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Simond

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[54] **JOINT ASSEMBLY FOR STRIKING TOOL**

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[51] **Int. Cl.** **B25g 3/28**

[58] **Field of Search** ..... 403/248, 250, 290, 297, 403/344, 358, 369, 371, 374, 409, 110, 368, 370; 145/29 B, 29 R, 61 H, 61 M; 125/40, 41, 42, 43

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[57] **ABSTRACT**

This tool, notably in the case of an ice ax comprising a tool head formed with a depending shank and a metal tubular handle of substantially elliptic or oval cross-sectional configuration receiving said shank in its upper portion, comprises between said shank and said tubular handle upper portion a pair of half sockets associated with a wedge member; driving this wedge member between one of said half-sockets and the shank permits of locking the assembly, this locking action being reinforced by two rivets axially spaced along the handle axis and extending at right angles to each other.

2 Claims, 5 Drawing Figures

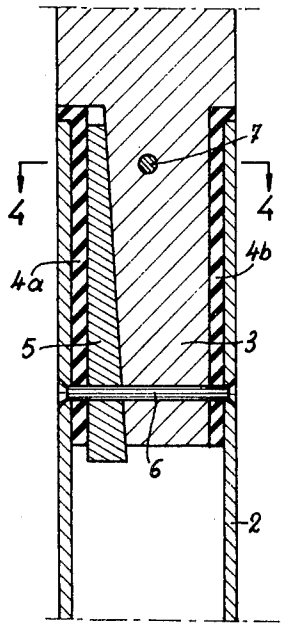


FIG.1

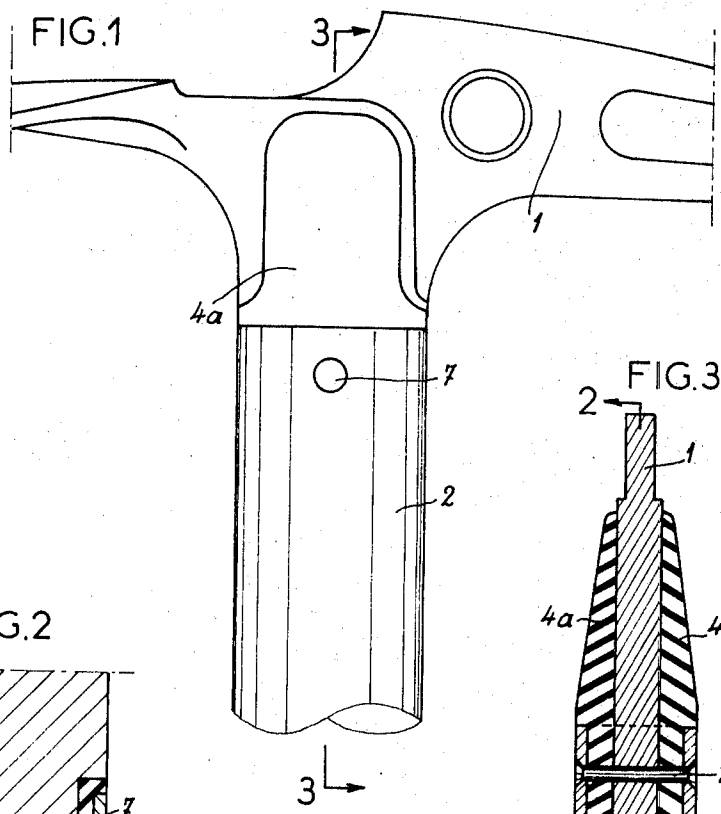


FIG.2

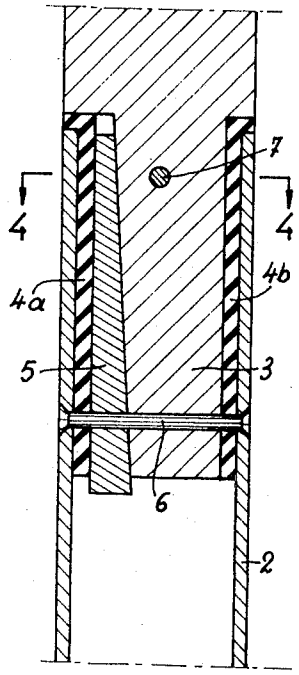


FIG.3

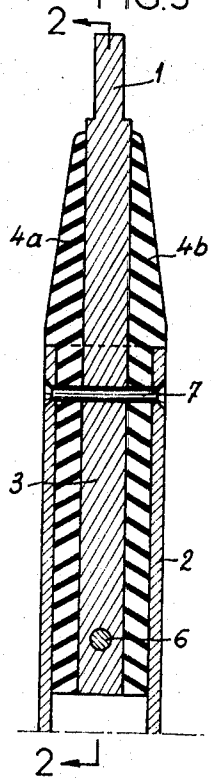


FIG.4

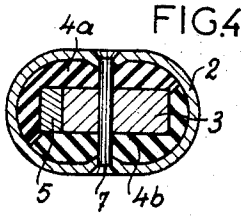
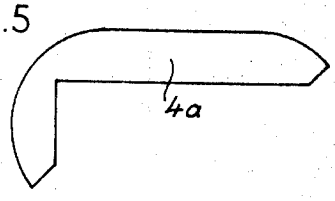


