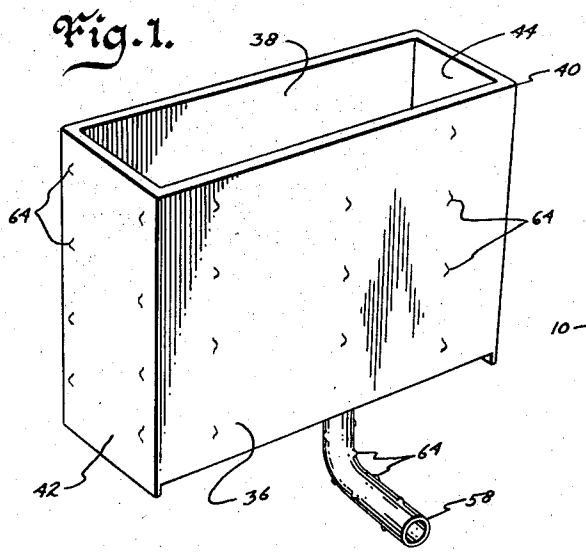
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WATER CLOSET TANK LINER

Filed Nov. 12, 1957

Fig. 1.



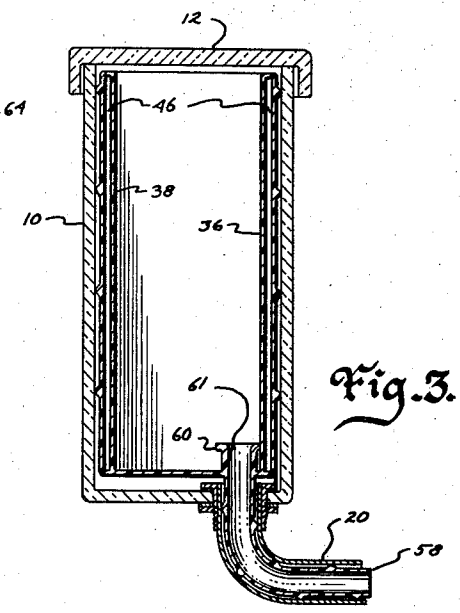
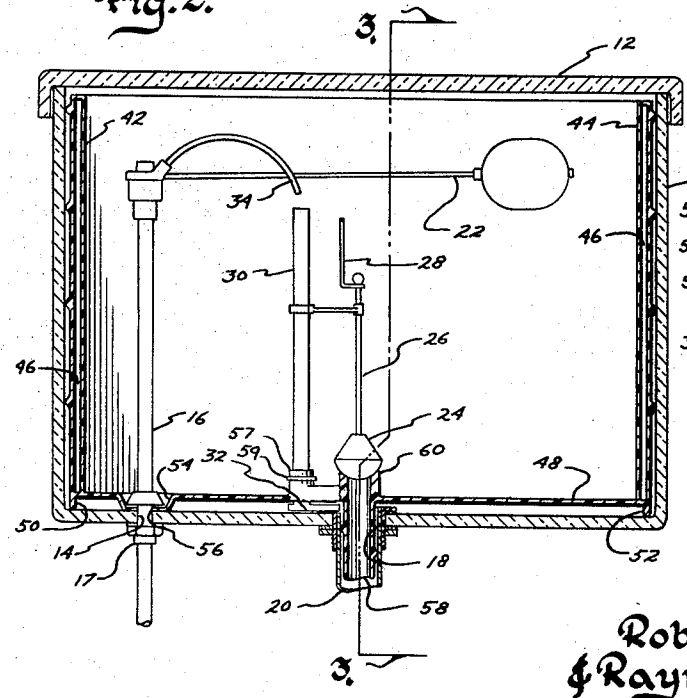


Fig. 3.

Fig. 2.



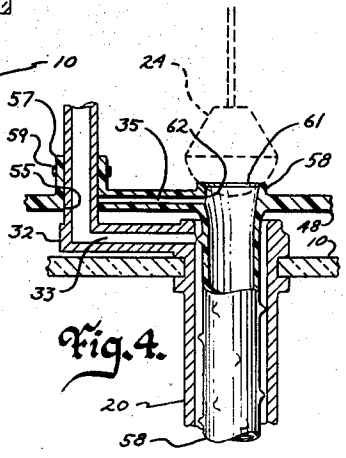


Fig. 4.

