

(19)



(11)

EP 1 947 218 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
03.08.2011 Bulletin 2011/31

(51) Int Cl.:
C25D 5/02 (2006.01) **B25F 5/00** (2006.01)
B25B 13/06 (2006.01)

(21) Application number: **08250001.8**

(22) Date of filing: **02.01.2008**

(54) **Metal hand tool and method for manufacturing the same**

Metallhandwerkzeug und Verfahren zu seiner Herstellung

Outil manuel métallique et son procédé de fabrication

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

(30) Priority: **22.01.2007 TW 96102293**

(43) Date of publication of application:
23.07.2008 Bulletin 2008/30

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Description

1. Field of the Invention

[0001] The present invention relates to a hand tool, and more particularly relates to a metal hand tool and a method to manufacture the metal hand tool.

2. Description of Related Art

[0002] Metal hand tools such as socket bits, wrenches, ratchet wrenches and screwdrivers, and are used frequently in our lives. A mark with drawings or words is manufactured with the metal hand tool to show the trademark and the standards of the metal hand tool.

[0003] In the past, there are two conventional methods for manufacturing the mark with the metal hand tool. The first method for manufacturing the mark with the metal hand tool is formed a salient or an indent to take as the mark when casting the metal hand tool, then electroplating the metal hand tool with an electroplate layer. However, the metal hand tool is electroplated with the same color, and this cannot let users see the mark obviously and clearly.

[0004] The second method for manufacturing the mark with the metal hand tool is electroplating the metal hand tool after casting the metal hand tool, and then printing a layer with multiple colors on the metal hand tool to take as the mark. This method can let users see the mark obviously and clearly. However, the printing layer cannot mount securely around the electroplate layer and this may make the printing layer falling off from the metal hand tool. In addition, the printing layer may fall off when rubbing against the metal hand tool.

[0005] Document US 6 787 248 discloses a method of manufacturing a hand tool comprising the steps of forming a marking recess on a tool, then electroplating the whole tool with a layer, then grinding the whole plated layer to remove the layer, so that only the recess marking is still plated and then replating the whole tool with another layer.

[0006] Therefore, the present invention provides a metal hand tool and a method to manufacture the metal hand tool to mitigate or obviate the aforementioned problems.

[0007] The main objective of the present invention is to provide a metal hand tool and a method to manufacture the metal hand tool.

[0008] A metal hand tool in accordance with the present invention is fabricated by a method to manufacture said metal hand tool, and said metal hand tool has a body with an outer surface and an preparing region, a printing layer with a mark and an electroplate layer.

[0009] The method to manufacture the metal hand tool in accordance with the present invention comprises a forming step, a printing step and an electroplating step. In the preparing step, the body is made from metal. In the printing step, the printing layer is printed on the pre-

paring region in the outer surface of the body and the mark is enched on the printing layer with an external surface. In the electroplate step, the electroplate layer is electroplated the external surface of the mark and the outer surface of the body except the preparing region with the printing layer to complete the metal hand tool.

[0010] Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

IN THE DRAWINGS:

[0011]

Fig. 1 is a perspective view of manufacturing a metal hand tool in accordance with the present invention; Fig. 2 is an enlarged cross section side view of the metal hand tool in Fig. 1; and Fig. 3 is a block diagram of manufacturing the metal hand tool in Fig. 1.

[0012] With reference to Figs. 1 to 3, a metal hand tool in accordance with the present invention is made by a method in accordance with the present invention for manufacturing the metal hand tool.

[0013] The metal hand tool is made of metal and comprises a body (10), a printing layer (20) and an electroplate layer (30).

[0014] The body (10) is made of casting or forging and has an outer surface and a preparing region. The preparing region is defined on the outer surface of the body (10).

[0015] The printing layer (20) is printed on the preparing region in the outer surface of the body (10) with a signal color or multiple colors and has a mark (21). The mark (21) is enched on the printing layer (20) by the signal color or the multiple colors and has an external surface.

[0016] The electroplate layer (30) is electroplated on the external surface of the mark (21) and the outer surface of the body (10) except the preparing region with the printing layer (20) to protect the metal hand tool. In addition, the electroplate layer (30) can be a signal layer or multiple layers. The mark (21) can be presented as a three-dimensional effect when the electroplate layer (30) is electroplated with multiple layers.

