

Design and Fabrication of Optimizer Machine

S. Umamaheswari, Ramalatha Marimuthu

Abstract-Medicinal machines are at the heart of poultry industry. The primary goal of the project is the fabrication a tailor made automated medicine mixing machine , which is the lighter, automated to keep it simple but effective, and to provide a homogeneous mixing environment to mix the medicine in the shortest time. chickens require nutritious food for required weight gain . Along with the food , medicine for immunity is sprayed using the medicine . The machine has the capability to mix together up to six liquids. The market requires an optimized mixing machine. The mechanical, electronics and electrical aspect of the project is completed, with the design and fabrication of a suitable impeller , mixing tank , storage tank and the frame of support. suitable material was selected base on machinability, weldability and corrosion resistance. FEA analysis was conducted to determine total deformation, maximum principles stress and strain, maximum shear stress and strain. compared to the conventional models, reduced the weight, stress intensities and deformation as a result of applied load .

Key Words: PLC, MCB, CONDUCTOR, SMPS, TRANSFORMER, RELAY.

I. INTRODUCTION

Poultry industry is huge lucrative and is gaining momentum presently. Throughout the country, there exist a number of chicken farms. The chicken farms contain from as small as 1000 chickens to 100,000 chickens or even more. Each chicken cannot be taken care of individually, as it is labor intensive and practically not feasible. Hence, poultry feed machines are sought after. For chicken to grow healthy and fast, it requires immune power, and proteins. Proteins include wheat, corn, maize, dry fish and so on, which is ground finely and is mixed with medicinal additives. The medicinal additives boosts the immune power of the chicken, keeps it healthy. The food is simply spread over a vast area filled with chickens. The chickens then peck and eat the food. The most important process here is the production of the medicine and mixing of mixing medicine with the chicken food. The final product however must also contain adequate moisture content, so that he chicken will be able to peck it, freeing itself from digestive problems.

The project deals with the medicinal mixing part in the chicken feed mill. The objectives of the work are decided and fixing in fulfilling them. A literature review is conducted to determine the scope of the improvisation,

lacunas in conventional system, consolidate the work researchers to identify their problems and what they had not considered in their research. On completion of the literature review, the methodology adopted by us in conducting the proceedings of the project is drafted.

II. RELATED WORK

Material selection is to be given the prime importance(1) The important considerations before the material includes the corrosion resistance of the material against the fluids, machinability, weldability and load carrying capacity. The austenitic structure of stainless steel

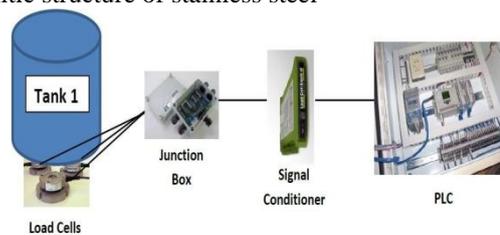


Figure .1.Strain Levels

is preferred as it is non- magnetic due to the presence of nickel, and this hence helps avoid magnetic interference with electronics and electrical equipment around the step-up(2). It is highly ductile and suitable for machining(9), which is not possible in ferritic and martensitic structures. martensitic structures provide low ductility while ferritic structures provide poor machining due to high carbon content. For the impeller to cause an effective dispersion of the immiscible fluids, the tank diameter to impeller diameter, clearance ratio from the bottom of the tank least power consuming height to diameter of vessel ratio, baffle calculations impeller width, impeller blade thickness, shell thickness, motor power are all to be taken into consideration. Motor power, Reynolds number, motor speed are correlated to two important parameters, flow number and power number, which defines the capacity or the mixing vessel(3) The major drawbacks associated with the conventional system is that it lacks a coherence in the integration of the various design parameters with other conditions such as material selection, space requirement and weight. Propeller agitators/ axial flow impellers are commonly made of three blades and attached to the main shaft. In these type of impellers, the liquid flows towards the tank ends and then undergo a circular rotation and reach the impeller again the axial direction(4).The 2xradius is directly proportional to the rate at which it operates. The material chosen for the proposed (8) medicinal spray machine is stainless steel (316 Grade). Other commonly used materials in food processing industries include polyethylene, polypropylene,

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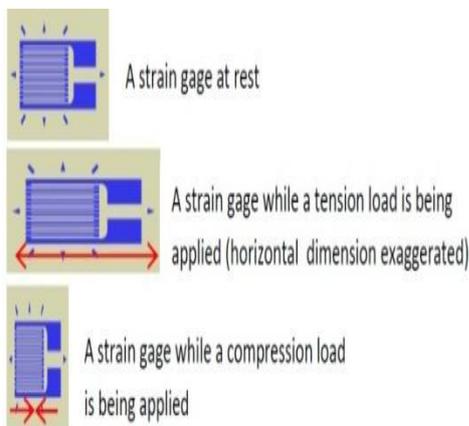
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kynar, polyvinylidene, telfon. Plastics are but good vibration resisting elements, but lack rigidity, corrosion resistance. They are cheaper and used in processes not requiring corrosion control.(6) The austenitic structure of stainless steel is preferred as it is non-magnetic due to the presence of nickel, and this hence helps avoid magnetic interference with electronics and electrical equipment around the set-up(7).



III. LOAD CELL

A strain gauge will be inside the load cell and that will find out the changes. Load cell and strain gauge are linked.



*Tension causes the gage to lengthen thus increasing its resistance;
compression shortens the gage, decreasing its resistance.*

Figure.2. Weighing of tank

IV. EXPERIMENTAL RESULT FOR SIMATIC S7-1200 – THE MODULAR MICRO CONTROLLER

While comparing this with other microcontrollers it provides very good performance in terms of speed.

Smart display of SIMATIC plays a very role. Many complicated applications are possible with the levers present in SIMTAC.

Benefits of SIMITAC:

1. It can be easily upgraded.
2. Transferring data to other networks are made easier here.
3. Power consumption is low.

V. DESIGN

Since to do different applications various versions are developed which needs different voltage inputs..

- 2 pulse outputs (PTO) with a frequency of up to 100 kHz.
- Pulse-width modulated outputs (PWM) with a frequency of up to 100 kHz.
- Integrated Ethernet interface (TCP/IP native, ISO-on-TCP)
- Expansion by additional communication interfaces, e.g. RS485 or RS232.
- Optional memory expansion

VI. VT100

A clean and flat surface should be selected in such a way to get accurate output. If it is placed at certain level will facilitate the user.

VII. CONCLUSION

The design and fabrication was successfully completed within the speculated constraints and requirements. The finish of the inner diameter was carefully fine-tuned in the mixer tank as well as in the storage tank. The parameter for power input through the different ratio were calculated. With this, completes the second phase of the project of having finished the mechanical part design and fabrication.

The project deal with the integration with load cell, microcontroller, weighing controller, PLC, MCB, relay bank, motor, pumps. The selection, integration and programming will next place during of the phase of the project. Presently PLC controller is in place, which is huge and hence a micro controller will be replacing it and it will feature the ability to control multiple machine at once. Also a new sensor to detect complete emulsion is put in place.

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