OIL BASED DISINFECTANT (OBD)

Technical Field

Embodiments described herein generally relates to an oil based disinfectant for toilet urinal or sanitary fitting in whatsoever form either liquid or solid or semi solid state or powder form to be used in sanitary fittings and urinals.

Background

Much effort had been invested to make the toilet more environmentally friendly. One source of odor is from urine. Urine is an aqueous solution of greater than 95% water, with a minimum of these remaining constituents, such as:

- Urea 9.3 g/L
- Chloride 1.87 g/L
- Sodium 1.17 g/L
- Potassium 0.75 g/L
- Creatinine 0.67 g/L
- Other dissolved ions, inorganic and organic compounds (proteins, hormones, metabolites)

Urine when expose to atmospheric environment is a source of odour. Traditional detergent / disinfectant used are generally soluble chemical. It provides cleansing effect and fragrance to mask the odour for a short time. After disinfecting / cleaning the sanitary fitting, the detergent / disinfectant will be flushed and drained off with water during the flushing / washing process.

In some countries like Singapore, under the prevailing plumbing code, sanitary fittings are required to have a liquid seal to prevent the transmission of viruses via the sewerage system. This was highlighted in the SARS episode in Y2003 where it was concluded in the findings that the viruses enter the environment via the sewerage system. Hence, the liquid seal will prevent the transmission of the viruses and insects into the toilet **(see Figure 1 for illustration)**

Besides having the same characteristic of the soluble detergent / disinfectant such as the cleaning / disinfectant capability, emitting various fragrance and having different colours of the product, Oil Based Disinfectant (OBD) had the following advantageous:

1. It has a **non-harmful to human oil component** in its ingredient that enables it to stays afloat to form an oil based barrier above the liquid seal in the S or P traps or cartridges in urinal (also see drawing A for illustration).

2. It has a chemical composition in its ingredient that will **minimise or neutralize the constituents** that cause odour in the urine such as ammonia, urea etc

3. It has a specific density of less than water at **0.98g/ml or less** at 4.0° Celsius

that enables it to stay afloat to form an oil based barrier above the contaminated water / urine (the liquid seal) that prevents the lethal gaseous from entering the toilet.

4. Since it is oil based, not easily soluble and washed away during the flushing / washing process. The fragrance and it effects will stay longer on the sanitary fitting than conventional soluble disinfectant / detergent etc.

5. It has a chemical composition in its ingredient that will have a chemically react with urine to emit a fragrance or pleasing smell

6. It is applied or to be used in sanitary fittings especially on conventional urinals to convert / transform them into waterless / water free urinal without any modification to the system or changing the urinal hardware.

Summary

Embodiments of the invention provide an Oil Based Disinfectant / Detergent (oil film / barrier to be formed and stays afloat the liquid seal) for sanitary fittings especially for, but not limited to, urinal in male toilet.

In one embodiment, it has a unique characteristic that it is **oil based disinfectant** instead of conventional soluble chemical as disinfectant.

In one embodiment, it has an **oil component that is non-harmful to human or flammable** in its ingredient that enables it to stays afloat to form an oil based barrier above the liquid seal in the S or P traps or cartridges in urinal

In one embodiment, it has chemical composition that will **minimise or neutralize the constituents** that cause odour in the urine such as ammonia, urea etc.

In one embodiment, it has a specific density of less than water at **0.98g/ml or less / lower** at 4.0° Celsius that enables it to stays above the contaminated water / urine to form the oil based barrier above the liquid seal that prevents the lethal gaseous from entering the toilet.

In one embodiment, since it is oil based, not easily soluble and washed away during the flushing / washing process, the fragrance and it effects has a more lasting capability / will stay longer on the sanitary fitting than conventional soluble disinfectant / detergent etc.

In one embodiment, it has a chemical composition in its ingredient that will have a chemical reaction with urine to emit a fragrance or pleasing smell

In one embodiment, it is applied or to be used in sanitary fittings to form an oil based film / barrier to promotes better toilet hygiene and environment by preventing the odour and insects from entering the toilet via the sanitary fittings.

