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**INTEGRATING SCIENCE, TECHNOLOGY,
AND
SOCIAL INNOVATION
FOR SUSTAINABLE DEVELOPMENT GOALS**



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YSS008 - PORTABLE SMART SINK

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ABSTRACT

The *Portable Smart Sink* is an innovative solution designed to redefine hygiene and cleanliness for outdoor enthusiasts, particularly campers and adventure seekers. One of the major challenges in outdoor activities is accessing a reliable source of clean water for hygiene purposes. Addressing this, our lightweight, foldable smart sink offers unparalleled portability and functionality, doubling as a cutting board for food preparation. Equipped with a spacious water supply bag, a wastewater collection system, and an advanced multi-stage water filtration unit, the Portable Smart Sink ensures safe, clean water in areas without plumbing. A durable carry bag ensures convenient storage and transportation, making it practical for use in remote environments. Unlike conventional sinks, its foldable design allows swift assembly anywhere, while its self-contained water system eliminates dependency on external water sources. This user-focused innovation not only meets the needs of campers but also supports broader sustainability goals by reducing plastic waste and promoting hygiene in underserved areas. Through iterative design and rigorous testing, the Portable Smart Sink emerges as a reliable, efficient, and environmentally conscious companion for anyone on the go.

Keywords: *Portable Smart Sink, Hygiene, Outdoor Activities, Water Filtration, Camping*

INTRODUCTION

The Portable Smart Sink represents a groundbreaking step in mobile hygiene solutions, specifically engineered for outdoor and remote settings. In addition to catering to camping and recreational needs, it also addresses hygiene requirements for event organizers, food vendors, and emergency responders. By providing instant access to clean water anywhere, it tackles the dual challenges of personal hygiene and environmental protection, especially in areas lacking adequate facilities.

OBJECTIVE

The objective is to promote hygiene and cleanliness by providing a portable and convenient handwashing solution suitable for diverse environments.

DESCRIPTION OF THE PROJECT

The folding, lightweight sink is an innovative portable hygiene solution designed to provide convenient handwashing, cleaning, and sanitation in locations without access to permanent plumbing. Its most distinctive feature is exceptional mobility, achieved through a foldable frame and compact structure that enable effortless transport, storage, and setup. Constructed from lightweight yet durable materials, the unit weighs only a few kilograms, ensuring that a single individual can carry and assemble it with ease.

The sink incorporates a self-contained water system consisting of two detachable tanks: a clean water reservoir for storing fresh water and a wastewater tank for collecting used water. This system enables users to maintain proper hygiene standards while preventing environmental contamination. The sleek, space-saving design allows the entire unit to be packed into a compact carrying bag, making it highly practical for temporary sites, outdoor events, educational institutions, food service operations, healthcare facilities, construction areas, and emergency response zones.

From a technological standpoint, the portable sink merges compact engineering design with user-centred functionality. The collapsible frame folds flat when not in use, while the basin design crafted from high-strength, easy-to-clean materials such as aluminium or reinforced plastic used offers long-term durability. Operation is straightforward when a user's simply fill the clean water tank, perform handwashing or cleaning tasks, and allow the wastewater to be collected in the second tank for safe disposal. Once the task is completed, the sink can be folded into its storage configuration within minutes. The sink features a water dispenser with a slow sand filter that delivers clean, safe, and great-tasting water anywhere. This eco-friendly system requires no electricity or chemicals, making it both sustainable and cost-effective. It also includes a dual tank system includes one tank stores filtered clean water while the other collects wastewater for easy disposal.

This integration of portability, rapid deployment, and self-contained water management positions the folding, lightweight sink as a pioneering solution for maintaining hygiene in remote, temporary, or mobile environments. Its adaptability, cost-effectiveness, and ability to promote better hygiene habits underscore its relevance to diverse sectors and its potential contribution to sustainable public health practices.

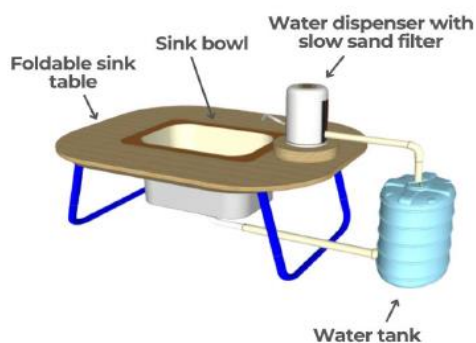


Figure 1: Prototype Product

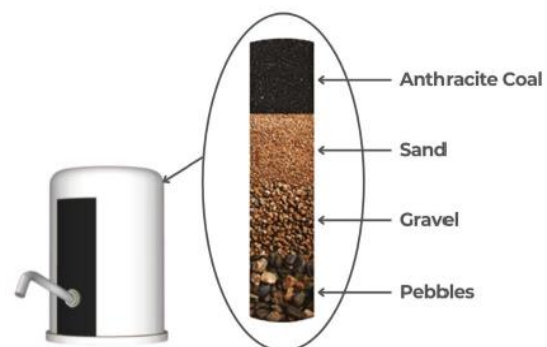


Figure 2: Inner multi-stage water filtration

NOVELTY

The portable smart sink was designed with various uniqueness to be offered to the customer. One of the unique features of the device was its folding design and lightweight, portable construction. When it comes to camping activities, campers usually look for an easy-to-carry gears so that they can carry it effortlessly throughout the activities and at the same time can be packed more quickly. This product can be the solution for the demand as it is ideal to use for temporary and remote locations where mobility is the priority. Other than that, the portable sink has a self-contained water system compared to other product. This feature is very useful when there is a situation where there were no sources of clean water around, for example in the flood area. The other uniqueness of this product was this product promotes hygiene in everywhere. Not like some others portable sink product, it ensures the customer's hygiene as it can be used indoor and outdoor area. Therefore, there no excuses for the customer to not stay hygienic as it can be used anywhere especially when they are having an outdoor activity.

CONCLUSION

The Portable Smart Sink stands as a market-ready innovation combining functionality, safety, and sustainability. Its development process, from conceptual design to feasibility testing, ensures a product that meets both technical and commercial expectations. With a clear commercialization plan covering marketing, distribution, and after-sales support, the Portable Smart Sink is poised to revolutionize portable hygiene for outdoor lovers, event planners, and humanitarian aid providers.

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