IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 09, Issue 5 (May. 2019), ||S (VI) || PP 22-28

Arogya: Automatic Hand Wash Record System for Hospital

Aditya Dorlikar[1], Tushar Bhowate[2] ,Sakshi Lakhapati[3], Priyanka Awarkar[4], Kshitija Bhivgade[5]

[1]*(Electronics & Telecommunication, Jhulelal Institute of Technology, India)*
[2]*(Electronics & Telecommunication, Jhulelal Institute of Technology, India)*

Abstract: *Hand washing is the most effective way to prevent germ transmission however, individuals do not always meet established standards. The goal of our project is to create a more consistent and clean way to wash your hands. The device should be simple and comparable, if not better than washing your hands with soap and water according to the CDC guidelines. This technique will eliminate dirt, kill phones and dry hands in less than 20 seconds. Our design stabilizes in the cost of soap, water and energy, and its cost unit is similar to the components in public buildings.*

We have created a prototype electrical control and a mechanically applicable design that demonstrates the validity of our ideas. Our prototype is designed to reuse the counters that clean the user's hand at the same time. The prototype uses simpler and less expensive components to disperse soap, wash hands and dry user's hands. Because there are no personal parts, the prototype forces the user to move the soap while wiping the hand and washing the water completely. The prototype job does not require the user to have anything to control the device. This non-contact is done using the infrared sensor and the LED. When the beam is interrupted, the lamp begins to wash hands. This leads to precise control of the various machine functions through a predefined set of tasks and the use of transistors. The whole device works until the end of the test and allows us to prove the feasibility of our model.

This prototype is used to make a final model. Our solution is designed in a single unit covering existing basins, soap dispensers and drying technology. Our units are suitable for existing nozzles and are supplied with water pipes and water pipes. This device that does not touch the infrared headset and MCU is used to control hand wash functions. The program starts when the sensor inside the device is recognized by the user. After identification, the soap spreads from the wrist within 3 seconds; allows a short break for the user to clean their hands to remove the dirt. The water is then passed from the user's hand to the finger for 3 seconds. Finally, the air is blown from the top and bottom of the machine's entrance, allowing the user to dry when removed from the machine.

Keywords: *Automated hand wash system, biometric hand wash record system, serial communication, biometric data storage by NodeMCU on XAMPP.*

I. Introduction

The bathroom faucet measures over one million bacteria, removing bacteria from the bacteria. If people wash their hands many times a day, the number of sick days and the number of cases per year will be dramatically reduced. In general, instead of coping with more people in this way, more attention should be paid to the hand washing concept to reduce the bacteria. One way to do this is to inspire people to wash their hands, but to make them more time-consuming and appropriate approaches in line with daily routine and speed. Today's technology delivers bacterial anti-bacterial soap, water-based bactericidal and UV-protection systems. However, the best hygiene method is traditional soap, water, and dry hands. Using this knowledge, we can use the existing principles and packages as an improved way to attract users and use them. The features and engineering required for the development of this product are already ready and merged.

The goal of the project is to continue developing the new and improved hand washing methods based on the preliminary research and design of the IQP Handwash Replacement System. The purpose of the equipment is as follows: Placement of equipment on the wall surface, cleaning the hands, such as hot air dryers, cleaning the hands, drying the hands, and placing the user's soap and sensor device to reduce the time required for the wash cycle. The new technology will reach approximately 15 seconds in the dry and dry cycle, and is currently in the process of technological laureate and below the dry cycle. Apply a handheld machine, launch the system, start the Stnther user's wrist from the wrist 3 to 4 seconds, heat the hand, and then wash the 3rd soap. The wrist starts again within 4 seconds and the system starts running the air dryer. This will allow people to wash

and dry

Their hands are so fast that they can do all the machines more efficiently and efficiently in one cycle so they do not have any queues and hard drives. Another purpose of the project is to use the filter system inside the machine. Clean the water before and after use to save energy and save water. Compared to existing methods, the device will be more suitable, efficient, and competitive. These projects aim to provide one-stop, time-saving, and economical equipment that will allow you to clean your hands in order to replace the needs of basins, paper towels and hot air dryers.

