyethylene, rigid vinyl, polystyrene, acrylonitrile-butadiene-styrene copolymers (known as ABS), and the like; or thermosets made by transfer or compression molding. The upper surface may contain a grained decorative panel 16 in addition, if desired.

The rigid upper member 12 is also formed adjacent its ends at its undersurface with a pair of U-shaped members 18 as wide as the member 12 but spaced apart to form a central portion therebetween to be engaged by the fingers. Each U-shaped member forms longitudinal slots 20 which open through their sides.

Substantially rectangular chain-type links 22 are provided, each having an upper transverse portion which extends through the slot 20. Retainers 24 are secured upon the wall 26 of the carrying case, each including a slotted arcuate portion 28 which journals or rotatably receives the opposite transverse portion 30, as indicated in said U.S. Pat. No. 3,479,702.

As seen in FIGS. 2 and 3, the undersurface of the rigid member 12 between the slotted members 18 is provided with transversely spaced longitudinal ribs 32 and 34 depending from its lower surface 36, the ribs being provided with longitudinally spaced through apertures 38 and 40.

The resilient member 14 is softer than the rigid member and is substantially coextensive with that length and width of the solid rigid member 12 between the slotted members 18 and is non-mechanically secured to the member, as seen in FIGS. 1 and 4, by having the resilient softer member envelop the ribs 32 with portions extending into and through the apertures 38 and 40. The resilient softer member is preferably made of a thermoplastic resin, having a preferred density of 4–12 lbs./cu. ft., of resins such as polyurethane, polyvinylchloride, polyolefines, copolymers of ethylene-vinyl acetate and the like. It may also be made of a non-foam thermoplastic resin with a low Shore "A" Durometer, such as up to 50.

While a plurality of apertured ribs depending from the lower surface 36 of the rigid member 12 is preferred for maximum anchorage of the foam member to prevent relative movement between it and the rigid member, a single rib 42, see FIG. 5, may also be used with a plurality of longitudinally space through apertures 44 through which the foam 14 extends.

Additionally, as seen in FIG. 6, the rigid member 12 can be provided between the slotted members 18 with longitudinally spaced transverse ribs 46 depending from its undersurface 36. The ribs 46 are provided with transversely spaced longitudinally extending through holes 48. Thus, the foam 14 is secured between the slotted members 18 by having portions extend in and through the holes 48.

It is also possible to do away with the ribs and substitute substantially T-shaped transversely spaced grooves 50 in the rigid member 12 which open through the lower face 52 of the rigid member between the slotted

members **18.** The closed-cell foam member **14** is secured to the undersurface of the rigid member by having portions of the foam extending into the T-shaped grooves.

As seen in the drawings the closed cell foam extends between the slotted portions **18** and from the lower surface **36** of the rigid member to a point where its outer face **54** is substantially flush with the lower faces of the slotted members **18.** It will be understood that the foam can be thinner or thicker depending upon the amount of finger-cushioning and esthetics desired. Also, the foam **14** may be colored the same as or different from the rigid solid palm-engaging member **12.**

The present handle can be made economically by first making the upper rigid solid member **12** by injection molding, then making a second mold with a cavity in which the rigid member **12** with its slotted members **18** is positioned. The closed-cell foam resin formulation is injection molded into the cavity, the foam forming first in the cylinder and finally in the cavity. After the cavity is filled with the foam extending through the through holes in the ribs of the rigid member or into the grooves, the molded unit is removed or ejected from the mold and then the links **22** are assembled through the slots **20** and the slotted retainers **28** on the carrying case wall to mount the handle on the wall. The closed-cell foam forms its own skin and, as stated earlier, the thickness of the foam may also be varied. Its undersurface may also contain transverse grooves for comfort in gripping the same with the fingers.

While preferred embodiments have here been shown and described, variations may be made by skilled artisans without departing from the spirit of the invention. Thus, the rigid solid member may be made of cast metal, such as aluminum. Also, by the term "non-mechanical" means to secure the foam member to and beneath the rigid member used herein is meant self-anchoring means as distinguished from special clamps, bolts or equivalent devices which would reduce the compressibility of the foam member.

What is claimed is:

1. A collapsible flat lying handle for hinged attachment to the wall of an appliance, carrying case or the like comprising an elongated substantially flat rigid palm-engaging member having a member adjacent each end depending from the undersurface thereof and including longitudinal slots therethrough adapted to receive links for hinged attachment to retainers on the wall, said slotted members extending only partially of the length of said rigid member to leave a substantially flat central portion between them, a resilient finger-engaging member softer than said rigid member and extending in said central portion between said slotted members and means securing said resilient softer member to said rigid member to prevent movement of said foam member relative to said rigid member, said means comprising at least one rib depending from the undersurface of said central portion of said rigid member between said dependent slotted members and a through aperture in said rib, said resilient softer member enveloping said rib and having a portion extending into and through said aperture.

2. The handle of claim **1** wherein a pair of transversely spaced longitudinal ribs are provided each with longitudinally spaced through apertures, said resilient softer member embracing both ribs and including portions extending into and through said apertures.

3. The handle of claim **1** wherein transversely extending longitudinally spaced ribs are provided each with longitudinal apertures therethrough, said resilient softer member embracing said ribs and including portions extending into and through said apertures.

4. The handle of claim **1** wherein said rib extends longitudinally between said dependent slotted members, said rib having a plurality of longitudinally spaced through apertures through which said resilient softer member extends.

5. A collapsible flat lying handle for hinged attachment to the wall of an appliance, carrying case or the like comprising an elongated substantially flat rigid palm-engaging member having a member adjacent each end depending from the undersurface thereof and including longitudinal slots therethrough adapted to receive links for hinged attachment to retainers on the wall, said slotted members extending only partially of the length of said rigid member to leave a substantially flat central portion between them, a resilient finger-engaging member softer than said rigid member and extending in said central portion between said slotted members and means securing said resilient softer member to said rigid member to prevent movement of said foam member relative to said rigid member, said means including longitudinally spaced grooves in said central portion of said rigid member, each groove including a vertical portion opening through the undersurface of said rigid member and a transverse portion at the top of and continuous therewith, said softer resilient member including portions extending into said grooves.

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