AUTOMATIC PLASTIC RAW MATERIAL LOADING SYSTEM

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Project background

Now a day, in the word most of items are made of plastic material. For making plastic material or product different machinery are uses. One of this, injection moulding machine is mostly use. In this machine plastic bin is use as a raw material for manufacturing final product. in this project system industries processes become fast compeer to manually and time of filling of raw material is reduce.This system is special focusing for small scale plastic industries.

PROBLEM

- Company is manufacturing plastic machinery parts in with good quality. But among of them they required one new system for some Company which is facing mainly two problems in production.

1. Moisture effect on raw material.
2. Loading raw material in hopper.

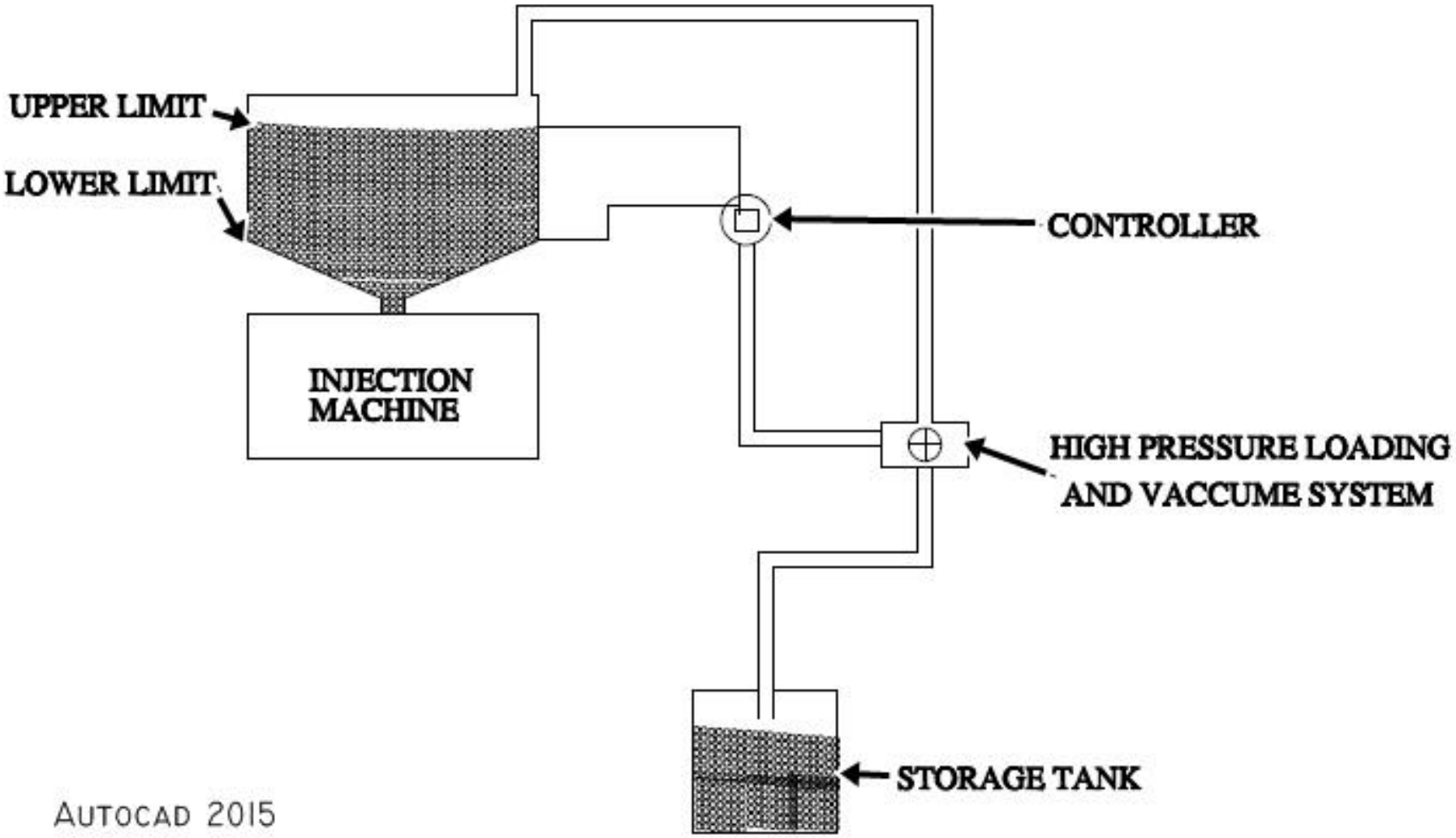
- Due to this problem some time company is not maintaining good quality at that time production rate is decrease. This production rate is directly affected to the cost of product as well as the profit rate.

- Available system is very costly so small scale industries are not possible for buying this available system.
- As per our knowledge, This system is available at the price of 1,50,000 to 8,00,000.

Company name:-**Shri Vahanvati Engineering**
Address:-15/2/C, Prakash Estate,Nr.Rita nager, Vastral Road, Ahmedabad-382418

Shri Vahanvati Engineering company is working on manufacturing parts as per drawing with material. Shri Vahanvati Engineering provides good facility to company employ and good environment. In this company all worker works happily and enjoy with their work platform. Now a day's company is planning for manufacturing same Owen product regarding to plastic industry and try for supplying best and good quality product.

