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BICYCLE MOUNTED WATER PURIFICATION UNIT DRIVEN BY HYBRID POWER SYSTEM

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Abstract — *Water is one of the prime requirements of any individual yet many people in the world residing in different area are facing the problem because of impure water. To treat the impure water, water purification system are available in the market but still the problems are associated with it i.e. Usage of electricity, fixed system, costly etc. To cope up with the above problem, we have designed the system which will treat the impure water by means of hybrid power system i.e. Water will be purified by means of pedaling system of bicycle and by utilization of solar panels. Also the system will be mobile. By utilizing the above technique, water can be purified in a desired quantity along with quality. Moreover the system will be cost effective.*

Keywords- *Bicycle Mounted; Water Purification Unit; Hybrid Powered; Portable*.

I. INTRODUCTION

The scope of water purification technologies and importance of safe and purified drinking water is increasing now-a-days. In context to the existing scope and to bring some modifications related to the same in future we are on the path of designing water purification system which will be operated by hybrid powered means i.e. pedaling system and utilization of solar panels. Adopting the above mentioned technique, we will have a provision of using the alternate source of energy as per our desire and also it will be helpful to us in case of emergency. Utilizing the above-mentioned technique, we will proceed with the step towards clean and green environment along with energy saving as we are not consuming electricity. Moreover the system will be cost effective and will require less maintenance.

II. PROBLEM DEFINITION

Though we have water purification technologies available with us, but still we need to focus much on cost effective and reliable means of water purification. Most of the technologies which are used in this field has some of the limitations associated with them and the same is required to be modified to make the system user free. Problems associated with the existing water purification are stated: Portability, Quality of purified water, Filtration techniques, Usage of energy, Affordability.

III. OBJECTIVE

- To develop mobile water purifier.
- To increase availability of distilled water at area where electricity is not accessible easily.
- To achieve contaminant free water for the public of rural area without serve up electricity.
- To get sublimate water at affordable value.

IV. MAIN WORK

Our most noticeable and eye catching work is to powered the system by hybrid means i.e. by pedaling and by utilization of solar panels. In case of solar panels, the charge that is generated by utilizing the solar energy will get store in the battery and hence the battery will be the source of providing the power to the RO pump through which water will be purified by

reverse osmosis and ultrafiltration technique. In case of other source i.e. Pedaling, the power will be transmitted from the rear wheel to the pump via belt and pulley mechanism and the pump will work as a mechanical pump instead of electricity operated pump giving the same pressure as earlier though it is operated by mechanical means. The above mentioned technique is worthy enough as one can purify the water in any one of the ways as per his/her desire.

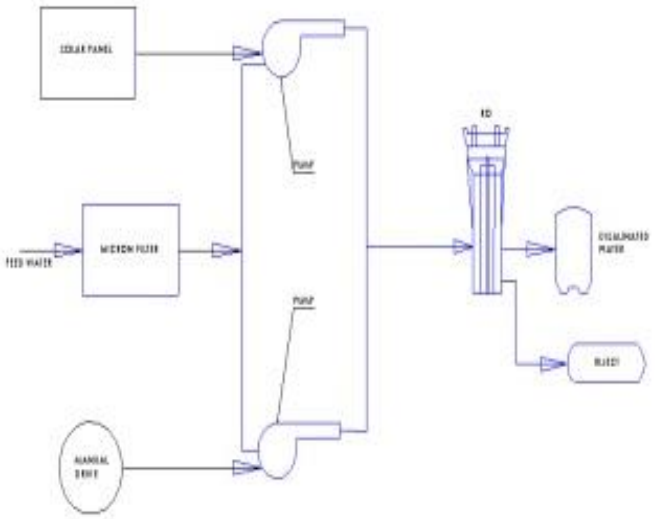

Fig.1 Two Dimensional Drawing of Water Purification Unit

V. COMPONENTS REQUIRED

SR. NO.	COMPONENTS	DESCRIPTION
1	BICYCLE	N.A.
2	SOLAR PANEL	40WATT
3	FILTERS	CARBON, MEMBRANE, SEDIMENT FILTER
4	PUMPS	24 VDC RO PUMP
5	WATER TANK	POLY-PROPYLINE WATER TANK
6	PULLEY	75MM, 200 MM ALUMINIUM
7	BELT	RUBBER

