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### “DESIGN AND MODELING OF PVC PLASTIC WRAPPING MACHINE ON S.S.SHEET”

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#### ABSTRACT

Nowadays, technology development demands of time and energy in all fields in order to create a product. That can compete in the global market. Breakthrough innovations are needed to survive in the global market. Time management and quality are must be required in all industry. We all know that PVC wrapping on S.S. sheet for dairy machinery. Wrapping is widely used in many industries, on such example of IDMC Limited. PVC is resistant to weathering, light weight, chemical reaction and corrosion. It is therefore the preferred choice for many different long-life and outdoor products. Also it is know that sheet metal has sharp edge which may tear off the skin while working on it. Hence, to avoid such kind of situation. We design PVC wrapping machine on S.S. sheet.

**Keyword:** Fabrication, modeling, PVC plastic, machine

#### I. INTRODUCTION

During company visit I found that the different operation is carried for manufacturing the BMC (BULK MILK CHILEER). I did observation in company unit making different storage tank and this tanks are required S.S sheet. Before using the S.S sheet they did wrapping on S.S Sheet. For this wrapping they are using 6-7 labor and 8 hours' time (1 shift). I analysis this and finally decided to make useful machine for wrapping.

#### II. OBJECTIVES

Here is the concept modeling machine for pvc plastic wrapping on ss sheet. With the use of this machine there where we obtain better finishing , proper attachment and less tendency of remaining air (bubbles) In company there is almost 6 to 7 peoples are required for “Pvc wrapping on s.s sheet” by manual method. With the use of this machine there is only 3 peoples can do the same work with better results. Also there is required time for this process is almost 8-8:30 hours by manually method (company's methods).

But with the help of our machine there is only 2-3 hours is enough for the same process Analysis is compulsory for better results and proper guidance and the main thing is to justify our concept modeling with the help of design and analysis we can find out our faults and there proper solutions. With the use of this machine there where we obtain better finishing, proper attachment and less tendency of remaining air (bubbles). In company there is almost 6 to 7 peoples are

required for “PVC” wrapping on SS sheet” by manually method (company's method). With the use of this machine there is only 3 peoples can do the same work with better results. Also there is required time for this process is almost 7-8 hours by manually method (company's methods). But with the help of our machine there is only 2-3 hours is enough for the same process.

### III. LITERATURE SURVEY

Victor Manuel Quinones, Horizon Peak, San Antonio studied on method for Wrapping a steel coil applies to wrapping a coiled material, particularly sheets of Steel, aluminum and other metals which have been wound into a coil, in paper or a polymeric packaging material which contains a volatile corrosion inhibitor for Storage or transport. The wrapper includes a cover piece, folded and Sealed along one Side, leaving two open Sides, and a base piece. A first edge of the open Side is secured to the coil by adhesive tape, and the Second edge is wrapped around the coil to overlap the first edge and also Secured by tape. The two peaked corners of the cover are folded down over the top of the cover and secured by adhesive tape. The present invention relates to a method for wrapping rolled material, particularly a roll or coil of metal, Such as Steel, aluminum, or other metal.

George William Berry, Far Hills and et. al. studied on composite pipe wrap material for underground pipe including a fiberglass pipe wrap material bonded to an outer protective pipe wrap material by a layer of adhesive which partially penetrates into the fiberglass wrap. The fiberglass wrap is preferably in the form of a mat. The composite pipe wrap material is adapted to position a portion of the fiber glass mat in approximately the outer one-third of the thickness of a metallic pipe protective coating when the material is wrapped metal pipe. Also disclosed is a method or protecting a metallic pipe by forming the composite pipe wrap material, coating the pipe with a protective coating and wrapping the pipe to position a portion of the fiber glass wrap in approximately the outer one-third of the thickness of the coating. Further disclosed is a method of positioning a portion of fiber glass pipe wrap material in approximately the outer one-third of the thick ness of a protective coating on a metallic pipe.

