Aug. 19, 1958 W. L. SHAY 2,847,682

TOILET VENTILATOR

Filed April 18, 1955

fig. 1.

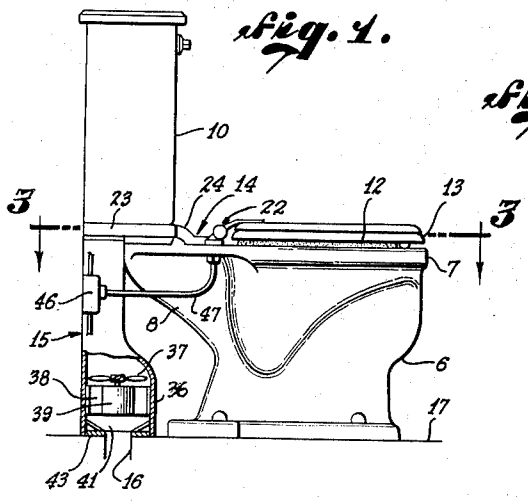



fig. 2.

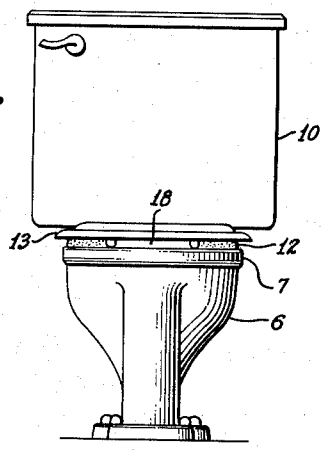



fig. 3.

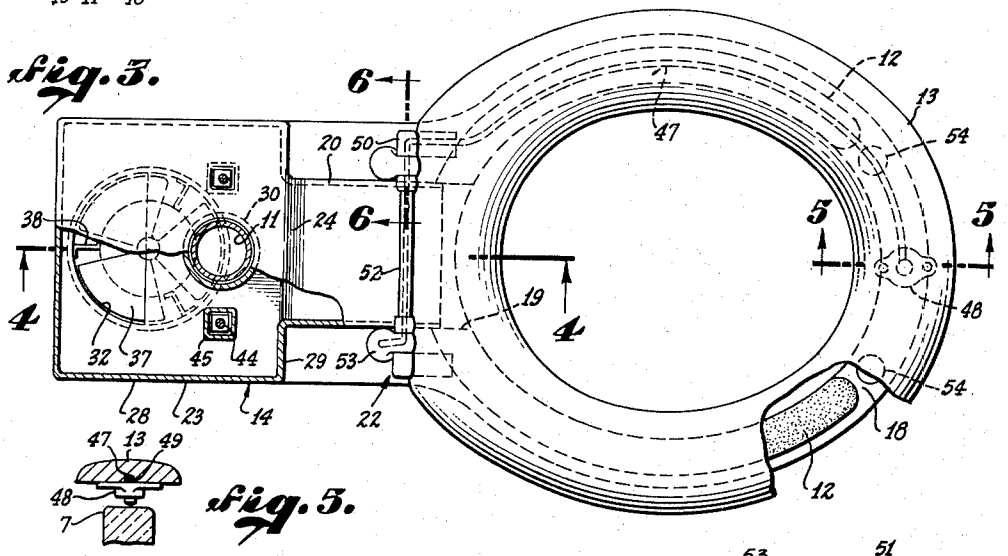
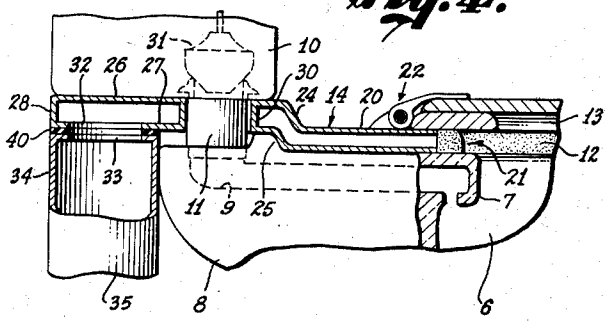



fig. 5.

fig. 4.



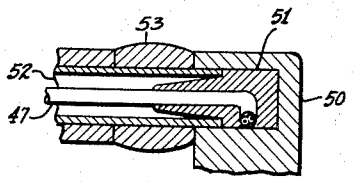




fig. 6.

WILLIAM L. SHAY,
INVENTOR.

SELLERS & LATTA,
ATTORNEYS.