PROJECT LAYOUT



ADVANTAGES OF PROJECT

- Fully automatic system
- Low cost system
- Time saving system
- Low wastage of plastic material
- Low maintenance cost

INTRODUCTION OF VACUUM

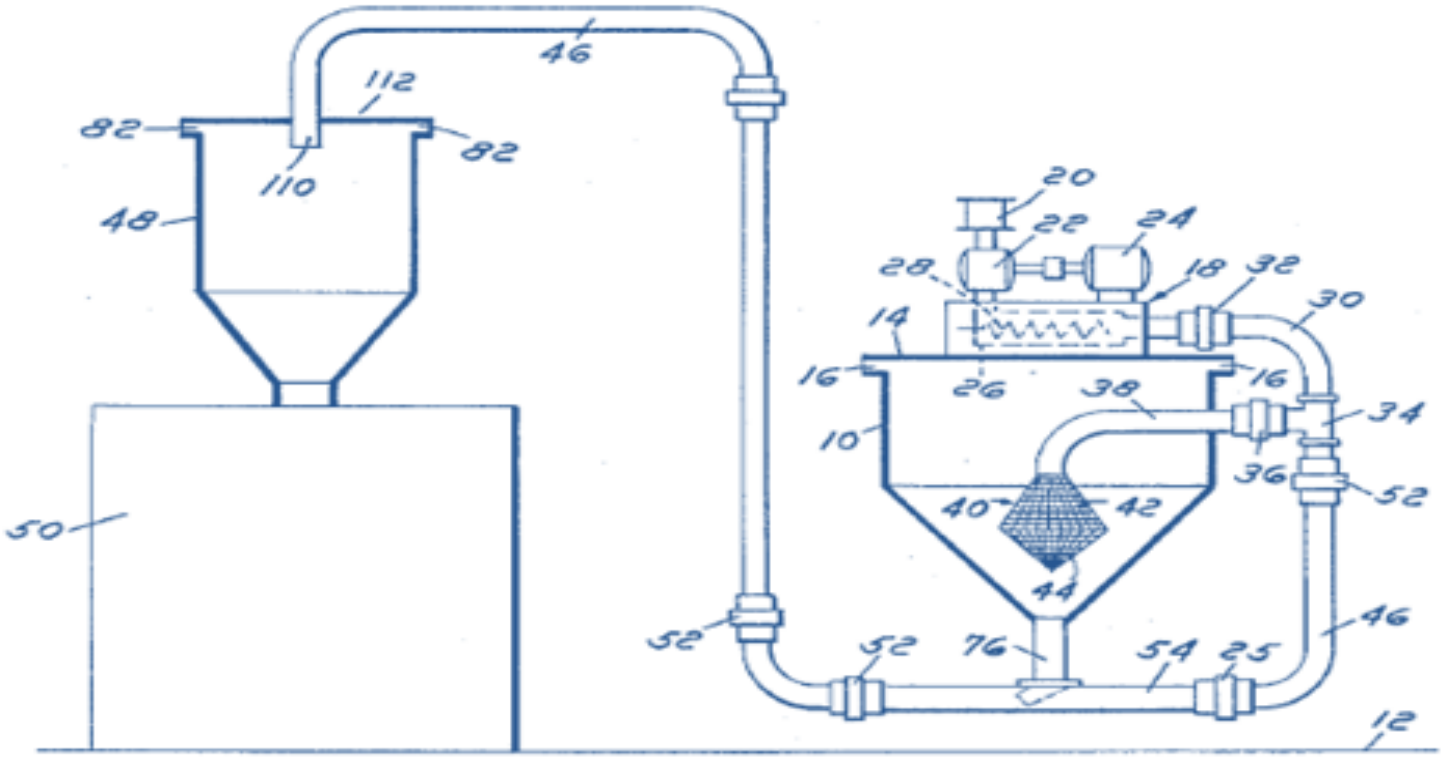
- Vacuum is space that is devoid of matter. The word stems from the Latin adjective vacuums for "vacant" or "void". An approximation to such vacuum is a region with a gaseous pressure much less than atmospheric pressure. Physicists often discuss ideal test results that would occur in a perfect vacuum, which they sometimes simply call "vacuum" or free space, and use the term partial vacuum to refer to an actual imperfect vacuum as one might have in a laboratory or in space .In engineering and applied physics on the other hand vacuum refers to any space in which the pressure is lower than atmospheric pressure. The Latin term in vacuum is used to describe an object as being in what would otherwise be a vacuum.

INTRODUCTION OF BLOWER

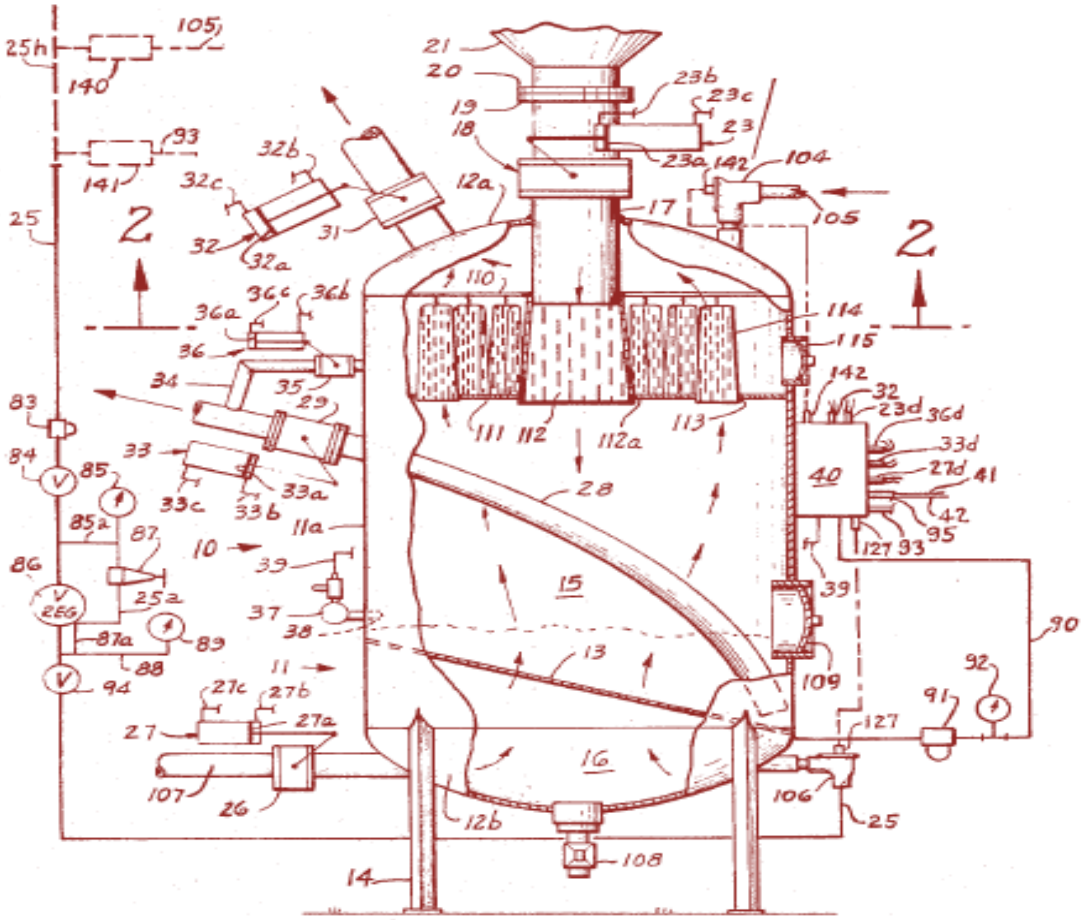
- A centrifugal blower is a mechanical device for circulating air or other gases. These blowers are used to produce pressurized air at the outlet to the tune of 1.51 bars to 2.75 bars. In the following project, Reverse Engineering of backward curved vane blower is used for its subsequent study and research. Reverse Engineering is the process of discovering the technological principles of a device, object, or system through analysis of its structure, function, and operation. In reverse engineering of complex components, ensuring that the new component will be equivalent to and meet or exceed all the specifications of the original design is critical.

