July 2, 1957 L. F. SHESLER 2,797,536

REFITTING FLUSH VALVES

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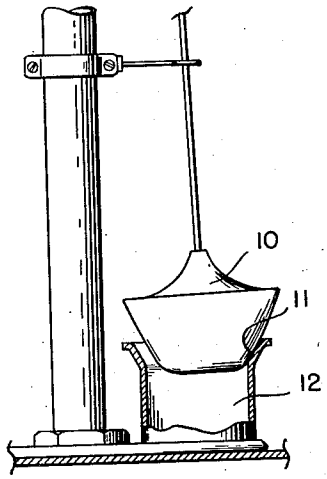


FIG. 1

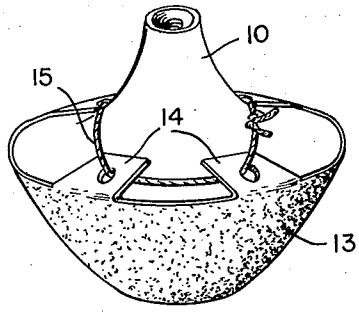


FIG. 2

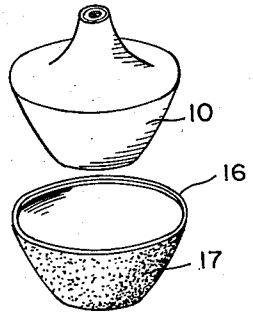


FIG. 3

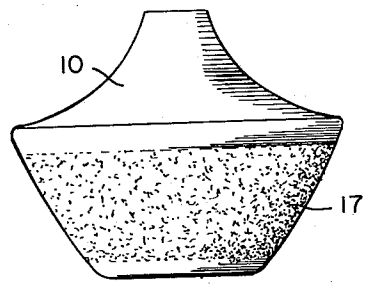


FIG. 4

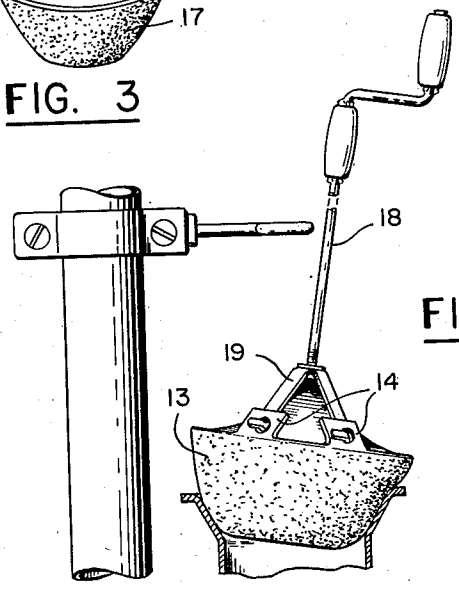


FIG. 5

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REFITTING FLUSH VALVES

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5 Claims. (Cl. 51—187)

This invention relates to water closets and in particular to the flush valve assemblage contained therein for regulating the flow of water to a toilet bowl.

A flush valve assemblage essentially comprises a rubberized ball-type float valve which operates in conjunction with a flow pipe leading to a toilet bowl, the head of said pipe being constructed so as to provide for the water-tight seating of the float valve. Ideally, the said flow pipe should be composed of a brass which contains a high percentage of copper for the brass must be able to withstand the corrosive effects of water for a lengthy period of time if it is to be a practical structure. However, brass containing a high percentage of copper is expensive and there is a tendency to reduce the copper component of that alloy while increasing the amount of zinc contained therein. Decreasing the percentage of copper within prescribed limits has little effect upon the general sturdiness of the flow pipe itself, but it does cause the pipe head which serves as a valve seat to become subject to a certain degree of corrosion with the passage of time. This corrosion causes the valve seat to become pitted and irregular.

