

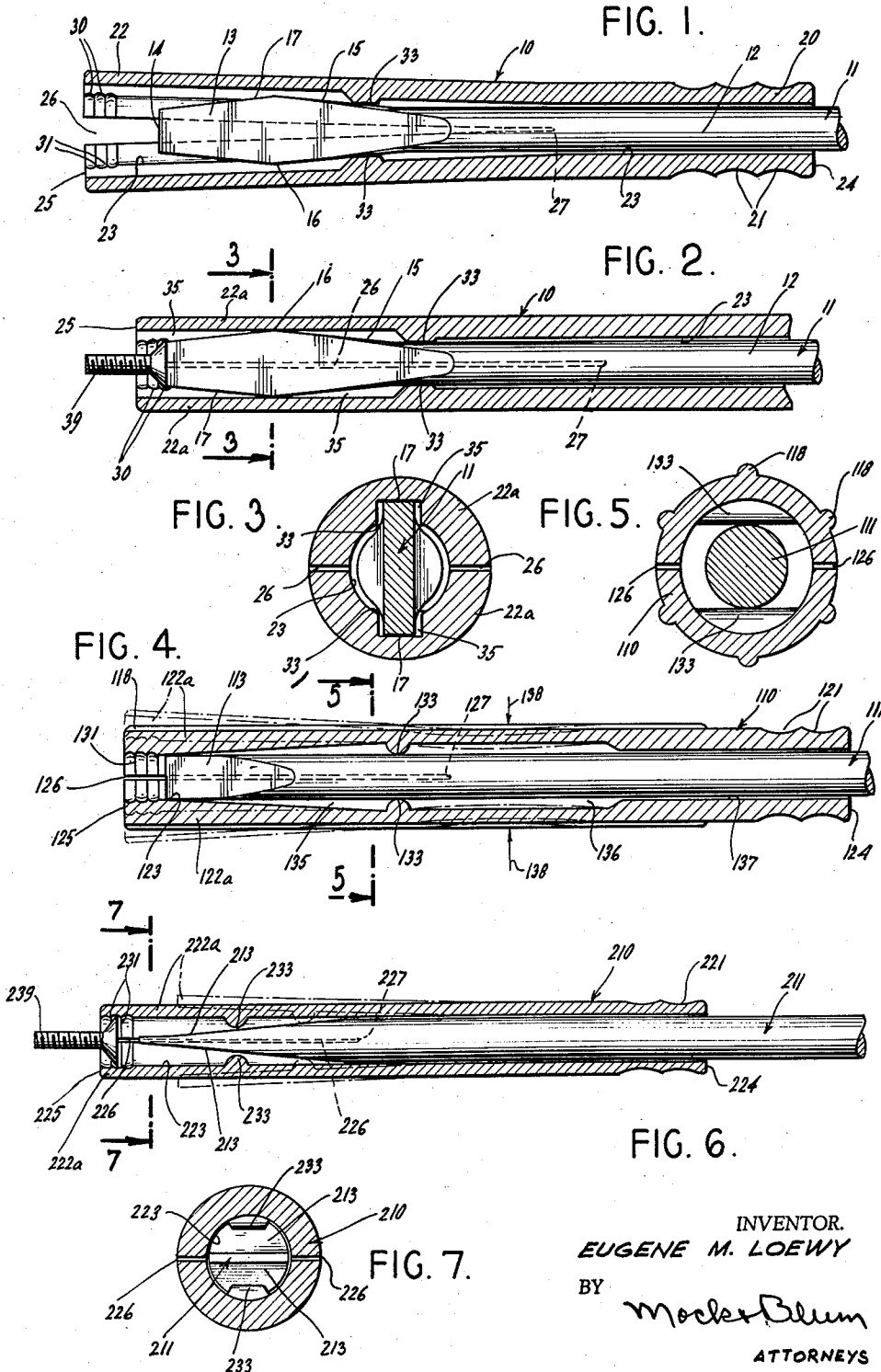
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SCREW HOLDING, SCREW DRIVER ATTACHMENT

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SCREW HOLDING, SCREW DRIVER ATTACHMENT

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2 Claims. (Cl. 145—52)

This invention relates generally to screwdriving devices, and is especially concerned with new and improved means for releasably retaining a screw during the driving or turning procedure.