LITERATURE SURVEY

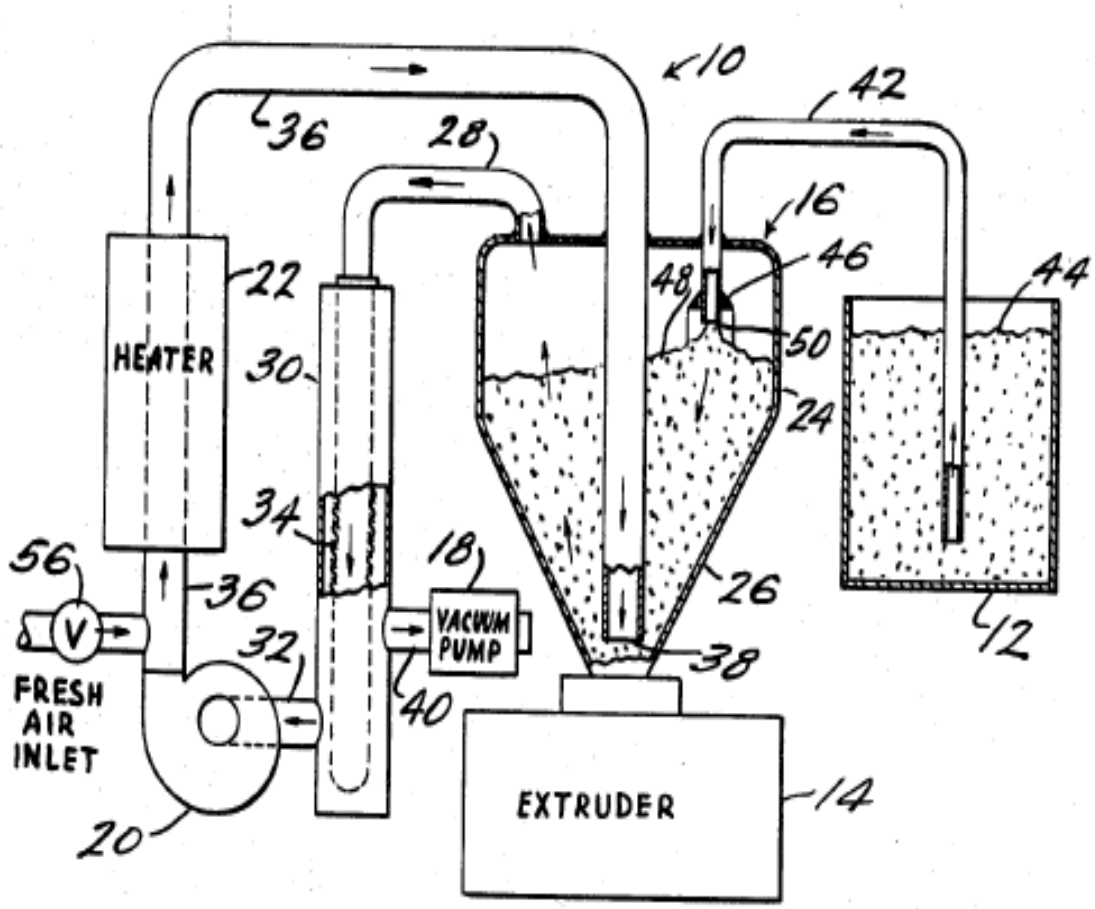
FREDERICK I. MCCOSH, DETROIT, MICH., ASSIGNOR TO THORE SON-MCCOSH, LNC., DETROIT, MICH., a corporation of Michigan work on plastic granule dryer and conveyor (April 29, 1955, serial no.504,863) 2,916,831 patented dec. 15, 11959



