Dec. 28, 1943. B. D. STUVEL 2,337,946

FLUSH TANK VALVE SEAT FINISHING TOOL

Filed Feb. 19, 1942

FIG. 1

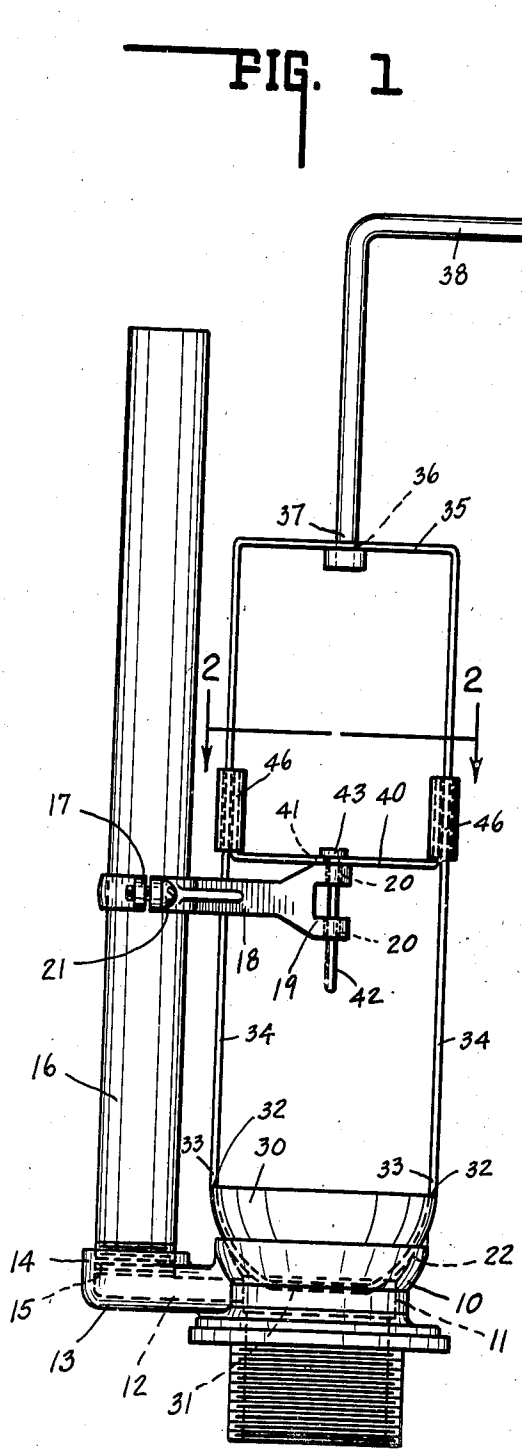


FIG. 2

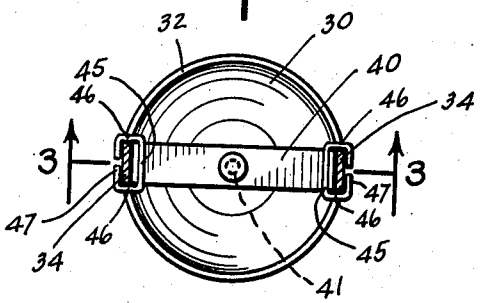
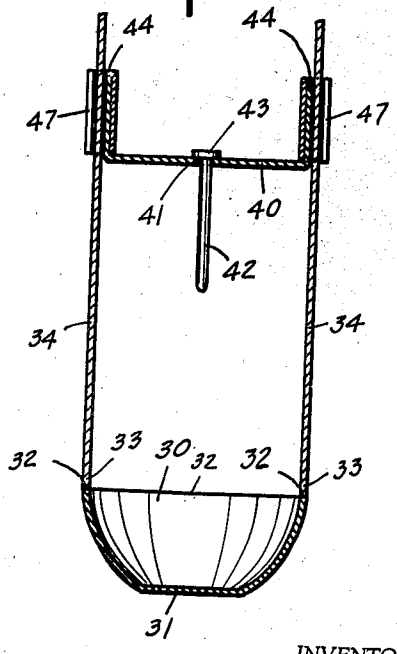


FIG. 3



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FLUSH TANK VALVE SEAT FINISHING TOOL

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7 Claims. (Cl. 51—241.1)

This invention relates to a flush tank valve seat finishing tool.

