

Emergency Life Saving Machine (ELSM) for manhole cleaners

TEAM :

Joe Thomas

Royam .D. Adhira

J.Vivian Osborn

SOME RECENT PICTURES THE DEPRAVITY OF A MANHOLE CLEANER'S LIFE



BRAZEN INDIFFERENCE OF GOVERNMENT, EMPLOYERS AND POLICE TOWARDS THIS PRACTICE

PERSISTING ABOMINATION



- **Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993**, covered employees in cleaning dry latrines.
- Prohibition of Employment as Manual Scavengers and Their Rehabilitation Bill, **2012 passed in Parliament on Saturday.**
- The new law also covers manual scavengers employed by **local bodies** and railway authorities.

- It does not provide for total mechanisation of scavenging; **but mandates protective gear and safety precautions.**
- There are about **1.80 lakh workers in T.N;** 95 % of workers belong to Arundathiyar community.
- **30 persons have died** of asphyxiation in 30 months. Though the 1993 Act provides for stringent punishment of employers, few have been booked.



When we seek information, most states say there are no manual scavengers. Till July 2017, 13 states finally admitted to having 13,500 manual scavengers.

THAWAR CHAND GEHLOT
MINISTER FOR SOCIAL JUSTICE

VALUE OF LIFE – MANHOLE CLEANERS

- Poverty drives people to take up the cleaning of manholes.
- This degrading work of cleaning waste and faecal matter is done without proper tools or protective gear.
- Multiple accidents are caused due to deep and narrow manholes and exposure to all kinds of waste and toxic gases resulting in diseases ranging from skin issues, major infection to asphyxiation and poisoning leading to death.
- The presence of Carbon Monoxide, Methane and Hydrogen Sulphide in manholes prove to be quite lethal many times.
- Manhole workers are always been treated as outcastes in the society and hence many are alcoholics or addicts.



SEWAGE GASES PRESENT IN MANHOLES

HYDROGEN SULPHIDE:- is a deadly gas with a distinctive "rotten egg" odour that can be detected at very low concentrations. At concentrations above 100 ppm, hydrogen sulphide has a paralysing effect on the sense of smell. Even at lower concentrations, hydrogen sulphide can affect the olfactory nerve and workers cannot detect the changes in concentrations. Therefore, it is very dangerous to rely on the smell to detect the presence of hydrogen sulphide.

CARBON MONOXIDE:- The lethal colourless and odourless gas – carbon monoxide, is given off when charcoal is burnt in poorly ventilated areas. Similarly, it is produced when gasoline/diesel generators or other fuel-driven tools are used in inadequately ventilated workplaces. Exposure to carbon monoxide at concentrations over 350 ppm can cause confusion, fainting on exertion and collapse.

METHANE:- Methane is commonly generated when organic matter is decomposed by a variety of bacterial processes. It is a colourless, extremely flammable and explosive gas that can cause fire and explosion. The accumulation of methane in a poorly ventilated area will displace normal air and result in an oxygen-deficient environment.





