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WASTE MANAGEMENT IN TRAINS

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***Abstract*— A major flaw of the Indian Railway system is its waste management and handling. Because there is a lack of efficient waste collection process, soo the wastes are thrown all over the tracks, inside the trains and this practice is very un higenic and asore to the eye. We are in a dire need of an efficient waste management system intrains.**

***Keywords*—Indian Railway, Waste Management, Tracks**

I. INTRODUCTION

Every object that moves in a certain direction with force and speed displaces air in front of it while it continues in its motion. We will be using this idea to develop an efficient waste management system for our Indian Railways. The Indian trains are well known to be dirty and lacking clean liness as there are less availability of waste disposals andeven if there are a few they are most of the times over flown or the people are too lazy to go and put the waste in the bin. Due to this reason most of the times the wastes are either inside the train or people tend to through the mout of the window in case of a non-ac compartment. And tend to make even the railway tracks full of wastes.
The rest of the paper is organized as follows. Proposed System is explained in section II. Concluding remarks are given in section III.

II. PROPOSED SYSTEM

So when a train is moving with a certain speed in a specific direction it is displacing air in front of it to continue with its motion. I came u with the idea to use this air displaced by the moving train. At the bottom of the train, on both the sides of the engine we will fit two suction pumps to suck in the air that is being displaced. The suction pumps [2] will be connected to two large pipes which will be running all the way till the last compartment. There will be inlets in each cell of every compartment of the train on both the sides, these will be joined to the two large pipes running down the length of the compartments. The two central pies will be specially designed with narrowing and broadening at various regions as required. This whole system works on the principle of the "Venturi Meter" [1] concept.

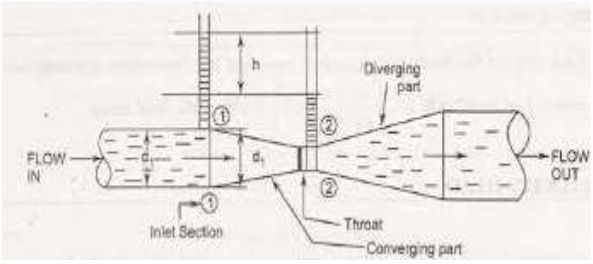
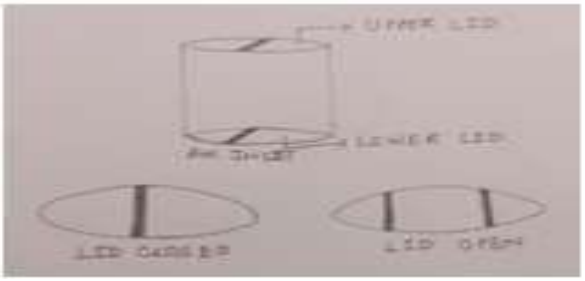


Diagram at icrepresentation of a Venturi Meter

The air entering through the central pipes, with force, will take along with itself the wastes that people will drop through the inlets to the last compartment of the train where all the wastes are being getting deposited.
The Inlets – will be cylindrical in nature, with the dimensions less than that of the two central pipes running down. The upper (where people will throw their wastes) and lower (the part where the inlet is connected to the central pipe) end of the inlets will be covered by lids. The cross section of the lower end of the inlet will have a sensor that will enable it to open uponly when the inlet is completely filled, the lid will open and the waste will get released into the large central pipe. The upper cross section of the inlet will also have sensors that will enable it to open only when it detects any kind of waste materials in its close proximity.


Representation of an Inlet

There will be a few controls in the engine of the train which will be provided to the driver of the train. When over fifty percent of the number of inlets of the whole train are filled the driver will get signal and he will switch on the suction pumps [2] and another switch to open up the lower cross section of all the inlets of the train, so that the wastes fall down into the large pipes and the moving air takes along with them all the wastes to the last compartment/the disposing chamber where all the wastes are being collected.

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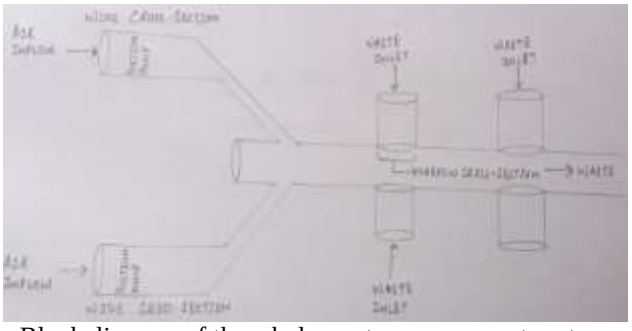
The Disposing Chamber/last compartment – The wastes will get deposited here and there will be two robotic arms[4] that will push the wastes back to prevent clogging at the ends of the large pipes. Some chemicals with the composition of anair freshener [3] will be added in the chamber so that the pungent smell can be neutralised. Exhaust fans will be added, and thedriver will have the controls to turn them on where ver possible.



Block diagram of the whole waste management system

III. CONCLUSION

The suction pumps shall be of high capacity so that the pressure exerted shall be enough to carry all the wastes along with it till the last compartment of the train. Not only the wastes but the toilets can also be connected to the large central pipes, given the fact that the bio toilets [5] were a failure. This will enable an efficient waste management system in the Indian railways and will take a step forward in the Swachh Bharat mission [6].

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