

Animal Cowdung Cleaner

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Abstract

Health is very important when concerned with work, so it's very important to keep the health in a good condition. While cleaning the animal waste many of people pick it up by hands and some of them by pads. People may undergo with diseases and some may feel allergic to do it. So the worker must be in good condition to make his/her work done.

Animal waste cleaner suitable for scrapping animal waste in a passageway the waste which is in semi-solid state and it will be collected in efficient way without harming the animals and maintain the hygienic conditions. This is a problem faced by many of the farmers who are undergoing the dairy practices they need to pick up with bear hands. Since there is no existing or affordable devices and because of this waste people get allergic and in order to avoid problems implementation of device is necessary.

Keywords: Animal Feces Cleaner, Animal Waste Cleaner, Animal Dung Scrapper.

I. INTRODUCTION

There is a need for designing an affordable waste cleaner for *large scale diary people*. This project proposes to take on challenges associated with the accessibility and sanitation in developing countries by designing and building a cleaning system that will be reliable, durable, cost-effective and user-friendly. When the carriage is moved in forward direction the belt which rotates on the dc motor supply collect the waste with the help of rubber pads, later which is dumped in the tank and this procedure repeats. So it need not to apply much manual power to push it. However; there can be certain established organizations or diaries found within the community that can acquire this mechanism and use it for the greater good.

II. PROBLEM STATEMENT

The problem faced by the farmers in cleaning and dumping the animal waste who are maintaining large scale dairies.

III. DESIGN ATTRIBUTES

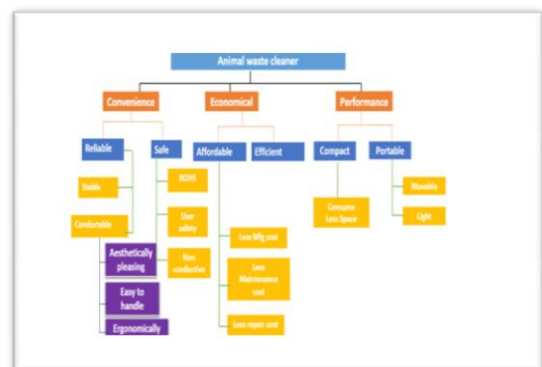
- Movable
- Durable
- Handy
- Portable
- Low maintenance
- Easy to repair

- Safe
- Compact
- To clean the surface
- Efficient
- Affordable

IV. DESIGN SPECIFICATIONS

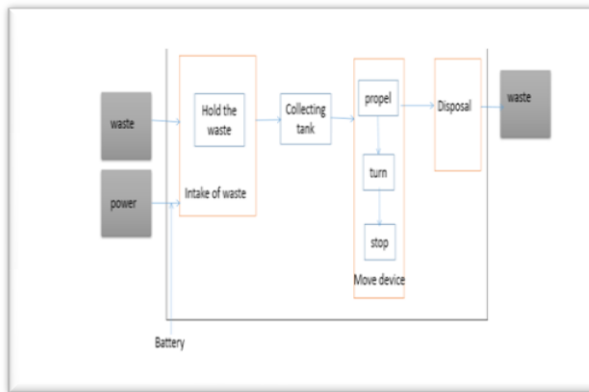
Weight	15kg
Durability	>1 year
Dimensions	840mm(length), 430mm(width), 940mm(height)
Storage capacity	36.29litres
Battery	12V
Belt drive	200mm(length), 6mm(thickness), 42mm(height)
Motor	With load-500rpm Without load-150rpm

