

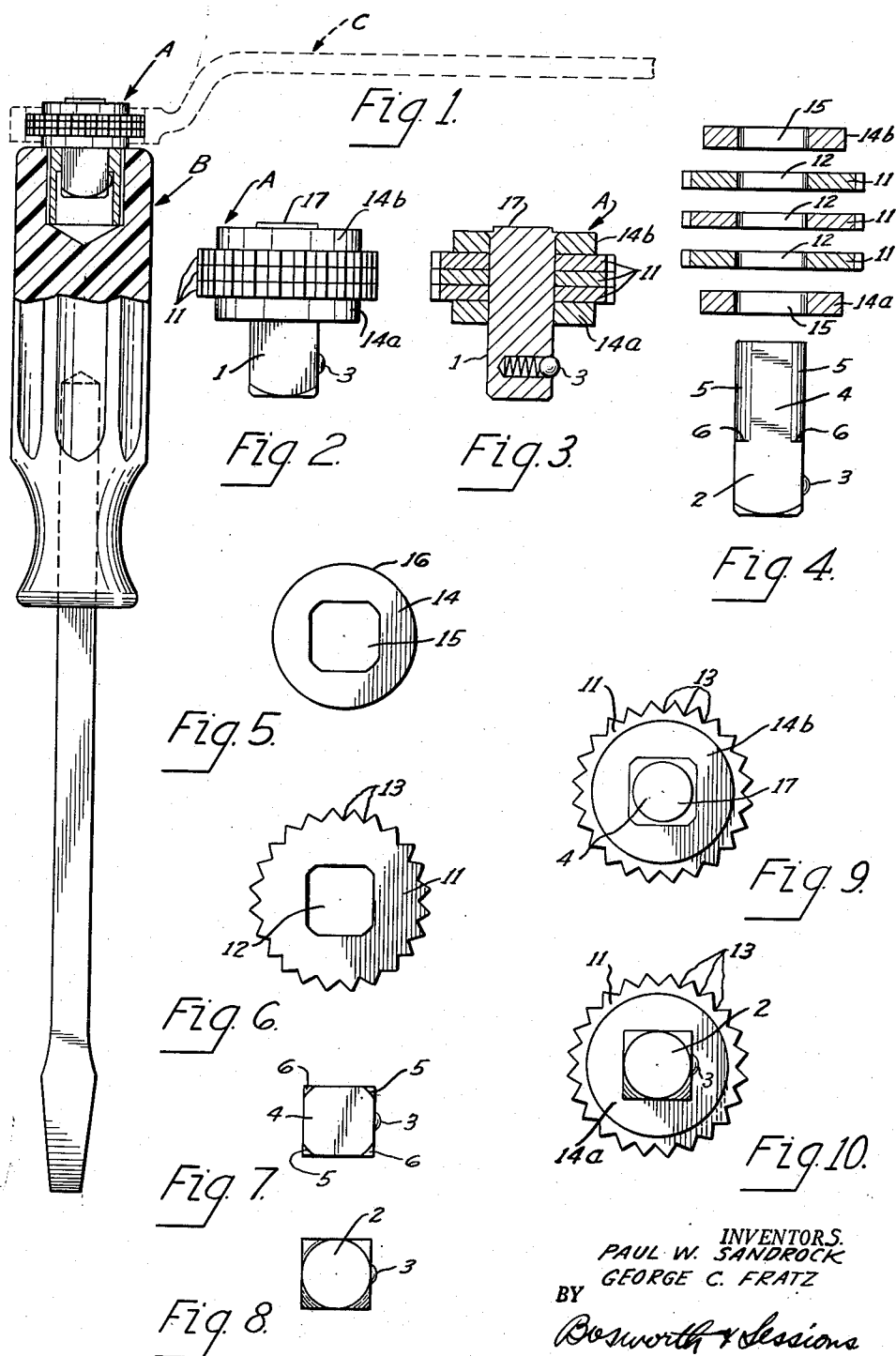
March 16, 1954

P. W. SANDROCK ET AL

2,672,066

TOOL HANDLE ATTACHMENT

Filed Aug. 18, 1951



UNITED STATES PATENT OFFICE

2,672,066

TOOL HANDLE ATTACHMENT

Paul W. Sandrock and George C. Fratz, Kipton,
Ohio, assignors to Kipton Industries, Inc., Kipton,
Ohio, a corporation of Ohio

Application August 18, 1951, Serial No. 242,543

3 Claims. (Cl. 81—71)

1

This invention relates to a tool handle attachment with the aid of which increased manipulative force may safely be applied to a tool handle by an auxiliary device of conventional construction.

