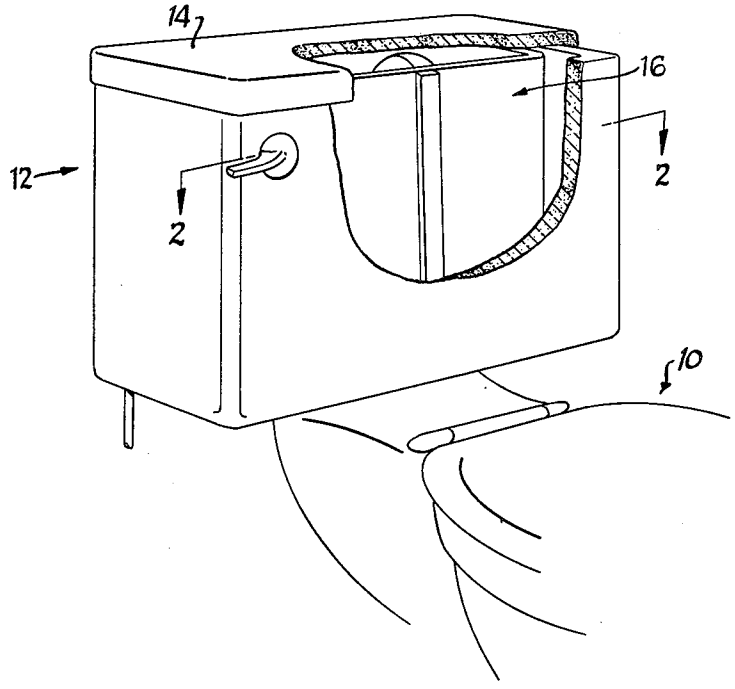
June 9, 1964 N. J. PARRISH 3,135,968

DRIPLESS TOILET TANK

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FIG. 1



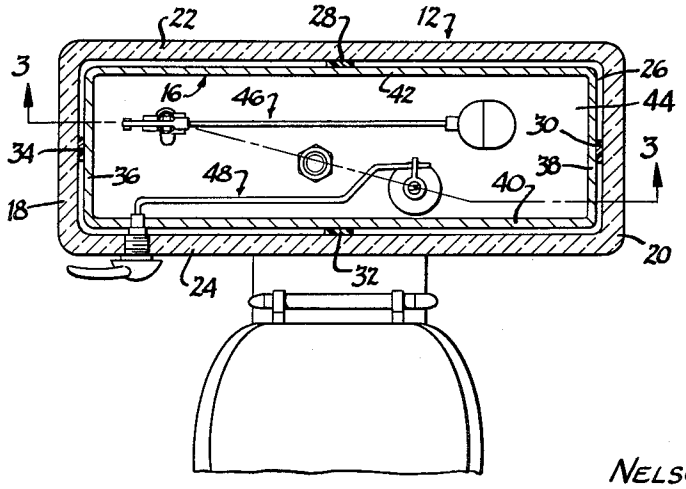


FIG. 2

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FIG. 3

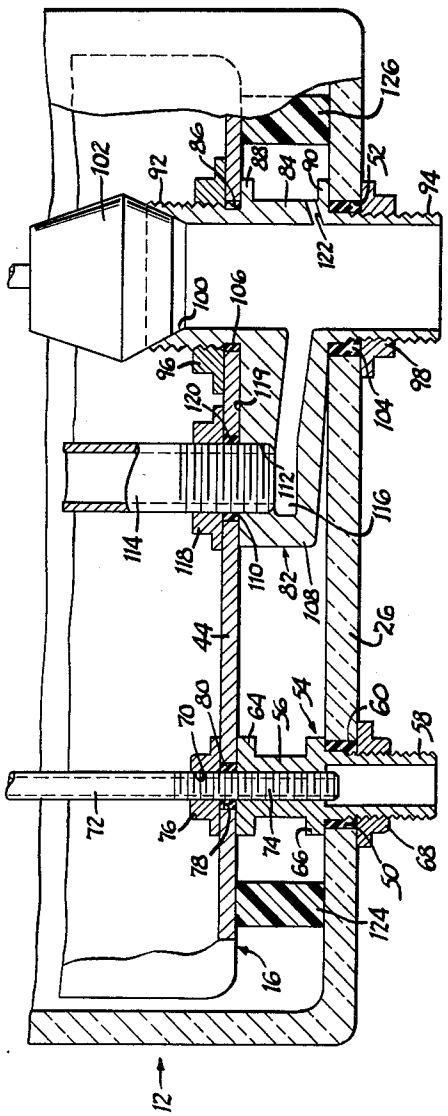


FIG. 4

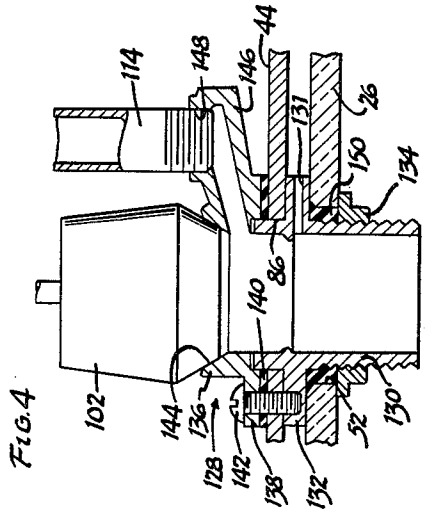


FIG. 5

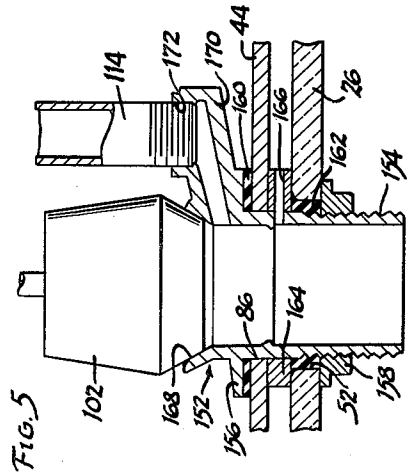
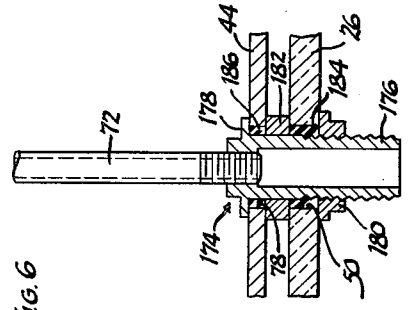


FIG. 6



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3,135,968

DRIPLESS TOILET TANK

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Filed Sept. 7, 1962, Ser. No. 222,007
2 Claims. (Cl. 4—18)

The present invention relates to a dripless toilet tank, and more particularly to a simplified liner construction and associated fittings for mounting within a toilet flush tank to prevent the collection of moisture on the exterior surface of the flush tank.

The collection of moisture on the exterior surface of toilet flush tanks has been a long standing problem. This problem is most severe in the summertime when the temperature of the water within the tank is normally lower than the air temperature, a condition which causes moisture to collect on the outside of the tank. It has been proposed in the past to provide a separate inner liner within the flush tank. The inner liner collects the moisture and the moisture subsequently drips from the liner to the bottom of the flush tank and is emptied therefrom by a suitable outlet. The constructions which have been proposed in the past have, however, been relatively complicated and expensive to manufacture. The present invention provides a suitable liner construction which is simple to install and relatively inexpensive to manufacture.

It is, therefore, an object of the invention to provide a dripless toilet tank construction.

A further object of the invention is to provide a liner for mounting within the toilet tank, the liner being mounted in the tank by a system of fittings which permit ready installation of the liner by one unskilled in the art, such as the average homeowner.

Another object of the invention is to provide a liner construction which is of plain design and may be inexpensively molded or otherwise formed without the complication of rib structures, flanges and the like.

