# SANITARY NAPKIN DISPOSAL SYSTEM

*Prof. Meena Ugale*
*Xavier Institute Of Engineering*
*(MUMBAI UNIVERSITY)*

*Yash Pawar*
*BE in Information Technology*
*Xavier Institute Of Engineering*
*(MUMBAI UNIVERSITY)*

*Pradnya Chavan*
*BE in Information Technology*
*Xavier Institute of Engineering*
*(MUMBAI UNIVERSITY)*

**ABSTRACT**

*Improper disposal of the sanitary pad can lead to various problems which include large heaps of pads all over, bacteria causing infection, unhygienic environment etc. The used sanitary pad that have not been disposed of properly sometimes block the drainage system. Incineration is a better technique to dispose of menstrual waste but burning of used pads releases harmful gases that effects health and environment. To incinerate sanitary napkins, electrical or physical fire – based incinerators can be used. Toilet facilities in India are very poor as they lack bins for the disposal of sanitary pads[1]. This system is one of the best way to dispose menstrual waste is to burner is napkin using electrical fire based burner without allowing smoke generate in the process to escape into the atmosphere. This steps must be taken to solve the problems that improper disposal of napkins causes to the environment and to the public health.*

**Keyword:-** *Sanitary Napkin, Micro steel gauge filter, Sanitary Napkin disposal, Incinerator*

## 1.Introduction

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health[3].

With Sanitary Napkins, we also need to give solution to dispose these sanitary napkins and avoid current ways of disposal like sanitary napkins are mixed with regular waste and it's difficult to segregate them and dispose them off. This exposes these viral borne wastes to the environment, animals and public at large causing diseases like Hepatitis B and C. It exposes waste pickers to disease-causing microorganisms E coli, Salmonella, Staphylococcus, HIV and pathogens that cause hepatitis and tetanus. Incinerating these napkins is the only way of getting rid of these problems. Hence, Installation of Incinerator is proposed[2].

Why is it necessary to dispose of sanitary napkins:

- If they are left in the open , they are sore sight.
- May lead transmission of infections like hepatitis B and hepatitis C.
- No danger of HIV infections.
- Will attract files and insects[3].

## 2.Liturature Survey

We need to educate and guide women, girls regarding the disposal of sanitary pads in a proper way. This will help them to be clean, hygienic and safe from unwanted diseases. To protect our environment, proper care and initiative must be taken by every single woman to carefully dispose of their used sanitary pads. In the long run, hygiene and sustainability are possible only through education. In both rural and urban areas, this is possible only through women to women as they can demonstrate and teach the pros and cons in Sanitary pad disposal[1].

At school, due to lack of sanitary facilities, girls throw their pads in the toilets. Since there are no dustbins, they leave the soiled pads wrapped or unwrapped in the toilet corners. This makes the toilet dirty and filthy. Whether at home or at public places, women have the habit of disposing of their used pads by flushing them and this leads to the blockage of the sewage system[1].

Every month, 353 million women and adolescent girls across India need to dispose of their that women did not want the menstrual waste in their houses so they disposed it away without thinking much about how it will be

disposed of further. In fact it was found that even if the facility was provided the behavior did not change much because of human psychology patterns[3].

Did you know a single woman can generate up to 125 kg of non-biodegradable waste through her menstruating years alone? Knowing this staggering fact, it doesn't take a genius to do the math to comprehend the waste implications of 355 million women who are generating so much of plastic waste that takes about 500-800 years to decompose[4].

Studies have shown that one sanitary pad could take from 500 to 800 years to decompose as the plastic used is not bio-degradable, and can lead to health and environmental hazards[4].

According to the research by Central pollution control board of India (CPCB), the methods of disposing sanitary napkins vary in urban and rural setting. Most urban women at home dispose sanitary napkin in a dustbin which eventually piles up in landfills. Whereas women in rural areas prefer to wash napkins and bury in a pit. It also varies if the women are using it at home or at school/workplace. When using a public washroom, often due to poor infrastructure, sanitary napkins are being flushed or are left in corners or other open areas. Very few women actually incinerate the soiled sanitary napkins[5].

Poor menstrual management and improper disposal of sanitary wastes lead to a various medical complication, raising awareness on menstrual management and breaking the silence and stigma around menstruation on the issue of safe disposal and to promote the cleanliness about our country. As the disposed sanitary napkins carry infectious bacteria like E-coli that causes hepatitis. When the soiled napkins are dumped in the waste bins and handed over to waste collectors they segregate the waste with their bare hands, and so they are easily exposed to diseases[6].