As has been hereinbefore stated, the head of the flow pipe, the valve seat, is designed with regard to the flush valve so as to provide for the water-tight seating of the rubberized ball-type flush valve. When the flush valve is sucked upon the valve seat at the end of a flushing operation, the valve must be perfectly seated to prevent leakage.

When the flow pipe and the valve seat are new, there is relatively little trouble in seating the flush valve. The said valve is sucked down towards the seat at the end of a flushing operation and then skids upon the smooth surface of the seat into a water-tight relationship therewith. However, with the passage of time, the valve seat becomes pitted and rough because of corrosion and when this occurs the flush valve can no longer skid into position on the valve seat and tends to remain improperly seated permitting leakage which must be avoided. Generally, this condition arises after the flow pipe and valve seat have been in use for a few years.

When considering the prevailing practice of replacing such flow pipes and/or the high cost of maintaining a water-tight seal in connection therewith, it struck me that the valve seat might be refitted for perfect valve seating without removing the flow pipe from the water closet, as is conventionally done.

Accordingly, it is one of the primary objects of my invention to devise a means whereby such valve seats may be refitted for water-tight seating without their removal from the water closet.

Another important object of my invention is to provide a means whereby an individual home owner will be able to refit such valves in a simple and inexpensive fashion.

A further object of my invention is to provide a means whereby a flush valve seat may be adapted to the flush valve instead of the valve being adapted to the seat.

Still another object of my invention is to utilize the flexible ball-type flush valve in refitting such valve seats.

Briefly stated, my invention comprises, as a device for refitting a valve seat of a water closet flush valve, an abrasive mantle adapted to fit over at least that portion of the flush valve member which drops into and engages the valve seat.

A fuller understanding of the invention and the manner in which its objectives and advantages may be realized will become apparent from the following detailed description thereof taken in connection with the accompanying drawing wherein:

Fig. 1 is a side elevation of a flush valve assemblage with a portion of the flow pipe broken away, and

Fig. 2 illustrates the form of the invention wherein an abrasive mantle is detachably affixed to the flush valve of Fig. 1, and

Fig. 3 is an exploded view of another form of the present invention in combination with the float valve of Fig. 1, and

Fig. 4 illustrates a float valve constructed in accordance with the present invention, and

Fig. 5 shows the invention in combination with a hand crank.

Referring to the drawings: in Fig. 1, flush valve **10** is shown improperly seated upon valve seat **11**, the said seat constituting the head of flow pipe **12**. As hereinbefore explained, improper seating results when the flush valve is not permitted to skid into water-tight relationship with the valve seat. This occurs when the surface of the valve seat has become rough and irregular due to corrosion.

In Fig. 2, abrasive mantle **13** having a plurality of flaps or tabs **14** is shown detachably affixed to the resilient ball-type flush valve of Fig. 1. The flush valve is readily removed from the assemblage shown in Fig. 1 so as to permit the affixation of the abrasive mantle. The mantle may be reliably secured to the flush valve by means of nylon cord **15** as shown in Fig. 2 threaded through flaps **14**.

The abrasive mantle may be of conventional canvas cloth to whose outer surface fine abrasive particles have been adhered. However, if it is desired to eliminate the flaps and the cord of Fig. 2, an elastic mantle **16**, shown in Fig. 3, the outer surface of which contains an abrasive **17**, may be stretched over flush valve **10**. Alternatively, the outer surface of the resilient flush valve itself may contain abrasive elements, as shown in Fig. 4.

In practice, when the resilient ball-type flush valve is not properly seated because of the corroded condition of its seat, the said valve is removed from the flush assemblage to permit an abrasive mantle, such as shown in Fig. 2, to be mounted thereupon. After the abrasive mantle is mounted upon the ball-type flush valve, the valve is returned to the said seat and rotated thereupon until the said seat is ground to a degree of smoothness wherein the ball-type valve will be permitted to skid into water-tight relationship with the said seat at the end of a flushing operation.

The grinding operation may be carried on by hand in the flush tank after the water has been removed therefrom, the flush assemblage being so constructed and arranged that it will not interfere with hand manipulation of the flush valve and the mantle mounted thereupon.