V. DESIGN SPECIFICATIONS VI. OBJECTIVE TREE



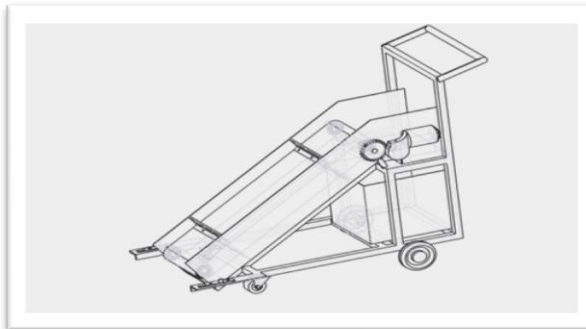
VII. Function STRUCTURE

WHITE BOX



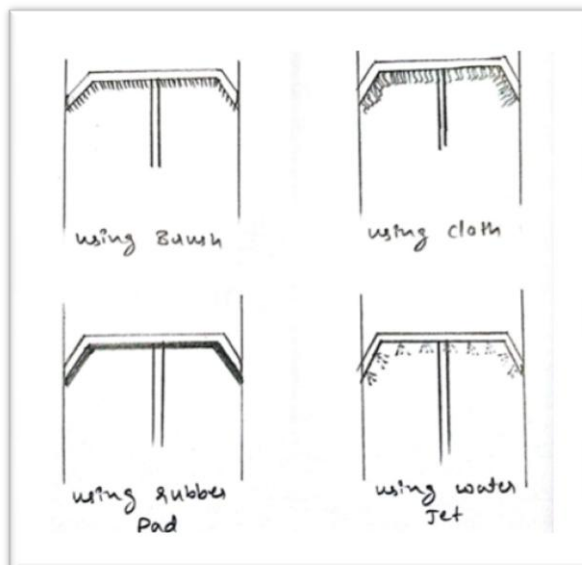
VIII. DESIGN ALTERNATIVE NO. 1

- Power consumption is less.
- Easy to operate.
- Easy to clean.
- Low maintenance



IX. DESIGN ALTERNATIVE No. 2

- Works best when in even surface
- Not applicable when used in uneven surface
- High maintenance
- More power consumption



X. ANALYSIS OF CONCEPTUAL DESIGN ALTERNATIVES

Analysis of design alternatives is done on Pugh method; this is based on comparing alternatives with the wishes list in the specification table. An alternative should meet the customer demands; otherwise it will be dropped in the initial screening. Also the concept should seem feasible to the engineering group or it will be dropped by the second stage of screening. The concepts that pass the initial two stages need to be evaluated with respect to each other, using fixed criteria (specification table). The Pugh evaluation method tests the completeness and understanding of requirements, rapidly identifies the strongest alternative and helps foster new alternatives. This method is effective if each member of the design team performs it independently, and the individual results are then compared.

1. The choice of the evaluation scheme is done by the design team.
2. Alternatives are compared.
3. For each comparison, the concept being evaluated is judged to be better than, about the same as, or worse than the datum. If it is better than the datum, the concept is given [+] score. If it is judged to be about the same as datum, the concept is given [0]. If the concept does not meet the criterion as well as the datum does, it is given [-].

Total score is then computed.

Pugh's Chart

Attribute	weightage	1 st	2 nd	3 rd	4 th
Low cost	5	0	0	0	
Quality	5	+	+	+	
Safe	5	+	+	0	
Consume less space	1	+	+	-	D
Less maintenance cost	3	0	-	+	A
Comfortable	5	+	0	+	T
Movable	3	+	+	0	U
Less weight	3	-	-	+	M
Total +		5	4	4	
Total -		1	2	1	
Overall total	32	4	2	3	
Total weightage	32	18	9	15	

SELECTED DESIGN:

Based on the above chart parameter



X. PROCESS INVOLVED AND FABRICATION

Body of the cow dung cleaner is completely made of MS square pipes of (1/2*1/2) inch and build by MS steel of 1.6mm thickness (16 gauge). Conveyor belt mechanism is used to drive the waste using rubber pads into the tank. Pad & belt assembly is of 1500mm length and 200mm width. DC permanent magnetic motor is used which is usually called as wiper motor without load it can run 500rpm and with load it can run 150rpm. In order to drive motor with less speed gear ratio is taken into account, the ratio reduction is 1:2, the major gear diameter is 40mm and minor gear diameter is 12.7mm. Belt runs on two shafts of length 200mm and diameter of 16mm. Ball bearings are used to rotate the shaft 6020std ball bearings are used, totally four ball bearings are used. M10 and M8 bolts and nuts are used with pitch 1.5mm. Length of the product is 840mm, width 430mm and height 940mm. Collecting tank is of 36.9 litres capacity whose width and length is 300mm and height of 410mm which is made MS steel, Pads are made of resins, whose thickness is 6mm and height of 42mm which are fixed by riveting process. Completely body is joined by arc welding process. Manufacturing Process Involved are:

- Boring
- Turning
- Drilling
- Bending
- Facing
- Welding
- Riveting
- Cutting
- Sawing

XI. CONCLUSIONS AND RECOMMENDATIONS

Through extensive research we found cost effective parts that met our goal of building a animal waste cleaner that can be used in any large scale dairies and facilitate the worker for the daily use of families in developing countries. Our initials goals were to construct a prototype that can collect the dung in an efficient way. Each component was thoroughly tested in order to provide results for the best product possible at the most reasonable price. There were obvious modifications applied to the final product in order to successfully aid to all the dairies in stress-free manner. Belt mechanism justifies this system can be utilized in developing countries. It can be understood that not everyone (dairy practice people) in the world has afford this product. However; there can be certain established of large scale dairies found within the dairy that can acquire this technology and use it for the greater good. In the future we hope to be able to partner with one of the many non-profit organizations dedicated to provide this product and maintain sanitation.

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