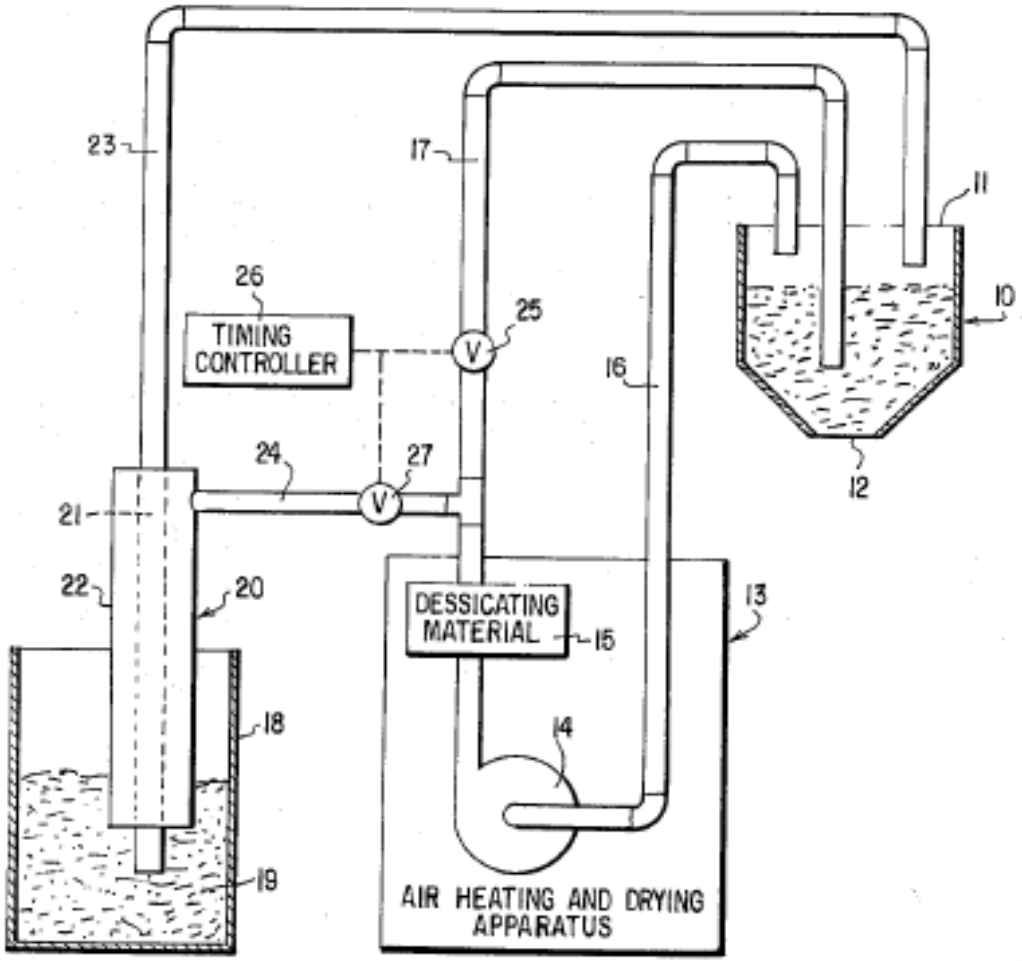
- **BRIAN R. RENTER, HOUSTON, TEX., AND STUART STERN, FORT LEE, N.J., ASSIGNORS TO CONSOLIDATED ENGINEERING COMPANY, INC. (CECO), HOUSTON, TEX.,** a corporation of Texas worked on material drying and conveying_ apparatus (filed Dec. 7, 1967, ser. No. 688,801)



- **John W. Jenkins Clayton County, Ga.** work on continuous vacuum drier (national service industries, inc. Atlanta, ga. continuation-impart of application sr.no.706, 965, Feb. 20, 1968, now abandoned.)

