

[54] **RIGID SUBSTANTIALLY U-SHAPED HANDLE WITH CLOSED-CELL FOAM HANDGRIP**

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[57] **ABSTRACT**

[21] Appl. No.: **320,942**

A soft-feel handle for attachment to an appliance, luggage, carrying case and the like comprised of a solid, rigid, substantially U-shaped member having arms joined by a web or core, a softer resilient material preferably closed-cell foam coextensive with the web, and non-mechanical means securing the softer resilient material to or around the web so that there is no relative movement between the softer resilient material and the rigid material and a method of making the handle.

[52] U.S. Cl. **16/119, 16/126, 190/57**
 [51] Int. Cl. **A45c 13/26**
 [58] Field of Search **16/116 R, 116 A, 126, 16/DIG. 12, 119, 115; 190/57, 58 R, 58 A, 190/58 B; 264/273**

[56] **References Cited**
UNITED STATES PATENTS

3,500,973 3/1970 Bush 16/126

3 Claims, 11 Drawing Figures

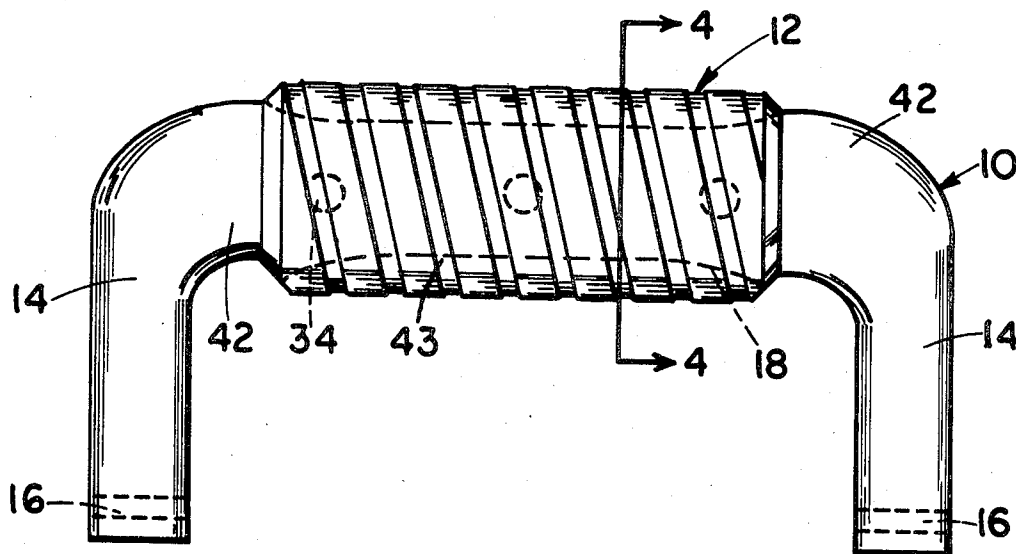


FIG. 1

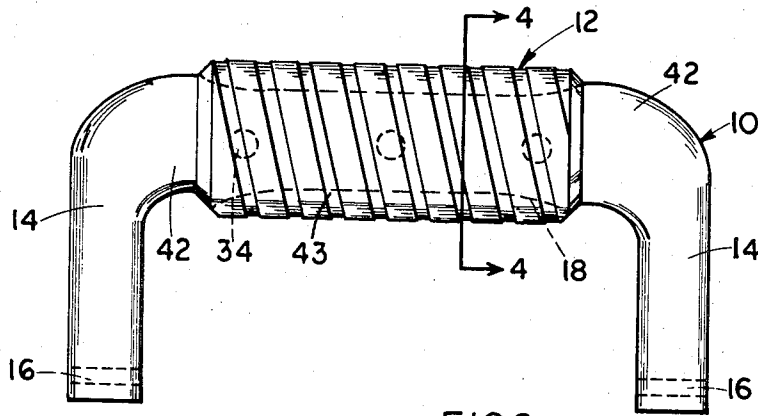


FIG. 2

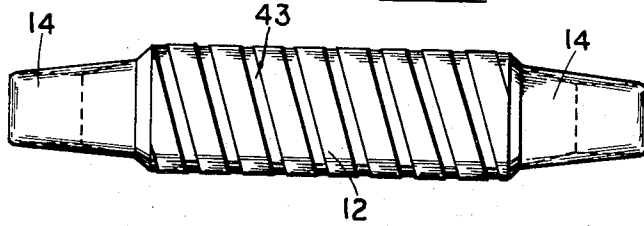


FIG. 3