It is an important object of the present invention to provide a device of the type described adapted for attachment to a screwdriver, which is extremely simple in construction and operation, being durable and reliable over a long and useful life, which requires a minimum of parts, and is adapted to be economically manufactured for sale at a reasonable price.

It is another object of the present invention to provide a screwdriver attachment having the advantageous characteristics mentioned in the preceding paragraph, which is of extremely slender proportions and adapted to be circumposed about the shank of a screwdriver so as to occupy negligible additional space, thereby affording ease of entry and operation in small and relatively inaccessible locations.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

Fig. 1 is a longitudinal sectional view showing a screwdriver attachment of the present invention associated with the shank of a screwdriver, and in one operative condition with respect to the latter;

Fig. 2 is a longitudinal sectional view similar to Fig. 1, but showing the attachment and shank in another operative condition of use;

Fig. 3 is a transverse sectional view taken substantially along the line 3—3 of Fig. 2;

Fig. 4 is a longitudinal sectional view showing a slightly modified form of screwdriver attachment of the present invention, associated with a screwdriver shank, and illustrating in phantom an alternative condition of operation;

Fig. 5 is a transverse sectional view taken substantially along the line 5—5 of Fig. 4;

Fig. 6 is a longitudinal sectional view showing still another slightly modified embodiment of the present invention, in operative association with the shank of a screwdriver, and illustrating an alternative condition of use in phantom; and

Fig. 7 is a transverse sectional view taken substantially along the line 7—7 of Fig. 6.

Referring now more particularly to the drawings, and specifically to Figs. 1 and 2 thereof, an attachment of the present invention is there generally designated 10, and illustrated as carried by the shank 11 of a screwdriver. The screwdriver shank 11 is broken away to conserve drawing space, and includes a major portion 12, generally of circular cross-sectional configuration suitably

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fixed to the handle (not shown), and having its end portion 13 of an outwardly tapering or wedge-shape terminating in a transverse, relatively thin distal or end edge 14 for engagement in the slot of a screwhead. That is, the working end portion 13 of the shank 11 tapers longitudinally outward toward the end edge 14 in a longitudinal plane substantially normal to the plane of Figs. 1 and 2, in the conventional manner. In the plane of Figs. 1 and 2, the shank end portion 13 is configured to diverge or increase in its lateral dimensions, as along its side edges 15 in the direction outward or away from the handle end of the shank, to a relatively wide or maximum width portion 16, and thence converging or tapering, as at 17 toward the end edge 14. The maximum width portion 16 of the end portion 13 thus projects laterally beyond opposite sides of the remainder of the shank 11.

The attachment 10 assumes the general configuration of an open ended tube or sleeve and is preferably fabricated of suitably stiff, but resiliently flexible material, such as durable plastic or rubber. More specifically, the sleeve of attachment 10 may be of generally cylindrical external configuration having its inner end portion 20, normally adjacent to the handle of the screwdriver, provided externally with peripheral grooves or recesses 21 to facilitate manual gripping of the sleeve. The outer or distal end portion 22 of the sleeve 10 is located adjacent to the outer or distal end portion 13 of the shank 11.

The sleeve 10 is internally formed with a longitudinal, generally cylindrical through passageway 23 opening through opposite inner and outer ends 24, 25 of the sleeve. At diametrically opposed locations on the sleeve 10, extending longitudinally of the sleeve inward from the outer sleeve end 25 are a pair of slots 26, each opening laterally between the interior passageway 23 of the sleeve and the exterior of the sleeve, and terminating at locations 27 spaced from the outer sleeve end. Interiorly of the outer sleeve end portion 22, adjacent to the outer end 25, are formed a plurality of internal annular grooves 30, defining there between internal annular ribs 31, which grooves and ribs are interrupted by the slots 26.