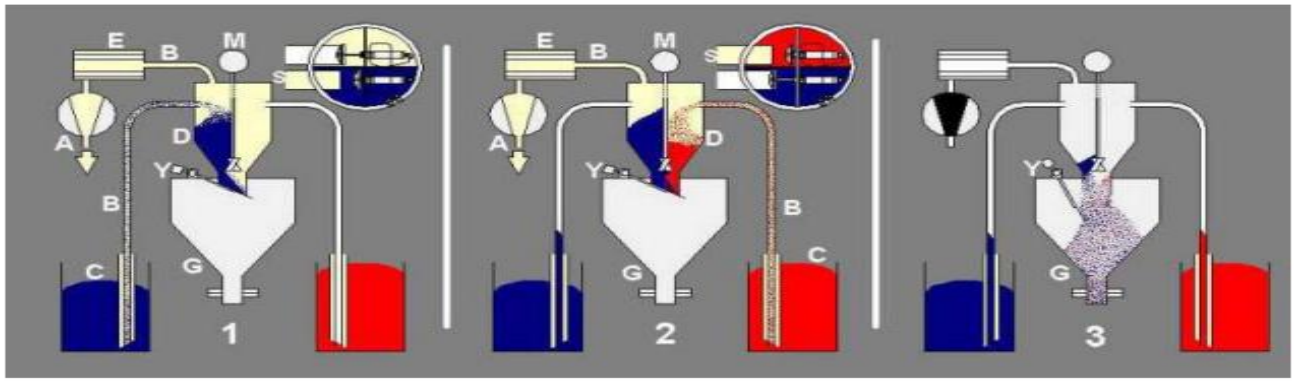


- **POLYMER MACHINERY CORP., BERLIN, CONN.** Worked on AUTOMATIC HOPPER LOADER



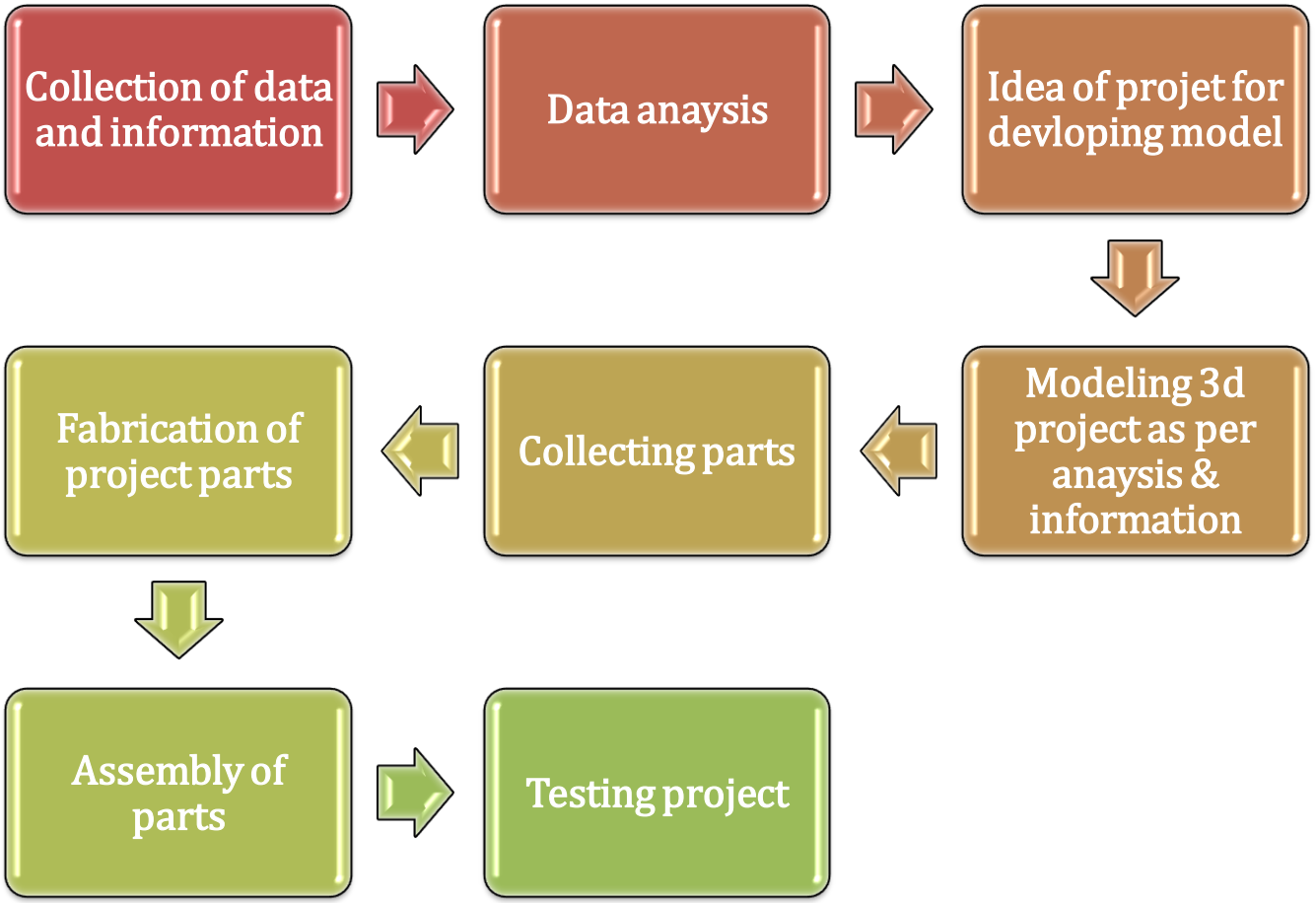
PROJECT WORK PRINCIPAL

- Vacuum loaders are widely used in the plastics industry to transfer virgin resins, regrind or master batch from storage sources to processing machines. A blower {A} sucks large amounts of air through the loading system at high speed creating a low pressure. The pipe {B} is immersed in a storage bin {C} containing the material to be transferred to the processing machine and the material is sucked into the pipe du e to the vacuum. A material-separating hopper {D} with and a filter {E} are installed at the end of the pipe.



- The filter allows the air to continue flowing to the blower but the material stays in the hopper and falls by gravity to the bottom of the hopper. The amount of material transferred depends on the size and shape of the pellets (bulk density), the amount of air sucked through the pipe and the vacuum level inside the system. One suction blower and one filter can suck two different materials from two storage bins through two pipes into a single separating hopper. Different amounts can be transferred into two chambers inside the separating hopper. Proportional loaders load one material at a time using a timer to control the suction time through each suction pipe {S}. Some proportional vacuum loaders include an auger {M} for better blending when the flapper {Y} is opened and the blend is dumped into the holding hopper {G}.

Methodology



MOTOR:

HP: 1/3 HP 115V AC, Single Ø

Max RPM: 3200 (Loaded at 120 Volts, 60 Hz)

Cord: 20’ AWG, with an on/off switch

Plug: NEMA 5-15P 125V

DUCTING: (included on 9533-15 and 9533-25 models)

•Single-ply lightweight vinyl/polyester, PVC coated 180° F temperature resistant

•Non-Collapsible Retractable design

•Class 1 hard drawn spring steel wire helix, ASTM 227 Specs Yellow with black wear-strip and integrated nylon attachment strap

•BLOWER DIMENSIONS:

Blower P/N	Length	Width	Height	Weight
9533	13 ¼”	12”	13 ¾”	17 lbs
9533-15	32”	13 ½”	14 ¾”	33 lbs
9533-25	32”	13 ½”	14½”	38 lbs

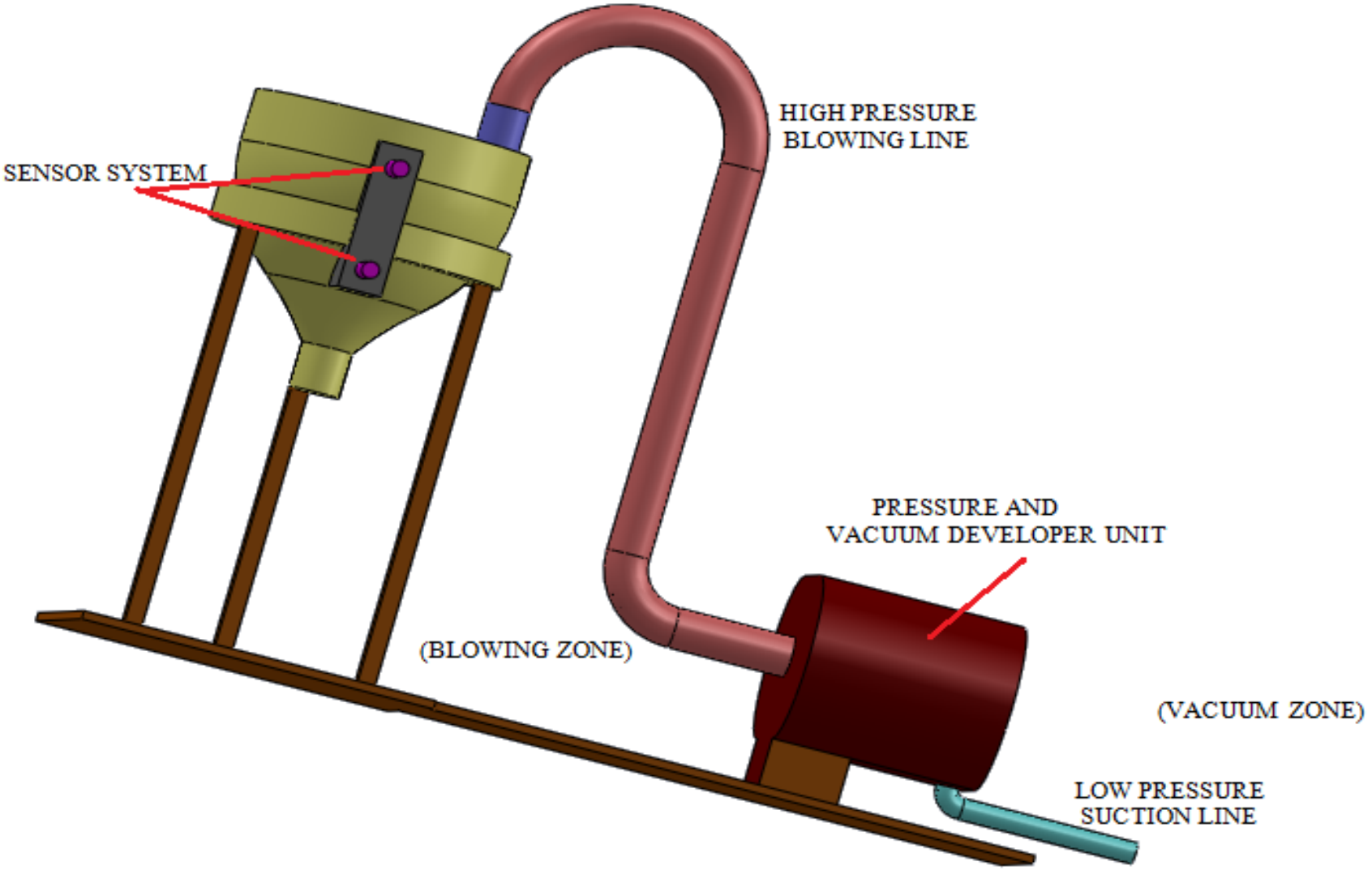
FLOW RATES: (CFM calculated using 15’ of 8” ducting

