

Portable Milking Machine for Small Farmers

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Abstract - The objective of this study is to provide the automation in the dairy farm. At present the extraction of modern milking machine is done by applying the high pressure systematically to the outward of the cup. It leads to teat pain and teat disease due to the continuous extraction. Moreover, there is no automation for monitoring milk level in the container also overflow identification of milk from the container. Hence in this work, the proposed system is designed to handle the absence of the previous system which works based on the pulse method.

Keywords: Flow sensor, Floating switch.

I.INTRODUCTION

Now a days milking machines are designed to extracting milk from cow by applying higher pressure (atmospheric) periodically to the exterior of the cup and causing the cup to collapse towards the teat. After the extraction of milk it convey to the suitable container. It works under the principle of extraction of milk from the cow by vacuum. In the existing system there is no automation to extract the milk from the cow teat and there is no overflow identification. In ordinary Milking machines, it creates teat pain and cause teat diseases due to continuous extraction of milk.

In the proposed portable milking machine, pulse method is used to extract the milk from the cow's stem which is the produces one type of massaging technique to the cow's teat and it doesn't create any pain to the stem, which avoids the teat disease.

The proposed system reduces the workload of the dairy farmers who holding off cows in their households. The system is designed to be handle by the illiterate people also. It mainly attracts the consumer by the low cost with the good quality. Furthermore, it can satisfy the consumer by its additional features of automation. On top of that, it does not occupy that much of space the reason for this is it is designed as portable one. It also helps to avoid the intermediates in the field who earn more benefits than the cow holder. Due to this, the intermediates are getting neglected and cow holders earn more benefits before than that. This machine can be shift to anywhere owing to the fact that easy to carry.

II. TOOLS AND TECHNIQUES

In this lore, the designed machine works on the impulse method, which involves one type of massaging technique. This massaging technique helps to prevent from teat diseases and teat pain in the stem of the cow which can be caused by the direct suction. Normally, the teat diseases occurs due to the over sucking of milk when there is unavailability of milk in the stem of the cow. But here, the machine is designed to stop will automatically if the milk is not available in the stem of the cow. Moreover, the milk quantity is measured and displayed with the help of LCD.

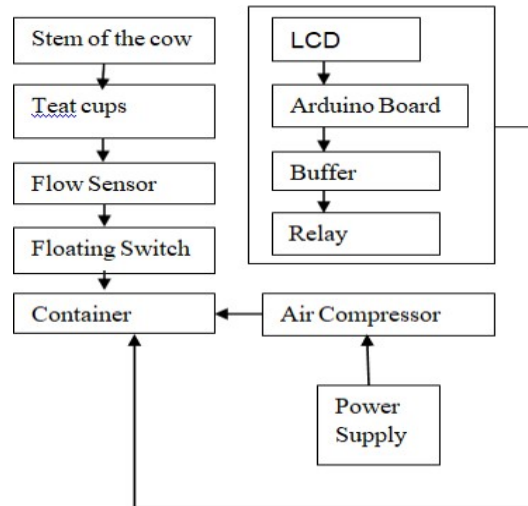


Figure: Block diagram of proposed system

Firstly, the cup of the designed machine connected to the stem of the cow. The flow sensor is connected with the tube which is placed at the end of the teat cup. Inside the flow sensor, there is a turbine which works under the principle of magnetic pick-up and it rotates when the milk is flowing in the tube from the stem of the cow to the container. In addition to this, the turbine in the flow sensor helps to stop the machine if the milk is not flowing in the tube when the milk is not available in the stem. Furthermore, the floating switch is connected to the end of the tube which is placed inside the container. This switch is used to indicate the overflowing of milk in the container. In between the flow sensor and the floating switch, there is a casket which contains the arduino board, LCD, buffer and relay.

Here, the arduino is used to take the fastest output other than raspberry pi and MSP430LaunchPad. Then the LCD is used to display the quantity of milk in the container which uses a liquid crystal to produce a visible image in the form of numbers and letters. The buffer is used to create alarm if the milk is filled in the container otherwise the milk is not available in the stem of the cow. Normally the relay is used to provide the delay function. Here, the relay supports to stop the machine automatically if the milk is not available in the stem of the cow within a minute.

Subsequently the air compressor is connected between the container and the power supply which act like a vacuum as well as it helps to suck the milk in the stem of the cow which leads to prevent from the teat diseases and teat pain in the stem. On top of that, the flowing of milk in the tube is equal to the cross –sectional area (A) of the tube in a volumetric flow meter and the velocity (V) of the flowing milk from the stem of the cow is given by

$$Q=A*V$$

In like manner, the piston pump is existed inside the air compressor which works under the limit of 15 L/Min together with the piston pump vacuum pressure in the limit of 0.60Kpa. On top of that, the designed machine is equipped with plastic shell, safe and convenient to use.

III. RESULT

The village people or rural area people who are having cows, goats, buffaloes in their farms or houses, and whose livelihood depend on the earnings of the dairy products is increasing rapidly .By using this prototype, they can make profit from dairy product effortlessly and can sell the product directly to customers or milk corporate societies with good profit.

IV. CONCLUSION

This method saves more time and efforts. Without spooking the cow, portable milking machine helps to extract fresh milk every day. The machine gets turned off when the milk overflows or stem is empty. So it creates a mystified situation to the farmers to identify whether the milk overflows or stem is empty.

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