## 3.Existing System

Improper disposal of the sanitary pad can lead to various problems which include large heaps of pads all over, bacteria causing infection, unhygienic environment etc. The used sanitary pad that have not been disposed of properly sometimes block the drainage system. Incineration is a better technique to dispose of menstrual waste but burning of used pads releases harmful gases that effects health and environment. At home, women generally throw pads openly which leaves the place exposed to mosquitoes for their breeding. This spreads bacteria and infection. They usually throw the pads along with the home waste because they fear from being known that they use a sanitary pad. At school, due to lack of sanitary facilities, girls throw their pads in the toilets. Since there are no dustbins, they leave the soiled pads wrapped or unwrapped in the toilet corners. This makes the toilet dirty and filthy. Whether at home or at public places, women have the habit of disposing of their used pads by flushing them and this leads to the blockage of the sewage system[1]**.**

Fig. 1 Existing system

## 4.Proposed System

- **Hardware Specifications:**

Arduino UNO R3
Temperature Sensor LM35
16*2 LCD Display
Electrical Heating Coil
Fan
4 channel Relay
Micro steel gauge filter

- **Software specifications:**

Arduino IDE

**4.1 Block diagram**

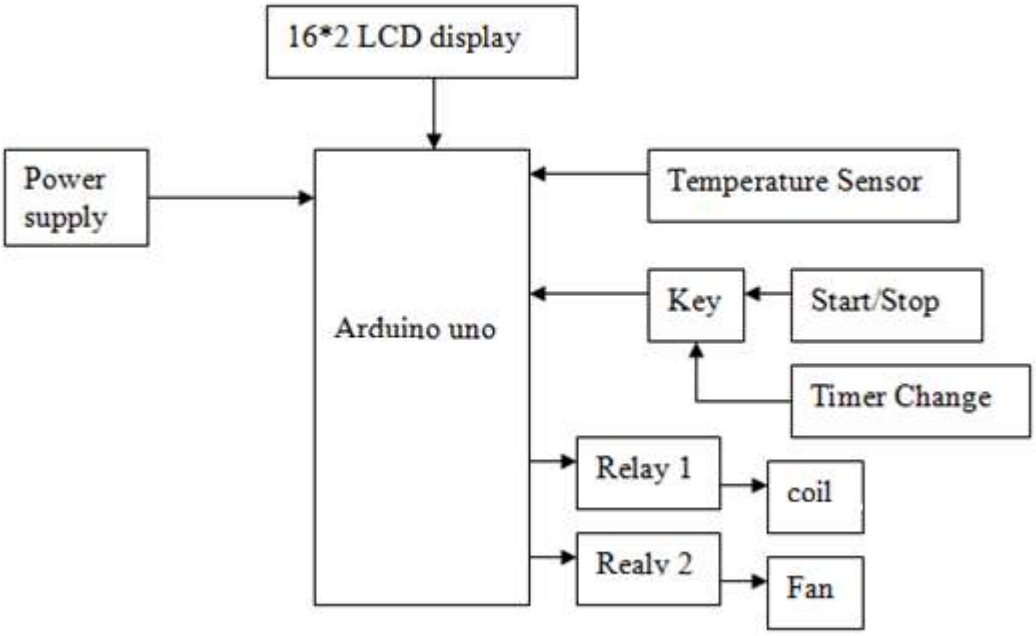


Fig. 2 Block Diagram

**4.2 Flow Diagram of Sytem**

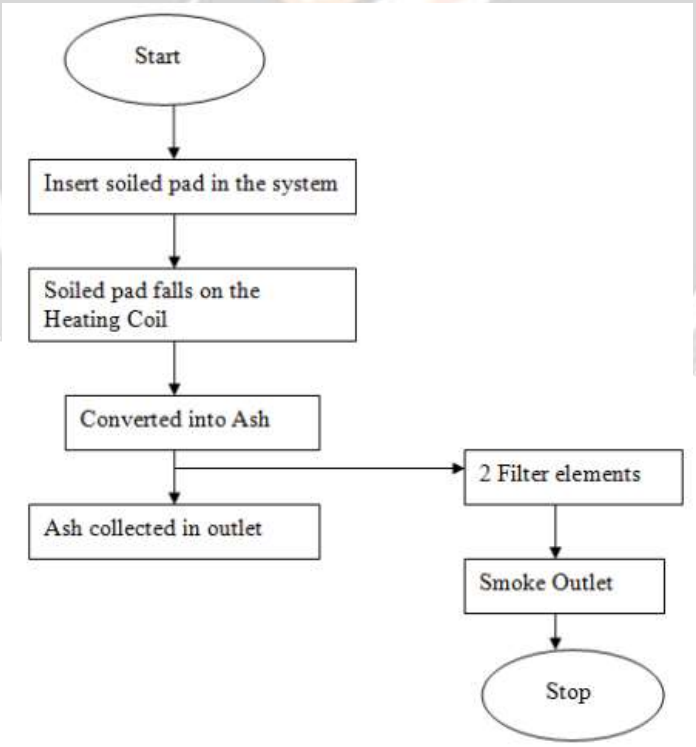


Fig. 3 Flow Diagram

Fig. 2 shows the block diagram of Sanitary Napkin Disposal System. It consists of different component like Arduino UNO R3, 4 channel relay for fan, Heating coil, Temperature sensor, Filter and 16*2 LCD Display.
Fig3 shows the flow diagram of Sanitary napkin Disposal system. When system is connected to AC mains i.e. 230V AC the power supply present in the system convert that 230V AC into 5V DC. This 5V DC voltage is applied to the Arduino UNO R3. Once the program is loaded into the computer along with a system name i.e." Sanitary Napkin Disposal System", the initial state of timer i.e. ON/OFF and temperature reading are display on

LCD. As system turn ON, another power supply converts 230V AC into 12V DC which is required for the relay to turn ON, its starts heating the coil of burner. Once the required heat to burn the napkin is attained, the Arduino displays the message regarding the system being ready for its process on the LCD Display. A timer is being programmed for 5min to dispose of one napkin. After the dispose ash is produce which is the final output we want. In this way system works.

## 5.Working

- The sanitary napkin is inserted through the door opening and allowed to fall andrest against the door extension which closes the material inlet.
