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2,371,923

TOILET DEODORIZER

Filed Feb. 15, 1943

3 Sheets-Sheet 1

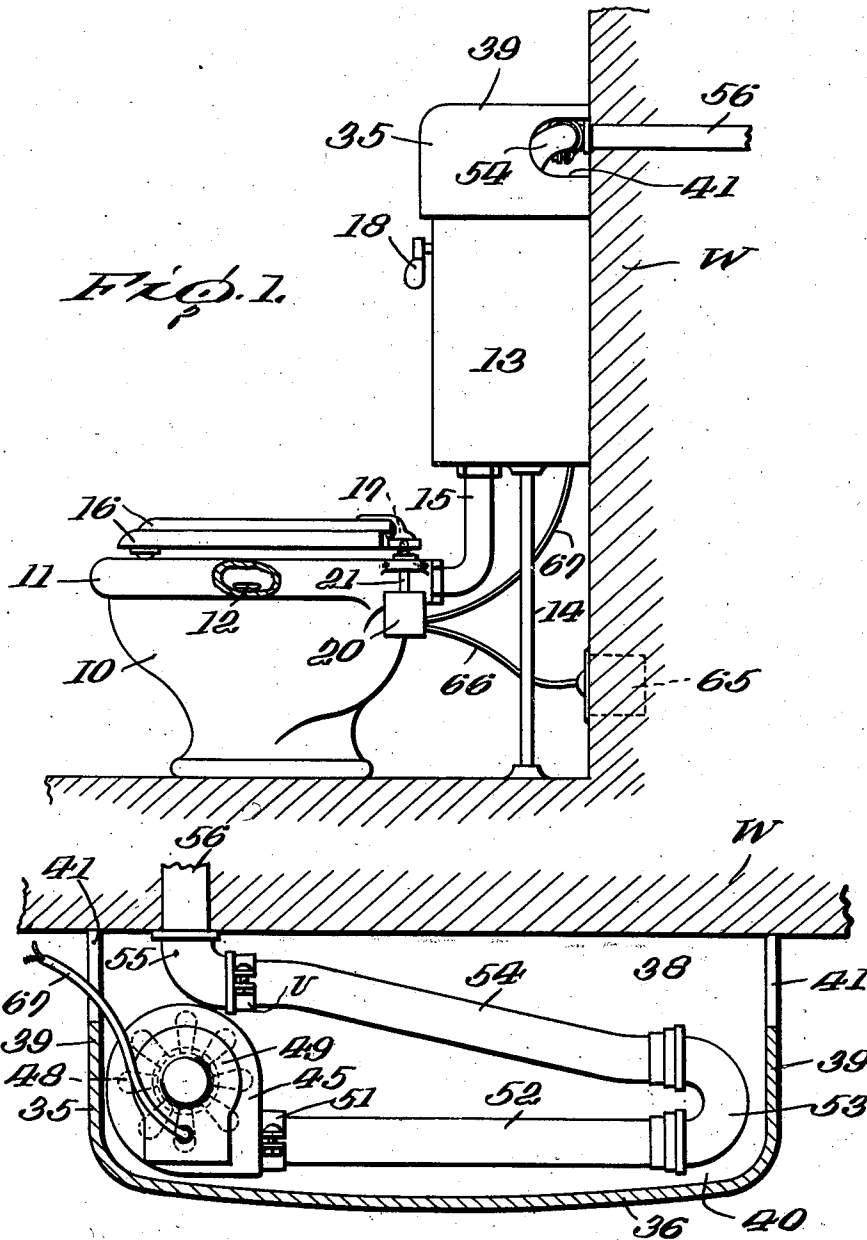


Fig. 2.

