SOAP FUMES AND PITS REMOVING PROCESS

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ABSTRACT

This process helps in removing fumes and pits from soap after solidifying soap. In manufactures of Glycerin based soaps (hot & cold process) there they were facing problem while pouring soap's liquid in mold that fumes were coming on the surface due to which fume pits were generated. So afterwards, labors have to remove it with the help of cutter and it becomes more time consuming plus gives less accuracy and more labor wages

Keyword: -*.for all soap manufacturing industries*

1. INTRODUCTION

Soaps are widely used in our society. Soaps are the product of the reaction between a fat and sodium hydroxide: 1) Fat + 3NaOH → glycerin + 3soap 2) 3CH2OCR + 3NaOH → 3CH2OH + NaOCR This reaction is exothermic, and progresses quickly and efficiently at around 125 degree inside an autoclave type reactor. The most common fats and oils used are, coconut oil, and palm kernel oil. Different oils produce soaps of varying hardness, odor and lathering, so the ratios of the oils used are closely monitored to produce a blend with the most desirable characteristics for the most reasonable cost.

However, pure soap is hard and easily oxidized, so various additives are added to correct this and to make a more aesthetically pleasing product. The first such "additive" is glycerin, which is produced in the saponification reaction. Glycerin makes the soap smoother and softer than pure soap. However, it is also much more valuable than soap itself, so only a minimum of glycerin is left in the soap and the remainder is extracted, purified and sold. The glycerin is extracted from the soap with lye- a brine solution that is added to the soap at the saponification stage. Wet soap is soluble in weak brine, but separates out as the electrolyte concentration increases. Glycerin, on the other hand, is highly soluble in brine. Wet soap thus has quite a low electrolyte concentration and is about 30% water (which makes it easily pump able at 70oC). To remove the glycerin, more electrolytes are added, causing the the wet soap to separate into two layers: crude soap and a brine/glycerin mixture known as spent lye, neutral lye or sweet waters.

1.1 Saponification Equation:

1) (CH2)14CH3 + 3NaOH → CH2OH + CH3(CH2)14CO3Na Usually, saponification is a process by which triglycerides are reacted with sodium or potassium hydroxide (lye) to produce glycerol and a fatty acid salt, called „soap". The triglycerides are most often animal fats or vegetable oils. When sodium hydroxide is used is used, a hard soap is produced. Using potassium hydroxide result in a soft soap. The chemical reaction between any fat and sodium hydroxide is a saponification reaction. Triglyceride + sodium hydroxide → glycerol + 3soap molecules

2) Soaps are the sodium and potassium salts of the long chain carboxylic acid. A soap molecule consists of a long hydrocarbon chain with a carboxylic acid on one end which is ionic bonded to metal ion usually a sodium or potassium. A soap has a large non-ionic hydrocarbon group and a ionic group COO-Na +. Examples of soaps: - Sodium stearate (chemical formula: C17H35COO-Na+), Sodium palmitate (chemical formula: C15H31COO-Na+), Sodium oleate (chemical formula: C17H33COO-Na+).

1.2 Standard Methods for Preparation of Soap:

Soap is produced industrially in four basic steps. This are lists different steps because in the industrial processes described each of these is done over several process steps, but in principle it could be done in the three steps outlined

here. Step 1 - Saponification a mixture of tallow (animal fat) and coconut oil is mixed with sodium hydroxide and heated. The soap produced is the salt of a long chain carboxylic acid. Step 2 - Glycerin removal Glycerin is more valuable than soap, so most of it is removed. Some is left in the soap to help make it soft and smooth. Soap is not very soluble in salt water, whereas glycerin is, so salt is added to the wet soap causing it to separate out into soap and glycerin in salt water. Step 3 - Soap purification any remaining sodium hydroxide is neutralized with a weak acid such as citric acid and two thirds of the remaining water removed. Step 4 - Finishing Additives such as preservatives, color and perfume are added and mixed in with the soap and it is shaped into bars for sale.