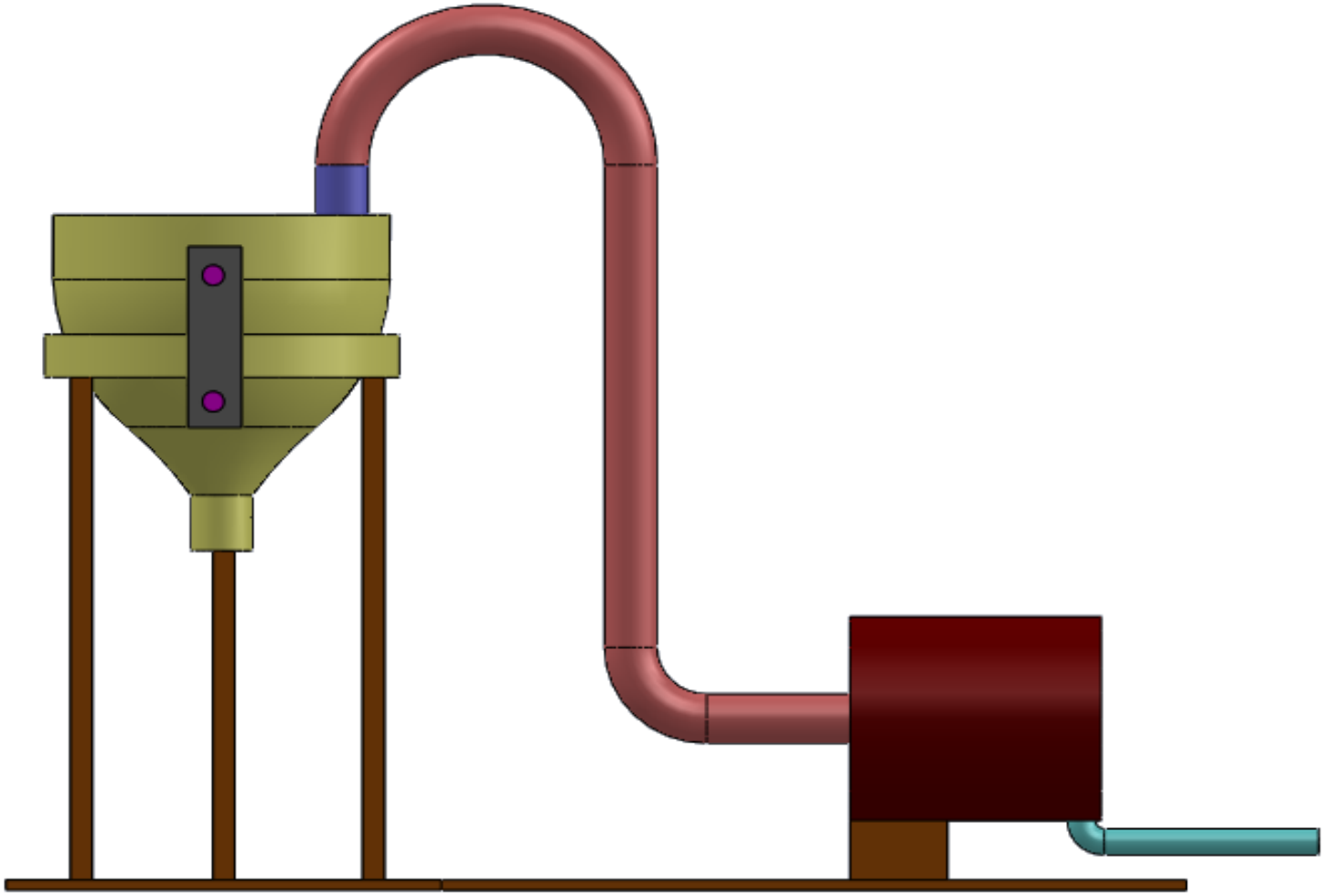
Free Air	One 90° Bend	Two 90° Bends
831 CFM	709 CFM	586 CFM