In one embodiment, it has the capability to convert conventional urinals into waterless / water free urinal without any modification required or changing the urinal hardware. This product enables and create greater flexibility for building owners to reduce the frequency of the flushing

process, its volume per flush or shut it off totally resulting in significant saving water consumption in their conventional urinals.

Brief Description Of The Drawing

Figure 1 illustrates:

- In a conventional urinal using soluble chemical as disinfectant, the disinfectant is used and rinse with water during the cleaning / flushing process. It will flow into the discharge area and mix with the existing liquid seal in the sanitary trap.

- In subsequent flushing / cleaning process, the excessive liquid in the trap will be drained off into the sewerage system.

- Meanwhile, when someone uses the urinal, the urine mixed with the existing liquid seal (in the sanitary fitting) will have a chemical reaction and emitting an odour which is not environmentally friendly.

- By using the oil based disinfectant / detergent (OBD), it will form an oil film / barrier on the urinal wall. Since it will stay longer on the urinal wall (as compared to soluble disinfectant chemical), hence its fragrance will have a more lasting effect.

- When sprayed on the sanitary fitting such as the urinal, some OBD will stay on the urinal wall while the “excess OBD” will flow into the discharge area and stays afloat (because it has a specific density less than water) to form an oil based film or barrier above the liquid seal which is contaminated water and urine. While the chemical reaction of water and urine will emit an odour, the oil based film / barrier will suppress / contain the odour in the sanitary fitting and prevents it from entering the toilet and makes it environmentally more pleasing.

- The film or barrier formed by the oil based disinfectant will be depleted during the cleaning / flushing process & usage. However, regular usage of oil based disinfectant during the cleaning process will also replenish and restore the oil film / barrier above the liquid seal.

- Climate change had resulted in many regions derived of precious water. Regions that were once rich with water resources are experiencing unprecedented drought & high temperature that threatens human lives, animals and livestock and are facing struggles in quest for survival. Urine is 95% water. Why used precious water to flush away water when it can be deployed to better usage and save lives! By using OBD, conventional urinal can be converted into waterless / water free urinal without having to change the system (hardware) or any modification required. The resulted in substantial saving for building owners on retrofitting cost.

- OBD also doesn’t not require any mind-set change in user behaviour when user visits the toilet. Its usage is not obvious to end users but they will enjoy a better toilet environment.

- To building owners, the saving in resources in terms of retrofitting cost and adopting a greener & sustainable environment approach in facilities management, are substantial. A simple change in the disinfectant agent used will achieve the desirable results.

- With less sewerage treatment required (less the amount of water required for flushing), it will also contribute to reduction in the carbon footprint and reduce the damage to our environment.

- It projects a good image for building owners to adopt a green and sustainable approach to facilities management by using a green product.

Claims

Oil Based Disinfectant (OBD) has the following characteristics:

1. It has a **non-harmful to human oil component** in its ingredient that enables it to stays afloat to form the liquid seal in the S or P traps or cartridges in urinal (also see Figure 1 for illustration).

2. It has a chemical that will minimise or **neutralize the constituents** that cause odour in the urine such as ammonia, urea etc

3. It has a specific density of less than water at **0.98g/ml or less** at 4.0° Celsius that enables it to stays above the contaminated water / urine to form the liquid seal that prevents the lethal gaseous from entering the toilet.

4. Since it is oil based, not easily soluble and washed away during the flushing / washing process, the fragrance and it effects will stay longer on the sanitary fitting than conventional soluble disinfectant / detergent etc.

5. It has a chemical composition in its ingredient that will have a chemical reaction with urine to emit a fragrance or pleasing smell

6. It is applied or to be used in sanitary fitting especially urinal either the conventional or the waterfree / waterless type.

7. It has the capability to convert conventional urinals into waterless / waterfree urinal without any modification required or changing the urinal hardware. This product enables and create greater flexibility for building owners to reduce the frequency of the flushing process, its volume per flush or shut it off totally resulting in significant saving water consumption in their conventional urinals.

8. It has a chemical composition in its ingredient that will have a chemical reaction with urine to emit a fragrance or pleasing smell