Table 1. Components

PULLEY	SIZE(MM)	RPM
LARGE PULLEY	200	300
SMALL PULLEY	75	800

Table 2. Dimensions of Pulley

VI. RESULT AND DISCUSSION

The unit can instantaneously convert raw water from any source to clean and purified drinking water. By incorporating the system and without any external manual work rather than daily work, one can easily purify 20-30 litres of water which is enough for the small family for the daily usage. The system will be able to remove toxicity, pathogens, turbidity and salinity (1000mg/1).water will be brought down to potable limits of the order of (>500mg/l).

Utilizing the above mentioned technique, we will be able to purify the water in a better way compared to the conventional methods of purifying the water. Moreover, we will also have a provision of using the alternate sources for transmission of power which will be an added advantage. We will be able to purify the water by utilization of renewable energy sources which will be a great step towards clean and green environment. Purifying the water by pedaling means will result into a dual advantage i.e. it will be sort of daily exercise while purifying the water and also the clean and healthy purified water will be obtained. People living in the rural area will get more advantage by adopting the system because though the system does not require electric supply but still will give a healthy purified water.

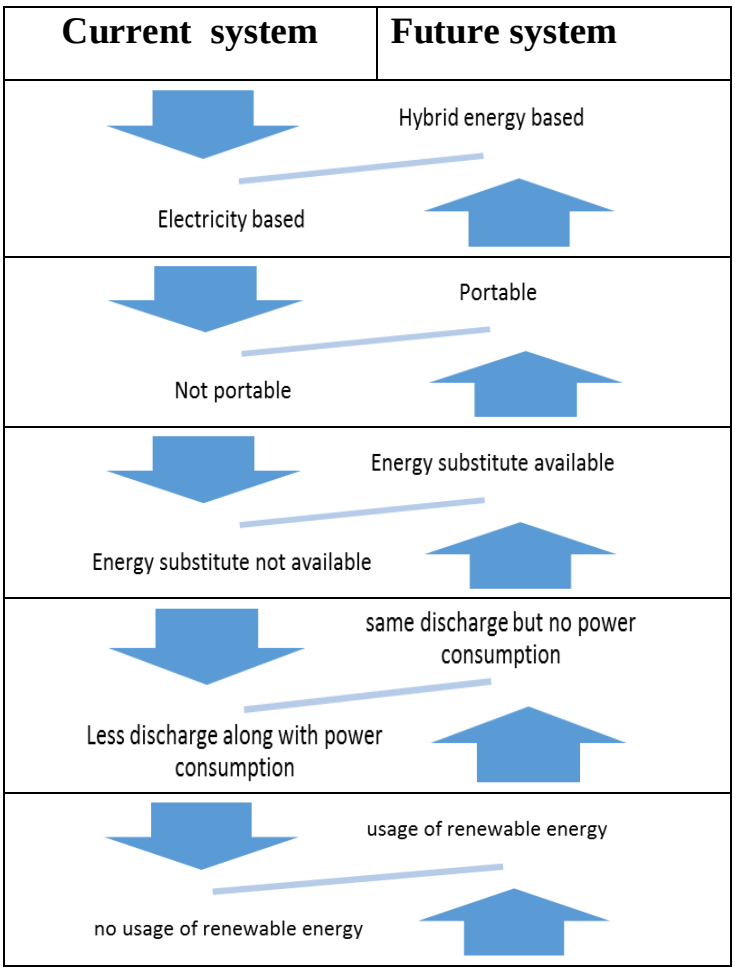

Fig.2 Comparison between conventional and hybrid system

VII. CONCLUSION

Conclusion after adopting hybrid powered source for purification of water are as stated:

- No need of electricity supply
- Safe and purified drinking water at reasonable cost Less maintenance
- One time investment
- Exercising means
- Step towards clean and green environment
- Compactness and light weight of the system

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