[0017] The method for manufacturing the metal hand tool comprises (a) a forming step, (b) a printing step and (c) an electroplating step.

[0018] The forming step comprises manufacturing the body (10) with an outer surface and a preparing region by casting or forging.

[0019] The printing step comprises printing signal color or multiple colors on the preparing region in the outer surface of the body (10) to form a printing layer (20) and enching a mark (21) with an external surface on the printing layer (20).

[0020] The electroplating step comprises electroplating an electroplate layer (30) on the external surface of the mark (21) and the outer surface of the body (10) except the preparing region with the printing layer (20) to complete the metal hand tool.

[0021] The metal hand tool and the method to manufacture the metal hand tool have the following advantages.

1. The electroplate layer (30) is electroplated on the external surface of the mark (21) and the outer surface of the body (10) except the preparing region with the printing layer (20) to protect the metal hand tool. This can let users see the mark obviously and clearly.
2. The printing layer (20) is printed securely around the outer surface of the body (10) and this can prevent the printing layer (20) from falling off the metal hand tool.
3. The mark (21) can be presented as a three-dimensional effect when the electroplate layer (30) is electroplated with multiple layers.

[0022] Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and features of the invention, the disclosure is illustrative only. Changes may be made in the details, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

Claims

1. A metal hand tool being made of metal and having a body (10) with an outer surface and a preparing region being defined on the outer surface of the body (10), and the metal hand tool being **characterized in that:**

a printing layer (20) being printed on the preparing region in the outer surface of the body (10) and having a mark (21) being encased on the printing layer (20) with an external surface; and an electroplate layer (30) being electroplated on the external surface of the mark (21) and the outer surface of the body (10) except the preparing region with the printing layer (20).

2. A method for manufacturing a metal hand tool that has a body (10) with an outer surface and a preparing region, a printing layer (20) with a mark (21) and an electroplate layer (30), and the method for manufacturing a metal hand tool being **characterized in that:**

(a) a forming step comprising forming the body

(10) with the outer surface and the preparing region;

(b) a printing step comprising printing the printing layer (20) on the preparing region in the outer surface of the body (10); and encasing the mark (21) with an external surface on the printing layer (20); and

(c) an electroplating step comprising electroplating the electroplate layer (30) on the external surface of the mark (21) and the outer surface of the body (10) except the preparing region with the printing layer (20) to complete the metal hand tool.

3. The method for manufacturing a metal hand tool as claimed in claim 2, wherein printing the printing layer (20) with a signal color.

4. The method for manufacturing a metal hand tool as claimed in claim 2, wherein printing the printing layer (20) with multiple colors.

5. The method for manufacturing a metal hand tool as claimed in claim 2, wherein electroplating the electroplate layer (30) with multiple layers.

6. The method for manufacturing a metal hand tool as claimed in claim 3, wherein electroplating the electroplate layer (30) with multiple layers.

7. The method for manufacturing a metal hand tool as claimed in claim 4, wherein electroplating the electroplate layer (30) with multiple layers.

Patentansprüche

1. Metallhandwerkzeug, das aus Metall hergestellt ist und das einen Körper (10) umfasst, wobei eine Außenfläche und ein Vorbereitungsbereich auf der Außenfläche des Körpers (10) definiert sind, und wobei das Metallhandwerkzeug **dadurch gekennzeichnet ist, dass**

eine Druckschicht (20) auf den Vorbereitungsbereich auf der Außenfläche des Körpers (10) gedruckt ist und eine Markierung (21) mit einer äußeren Fläche in die Druckschicht (20) eingraviert ist; und dass eine elektroplattierte Schicht (30) auf der äußeren Fläche der Markierung (21) und der Außenfläche des Körpers (10) mit Ausnahme des Vorbereitungsbereichs mit der Druckschicht (20) elektroplattiert ist.