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WATER CLOSET TANK LINER

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5 Claims. (Cl. 4—18)

The water storage tank of a conventional water closet presents a great problem to the housewife. Difference in temperature between the water in the tank and air surrounding the tank often causes condensation of moisture on the outside surface of the tank. As this moisture accumulates on the tank, it drips to the floor surface below which has an obvious adverse result.

Therefore, the principal object of our invention is to provide a water closet tank liner that will insulate the water from the tank and thus prevent the temperature differential between water and air from resulting in condensation of moisture on the outside surface of the tank.

A further object of our invention is to provide a water closet tank liner than can be easily installed in a conventional water closet tank, regardless of whether or not the tank overflow unit is present.

A still further object of our invention is to provide a water closet tank liner that is economical of manufacture, durable in use and refined in appearance.

These and other objects will be apparent to those skilled in the art.

Our invention consists in the construction, arrangements, and combination, of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in our claims, and illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of our device showing the flexible tube at the bottom of the tank liner in a bent position;

Fig. 2 is a sectional view of our device installed in a conventional water closet tank;

Fig. 3 is a sectional view of our device taken on line 3—3 of Fig. 2; and

Fig. 4 is a partial sectional view of the outlet portion of our device shown in Fig. 2 but drawn to a larger scale.

We have used the numeral 10 to generally designate a porcelain water closet tank having a lid 12. The bottom of the tank has an opening 14 which is adapted to receive water inlet pipe 16. A conventional sealing system 17 comprised of washer, nuts and gaskets, is shown about opening 14 and pipe 16 but this exact structure does not comprise a part of our invention.

Tank 10 has a second opening 18 in its bottom which receives conventional flush or outlet pipe 20. Other conventional parts of a water closet are shown in Fig. 3. The numeral 22 designates a float mechanism which is operatively secured to sealing ball 24 by stems 26 and 28. Overflow pipe 30 is secured to hollow bracket 32 in conventional fashion and hollow stem 34 is secured to the top of inlet pipe 16 and terminates directly over overflow pipe 30. A partial sectional view of bracket 32 is shown in Fig. 4 revealing a passageway 33 therein. The parts thus far discussed do not comprise a part of our invention and the details of their operation and structure will not be mentioned further except as they directly relate to our invention.

The numerals 36 and 38 designate opposite hollow

side walls of our tank liner 40. End walls 42 and 44 are similar in construction to side walls 36 and 38 and all the walls have a dead air space 46 therein. The numeral 48 designates the bottom of our tank liner, which is preferably made of plastic material, and leg protrusions 50 and 52 can extend downwardly from the ends of the bottom. A depression 54 is located in the bottom 48 and has an opening 56 which is adapted to register with opening 14 in tank 10. An opening 55 in bottom 48 is surrounded by an inwardly extending flexible flange 57 which is adapted to receive a pipe member such as overflow pipe 30. A wire or band 59 can be used to tighten flange 57 about a pipe extending therethrough. A flexible tube 58 passes through the bottom 48 of liner 40 and is positioned so that it can coincide with pipe 20 in tank 10. Tube 58 is smaller in cross section than pipe 20 but the outside diameter of the upper end of the tube is substantially equal to the diameter of pipe 20. The upper end of tube 58 extends into the interior of tank liner 40 and terminates in a shoulder 60 which has a flared circular shaped portion 61 on its inside surface. An opening 62 is located in tube 58 at a point just below shoulder 60 just inside tank liner 40. Opening 62 is adapted to register with the passageway 35 in bottom 48 to communicate with opening 55. A plurality of protrusions 64 are distributed over the outside surface of the walls of the tank liner 40 and tube 58.

The normal operation of our device is as follows: The inlet pipe 16, hollow stem 34 and float assembly 22 are conventionally removed from tank 10 by actuating sealing system 17. The tank liner 40 is then inserted into tank 10. Tube 58 is directed down into pipe 20 and depression 54 and opening 56 in the bottom of liner 40 are positioned to register with opening 14 in tank 10. Overflow pipe 30 is permitted to pass through opening 55 and flange 57 on liner bottom 48. Sealing system 17 can then be actuated to replace inlet pipe 16, and as shown in Fig. 2, depressed portion 54 becomes an integral part of the seal. Band 59 can then be tightened to create a watertight seal about overflow pipe 30.

