United States Patent [19]

Fish

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[54] **IMPACT TOOLS AND HANDLES THEREFOR**

[76] Inventor: **Herbert I. Fish,** 6525 Kerns Rd., Falls Church, Va. 22044

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[51] **Int. Cl.** **B25g 1/10**

[58] **Field of Search** ..... 16/110 R; 145/29 R, 61 R, 145/61 C, 61 F, 61 H, 61 M; 156/293, 330; 264/154, 155; 273/67 R, 67 A, 67 C, 67 DA, 68, 72 R, 73 R, 73 J, 8 DR, 802–808, 82 R, 83, 84; 287/202 R; 294/57; 306/32

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Primary Examiner—James L. Jones, Jr.
Assistant Examiner—Mark S. Bicks
Attorney, Agent, or Firm—Shapiro and Shapiro

[57] **ABSTRACT**

The wooden handle of a hammer or other impact tool is strengthened and the tool is reinforced against sudden loss of the head by drilling a bore along a substantial portion of the length of the handle from the head end, inserting a tension wire into the bore, and locking the ends of the wire in the bore by means of a plastic, such as an epoxy resin.

6 Claims, 4 Drawing Figures

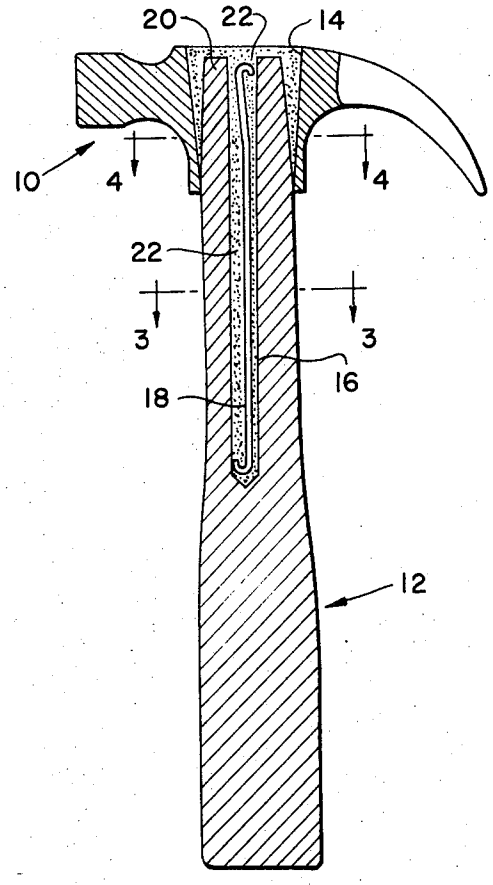


FIG. 1

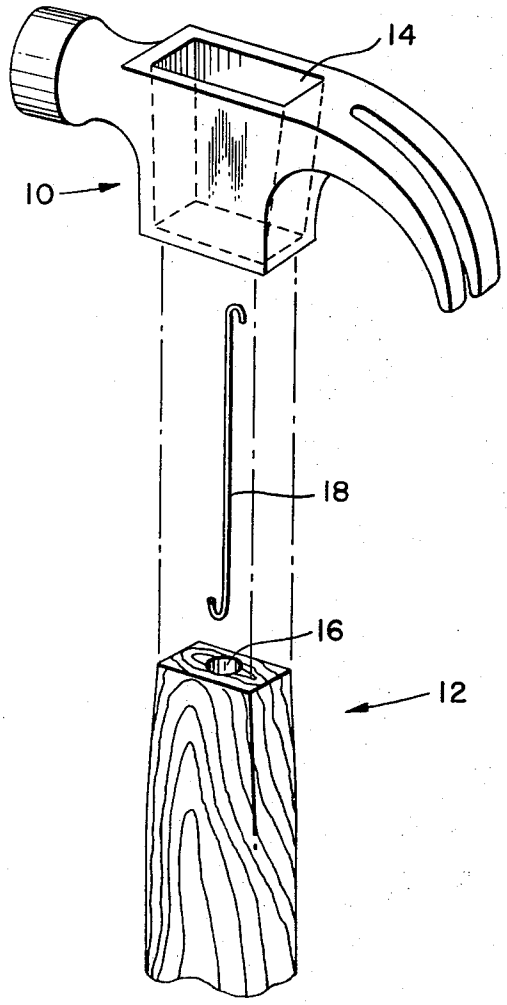


FIG. 2

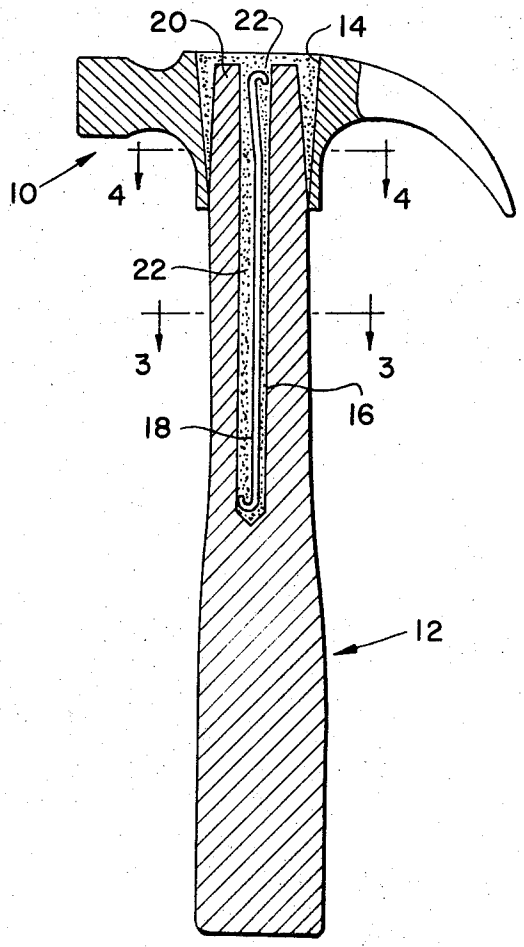


FIG. 3

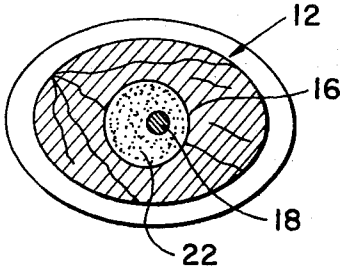
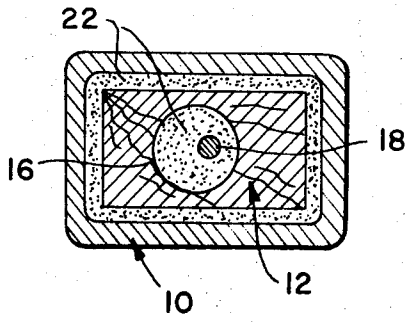


FIG. 4



IMPACT TOOLS AND HANDLES THEREFOR

BACKGROUND OF THE INVENTION

This invention relates to a handle for impact or striking tools, such as hammers, axes, picks or the like, and is more particularly concerned with strengthening the handle against the effects of over-blows and avoiding sudden loss of the head after the handle is bonded or otherwise affixed to the head of the tool.

It is well known that the head of an impact or striking tool is capable of inflicting serious injury if the handle breaks suddenly. Attempts have been made to provide "unbreakable" handles, as of metal or fiber glass, and it has even been proposed to provide such handles with elongated reinforcing elements. In general, such "unbreakable" handles are unduly expensive, and in many instances they are not significantly better than simple wooden handles in preventing head loss. A need has long existed for a simple wooden handle for impact or striking tools which will remain securely affixed to the head of the tool even if the handle breaks under severe use or misuse.