BY Lynn H. Latta

United States Patent Office 2,847,682 Patented Aug. 19, 1958



2,847,682

# TOILET VENTILATOR

William L. Shay, Reseda, Calif.

Application April 18, 1955, Serial No. 501,904

2 Claims. (Cl. 4—213)

This invention relates to apparatus for ventilating a toilet to remove noxious odors. Its primary object is to provide attachment apparatus which can be readily incorporated in the conventional toilet apparatus (of the current type wherein the flush tank is mounted upon the rear end of the toilet bowl) without the necessity for altering the structure of either the bowl or the flush tank. More specifically, the invention contemplates a ventilating attachment which may be installed simply by detaching the flush tank, elevating it a short distance, inserting the ventilating apparatus between the bowl and the tank, and reattaching the tank in its elevated position.

A further object is to provide such a ventilating attachment which is securely attached to the existing toilet apparatus by being sandwiched between the flush tank and the rear end of the toilet bowl.

A still further object is to provide such a ventilating attachment which, when installed, is largely concealed at the back end of the toilet bowl and beneath the flush tank, so as to blend harmoniously with the existing toilet installation.

The invention further contemplates a ventilating attachment which is adapted to be connected to a vent which can be made in the floor of a bathroom immediately behind the toilet bowl and extended down through the floor to connect to an existing venting stack.

Other objects will become apparent in the ensuing specifications and appended drawing in which:

Fig. 1 is a side view of a toilet installation with my improved ventilating attachment embodied therein, a portion of the attachment being broken away and shown in section to more clearly illustrate the same;

Fig. 2 is a front view of the toilet construction with exposed portions of the ventilating attachment shown.

Fig. 3 is a plan view of the toilet bowl and ventilating attachment with the flush tank removed, viewed in the plane indicated by the line 3—3 of Fig. 1, with the interconnecting parts shown in section and other parts broken away;

Fig. 4 is a vertical longitudinal sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a detail sectional view taken on the line 5—5 of Fig. 3; and

Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 3.

Referring now to the drawings in detail, my improved ventilating attachment is particularly adapted for association with a toilet installation including a bowl **6** having a rim **7** and having at its rear a bracket portion **8** in which is embodied a duct **9** (Fig. 4) for conveying a flushing stream into the bowl from a flush tank **10** which is supported upon the normally attached with its bottom directly mounted upon the upper end of the rear bowl



portion **8**. The valve opening in the bottom of tank **10** normally is connected to the upper end of duct **9** by a nipple fitting which, in the use of the present invention is replaced by a nipple fitting **11** of greater length than the conventional fitting, in order to accommodate elevation of the tank **10** as hereinafter specified.

My invention provides attachment apparatus which, in addition to the extension nipple **11**, includes, in general, the following units: a pair of crescent shaped gaskets **12** which are interposed between the bowl **6** and the toilet seat **13**; a withdrawal duct **14** extending from the rear extremity of the bowl mouth and beneath the flush tank **10**; and a scavenging duct and blower unit **15** which extends downwardly, behind bowl **6**, from the rear end of withdrawal duct **14** to a vent **16** in the bathroom floor **17**.

In detail, the above units are as follows: the gaskets **12** are curved longitudinally to conform to the contours of the respective sides of bowl rim **7**, and they are terminated short of the forward end of the bowl, to define an inlet **18** between the laterally spaced forward ends of the respective gaskets, and beneath the projecting forward end portion of the toilet seat **13**. The rear ends **19** of gaskets **12** are likewise laterally spaced, with a spacing such that the forward end portion **20** of withdrawal duct **14** is snugly fitted between said rear ends **19**. Thus the forward end of duct **14**, which is open, is in fluid transfer communication with a flat shallow outlet **21**, defined between the upper face of bowl rim **7** and the lower face of rear central portion of toilet seat **13** and extending from side to side between the rear ends **19** of gaskets **12**.

Gaskets **12** are preferably secured to the lower faces of seat **13** by a suitable cement, and their lower faces are positioned to be engaged, with fluid sealing contact, against the upper face of bowl rim **7**. Gaskets **12** are preferably of a resilient compressible material such as a soft rubber or synthetic rubber or equivalent plastic material, with a thickness slightly greater than the normal spacing between toilet seat **13** and the upper face of rim **7**. Thus the seat, conventionally hinged to the bowl **6** by hinge mechanism **22**, when lowered, will place the gaskets in contact with bowl rim **7** under compression to establish a good fluid seal between the seat **13** and bowl rim **7** along the respective sides thereof, so that a passage for the flow of ventilating air into the bowl **6** through the forward inlet **18** and thence out of the rear end of the bowl through the outlet **21** and into the withdrawal duct **14**, is established.

