Aug. 2, 1960 C. KOSTKA 2,947,209

SOCKET WRENCH

Filed April 10, 1958

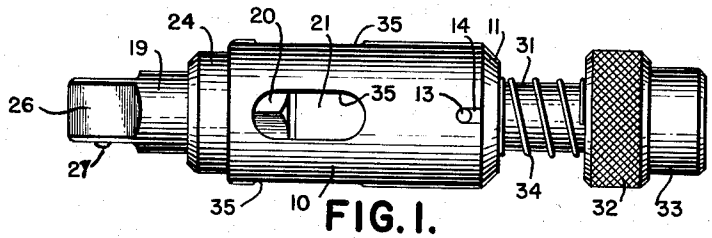


FIG. 1.

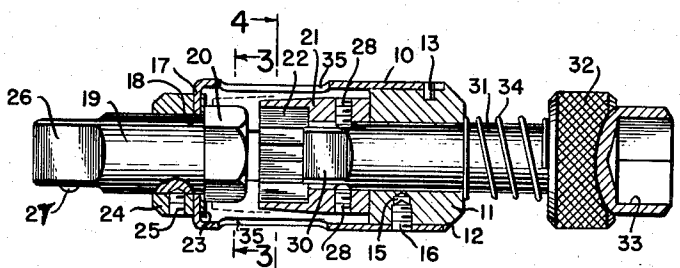


FIG. 2.

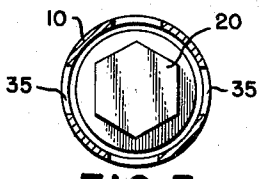


FIG. 3.

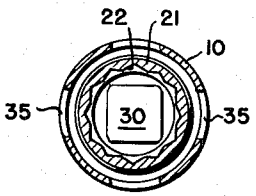


FIG. 4.

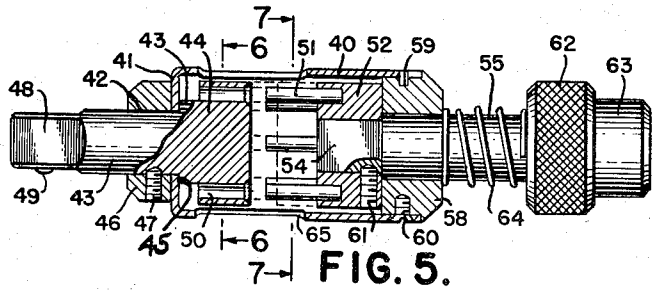


FIG. 5.

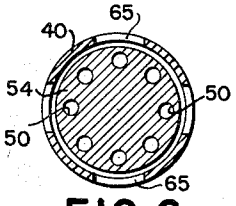


FIG. 6

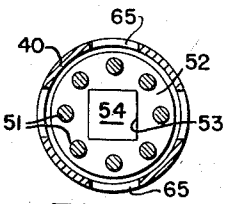


FIG. 7.

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SOCKET WRENCH

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4 Claims. (Cl. 81—58.3)

This invention relates to a gearless, strip-proof, clutch wrench.

It is the principal object of the invention to provide a clutch wrench in which the clutching parts are gearless and cannot be stripped.

It is another object of the present invention to provide a gearless, strip-proof, clutch wrench in which the engagement and disengagement of the clutching parts are effected by axial engagement with and disengagement from one another.

It is still another object of the invention to provide a gearless, strip-proof, clutch wrench in which the clutch parts are arranged so that one of the parts can be hand turned free of the other for initial tightening and final loosening of the bolt or nut and without moving the wrench from the bolt or nut.

It is a further object of the invention to provide a gearless, strip-proof, clutch wrench in which the coupling parts are automatically disengaged from one another as axial pressure is removed from the wrench in order to effect the clutch action thereof.

Other objects of the invention are to provide a gearless, strip-proof, clutch wrench, having the above objects in mind, which is of simple construction, has a minimum number of parts, inexpensive to manufacture, easily and quickly connected to the socket extensions and like parts, compact, durable, effective and efficient in use.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which

Figure 1 is a side elevational view of the gearless, strip-proof, clutch wrench constructed according to one form of the invention,

Fig. 2 is a fragmentary elevational view of the wrench with portions broken away to show the interior construction thereof,

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 2,

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 2,

Fig. 5 is an elevational view of a gearless, strip-proof, clutch wrench constructed according to another form of the invention with portions broken away to show the interior construction thereof,

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 5, and

Fig. 7 is a transverse sectional view taken on line 7—7 of Fig. 5.

Referring now particularly to Figs. 1 to 4, 10 represents a sleeve body, in one end of which is fitted a plug 11 having a shoulder 12 abutting the end of the sleeve 10. This plug 11 has an alignment pin 13 adapted to fit a slot 14 in the end of the sleeve 10 so that quick alignment of screw openings 15 when fixing said sleeve 10 to the plug with screws 16 can be made. The opposite end of the sleeve 10 has inwardly extending flange 17 with a central opening 18 in which a headed clutching or coupling drive part 19 is journalled. This drive part 19 has a hexagonal head 20 that is rotatable within the sleeve 10 and is adapted to be engaged by a socket clutching part 21 having a socket opening 22 which accommodates the hexagonal head when the socket part 21 is axially moved for engagement therewith. The hexagonal head 20 bears upon a wear washer 23 and is held in engagement therewith by a set collar 24 having a set screw 25. The clutching or coupling drive part 19 has a squared end 26 with a ball detent 27 adapted for engagement with a standard wrench socket.