BRIEF DESCRIPTION OF THE INVENTION

It is accordingly a principal object of the invention to provide an improved handle for impact or striking tools which, when assembled with a tool head, prevents sudden loss of the head if the handle breaks.

Another object of the invention is to provide a strengthened wooden handle for impact tools or the like.

A further object of the invention is to provide an improved method of making such a handle.

Briefly stated, in accordance with a preferred embodiment of the invention the wooden handle of a striking tool, such as a hammer, is drilled longitudinally from the head end to provide a bore extending a substantial distance along the length of the handle. An elongated metal tension member, such as a wire with bent ends, is inserted into the bore. An epoxy resin or other suitable bonding material (all hereinafter referred to as epoxy resin) is then molded into the bore to lock the ends of the wire in the bore. The handle so formed may be secured to the head of an impact tool by the use of epoxy resin, for example.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be further described in conjunction with the accompanying drawings which illustrate a preferred embodiment, and wherein:

FIG. **1** is a fragmentary exploded perspective view illustrating components of a typical impact or striking tool provided with a handle in accordance with the invention;

FIG. **2** is a longitudinal sectional view showing the handle inserted in and bonded to a typical tool head; and

FIGS. **3** and **4** are transverse sectional views taken along lines **3—3** and **4—4**, respectively, of FIG. **2.**

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, an impact or striking tool employing a handle in accordance with the invention may be a hammer having a head **10,** conventionally of metal. The handle **12** of the invention may be formed of hickory wood, for example, and may have the usual external configuration, being somewhat thicker at the grip end than the head end. The head of the tool is conventionally provided with a hole **14** therethrough for receiving the handle, the hole preferably diverging away from the handle.

