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VALVE SEAT DRESSING TOOL

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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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2,677,309
This invention relates to improvements in valve seat dressing tools adapted for use in connection with faucets and the like. Although there are many types and varieties of valve seat treating tools which have been patented and serve to some extent to perform the function of grinding a valve seat to render it leakproof, the present invention differs from these in that it is so constructed that it can dress only the portion of the valve seat that requires dressing without affecting the remainder of the seat, and thus prevents making a lopsided seat, as in the case with the conventional tools now provided for valve seat grinding.

Plumbers as well as home owners and renters of houses and apartments are aware of the fact that when a worn rubber valve seat washer has to be removed and replaced with a new one frequently the valve seat has a burr on it caused by foreign material accumulating thereon which burr if not removed will cause the applied washer to assume a skewed relation to the valve seat and thereby cause a drip. When such a condition arises it is not necessary to apply a full circle grinding tool to the seat to remove the burr, for if that is done the portion of the seat opposite the burr will be ground down below normal so that after removal of the burr a new defect will have resulted from removing material from the seat which should have remained where it was.

An important object of this invention is to cure disadvantages like the above which arise through the use of present day tools, by providing an improved tool which can be properly seated on the valve seat and then be repeatedly partially rotated through an arc of the circumference in which the burr lies to cause one blade or cutter at a time to perform a cutting operation on the burr while the remaining cutters maintain the vertical alignment of the operating handle and the proper non-cutting relation of the position maintaining cutters on the seat. This positioning condition is further accurately maintained through the use of an improved resilient short sleeve which maintains the blade dressing portion of the tool in a horizontally applied condition, but when one cutter element overrides the burr to reduce it the resiliency of said sleeve will allow it to yield sufficiently to permit a slight wobble of the cutter assembly as a whole so as not to perform any cutting operation except on the elevated portion needing removing by dressing it in the improved manner provided by this tool.

A further object resides in the employment of only a few simple parts which are combined differently and more cheaply; which operate differently yet easier and which, as compared with prior art devices, requires less mechanical skill on the part of the individual using the tool.

Other objects, advantages and features of invention will hereinafter appear.

Referring to the accompanying drawing, wherein is shown a preferred embodiment of the invention as now reduced to practice and being sold in the trade.

Fig. 1 is a vertical, side elevational view of the assembled device with a portion of the handle sleeve broken away.

Fig. 2 is an enlarged bottom plan view of one element shown in phantom lines.

Fig. 3 is an enlarged fragmentary section taken on line 3—3 of Fig. 1 with the operating stem shown in elevation.

Fig. 4 is a section on line 4—4 of Fig. 3.

Fig. 5 is an elevational view of the complete device operatively related to the valve seat of a conventional faucet fragmentarily shown in cross section.

Referring in detail to the drawing, the improvement therein shown fully assembled in Fig. 1 comprises essentially: an operating stem 6 having a handle portion 7 mounted on its upper end; a valve seat dressing member 8 mounted on its lower end and held in place thereon by means of a clamping member 9; and a centering member 10 slidably and rotatively mounted on said operating stem 6 intermediate the valve seat dressing member 8 and the handle 7, the complete device being operatively related to a faucet 11 with the member 8 resting upon the valve seat 12 thereof as shown in Fig. 5.

The handle portion 1 is cut from axially apertured, cylindrical rubber stock, as is also the clamping member 9, however, the latter is considerably shorter in length than the former.

The operating stem 5 is cut into the lengths desired from polygonally shaped steel rods, preferably hexagon in cross section, and at one end of each so cut piece the apex portion of each hexagon point is cut away or removed in any desired manner a suitable distance to provide downwardly facing shoulders 13, as shown in Figs. 2 and 3, at the ends of the cut away portions whereby to about the member 8, and to provide room for telescoping onto the remaining portion the securing member 9 consisting of a short sleeve to clamp the dressing member 8 in a cushioning manner against said shoulders.

The valve seat dressing member 8, per se, comprises a dodecaagonally apertured toothed cutter disc which is die stamped from sheet metal and suitably tempered, the edges of each tooth thereof (four in all) being drawn in the stamping operation, as shown in Fig. 4, to provide cutting edges 14 which are deflected toward the aforesaid securing member 9. When the disc is
assembled on the operating stem such cutting edges will be directed toward the work to perform the necessary shearing action in the operation of the tool. Four teeth are preferably provided so as to have three widely spaced apart teeth to horizontally engage the valve seat at all times to maintain the operating stem vertical while the leading cutting edge of the fourth tooth is adapted to be rocked repeatedly back and forth through a partial circumference to reduce and finally remove a burr or built up spot accumulated on the valve seat. From time to time the position of the toothed cutter may be changed on the seat to bring the leading edge of another cutting tooth into use. This repeated partial rotation facilitates manual operation of the tool by back and forth turning movement of the wrist of the operator.

