Dec. 6, 1949 R. J. SCHAEDLER 2,490,478

WRENCH SOCKET RETAINER

Filed Jan. 22, 1946

Fig. 1.

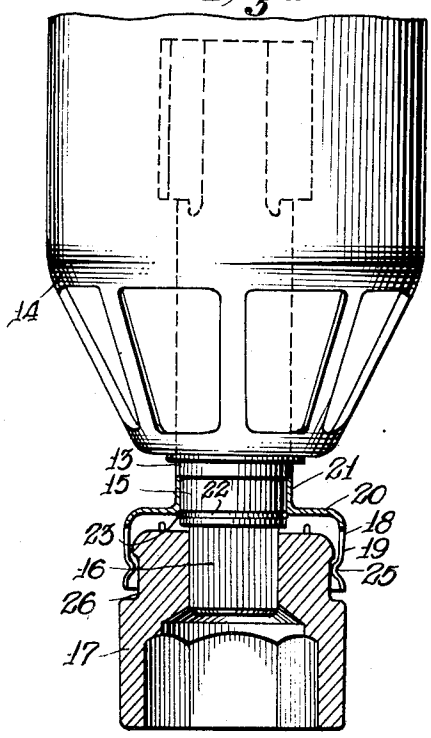


Fig. 2.

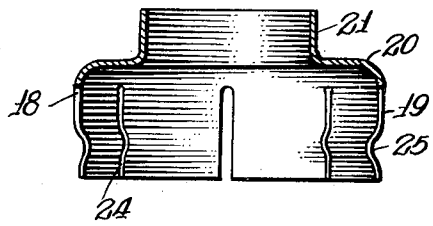
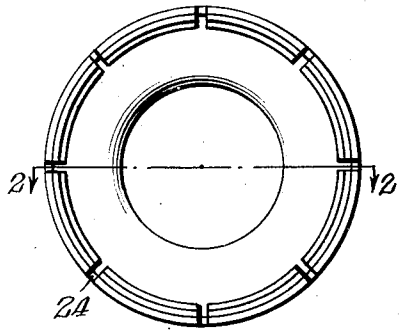


Fig. 3.



Inventor

RAYMOND J. SCHAEDLER,

By Raymond G. Mullee

Attorney

Patented Dec. 6, 1949

2,490,478

UNITED STATES PATENT OFFICE

2,490,478

WRENCH SOCKET RETAINER

Raymond J. Schaedler, Cleveland, Ohio, assignor to Chicago Pneumatic Tool Company, New York, N. Y., a corporation of New Jersey

Application January 22, 1946, Serial No. 642,689

1 Claim. (Cl. 279—19.6)

1

This invention relates to retainers for securing a wrench socket in operative position on the tool head of a power operated wrench, particularly a wrench of the impact type.

Power operated wrenches of the impact type comprise a tool head, the lower or forward portion of which is provided with a polygonal extension which slidably engages a socket formed to cooperate with the driven piece—usually a nut or bolt. The rotary motion of the tool head is transmitted through the socket to the driven piece. Such motion derives from a reversible air motor, which is controlled to rotate clockwise to run in a right threaded piece or to run out a left threaded piece and counterclockwise to run in a left threaded piece and to run out a right threaded piece.

Arranged between the air motor and the tool head is a clutch hammer assembly. During the free running period when the driven piece offers relatively light resistance, the clutch may impart continuous and substantially uniform rotation to the tool head. But the clutch is designed to respond to the torque requirements of the driven piece, and under conditions of excessive tortional resistance, particularly after the seating of the driven piece when there is an abrupt increase of resistance, the clutch operates to effect a series of disengagements and impacts by hammer elements upon the anvil portions of the tool head. A motor driven wrench provided with such a clutch arrangement is disclosed in Patent No. 2,285,638, granted June 9, 1942 to Lester A. Amtsberg.

The socket detachably fits the end of the tool head, and on account of the heavy duty to which the device is subjected, play will develop between the socket and the head. This usually results in a tendency for these elements to disengage.

It is an object of this invention to provide a retainer to prevent longitudinal or axial movement of the socket on the tool head which might result in accidental disengagement therebetween.

A further object is the provision of a retainer easily and rapidly engageable with, or disengageable from, the socket when the latter is attached to, or detached from, the tool head.

A feature of the invention resides in a swivel connection between the retainer and tool head, or between the retainer and socket, or both.