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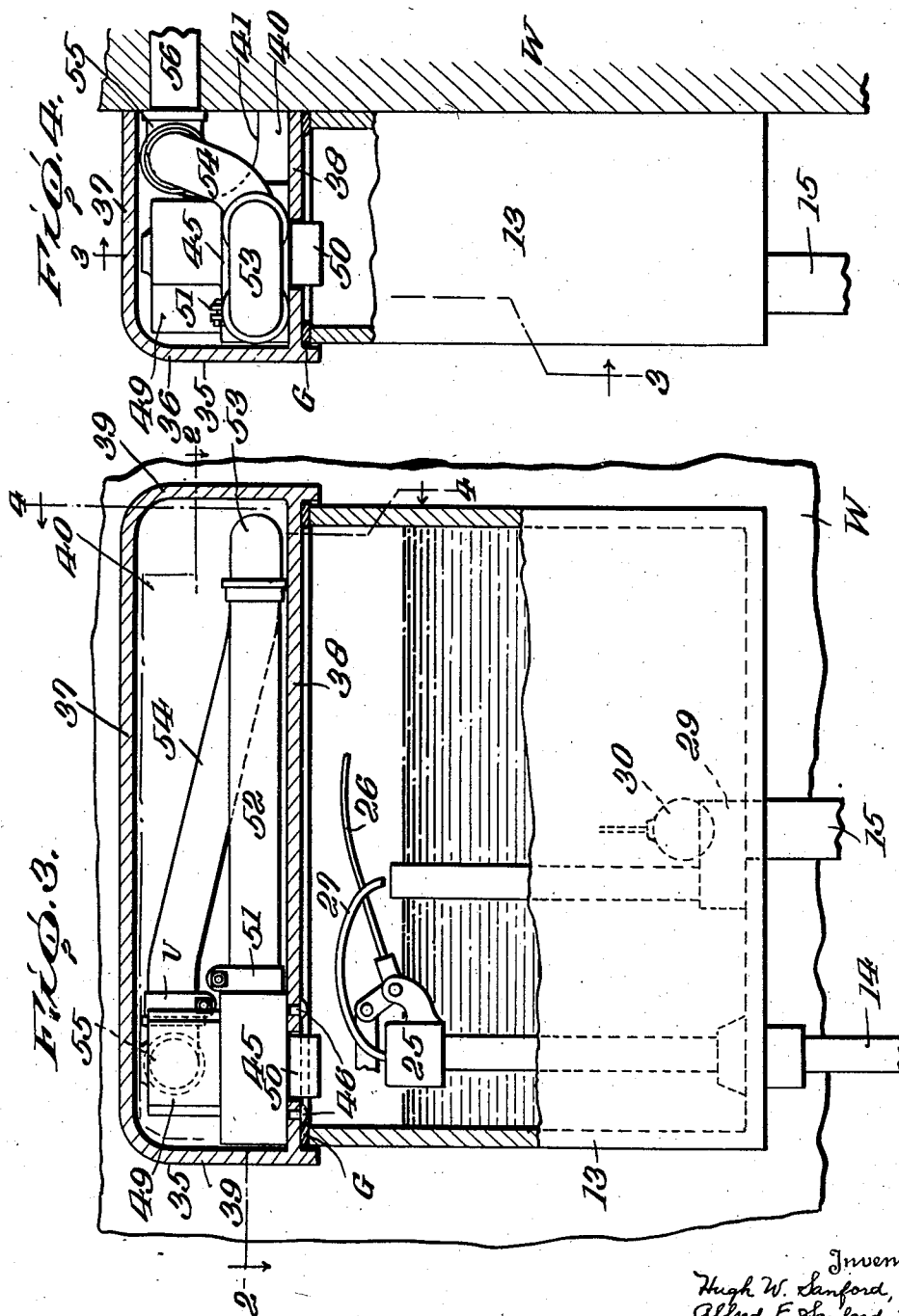
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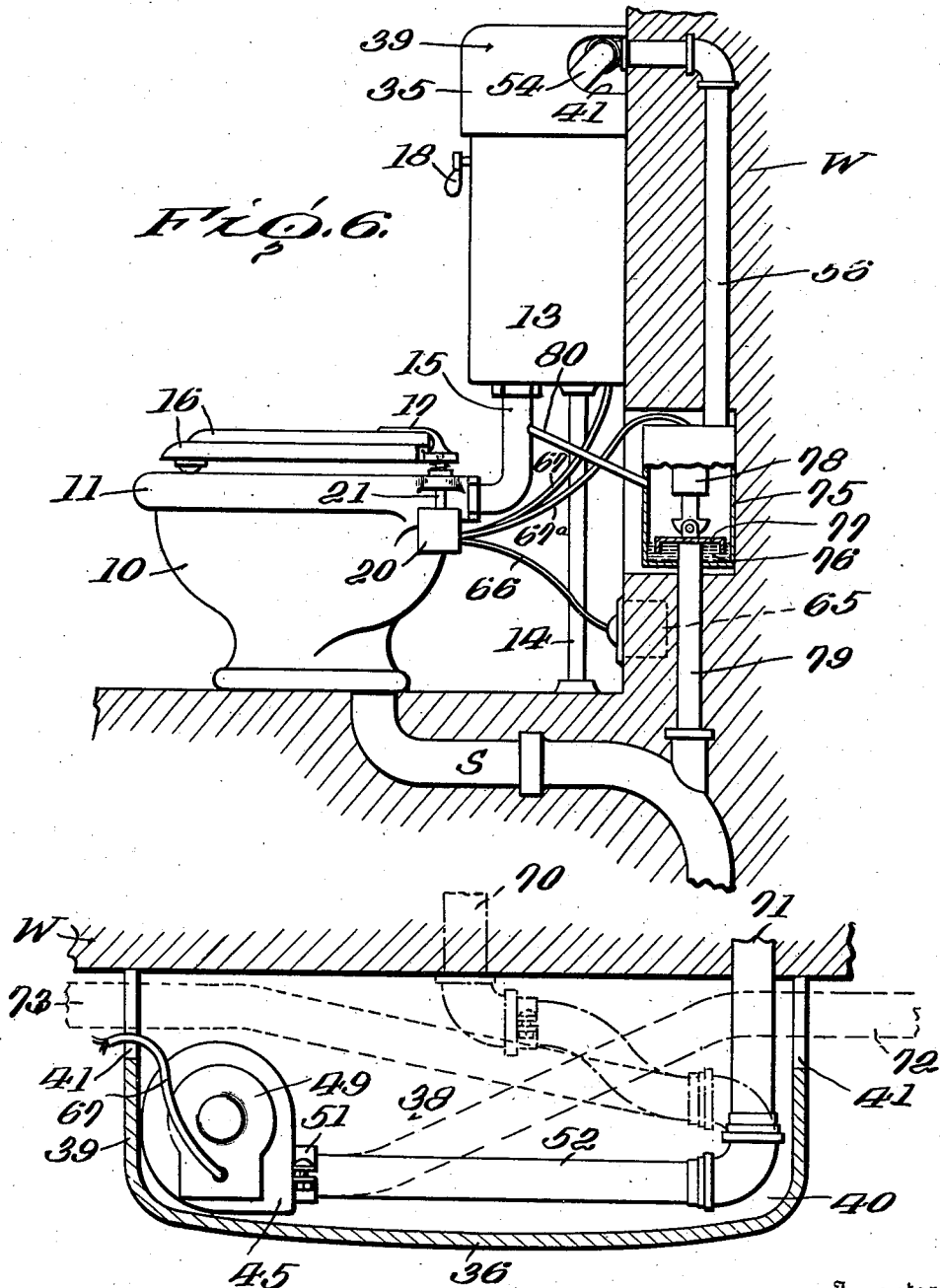