Heretofore, screw driver handles have been available incorporating cylindrical inserts designed to receive a square shank of a conventional ratchet head. An insert of this kind is described in copending application Serial No. 153,194, filed March 31, 1950, now Patent Number 2,620,001, for "Tool Handle." It consists of a sleeve-like element having therein one or more interiorly located segmental shoulders acting as self-contained detent means for coaction with the ball detent incorporated in the shank of the ratchet head. With such inserts can of course be used any other type of auxiliary device that has a square shank of proper size, particularly if it is equipped with a suitably located ball detent. However, unless an auxiliary device so equipped happens to be at hand, the user is unable to take full advantage of the fact that the tool is adapted for use in conjunction with a device for applying increased manipulative force to the tool handle.

It is an object of the present invention to provide an attachment fitting into inserts of the type described with the aid of which increased manipulative force may be applied to the tool handle by a standard socket wrench, a Stillson wrench, a pair of pliers, or any similar auxiliary device that lacks the square shank of the conventional ratchet head, all without necessitating the application of such auxiliary device to the tool handle itself. It is a further object of the invention to provide an attachment of the type described that will not project laterally beyond the tool handle itself to interfere with the means usually provided for limiting or preventing rolling of the tool when in contact with a flat surface. It is a further object of the invention to provide a tool handle attachment of built-up construction that is susceptible of being assembled with ease from parts that can be turned out readily by such machines as punch presses, automatic screw machines, and the like.

Other objects and advantages of the invention will be apparent from the description which follows and from the accompanying drawings, in which Figure 1 is a full-scale side elevation of a screw driver with the tool handle attachment of the present invention applied to it, the socket wrench shown in dotted lines being representative of the type of auxiliary device that may be used with such attachment; Figure 2 is a side ele-

2

vation of the tool handle attachment shown in Figure 1, the same being shown as it appears when removed from the tool handle with which it is used; Figure 3 is a vertical central section of such tool handle attachment; Figure 4 is an exploded view of the parts of the tool handle attachment before they are assembled, the various parts being shown in section; Figure 5 is a plan of one of the spacer washers used in the tool handle attachment; Figure 6 is a plan of one of the gripping washers; Figure 7 is a top plan of the shank to which the gripping and spacer washers are applied; Figure 8 is a bottom plan of the same shank; Figure 9 is a top plan of the assembled tool handle attachment; and Figure 10 is a bottom plan of the assembled tool handle attachment. Figures 2 to 10, inclusive, are all on a somewhat enlarged scale as compared with that of Figure 1.

As is apparent from Figure 1, tool handle attachment A fits into the end of tool handle B. The latter is recessed to permit it to take a metal insert of the kind shown, described and claimed in application Serial No. 153,194, now Patent Number 2,620,001. Such an insert has a square opening terminating in a plurality of transversely extending segmental shoulders that hold tool handle attachment A in position by engaging the ball detent with which the tool handle attachment is equipped. A socket wrench C is shown in dotted lines, such socket wrench being representative of a variety of auxiliary devices that can be used with the tool handle attachment of the invention.

Tool handle attachment A is shown to better advantage in Figures 2 and 3. Built up of metal components, it includes a shank 1 which is co-extensive in length with the attachment itself. Such shank is made from square bar stock, preferably $\frac{3}{8}$ inch by $\frac{3}{8}$ inch in cross section, this in order that it may be used wherever one may use a ratchet head provided with a shank of like dimensions. As indicated in Figure 4, shank 1 has a block-like portion 2 adapted for entry into the recess in the tool handle insert, such block-like portion being equipped with a spring-pressed ball detent 3.

Surmounting block 2 and integral with it is a more or less polygonal stud 4. The generally polygonal shape of stud 4 may be imparted to it in an automatic screw machine by rounding corners 5 of shank 1 above the upper limits of block 2. By giving stud 4 a rounded contour, which is accomplished as stated by rounding off corners 5, transversely extending shoulders 6

3

are formed in the plane wherein stud 4 meets block 2. Shoulders 6 may therefore be considered as dividing shank 1 into two parts, one on one side of shoulders 6 having the characteristics of a block and the other, on the opposite side, having the characteristics of a stud. The axial length of stud 4 may be less than, equal to, or greater than that of block 2, as may be desired in a given case.