Specification of material

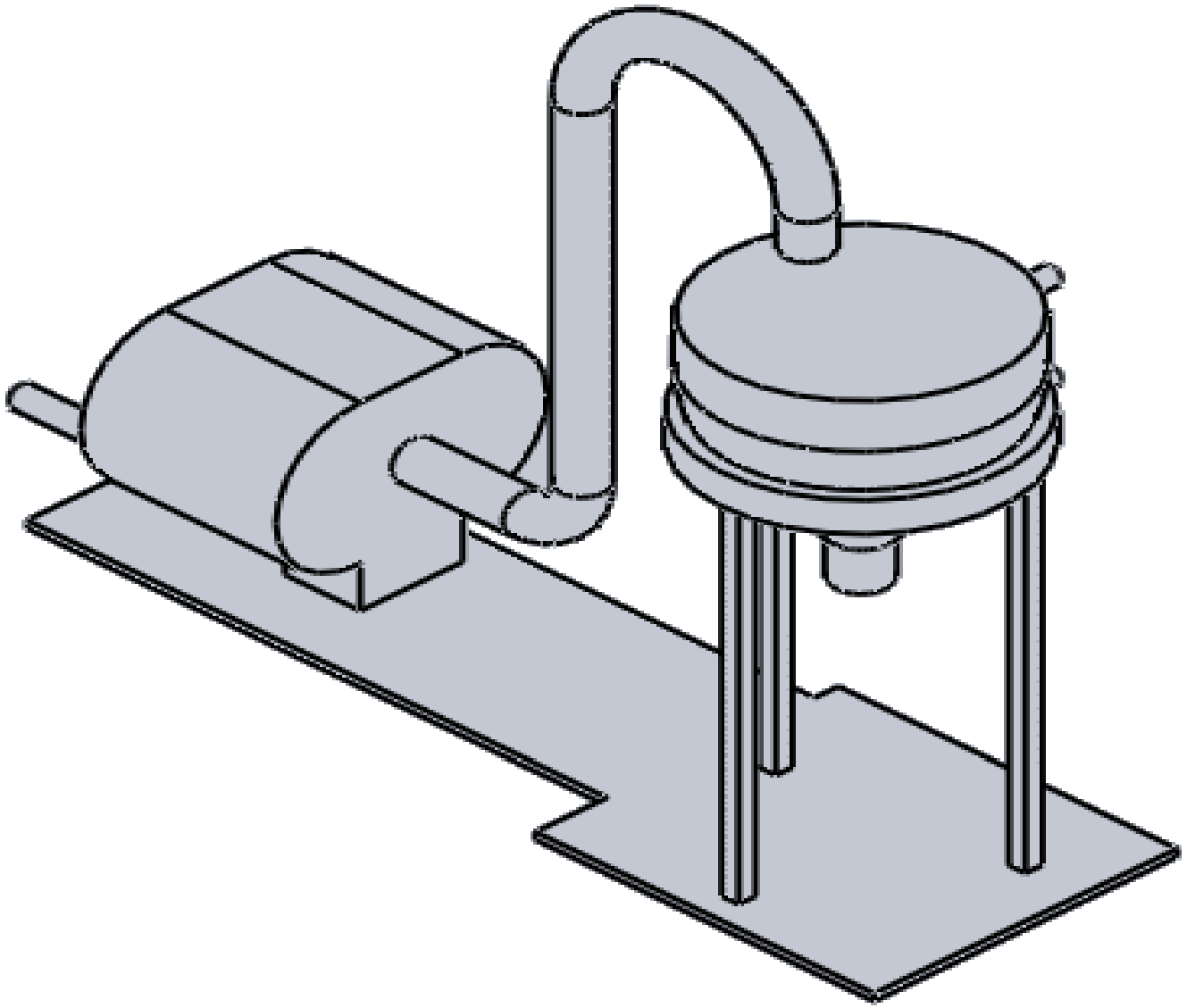
S.R	PARTS NAME	Technical specification
1	Hopper	Ø 10 mm M.S/PLASTIC
2	High pressure blower	220 AC 80 watt PLASTIC
3	High pressure vacuum	220 AC 150 watt PLASTIC
4	Photo sensor	Capacitive sensors 5v D.C
5	Controller	Microcontroller
6	Flexible pipe	Ø 25mm PLASTIC
7	Frame structure	M.S