Fig. 5.

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UNITED STATES PATENT OFFICE

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TOILET DEODORIZER

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Application February 15, 1943, Serial No. 475,982

3 Claims. (Cl. 4—213)

This invention relates to a deodorizer for toilets.

A feature of the invention is the provision of a structure including necessary parts for a deodorizer, which may be employed for sealing the top of an existing toilet tank and employed for evacuating foul gases from the sealed top space to the exterior of the toilet apartment, and effective to accomplish exhaustion of such gases from the toilet bowl through the usual overflow and flushing pipes.

Another feature of the invention is the provision of a deodorizer which can be applied to an existing toilet installation without change of the permanently installed toilet bowl and tank body.

A further feature is the provision of a deodorizer structure including a removable top member for the toilet tank, with the top member providing concealment for the exhaust elements so that they are out of sight and protected from damage, and with the top member providing a smooth and finished surface on top of the flushing tank; the installation of the exhaust elements in the removable top permitting easy access for inspection and repairs when required, and affording concealment of the exhaust pipe in such a way that the exhaust gases may be delivered in any preferred direction.

With these and other features as objects of the invention, illustrative forms of practicing the same are shown in the accompanying drawings, in which:

Figure 1 is a side elevation of a toilet having the structure of the invention applied thereto.

Figure 2 is a horizontal sectional view substantially on line 2—2 of Fig. 3.

Figure 3 is an upright transverse sectional view substantially on the line 3—3 of Fig. 4.

Figure 4 is an upright sectional view substantially on the line 4—4 of Fig. 3.

Figure 5 shows various ways of making the deodorizer connection.

Figure 6 shows a modified structure for disposing of the exhausted gases.

In these drawings, the illustrative toilet has a bowl 10 provided with a peripheral tube 11 at its upper edge, the interior of the tube communicating with the interior of the bowl by orifices 12. The toilet tank 13 is mounted on the wall W and is supplied by water through a water pipe 14, and during flushing discharges its content of water through the flushing pipe 15 into the passage in the tube 11. The lower and upper seats 16 are mounted upon the bowl at a pivot 17. The flushing of the toilet is effected by the handle 18.

These structures are old and well known in the art, and are shown illustratively as an assemblage to which the present invention may be applied.