- The door is then closed, thereby enabling the door extension to rotate downwardlyto allow the sanitary napkin to fall onto the heating coil.
- The switch is then depressed which activates both the heating coil and the motorof the fan. The heat supplied by the heating coil burns the sanitary napkin to ashwhich falls, by gravity, through the heating coil into the removable tray where thedebris is collected. The heat supplied by the heating coil is reflected by the angularly positioned heat reflecting surfaces and concentrated at a central pointwithin the heating chamber. By this technique the sanitary napkin is efficientlyburned.
- Air passing into the housing through air inlet also aids in both the combustion ofthe sanitary napkin and the conveyance of the undesirable fumes andodors to the filter assembly. The fumes and odors, circulated by the incoming air, thereby pass only through the filter element.
- The filter assembly filters the gases passing there through and removes anyundesirable odors and fumes so that only filtered and clean gases may be returnedto the immediate environment of the room through the clean gas outlet.
- The operation of the circuit is such that, when the Switch is closed, current willflow through the switching mechanism directly to the heating coil and to themotor of the fan.
- Either upon the expiration of a time interval or upon the presence of a specifiedtemperature in the heating chamber, the current to the heating coil will beterminated and the current will be directly passed to the motor of the fan whichwill operate the fan for a specified period of time after the heating coil isdeactivated.

**Hardware circuit diagram:**


Fig. 4 Heater ON (LED is glow)


Fig. 5 Heater OFF (LED is off)

## 6.Results & Discussion

Micro steel gauge filter is used to remove the highly toxic and carcinogenic gases called furans and dioxinsfrom the exhaust fumes burnt from napkins, and also used to filter micro-dust particles from the emissions.

TABLE I
RESULTS TABLE

| Material | Count | Temperature | Burning time | Ash generated |
|---|---|---|---|---|
| **A4 size paper** | 1 | 80°C | 10 mins | < 1 gram |
| **Whisper** | 6 | 120°C | 10 mins each | < 5 grams |
| **Stayfree** | 6 | 120°C | 15 mins each | < 5 grams |

Fig. 6 Stayfree Ash

Fig. 7 A4 Paper Ash

Fig. 8 Whisper Ash

Fig. 9 Final prototype

## 7.Conclusion & Future Scope

- This system gives a solution for destroying napkin waste in a very hygienic way.
- On the Industrial level, incineration process requires very high temperature ranging from 800°C - 1000°C.
- As our project is being implemented on the educational level, there were some limitations we had to follow for safety purpose. Our system operates at a max temperature of 120° C and it generates some amount of smoke.
- Whereas if implemented at the industrial level with very high temperatures, it will reduce the burning time and generate very low smoke.