Edward N. Biel, Munster, Ind. Studied on a cling wrap plastic film is provided comprising a mixture of high pressure-low density poly ethylene (HPLDPE) and low pressure-low density polyethylene (LPLDPE), and a cling agent in an amount between about 0.5 and about 2.5 wt.% of the film. The HPLDPE has melt index between about 0.5 and about 7.0 gms/10 minutes, and density below about 0.932 s/cm<sup>3</sup>. The LPLDPE has melt index between about 0.5 and about 4.0 gms/10 minutes, and entity below about 0.932 gms/cm<sup>3</sup>. For the single layer embodiment the LPLDPE is present in quantity between about 5 and about 16 wt. % of the LPLDPE plus HPLDPE total weight. For the multiple layer embodiments the LPLDPE is present in quantity between about 5 and about 13 t. % of the LPLDPE plus HPLDPE total weight. The film thickness is between about 0.3 and about .5 mils.

The film of this invention may be in the form of a single layer with LPLDPE and HPLDPE substantially uniformly distributed through the entire film. Alternatively, the film may be in the form of multiple layers with the LPLDPE and HPLDPE substantially uniformly distributed through at least one layer. By way of example, the film may comprise three layers in which the polyethylene content of the outer layers is only HPLDPE and the middle layer has LPLDPE and HPLDPE substantially uniformly distributed there through.

#### IV. COMPONENTS

##### 4.1 Roller

Here mainly two roller are use Supporting roller and Pressing roller. The supporting roller to reduce angle of contact. Its main benefit is to make smooth operation and less force required for wrapping. Pressing roller to press the wrapped PVC foil to reduce the air bubbles and provide good finishing on S.S.Sheet.



Fig. 1 Roller

##### 4.2 Wrapping coil

Wrapping coil is in roll form and its used to wrapped s.s sheet



Fig. 2 Wrapping coil

### 4.3 Wheel

In this model used 4 wheel its can resist 200 kg weight and can run smoothly on any surface and its benefits are Less noisy , High performance , Good rubber material can resist up to 100° C temperature.



Fig.3 Wheel

## V. DESIGN

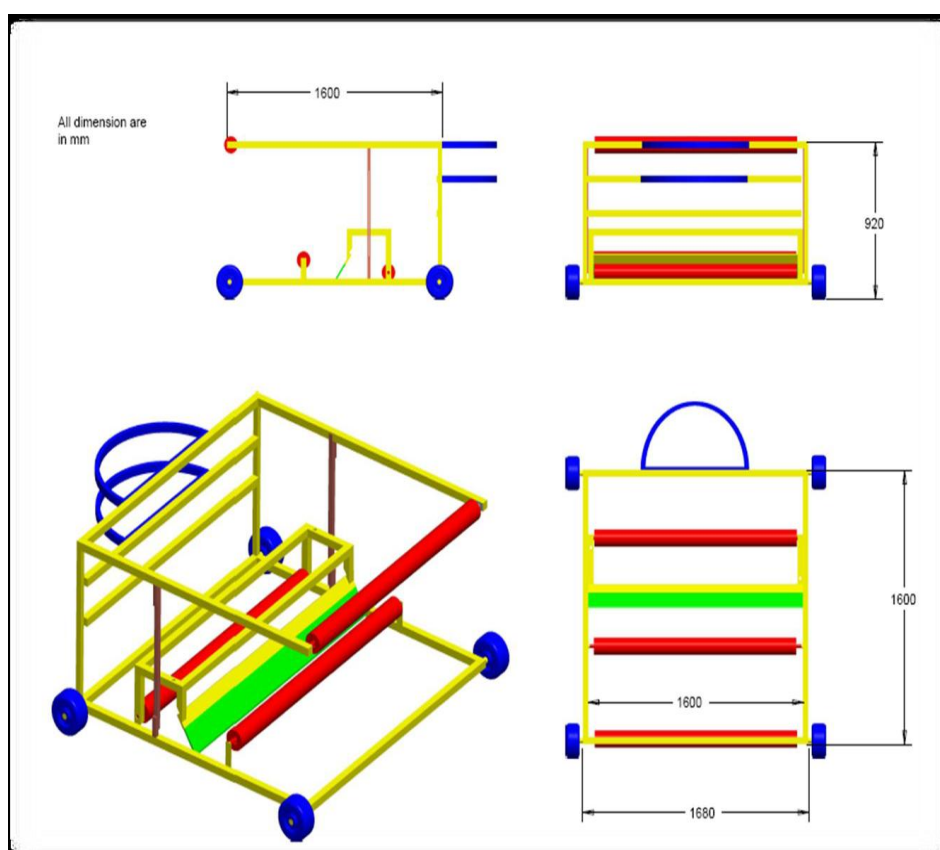


Fig.4 3D Design model

In this section unique parts were constructed in 3d modeling software and after that assemble in that.