A switch box 20 is connected to the bowl and is operated by a plunger 21 from the seats 16, suitable spring means (not shown) being employed for normally holding the seat 16 in a slightly raised position with the switch open. When the lower seat is occupied, the weight of the occupant causes the switch 20 to be closed. As set out in the copending application of Hugh W. Sanford, Serial No. 387,961, filed April 10, 1941, this switch may include a timing device, whereby the circuit is held closed for a predetermined time interval after the seat has been vacated.

As shown in detail in Figs. 2, 3 and 4, the tank 13 has the ballcock assembly 25 within it, connected to the water supply pipe 14, and including the float arm 26 for a float (not shown) which is actuated by the water within the tank 13 for closing the ballcock. The usual refill pipe 27 leads from the ballcock for discharge into the overflow pipe 28 which is connected by its lower end into the Douglass valve structure 29 in the usual way. The ball 30 closes the Douglass valve, and may be raised in any suitable fashion (not shown) upon actuation of the handle 18.

According to the present invention, a cover 35 is mounted upon the top of a toilet tank 13 for closing and essentially sealing the same, a gasket G being interpolated, if desired. This cover has a front wall 36 and a top wall 37 which are designed to conform to the general pattern of the tank 13, and also includes a bottom wall 38 which joins the walls 36 and 27, to provide a chamber 40 which in the illustrated form extends from side to side of this cover (Fig. 2). The end walls 39 of the cover conform to the general pattern of the tank 13, and are illustrated as having notches 41 at their rear portions to permit access to the chamber 40. These walls of the cover structure may be formed of porcelain, plastic, or other materials, and are illustrated as being integral with one another.

The housing 45 of an impeller fan 48 is fixedly mounted on the wall 38 by screws 46. The upper part of the housing is connected with the structure 49 of an electric motor which drives the impeller 48. The lower part of the housing has a suction intake port 50 which is open to the space above the water within the tank 13.

The housing 45 has a separable connection 51 to which is attached one end of a flexible hose 52 which extends toward the right within the chamber 40 in the illustrated form, and is attached

at its other end to a pipe U-bend 53 which in turn is attached to a second flexible hose 54 extending back toward the left in this form of practice. The hose 54 is connected through a separable connection to an L 55 which is seated on a discharge pipe 56 extending into the wall W and thence to a suitable final discharge point, being concealed by the wall. It will be noted that the distance from the front wall 36 to the wall W affords space for the housing 45 and the L 55; and the preferred positioning of the L 55 closely beneath the top wall 37 affords a permitted unrestricted upward movement of the bottom wall 38, so that the cover may be raised and lowered as a whole. The separable connections 51 and U are illustrated as peripheral clamping bands which are tightened or released by rotating the illustrated screws.

With this arrangement, while the fan is operating, air and gases within the toilet bowl is drawn through the slots 12 and along the passage in the tube 11, and thence through the flushing pipe 15 and overflow pipe 28 to the free upper space within the tank and cover, and thence into the intake port 50. The movement of the fan then expels these gases through the flexible hose 52, 54 to a point outside of the toilet apartment. As shown in Fig. 1, the fixed pipe connection 56 is illustrated as leading to the exterior of the building.

Current for energizing the motor 49 may be taken from an electrical connection box 65 in the wall W, having the usual electrical receptacle therein, by a separable connection and conductor 66 which leads to the switch box 20. When this switch is closed, current then flows through the conductor 67 to the motor, this conductor extending into the chamber 40, as shown in Fig. 2, and passing to the motor 49.

Depending upon the construction of the building, the flexible hose may be arranged in various manners, as shown in Figs. 2 and 5, since the chamber 40 affords opportunity for disposing the hose as necessary for the purposes in view. Thus, it may be extended in any of the various positions 70, 71, 72, 73 (Fig. 5), in addition to the particular location shown in Fig. 2.

When it is desired to inspect the deodorizing apparatus, the ballcock or the Douglass valve, or otherwise gain access to the toilet tank and its associated parts, the cover 35 may be simply and directly raised as this operation is permitted by the flexibility of the hose 52, 54 and of conductor 67. The connection U between the flexible hose 52 and the housing 45 and the connection to the conductor 67 are separated, and the cover can be taken from the toilet compartment for inspection or repair. It can be replaced easily by reverse operations.

The structure of Figs. 1 to 5 permits substitution of a seat and switch structure and of a sealing toilet tank top having the fan and conduit connections, in lieu of the plain seat and tank top presently employed, and without other changes in the tank, water pipes, or toilet bowl. Hence it can be utilized without fundamental change in the sewer connections or major structures.

