Dec. 14, 1971 W. L. MARTZ 3,626,554

VENTILATOR FOR BATHROOMS

Filed Dec. 8, 1969 2 Sheets-Sheet 1

FIG. 1

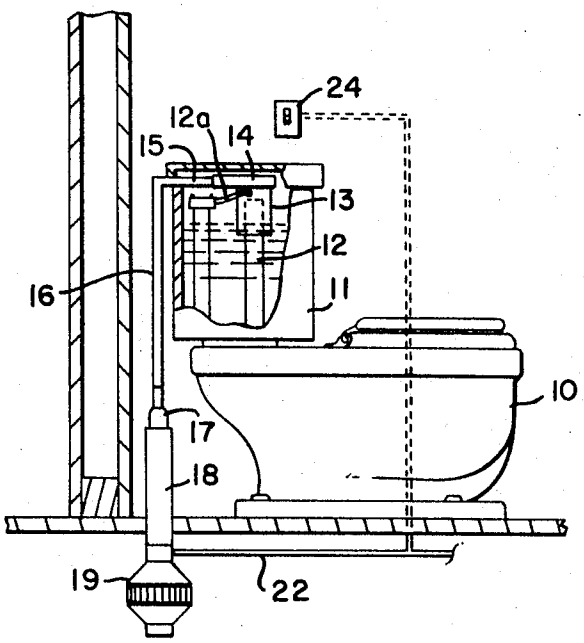


FIG. 2

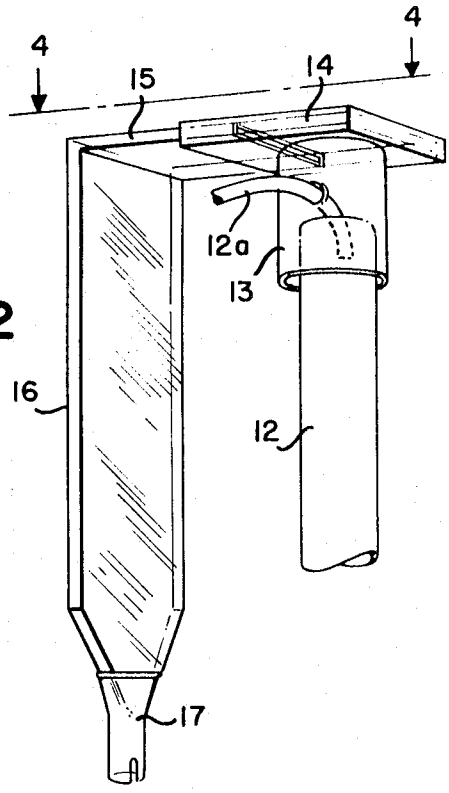


FIG. 3

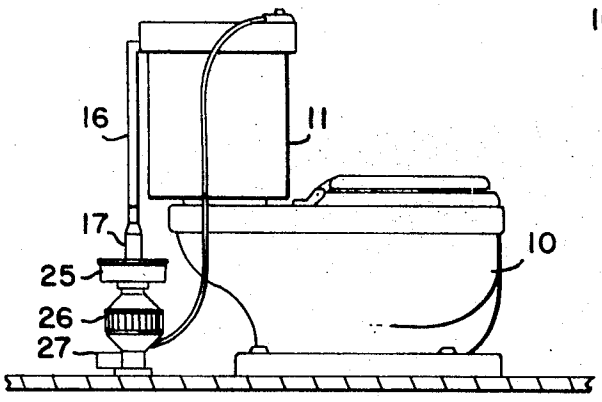
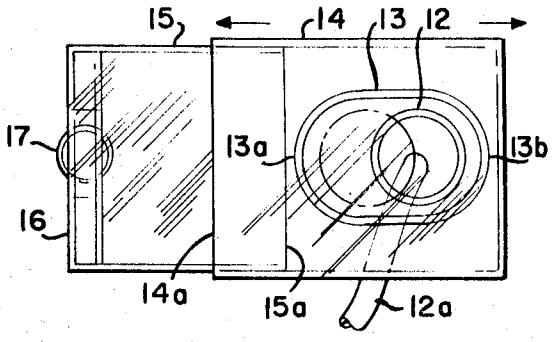


