

## Eco Beach Cleaner

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### ABSTRACT

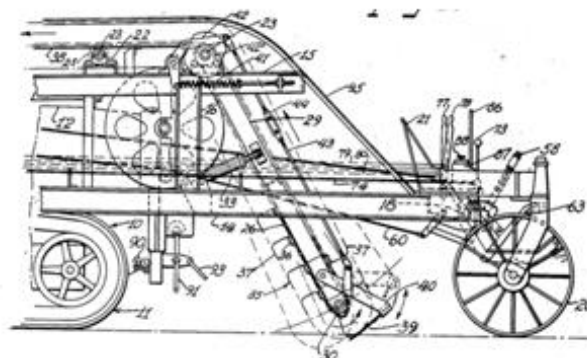
Trash and litter left on beaches can endanger the life of coastal animals, like turtles and birds, and also damage tourism industries by diminishing the natural beauty of beaches. To solve this problem, most coastal areas employ manual labor, volunteer work, or large zambonini-like machines to pick of trash. However, these operations are very expensive and time-consuming. In order to efficiently stop the increasingly negative impact of trash debris on coastal ecosystems, forms of mechanized, autonomous trash collection and disposal need to be utilized. Developing a robot that can transverse sandy terrain, pick up small trash debris, dispose of contained trash debris, and avoid large objects and the ocean all while functioning autonomously presents a variety of technical challenges. The invention is predicated upon the later developed concept of raking or combing the sand to a degree of continuity and thoroughness that will assure removal of not only larger sized debris, but also the bulk of smaller pieces such as broken glass, nails and the like, without necessitating or involving the removal or displacement with the debris, of any consequential quantities of the beach sand itself. This paper present the controlling and monitoring of the solar power device which is capable of picking up the miscellaneous litter which accumulates on the beach and collects all the litter after filtering the sand to a self attached trash box.

**Keyword--** Solar panel, Filtration unit, Trash/Debris Box, Conveyor Belt Mechanism

### I. INTRODUCTION

Beach pollution has become a wide spread problem for the human as well as marine life. Beach pollution is a persistant problem. Beach pollution is a growing problem in our society. Does it have an effect on our environment?

If it does, how does it affect us? Are there solutions to prevent beach pollution? We will examine the issue of beach pollution, the effect it has on our environment and possible solutions to preventing it's getting worse. An enormous amount of the human population and infrastructure is found along one of our most precious resources, better known as the coastline or State beaches.

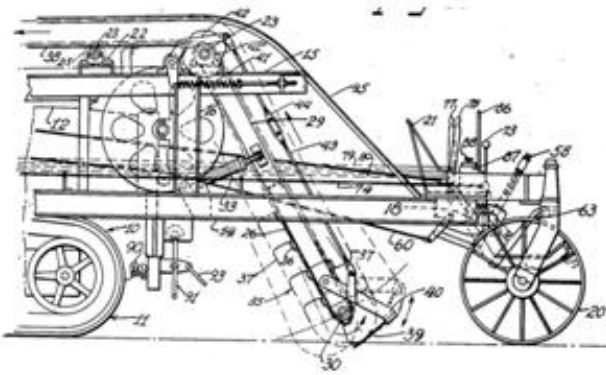


Studies have shown that beach pollution is usually infrequent and confined to local areas. Pollution can also occur from disruption or damage to wastewater collection and treatment infrastructure due to severe natural events such as hurricanes or floods, illegal dumping, accidental oil spills, and solid waste trash left behind by people. Plastic, rubber, foam materials, and metals take hundreds of years to break down. Animals are sometimes killed by the ingestion of plastic, rubber, or foam that they have mistaken for food.

Some animals drown from entanglement, others are choked by plastic rings. With every wave that crashes on our beaches, more and more plastic is deposited. This wave of plastic is not going to stop and the problem will not go away if you ignore it. Even our **fish are consuming the plastic** fragments, so you are consuming the plastic too. Thats why it's the need of the hour efficiently stop the

increasingly negative impact of trash debris on coastal ecosystems, forms of mechanized & autonomous trash collection. We design this device with solar panels to make it environment friendly. The device filter & collects the debris into the trash collection box.

## II. OBJECTIVE AND SCOPE



The main objective of this project was to design a small confiscated machine that utilise the power of solar energy via solar panels (making it eco-friendly) and help to collect the debris /trash from the costal areas i.e sand beach in a well-organized way and stores in the trash box & also minimizing the cost of labor. The following aspects were considered in the choice of design solution

- Installation cost
- Solar Energy
- Human intervention
- Reliability
- Power consumption
- Maintenance
- Expandability

A critical Consideration in the segment costs, since cost define the viability and feasibility of a project. The energy saving was also an important feature, since it is powered by solar energy as well as can be charged by DC.