## 8.References

1. World; WaterAid Report; 2012; p. 347. Available online: http://www.wateraid.org/what-we-do/our-approach/research-andpublications/view-publication?id=02309d73-8e41-4d04-b2ef-6641f6616a4f (accessed on 4 September 2018). 5. Das, P.; Baker, K.K.; Dutta, A.; Swain, T.; Sahoo, S.; Das, B.S.; Panda, B.; Nayak, A.; Bara, M.; Bilung, B.; et al.

2. Kjellén, M.; Pensulo, C.; Nordqvist, P.; Fogde, M. Global Review of Sanitation System Trends and Interactions with Menstrual Management Practices; Report for the Menstrual Management and Sanitation Systems Project, Project Report-2011; Stockholm Environment Institute: Stockholm, Sweden, 2011.

3. Abera, Y. Menarche, Menstruation Related Problems and Practices among Adolescent High School Girls in Addis Ababa, 2003/04; Addis Ababa University: Addis Ababa, Ethiopia, 2004.

4. Aluko, O.O.; Oluya, O.M.; Olaleye, O.A.; Olajuyin, A.A.; Olabintan, T.F.; Oloruntoba-Oju, O.I. Knowledge and menstrual hygiene practices among adolescents in senior secondary schools in Ile Ife, South-Western Nigeria. J. Water Sanit. Hyg. Dev. 2014, 4, 248–256. [CrossRef]

5. Anand, E.; Singh, J.; Unisa, S. Menstrual hygiene practices and its association with reproductive tract infections and abnormal vaginal discharge among women in India. Sex. Reprod. Healthc. 2015, 6, 249–254. [CrossRef][PubMed]

6. Lawan, U.M.; Yusuf, N.W.; Musa, A.B. Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. Afr. J. Reprod. Health 2010, 14, 201–207. [PubMed]

7. El-Gilany, A.H.; Badawi, K.; El-Fedawy, S. Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. Reprod. Health Matters 2005, 13, 147–152. [CrossRef]

8. Crofts, T.; Fisher, J. Menstrual hygiene in Ugandan schools: An investigation of low-cost sanitary pads. J. Water Sanit. Hyg. Dev. 2012, 2, 50–58. [CrossRef]

9. Averbach, S.; Sahin-Hodoglugil, N.; Musara, P.; Chipato, T.; van der Straten, A. Duet for menstrual protection: A feasibility study in Zimbabwe. Contraception 2009, 79, 463–468. [CrossRef][PubMed]

10. Baridalyne, N.; Reddaiah, V.P. Menstruation: Knowledge, beliefs and practices of women in the reproductive age group residing in an urban resettlement colony of Delhi. Health Popul. 2004, 27, 9–16.

11. Ali, T.S.; Rizvi, S.N. Menstrual knowledge and practices of female adolescents in urban Karachi, Pakistan. J. Adolesc. 2010, 33, 531–541. [CrossRef][PubMed]

12. Gultie, T.; Hailu, D.; Workineh, Y. Age of Menarche and Knowledge about Menstrual Hygiene Management among Adolescent School Girls in Amhara Province, Ethiopia: Implication to Health Care Workers and School Teachers. PLoS ONE 2014, 9, e108644. [CrossRef][PubMed]

13. https://www.streesanman.com/sanit ary-pad/importance-of-sanitarypad-disposal/

14. https://www.streesanman.com/sanitary-pad/why-sanitary-napkindisposal-machines-incinerator/

15. http://ijsart.com/Content/PDFDocuments/IJSARTV4I422236.pdf

16. https://swachhindia.ndtv.com/urgent-challenge-india-needs-tacklemenstrual-waste-6665/

17. https://saraldesigns.in/sanitarynapkins-and-its-environmentalimpact-part-1/

18. https://shriramminc.com/why-is-asanitary-napkin-incinerator-soimportant/

19. https://www.allforasmile.com/used -pads-incinerators-spewing-cancercausing-gases-in-pune/