May 23, 1933. R. A. MINKLER 1,911,032

TOILET BOWL VENTILATOR

Filed Sept. 29, 1931

FIG. 1

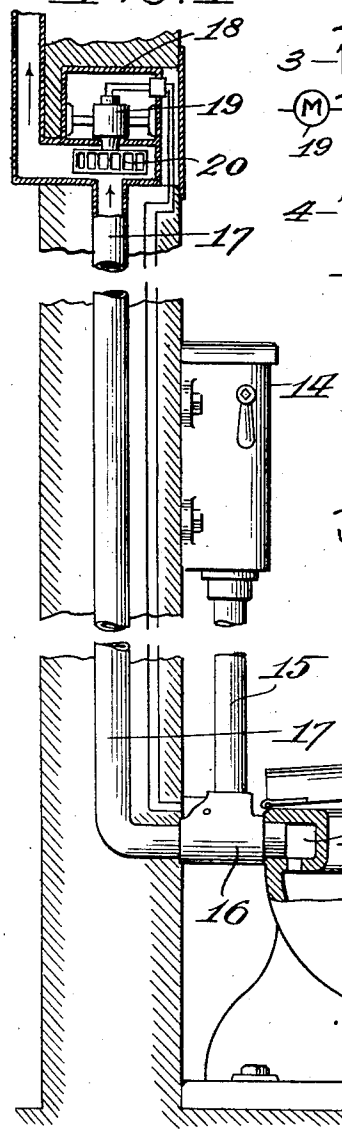


FIG. 2

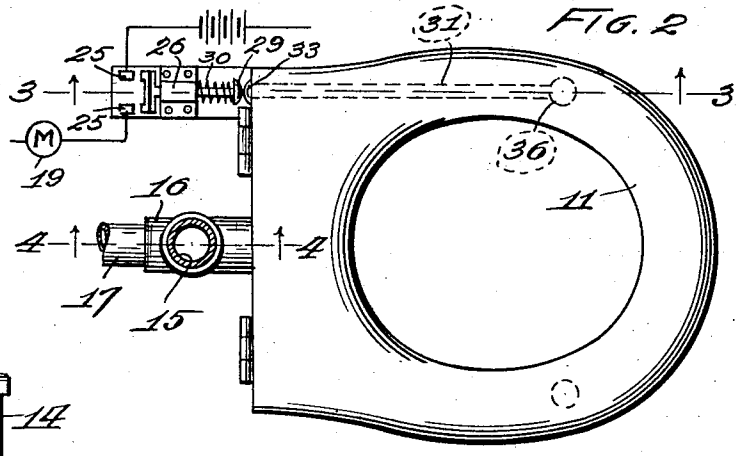


FIG. 3.

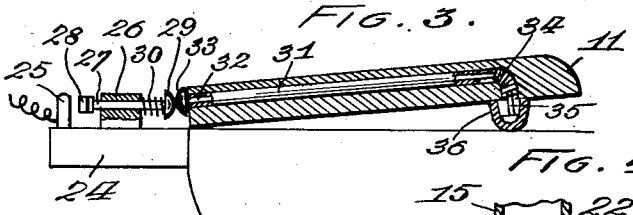


FIG. 4.

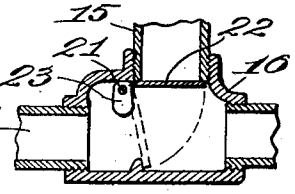


FIG. 6.

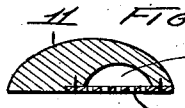


FIG. 7.

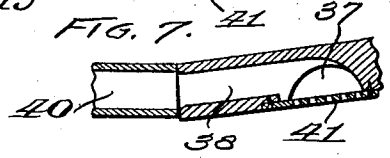


FIG. 5.

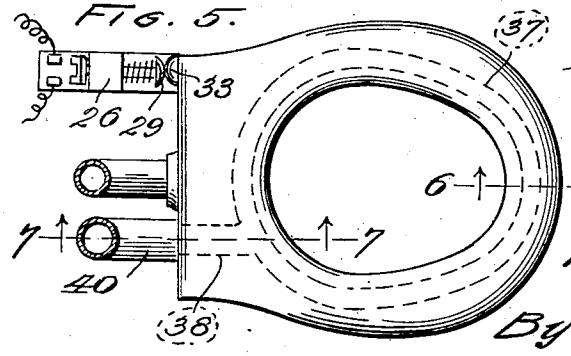


FIG. 8.

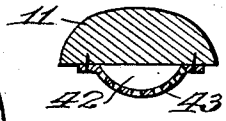
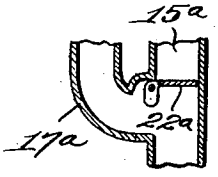


FIG. 9.