II. Methods Currently In Use

The According to control centers and disease prevention, wash your hands with five important steps.
These five steps are:

1. Wash your hands with soap and hot water.
2. Wash your hands for at least 20 seconds and carefully clean your wrists.Wash your hands with water.
3. Store water, but dry it with a hectare.
4. To remove the pipeline, use a disposable towel.

The problem is that this method is not always available, because all sites are unable to clean their hands and the same information. Therefore, the most important thing is to use sandwiches and hot water, washing your hands together and wiping your wrists, then washing your fingers and washing with hot water. The last part should spread and spread quickly in wet areas to prevent smaller colonization. (Rybicki, [38]).

The normal handwashing procedure has five simple steps. Moisten with water, clean with water, remove lime, clean soap and lime and then dry.

Learn more. Under the contract, ordinary people should wash their hands and dry them within 30 seconds and 1 minute, depending on the dry process. One of the leading suppliers with clean hands is the soap used in point 2. The reason why you want to follow the above order is that the user can cut his hand and spray a little. Because the soap itself is too low, there is no water. This section describes the ability of different products to wash the soap and how to clean your hands?

Standard disinfectants are used in public toilets often with iron and alkaline oil. The alkaline plants found in them are mainly potassium hydroxide found in containers of solid sodium hydroxide and water containers. The combination of iron anchors produces fat as fat and produces glycerol. The reactions are shown in the imagebelow. Figure 1. These answers can be used as a spoon, because they reflect chemical substances that combine soil and larvae from the hands of new chemicals.

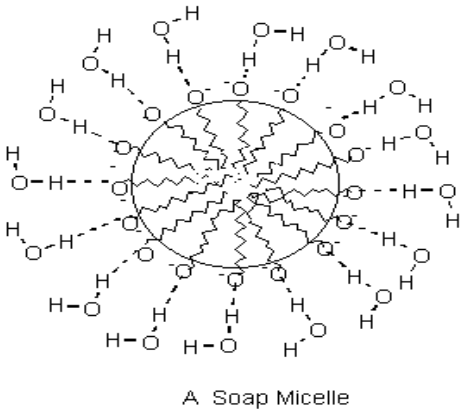

Figure 1 Soap Micelle Created

How can the image look at 1 in the lotion that requires soap, water and a marmalade cream one of the rise and remove power after a long okubhikisana one, of course with hands that are different. Textile homework tape trading technique used. The second photo shows two public forms of public zesepha commercial emafenini available to the public.

Figure 2 common liquid hand soap, Softsoap (left), and common solid bar soap, Dial (right)

Liquid soap, public baths were found in almost every hand to hand and easily to soap and cleaning processes are common. Basic services are used above for employment. But not the best cleaners

Scrub surgery is suitable for her name, which came from surgery. This unique form of surgery before surgery to make sure it is used by the doctors for is sterile, so the patient is compressed to the fore. Special Surgery Name shows N-Duopropenide (Today) and the text (Puente, [36]) According to scrub, it is good for harjojo Cabrera and lasts longer than the other options. Hanting washing machine

N-Duopropenide ammonium ayodeda and formaldehyde (Zentralbl, [45]), this dynamic pair, which kills bacteria and viruses in an assembled device, is to prevent bacteria and viruses from connecting. Development work is part of a new ammonium iodide, and is used four: benzyldimethyldecadecylammonium, benzyldimethyltetradecylammonium and benzyldimethyecadecylammonium (Puente, [36]). This scrub is also included in the 60% isopropyl alcohol, which is usually a liquid hand care agent is usually found on. The bacterial cell is membrane of all things, the effect of dehaidresanal chandacha and the destruction of the virus kyapsula. This effect can determine the 99.9% clearance in each experiment. However, it is roganuharu Dries, but it may be due to infection, every area of skin is dry from the palace. The third supporter of this problem is playing. Imoletara skin hydration can be used to solve problems that cause skin palace abuse. So with other words, it is not only the not but the same amount of money that a regular hand pollutants roganuharu die, but they also tend to feel damp, cold hands can be used as a formal matter

Figure 3 illustration of common surgical scrubs, NDP (left) mentioned above, and Chlorhexidine (right).