A still further object of the invention is to provide a liner construction which is adaptable for installation in the majority of toilet flush tanks without the necessity for reworking or otherwise modifying the toilet tank construction.

A further object of the invention is to provide fitting structures which comprise only three elements threadingly joined together, the simplicity of the fitting structures resulting in reduced manufacturing costs and simplified installation.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

FIGURE 1 is a view in perspective of a toilet construction embodying the present invention;

FIGURE 2 is a top sectional view of the flush tank construction of FIGURE 1 taken along the line 2—2 of FIGURE 1 looking in the direction of the arrows;

FIGURE 3 is a partial side elevational view in section taken substantially along the line 3—3 of FIGURE 2 looking in the direction of the arrows;

FIGURE 4 is a sectional view of an alternate construction of the water outlet fitting;

FIGURE 5 is a sectional view of another construction of the water outlet fitting; and

FIGURE 6 is a sectional view of an alternate construction of the water inlet fitting.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement

of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring to FIGURE 1, it will be seen that the invention is adapted for use in connection with a conventional toilet construction including a bowl 10 and flush tank 12 having a removable top 14. The liner 16 of the present invention is positioned within the tank 12.

Referring to FIGURE 2, it will be seen that the tank 12 has the usual side walls 18, 20 back walls 22, 24 and bottom wall 26. The liner 16 is positioned within the tank 12 and spaced from the side and back walls thereof by means of vertically extending elongated spacing elements 28, 30, 32, 34. One of the spacing elements is provided between the liner 16 and each of the tank walls 18, 20, 22, 24. Thus, the liner is spaced from the tank 12 to the end that an air space is created between the liner and tank which acts as an insulating medium to prevent heat transfer between the liner and tank. The spacing elements are preferably fabricated from a heat-insulating material such as rubber or plastic.

The liner 16 is an open-top box-like structure having upstanding end walls 36, 38, front and back walls 40, 42 and bottom wall 44. As is conventional, the water inlet to the liner 16 is controlled by a float-type valve 46 and the outlet from the tank is manually operated by valve structure 48.

Referring to FIGURE 3, it will be seen that the tank 12 is provided with a water inlet opening 50 and a water outlet opening 52 in the bottom wall 26. The outlet opening is suitably connected to the toilet bowl 10. A fitting 54 is provided in the inlet opening 50. A suitable conduit (not shown) is attached to the fitting 54 and is connected to a source of water. The fitting 54 comprises a tubular element 56 which extends through opening 50. The lower end of element 56 has external threads 58. A resilient sealing gasket 60 is provided in the opening 50 to make this joint water-tight. Upper and lower peripheral flanges 64, 66 are provided on element 56. The lower flange 66 abuts against the bottom wall 26 of the tank 12. A nut 68 is threadingly received on threads 58 to secure the fitting 54 in place and place the gasket 60 in compression. The upper flange 64 abuts against the bottom wall 44 of the liner 16.

The upper end of element 56 is internally threaded at 70. An inlet water conduit 72 having a threaded lower end 74 extends through opening 78 and is threadingly received in the upper end of element 56. A nut 76 is threadingly received on the conduit 72 and abuts against the upper surface of the liner bottom wall 44 to secure the conduit in place. An annular sealing gasket 80 is positioned in opening 78 and is placed in compression by nut 76 and flange 64.

A second fitting 82 is provided at the outlet opening 52. The fitting 82 has a tubular element 84 which extends through the opening 52 and an opening 86 in the bottom wall of the liner 16. Upper and lower annular flanges 88, 90 are provided on the element 84 to space the bottom walls 26, 44 of the tank and liner. The upper and lower ends 92, 94 of the element 84 are externally threaded and receive nuts 96, 98 to secure the fitting in place. The upper end 92 is provided with an internal valve seat 100 which receives valve element 102. The openings 52, 86 of the tank and liner are provided with annular sealing gaskets 104, 106 which are placed in compression by the nuts 96, 98 and flanges 88, 90 to make the joints water-tight.