## VI. ANALYSIS

The present design is modeled in 3D with plain stain condition for which analytical solutions are done. CAE tool is used to FEA Simulations. Contact must be defined between two bodies so that the mesh continuity is managed. Here i have to select model to be meshed with a mesh size 3 mm and selecting quad element with a uniform meshing. Fixed support was given at required point. After considering these all parameter in CAE software I get following result. I mainly focus on Total deformation, directional deformation, Equivalent (von-misses) stress, Status Image of contact tool. Some of analysis figures are shown below.

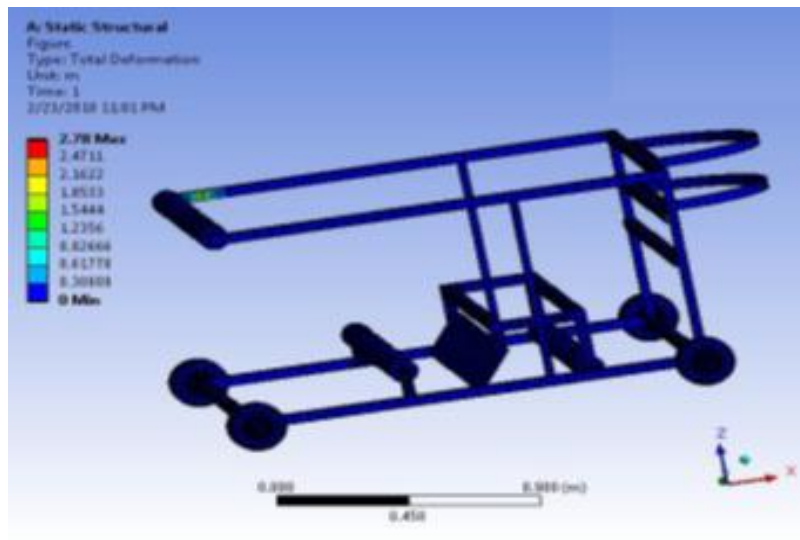


Fig. 5 Simulation of model

## VII. ACTUAL WORKING MODEL

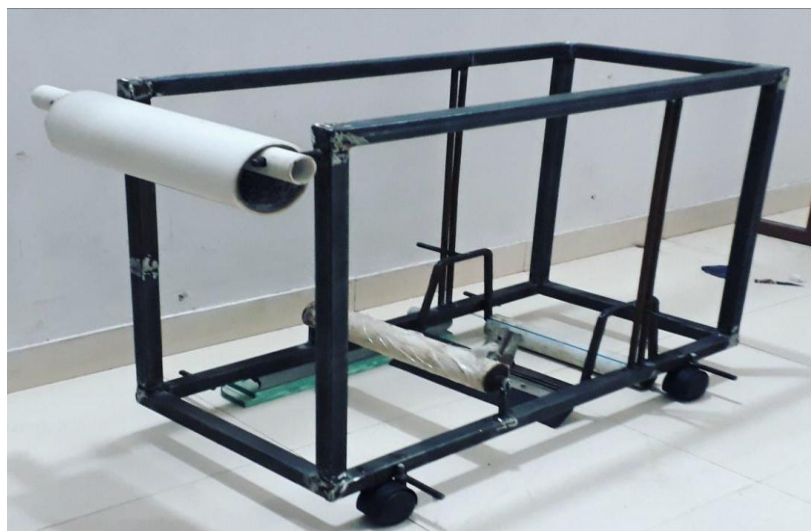


Fig. 6 Actual working model

### VIII. CONCLUSION

Thus a low cost and simple design pedal and fabrication of model, this machine reduces the human effort and hence we don't need 6-7 persons to wrapped plastic on S.S sheet. This simple design of conventional design which can enhance day today household needs and daily day to day purposes and it can be also used in for industrial applications. By using this method we can do operation very easily with nominal man power. so we can save cost of labor. This project saves time and lead to efficient of working. The operating procedure of this system is very simple so any person can operate this mechanism.

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