Duct **14** has a rear portion **23** which is rectangular as disclosed in Fig. 3, is substantially wider than the forward end portion **20** and is offset upwardly from the latter at **24**. The offset **24** accommodates an upwardly projecting ridge **25** on bracket portion **8** of the toilet bowl **6**, against which the forward corner of flush tank **10** is normally mounted.

Withdrawal duct **14** may be fabricated from sheet material, preferably sheet metal, and includes an upper wall portion **26**, a lower wall portion **27**, a marginal wall portion **28** which extends around the rear, and along both sides of the duct, being offset inwardly at **29** where the wider rear portion **23** thereof, merges with the narrower forward portion **20** thereof. The bottom wall portion **27** rests upon the upper face of the toilet bowl **6**, and the upper wall portion **26** is fitted to the bottom of flush tank **10**.

In the forward area of the widened rear portion **23** of

duct 14 is a collar 30, joined at its upper and lower ends to the upper and lower wall members 26 and 27 respectively, at the margins of registering openings therein, whereby there is provided a passage extending downwardly through the duct 14, to accommodate the extension nipple 11 which passes downwardly through the duct from the bottom of flush tank 10 to connect with the upper end of flushing duct 9 in bowl 6, and is sealed thereto in the same manner as the conventional connector nipple which it replaces. The upper end of nipple 11 is provided with a valve seat, corresponding to the valve seat of the conventional nipple, for coaction with the flush tank valve 31.

Rearwardly of collar 30, in the lower wall 27 of duct 14, is a roughly semi-circular shaped outlet port 32 which communicates with a correspondingly shaped inlet 33 in the upper end portion 34 of scavenging duct 15. Upper end portion 34 is suitably shaped to correspond generally to the semi-circular shape of aperture 32 and, in its lower portion the duct 15 may merge into a more or less cylindrical body portion 35. At its lower end, duct 15 again enlarges in diameter to provide a blower housing 36. A blower 37, driven by an electric motor 39 suitably mounted in the housing 36, as by means of brackets 38, circulates air downwardly in duct 15 when operated.

The upper end portion 34 of the discharge duct has its inlet 33 sealed to outlet 32 of withdrawal duct 14 by a suitable gasket 40 interposed between the coupled ends of the two ducts. The weight of the flush tank 10, pressing downwardly upon the rear portion 23 of the withdrawal duct, may be depended upon to maintain the sealing connection between the ducts 14 and 15, the lower end of duct 15 resting directly against the floor 17 so that the duct is interposed under compression between the floor and the gasket 40. Thus the duct 15 functions as a supporting column. At its lower end, duct 15 has an outlet 41 which communicates with vent 16 which is fashioned in the floor 17, and is preferably sealed thereto by a gasket 43. The vent 16 may simply discharge beneath the building or may be connected by suitable plumbing to an existing vent stack, in a manner which will be readily apparent to a plumber.

Normally, the flush tank 10 is connected to the bowl 6 by a pair of laterally spaced bolts, one on either side of the tank discharge nipple. In assembling the present invention between the bowl and flush tank, slightly longer bolts 44 may be substituted for the conventional bolts, and the withdrawal duct 14 is provided with sleeves 45 extending vertically between upper and lower wall members 26, 27 respectively of the rear portion 23 of the withdrawal duct, and sealed to registering openings in said wall members 26 and 27.

The invention provides for automatic control of the motor 39. A relay 46, for connecting motor 39 to a source of 110 volt current, is energized by a low voltage current supplied through a conductor 47, under the control of a switch 48 attached to the under side of seat 13 at its forward end. Conductor 47 (Fig. 5) lies in a groove 49 in one side of seat 13 and follows the contour of the seat from front to rear, where it enters the hinge bracket 50 (attached to the seat at the one side) and passes through a nipple fitting 51 into the tubular shaft 52 (Fig. 6) on the ends of which brackets 50 are pivotally mounted. Conductor passes through shaft 52 to the other end of hinge assembly 22, where it leaves through one of the mounting posts 53 (in which tube 51 is mounted) projecting downwardly through the side flanges of bowl bracket 8, and proceeds to relay 46. The stretch of conductor 47 within shaft 51 is of sufficient length to endure a 90° twist (enough to accommodate lifting of seat 13) without being damaged thereby.