The socket 21 is fixed by means of set screws 28 to a squared end 30 of an axially removable drive shaft part 31, slidable and journalled in the plug 11. This shaft part 31 has a knurled knob 32 and a socket formation 33. The shaft part 31 is normally retained so that the socket 21 is disengaged from the head 20 by a compression spring 34 that surrounds the shaft part 31 and reacts between the plug 11 and knob 32. Automatically, as pressure is released from the shaft 31, the spring 34 disengages the socket 22 from the head 20 to permit the clutching of the socket 21 with respect to the head 20 of the coupling part 19. As pressure is again applied to the shaft part 31, automatic engagement with the head 20 is effected for the next turn. The socket opening 22 has twelve side edges to provide minimum clutch turning action. Sleeve 10 has elongated clean out openings 35 which not only serve to permit the easy removal of dirt and the washing out of the sleeve but also permits the operating parts to be observed.

Referring now particularly to Figs. 5, 6 and 7 there is shown the other form of the invention in which the coupling parts are coupled with one another by means of circumferentially-spaced pins on one part and cooperating similarly-spaced openings on the other part. A sleeve 40 has an inwardly turned flange 41 with a journal opening 42 therein. A clutching or coupling part 43 is journalled in the opening 42 and has an enlarged head 44 and a shoulder 45, the latter of which engages the inner face of the flange 41 and is held against inward axial displacement therefrom by a set collar 46 secured to the coupling part 43 by set screw 47. This coupling part 43 has a squared end 48 and a ball detent 49 adapted to detachably receive an extension or wrench socket.

The head 44 of the coupling part 43 has a plurality of holes 50 countersunk on their inner faces and circumferentially-spaced from one another, these holes 50 are penetrated by similarly-spaced engaging pins 51 projecting from a retaining head 52 having a square central opening 53 for drivingly receiving a squared end 54 of a drive shaft 55 journalled in a plug 58 centered and secured to the end of the sleeve 40 and by an alignment pin 59 and fastening screws 60. The retaining head 52 is made secure to the portion 55 by set screws 61.

The drive shaft 55 has a combined knurled knob 62 for hand turning of the shaft 55 and the coupled parts and a socket connecting portion 63. The pins 51 are normally held out of engagement with the openings 50 by a compression spring 64 that reacts between the plug 58 and the knurled knob 62. As pressure is applied to the shaft 55 the pins 51 will enter and interlock with the countersunk openings 50 of the head 44 to provide a temporary drive connection therebetween so that the coupled parts turn together as a solid unit. The sleeve 40 has openings 65 through which dirt can be washed and the parts observed.

Any number of pins can be used in different space relationship with reference to each other and these pins may be of any length or size desired sufficient for heavy duty work. Once these pins are interlocked with the openings a positive connection is thereby made and they cannot slip or be stripped.

It will also be apparent that this clutch action has been

effected without need of gears and yet has the same clutch action as can be effected with a gear type clutch.

While various changes may be made in the detailed construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. A socket wrench having an axially shiftable clutch mechanism comprising an outer sleeve, said sleeve having journal openings in the opposite ends thereof, coupling parts journalled in the opposite ends of the sleeve and adapted to be engaged with one another by axial adjustment of one of said parts relative to the other, said sleeve having a removable plug connected thereto and having a journal opening at that end of the sleeve, one of said coupling parts being journalled in the plug and having a knurled turning knob thereon by which hand turning can be effected and a spring on said coupling part reacting between the plug and the knurled knob.

2. A socket wrench having an axially shiftable clutch mechanism comprising an outer sleeve, said sleeve having journal openings in the opposite ends thereof, coupling parts journalled in the opposite ends of the sleeve and adapted to be engaged with one another by axial adjustment of one of said parts relative to the other, and one of said coupling parts having a polygonal head formation lying within the sleeve, and the other of said coupling parts being axially aligned therewith and having a cooperating socket opening with twice the number of sides of the polygonal head formation for permitting minimum turning of the polygonal head, and a set collar on said part having said polygonal head adapted to be secured thereto to hold the part in the sleeve against inward axial displacement.

3. A socket wrench having an axially shiftable clutch mechanism comprising an outer sleeve, said sleeve having journal openings in the opposite ends thereof, coupling parts journalled in the opposite ends of the sleeve and adapted to be engaged with one another by axial adjustment of one of said parts relative to the other, and said sleeve having a removable plug on one end thereof and said other part being journalled in said plug.

4. A socket wrench having an axially shiftable clutch mechanism comprising an outer sleeve, said sleeve having journal openings in the opposite ends thereof, coupling parts journalled in the opposite ends of the sleeve and adapted to be engaged with one another by axial adjustment of one of said parts relative to the other, and one of said coupling parts having a head with a plurality of circumferentially-spaced longitudinally-extending holes and said other part having a head with a corresponding number of similarly-spaced coupling pins adapted to enter and interlock with said holes in the head of the one coupling part.

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