cWater

A self desalinating water bottle, nicknamed cWater: a portable self-use water bottle that evaporates contaminated water into purified drinking water. On the market today, there exists reusable water bottles that allow the user to fill dirty, murky water into the holding chamber, and filter the water to remove unhealthy bacteria and agents that exist in the water. A product like this is excellent for hikers, who then do not have to lug around gallons of water, but instead can refill at a puddle or river without the risk of catching a disease. The problem is, hikers are not the largest market for clean water.

Poor nations, such as India and many countries within Africa, face a problem every day, that Americans consider a luxury: drinkable water. But what all of these nations do have in common is their access to some sort of water, whether it be waste contaminated or salt water from the surrounding oceans. Every day, Parents and children are forced to drink the contaminated water, resulting in the spreading of diseases as well as water related deaths amongst children. This is the market; a market place containing the whole world. Every day, whether we notice it or not, clean drinking water gets more and more scarce. But how is that possible, when 71 percent of the entire world is water? 97 percent of the world's water is ocean water, which is contaminated by salt, and the 3 percent remaining fresh water is dwindling, caused by industrial and waste contamination.

Companies already exist for the purpose of desalinating water, but a poor nation cannot afford a billion dollar facility to do that. Desalination techniques exist on the large scale, for companies figure the one way to make a difference is to take large steps. But the normal child who suffers from water related diseases is not on the large scale. That's what makes the desalinating water bottle so unique; it focuses on the small scale first. A water bottle is a personal item, while a company desalinating water is communal. When water is desalinated on a large scale, it is brought to a holding facility and then transported to certain locations where the demand is the highest. So what happens to the child who lives in the small scale town? With cWater, clean drinking water would be available at their fingertips, no matter their location. The cost to desalinate water in a facility is beyond expensive, for it requires an immense amount of outside energy to heat the water, to ensure the company produces enough drinkable water to distribute in bulk. cWater, serving only one, runs off solar energy, a free alternative, and provides for just one individual. If every child and individual in an African village had a water bottle, the mad dash to the small amount of drinkable water can be avoided on a daily basis, as clean water could be created specifically for the owner.

The design of the desalinating water bottle, cWater, is based around accessibility. cWater will consist of two chambers, a bottom chamber, which will contain the contaminated water, and a top, which will hold the purified drinking water. The only passage between the two chambers is through a semi-permeable membrane sack, which hangs from the top chamber. From the top chamber, there is an opening in the membrane, but from the bottom chamber, there

is no way into the top chamber, other than through the membrane. When contaminated water surrounds the membrane, the water will separate from the solute by osmosis, resulting in a sack filled with purified water. The user can use a small lever on the side to squeeze the water through a one way cap, into the top chamber, allowing the pure water to be utilized. Also by doing this, the membrane is left closer to empty, allowing for more water to diffuse across, for the concentration on the inside of the membrane is lower than that in the contaminated water. To speed up the osmosis process even more, the pressure within the bottom chamber will be lowered, with the use of a reverse air pump. A ball on the underside will fill up with air from the bottom chamber, and when the ball is squeezed, air is released from the chamber. The material used for the bottom half of the cWater will be a conductive material, perhaps metal, so that the water can be heated, making osmosis easier. Not only will the water be heated, but parabolic mirrors will fold down from the side, like wings, and direct a greater amount of sunlight onto the bottom chamber. The separation of the two chambers is vital because the user is able to drink from the purified source, while the contaminated water is still making progress on a new batch of drinking water. A filtration system for the purified water, similar to those in already existing water bottles, is not necessary, for evaporated water is cleared of all microorganisms and minerals.

To minimize the cost of the water bottle, the manufacturing would primarily take place in a factory setting, made in bulk. By doing this, the water bottle can be sold for the cheapest price possible, allowing poor citizens of third world nations to have access to the technology. A factor option could be explored to manufacture the product, or the licensing could be handed over to a corporation, which already has all the equipment necessary to build cWater. To market the product in locations that have access to clean water, such as America, an offer of buying one for yourself, and donate a free bottle to a child in poverty would be used. Shoe companies have already used this method, and have been successful in doing so. As an added bonus, this marketing method would allow the product to make its' way into Africa and India without personal startup money, once again reducing the overall cost of the product. Humanity charities would be asked to sponsor the product, to allow for free advertisement and credibility of the water bottle. Decreasing the total cost of the company, from prototype to marketing and selling allows the product to reach its goal of being sold for under ten dollars. The amount needed to start this company, including costs from research and design, manufacturing prototypes, patenting the design and idea, as well as distribution is estimated to cost under $100,000.

The overall goal of the water bottle is not for profit, but profit will surely be a byproduct, caused by the over demanding and growing market for clean water. Success will be determined on the number of lives saved by the use of the technology, rather than the money earned.

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