FIG. 4



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VENTILATOR FOR BATHROOMS

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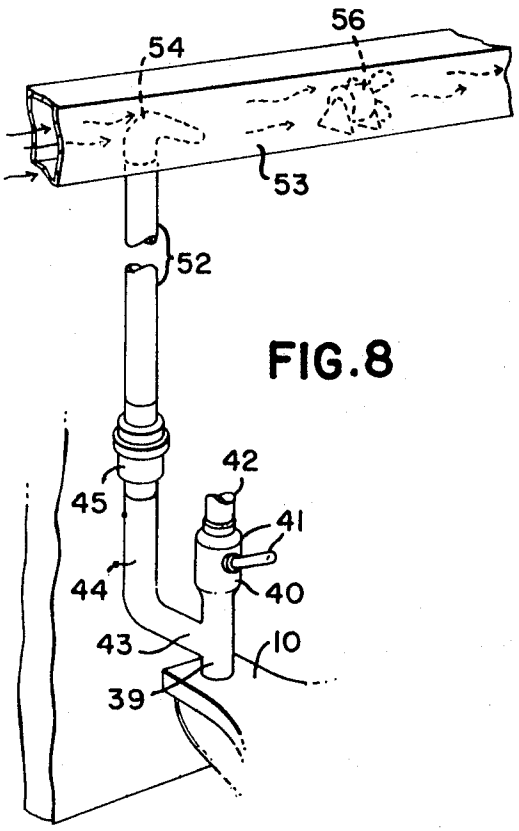