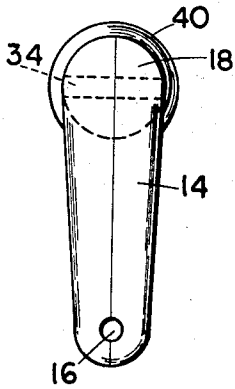


FIG. 4

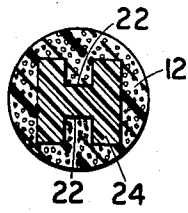


FIG. 5

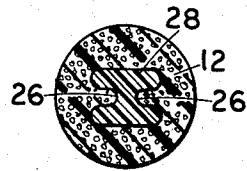


FIG. 7

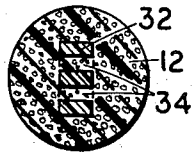


FIG. 6

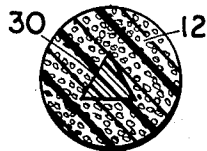


FIG. 8

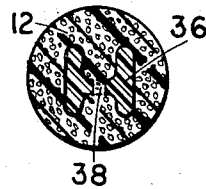


FIG. 9

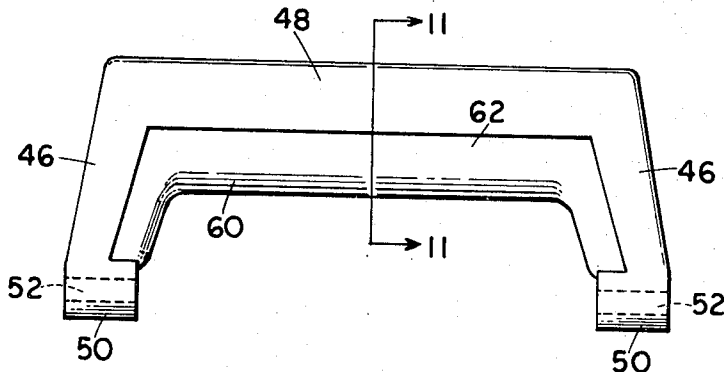


FIG. 10

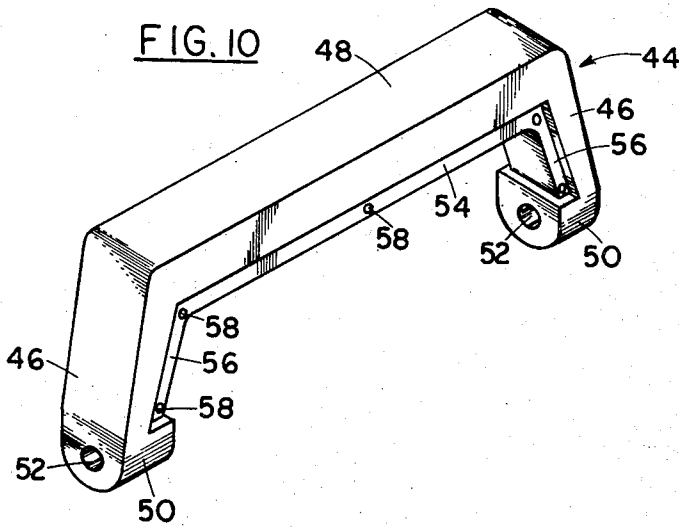
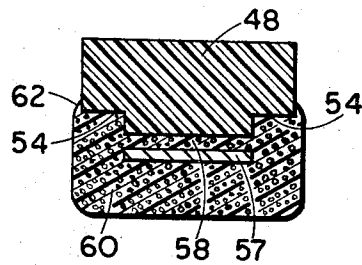


FIG. 11



RIGID SUBSTANTIALLY U-SHAPED HANDLE WITH CLOSED-CELL FOAM HANDGRIP

This invention relates to a substantially U-shaped handle of the type having a palm-engaging or handgrip portion and depending arms adapted for hinged attachment to the wall of a portable radio, television set, electronic instrument, luggage, carrying cases and the like.

The primary object of the invention is to provide such a handle in which the handle is made of a rigid material but the handgrip which is resilient and softer than said rigid material and preferably made of a closed-cell foam with non-mechanical means non-rotatably securing the foam handgrip to the handle.