PROJECT MODEL 3-D DIAGRAM



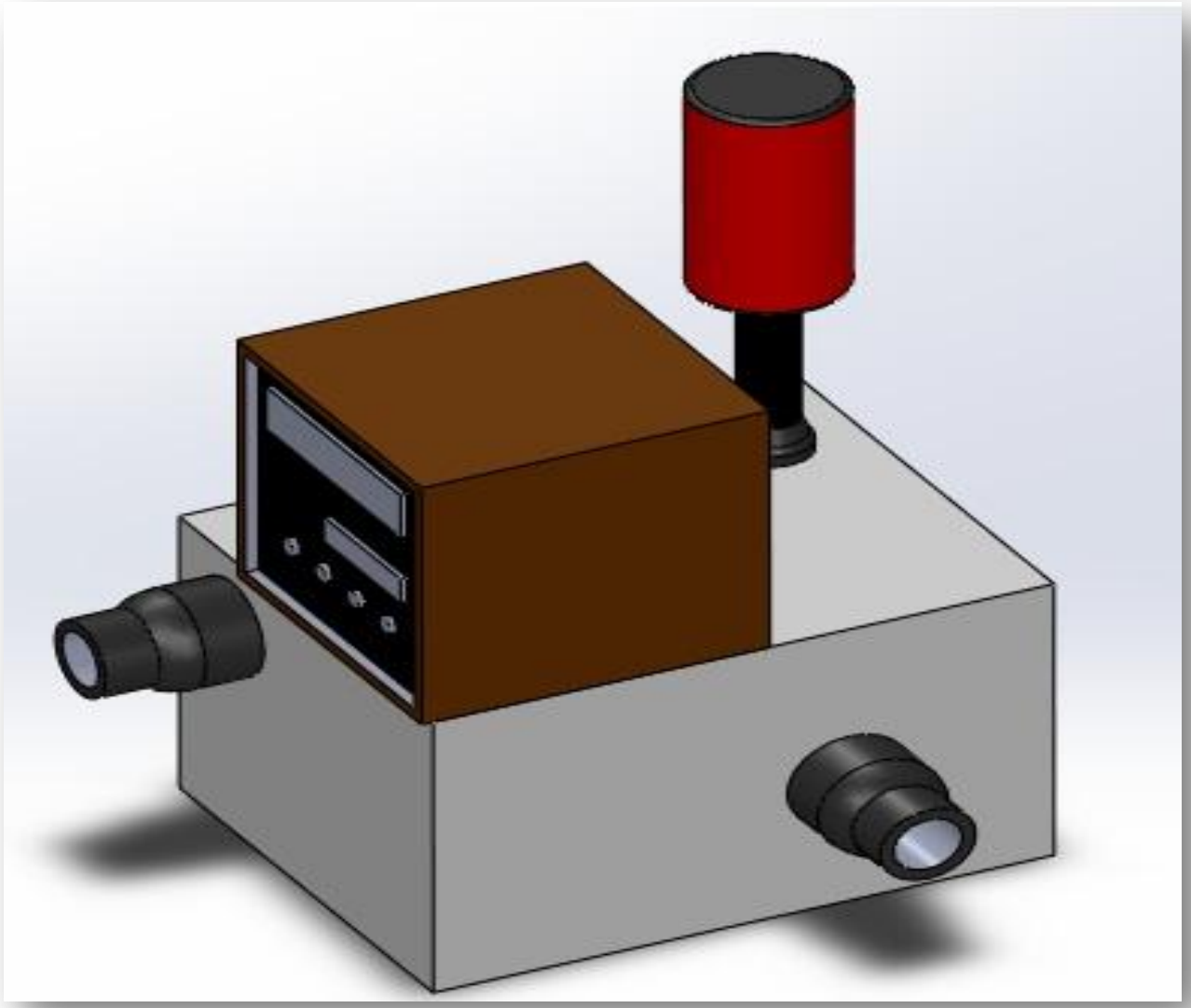


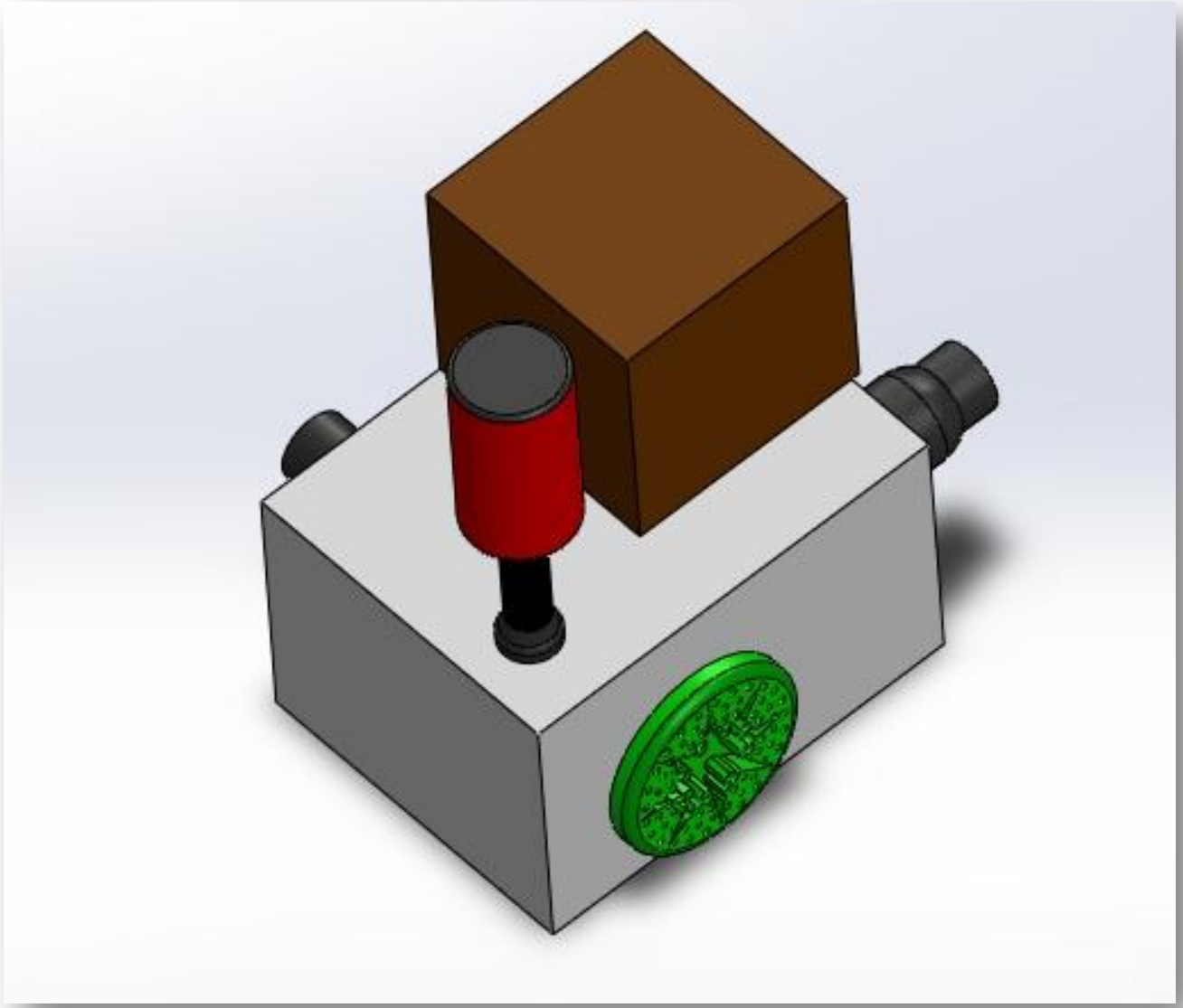
SIDE VIEW OF PROJECT CONCEPT 3-D MODEL



SCHEMATIC VIEW OF PROJECT CONCEPT MODEL

FINAL PROJECT MODEL





Cost of machine

S.R	PARTS NAME	NOS.	PRICE	TOTAL
1	Hopper	1	2500	2500
2	High pressure blower	1	3500	3500
3	High pressure vacuum	1	2800	2800
4	Photo sensor	2	800	1600
5	Controller	1	3450	3450
6	Flexible pipe	5 m	80	400
7	Frame structure			3000
	Total			**17,250**

CONCLUSION

- For performing this project model we are finally conclude that the filling time of plastic material is reduce and wasted raw material also reduce, in this project model we used timer controlling system
- by using this timer controlling system the accuracy of filling material is increased compare to the photo sensor system
- Overall finally conclude that the system cost is low compare to industrial market system and maintenance cost nearest to zero.

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THANK YOU