2. Verfahren zur Herstellung eines Metallhandwerkzeugs, das einen Körper (10) mit einer Außenfläche und einem Vorbereitungsbereich, eine Druckschicht (20) mit einer Markierung (21) und eine elektroplattierte Schicht (30) umfasst, wobei das Verfahren zur Herstellung eines metallenen Handwerkszeugs **da-**

durch gekennzeichnet ist, dass:

- (a) ein Formungsschritt das Formen des Körpers (10) mit der Außenfläche und dem Vorbereitungsbereich umfasst,
 - (b) ein Druckschritt das Drucken der Druckschicht (20) auf den Vorbereitungsbereich auf der Außenfläche des Körpers (10) und das Gravieren der Markierung (21) mit einer äußeren Fläche auf der Druckschicht (20) umfasst und
 - (c) ein Elektroplattierungsschritt das Elektroplattieren der Elektroplattierungsschicht (30) auf der äußeren Fläche der Markierung (21) und der Außenfläche des Körpers (10) mit Ausnahme des Vorbereitungsbereichs mit der Druckschicht (20) umfasst, um das Metallhandwerkzeug zu vervollständigen.
3. Verfahren zur Herstellung eines Metallhandwerkzeugs nach Anspruch 2, wobei das Drucken der Druckschicht (20) mit einer Signalfarbe erfolgt.
 4. Verfahren zur Herstellung eines Metallhandwerkzeugs nach Anspruch 2, wobei das Drucken der Druckschicht (20) mit mehreren Farben erfolgt.
 5. Verfahren zur Herstellung eines Metallhandwerkzeugs nach Anspruch 2, wobei das Elektroplattieren der Elektroplattierungsschicht (30) mit mehreren Schichten erfolgt.
 6. Verfahren zur Herstellung eines Metallhandwerkzeugs nach Anspruch 3, wobei das Elektroplattieren der Elektroplattierungsschicht (30) mit mehreren Schichten erfolgt.
 7. Verfahren zur Herstellung eines Metallhandwerkzeugs nach Anspruch 4, wobei das Elektroplattieren der Elektroplattierungsschicht (30) mit mehreren Schichten erfolgt.

Revendications

1. Un outil métallique à main fabriqué en métal présentant un corps (10) avec une surface extérieure et une zone de préparation définie sur la surface extérieure du corps (10), et l'outil métallique à main est **caractérisé par le fait** :
 - une couche d'impression (20) est imprimée sur la zone de préparation dans la surface extérieure du corps (10) et comporte une marque (21) qui est gravée sur la couche d'impression (20) avec une surface extérieure ; et
 - une couche (30) de galvanisation que l'on a appliquée par un procédé de galvanisation sur la surface extérieure de la marque (21) et sur la

surface extérieure du corps (10), où la zone de préparation avec la couche d'impression (20) est exclue.

2. Un procédé pour fabriquer un outil métallique à main présentant un corps (10) avec une surface extérieure et une zone de préparation, une couche d'impression (20) avec une marque (21) et une couche de galvanisation (30), où le procédé pour fabriquer un outil métallique à main est **caractérisé par** :

(a) une étape de formation comprenant la formation d'un corps (10) avec la surface extérieure et la zone de préparation ;

(b) une étape d'impression comprenant :

l'impression de la couche d'impression (20) sur la zone de préparation dans la surface extérieure du corps (10); et
gravure de la marque (21) avec une surface externe sur la couche d'impression (20); et

(c) une étape de galvanisation comprenant la galvanisation de la couche de galvanisation (30) sur la surface extérieure de la marque (21) et sur la surface extérieure du corps (10), où la zone de préparation avec la couche d'impression (20) est exclue, pour parfaire l'outil métallique à main.

3. Le procédé pour fabriquer un outil métallique à main selon la revendication 2, où l'impression de la couche d'impression (20) est réalisée avec une couleur de signalisation.
4. Le procédé pour fabriquer un outil métallique à main selon la revendication 2, où l'impression de la couche d'impression (20) est réalisée avec plusieurs couleurs.
5. Le procédé pour fabriquer un outil métallique à main selon la revendication 2, où la galvanisation de la couche de galvanisation (30) est réalisée avec plusieurs couches.
6. Le procédé pour fabriquer un outil métallique à main selon la revendication 3, où la galvanisation de la couche de galvanisation (30) est réalisée avec plusieurs couches.
7. Le procédé pour fabriquer un outil métallique à main selon la revendication 4, où la galvanisation de la couche de galvanisation (30) est réalisée avec plusieurs couches.