THE PROBLEM AND PROPOSED SOLUTION



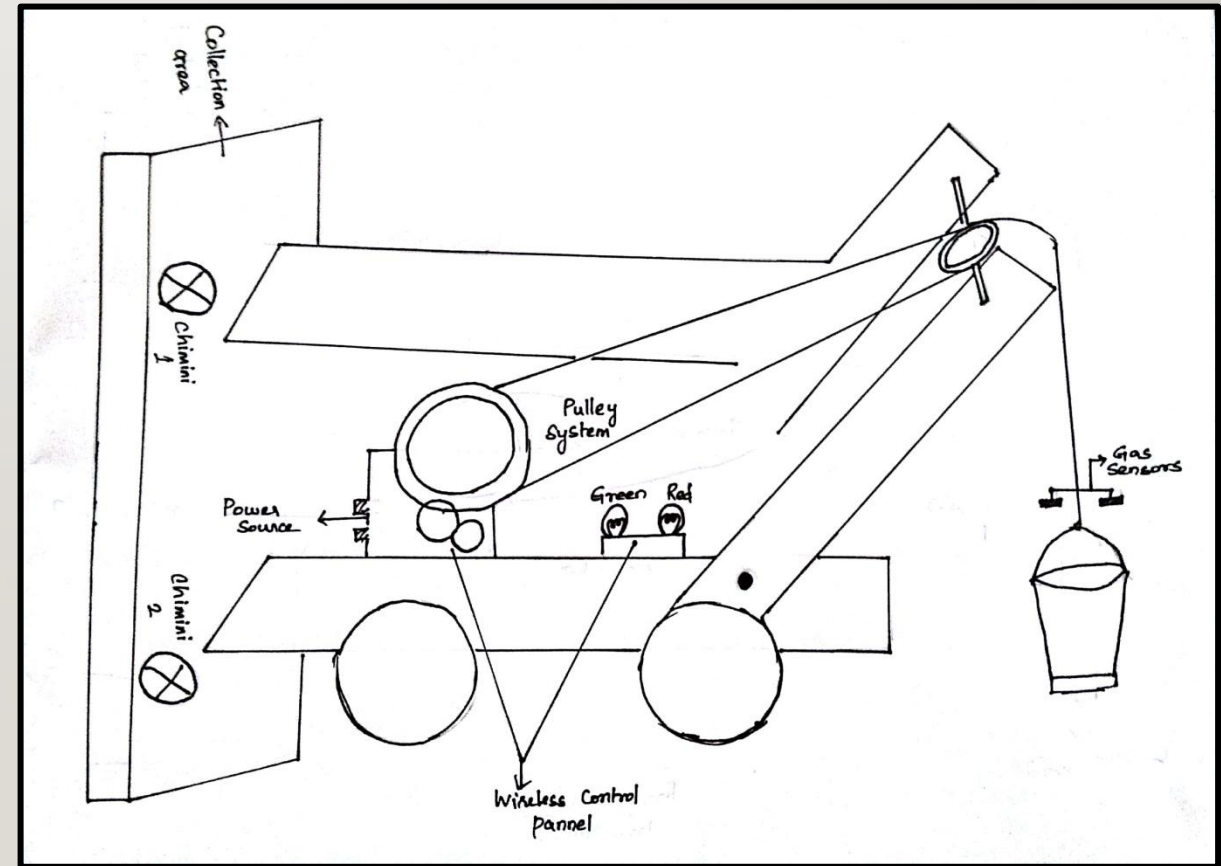
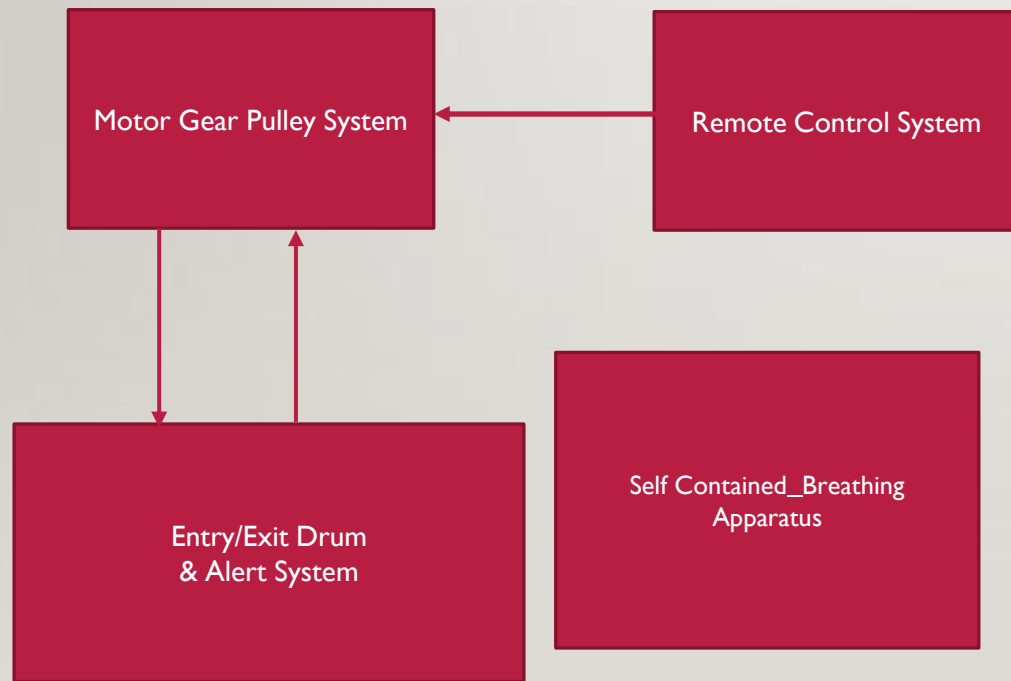
PROBLEMS

- Handling entry into /exit from deep and narrow Manholes
- Lack of help when faced with problems/danger once inside
- Inhalation of Toxic Gases
- Lack of proper Air Supply
- No protective gears or tools for cleaning

PART OF THE ELSM

- Remotely Control System
- Pulley and Carriage
- Alarm unit for alerting during emergencies
- Gas sensors
- Exhaust /Filter Pipes

ELSM FOR MANHOLE CLEANERS



PROS AND CONS OF THE ELSM SYSTEM

PLUSES

- Works on simple principles
- Easily Buildable and Economical
- Makes manhole cleaning easy when compared to before
- Simple system and can be easily operated by layman – does not require technical knowhow
- IT does not rob the present workers of their livelihood.

MINUSES

- Needs human interference
- All pain points not covered

ADVANCED SOLUTIONS

There is always room for improvement. While our solution is simple and addresses the main issues of this occupation, for safety reasons the human involvement can be completely avoided in such cases through usage of robots to get the work done.

“ If we truly believe in the value of human life, we should care about all of the weakest and most vulnerable members of the society.”

Every life is precious and should be treated as such..

Our solution is a humble but heartfelt initiative into making lives of our helpless brothers a little better as they struggle to earn the daily bread.