FIG.8

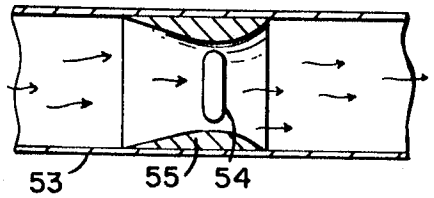

FIG.10

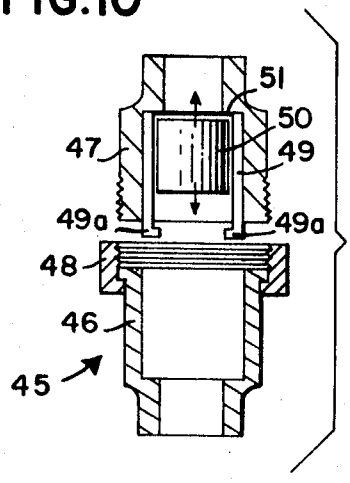

FIG.9

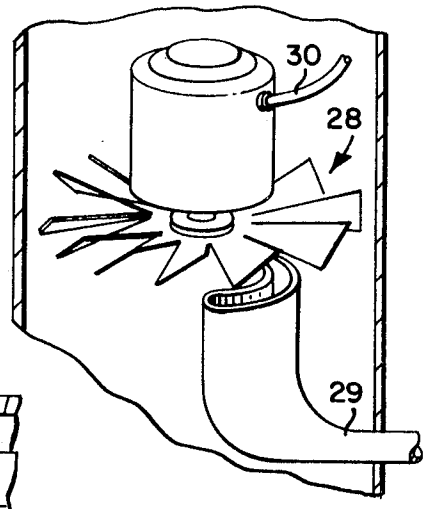

FIG.5

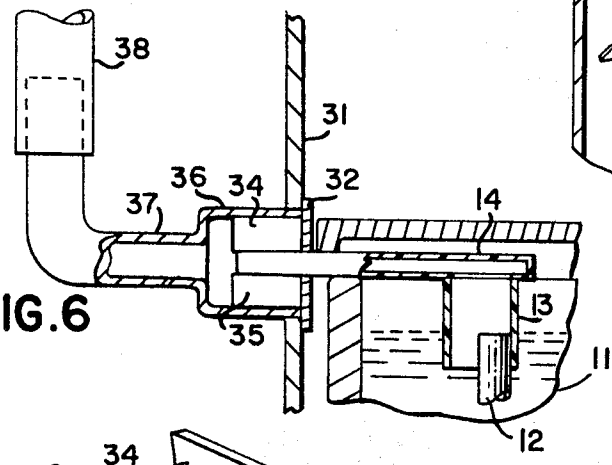

FIG.6

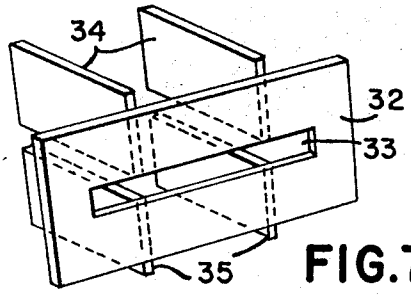

FIG.7

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VENTILATOR FOR BATHROOMS

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Int. Cl. E03d 9/04
U.S. Cl. 4—213 3 Claims

ABSTRACT OF THE DISCLOSURE

A ventilator for bathrooms and the like which may be easily installed in existing bathrooms and which is provided with a hood that is placed over the overflow pipe in the water tank. This hood is connected to a channel member that telescopes over another channel member to facilitate installation of the device. A blower is connected to the channel members and one embodiment of the device provides a filter of activated charcoal connected to the channel just ahead of the blower. Another embodiment of this device employs a check valve provided in the ventilating pipe of a toilet bowl which is equipped with a flush type valve. The check valve functions to prevent water from entering the ventilating duct during flushing of the toilet.

DESCRIPTION OF THE INVENTION

This invention relates to ventilators for water closets.

An object of this invention is to provide an improved bathroom ventilating device for efficiently eliminating odors that appear in water closets during use.

Another object of this invention is to provide an improved bathroom ventilator that is economical to manufacture and may be easily installed by any home owner.

Still another object of this invention is to provide an improved bathroom ventilator employing a device for drawing the odors from the toilet bowl through the overflow pipe of the water tank and passing these fumes and odors through a filter of activated charcoal before exhausting the purified air into the bathroom.

Still another object of this invention is to provide an improved toilet ventilator that is adapted for use in toilets equipped with flush type valve, said ventilator being provided with a check valve that prevents water from entering the ventilating duct during flushing of the toilet.

Other and further objects of this invention will be apparent to those skilled in the art to which it relates from the following specification, claims and drawings in which, briefly:

FIG. 1 is a view in side elevation partially in section of an embodiment of this bathroom ventilator invention in which the ventilator exhaust fan is located below the bathroom floor;

FIG. 2 is a perspective view of the hood and channel members employed in this ventilator invention in conjunction with the overflow pipe of the toilet water tank;

FIG. 3 is a view in side elevation of an embodiment of this invention employing a charcoal filter;

FIG. 4 is a view taken along the line 4—4 of FIG. 2 showing the oval shape of the hood which is placed over the top of the overflow pipe of the toilet water tank;

FIG. 5 is a sectional view of a fan and nozzle arrangement that is adapted to be used in conjunction with this ventilator invention;

FIG. 6 is a fragmentary sectional view showing the installation of the ventilator channel through a bathroom wall;

FIG. 7 is a perspective view of the wall plate used for the ventilator channel in the embodiment of this invention shown in FIG. 6;

FIG. 8 is a fragmentary view of an embodiment of this ventilator invention adapted for use with flush type valve water connection;

FIG. 9 is an exploded view of the check valve shown in FIG. 8; and

FIG. 10 is a sectional view of the Venturi tube employed in the air duct shown in FIG. 8.

Referring to the drawing in detail there is illustrated a water closet ventilator which is adapted to be used with conventional water closet equipment employing a bowl **10** and a water tank **11** connected thereto. The water tank **11** is provided with an overflow pipe **12**, the top part of which extends into the hood **13** which is of generally oval cross section as shown in FIG. 4. The bottom of the hood **13** extends below the water level in the tank **11** so that the fumes from the toilet bowl **10** pass upward through the overflow pipe **12** and into the hood **13** and they are prevented from going into the tank above the water level because of the water seal between pipe **12** and hood **13**.