The chief object of this invention is to provide a tool which may be readily associated with a valve seat of a flush tank for the resurfacing and finishing thereof without disturbance of any of the flush tank parts.

The chief feature of the invention consists in the provision of a tool capable of use as aforesaid and which is comparatively light, easily fabricated, and which can be readily adapted to any flush tank structure of standard type.

Other objects and features of the invention will be more fully set forth hereinafter.

The full nature of the invention will be understood more fully from the accompanying drawing and the following specification and claims.

In the drawing, Fig. 1 is a side elevation of a flush tank discharge valve fitting with overflow attachment, ball valve guide mounted thereon and the invention operatively associated with these parts, the invention being shown in elevation.

Fig. 2 is a transverse sectional view of the invention taken on line 2—2 of Fig. 1 and in the direction of the arrows.

Fig. 3 is a vertical sectional view taken substantially in the plane 3—3 of Fig. 2 and in the direction of the arrows.

In Fig. 1 of the drawing, there is illustrated a flush tank, ball valve, seat providing member 10 having the discharge passage 11 therethrough with which communicates a channel 12 formed within a lateral extension 13 on the body portion 10. The portion 13 is upwardly directed as at 14 and is provided with an opening 15 to receive the lower end of an overflow tube 16.

Clampingly mounted as at 17 on the overflow tube 16 is an arm 18 which at its free and outer end, is bifurcated as at 19 and each bifurcation is apertured as at 20, the apertures being aligned. By the adjustment 21 associated with the parting 17 it will be obvious that the arm 18 may be secured on the overflow pipe 16 at any desired elevation and in any angular relation about the overflow pipe. The critical position is where by the axes of the aligned apertures 20 coincide with the center or axis of the ball valve seat 22 in the member 10.

It has been the experience that quite frequently the ball valves, almost universally of rubber, when they become soft and worn, seat and lock in the valve seat 22 and adhere thereto so that the ball valve is not readily lifted to permit flush tank water discharge, to the toilet bowl thereby beneath and in those instances forcible elevation of the ball valve will result in roughening of the seat and destruction of the ball. The roughened seat accordingly will not seal properly when a new ball is replaced.

The present invention, therefore, is intended to permit resurfacing or more accurately refinishing of the ball valve seat 22 in the aforesaid fixture so that proper cooperation is obtained between the new and substituted ball valve and said seat.

The present invention, therefore, is illustrated as a shell of spheroidal form. This form is used in its generic sense because the shell 30 has an outwardly and upwardly directed conformation that is so constructed that the same can be associated with the several standard sizes of valve seats. The end of such spheroidal shell may be flattened as at 31 or may be rounded and such a shell may be formed by spinning or stamping, as desired.

At diametrical points, as illustrated in Fig. 2, there is secured to the upper edge 32 of said shell, the lower ends 33 of an inverted U-shaped support member having the arms 34 and the connecting portion 35. Herein the latter is apertured as at 36 at its midportion and seated therein is the lower end 37 of a crank having the offset portion 38 and the hand gripping portion 39. The overall length of the fixture from the shell to the offset portion 38 is such that it clears the top of the tank when the cover is removed. The length of the offsetting portion is such that the handle portion 39 does not engage the back wall when the handle is rotated. Preferably the arms 34 and the connecting portion 35 are formed from a single piece of rectangular strap metal, having comparative rigidity and the connection between the lower ends of said arms and the shell edge is by a weld.

