

Ecofriendly Liquid Regeneration From Train Operational Network

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I. INTRODUCTION

In today's present world, water has become an essential necessity for mankind. Water is literally the source of life on earth.

Approximately 70.8% of the earth's surface is covered with water mainly in the form of oceans. 2% of water are present as freshwater and under glaciers.

The abundance of water has made it scarce. Only water present in the glaciers are been able to be used by man. The rest is saline. So pure water is getting rarer.

Due to various environmental hazards, there has been a significant change in the climatic conditions at different areas of the planet.

Some climatic changes pose a greater threat to the respective area than we know it.



Fig a Local train

Many cases of significant drought has been reported across the globe. Based on these facts and severity of the crisis, people face water shortages in trains.

Most of the time water is collected in tanks and served in the local train (as shown in fig a) which runs out. Here in this paper, we bring an innovative method to counter this problem.

II. HONOR OF OUR OWN INTRODUCTION

This paper describes the way how water scarcity and crisis faced by travellers in train can be removed completely. The water gained from the process is drinkable and can be used for personal hygiene.

Maintenance of personal hygiene is an issue due to lack of water. This paper illustrates the intelligent way to make water from air. The people travelling in train need water in order to refresh and stay hygiene.

We collect air through the slots placed on top of the train roof. Since the train travels at a high speed the moisture containing air is driven right in to the slot. The slot is attached with a filter screen that is used to filter out other impurities like dust, insects..etc.



Fig b A dehumidifier

The slot leads to a dehumidifier (fig b) where the moisture is removed from the air by normal desiccant such as silica gel, lithium bromide or lithium chloride.

Hygrosopy is the phenomenon of attracting and holding water molecules from the surrounding environment, which is usually at normal or room temperature.

This is achieved through either absorption or adsorption with the absorbing or adsorbing substance becoming physically changed somewhat.

This could be an increase in volume, boiling point, viscosity, or other physical characteristic or property of the substance, as water molecules can become suspended between the substance's molecules in the process.

Hygroscopic substances include cellulose fibers (such as cotton and paper), sugar, caramel, honey, glycerol, ethanol, wood, methanol, sulfuric acid, many fertilizer chemicals, many salts (including sodium chloride), and a wide variety of other substances

The air is cooled by cooled metal plates placed in between the pathway. The metal plates cause the water to condense forming dew drops.

Since such large amount of air passes through the pathway water gets condensed in large amount.

This large amount of water is filtered using natural filtering method by passing it through different layers of marble, charcoal, pebble, sand, gravel and twigs (shown in fig c).

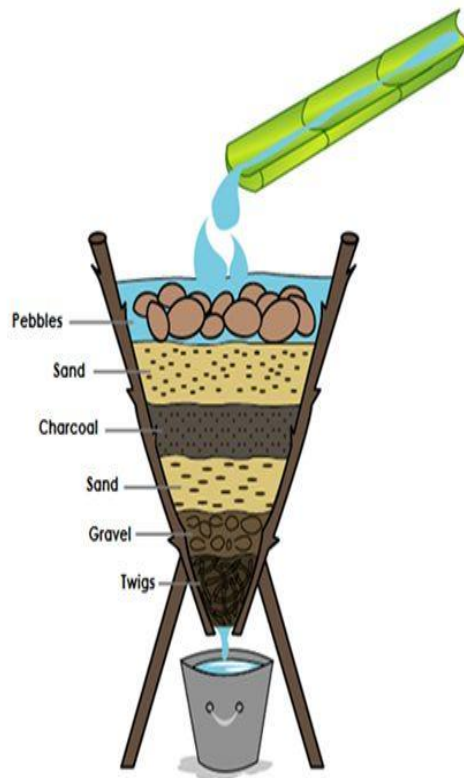


Fig c Natural Filter System

The rest of the dry air is allowed to pass through the other side of the cooled metal plates.

The condensed water is stored in the usual water storage tanks of the train(as shown in fig d &fig e) . This ensure steady flow of water without disrupting the flow of water.



Fig d Water Tank



Fig e Water storage



It is a four-step process

Step 1. Collecting air via slot on train

Collection of rich and vibrant natural green air from the surrounding through slots fixed on the top roof of the train.

Step 2. Absorbing moisture

The moisture present in the air is absorbed by silica gel, lithium chloride or lithium bromide which have water absorbing capabilities.

They take about 84% of moisture from the air.

Step 3. Filtering the absorbed water

The collected water is then filtered out via natural filtering agents like gravel, sand and pebbles. The water is allowed to pass through different layers of filters that ensure pure water.

Step 4. Storing water in tank and releasing dry air.

The filtered water is then allowed to be stored in the normal water storage tanks of the train to ensure steady supply of water.

IV. WHY WE MADE IT?

In present world as more and more industries are growing at high rate and manufacturing of automobiles are also the high.

The unburnt carbon particles and chemical smokes from manufacturing industries pollute the air so much that it makes it difficult for humans to breathe and causes drastic climatic changes that cause droughts in many parts of the world.

We ourselves faced shortage of water in our travel in local trains. We thought more about this problem

This questioned our insights, which we took a deep thinking a came over with this paper to solve the crisis and to bring a revolution.

V. ADVANTAGES

1. Reduce water shortage
2. Saves time
3. Steady supply of water
4. Very less cost
5. First of its kind
6. More purity
7. More personal hygiene
8. Easy to implement
9. Better alternative for industrial regeneration processes



This new technology of ours is capable of providing people with pure water and reduces shortage of water supply in trains. Save millions of lives.

An establishment of manufacturing plant for this technology can provide more job opportunities to many unemployed people.

This is one of its kind in Asia itself.

This new innovation will be revolutionary.

REFERENCES

- [1.] Electrical Engineering by Jain and Jain.
- [2.] Electrical machines by BL Theraja.
- [3.] www.electronic-tutorial.ws
- [4.] www.hindustantimes.com
- [5.] [india today.intoday.in](http://india.today.intoday.in)
- [6.] www.wikipedia.com
- [7.] science.howstuffworks.com
- [8.] www.treehugger.com