The top of the hood **13** is connected to the rectangular chamber **14** which is sealed on three of its sides. The fourth side of chamber **14** is open and receives the rectangular channel **15** which fits closely into chamber **14** and extends therein a short distance as shown in FIGS. 2 and 4. The outer end of the channel **15** is connected to a channel **16** which extends downward on the back side of the tank **11** and the bottom tapered end of which fits into a round coupling member **17**. The round bottom portion of coupling member **17** is connected to the pipe **18** that leads through a hole in the bathroom floor to the exhaust blower **19** which is positioned beneath the bathroom.

An electrical connection **22** which is adapted to be controlled by the switch **24** is provided to the electric motor of blower **19** so that the blower may be turned on by operating the switch **24** when it is desired to exhaust the fumes from the toilet bowl **10** through the overflow pipe **12**, hood **13** and connecting channels **14, 15, 16, 17** and **18**.

The hood **13** is made in generally oval cross section as shown in FIG. 4 so that it may be readily placed over the top of the overflow pipe **12** after the channels **15** and **16** are positioned with reference to the water tank **11**. Thus when the side **13***a* of the hood **13** is placed against the pipe **12** the end **14***a* of the chamber **14** is in line with the end **15***a* of the channel **15**. Chamber **14** is then telescoped over channel **15** until the side **13***b* of the hood **13** is almost against the overflow pipe **12**. Thus the hood **13** may be readily removed from the pipe **12** for sevicing if necessary.

The arrangement shown in FIG. 3 is similar to that shown in FIG. 1 except that this embodiment of the invention is provided with a cannister **25** filled with activated charcoal. The cannister **25** is connected with its inlet to

the coupling member **17** and the outlet thereof is connected to the exhaust blower **26**. The outlet **27** of the exhaust blower **26** is vented directly into the bathroom since the activated charcoal in the cannister **25** absorbs the fumes and odors drawn through it from the toilet bowl **10**. The cannister **25** is readily detachable from the coupling member **17** and blower **26** so that it may be removed and the charcoal replaced periodically.

Instead of the blower **19** being positioned beneath the bathroom an exhaust fan **28** may be employed located in the attic with an inlet port in the ceiling of the bathroom in this case the pipe **29** which has a curved outlet as shown in FIG. 5, is connected to the round portion of the coupling **17**, instead of the pipe **18** as shown in FIG. 1. The curved outlet of the pipe **29** extends approximately half way around the fan on the underside thereof to increase the effective suction of the fan in drawing air through the pipe **29**. The electrical connection **30** to the motor driving the fan **28** may also be controlled by the bathroom switch **24** to provide electric current to the motor which may be turned on when it is desired to exhaust the fumes from the toilet bowl **10**.

In FIG. 6 there is shown a modification of this invention in which the channel member **14** extends into the bathroom wall **31** through a face plate **32** which is provided with a rectangular opening **33** for receiving the channel member **14**. The face plate **32** is supported in the wall by two sets of supporting members **34** and **35** which are attached to the back side of this face plate. Initially the supporting members **34** and **35** are made quite large in relation to the face plate **32** so that the face plate may be adjusted when it is being positioned into the wall **31** to bring the hole **33** in alignment with the channel member **14**. This aligning operation is performed by removing different amounts of the supporting members **34** and **35** to locate the face plate at the proper level. The inner end of the channel **14** is received by the coupling member **36**, the coupling member **36** is provided with a rectangular portion which is adapted to receive the channel member **14** and a round portion which is adapted to fit into the pipe elbow **37**. The elbow **37** is fitted into the pipe **38** which extends into the attic and is connected to the pipe **29** shown in FIG. 5.

In FIG. 8 there is shown another modification of this invention that is adapted to be used with toilet bowls equipped with a flush type valve, also sometimes referred to as a sloan valve. The toilet bowl **10** which is of conventional construction is equipped with a pipe **39** and flush valve **40**. The flush valve **40** is provided with an actuating lever **41** and is connected between the water supply pipe **42** and the pipe **39**. A T-connection **43** is provided to the pipe **39** and the pipe **44** which extends to the check valve **45** is connected to the T **43**.