Alternatively, the flush valve with its abrasive mantle may be combined with drive means **18** inserted into the head of the flush valve as is shown in Fig. 5. A mechanical driving aid such as is shown is employed if a rapid rate of rotation is desired. When the invention, as shown in Fig. 2, is used in combination with a drive means thereby imparting a high rate of rotation to the structure, I find that most effective operation can be obtained if a mantle possessing a fine grade of abrasive is employed. However, a rougher grade of abrasive may

be employed in connection with the drive means of Fig. 5 for in that embodiment the mantle is securely affixed to retaining means **19** threaded upon the valve end of the said drive means.

It is to be noted that because of the resilient nature of the ball-type flush valve and its nippled head, the elongated drive means inserted therein does not necessarily have to be maintained in a vertical position during the grinding operation but may be tilted away from the vertical without disturbing the seating of the rotating flush valve. This feature makes for free manipulation of the device of Fig. 5.

The actual grinding of the valve seat need not be done by hand or with power driven means for the flush valve provided with an abrasive coat, such as shown in Fig. 4, will gradually sand the seat smooth during the course of many flushing operations.

While the invention has been described in detail with respect to several preferred embodiments thereof, it will be understood by those skilled in the art, after reading this specification, that various changes and modifications may be made without departing from the spirit of the invention and the scope of the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A means for refinishing the roughened seat of a water closet flush valve so as to permit the resilient tank ball associated therewith to engage said seat in leak proof relationship comprising a collapsible tank ball covering, the valve seat end of said tank ball being insertable in said covering, said covering opening to fit smoothly over the tank ball when the tank ball is inserted therein, the outer side of said covering incorporating abrasive material for grinding said valve seat, the covering being flared to permit said tank ball to be fully inserted therein.

2. A means for refinishing the roughened seat of a water closet flush valve so as to permit the resilient tank ball associated therewith to engage said seat in leak proof relationship comprising a collapsible tank ball covering, the valve seat end of said tank ball being insertable in said covering, said covering opening to fit smoothly over the tank ball when the tank ball is inserted therein, the outer side of said covering incorporating abrasive material for grinding said valve seat, the covering being flared to permit said tank ball to be fully inserted therein, said covering being detachably affixable to the tank ball.

3. A means for refinishing the roughened seat of a water closet flush valve so as to permit the resilient tank ball associated therewith to engage said seat in leak proof relationship comprising an annular covering of collapsible material for said tank ball, the valve seat end of said tank ball being insertable in said covering, said covering opening to fit smoothly over the tank ball when the tank ball is inserted into the annulus, the outer side of the annular covering incorporating abrasive material for grinding said valve seat, the annular covering being flared to permit said tank ball to be fully inserted therein.

4. A means for refinishing the roughened seat of a water closet flush valve so as to permit the resilient tank ball associated therewith to engage said seat in leak proof relationship comprising an annular covering of collapsible material for said tank ball, the valve seat end of said tank ball being insertable in said covering, said covering opening to fit smoothly over the tank ball when the tank ball is inserted into the annulus, the outer side of the annular covering incorporating abrasive material for grinding said valve seat, the annular covering being flared to permit said tank ball to be fully inserted therein, said covering being detachably affixable to the tank ball.

5. A means for refinishing the roughened seat of a water closet flush valve so as to permit the resilient tank ball associated therewith to engage said seat in leak proof relationship comprising an annular covering of collapsible material for said tank ball, the valve seat end of said tank ball being insertable in said covering, said covering opening to fit smoothly over the tank ball when the tank ball is inserted into the annulus, the outer side of the annular covering incorporating abrasive material for grinding said valve seat, the annular covering being flared to permit said tank ball to be fully inserted therein, said covering being detachably affixable to the tank ball and tiltable with the tank ball on the valve seat when the tank ball and covering are mounted on said seat for grinding.

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