In Table 1 and Figure 4 and 5 taken from R. Herruzo-Cabrera's paper titled: Usefulness of an Alcohol Solution of *N*-Duopropenide for the Surgical Antisepsis of the Hands Compared with Hand washing with Iodine-Povidone and Chlorhexidine: Clinical Essay, we can see clear indications of the effectiveness of the NDP scrub.

Study of the Efficiency of Surgical Scrubbing Up with Three Products on Cutaneous Germs (n = 15 healthy volunteers), Expressed as Log CFU/5 Fingertips[a]

	4% Chlorhexidine		7.5% I-pov		2.3% NDP-alc	
Time	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Before washing	4	0.5	4	0.4	3.9	0.4
After washing	<1	—	3.1	0.2	<1	—
+1 h	2	0.3	4.3	0.9	<1	—
+3 h	2.7	0.6	4.5	1.2	<1	—

Bivariant analysis

1. Time	
"Before"	$P > 0.05$ (NS)
"After"	I-pov > (**) chlorhexidine (NS) NDP-alc
+ 1 h	I-pov > (**) chlorhexidine > (**) NDP-alc
+ 3 h	I-pov > (**) chlorhexidine > (**) NDP-alc
2. Products	
I-pov	Before > (**) after
	+ 3 h > (*) after
	+ 1 h > (*) after
	Before (NS) + 1 h (NS) + 3 h
Chlorhexidine	Before > (**) + 3 h > (**) +1 h > (**) after
NDP-alc	Before > (**) + 3 h (NS) +1 h (NS) after

[a] I-pov, iodine–povidone; NDP-alc, *N*-duopropenide in alcohol; NS, no significant differences.
* $P < 0.05$.
** $P < 0.01$.

Table 1: Study of the Efficiency of Surgical Scrubbing Up.

The above table shows how the three surgical scrubs compared to each other after the in vivo tests against cutaneous germs. The following two figures, Figure 4 and 5 show the test results. After analyzing both the table and figures we can clearly see that the NDP scrub is the best scrub of those that were analyzed. In comparison to the other scrubs the NDP killed off the germs and kept them off hour after hour, whereas the other scrubs, especially the 7.5% I-POV saw returns of the germs in the first time frame and actually some saw increases in the return from the original state.