Gaskets 12 are sufficiently elastic to normally support seat 13 in a position slightly elevated above its lower limit position determined by engagement of buttons 54 on the underside of seat 13, against rim 7; and is sufficiently resilient to allow the seat to shift downwardly to this lower limit position when subjected to the weight of a person seated on seat 13. In the slightly elevated normal position of the seat, switch 48 is open. When the seat is depressed to its lower limit position, the switch, by engagement with rim 7, will be closed to start the operation of blower 37.

In the installation of my improved ventilating apparatus, the conventional anchor bolts are removed and the tank 10 is lifted away from the bowl. The gaskets 12 are suitably cemented to the bottom face of the seat, with their rear ends fitted snugly against the respective sides of the forward portion 20 of withdrawal duct 14, which is arranged in place upon the rear portion 8 of the bowl after the removal of the tank. A suitable vent 16 having been formed in floor 17 the scavenging duct 15 is inserted in place between the rear end portion of the withdrawal duct and the floor, with the gaskets 40 and 43 cemented into place. The extension nipple 11 is then installed in the bottom of the tank 10 in place of the conventional nipple, and projecting below the bottom of the tank for insertion through the collar 30 of withdrawal duct 14, and connection to the upper end of duct 9 in the bowl. The flush tank 10 is then reinstalled on top of the rear portion 23 of duct 14, and anchor bolts 44 are inserted upwardly through the bottom of the tank and secured by conventional nuts engaging the bottom of the tank. Upon tightening these nuts, the parts will be cinched together tightly to establish compression against the gaskets 40 and 43 and the sealing connections between nipple 11 and the tank and rear bowl member 8 respectively, and the apparatus is then ready for operation.

I claim:

1. In combination with a toilet assembly comprising a bowl including a rim defining a mouth and a tank supporting bracket extending rearwardly from said mouth and embodying a flushing duct; a seat; a pair of laterally spaced hinges providing a hinged connection between said seat and said bowl at the junction between the rear extremity of said mouth and said bracket; a pair of gaskets of resilient compressible material attached to the underside of said seat along the side portions thereof and closing the spaces between said rim and said seat when the latter is lowered, said gaskets being laterally spaced at their rear ends to define an outlet above the rear portion of said rim; a shallow substantially flat withdrawal duct mounted on the upper face of said bracket portion, said duct being of T-shape in plan and including a relatively wide transversely extending rear portion disposed partially over the rear portion of said bracket and partially projecting rearwardly from and overhanging the rear extremity thereof, and including a relatively narrow central portion extending forwardly between said hinges and sealed to said outlet for withdrawing vapors therethrough from said bowl, said withdrawal duct having an outlet port in the underside of said overhanging portion thereof; a scavenging duct having an upper end sealed to the said outlet port and embodying means for withdrawing vapors from said withdrawal duct therethrough; a flushing tank seated upon the upper side of said rear portion of the withdrawal duct; a collar extending vertically between and joined to the upper and lower walls of said withdrawal duct in said relatively wide rear portion thereof immediately forwardly of said outlet port, said withdrawal duct having an opening extending vertically therethrough and defined by said collar; a nipple extending through the bottom of said tank and downwardly through said opening and sealed in said bracket in communication with said flushing duct, the upper end of said nipple being provided with a valve seat for a flushing valve; a pair of sleeves extending vertically between and joined to the upper and lower walls of said withdrawal duct in said relatively wide portion thereof on either side of said collar and providing a pair of bolt openings extending vertically through said withdrawal duct; and anchor bolts

extending through said sleeves and anchoring the bottom of said tank to said bracket with said withdrawal duct interposed between the brackets and the tank, supported by the bracket and in turn supporting the tank.

2. The combination defined in claim 1, wherein said scavenging duct extends vertically between the bottom of said overhanging portion of the withdrawal duct and a floor surface upon which said bowl is mounted, and functions as a supporting pillar between said floor surface and said overhanging portion of the withdrawal duct.



**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,447,028 | McLanahan | Feb. 27, 1923 |
| 1,600,704 | Albrecht | Sept. 21, 1926 |
| 1,940,163 | Bystrom | Dec. 19, 1933 |
| 1,998,657 | De La Croix | Apr. 23, 1935 |
| 2,238,461 | Carman | Apr. 15, 1941 |
| 2,342,714 | Wheeler | Feb. 29, 1944 |
| 2,777,137 | McFadden | Jan. 15, 1957 |