US005622090A

United States Patent [19]

Marks

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[45] Date of Patent: Apr. 22, 1997

[54] **SCALLOPED INTERIOR SOCKET TOOL**

[75] Inventor: **Joel S. Marks**, Los Angeles, Calif.

[73] Assignee: **WorkTools, Inc.**, Chatsworth, Calif.

[21] Appl. No.: **633,860**

[22] Filed: **Apr. 16, 1996**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 544,314, Oct. 17, 1995.

[51] **Int. Cl.**[6] **B25B 13/58**

[52] **U.S. Cl.** **81/185**; 81/DIG. 11; 269/266

[58] **Field of Search** ..... 81/179, 185, 436, 81/442, 448, DIG. 11; 269/266

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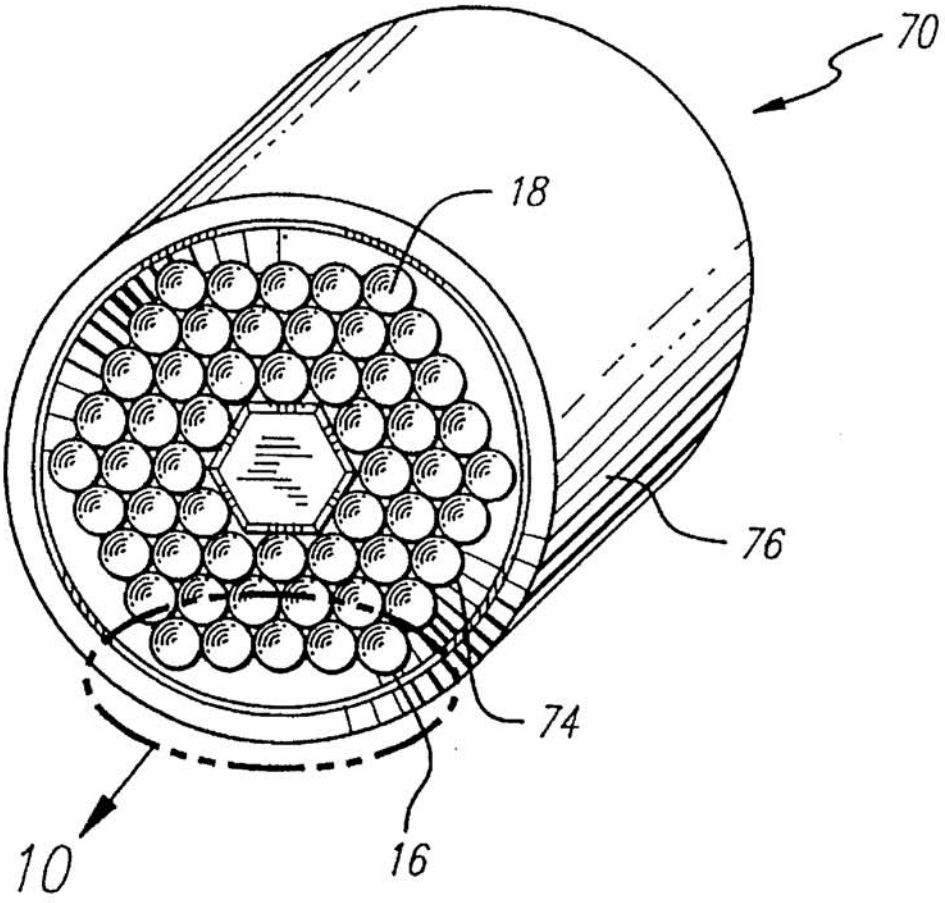
Primary Examiner—James G. Smith

Attorney, Agent, or Firm—Paul Y. Feng; Fulwider Patton Lee & Utecht

[57] **ABSTRACT**

A self-forming socket having a plurality of retractable pins bundled in parallel within a housing. The bundled pins may displace longitudinally and are biased by spring force away from a frame onto which the pins are slidably held. A spacer pin may be positioned at the center of the socket and is similarly biased away from the frame under spring force. When the socket is forced over a fastener, nut, or bolt head, groups of pins are pushed inward toward the frame and into the housing thereby conforming the pins to the contours of the fastener. Applying a torque to the socket transfers the torque through the bundled pins to the fastener. Each pin has a circular cross-section and an enlarged head and the interior walls of the housing containing the bundled pins has a hexagonal shape and may not contain any right angles. Grooves can be formed in the sides of the hexagonal shape to receive therein circular sides of adjacent ones of the enlarged heads. The pins are packed in a hexagonal arrangement.