Other objects and features will appear more clearly from the description of the invention which follows:

2

In the accompanying drawing which illustrates one embodiment of the invention, and in which like reference characters designate like parts:

Fig. 1 is a view of the forward or lower portion of the wrench, the socket, the retainer in its preferred form, and a snap ring being in longitudinal section, and the forward portion of the tool head and housing being in elevation;

Fig. 2 is a longitudinal sectional view of the retainer; and

Fig. 3 is a bottom plan view of the retainer.

Figs. 2 and 3 are drawn to a larger scale than Fig. 1.

In the illustrative embodiment of the invention (Fig. 1), a tool head 13 is supported for rotation in the front or lower end of a wrench housing 14. The tool head has a cylindrical shank 15 which terminates in a square projection 16 to fit and drive a corresponding apertured socket 17. The socket 17 is adapted for engagement with the driven piece (not shown), usually a nut or bolt.

To retain the socket 17 upon the tool head by preventing it from sliding therefrom, the retainer 18 is provided. The retainer is preferably made of steel, although any suitable metallic alloy or plastic compound may be used. The retainer comprises a sleeve 19, the wall of which turns inwardly at its upper portion to form a shoulder 20 and then turns upwardly to form a tubular projection 21, the interior shape and size of which conforms to the shank portion 15 of the tool head so as to effect a sliding engagement therewith.

The periphery of the tool head shank 15 is formed with an annular groove 22 adjacent its lower end. A snap ring 23 is provided for seating in the groove, the ring being of sufficiently large cross section so that the outside diameter of the ring, in seated position, shall be somewhat greater than the inside diameter of the upward projection of the retainer. After the retainer has been mounted upon the tool head shank 15, the snap ring is disposed into position in the groove, thereby securing the retainer against axial movement downwardly along the tool head shank 15.

The lower portion or sleeve 19 of the retainer is of somewhat larger internal diameter than the outside diameter of the top face of the socket and it is formed with spaced longitudinal slits 24 to provide resiliency. The sleeve is also formed with an inward annular crimp 25, the inside diameter of the sleeve measured at the crest of the crimp being somewhat less than the outside diameter of the top face of the socket. The socket has a

peripheral recess 26 adjacent its upper end. Accordingly, as the socket is forced upwardly into position upon the tool head, after the retainer has been mounted as hereinabove described, the sleeve will yield outwardly as the head of the socket is moved past the crimp, but will be urged back to normal position by the resiliency of the sleeve, thus providing for retaining the socket against longitudinal movement upon the tool head shank. As the socket reaches seating position upon the tool head, the peripheral recess 26 will be disposed opposite the crimp, and the sleeve sections will press inwardly against the recess in the socket with sufficient force to prevent longitudinal movement of the socket on the tool head under conditions of ordinary operative usage. Such inward pressure, however, will allow for the manual removal of the socket.

In the embodiment shown the engagement of the retainer with the socket is yieldable only, and the engagement between the retainer and the tool head is likewise yieldable only. Upon any stopping or abrupt retardation of rotation of the tool head and socket because of a sudden increase of resistance, as when the driven piece is seated, the retainer, due to its inertia, will continue to rotate with reference to the tool head and socket, acting as a swivel. Such swivelling arrangement avoids torsional strains upon the retainer such as would result if any portion of the sleeve were in fixed engagement with the wrench and subject to abrupt action.

The socket can be readily attached to or detached from the tool head with a simple push or pull on the socket. Thus the invention is advantageous over the conventional pin retainer arrangement which requires a considerable time for the removal of the pin.

What is claimed is:

In combination, the tool head of a rotatable power tool having an exterior annular groove, a socket member mounted thereon to rotate in unison therewith and having an exterior peripheral recess, retainer means for maintaining the socket on the tool head comprising a sleeve, said sleeve being adapted at one end to engage the tool head in swivel relation, and adapted at the other end to engage the socket in swivel relationship by means of an inward annular crimp which engages with the peripheral recess of the socket, said latter end having a plurality of slits to provide yieldability for the insertion of the socket under slight pressure, and a ring means mounted in the tool head groove and arranged to maintain the sleeve on the tool head.

RAYMOND J. SCHAEDLER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
952,570	Lamb	Mar. 22, 1910
1,220,100	Haeseler	Mar. 20, 1917
1,462,293	Mason	July 17, 1923
1,801,577	Stevens	Apr. 21, 1931
1,847,843	McKeagan	Mar. 1, 1932
1,882,520	Pollard	Oct. 11, 1932
1,982,278	Allen	Nov. 27, 1934
2,154,651	Wodack	Apr. 18, 1939
2,410,600	Cowles	Nov. 5, 1946