



US006457387B1

(12) **United States Patent**
Hu

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(54) **REVERSIBLE RATCHETING TOOL WITH A SMALLER HEAD AND IMPROVED DRIVING TORQUE**

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(76) Inventor: **Bobby Hu**, P. O. Box 63-247, Taichung (TW)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(21) Appl. No.: **09/523,625**

Primary Examiner—Joseph J. Hail, III
Assistant Examiner—Willie Berry, Jr.
(74) *Attorney, Agent, or Firm*—Alan Kamrath; Rider, Bennett, Egan & Arundel, LLP

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(30) **Foreign Application Priority Data**

(57) **ABSTRACT**

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(51) **Int. Cl.**⁷ **B25B 13/46**

A ratcheting tool includes a handle and a head with a compartment. A drive member includes a first end extended beyond the compartment, a second end extended beyond the compartment, and a gear wheel formed between the first end and the second end. The gear wheel is rotatably mounted in the compartment and includes a toothed outer periphery. A pawl is mounted in the compartment and includes a toothed side facing the gear wheel teeth. The toothed side of the pawl includes a first teeth portion having a first center of curvature and a second teeth portion having a second center of curvature located at a position different from the first center of curvature. A ring is mounted in the compartment and around the first end of the drive member. The ring is operably connected to the pawl such that the ring and the pawl are pivotable about a rotational axis of the gear wheel and that the pawl is movable in a radial direction relative to the ring. A reversing plate is mounted to the first end of the drive member and pivotable about the rotational axis of the gear wheel between a first position and a second position. A spring having a small pitch provides transmission between the reversing plate and the pawl for moving the pawl between a first ratcheting position and a second ratcheting position.

(52) **U.S. Cl.** **81/63.2**; 81/63.1; 81/63; 81/62; 81/61

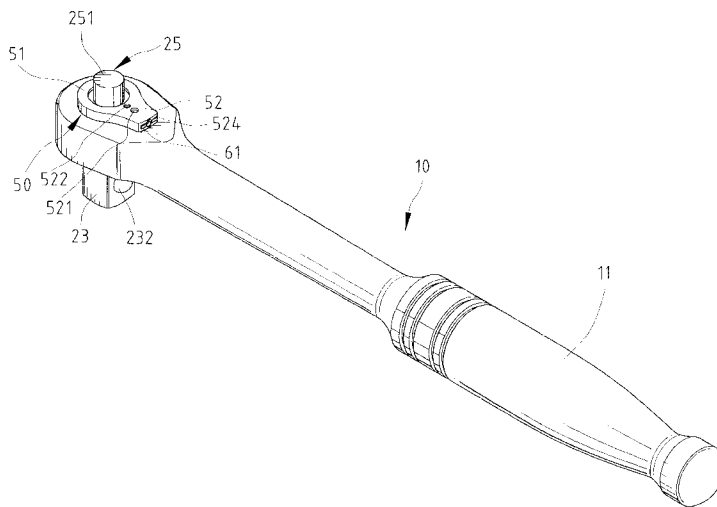
(58) **Field of Search** 81/60, 61, 62, 81/63, 63.1, 63.2

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25 Claims, 13 Drawing Sheets





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(12) **United States Design Patent** (10) **Patent No.:** **US D507,466 S**
Hu (45) **Date of Patent:** **** Jul. 19, 2005**

(54) **WRENCH**

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(76) Inventor: **Bobby Hu**, 8F, No. 536-1, Ta Chin Street, Taichung (TW)

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(**) Term: **14 Years**

Primary Examiner—Raphael Barkai

(21) Appl. No.: **29/205,308**

(74) *Attorney, Agent, or Firm*—Alan D. Kamrath; Nikolai & Mersereau, P.A.

(22) Filed: **May 12, 2004**

(57) **CLAIM**

(51) **LOC (8) Cl.** **08-05**

The ornamental design for wrench, as shown and described.

(52) **U.S. Cl.** **D8/27; D8/21; D8/28**

DESCRIPTION

(58) **Field of Search** **D8/17, 21-29;**
81/176.1, 119, 186, 177.1, 177.8, 177.9,
185.1, 120, 121.1, 125.1, 177.85

FIG. 1 is a perspective view of a wrench showing my new design;

FIG. 2 is a front view thereof;

FIG. 3 is a rear view thereof;

FIG. 4 is a left view thereof;

FIG. 5 is a right view thereof;

FIG. 6 is a top view thereof; and,

FIG. 7 is a bottom view thereof.

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1 Claim, 2 Drawing Sheets