## III. LITERATURE SURVEY

In the form of the invention which we have evolved, the machine comprises a more or less standard form of track laying tractor or vehicle upon which is mounted a conveyor belt having a plurality of sets of rakes extending around the belt, one part of this belt being swingable to engage the beach surface, with varying degrees of pressure, so that the rakes, as they progress around the conveyor belt, will effectively pick up bottles, paper of various sizes and other matter which is likely to be dropped upon the beach by pleasure seekers. The rakes carried by the conveyor belt must be of a width sufficient to clear a fairly wide swathe along the beach we have found that a width of approximately eight feet is

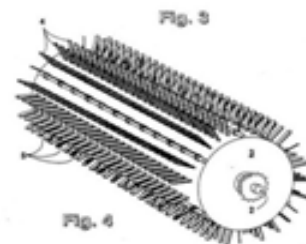
satisfactory in this respect. The operator of the cleaning machine must necessarily be forwardly located thereon, ahead of the conveyor apparatus, so we have devised the conveyor superstructure in such a manner "as to permit the operator to steer and control the vehicle while being located at the extreme forward end thereof; The machine is adapted to tow a box (trash collector) which receives the litter discharged by the conveyor belt, and a suitable stripping device 'is provided at the rear end of the machine, over the wagon, by which material impaled upon the tines of the rakes is stripped from the conveyor belt and discharged into the trash box.

When designing the collection mechanism, our biggest concerns were manufacturability, and durability. Furthermore, our design had to allow the beach cleaner to pick up a wide range of trash: items as small as a bottle cap or as large as a two liter bottle. Our first concept was to produce a cylindrical device that would allow individual rake tines to be directly attached. Breaking the collection mechanism into two, relatively easy to make parts simplified manufacturing. However, this method made complicated assembly.

The machine's controlling device as well as its conveyor belt mechanism is connected by the battery which is powered by solar energy by solar panels. This makes this device environment friendly. The machine's main function as well as its direction function is powered by solar panels which is a new & important feature compared to other machines in the market. This sets it different from others.

## IV. PROPOSED SYSTEM

The invention is predicated upon the later developed concept of raking or combing the sand to a degree of continuity and thoroughness that will assure removal of not only larger sized debris, but also the bulk of smaller pieces such as broken glass, nails and the like, without necessitating or involving the removal or displacement with the debris, of any consequential quantities of the beach sand itself. We have accomplished the application and its principle in a simple machine capable of being advanced along the beach and by being connected with a battery powered by solar panels, so that the machine cleans a wide strip of the sand as it advances and has such maneuverability as to permit the cleaning of large areas in such short periods of time as to render practicable the use of the machine for daily beach upkeep.



## V. SOLAR POWER

Solar power is the alteration of energy from sunlight into electricity, either directly by means of photovoltaics (PV), or indirectly by means of intense solar power. Solar energy is most abundant source of energy in world. Photovoltaic is an effective approach for using solar energy.

Solar powered Beach Cleaning system can be appropriate alternative for everyone in present state of energy disaster automatic system using solar power. The main objective of this project is to advance an cleaning system in field of cleaning against beach pollution beach by using solar energy.



## VI. NEED FOR BEACH CLEANING

- (i) It is estimated that there are over 5 trillion pieces of plastic debris in the ocean today. While not all of this trash is from what is left on beaches, some of it.
- (ii) Fish, sea turtles, birds, and many other marine animals mistake our trash as food and end up dying because they cannot digest the plastic.
- (iii) A variety of fish and other seafood have had increasing levels of mercury in them throughout the past few years. In some cases, the fish ingest these pollutants (such as mercury) from chemicals being dumped into the ocean, in other cases it has been found that the fish ingest these chemicals from the plastic debris they mistake as food.

## VII. ADVANTAGES

The system is inexpensive in terms of hardware component and power consumption. The system helps in removing and collecting the trash and debris from the beach. It can be applied in large coastal areas. The system helps in labor problem when there are no labors to work and eradicates man power. System can be swapped into manual mode whenever required. It is convenient to all climatic conditions. It is Eco-friendly as it is powered by solar energy via solar panels which is step further forward to Green energy.

## VIII. APPLICATIONS

Cleaning by this machine can be completed in small fields, gardens, farms etc. It is effective for small as well as large coastal areas. This application can be used for patient monitoring. It can be used singly for small area, but for large coastal area, they can be used in pairs simultaneously. This system can be functioned automatically as well as manually.

## IX. RESULT

Beach cleaning becomes easy, accurate and practical with the impression above shared and can be executed in various fields in future to endorse eco friendly environment to next level. The result of getting clean & healthy beach can save millions of marine life which gets killed or poisoned to death by eating plastic. This way we not only ensuring a healthy and eco friendly environment not to ourselves but also for marine life.

## X. CONCLUSION

The main applications for this project to ensure a healthy beach (coastal areas) not only for human as well as for marine life. This project ensure that seafood's like fish, lobster etc. didn't get poisoned, by eliminating the poison plastic from their reach. And as it is powered by solar energy, it is a step ahead from the regular other machine and gets closer to eco friendly environment.

## ACKNOWLEDGEMENT

The successful completion of project would be incomplete without complementing those who made it possible and whose guidance and encouragement made our efforts successful. With deep sense of gratitude we acknowledge the help and encouragement of our project guide, Professor **Dr. M.A. Murtaza**, ASET Lucknow and co-guide Ass. Professor **Mr. Ajendra Kumar Singh** (ASET) for his successful guidance, support, help and suggestions. We are thankful to our Head of Department, **Prof Mr. AK Jouhary** (ASET) for his support and enquiry towards our project. We would also like to thanks all those who were involved directly or indirectly and who helped in our project. Finally, we would like to thanks our parents and friends who have bestowed faith in our ability and helped us stand in a place where we are.

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