

Invention Title: **Waterless Toilet Flushing System**

Abstract: The waterless toilet flushing system, an alternative to conventional water and vacuum-based flushing systems, features a toilet system comprising with a toilet, a solid seat and a lid each fitted with a soft rubber gasket at its bottom, a slam-to-close and push-to-open latch fitted on the lid to close pressure-tightly, a compressed air system, a refill water system, and a control and sensor system including a display to interact with the user. Flushing will be performed via the compressed air system, injecting compressed air into the pressure-tight toilet bowl to flush waste into the sewage system. Through the refill water system, the trapway will be sealed back with water immediately after air flushing, which is required to form a barrier to prevent sewer gas from entering the toilet from the main pipe. This system will work as a standalone unit for a new single toilet, as part of a centralized system for multiple new toilets, interact with a building automation system, and communicate with a wireless network. This system can also be used in existing toilets, with modifications to the toilet seat, lid, and flushing system, including the addition of pneumatic air system.

Figure 5