1.3 Steps used to manufacturing soap in industry:

1. Prepare the additional ingredients you plan to add to your herbal soap. Grind the dried herbs or flowers with a mortar and pestle. Boil water, take it off the heat. The dried herbs and flowers of your choice steep for 15 minutes. This step is optional in how to make herbal soap. 2. Cut the glycerin soap into cubes or slivers for easy melting. You can also grate it. 3. Melt the glycerin soap, enough for one bar. Use a double boiler to melt your soap. Stir gently. Melt the soap. 4. Add your additional ingredients and stir 5. Pour the soap mixture into a soap mold. 6. Let the soap harden at room temperature for about 30 minutes or until the surface of the soap becomes slightly firm. 7. Put the soap molds under low temperature for about 20 minutes so it is firm and cool. You do not need to use the freezer but this speeds the process for making herbal soaps. 8. Carefully remove the soap from the mold and leave it on a towel to complete the drying process. This should take few hours.

2. MACHINE USED IN INDUSTRY:-

1) Gel filling machine- It is used to filling the gel of aloe Vera product. It is used manually shown in fig.

Fig.2.1 Gel filling machine

2) Liquid filling machine- It is used to fill the liquid form of shampoo, soap etc. It is used manually as shown in fig.

Fig.2.2 Liquid filling machine

3) Bubble bath - for melting and heating soap liquid , it is used to give heat to soaps liquid indirectly without help of fire flames.

Fig.2.3 Bubble bath machine

4) Soap manufacturing tank- here the soap is manufactured here hot process is done

Fig.2.4 Soap manufacturing tank

5) Tube filling, Sealing and crimping machine- in this machine face pack, shampoo, etc. are filled and sealed.

Fig.2.5 Tube filling

6) Mixing machine – it is used to mix the liquids while manufacturing.

Fig.2.6 mixing machine

7) Cold process tank- in this tank soap and other liquids are mixed.

Fig.2.7 cold process tank

8) Stirrer machine- it is used for mixing liquids while they are in tank for hot process

Fig.2.8 stirrer machine

9) Molds- it is used to pour soaps liquid state in it and after solidifying we will get solid soap.

Fig.2.9 different sizes molds

3. PROBLEM OCCUR DURING THE PROCESS:

The company during production, face a problem of bubbles which forms on the upper surface of soaps while pouring into molds. Bubbles are settled by sprinkling ethanol over the soaps instantly while at the time of pouring. But fumes and pits stays and they have to remove it by cutting the edge of every single soap which is very time consuming & it's not so accurate & also labor cost increases. Since their major production is into exports and mainly transparent soaps they have to concentrate more on Aesthetic look. So, they need to get a solution of that problem.