A lateral projection 108 extends from the element 84

in the space between the tank and liner. The projection 108 terminates beneath an opening 110 in the bottom wall 44 of the liner. An internally threaded opening 112 is provided in registry with the opening 110 and threadingly receives the lower end of a conduit 114. The conduit 114 is an overflow conduit and controls the level of the water in the liner 16. A passageway 116 extends from the connection with the conduit 114 to communicate with the interior of element 84, thus permitting the overflow water to bypass the valve element 102 and empty into the toilet bowl.

A nut 118 is received on the conduit 114 interiorly of the liner to secure the conduit in place. The opening 110 is provided with an annular gasket 120 which is held in compression by nut 118 and surface 119 to make the joint water-tight.

A small downwardly inclined passageway 122 is provided in the element 84. The passageway 122 serves to permit water which drips from the liner 16 and collects on the bottom wall 26 of the tank to empty by gravity into the interior of tubular element 84 and then into the toilet bowl. It will be noted that the opening to the passageway 122 is slightly above the level of the upper surface of the bottom wall 26. This distance is substantially equal to the thickness of the flange 90. The provision of flange 90 is necessary in order to properly seal the opening 52. Consequently, a very shallow pool of water will be present on the bottom of the tank 12. The amount of water is very slight and does not collect to a harmful extent. The advantage of this construction resides in the fact that the fitting 82 may be installed without modifying the structure of the tank 12. This is desirable when converting tanks which have been already installed.

The structure is completed by a pair of spacing elements 124, 126 which extend between the front and back walls of the tank and liner and act to support the bottom wall 44 of the liner and maintain the liner and tank in spaced apart relationship. The spacing elements 124, 126 are preferably fabricated from a resilient heat-insulation material.

The structure of the present invention is relatively simple to install. The fittings 54, 82 are first inserted through the openings 50, 52 of the tank 12. The nuts 68, 98 may then be threaded to secure the fittings in place. The spacing elements 124, 126 are then placed on the bottom wall of the tank. The liner 16 is then placed in the tank, after which the conduits 72, 114 are threaded into the fittings. The nuts 76, 96, 118 are then threaded onto their respective elements. The spacing elements 28, 30, 32, 34 may be placed in position either before or after installation of the liner 16. The unit is then complete except for making the proper inlet and outlet connections to the fittings 54, 82 and installing the valve structures 46, 48.

FIGURE 4 illustrates another embodiment of the fitting structure for the water outlet. As will be noted, the fitting structure 128 comprises a tubular member 130 which extends through the openings 52, 86. A peripheral flange 132 is provided intermediate the ends of the member 130 and extends between the bottom walls 26, 44. A tank drain passageway 131 is provided in the flange 132. The lower end of the member 130 is externally threaded and receives a nut 134 which abuts against the lower surface of the bottom wall 26. A second tubular member 136 is received on the upper end of the member 130. The member 136 has a peripheral flange 138 which abuts against the upper surface of the liner bottom wall 44. An annular sealing element 140 is provided beneath the flange 138. The member 136 is secured in place by a plurality of screws 142 which extend through the flange 138 and liner wall 44 into threading engagement with openings in the flange 132 of the member 130. A valve seat 144 is provided on the upper end of the member 136 to receive the valve element 102.

The member 136 is provided with a laterally extending tubular projection 146. The projection 146 has an internally threaded opening 148 which threadingly receives the overflow conduit 114. The structure is completed by an annular sealing element 150 which is positioned in compression in the opening 52 between the nut 134 and flange 132.

A third embodiment of a fitting structure 152 for the water outlet is shown in FIGURE 5. The fitting structure 152 comprises a tubular element 154 which extends through the openings 52, 86. The element 154 has a peripheral flange 156 adjacent the upper end thereof and is externally threaded on its lower end. A nut 158 is threadingly received thereon to secure the structure in place. An annular sealing element 160 is positioned between the upper surface of bottom wall 44 and the flange 156 and a second sealing element 162 is provided in the opening 52 between the nut 158 and a spacer 164. The spacer 164 is an annular element received on the tubular member 154 and positioned between the walls 26, 44. An opening 166 is provided in the spacer 164 for drainage of water from the tank 12 through the element 154. A valve seat 168 is provided on the upper end of the element 154 to receive the valve element 102. A lateral tubular projection 170 extends from the upper end of the element 154 and is provided with a threaded opening 172 to receive the overflow conduit 114.