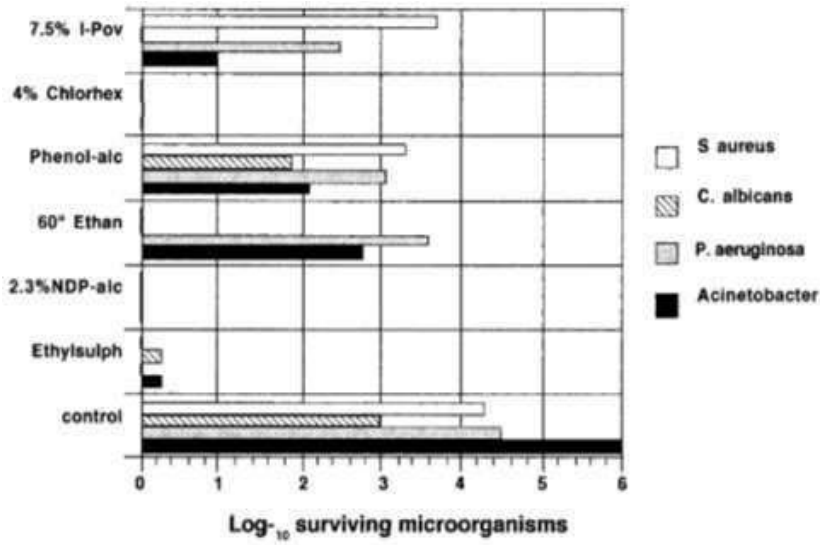

Figure 4 illustrated In vitro germicide effect of six products

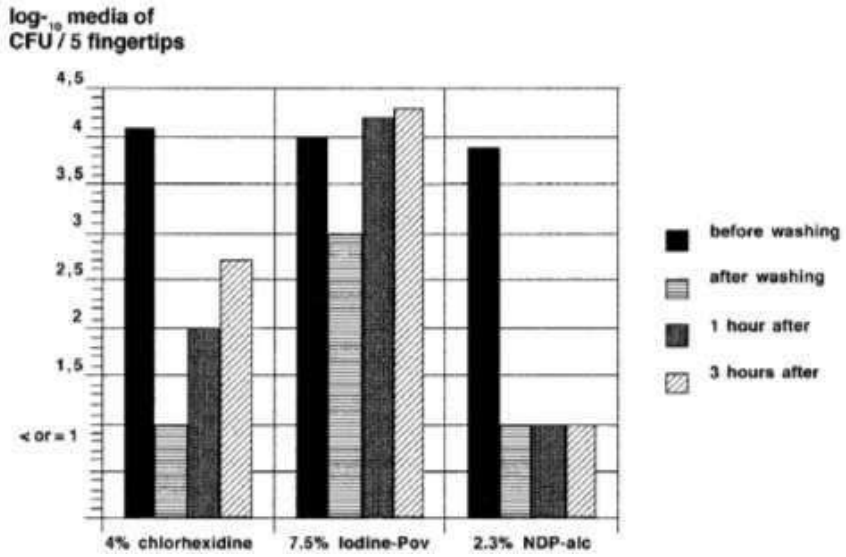

Figure 5 Study of the efficiency of surgical scrubbing on cutaneous germs

Figure 4 is an illustration of the killing capabilities of six cleansers in the test against common germs found on hands. As can be seen the N-Duopropenide solution has little to no logarithmic growth, indicating the best killing. In Figure 5, the same N-Duopropenide solution is compared to the other two cleansing solutions found in Table 1 by growth of CFU (colony

forming units) over time and again the NDP reiterates the fact that it is a better cleansing solution. For these reasons and those previously mentioned about this scrub, hospitals and doctors chose this scrub because they need the best when it comes to protecting their patients.

Although they may not be on the same level of germ killing as the previously discussed soaps, gentle soaps are necessary for certain age groups, such as very young and the elderly. The gentle soaps provide a degree of cleansing while also ensuring that it moisturizes and nourishes the delicate skin of the young and old alike. The benefits behind this particular soap are that it is for the most part all natural and chemical free. An illustration of common organic baby soap can be seen in Figure 6.

Figure 6 shows bare organics, organic baby soap with no scent.

	Cost	Killing Germs Ability	Time Kill Germs	Accessibility	Effects On Skin	Totals
Regular Soap	3	7	5	2	3	20
Surgical Scrub	9	1	2	8	2	22
Gentle Soap	4	7	6	3	2	22
Hardcore Dirt Soap	6	5	5	4	5	25

Table 2: Comparison of the current varieties of soap (Scale 1-most effective -> 10 least effective)

III. Conclusion

Besides obvious improvements technologically, which would significantly increase the budget of the project, there are several simple design changes that could be implemented on the All-In-One Hand-Washing station in order to improve production. One last minute improvement the group was able to make in order to improve the flow rate of the water was to raise the height of the reservoir below. This allowed for over six inches of tubing to be removed, therefore increasing the flow rate of the water by approximately 25 gallons per hour. This improved the quality of the prototype, making it more similar to the flow rate ifthe housing was attached to the plumbing of a sink as opposed to a water pump. This allowed the group to run improved tests of the prototype.

Air flow rate is another factor that could be improved upon in a future design. Ideally, the group would have liked to match the flow rates of the Dyson AirBlade illustrated in Figure

15 but this was not within budget. Instead the group used a similar method as the water pump in order to produce a blow-drying effect. In order to remain within budget, the group only purchased one air pump. Ideally, two would have been used to mimic the AirBlade's design to strip the water off both sides of the user's hands. The slit in the pipe only increased the air flow rate by a factor of 1.325 because the group used a knife to cut the slit in the tube. Had the slit in the tube been made smaller, the flow rate of the air could have been increased to over two times that of the pump itself. These several factors could be used to improve a future model of the All- In-One Hand-Washing station.

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