To stud 4 may then be applied one or more gripping washers 11, the same being preferably formed by a stamping operation from $\frac{1}{8}$ inch metal stock. The number of gripping washers 11 is dependent on the thickness of the stock and the needs of the situation, but in cases wherein $\frac{1}{8}$ inch stock is used three such washers, superimposed one upon another, may be conveniently employed. Each washer has a central opening 12 (Figure 6) corresponding generally to but slightly larger than the transverse cross section of stud 4 on shank 1. Opening 12 may conveniently take the form of an octagon as shown, but the precise shape is unimportant so long as there is no mutual interference, as at the corners, between washers 11 and stud 4.

As further shown in Figure 6, each gripping washer 11 is provided at its periphery with a plurality of gripping portions. Preferably, but not necessarily, such gripping portions take the form of triangular serrations 13 of suitable size, shape and number. Where two or more serrated gripping washers are mounted on stud 4, the serrations are preferably aligned to form longitudinally extending grooves in the edges of the gripping washer assembly. If (as may be desired) no spacer washers are used therewith, the first gripping washer 11 to be applied to stud 4 will come to rest against shoulders 6; subsequently applied gripping washers will be supported by it, the last of them at approximately the level, but usually very slightly below the level, of the extreme upper end of stud 4. For some purposes it is sufficient if all of the washers take the form of gripping washers, but it is practicable and sometimes desirable to flank the gripping washer or washers 11 by spacer washers, such spacer washers, designated 14, being shown in Figure 5.

Each spacer washer 14 is preferably of $\frac{1}{8}$ inch metal stock. It is provided as shown with a central opening 15 and a smooth (non-serrated) circular periphery 16. The opening 15 in spacer washer 14 is similar in size and shape to opening 12 in gripping washer 11, having, like the latter, a more or less polygonal shape. Spacer washers 14, where used, need not necessarily fit so closely to stud 4 as do gripping washers 11, which are to carry the stresses; consequently, the openings in spacer washers 14 may be slightly larger than the openings in gripping washers 11. In the preferred form of the invention shown in Figures 2 and 3, two spacer washers are employed, the first, designated 14a, being in contact with shoulders 6 and the second in proximity to the end of stud 4. In the construction shown, the height of the washer stack is just short of the length of stud 4; this so as to leave at the upper end of stud 4 a projecting portion 17 which may be headed over to hold the washer stack to shank 1.

In one entirely practicable form of the invention, the various washers are held to shank 1 in the manner above described by heading over the end of the shank 1 into contact with the washer farthest from the shoulders separating block 2

4

from stud 4; however, other forms which the invention can take may, if desired, employ a metallic bond, such as that formed by silver solder or some other suitable material of a similar nature.

If silver solder or the like is used to hold the parts together, the solder is introduced, together with the flux, at or near the surfaces to be bonded together, after which the solder is heated to a temperature sufficient to cause it to melt and flow into the interstices between the parts. In a closely related form of the invention, shank 1, gripping washers 11 and spacer washers 14a and 14b are coated with copper, which may be deposited on them in conventional fashion from a solution of an inorganic copper salt, then assembled together without the use or application of any flux, and then brazed together by exposing the assembly as a whole to elevated temperatures in a reducing atmosphere. In the preferred form of the invention, the parts are first copper-coated as above described, then brought together, then formed into a unitary assembly by heading over ("staking") the end of shank 1, and finally hydrogen-brazed to introduce a metallic bond. Other methods of uniting the washers to the shank are available, some making use of metallic bonds and others making use of mechanical means for holding the parts together.

The result of the foregoing operations is to provide a built-up tool handle attachment which, being unitary, operates as if it were integrally formed, as by casting or by machining it from a somewhat larger work piece. However, as compared with cast or machined tool handle attachments, it has the advantage that a minor crack in the shank presents no especial problem, this for the reason that the greater part of the load is carried by the washers. By contrast, in a cast or machined tool handle attachment, a minor crack in the stock tends to spread to the portion in which the serrations are formed, resulting in breakage in this portion. The advantages so provided by a built-up tool handle attachment are important from a practical standpoint.

The materials of which the parts are formed may vary widely but can be of a suitable ferrous alloy such as mild steel. A non-ferrous alloy, of which beryllium-copper is an example, may be used instead. If desired, the parts of the assembly and even the assembly itself may be chromium plated; however, the use of a rust-resistant steel such as Stainless Steel 18-3 is preferred, if there is a possibility of rusting, in view of the nature of the stresses to which the attachment is subjected in use. If the parts are copper-coated and hydrogen-brazed as above described, the hydrogen-brazing step will itself give a bright, attractive finish to the metal.

