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VENTILATING SYSTEM FOR DRY CLOSETS AND SEPTIC TANKS

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This invention relates to dry closets of the kind comprising a closet chamber, an apertured seat in said chamber, and a covered pit into which dejecta are gravitationally delivered and in which the dejecta are retained.

The principal object of the invention is to exclude, from the closet chamber, odours arising from the dejecta.

In most existing dry closets no systematic provision is made for dealing with the odoriferous gaseous matter that is evolved from the collected dejecta, and in many the construction is such that the seat aperture is the easiest available outlet, or the only outlet, for the escape of such gaseous matter from the pit.

According to the present invention, the entry of such gaseous matter to the closet chamber is counteracted by a down draught of air flowing from the chamber through the seat aperture, and thence through an enclosed conduit by which the dejecta are conducted to the pit. The energy for setting up said draught is natural energy which is inherently available in and around the closet and is caused to energise the draught by the structural form of the closet.

Regarding the structural aspect of the invention, the closet structure comprises a flow system for aeriform fluid, said system including the pit, a conduit leading down from the seat aperture to the pit, and an outlet for aeriform fluid from the pit to the open air. Said flow system is completely closed in except for its two terminal openings consisting of the seat aperture and the outlet orifice in the open air. Said system moreover is such as to bias aeriform fluid flow through it in the direction from the seat aperture to the pit outlet. The first portion of said flow system, comprising the seat aperture, the conduit, and the adjacent portion of the pit, is also the flow system for dejecta.

Also according to the invention, the conduit referred to is a chute having downward and horizontal direction components to lead from the seat aperture to the pit displaced in plan from the chamber.

According further to the invention, the outlet of the enclosed aeriform fluid flow system is a vent pipe or chimney extending from the pit into the open air. By carrying said vent pipe or chimney to a height substantially above the level of the seat aperture, the flow system constitutes an inverted syphon with a shorter leg comprising the conduit and a longer leg comprising the vent pipe or chimney; through which syphon gaseous flow down the shorter leg and up the

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longer leg can be set up automatically by any one or more of several sources or kinds of energy inherently associated with the stationary structure described, particularly when such structure is in active use for its normal purpose.

The inventor is unable to point out exactly the kind or origin of the energy that is active in his invention but he has reason to believe that any one or more of the following play some part simultaneously or not and in varying degrees according to circumstances:

(a) A factor that experiment has proved certainly to contribute substantially, is the heat energy rendered available by the decomposition of the collected contents of the pit. Such decomposition warms the gaseous content of the pit cavity, which consequently tends to move upward through the pit cavity and the vent pipe, such movement being permitted by inflow of fresh air through the seat aperture; thus providing the desired down draught through the seat aperture.

(b) Another way in which thermal energy is made available, is the heating of the vent pipe and the gaseous matter within it by the heat of the sun when the conditions are such that the chimney is exposed to the sun.

(c) Another kind of natural energy is that which manifests itself in connection with chimneys as a class, and causes an updraught through a chimney without apparent dependence on any heat source.

(d) Another specific source of energy, which however may be included in the last mentioned class, is wind energy causing an aspirating effect at the top of the chimney.

According to a further feature of the invention, the aforesaid conduit opens into the pit at a level substantially below the top of the pit.

It is a feature of the invention that the conduit is a chute the receiving end of which provides a horizontal receiving mouth supported at seat level, and the discharge end of which is inclined to the vertical and is sealed into the wall of the pit that is adjacent to the closet. It is a further feature of the invention that said chute is a pre-formed article built into the closet structure. According to the invention, the said pre-formed chute consists of a curved tube tapered substantially from one end to the other, the end orifices of the tube being in planes perpendicular to one another, the total angle of curvature of the tube being substantially not more than 135°, the plane of the receiving mouth being materially perpendicular to the centre line of the tube at its end. The most suitable mate-

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rial of which to make the chute is cementitious composition containing a filler that gives substantial tensile strength to the hardened composition.

In the accompanying drawing:

Figure I shows an example of the invention carried out in the detailed manner which has been found to give the best results.

Figure II is a perspective view of the detached chute.

Therein 2 indicates the closet chamber having adequate ventilation openings 3. 4 indicates the pit sunk in the ground beyond the chamber. A chute 5 is set in the floor 6 of the chamber and in the adjacent wall 7 of the pit 4, and forms an enclosed conduit between the seat and the pit. Said chute is a pre-formed article made of a cementitious composition containing a filler that gives substantial tensile strength to the set mixture; for instance, asbestos cement. The chute 5 is tapered and curved to provide a streamlined path 8 extending from a relatively wide receiving mouth 9 at its upper end (which mouth is in practice set with its rim 10 horizontal) to a narrower discharge mouth 11 forming the termination of the lower portion 12 of the chute, which is approximately straight but still tapered. Said lower portion 12 delivers dejecta gravitationally into the pit 4 at a downward angle that is as steep as possible consistent with imparting to the descending dejecta the horizontal displacement necessary to transfer them from the plan-position of the chamber to the plan-position of the pit. A downward angle of about 55 degrees is effective. The discharge mouth 11 of the chute lies in a plane at right angles to the plane of the receiving mouth 9; enabling said discharge mouth to be made flush with the inner surface 13 of the vertical wall 7 of the pit. Said downward angle and the length of the chute are such that the receiving mouth 9 is at seat level above the chamber floor 6; whilst the discharge mouth 11 opens into the pit at a low level of the latter which is nevertheless above the expected height of the collected contents 14 of the pit.

Surmounting the upper end of the chute 5 is the pedestal 15, which is shown as being of the well known form comprising side walls 16 joined by a curved front wall 17 and comprising also the seat member 18 formed with the usual aperture 19. Said pedestal is preferably a pre-formed and integral structure made of the same material as the chute 5. The seat member 18 makes an approximately tight joint with the receiving mouth of the chute.

The top of the pit is completely covered in by a permanent ledge 20 which supports the vent pipe 21—and by the removable cover 22. The latter is arranged to slope upwards towards the

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vent pipe and thereby to assist in guiding rising gas to said pipe. The pit is made long enough in the direction away from the outlet 11 of the chute 5 to allow of the draught from said outlet taking a wide sweep and being reflected from the opposite wall 23 of the pit, and thence ascending by a generally curved path to the lower open end 21a of the vent pipe 21.

The upflow of warmed gaseous matter in the pit cavity 24 is indicated by arrow A; and the consequent gaseous flow through the flow system 19, 8, 4 and 21 is indicated by arrows B. The down draught not only forms a seal against upflow of gaseous matter from the pit, but carries down with it odour arising from dejecta that may lodge within the chute 5.

I claim:

A dry closet comprising a closet chamber, an apertured seat in the chamber, a covered pit in which dejecta are received gravitationally from the seat, and are retained, the closet structure comprising a flow system for aeriform fluid, said system including the pit, an enclosed open-ended and unobstructed conduit leading down from the seat aperture to the pit, and a chimney extending from the top of said pit into the open air to an elevation well above the level of the seat opening; said conduit being shaped as a tapered nozzle with the larger diameter end supported next to the seat and its smaller diameter end opening in a side wall of the pit at a level substantially below the top of the pit, and of a length several times the diameter of its larger end, whereby the nozzle shape favours one-way aeriform fluid flow from the seat to the pit, the flow system being always completely closed in except for its two terminal openings consisting of the seat aperture and the chimney top, the first portion of the flow system (comprising the seat aperture, the conduit and the adjacent portion of the pit) being also the flow system for dejecta.

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