

Literature Review on Design & Fabrication of Oil Measuring & Dispensing Machine

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Abstract

Liquid dispenser machine is commonly found in our daily life in different places like offices, bus stands, railway stations, petrol pumps. In this thesis we are going to present a pneumatic operated oil dispenser machine. Using a pneumatic system interface, we can effectively increase operator accuracy, reduce training time and improve overall efficiencies, thus keeping cost down a properly designed pneumatic system interface can improve overall accuracy. Present liquid dispenser machine available in industries are costly, complex and hard in design and fabrication. Main requirement from this machine is its metering or measuring quality. Accuracy of measuring is very less in various machines. Hence, the basic theme behind this research is to improve these disadvantages of oil dispenser machine. The oil dispenser machine presently available is based on practice and past experience of the employer in his working field and also, its efficiency declines at a greater rate after a period of time. By surveying the present machines and comparing their present limitations, new model will be fabricated so that designs data can be obtained to formulate experimental data based model for this process. The design of model will be so simple that it can be adopted easily by small industries & automobile workshop. Easy technology will help to reduce metering problem. The present work reports the design & fabrication of oil measuring & dispensing machine which is used in small industries & automobile workshop.

Keywords: Oil Dispenser Machine, Relays, Solenoid Valve, Pneumatic Actuator & Air Compressor

I. INTRODUCTION

Liquid dispenser machine is widely used in all industries like liquid filling machine, bottle filling machine, paint industry, etc. Liquid dispenser machine is commonly found in our daily life in different places like offices, bus stands, railway stations, petrol pump. In our day to day life, we come across the measurement of oil for our two/four wheeler. Many a times we have come across the situation where the quantity of Oil dispense to the Oil tank will not accurate. As the measurement of oil is done by standard oil can and oil is dispensing from the barrel by rotary hand pump which does not measure the oil. I have decided to do this project which will measure the oil and dispense the oil from the Oil barrel accurately.

As the rate of the oil in standard packing is 30-35% more than that of oil of same grade in 210 liter barrel. But in present situation use of barrel oil in garages is very less, because of hand operated rotary dispenser which dispense the oil only and it does not measure the oil. Also there is wastage of oil by using this conventional oil hand operated rotary pump. Due to this several disadvantages garages are not using the barrel oil which is 30 to 35% less in cost as compare to standard packed oil in small packing of same grade. In present situation consumer has to pay 30-35% more money of same grade oil by using the standard packing oil.

II. LITERATURE REVIEW

- 1) Rajesh G. Khatod, Chadrashekhar N. Sakhale, "Design and Fabrications of Liquid Dispensing machine using Automatic control of Engg. Industry", IJITEE ISSN: 2278-3075, Volume-1, Issue-5, October 2012, designed Liquid dispensing machine for paint industry. Main requirement of this machine is metering, mixing and dispensing. Metering is main purpose to use device of high quality like solenoid valve, programmable syringe etc. It uses Micro controller AT89C52 with the help of programming VB, .net or MATLAB. It is touch screen operated dispensing machine.
- 2) S.R.Bhagyashree, Anitharaghavendra, Suprajapranesh, "Microcontroller Based oil dispensing Unit" IJEEDC, ISSN: 2320-2084, Volume-1, Issue-10, December-2013. Designed a unit to measure with accuracy of 99% to dispense any fluid, using oil pump and microcontroller. The system is cheaper and it is very accurate compared to other dispensing unit which use the sensor for measuring oil flow and initial cost of those sensors are very high. It is a portable unit and it is not affected by climatic condition.
- 3) Manouchehr Hashemi, 2006, "MODELING OF THE ROTARY-SCREW-DRIVEN DISPENSING PROCESS", M.Sc. Thesis, University of Saskatchewan, Saskatoon, Canada designed Fluid dispensing is a process used to deliver fluid materials to targets such as substrates, boards, or work-pieces in a controlled manner. This process has been widely used in electronic packaging industry for such processes as integrated circuit encapsulation (ICE) and surface mount technology

(SMT). The most important parameters needed to be controlled in this process are the flow rate of fluid dispensed and the profile of fluid formed on a target. The modelling and control of such a process involves different engineering disciplines including mechanical, control, software/hardware, and material science.

- 4) Zhiqi Ge, Guiling Deng, "Design and modeling of jet dispenser based on giant magnetostrictive material" Electronic Packaging Technology & High Density Packaging, 2009. ICEPT-HDP '09. International Conference on Date of Conference: 10-13 Aug. 2009, E-ISBN: 978-1-4244-4659-9. Page(s): 974 – 979, presented a jet dispensing technology is a non-contact method and has the following advantages: (1) it has high flow rate, high dispensing frequency; (2) This method needn't z-axis motion; (3) it has high dispensing accuracy and smaller wet area; (4) Needle bending and Chip surface damage situation does not arise. In this paper, a non-contact jet dispensing device based on giant magnetostrictive material. The giant magnetostrictive material (GMM) is a new type of function material with giant strain, high response speed, high power density and great output force. For this jet dispenser, the GMA (Giant Magnetostrictive Actuator) provides the driving force of dispensing. The structure and principle of jet dispenser with a displacement amplifying mechanism are presented.

III. OBJECTIVE

The main aim of this project is to overcome the traditional method.

- To reduce human effort.
- To increase the capacity of oil dispensing machine.
- To reduce the time of oil dispensing machine.
- To design a oil measuring & dispensing machine for workshops, automobile garages and industry.
- Oil measuring & dispensing machine has been developed using pneumatic system, solenoid valve & non return valve etc.
- It has wider application in automobile garages, workshop and industry.
- Our aim is to use of barrel oil in big to small garages so that consumer can get oil in low rate as compared to standard small packing tin rate.
- After identification of low cost oil measuring & dispensing machine, the performance of the machines will be tested for commercial applications. If performance is found satisfactory, the machines would be used for commercial applications
- To develop a low cost machine this can be used by automobile garages & workshop and industry.

IV. CONCEPT

Introducing low cost automation was to overcome problems with the current manual traditional method. The concept of the work is,

- 1) Observe the manual methods to identify the important process variables.
- 2) Quantify the important method.
- 3) Develop a model automation system which could control over all of the process.
- 4) Investigate all areas of automated forming.
- 5) Produce a specification for a low cost automated system.

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