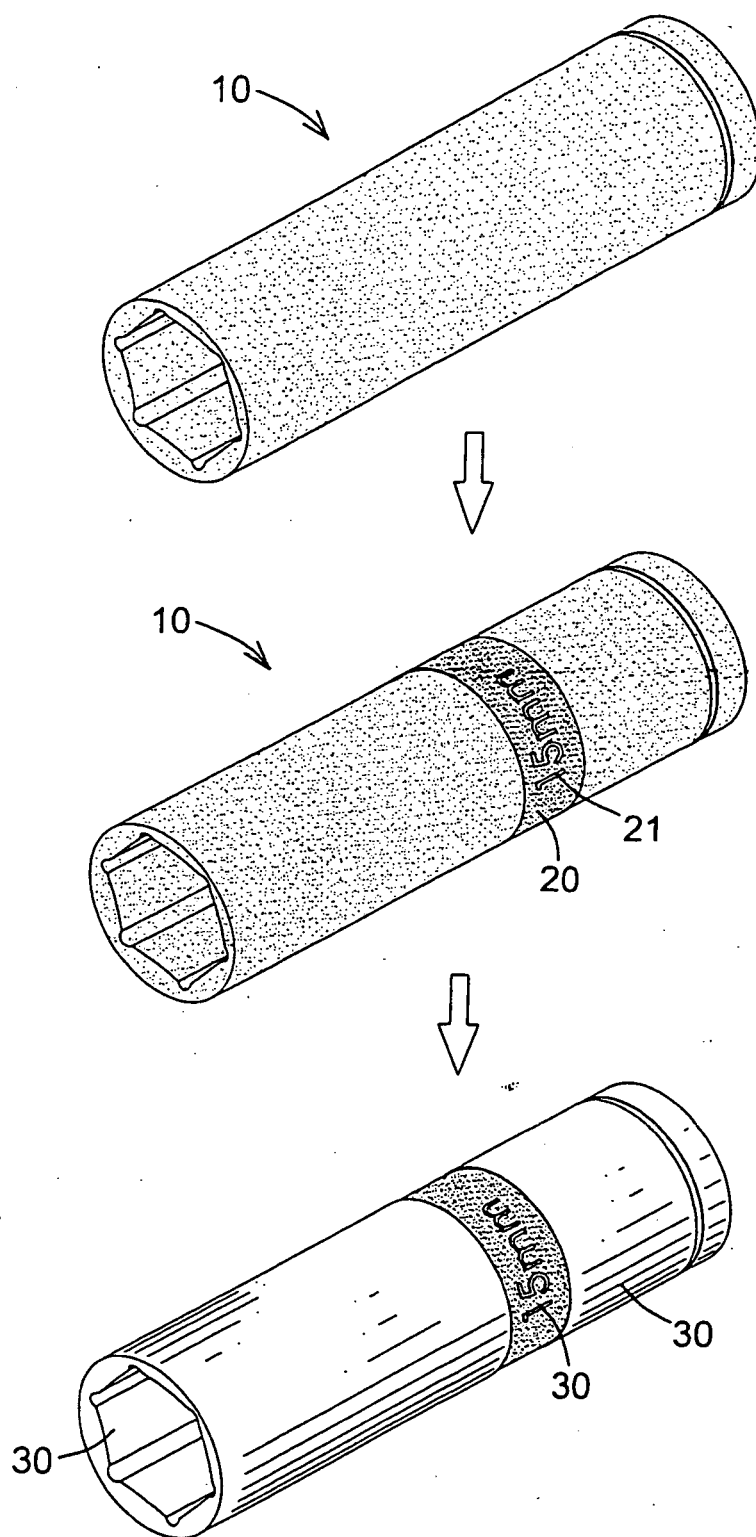


FIG. 1

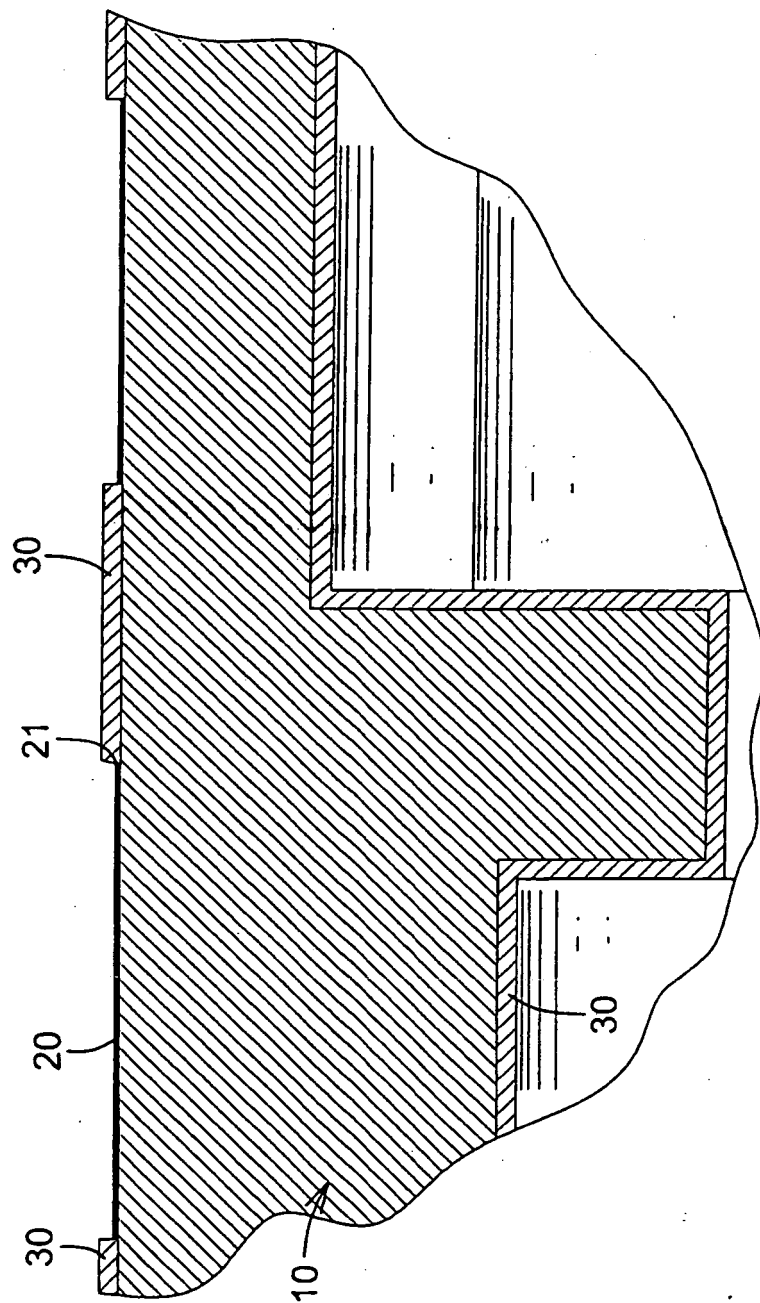


FIG. 2

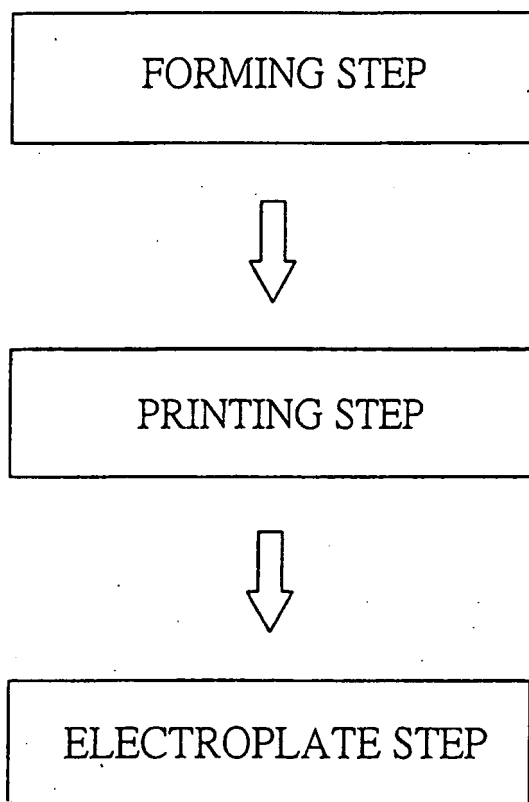


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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