In accordance with the invention, a bore **16** is drilled along the axis of the handle from the head end thereof so that the bore extends along a substantial portion of the length of the handle (about one-half the length in the case of an ordinary hammer). The bore may be of the order of 1/4 to 5/16 inch in diameter. An elongated tensioning member, such as a wire **18,** which may be formed of ordinary coat-hanger wire, for example, is inserted in the bore. The ends of the wire are bent or looped as shown. The wire is substantially smaller in cross-section than the cross-section of the bore **16,** so that the cross-sectional area of the bore is several times the cross-sectional area of the wire. The length of the wire is preferably somewhat less than the length of the bore.

The wire **18** is fully inserted in the bore **16** and a strong moldable bonding material **22,** such as a conventional two-part epoxy resin adhesive, is molded into the bore **16** around the wire. When the plastic material is cured, the wire **18** will be securely locked within the bore **16,** especially by virtue of the bent ends. The finished handle may then be secured in the head in a conventional manner, as by molding additional epoxy resin about the handle end as shown in FIG. **2.** This may be done before or after the plastic in bore **16** has set. In fact, the bore may be drilled and provided with the wire and epoxy in a handle already secured to a head. One end of the wire should be located within the head and the other end beyond the head, as shown in FIG. **2.**

The provision of epoxy resin or the like within the bore **16** strengthens the longitudinal wood fibers, greatly increasing the resistance to breakage of the handle by over-blows. In the event of breakage of the wooden handle in the vicinity of the head under severe misuse, the metal wire will restrain the head and prevent the head from becoming a missile capable of inflicting serious injury. As is apparent, the lengths of the bore **16** and the wire **18** are sufficient (substantially more than twice the corresponding dimension of the head **10** as shown in the drawings) to insure that any breakage due to over-blows would occur well between the head and the lower end of the wire. A further advantage of the invention is that due to the increase in strength of the handle, one size wooden handle may be employed for a large number of striking tools. Custom fit of the handle to the head is not necessary, because bonding material may be used to fill in the open spaces between the head and the handle, and the bonding material will be stronger than the handle itself.

While a preferred embodiment of the invention has been shown and described, it will be apparent to those skilled in the art that changes can be made in this embodiment without departing from the principles and spirit of the invention, the scope of which is defined in the appended claims.

The invention claimed is:

1. A wooden handle for the head of an impact tool such as a hammer or the like having means for strengthening the handle against the effects of over-blows, said means comprising an elongated bore leading from an end of said handle adapted to receive the head of said tool and along a substantial portion of the length of the handle, an elongated metal wire tension member ex-

tending in the bore from the vicinity of said end and substantially along the length of said bore for a distance substantially more than twice the corresponding dimension of said head, said bore having a cross-sectional area several times the cross-sectional area of said tension member, and an epoxy resin bonding material substantially filling the bore around the wire tension member and self-bonded to the surface of the bore over substantially the entire length of the wire tension member, said wire having means for anchoring the opposite ends thereof in said bonding material.

2. A handle in accordance with claim **1,** wherein said anchoring means comprises bent ends of said wire tension member.

3. A handle in accordance with claim **1,** wherein said bore is of the order of 1/4 to 5/16 inch in diameter and extends along about 1/2 the length of the handle.

4. An impact tool comprising a head having a hole therein, a wooden handle having one end inserted in said hole and secured to said head, and means for strengthening said handle against the effects of over-

blows, said means comprising an elongated bore leading from said one end of said handle along the length thereof, an elongated tension member extending in the bore along the length thereof, the length of said bore and said tension member being substantially more than twice the corresponding dimension of said head, said bore having a cross-sectional area several times the cross-sectional area of the tension member, and an epoxy resin bonding material substantially filling the bore around the tension member and self-bonded to the surface of the bore over substantially the entire length of the tension member, said tension member having means for anchoring opposite ends thereof in said bonding material with one end locked in bonding material in said head and the other end locked in bonding material in said bore remote from said head.

5. A tool in accordance with claim **4,** wherein said tension member is a metal wire.

6. A tool in accordance with claim **5,** wherein said anchoring means comprises bent ends of said wire.

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