

## Smart Sanitary Napkin Disposal Machine

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### **Abstract**

*The disposal of sanitary napkins has been a issue, especially in public facilities such as lavatories. Attempts to dispose of these items by flushing them down the toilet have resulted in clogging of the toilet or of the plumbing associated therewith. While attempts have been made to solve the problem of disposing of sanitary waste, and human excrement, by incinerator systems, no prior attempts have been made to satisfactorily dispose of sanitary napkins in such systems. Furthermore, the systems of the prior art concerned with sanitary waste disposal in general have been found to be cumbersome in construction and too costly for practical adaptation to dispose of sanitary napkins in public lavatories. This project focuses on solving the issues of these incinerators by making them more smart and efficient. We can overcome these problems by making the machine less heavy and easy to use as well as the machine should be environment friendly. Considering these points, we have designed our model of incinerator, which consists of three chambers, the storage area, the burning chamber and the basin, which would be flushed into the drainage. The machine will be ARDUINO driven with a display showing the current state of the machine and will be completely automatic. Once the sanitary napkin enters the machine, the process will be initiated and will continue until the pad is burnt to ashes. The burning chamber has heat-reflecting surfaces for concentrating the heat to a central portion in the chamber. There will be a customized filter assembly to filter the undesirable odours and fumes emanating from the burning pads and routing it directly into drainage in a clean and harmless state. The ashes of the burnt pads collected in the basin will be flushed into drainage after regular intervals of time by providing a built in tank for water storage.*

**Keywords—** ARDUINO, Smart Sanitary Napkin Disposal Machine, Luna Smart Incinerator, Automatic Flush Technology, Carbon Filter, Cerawool, Storage Chamber, Heating Chamber, Flush Chamber.

### **I. INTRODUCTION**

The main objective of this research is to design a smart sanitary napkin disposal machine, which could be used to reduce the problem of disposing of sanitary waste. Further attempts to provide ordinary receptacles in public lavatories have also not met with success since these receptacles have not been used by the public. Also disposing off these napkins in open lands leads to pollution and unhygienic conditions. 45% menstrual waste in India disposed of with routine waste, data shows is disposed of as

routine waste along with other household garbage. This can be a very unhealthy practise since this type of waste is very harmful in the surrounding and can cause a lot of harm to the environment.

Experts claim that flushing tampons and sanitary napkins causes the majority of household clogs. Diapers will clog a toilet, or an outgoing line, in a heartbeat. Moreover, cotton does not easily break down in water. This could cause some serious problems over time, especially if you are using a septic Machine. The incinerators available in the market are very costly and they are not much appealing.

## II. LITERATURE SURVEY

In the beginning, we did an extensive literature survey of our project and gather all the required information from the past published papers and elsewhere. With the help of this information we had gathered from various sources, we assemble the required hardware components and design the circuit as per the requirements, we have used minimal components and made the circuit less complicated. Then we move on to the Arduino software programming. We have enhanced the Arduino programming and implemented it to the circuit and after few successful attempts and desiderate output, we moved forward to develop and enhance the physical outer structure of the project. Sanitary pads are used but problems we face today are with the disposing them. The available machines are very less effective with respect to expected output. Yearly many women around India have to dispose the used pads openly in the dustbins or toilets. Disposal of commercial sanitary napkins is also a problem even when the community does burn in the open, often incompletely, leaving gobs of half-consumed objects for dogs or children to pick out, which is hence, harmful.

[1] This paper gives knowledge of poor menstrual hygiene management Machine. Hygiene being a huge factor of concern considering women's health when dealing with menstruation, and no such information about disposal of pads in the vicinity. Major environmental health issues are our concerns.

[4] This paper has proven that women manage menstrual waste in the countryside. Various investigations happened to determine the ways to dispose menstrual waste. Disposal of pads through sewage pipes clogs itself, and dumping plastic into the water bodies, where they do not degrade or decompose, causing pollution in waterbodies. This paper also gives us some idea of impure water and poor sanitation facilities

[3] This paper covered the issues of modern time, disadvantages of heating burning changers, the removable tray for ash which is to be disposed manually. No filters to eliminate the odors and fumes from realizing the harmful gaseous waste. The maintenance issue is also a major concern.

## III. PROPOSED MACHINE

The block diagram consists of various components like Arduino Mega, MG996R, Servo Motors (SG-90 mini servos), L.R. Sensors, Relays (5V), Air Heaters, Insulators (here: Cerawool), Thermostat, Carbon Filters, Acrylic Sheet (Black smoke and White colour), Pipes (T-pipe, PVC, Coupling B-pipe), LCD Display. The machine will be ARDUINO driven with a display showing the current state of the machine and will be completely automatic. The machine would be in idle state initially. Once the sanitary napkin enters the machine, the Infrared Sensor – 1, would first sense the input.