FIG.5



JOINT ASSEMBLY FOR STRIKING TOOL

BACKGROUND OF THE INVENTION

This invention relates in general to striking tools and has specific reference to tools called ice-axes or piolets, of the type used by mountaineers for cutting steps in the ice, which are manufactured in various sizes and shapes; more particularly, this invention is directed to tools of this general type but wherein the handle consists of a tube having the tool head secured to one end.

DESCRIPTION OF THE PRIOR ART

To facilitate the understanding of the present invention, a preferred form of embodiment thereof will be described presently, in the case of an ice-ax, but this application should not be construed as limiting the scope of the invention since various other striking tools can be construed according to the same basic principles.

Therefore, considering the specific case of ice axes having a tubular metal handle or stick, it is customary to secure the tool head to the handle by fitting a depending shank formed integrally with this head into the tubular handle and crimping the corresponding portion of the handle thereon. In addition to the poor aesthetic appearance of the assembly thus obtained, this mounting procedure is difficult to carry out for in most distances the shank of the ice ax head and the handle have very different dimensions; in fact, it is required on the one hand that the shank be relatively slender in order to minimize the weight of the ice ax and on the other hand that the tubular handle have a cross-sectional dimension sufficient to permit a proper gripping thereof.

Various attempts have been made with a view to improve this assembling method, for example by interposing between the head shank and the tubular handle a socket consisting generally of aluminum or light alloy, having an internal configuration matching that of said shank and an external configuration matching that of the inner cavity of the handle. This assembly, although constituting an improvement over the one mentioned hereinabove, is attended however by the following inconveniences:

when imparting to the socket an internal shape corresponding to that of said shank, due consideration must be given to the tolerances existing in the shank dimensions, and

similarly, the internal shape of the socket must be designed with due consideration for the manufacturing tolerances of the tubular handle; almost inevitably the assembly comprising these three members: the shank, the socket and the tubular handle has a play or clearance resulting from the manufacturing tolerances of each member.

Of course, attempts have been made to take up this play or these clearances by using rivets or the like for interconnecting these three members, but the only result thus achieved is a local clamping action having little or no influence on the plays existing in a direction perpendicular to each rivet or like fastening member, which plays are due to the machining, with tolerances, of said three members, i.e., the shank, the socket and the tubular handle.

Now in ice axes as well as in all striking tools these clearances will only increase in actual service. Therefore, the tool deteriorates rapidly, the existing plays increase and finally make the use of an ice ax not only difficult but sometimes impossible, and may even jeopardizing the user's life.

SUMMARY OF THE INVENTION

The present invention is directed to avoid the inconveniences of striking tools of the type broadly defined hereinabove, notably ice axes, by providing a striking tool, more particularly and preferably an ice ax, of the tubular-handle type, characterised by an improved mounting of the tool head in the tubular handle, which comprises a pair of complementary half-sockets associated with a wedge member, these three elements, namely the pair of half-sockets and the wedge member, being interposed between the upper portion of the tubular handle and the depending shank of the tool head, whereby driving the wedge member towards said head will cause the expansion of said half-sockets and thus safely lock the assembly comprising said head shank, half-sockets and wedge member within the tubular handle.

BRIEF DESCRIPTION OF THE DRAWING

A clearer understanding of this invention and of the advantageous features characterising same will be had as the following description proceeds with reference to the accompanying drawing illustrating diagrammatically by way of example a typical form of embodiment of this invention. In the drawing:

FIG. **1** is a fragmentary side-elevational view showing the upper portion of the handle and the central portion of the head of an ice ax constructed according to the teachings of this invention;

FIGS. **2** and **3** are sectional views taken along the lines **2—2** of FIG. **3** and **3—3** of FIG. **1**, respectively;

FIG. **4** is a cross-section taken along the line **4—4** of FIG. **2**, and

FIG. **5** is a plan view from above of one of the half-sockets.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawing, the reference numeral **1** designates the head of the ice ax, **2** being its tubular handle or stick.

As already known in the art, the head **1** as a central depending extension, towards the handle **2**, in the form of a shank **3** adapted to be fitted in the upper portion of this handle **2**; however, according to this invention, the shank **1** and handle **2** are assembled not directly by clamping the corresponding handle portion against the shank but indirectly by means of complementary elements, namely a pair of symmetrical half-sockets **4*a***, **4*b*** and a wedge member **5**.

