



US005857390A

United States Patent [19]

Whiteford

[11] **Patent Number:** **5,857,390**[45] **Date of Patent:** ***Jan. 12, 1999**[54] **REVERSIBLE RATCHET WRENCH
INCLUDING THIN-WALLED SOCKETS**[76] **Inventor:** **Carlton L. Whiteford**, 3 High Point
Rd., Westport, Conn. 06880[*] **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).[21] **Appl. No.:** **772,929**[22] **Filed:** **Dec. 24, 1996**[51] **Int. Cl.⁶** **B25B 13/46**[52] **U.S. Cl.** **81/62; 81/124.3; 81/63**[58] **Field of Search** **81/58, 60, 61,
81/62, 63, 63.1, 63.2, 121.1, 124.3**[56] **References Cited****U.S. PATENT DOCUMENTS**

1,391,677	9/1921	Foss	81/62
1,798,194	3/1931	Dodge	81/62
2,107,568	2/1938	Haist	81/62
2,570,779	10/1951	Dodge et al.	81/62
2,651,230	8/1953	Waterval	81/185
2,943,523	7/1960	Gray et al.	81/62
3,299,750	1/1967	Campanile et al.	81/62
4,631,988	12/1986	Colvin	81/62
5,203,240	4/1993	Sorter	81/63.2
5,295,422	3/1994	Chow	81/124.3

5,365,807	11/1994	Darrah et al.	81/60
5,448,930	9/1995	Miner et al.	81/124.3
5,584,220	12/1996	Darrah et al.	81/63
5,626,062	5/1997	Colvin	81/63.2

FOREIGN PATENT DOCUMENTS

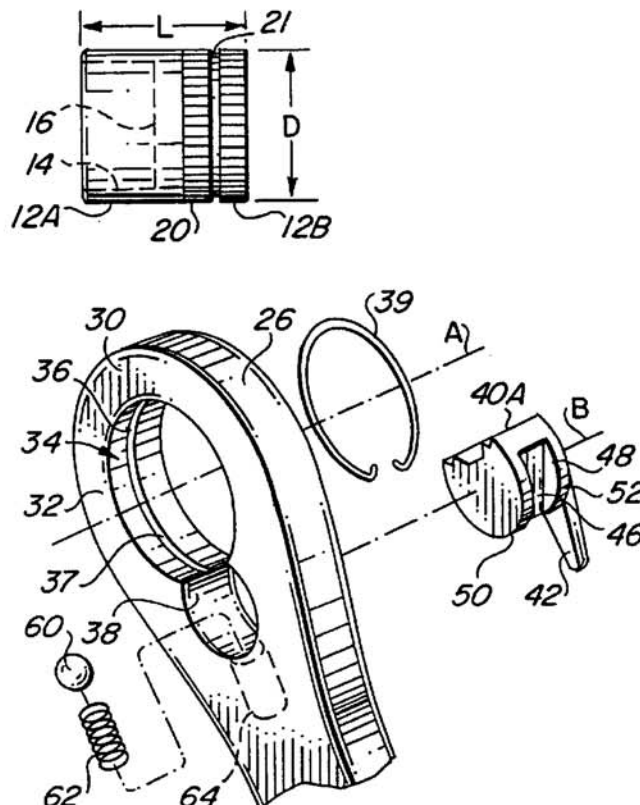
671630 12/1929 France 81/61

OTHER PUBLICATIONS

"Armstrong Reversible Bridge Wrenches," Armstrong Bros. Tool C. catalog, p. 87, 1973.

Primary Examiner—Eileen P. Morgan*Assistant Examiner*—Joni B. Danganan*Attorney, Agent, or Firm*—Spencer E. Olson[57] **ABSTRACT**

A light-weight, low-profile socket wrench system includes a set of cylindrical thin-walled sockets, each having a through axial opening sufficiently large to allow a bolt engaged by a nut of a size corresponding to that of the nut-receiving opening to pass through the axial opening and extend beyond the nut, and a ratchet wrench releasably engageable with the socket for applying rotational torque directly to a peripheral surface of the socket. In a preferred embodiment, the socket has a round peripheral surface around which a multiplicity of teeth are distributed, and the head of the ratchet wrench has a circular cylindrical opening in which the socket is releasably maintained with its teeth directly engaged by teeth on a pawl.

16 Claims, 4 Drawing Sheets



US005913954A

United States Patent [19]

Arnold et al.

[11] **Patent Number:** **5,913,954**[45] **Date of Patent:** **Jun. 22, 1999**[54] **PAWL FOR A LOW PROFILE WRENCH**[75] Inventors: **Robert L. Arnold**, Jacobus, Pa.; **Dana L. Delaney**, South Windsor, Conn.; **Derek Richner**, Whately, Mass.; **James A. Van Lenten**, Lancaster, Pa.[73] Assignee: **Hand Tool Design Corporation**,
Wilmington, Del.

2,542,241	2/1951	Fors .	
3,250,157	5/1966	Badger .	
4,328,720	5/1982	Shiel .	
4,485,700	12/1984	Colvin .	
4,631,988	12/1986	Colvin .	
5,178,047	1/1993	Arnold et al. .	
5,626,062	5/1997	Colvin	81/63.2

[21] Appl. No.: **08/928,117**[22] Filed: **Sep. 12, 1997**[51] **Int. Cl.⁶** **B25B 13/46**[52] **U.S. Cl.** **81/63.2**; 81/60; 81/63;
81/63.1; 81/62[58] **Field of Search** 81/60, 63, 63.1,
81/63.2, 62, 58.4[56] **References Cited****U.S. PATENT DOCUMENTS**

Re. 23,661 5/1953 Able et al. .

Primary Examiner—David A. Scherbel*Assistant Examiner*—Sinclair Skinner*Attorney, Agent, or Firm*—Leonard Bloom[57] **ABSTRACT**

A hand tool having a pawl with a flange formed on the bottom surface. A bore is formed axially in the pawl. A reversing lever is connected to the pawl. The pawl is received in an opening which has an annular shoulder, the flange on the pawl abutting the annular shoulder.

12 Claims, 7 Drawing Sheets