The check valve **45** is made in two parts **46** and **47** which are coupled together by the coupling member **48** that engages a shoulder on the bottom part **46** and is threaded to the upper part **47**. The upper part **47** is provided with members **49** which support the valve member **50** in its rest position. For this purpose the bottom portions of supporting members **49** are provided with inturned portions **49***a* on which the valve member rests. The upper part **47** of the check valve **45** is connected to the pipe **52** which extends into the ventilating duct **53** and is provided with a nozzle **54** that is located in the side of the duct **53**. The upper end of the tube **52** extends into the opening **54** of the Venturi **55** that is provided in the exhaust **53**. Thus as the fan or blower **56** which is positioned in the duct **53** draws air through the duct the Venturi **55** causes air to be sucked up through pipe **52**, check valve **45**, pipe **43** and **39** and the bowl **10**. When the sloan valve **40** is operated by pressing on the lever **41** thereof and the bowl **10** is flushed by water coming from supply pipe **42** through valve **40** some of the water will enter the pipe **44** and proceed up into the check valve **45**. Water entering the check valve **45** lifts the valve member **50** off of its supporting shoulders **49***a* and presses this valve against the seating surface **51**, thereby preventing water from passing through the check valve **45** and into the pipe **52**. When the flush valve **40** is closed water leaves the pipe **44** and flows into the bowl **10**, at the same time the valve member **50** drops to its rest position on supporting shoulders **49***a*.

While I have shown preferred embodiments, it will be understood that the invention is capable of modification from the forms shown so that the scope of the invention should be limited only by the proper scope of the claims appended hereto.

What I claim is:

1. In a ventilator for a conventional bathroom toilet provided with a water tank having an overflow pipe positioned therein connected to the toilet bowl the combination comprising a hood positioned over the top of the overflow pipe with the bottom of said hood extending below the water line in the tank, said hood having an oval shape with the long diameter thereof equal to approximately twice the diameter of said pipe, said supporting means comprising a hollow chamber having the bottom thereof fixedly attached to the top of said hood, said bottom being provided with an aperture through which the cavity in said hood is connected to the hollow of said chamber, said supporting means also including a substantially flat channel member forming a telescoping connection with said chamber so that said chamber may be attached to said channel member after said hood is placed over said overflow pipe by telescoping said channel member into said chamber, the channel through said channel member opening into the hollow of said chamber, and communicating with the cavity in said hood, said substantially flat channel member being positioned between the cover and the top of the rear wall of said tank and being clamped therebetween, and means producing suction through said channel member, said chamber, said hood and said overflow pipe when said tank is filled with water to said water line so that fumes are drawn from said toilet bowl.

2. In a bathroom ventilator adapted for use with a toilet provided with a sloan type flush valve connected to the toilet bowl by a water inlet pipe, the combination comprising a T connection positioned in said water inlet pipe so that the water flowing through said sloan valve flows into said toilet bowl through said T connection, a ventilator pipe connected to said T connection so that fumes from said toilet bowl are vented through said water pipe, said T connection and said ventilator pipe, an air duct, a Venturi tube positioned inside said air duct, said ventilating pipe being connected to said Venturi tube so that means drawing air through said air duct produces suction in said Venturi tube to draw the fumes out of said toilet bowl through said Venturi tube, a check valve positioned in said ventilator pipe a short distance from said T connection, said check valve being normally open so that said fumes may be vented therethrough, said check valve having a valve member actuated by water pressure when said toilet bowl is being flushed so that water cannot flow out of the water inlet pipe through said ventilating tube and said check valve functions as a vacuum breaker.

3. In a ventilator for a conventional bathroom toilet provided with a water tank having an overflow pipe positioned therein connected to the toilet bowl the combination as set forth in claim **1** further characterized in that said means producing suction through said channel member, said chamber, said hood and said overflow pipe when said tank is filled with water to said water line so that fumes are drawn from said toilet bowl comprises means connecting said substantially flat channel member to a ventilator pipe an end of which is open in a hole in the bathroom wall, said connecting means including a face plate and members for supporting said face plate over said open end of said ventilator, said face plate hav-

ing a hole receiving said channel member, said supporting members fitting into said open end of said ventilator.

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