Internally of the attachment sleeve 10, spaced inward from the outer sleeve end 25 and located medially of the longitudinal extent of slots 26 are a pair of opposed, facing shoulders 33. That is, the shoulders 33 are disposed in facing, diametrically opposed relation interiorly of the sleeve 10, each extending chordally or transversely with respect to the sleeve and being located between the slots 26 on respective opposite sides of the slots. Viewed otherwise, the slots 26 may be considered as subdividing the outer end portion 22 of the sleeve 10 into a pair of complementary semi-cylindrical sections 22a disposed in facing relation with respect to each other and resiliently deflectable by the character of the material of sleeve 10 between their adjacent condition of Fig. 2, and their spaced or spaced apart condition of Fig. 1. It will be noted that the shoulders 33 are respectively located in the sections 22a.

The sleeve 10 is further formed with a pair of diametrically opposed, longitudinally extending internal grooves 35, each located in a respective complementary section 22a and spaced medially of the slots 26. The grooves 35 each extend longitudinally inward from the end surface 25 of the sleeve 10 and terminate at the shoulder 33 of the respective sleeve section 22a.

In the condition of Fig. 1 it will be noted that the shank 11 has been withdrawn from the position of Fig. 2, with the shoulders 33 riding on the shank edge portions 15 to spread apart the shoulders and their associated sections 22a. This, of course, enables a screw to be placed in position on the shank end edge 14, whereupon the sleeve 10 is withdrawn to the position of Fig. 2 relative to the shank 11 with the shoulders 33 removed from

the diverging edge portions 15. In this condition of Fig. 2, the shoulders 33 engage with the cylindrical portion 12 of shank 11, the maximum width portion 16 of the shank end portion 13 engaging with the bottom walls of grooves 35, and the ribs 31 engaging with the head of a screw 39 to releasably and resiliently retain the latter in position on the end edge 14 of the shank. This illustrated condition approaches a minimum size of screw adapted to be retained in the particular attachment 10, and it is appreciated that a wide variety of larger screw head sizes may be releasably retained in the same attachment sleeve.

The screw 39 is retained in the condition of Fig. 2 in position to be driven or turned, after which it is only necessary to withdraw the shank and sleeve, the latter automatically releasing the screw head.

In Figs. 4 and 5 are shown a slightly modified form of the instant invention, wherein an attachment sleeve generally designated 110 is adapted for application to a screwdriver shank 111 which includes a wedge-type working end portion 113, but is of constant width, having no maximum width portion as in the first described embodiment.

The sleeve 110 is of generally cylindrical external configuration, being provided adjacent to its inner end 124 with annular external gripping grooves 121, and formed with a plurality of longitudinally extending, circumferentially spaced, external ribs 118 extending from the outer end surface 125 toward and terminating short of the external grooves 121.

Interiorly of the sleeve 110 is formed an axial, longitudinally extending through passageway 123 opening at its inner and outer ends through the inner and outer end surfaces 124 and 125 respectively. Interiorly of the passageway 123, adjacent to the outer end 125 of the sleeve 110 are formed a plurality of internal, annular ribs 131. A pair of diametrically opposed slots 126 extend longitudinally of the sleeve 110 inward from the outer end 125 and terminate medially of the sleeve at diametrically opposed locations 127. The slots 126 each open laterally from the interior passageway 123 of the sleeve 110 outward to the exterior of the sleeve, and serve to divide the outer end portion of the sleeve into a pair of facing, complementary semi-cylindrical sections 122a resiliently distensible away from each other by the character of material of the sleeve 110.

The interior passageway 123 of the sleeve 110 is of a gradually expanding or diverging configuration in the region 135 extending inward from the outer end region of the ribs 131. The inwardly expanding internal region 135 of the passageway 126 terminates at a pair of diametrically opposed, chordally or the transversely extending internal shoulders 133 located adjacent and longitudinally outward of the slot termini 127. More specifically, each of the opposed internal shoulders 133 is located in a respective sleeve section 122a medially between and on respective opposite sides of the slots 126. Extending longitudinally of the sleeve 110 inward from the shoulders 133, the portion 136 of passageway 123 remains at approximately its maximum internal diameter until it opens into a reduced inner end portion 137 of the passageway.