Each half-socket **4*a***, **4*b*** has the configuration illustrated in the drawing, and the shape and dimensions of the cross-section of said shank **3** are such that a space actually permitting the insertion of the wedge member **5** is left between this shank **3** and the half-sockets **4*a*** and **4*b***.

Thus, by engaging and subsequently force-fitting or driving this wedge member **5** into said space, the pair of opposite and symmetrical half-sockets **4*a*** and **4*b*** are firmly pressed against the inner wall of the tubular handle **2**, said wedge member **5** bearing on the one hand against the oblique face of shank **3** and on the other hand against the inner surfaces of the pair of half-sockets **4*a***, **4*b***.

The wedge member **5**, by bearing against the shank **3** of head **1**, will thus act as an expansion element by locking the two half-sockets **4***a*, **4***b* within the tubular handle **2** and therefore the shank **3** of the tool head **1** in the chamber formed between these half-sockets **4***a*, **4***b* and said wedge member **5**.

In order definitely to lock the assembly comprising the shank **3** of head **1**, wedge member **5**, half sockets **4***a*, **4***b* and tubular handle **2**, a pair of spaced rivets disposed at right angles to each other, as shown at **6** and **7**, respectively are provided. One rivet **6** locks the wedge member **5** in relation to the shank **3**, the half sockets **4***a*, **4***b* and the tubular handle **2**, and extends along the major axis of the ellipse constituting the cross-sectional configuration of the handle. The other rivet **7** disposed as already mentioned hereinabove at right angles to the first rivet **6** extends through the head shank **3**, across the pair of half-sockets **4***a*, **4***b* and the handle **2**, to complete and reinforce the locking action exerted on the assembly.

The assembling is completed of course by locking in position the wedge member **5** by striking this member from the lower or opposite end of the handle **2**, i.e., before this end has been provided with its conventional spiked butt. From a practical point of view it is advantageous to adhere to the following procedure: the assembly comprising the shank **3** of head **1**, the pair of half-sockets **4***a*, **4***b* and the wedge member **5** is introduced (without locking the latter) into the upper end of the tubular handle **2** until the shoulder of said sockets engage the upper edge of the handle; the assembly is maintained by artificial means such as adhesive, cement or the like; then, the only step required consists in driving home the wedge member **5**. To this end, the tubular handle **2** carrying the head **3**, **1**, the pair of half-sockets **4***a*, **4***b* and the wedge member **5** is placed upon a rivet-snap or die, and by exerting a pressure of the head **1** of the ice ax the desired fit of the wedge member **5** is obtained, thus locking the component elements into a unitary block. The final locking action is achieved by inserting and upsetting the rivets **6** and **7**, in this order.

An ice ax constructed according to the teachings of this invention is characterised inter alia by the following advantageous features

the presence of a metal handle is advantageous on account of its light weight and mechanical strength, more particularly its resistance to shocks and flexion stress;

as the tubular handle is secured to the head of the ice ax from within, instead of from outside, the final appearance of the ice ax is improved considerably;

instead of locating the fastening means at one or two points, they are distributed throughout the internal surface of the tubular handle, thus improving considerably the efficiency of the assembling means, the presence of a pair of complementary rivets definitely precluding any accidental loosening;

the presence of a wedge member **5** permits of taking up any play likely to exist initially between the shank **3** and half-sockets **4***a*, **4***b*, on the one hand, and the handle, on the other hand, so that the various parts can be manufactured without imposing very accurate machining or manufacturing tolerances.

Of course, and as already mentioned hereinabove, this invention should not be construed as being strictly limited by the specific form of embodiment described and illustrated herein, since various applications, modifications and variations, as may readily occur to those conversant with the art, may be contemplated without departing from the basic principles of the invention as set forth in the appended claims. Thus, notably, instead of ice axes, the present invention may apply to any other striking tools such as hammers, etc...

What I claim as new is:

1. A striking tool, notably an ice ax of the type having a tubular metal handle, a tool head being fitted at the top of said tubular metal handle, said tool head comprising a depending shank formed as a single piece construction with said tool head, a tapered wedge member and a pair of complementary half-sockets surrounding said wedge member, said wedge member and half-sockets being interposed between said shank and the upper portion of said tubular handle, the wedge member tapering inwardly in a direction toward said tool head, said half-sockets and wedge member being located inside said upper portion of the tubular handle adjacent said tool head, whereby when said wedge member is driven upwardly towards said tool head, said wedge member will expand said half-sockets and lock the assembly with said shank.

2. A striking tool as set forth in claim **1**, including a first aperture formed in and extending through said tubular handle portion, said pair of half-sockets and said tool head shank, a second aperture formed in and extending through said tubular handle portion, said pair of half sockets and said wedge member, said apertures being disposed in planes perpendicular to each other and at different levels along said tubular handle, and further locking means for locking said assembly together including upset rivets received in said apertures.

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