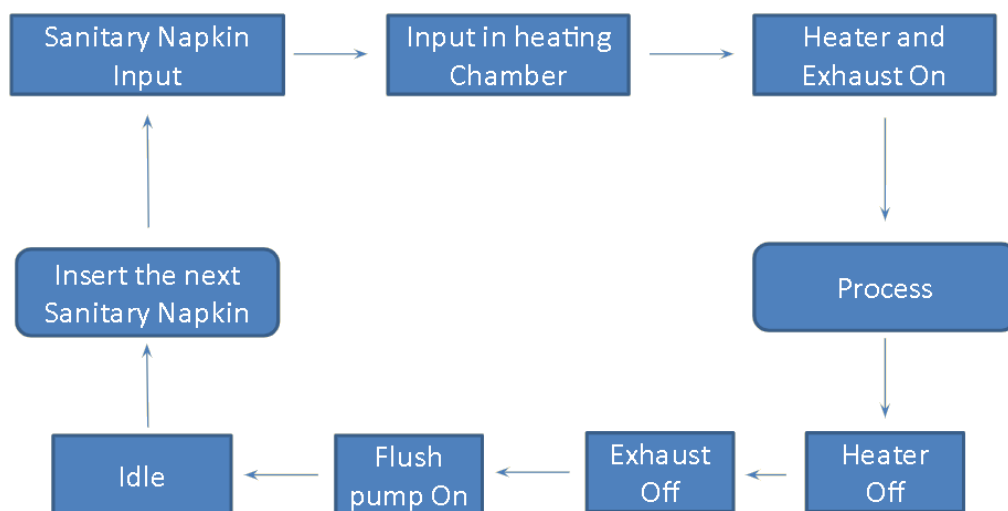
Once the input pad is then sensed, the upper flaps will open and the pad will be allowed to enter the machine. The flap closes in given time-period. Once the Infrared Sensor – 1, senses the input, our process will be initiated. As soon as our process initiates, there will be a message displayed onto the screen displaying the status of the machine.

Then this input pad allowed to pass through the narrow path and then is sensed by the Infrared Sensor – 2. Once the sensor senses the input, the Lower flap will be opened and a message will be displayed onto the display screen displaying the status of the machine. Meanwhile, the ATmega32 sets ON the Heater and Exhaust fan, in the burning chamber. Hence, the pad then enters the burning chamber and the burning process will start.

This will continue until the burnt out pad ashes until maximum time allocated while programming ATmega32 (maximum 20-22 minutes). After the time expires, the Heater is set OFF. The exhaust is kept ON and the Pump is set ON which flushes out the ashes in the drainage. The burning chamber has heat-reflecting surfaces for concentrating the heat to a central portion in the chamber and has better burning ability within limited period of time. There will be a customized filter assembly to filter the undesirable odours and fumes emanating from the burning pads and routing it directly into drainage in a clean and harmless state.

The ashes of the burnt pads collected in the basin will be flushed directly into the drainage after regular intervals of time by providing a built in tank for water storage. The machine would be user-friendly interface and smoke exhaust will be filtered and is then released into drainage. Hence, this entire process will be automated. In this way our machine works.

#### IV. MACHINE ARCHITECTURE



##### Machine Requirements:

###### Selection of software and language

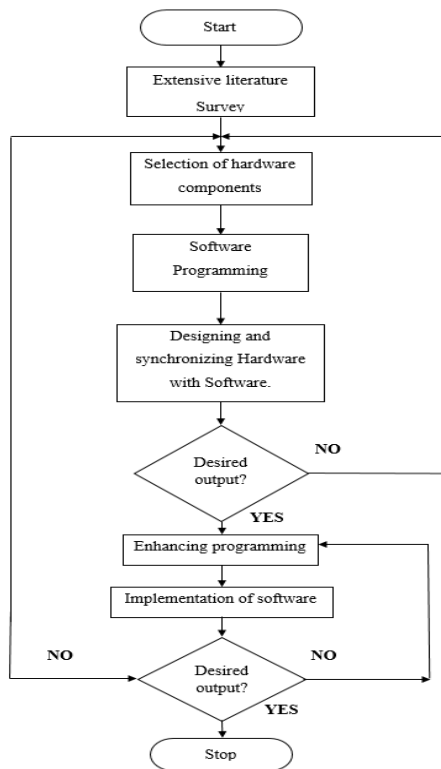
- Embedded C
- Express PCB

###### Selection of hardware

- Power Supply
- Arduino Mega
- MG996R
- Servo Motors (SG-90 mini servos)
- L.R. Sensors
- Relays (5V)
- Air Heaters

- Insulators (Cerawool)
- Thermostat
- Carbon Filters
- Acrylic Sheet (Black smoke and White colour)
- Pipes (T-pipe, PVC, Coupling B-pipe)
- Light Emitting Diode [LED]

## V. MACHINE PROCESS FLOW



## VI. ADVANTAGES

- User-friendly interface.
- Higher burning ability within short time.
- Residues will be directly flushed out into drainage.
- Exhaust is released in the drainage.
- Processes is fully automatic.

## VII. APPLICATIONS

- The Luna Smart Incinerator has a New Automatic Flush Technology, which will flush the waste ash residue just after the napkins are combust completely.
- In The Luna Smart Incinerator, smoke passing from drainage is purified and the pollution contents are efficiently reduced with the help of Carbon Filter. The outlet is passed through the drainage pipe only.
- The Luna Smart Incinerator has a smart display, which requires no manual tasks, and the combustion takes place automatically. The waste ash and smoke is drained out via flush and Carbon filters. The display indicates the status of the machine.

- The Luna Smart Incinerator has a Foul Odor Emitting Technology, which removes the foul odor of the vicinity.
- The Luna Smart Incinerator is lightweight and most importantly is cheap and affordable by various NGOs.

## VIII. CONCLUSION

The machine as promised will deliver the required output and help to reduce the pollution, health and various issues discussed above. This project can be extended for disposing medical wastes and can be extensively used for monitoring the use of Sanitary Napkins in the vicinity. This project can will be helpful for the local Hospitals, dispensaries and public toilets. Also ensuring safety of the environment and minimal pollution and least possible waste production.

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