Another object of the invention is to provide a combined rigid and foam handle in which the foam handgrip portion is economically and accurately molded to the desired contour and simultaneously anchored to the handle for non-rotational mounting thereto.

Another object of the invention is to provide an attractive soft-feel handle of the character described and a method of making the same economically, accurately and effectively by injection molding techniques.

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

FIG. 1 is a side elevational view of one form of the invention;

FIG. 2 is a top plan view thereof;

FIG. 3 is an end elevational view thereof;

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

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

FIG. 6 is a view similar to FIG. 4 of yet another modification;

FIG. 7 is a view similar to FIG. 4 of yet another modification;

FIG. 8 is a view similar to FIG. 4 of still another modification;

FIG. 9 is a side elevational view of another form of the invention;

FIG. 10 is a perspective view of the handle without the foam grip; and

FIG. 11 is a sectional view taken on the line 11—11 of FIG. 9.

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

The handle shown in FIGS. 1-8 essentially comprises a substantially U-shaped solid rigid member 10 and a central softer resilient portion 12 serving as the handgrip.

The member 10 comprises spaced arms 14 with through apertures 16 adjacent its free ends for hinged attachment to the wall of a portable radio, television set, electronic instrument, luggage or other carrying case. The arms 14 are joined by a web 18 of preferably reduced diameter and of shape and construction to be described hereinafter.

The member 10 is a one-piece 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 web or core 18 can take the forms illustrated in FIGS. 4-9, the function of which is to permit attachment of the foam handgrip 12 thereto in such a manner that there is no relative rotation between the handgrip 12 and the web or core 18. Thus, the member 10 can be molded or formed with a web 18 having longitudinal, vertically opposed diametrical slots or grooves 22, in which case the web or core 18 is substantially vertically H-shaped in cross-section as at 24 or longitudinal, horizontally opposed diametrical slots or grooves 26 in which case the web or core 18 is substantially horizontally H-shaped in cross-section as at 28. It should here be understood that other core shapes can be employed to provide circumferentially spaced longitudinal slots or grooves.

In the form of invention shown in FIG. 6, the web of the rigid member 10 is substantially triangular in cross-section as at 30. In the form shown in FIG. 7, the web of the rigid member is substantially rectangular as at 32 and is provided with spaced transverse through apertures 34 for a purpose soon to appear. In the form shown in FIG. 8, the web 36 can take the same H-shape as that shown in FIG. 4 or FIG. 5 but the narrower core of the same may be additionally provided with longitudinally spaced through apertures 38.

The handgrip 12 is a resilient member which is softer than the rigid member and is preferably made of a closed-cell thermoplastic resin, having a preferred density of 4-12 lbs./cu. ft., and made of such resins 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.

In the process of forming the handle, the rigid member 10 is first formed by injection molding or any other economical molding process. The member 10 is then positioned as an insert centrally in the cavity of a second mold designed to conform to the contour of the desired handgrip. The foam resin formulation is then fed through an injection molding into the cavity of the second mold. The resin begins to foam in the heating cylinder of the injection molding machine and completes its foaming and fills out the cavity around the web or core 18 of the rigid member 10 to complete the formation of the handle which may be ejected or otherwise removed from the mold.

As seen in FIGS. 4 and 5 the foam handgrip, because it is closed-cell or unicellular, forms its own skin and fills in the slots or grooves 22 and 26 as well as surrounds the web to the outer contour of the handgrip, which may be circular or of any other shape. Although the outer diameter 40 of the foam handgrip exceeds the average diameter of the portions 42 of the rigid member 10, the thickness of the foam handgrip may vary and may even be level with the outer surface of the rigid member 10, in which case, to get good cushioning of the palm and fingers gripping the same, the core or web 18 would have to be narrowed still further, which is not as desirable as having the foam handgrip bulge out somewhat, as shown in the drawings.

Because the foam fills in the slots 22 and 26, relative rotation between the grip 12 and the web 18 of the rigid member is eliminated or at the very least almost completely restrained. Similarly, when the cross-section of the web 18 takes a non-circular form such as the trian-

gle 30 in FIG. 6, relative rotation of the foam grip around the core or web is also substantially eliminated.

To insure that the foam grip is non-rotationally mounted on the core or web of the rigid member, transversely spaced through bores or apertures 34 or 38 can be provided in the web or core which are filled in with the foam material when it fills the cavity of the second mold in which the rigid member 14 is a central insert.