There is provided a crossbar portion 40. This crossbar portion 40 is apertured as at 41. It mounts an elongated member 42. The aperture 41 is in alignment with the central aperture 36 in the connecting portion 35 and both are in alignment with the central axis of the shell.

Herein, the member 42 is shown provided with a head 43 and preferably but not necessarily, the cross bar 40 and the member 42 are welded together. They may, however, be detachably connected. Member 42 is seated in the aligned apertures 20 and serves to align the fixture properly with respect to the seat 22 so that the seat is finished properly for perfect seating of the ball valve.

Herein the cross member 40 is shown provided with upturned arms 44 and secured to each is a generally U-shaped member 45 and at the midportion. The arms 46 of this U-shaped member straddle the side edges of the arm 34 and each of the straddling arms 46 is provided with an inwardly directed end portion 47. The two ends of this U-shaped structure are directed towards each other for embracing the arm 34. While the U-shaped connection and the crossbar 40 herein is shown as formed of two pieces suitably secured together, it will be quite apparent that the U-shaped structure embracing the arm 34 may be formed integral with the crossbar portion 40.

The embracement of the two arms 34 by the two U-shaped structures may be of frictional character so that the crossbar structure will be retained in adjusted position upon said arms but may be forcibly raised or lowered relative thereto. The vertical length of the embracing U-shaped structures insures substantially transverse positioning of the crossbar relative to the parallel arms 34. The rigid connection between the member 42 and the crossbar insures the parallel positioning of the member 42 with respect to said arms 34. Hence, when this pilot 42, as it were, is seated in the apertures 20 of the bifurcations 19, the shell 30 will be properly positioned with respect to the seat 22 for properly finishing said seat. The embracing U-shaped structures are preferably upwardly directed so that there will be little or no interference between the crossbar 40 and the arm 18. The limit of rotation, accordingly, possible when the crank 39 is turned first in one direction and then in the other, is such that the shell completely wipes the seat 22. Valve grinding compound, or the like, may be applied to the seat 22 or the shell and thus all rubber deposits and other irregularities such as scale deposits, et cetera, on the seat, will be removed, the result being, after the finishing operation, that a clean, true, smooth seat is provided for the new ball valve.

While the invention has been illustrated and described in great detail in the drawing and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. A flush tank valve seat finishing tool adapted for application to a conventional flush tank valve stem guide and including in combination a valve seat engaging member having a spheroidal exterior surface adapted for annular engagement with various sizes of flush tank valve seats, an inverted U-shaped means extending upwardly from said member, a crank handle secured to the upper midportion thereof, a crossbar carried at opposite ends by the U-shaped means and a guide member depending therefrom for operative association with the stem guide for tool alignment, the axis of said guide member and that of the spheroidal member being in alignment resulting in proper and aligned seat formation relative to the tank valve stem guide.

2. A tool as defined by claim 1, characterized by the crossbar being slidably supported by said U-shaped means.

3. A tool as defined by claim 1, characterized by the spheroidal member being of shell-like form and the U-shaped means being secured at its lower ends to the upper end of the shell.

4. A tool as defined by claim 1, characterized by the crossbar being apertured and the guide member being headed, the shank thereof passing through said aperture.

5. A tool as defined by claim 1, characterized by the crossbar being apertured and the guide member being headed, the shank thereof passing through said aperture, said crossbar and guide member being rigidly connected together.

6. A tool as defined by claim 1, characterized by the crossbar being slidably supported by said U-shaped means, said crossbar having angularly directed ends adapted to lie inside the U-shaped means, and a lateral portion on each end partially embracing the adjacent arm of the U-shaped means.

7. A tool as defined by claim 1, characterized by the crossbar being slidably supported by said U-shaped means, said crossbar having angularly directed ends adapted to lie inside the U-shaped means, and a pair of oppositely directed lateral portions on each end and of angular formation, the adjacent immediate ends being directed towards each for embracement of the adjacent arm of the U-shaped means.

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