An alternate embodiment for the water inlet fitting is illustrated in FIGURE 6. The fitting structure 174 comprises a tubular element 176 which extends through the openings 50, 78. The tubular element 176 is provided with a peripheral flange 178 adjacent the upper end thereof which abuts against the upper surface of the liner wall 44. The lower end of the element 176 is threaded and receives a nut 180 which secures the fitting assembly in place. An annular spacer 182 is received on the tubular element 176 and positioned between the walls 26, 44. Annular sealing elements 184, 186 are positioned in the openings 50, 78 and placed in compression by the flange 178, nut 180 and spacer 182. The upper end of the element 176 is internally threaded and threadingly receives the inlet conduit 72.

Having thus described my invention, I claim:

1. In a dripless toilet flush tank construction including a tank having upstanding front, back, side and bottom walls, the tank bottom wall having a water inlet opening and a water outlet opening, a liner received in the tank, said liner having upstanding front, back, side and bottom walls, means spacing the liner walls from the respective tank walls, said liner bottom wall having a water inlet opening and a water outlet opening, a tubular fitting structure extending through the water outlet opening of the tank and liner, a tubular projection extending laterally from said fitting structure and in communication with the interior thereof, said fitting structure having a tank drain opening therethrough between the bottom walls of the tank and liner, said opening being positioned slightly above the upper surface of the tank bottom wall for the flow of water from the interior of the tank into the second fitting structure,

the improvement comprising an inlet tubular fitting having a tubular element extending through the inlet opening of the tank, said tubular element having an enlarged portion extending between the bottom walls of the tank and liner and overlapping the inlet openings, a portion of the tubular element extending out of the tank and being externally threaded, a first nut received on said threaded portion to secure the tubular element to the tank bottom wall and overlapping the tank inlet opening, said tubular element being internally threaded at its upper end, an upstanding water inlet conduit extending to the upper portions of the liner, the lower end of said inlet conduit being externally threaded and extending through the liner

inlet opening into threaded engagement with said tubular element, and a pair of annular resilient sealing elements, one of said elements being positioned in the inlet opening of the liner and the other of said sealing elements being positioned in the inlet opening of the tank, said resilient sealing elements being in compression to seal the water inlet openings.

2. In a dripless toilet flush tank construction including a tank having upstanding front, back, side and bottom walls, the tank bottom wall having a water inlet opening and a water outlet opening, a liner received in the tank, said liner having upstanding front, back, side and bottom walls, means spacing the liner walls from the respective tank walls, said liner bottom wall having a water inlet opening and a water outlet opening, a tubular fitting structure extending through the water outlet opening of the tank and liner, a tubular projection extending laterally from said fitting structure and in communication with the interior thereof, said fitting structure having a tank drain opening therethrough between the bottom walls of the tank and liner, said opening being positioned slightly above the upper surface of the tank bottom wall for the flow of water from the interior of the tank into the second fitting structure,

the improvement comprising an inlet fitting structure including a tubular portion extending through the inlet openings of the tank and liner bottom walls, an

enlarged portion on said tubular portion abutting against the upper surface of the liner bottom wall and overlapping the liner inlet opening, the lower end of said tubular portion being externally threaded, a nut received on said threaded portion and abutting against the lower surface of the tank bottom wall, said nut overlapping the tank inlet opening, an annular member received on the tubular portion between the tank and liner bottom walls, said annular member overlapping said inlet openings, the upper end of said tubular portion being internally threaded, an upstanding water inlet conduit extending to the upper portion of the liner, the lower end of said conduit being externally threaded and threadingly received in said internally threaded portion of the tubular member, and a sealing element provided in each of the tank inlet opening and liner inlet opening.

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