Fig.3.1 Fumes on soap

4. SOLUTION OF THIS PROBLEM OCCUR DURING THE PROCESS:

4.1 Soap Fumes & Pits Removing Machine

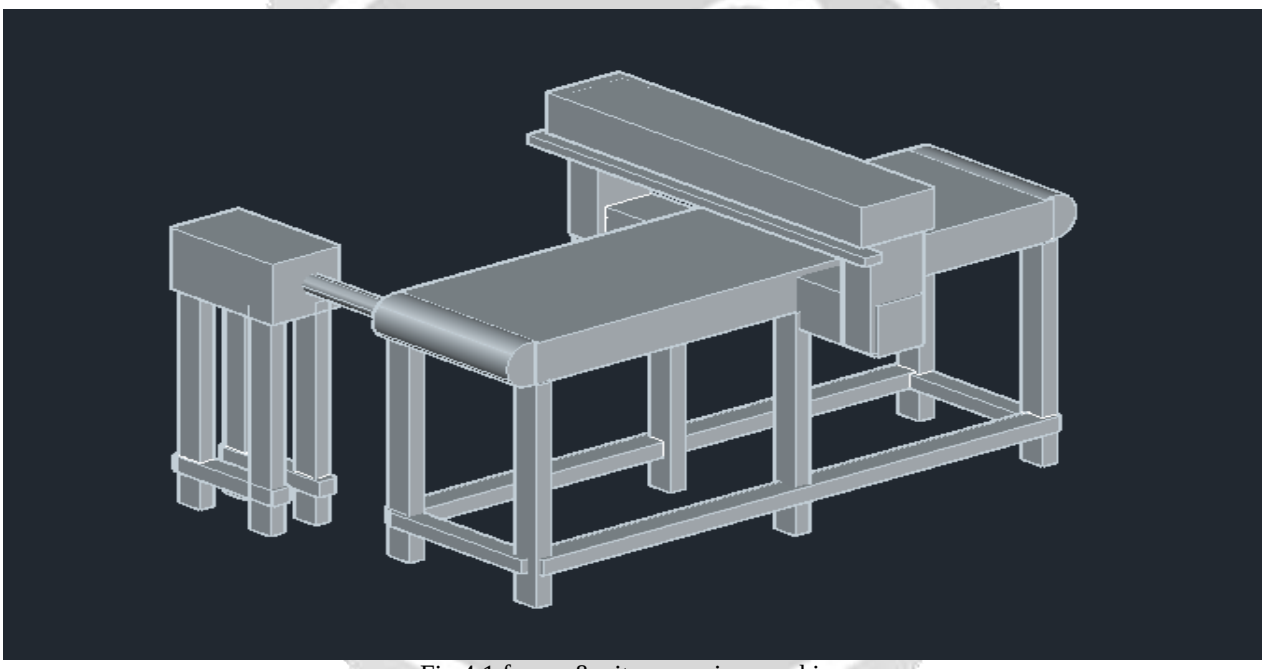

Fig.4.1 fumes & pits removing machine

4.2 Working Principle:

The soap is fixed on aluminum plate and plate is fixed on conveyor belt the cutting tool is held properly in tool holder and due to rotary motion conveyor belt goes in forward direction and soaps upper 1 to 2 mm layer is cutted. Here the soaps layer is cutted during forward motion of conveyor belt.

4.3 Parts Used in Machine:

1) Cutter

Fig.4.3.1 cutter

2) Conveyor

Fig.4.3.2 conveyor

3) Tray

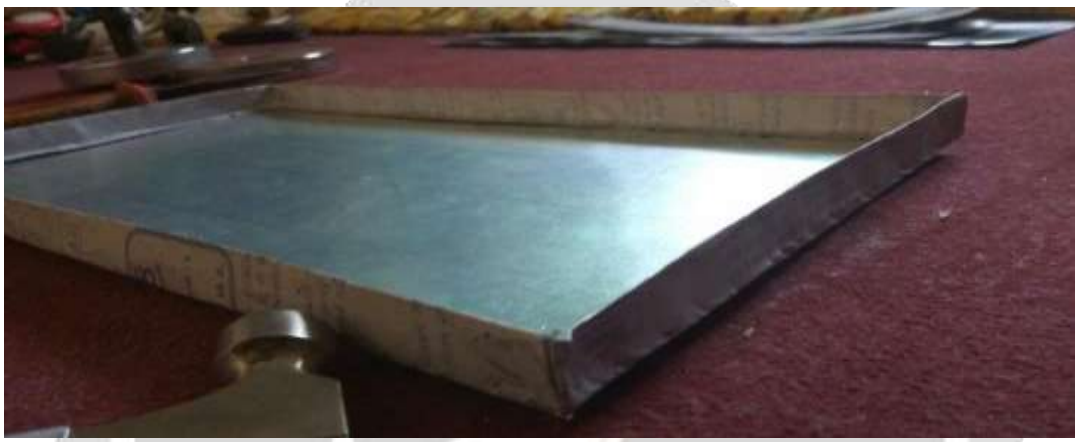

Fig.4.3.3 Tray

4.4 Advantages of this Machine:

This process saves time. Minimize labor cost. Increase accuracy. Increase efficiency. Easy to handle. Easy to operate. Thus increases profit margin of company

4.5 Application of this Machine:

Used to remove 1mm to 2mm layer of soap having fume‟s and pit‟s on its surface accurately. Used for fast and speedy material removal process.

5. CONCLUSION

With the help of this machine, we can remove 1mm to 2mm layer of soap having fumes and pits occurs during the manufacturing of soaps. By use of this machine, minimize the labor cost and increase the profit margin.

6. REFERENCES

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