15 Claims, 6 Drawing Sheets



US005806385A

United States Patent [19]

Schupp

[11] Patent Number: 5,806,385

[45] Date of Patent: Sep. 15, 1998

[54] **UNIVERSAL SOCKET DEVICE**

[75] Inventor: **Andreas Schupp**, Kowloon, Hong Kong

[73] Assignee: **Continental Automotive Parts Center (H.K.) Ltd.**, Hong Kong, Hong Kong

[21] Appl. No.: **645,908**

[22] Filed: **May 14, 1996**

[51] **Int. Cl.**[6] **B25B 13/58**

[52] **U.S. Cl.** **81/185**; 81/DIG. 11; 81/442; 81/448

[58] **Field of Search** ..... 81/185, DIG. 11, 81/124.4, 437, 461, 442, 448; 269/266

[56] **References Cited**

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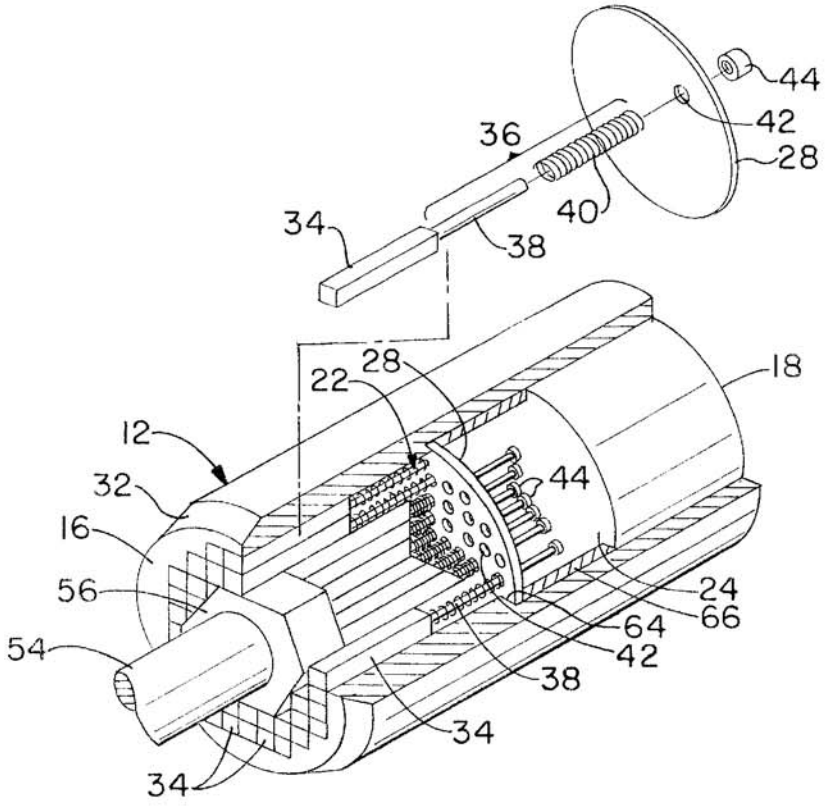
Primary Examiner—James G. Smith
Assistant Examiner—Joni Danganan
Attorney, Agent, or Firm—Oldham & Oldham Co., L.P.A.

[57] **ABSTRACT**

A universal socket is described which is suitable for use upon a myriad of fastening means whereupon at least a plurality of pins are capable of longitudinal axial movement in concert and in conformity with contact with a workpiece. This result is achieved by the incorporation of a biasing mechanism on the pins which biases the pins in a normally extended position, but which permits movement to a second retracted position. In one embodiment, the cross-sectional area of the pins is decreased in either a linear or non-linear manner from the outer periphery to the center of the socket. In operation, as the workpiece is inserted into the socket, the pins are moved in a longitudinal axial direction from their normally extended position to the second retracted position in conformity with the shape of the workpiece. Upon the application of a torque force to the closed end of the socket fitted with a drive means, the workpiece is either moved clockwise or counterclockwise depending upon the nature of the operation to be performed, i.e., tightening or loosening. Upon removal of the workpiece, the pins return to their original extended position due to the biasing mechanism, typically being a spring positioned around a reduced diameter uppermost end of the pins. In one configuration of the pins, accommodation is made for larger multi-sided workpieces than would normally be expected to be inserted into the socket based on the available surface area of the pins through the incorporation of triangular shaped free space within the socket adjacent to the pins. This permits larger sized 4- sided and 6-sided nuts and bolts to be effectively removed or tightened for example.

21 Claims, 4 Drawing Sheets



US006098507A

United States Patent [19]

Lin

[11] Patent Number: 6,098,507

[45] Date of Patent: *Aug. 8, 2000

[54] **UNIVERSAL SOCKET WRENCH**

[76] Inventor: **Chin Ho Lin**, No. 20, Lane 458, Guang Der Road, Tai Ping City, Taichung Hsien, Taiwan

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **09/286,578**

[22] Filed: **Apr. 5, 1999**

[51] **Int. Cl.**[7] **B25B 13/58**

[52] **U.S. Cl.** **81/185**; 81/DIG. 11

[58] **Field of Search** ..... 811/185, DIG. 11, 811/442, 448, 124.4, 124.5

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Primary Examiner—David A. Scherbel
Assistant Examiner—Joni B. Danganan
Attorney, Agent, or Firm—Charles E. Baxley, Esq.

[57] **ABSTRACT**

A universal socket wrench includes a housing having an inner bore and an outer opening of different sizes for forming a shoulder between the opening and the bore. The housing has a number of depressions communicating with the shoulder of the housing. A plate is engaged with the opening and the shoulder of the housing and has a number of projections engaged with the depressions of the housing for solidly securing the plate to the housing. A number of spring biased posts are slidably engaged with the plate for driving fasteners of various sizes.

2 Claims, 2 Drawing Sheets