The outer surface of the handgrip may be smooth, textured or otherwise decorated with, for example, spiral grooves 43 for esthetic effect and the same may be colored the same or different from the rigid member 14.

While it is preferred that the foam resin of the handgrip be different from the resin of the rigid member 14, in which case there is no fusion between the handgrip and the web 18 which it surrounds, it is possible to make the rigid and foam material of the same resin, in which case fusion between the members will take place at the handgrip portion.

The principles of the application are applicable to all forms of handles which have a grip portion and ends destined for attachment to various appliances and carrying cases. In FIGS. 9-11 is illustrated another such form whose general construction is shown in U.S. Pat. No. 3,531,822.

Referring first to FIG. 10, a rigid substantially U-shaped member 44 is provided having arms 46 joined by a palm-engaging web 48 the arms terminating in outwardly-rounded bosses 50 with through holes or bores 52 for hingedly attaching the same to an appliance, carrying case and the like.

Substantially L-shaped fairly deep recesses 54 are provided on opposite sides of the lower edges of the web portion 48 which are contiguous to and continuous with recesses 56 of the same depth on the opposite inner sides of the arms 46. These continuous grooves, in effect, form a ledge 57. Spaced along the length of the entire handle from one boss 50 to the other are transverse through apertures 58 located preferably at least at the junctures of the arms 46 with the web 48 and extending through the narrower ledge 57.

As with the previously described handles of FIGS. 1-8 the rigid member 44 may be made of the same resins as those used to injection mold member 10. In the cavity of a second mold, the rigid member 44 is positioned to one side therein and the same foam material as described hereinbefore with relation to grip 12 is injection molded into the cavity of the second mold. A resilient foam member 60 is formed whose peripheral edge 62 overlies the outer edge of the recesses 54 and 56 and covers them, portions of the foam extending into and through the apertures 58 to thereby anchor the foam on the rigid member and minimize if not eliminate movement of the finger-engaging foam material relative to the rigid member.

While preferred embodiments of the inventions have here been shown and described, it will be understood

that skilled artisans may make variations without departing from the spirit of the invention. Thus, the rigid U-shaped members 10 and 44 may also be made of cast metal, such as aluminum. Also, by the term "non-mechanical" means used herein to secure the foam grip to the rigid member is meant, so to speak, self-anchoring means as distinguished from special clamps, bolts or equivalent devices which would reduce the compressibility of the foam member.

It should further be understood that shapes for the webs of the rigid U-shaped member other than those shown can be used provided that the relative movement between the foam handgrip and the web is minimized or eliminated. Thus, for additional security, longitudinally spaced apertures can be provided in the triangular web 30 of FIG. 6 through which the foam 12 will pass. Also, the web may be oval in cross-section and provided with longitudinally spaced apertures through which the foam will pass. While even a web of circular cross-section with longitudinal apertures through which the foam passes may also be used, this is not preferred since continued use of the handle will put stress on the portions of the foam passing through the holes and the circular cross-section of the web will not in itself offer resistance to the relative rotation of the foam handgrip and the web.

What is claimed is:

1. A soft-feel handle for hinged attachment to an appliance, carrying case and the like consisting essentially of a solid rigid substantially U-shaped member made of a thermoplastic resin and having arms joined by a web, said web being generally H-shaped in cross-section and thereby including a longitudinal central core and circumferentially spaced longitudinal grooves extending from said core, a resilient handgrip member substantially coextensive with said web embracing the same and filling in said web grooves, said resilient handgrip member being made of a closed-cell foam of the same type of resin as the rigid member forming its own skin and being fused to said rigid member.

2. The handle of claim 1 and longitudinally spaced transverse apertures in said core of said web through which portions of said resilient handgrip extend.

3. A soft-feel handle for hinged attachment to an appliance, carrying case and the like consisting essentially of a solid rigid substantially U-shaped member made of a thermoplastic resin and having arms joined by a web, said web including a longitudinal central core and circumferentially spaced longitudinal grooves extending from said core, a resilient handgrip member substantially coextensive with said web embracing the same and filling in said web grooves, said resilient handgrip member being made of a closed-cell foam of the same type of resin as the rigid member forming its own skin and being fused to said rigid member, and longitudinally spaced transverse apertures in said core of said web through which portions of said resilient handgrip member extend.

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