If an overflow pipe 30 and bracket 32 are not already mounted in the tank 10, as would possibly be the case in a tank during manufacture, a closed bottom pipe having an opening capable of registering with passageway 35 could be substituted for overflow pipe 30. This closed bottom pipe and passageway 35 could then perform the very same function performed by overflow pipe 30 and passageway 33 in bracket 32. The great utility of passageway 35 in the bottom 48 of our tank liner enables our tank liner to be adapted for use in tanks 10 whether or not the conventional structural of overflow pipe 30 and bracket 32 are present.

After having been so installed in tank 10, our tank liner 40 is ready for use. The leg protrusions 50 and 52 keep the liner 40 away from the bottom of the tank and protrusions 64 keep the walls of the tank liner from engaging the walls of the tank 10. Similarly, the protrusions 64 on tube 58 keep the outside surface of the tube from engaging the inside of pipe 20. The spaced apart relation of the outside of the tank liner 40 from the inside surface of tank 10 and pipe 20 reduces heat transfer between the liner 40 and tank 10. The dead air space 46 in the walls of liner 40 further act as insulation to prevent this heat transfer. Obviously, the reduction of heat transfer between the water inside the tank liner and the walls of the tank 10 will pervent the temperature of tank 10 from being reduced so that moisture will condense thereon. The flared circular portion 61 on the upper end of tube 58 will permit ball seal 24 to seal off pipe 20 and tube 58 from the interior of the tank liner whenever the ball rests on the tube. Over-

flow pipe 30, bracket 32 and passageway 33 will permit any water entering the pipe to by-pass the ball seal 24 in conventional fashion. If a closed bottom pipe is used in place of overflow pipe 30 which can communicate with passageway 35 in the liner bottom 48, the overflow characteristics of the above conventional unit will be retained. The flexible qualities of tube 58 facilitate the installation of our liner in tanks having different shaped outlet pipes.

Thus, it can be seen that our invention accomplishes at least all its stated objectives.

Some changes may be made in the construction and arrangement of our Water Closet Tank Liner without departing from the real spirit and purpose of our invention, and it is our intention to cover by our claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

We claim:

1. In a water closet tank liner, a container comprised of two opposite end walls, two opposite side walls, and a bottom; the bottom of said container having a first opening, a tube secured to the bottom of said container about said opening and extending outwardly therefrom, a second opening extending completely through the bottom of said container, an upwardly extending flange around said second opening and a passageway in the bottom of said container connecting the interior of said flange with the interior of said tube.

2. In a water closet tank liner, a container comprised of two opposite end walls, two opposite side walls, and a bottom; the bottom of said container having a first opening, a tube secured to the bottom of said container about said opening and extending outwardly therefrom, a second opening extending completely through the bottom of said container, an upwardly extending flange around said second opening and a passageway in the bottom of said container connecting the interior of said flange with the interior of said tube; said end walls and said side walls having heat transfer resisting qualities.

3. In a water closet tank liner, a container comprised of two opposite end walls, two opposite side walls, and a bottom; the bottom of said container having a first opening, a tube secured to the bottom of said container about said opening and extending outwardly therefrom, a plurality of protrusions on the outside surface of said tube and said container, a second opening extending completely through the bottom of said container, an upwardly extending flange around said second opening and a passageway in the bottom of said container connecting the interior of said flange with the interior of said tube; said end walls and said side walls having heat transfer resisting qualities.

4. In a water closet tank liner, a container comprised of two opposite end walls, two opposite side walls, and a bottom; the bottom of said container having a first opening, a flexible tube secured to the bottom of said container about said opening and extending outwardly therefrom, a second opening extending completely through the bottom of said container, an upwardly extending flange around said second opening and a passageway in the bottom of said container connecting the interior of said flange with the interior of said tube.

5. In a water closet tank liner, a container comprised of two opposite end walls, two opposite side walls, and a bottom; the bottom of said container having a first opening, a tube secured to the bottom of said container about said opening and extending outwardly therefrom, a second opening extending completely through the bottom of said container, and a passageway in the bottom of said container connecting the interior of said second opening with the interior of said tube.

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