As seen in Figs. 4 and 5, the shoulders 133 engage with diametrically opposite regions of the shank 111, while the adjacent longitudinally inward portion of the sleeve 110 is spaced appreciably from the shank by the relatively large passageway portion 136. Hence, by manual inward deflection or squeezing of the sleeve 111, at the locations of the arrows 138, the shoulders 133 serve as fulcrums to effect outward swinging or spreading apart of the outer end portions of sections 122a. This facilitates placement of a screw on the working end of the screwdriver shank; and of course, release of the squeezing force permits return of the sections 122a toward each other into screw holding engagement. This

manual operation thus serves to distend the outer end portion of the sleeve 110 for the insertion therein of a screw to be retained thereby.

Still another modification of the present invention is shown in Figs. 6 and 7, wherein a screwdriver shank 211 is illustrated as being of the same type as shank 111 described hereinbefore. A sleeve 210 of stiff, resiliently deformable material is formed in an open ended tubular configuration and circumposed about the shank 211. The sleeve 210 may have manual gripping grooves formed externally thereof, as at 221, adjacent to its inner end surface 224, and is provided interiorly thereof with a generally cylindrical, longitudinally extending through passageway 223 opening outward through the outer sleeve surface 225, and inward through the inner sleeve end surface 224. Internal screw gripping ribs 231 may be formed in the sleeve passageway 223, adjacent to the sleeve end 225; and, a pair of longitudinally extending, diametrically opposed slots 226 are formed extending inward through the outer sleeve end 225 and terminating at diametrically opposed locations 227 medially of the sleeve. Thus, the slots 226 interrupt the internal end ribs 231, as in the aforedescribed embodiments, and separate the outer sleeve end portion into a pair of resiliently spreadable complementary, semi-cylindrical sections 222a. Interiorly of the sleeve 210, medially of the longitudinal extent of slots 226, are formed a pair of diametrically opposed, chordally or transversely extending shoulders 233. The shoulders 233 are each located in a respective section 222a spaced medially of the slots 226.

The converging surfaces of the wedge-shaped working end portion 213 of shank 211 are engageable with the shoulders 233, respectively, upon relative sliding movement of the shank and sleeve 210 to effect resilient distension of the outer sleeve end portion or spreading apart of the sleeve sections 222a, as by shifting of the sleeve from its solid line position to its dot-and-dash outline position. Of course, upon return of the sleeve and shank to their solid line positions, the sections 222a return into their contiguous relation. Thus, the shoulders 233 define cam means, in a manner similar to the shoulders 33 of the first described embodiment, and ride upon the opposed converging surfaces of wedge portion 213 to effect the desired distension of the outer sleeve end portion. A screw 239 may be engaged on the working end edge of the shank 211 when the sleeve sections 222a are spread apart, and retained thereon by the sleeve sections when retracted toward each other; or, the head of the screw may be manually snapped into the outer end portion of the sleeve, the sleeve sections 222a yielding as required to receive and retain the screw head.

From the foregoing, it is seen that the present invention provides a screwdriver attachment for retaining a screw which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A screwholding attachment for the shank of a screwdriver, said attachment comprising an open-ended sleeve of stiff resiliently deformable material adapted to slidably receive the screwdriver shank, said sleeve being formed in one end portion thereof remote from the screwdriver handle with a pair of diametrically opposed slots extending longitudinally inward from one sleeve end and terminating short of the other end, said slots defining of the sleeve material therebetween a pair of longitudinally extending tongues resiliently flexible away from each other for receiving therebetween and snugly retaining a screw, and a pair of internal transversely extending

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shoulders carried by said sleeve each located between and on respective opposite sides of said pair of slots spaced inward from said one sleeve end, said shoulders being respectively engageable with opposite edges of said screwdriver shank for effecting flexure of said tongues away from each other upon longitudinal relative sliding of said sleeve on said screwdriver shank, said sleeve being formed internally thereof with a pair of longitudinally extending grooves on opposite sides of said pair of slots for respectively slidably receiving opposite side edges of said shank. 10

2. A screwholding attachment according to claim 1, said grooves extending longitudinally inward from said one sleeve end and terminating at said shoulder respectively.

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