Interparticle Water Cleaning Machine

An Original Innovation Concept by Ishan Jain

Introduction

My name is Ishan Jain and I study at Modern School, Vasant Vihar. This project is based on my own original idea about cleaning water at a microscopic level using different scientific principles that I have studied and observed.

Today, plastic pollution has become one of the biggest problems in the world. Plastic bottles are one of the most common ways through which water is stored and distributed globally. Scientists have already discovered nanoplastics inside the human body, and this issue is becoming more serious every year.

While thinking about this problem, I noticed something interesting. Water stored in a silver vessel is traditionally considered healthier and purer compared to water stored in plastic bottles. This made me think deeply about what changes inside water when it moves from one material to another.

My idea is based on the concept of interparticle water cleaning. The machine is designed to clean water internally by working on the movement, separation, and purification of particles present inside the water.

This is not a large industrial setup. It is meant to be a small-scale portable concept that can eventually be developed into a smart purification device.

Core Scientific Principles

The machine uses five main scientific concepts:

- *Interparticle spaces*
- *Kinetic energy*
- *Filtration*
- *Coefficient of viscosity*
- *pH scale*

These concepts work together to help identify and remove harmful impurities and nanoplastic particles from water.

The Main Idea Behind the Machine

The design of my machine is simple but advanced in concept. The device would be shaped like a thick smart straw or funnel-shaped purifier.

When placed inside water, the machine would first check the pH level of the water through a sensor at the bottom. The pH level would then be displayed on the neck of the machine.

If the water is not safe, the cleaning process would automatically begin.

Stage 1 – Coefficient of Viscosity and Water Rotation

The first stage of the machine is based on the coefficient of viscosity and interparticle movement.

Inside the machine, water would spin at a very high speed. Since water particles pull and move with one another, this spinning motion would create rapid circulation inside the chamber.

The idea is that through controlled spinning and churning, unwanted particles and impurities can begin separating from the cleaner water.

Stage 2 – Kinetic Energy Principle

The second stage is based on kinetic energy.

In 9th grade chemistry, I learned that particle movement changes according to temperature. Using this concept, the machine would slightly heat the water in a controlled environment.

The purpose of this stage is to reduce kinetic instability and allow harmful particles and nanoplastics to separate more effectively from the cleaner water.

As the water spins and heats, the heavier dirt particles and nanoplastics would move outward and collect into a separate waste chamber.

Stage 3 – Particle Grouping and Settling

After the spinning process, special salts or binding substances would be used to group the dirt particles together.

This process would help the impurities settle down more easily instead of remaining suspended inside the water.

The settled waste and contaminants would collect in the lower chamber of the device, where the user could physically see how much dirt and nanoplastic waste had been removed.

Stage 4 – Multi-Tube Filtration

Once the larger and grouped particles are separated, the water would pass through multiple thin filtration tubes inside the machine.

This final stage would help clean the remaining impurities before the water becomes ready for consumption.

Final Safety Check

After filtration, the machine would once again check the pH level of the water.

If the water reaches the safe drinking range, the display would show that the water is fit to drink.

If the water is still unsafe, the purification cycle would continue automatically until the water becomes cleaner and safer.

What Makes This Idea Different

Most portable water filters focus only on basic filtration using membranes or cartridges. My idea combines multiple scientific principles together in one compact system.

The machine does not only filter water but also:

- *Detects pH changes*
- *Uses spinning and viscosity principles*
- *Applies kinetic energy concepts*
- *Separates dirt into a visible waste chamber*
- *Rechecks water quality automatically*

Another important aspect of this concept is transparency. Users would actually be able to see the collected dirt and particles at the bottom chamber, making the purification process more understandable and trustworthy.

Future Vision

Right now, this is an original innovation idea and conceptual prototype.

In the future, I would like to:

- *Build a working small-scale prototype*
- *Test the machine on different water samples*
- *Improve the purification efficiency*
- *Explore scientific validation of the process*
- *Apply for patent protection for the concept*

I believe that future water purification systems should become smarter, more portable, and more transparent for users.

> *Another inspiration behind this concept was the machine "Tethys" created by Gitanjali Rao, a young innovator who developed a smart device to detect lead contamination in water using sensors and technology. Her invention showed how compact scientific devices can help solve real-world water problems. Similarly, my machine will also include a sensor system at the bottom to detect the pH level and contamination level of water before and after purification. However, while Tethys mainly focused on contamination detection, my concept focuses on both detection and the purification process together in one compact interparticle water-cleaning system.*

Conclusion

The Interparticle Water Cleaning Machine is my attempt to think differently about water purification by combining concepts from chemistry, particle movement, viscosity, filtration, and pH analysis.

The goal of this idea is not to create a large industrial machine but a compact and advanced smart purifier which is affordable and that can help people better understand and improve water quality.

This project reflects my interest in science, innovation, and solving real-world environmental problems using practical ideas.

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