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Patented May 23, 1933 1,911,032

UNITED STATES PATENT OFFICE

RAY A. MINKLER, OF LOS ANGELES, CALIFORNIA

TOILET BOWL VENTILATOR

Application filed September 29, 1931. Serial No. 565,766.

My invention relates to a toilet bowl ventilator and has for its principal objects, to generally improve upon and simplify the construction of the existing forms of toilet bowl ventilators and to provide a ventilator that is relatively simple in construction, inexpensive of manufacture, automatic in action and very effective in performing the fuctions for which it is intended.

Further objects of my invention are, to provide a toilet bowl ventilator that includes a vent duct that leads through the wall of the building immediately to the rear of the toilet bowl, said duct having arranged therein a small electrically operated suction fan, which in operation produces suction through the duct and toilet bowl, further, to provide a switch in the connections to the electric fan which switch is automatically closed when the seat on the toilet bowl is occupied and which switch automatically opens when the weight of the occupant of the seat is removed therefrom and further, to provide a toilet bowl ventilator that in no wise interferes with the operations incident to the flushing of the bowl.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts that will hereinafter be more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is a side elevational view of a toilet bowl and showing my improved ventilating device associated therewith and with parts of the bowl and the building wall to the rear thereof being shown in section.

Fig. 2 is a top plan view of the toilet bowl and showing parts of the ventilator associated therewith.

Fig. 3 is an enlarged vertical section taken on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged detail section taken on the line 4—4 of Fig. 2.

Fig. 5 is a plan view of a toilet bowl seat and showing a modified form of the ventilator.

Fig. 6 is an enlarged cross section taken on the line 6—6 of Fig. 5.

Fig. 7 is an enlarged cross section taken on the line 7—7 of Fig. 5.

Fig. 8 is a detail section similar to Fig. 6 and showing a modified form of the vent duct that is arranged on the underside of the toilet bowl seat.

Fig. 9 is a detail section showing a modified form of the connection between the flush water pipe and the vent pipe.

Referring by numerals to the accompanying drawing which illustrates a practical embodiment of my invention, 10 designates a toilet bowl, 11 the hinged seat thereof, 12 the usual flushing water channel that is formed around the upper inner portion of the bowl and said channel being provided with the usual outlets 13, 14 the flushing tank and 15 the tube that carries the flushing water downwardly from the tank to the bowl.

Seated in the upper rear portion of bowl 10, is a suitable connection 16, preferably an inverted T and the lower end of tube 15 is suitably connected to the upper portion of this T connection.

One end of the horizontal portion of the connection 16 is suitably connected to the duct 12 and leading from the other end of the horizontal portion of this connection rearwardly into the wall directly behind the bowl and thence upwardly through said wall is a vent pipe 17.

Located at a suitable point in this vent pipe 17 is an enlarged portion or housing 18 and suitably supported therein is a small electric motor 19, the shaft of which is vertically disposed and arranged on the lower end of said shaft is a fan 20.

Mounted to swing freely on a horizontally disposed pin 21 that is seated in the upper rear portion of the fitting 16, is a plate 22 that functions as a valve to normally close the lower end of the flush water supply pipe 15 and projecting downwardly from the rear end of this plate or the end that is mounted on the pin 21 is a counterbalancing weight 23, which normally retains plate 22 in a horizontal position so as to close the lower end of the tube 15 (see Fig. 4).

Thus under normal conditions the flushing duct or chamber 12 in the upper portion of

bowl 10 is in direct communication with vent pipe 17 and the valve plate 22 closes the lower end of pipe 15 so that there is very little if any suction produced in said pipe 15 while the suction fan 20 is in operation.

When a flushing action takes place as a result of manual operation of the flushing mechanism, the force of the water flowing downwardly through tube 15 swings plate 22 downwardly into the position shown by dotted lines in Fig. 4 and thus practically all of the flushing water is directed by said plate into the circulation duct or chamber 12 and after this flushing water has discharged from pipe 15 the counterbalancing weight 23 causes plate 22 to swing back to its normal position against the lower end of tube 15.

Suitably supported to the rear of the seat 11 and to one side of the connection 16 is a block 24 of insulating material, on which is mounted a pair of spaced contacts 25, one of which is suitably connected to a source of an electric current supply, preferably the household lighting system and the other contact is connected to the motor 19.

Mounted for sliding movement through a bearing 26, that is located on block 24, is a rod 27 that carries at its rear end a cross bar 28, of metal and which is adapted to engage the contacts 25 when moved rearwardly.

Secured on the forward end of rod 27 is a head 29 and located on said rod between this head and the bearing 26, is an expansive coil spring 30.

Extending lengthwise through the side portion of the body of seat 11 and in longitudinal alignment with rod 27 is a tube 31, the forward portion of which is curved downwardly and the forward end of said tube terminates flush with the underface of the seat 11.

Arranged for sliding movement in the straight portion of this tube 31 is a rod 32, the rear end of which projects from the rear end of said tube and carried by the projecting end of this rod is a head 33 that normally bears directly against head 29 or rod 27.