The make-up, dimensions and proportions of the tool handle attachment may be varied within wide limits. In a typical case, using a shank of bar stock measuring $\frac{3}{8}$ inch by $\frac{3}{8}$ inch, three gripping washers of $\frac{1}{8}$ inch stock, and two spacer washers of $\frac{1}{8}$ inch stock, a suitable tool handle attachment may be made from a shank measuring approximately 23 mm. in length before heading over. In such case, block 2 would measure about 10 mm. or perhaps slightly more than 10 mm. in length. Stud 4 before heading over would measure from 12 to 13 mm. in length. Gripping washers 11 would measure in diameter about 25 mm. overall and, from the base of one serration to the base of the nearest serration on the opposite side, about 23 mm., in which case each serra-

tion would have altitude of about 1 mm. Twenty-four serrations may advantageously be used, although a greater or lesser number may be used if desired. Spacer washers 14 may conveniently have a diameter of about 20 mm., although they may be greater or less so long as they do not interfere with the function of the serrations on gripping washers 11. Using a tool handle of typical size; e. g., 28 mm., the tool handle attachment will not ordinarily come into contact with or roll on a flat surface on which the tool handle may be placed.

Obviously, changes within the scope of the invention may be made by those skilled in the art, such changes going, for example, to the shape, proportion and materials used in block 2, stud 4, gripping washers 11 and spacer washers 14. The assembled tool handle attachment may be applied to a tool handle of any kind that is equipped with an insert of the kind shown in Figure 1, whether the tool carried by the tool handle be a screw driver, awl, auger bit, or the like. The auxiliary device for applying power to the tool handle attachment and transmitting it by means of the tool handle attachment to the tool handle itself may conveniently take the form of a socket wrench, although various other conventional auxiliary devices may be used instead. The tool handle attachment may be incorporated bodily in a ratchet head, although in such case there is a sacrifice of the flexibility of use that follows from the fact that with the tool handle attachment as shown and described may be used, interchangeably, such tools as socket wrenches, Stillson wrenches, pliers and other common tools that are everywhere available.

It is intended that the patent shall cover, by summarization in the appended claims, whatever features of patentable novelty reside in the invention.

What is claimed is:

1. A built-up knob for a tool handle or the like comprising a plurality of similarly shaped stamped metal washers each of which has a polygonal opening therein and at least one of which has a series of serrations in its periphery, said washers being held together to enable them to act as a unit when an auxiliary device is applied to them; a piece of metal bar stock of a corresponding polygonal cross section passing through the polygonal openings in the washers and extending for a substantial distance beyond the washers on one side but not on the other side thereof, said piece of bar stock being divided by an intermediate shoulder into a projecting block-like part provided with a ball detent for coaction with the tool handle and a stud-like part of lesser cross-

sectional area for mounting the washers; fastening means locating the washers in place on the piece of bar stock; and a metallic bond uniting the washers and the piece of bar stock into a unitary structure to which force may be applied by the auxiliary device and by which the force so applied may be transmitted to the tool handle.

2. A built-up knob for a tool handle or the like comprising a plurality of similarly shaped stamped metal washers each of which has a polygonal opening therein and at least one of which has a series of serrations in its periphery, said washers being held together to enable them to act as a unit when an auxiliary device is applied to them; a piece of metal bar stock of a corresponding polygonal cross section passing through the polygonal openings in the washers and extending for a substantial distance beyond the washers on one side but not on the other side thereof, said piece of bar stock being divided by an intermediate shoulder into a projecting block-like part provided with a ball detent for coaction with the tool handle and a stud-like part of lesser cross-sectional area for mounting the washers; and fastening means holding the washers in place on the stud-like part of the piece of bar stock, said fastening means taking the form of a portion of the piece of bar stock headed over into contact with that one of the washers that is farthest removed from the shoulder intermediate the ends of the piece of bar stock.

3. A method of making a tool handle attachment comprising the steps of forming an intermediate shoulder in a piece of bar stock by rounding off the corners of the piece while leaving the sides substantially intact for a substantial part, but less than all, of its length; mounting a series of washers on the rounded off part of the piece; locating the washers in place in the stretch between the shoulder and the end of the piece by fastening together the end of the piece and the washer nearest the end of the piece and bonding the washers to the piece to form a unitary structure.

PAUL W. SANDROCK.
GEORGE C. FRATZ.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
D. 45,165	Warren	Jan. 13, 1914
1,028,675	Van Sickle et al.	June 4, 1912
1,381,900	Barnes	June 21, 1921
1,888,793	Erickson	Nov. 22, 1932
1,904,100	Taylor	Apr. 18, 1933