Owing to the fact that the rubber member 3 bears yieldingly against the bottom side of the flat body portion of the disc 5, each tooth may be slightly elevated repeatedly to override the burr being operated upon and then be brought again into horizontal position. This manner of treating the valve seat prevents it from becoming lapped. The dodecagonal aperture in the cutter disc is large enough to provide a fit sufficiently loose to permit wobbling.

The part 10 is also a metal stamping and is used as a centering means for maintaining the operating rod vertical. It is constructed in the dished manner shown making it adjustable for manual seating on the valve operated end of the faucet. With one hand the operator will keep it positioned as shown in Fig. 5 while the other hand is utilized to operate the handle 1. The aperture in disc 10 through which the stem 6 extends is sufficiently large to permit repeatedly turning the stem therein through the angle desired.

It is owing to the fact that the teeth of the disc 8 have cutting edge portions which are deflected toward the elastic clamping member 9, and to the presence of the shoulders 13 above said disc, that said clamping member can be attached to that end portion of the stem 6 which is opposite to the handle member 7, thus making it possible to hold said disc yieldingly in its operative position by the use of only a single attaching member, said clamping member consisting of an elastic sleeve the normal internal diameter of which is slightly greater than the diameter of said stem between diametrically opposite corners thereof, so that said corners indent the applied sleeve and efficiently keep it in place.

Although a polygonal, handle carrying stem has been described, cut away in the aforesaid manner to provide shoulders 13, yet it is obvious that, without exceeding the scope of the claimed invention, stems of other cross sectional contour, not necessarily polygonal, may be used and otherwise formed, which will function in the same manner.

I claim:

1. A valve seat dressing tool comprising an operating stem which is polygonal in cross section, said stem having a handle portion at one end and having in a spaced relation to its opposite end shoulders facing away from said handle portion, said shoulders resulting from the apex portions between the flat sides of the stem being cut away throughout the end portion of the stem beyond said shoulders, thus doubling the number of flat sides throughout said cut-away end portion of said stem, a toothed cutter disk having centrally through it a polygonal aperture dimensioned and contoured to fit said cut-away part of said stem, and an elastic short sleeve fitted around said cut-away part of said stem in a contacting relation with the underside of said cutter disk.

2. A valve seat dressing tool comprising an operating stem, said stem having a handle portion at one end and having in a spaced relation to its opposite end a series of circumferentially spaced apart shoulders facing away from said handle portion, a toothed cutter disk having through it an aperture which contains said stem, said cutter disk being tilttable and non-rotatable in relation to said stem, and an elastic short sleeve fitted around the end portion of said stem and holding said disk in an abutting relation to said shoulders.

3. A valve seat dressing tool comprising an operating stem, said stem having a handle portion at one end and having in a spaced relation to its opposite end a plurality of circumferentially spaced apart shoulders facing away from said handle portion, a cutting disc having peripheral teeth with cutting edges, and an elastic short sleeve toward which the cutting edge portions of said teeth are deflected, said sleeve being carried by that end portion of said stem which is opposite to its said handle portion, said sleeve being the sole attaching means for said disc and holding it in engagement with said shoulders so that the disc may tilt upon the stem during the valve seat dressing operation.

4. A valve seat dressing tool comprising an operating stem, said stem having a handle portion at one end and an opposite end portion which is polygonal in cross section and which is provided in a spaced relation to its extremity with shoulder means facing away from said handle portion, a toothed cutter disc having centrally through it a polygonal aperture dimensioned and contoured to fit loosely around said polygonal stem portion with the disc contacting said shoulder means, and an elastic short sleeve having through it a cylindrical bore the normal diameter of which is slightly less than the greatest diameter of said polygonal stem portion so that when said sleeve is forced over said polygonal end portion into a contacting relation to said disc the corner portions of the stem aid in keeping said sleeve in place.

5. The subject matter of claim 4 and said disc having peripherally projecting tooth portions with cutting edges deflected toward said sleeve.

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