Secured to the forward end of rod 32 and extending downwardly through the curved forward end of the tube 31 is a flexible member 34, preferably a section of coiled wire, the coils of which are directly in contact with each other and carried by the end of this flexible member that projects from the end of tube 31 is a short pin or finger 35 that projects into an opening that is formed in a button 36 and the latter being formed of rubber or other elastic material.

Under normal conditions the elastic button 36, when expanded, rests directly on top of the bowl 10 and maintains the seat 11 in a slightly inclined position, as illustrated in Figs. 1 and 3. Under such conditions the head 29 on the forward end of rod 27 is maintained in contact with head 33 on rod 32 by the expansive action of spring 30 and contact bar 28 is out of engagement with contacts 25.

When the seat 11 is occupied the weight of the occupant swings said seat downwardly into a substantial horizontal position, thereby compressing the elastic button 36 and forcing rod 35 upward a short distance and consequently moving flexible member 34 and the rod 32 rearwardly through tube 31. Such action causes head 33 to engage head 29 and move rod 27 rearwardly against the resistance of spring 30, with the result that the contact bar 28 engages contacts 25, thereby closing the circuit from the source of current supply to the motor 19 and the latter carrying the suction fan 20 will be operated.

The operation of the fan causes suction to be produced through vent pipe 17 and this suction prevails within the circulation chamber 12 and the interior of the bowl with which said circulation chamber is connected by means of the openings 13.

As the occupant leaves the seat 11, the expansive action of the button 36 and the spring 30 will return the rods 32 and 27 to their normal positions with the result that the circuit to the motor 19 will be broken and the suction fan will cease to operate.

In the modified construction illustrated in Figs. 5, 6 and 7, a vent duct is provided by forming a continuous groove or channel 37 in the underside of the seat 11 and which groove is substantially concentric with the opening in said seat.

Projecting rearwardly from the groove 37, is an outlet duct 38 that is open on the rear edge of the seat and when the seat is swung downwardly unto the bowl and while the seat is occupied, the rear open end of this duct 38 communicates directly with a vent tube 40 that leads upwardly through the wall to the rear of the toilet bowl and which tube corresponds with the vent tube 17.

Secured to the underside of the seat 11 and overlying the groove or channel 37 is a perforated plate 41.

When this modified construction is used, the suction produced by the fan through vent pipe 40 is also produced through connection 39, duct 38, groove or channel 37 and the apertures or perforations in plate 41.

In the modified construction illustrated in Fig. 8, a vent duct or chamber 42 is formed on the underside of the seat 11 by arranging on the under side of said seat a curved perforated plate 43 which extends entirely around the opening in the seat and the rear portion of which vent is suitably connected to a vent pipe similar to the vent pipes 17 and 40.

In the modified construction illustrated in Fig. 9, the vent pipe 17^a connects with the flush water pipe 15^a at a point a short distance above the rear end of the bowl and

where such construction is employed, the gravity valve plate 22ª is pivotally arranged so as to normally close the passageway through the flush pipe 15ª and to swing downwardly and close the lower end of vent pipe 17ª when the flushing water flows downwardly through pipe 15ª.

Thus it will be seen that I have provided a toilet bowl ventilator that is relatively simple in construction, entirely automatic in action and which may be conveniently employed to practically all forms of toilet bowls.

It will be understood that minor changes in the size, form and construction of the various parts of my improved toilet bowl ventilator may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. The combination with a toilet bowl provided in its upper portion with a circulation duct, of a flushing water pipe and a vent pipe connected to said circulation duct, a gravity plate arranged between said flushing water pipe and vent pipe for normally closing the end of the flushing water pipe that is connected to the circulation duct in the bowl, a suction fan located in said vent pipe, an electric motor for operating said fan, electrical connections to said motor, a normally open switch in said connections, a seat hinged on top of the toilet bowl, a switch actuating rod arranged for sliding movement in said seat, a flexible member connected to and depending from the forward end of said rod, a pin connected to and depending from said flexible member, which pin projects a short distance below the front portion of the seat and an elastic button enclosing the projecting portion of said pin and adapted to rest on top of the toilet bowl.

2. The combination with a toilet bowl, of a seat hinged to the top of said bowl, there being a vent duct formed on the underside of said seat, a perforated member covering said vent duct, a vent pipe to which said duct is connected, a motor driven suction fan located in said vent pipe, electrical connections to the motor of said fan, a normally open switch in said connections and means carried by said seat, a switch actuating rod arranged for sliding movement in said seat, a flexible member connected to and depending from the forward end of said rod, a pin connected to and depending from said flexible member, which pin projects a short distance below the front portion of the seat and an elastic button enclosing the projecting portion of said pin and adapted to rest on top of the toilet bowl.

In testimony whereof, I affix my signature.

RAY A. MINKLER.