The air moving means, illustrated in the several figures as a centrifugal force, exhausts air and gases from the sealed space above the water level in the tank, and the usual ballcock refill pipe remains in position for delivery into the overflow pipe in the customary way.

In the modified form shown in Fig. 6, the discharge pipe 56 leads to the main sewer discharge S, through a valve 75 which is shown as having

an internal annular trough 76 into which fits the skirt of a bell 77. A solenoid 78 is connected by conductors 67a in parallel with the fan motor 49, and raises the bell and holds it elevated while the fan is operating, and permits the bell to drop to closing position when the current ceases. The pipe 79 completes the discharge from the valve 75 into the sewer S. A duct 80 from the flushing pipe 15 leads to the valve, for assuring delivery of a limited quantity of water into the trough 76 at each flushing operation, whereby to compensate for any water lost therefrom by evaporation, etc. In this form, the gases are discharged to the sewer and the valve 75 prevents any retrograde discharge of sewer gas to the toilet apartment while the fan is not running.

This form, like that of Figs. 1 to 4, permits employment of an air moving means mounted as a part of a toilet tank top for exhausting gases from the sealed space above the water level in the tank, and thus through the flushing pipe connection to the bowl; and delivery of such gases through an easily separable connection to a conduit which leads them outside the apartment.

It is obvious that the invention is not limited to the illustrated form but may be modified in many ways within the scope of the appended claims.

What is claimed:

1. A deodorizer for a toilet having a flushing tank including a foot valve and an overflow pipe connected to the toilet bowl by a flushing pipe, comprising a cover for closing and essentially sealing the top of the tank, an electrically driven fan including a housing connected to the cover structure and separable therewith from the tank, said cover including walls for providing a chamber open at the rear of the cover, electrical conductor means connected with said fan housing for energizing the same and extending in said chamber, said fan when energized being effective to draw air and gases from the toilet tank and thereby evacuate air and gases through the flushing pipe and overflow connection from the toilet bowl, and a gas discharge duct leading from said fan housing to a stationary discharge conduit and including a flexible portion whereby the cover may be removed from the tank without separation at said separable connection and thereby permitting access to and inspection of the parts normally concealed by the cover, said duct also including a separable connection only accessible while the cover is removed from the tank, said cover when in position on the tank being effective to conceal said fan and its housing and the discharge duct.

2. A deodorizer for a toilet having a wall-supported flushing tank connected to the toilet bowl by a valved flushing conduit and including an open passageway leading from the flushing conduit at a point below the valve and communicating with the tank space above the maximum liquid level therein, said toilet also having a fixed gas discharge conduit, comprising a removable top structure for the tank, a fan structure located above the said maximum liquid level and having an inlet communication with the tank space above said maximum liquid level and effective for drawing air and gases from the bowl through said flushing conduit and said passageway, and a discharge duct from the fan structure to the fixed gas discharge conduit, said top structure including means for supporting the fan structure, said discharge duct including a flexible portion and a separable connection by which the assembly of

the cover parts, fan structure and supporting means may be removed from the tank without severance of said connection and thereafter disengaged from the fixed discharge conduit at said connection, said tank cover including parts cooperative with the tank and the said supporting wall for concealing the fan structure and discharge duct when in operating position.

3. A deodorizer for a toilet having a flushing tank connected to and supported on an upright wall and including a foot valve and an overflow pipe connected to the toilet bowl by a flushing pipe, said toilet also including a fixed gas discharge conduit having an end accessible at a point of said wall above the tank, comprising a cover for closing and essentially sealing the top of the tank and extending substantially to the said upright wall, said cover including spaced upper and lower substantially horizontal walls and other walls delimiting a rearwardly open pocket between said horizontal walls, the pocket being located opposite the end of said fixed conduit, the lower wall being sealed to the flushing tank, a fan housing and a fan therein for drawing air from the toilet tank, said housing being fixed

to the lower horizontal wall and including a port communicating with the space within the flushing tank and including a discharge connection leading to said pocket, said fan when energized being effective to draw air and gases from the flushing tank and deliver the same to the discharge connection, a discharge conduit leading from said fan discharge connection and including a separable connection and a flexible portion located within said pocket, said flexible portion being effective to permit movement of the cover relative to the flushing tank without separation at said separable connection and to permit connection of said discharge connection to the end of the fixed conduit regardless of the relative location of the said end within the wall area delimited by the said open pocket, said cover including parts effective to conceal said fan housing, separable connection, flexible portion and the end of the fixed gas discharge conduit when the cover is in operating position.

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