

DESIGN AND CONSTRUCTION OF PEANUT COATING MACHINE USING LOCALLY SOURCED MATERIALS

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ABSTRACT

Coated peanut exist in the supermarkets in many parts of the world. However, machines for coating peanuts with additives does not exist in Nigeria. Therefore, a machine for coating peanut with wheat flour and egg suspension was designed and fabricated for market oriented production. The procedures employed include the design. Construction, testing and performance evaluation. The machine components are the rotating drum, frame, shaft, pipe, holder, machine cover, the speed reduction gear, the electrical motor and the driving and driven pulleys. The shaft rotates the drum by the transmission system through the shaft system in order to carry out coating operation. The machine runs on a single form 0.754kw, 1420rpm, electric motor cum reduction gear system at speed or 30rpm. The rotating drum is mounted on the shaft. Supported by 2 bearings with the shaft rotation in a stationary position. The rotating shaft is arranged horizontally on the shaft to be powered by the reduction gear cum electrical motor. The performances of the coating machine was tested with 2 weight sample of egg suspension (0.16kg/1.52kg) and wheat flour (0.82kg/1.97kg). 3 level of coating speed (10,20,30rpm) 5 level of coating time (5,10,15,20 and 25 minutes) arranged in randomized complete design (RCD) of a 2x2x3x5 factorial experience replicate in each and compare between treatments mean were done by least significant difference (LSD) at $P < 0.05$. The result shows that the highest effective coating capacity was 2.47kg/minutes with the coating speed of 10rpm. The coating machine is recommended for small and medium producers in order to enhance their production output.

KEYWORDS: *Peanut, Coating, Shaft*

INTRODUCTION

As an agricultural nation, peanut is widely cultivated in Nigeria yearly, among other seedlings during planting season. Peanut belongs to the fabacea pea family (Arachishypogea). Peanut is a snack made from groundnut which belongs to the legume family. Groundnut refers to peanut as well as root or semi tube large quantities. Peanut are costly due to increase in cost of processing them. In order to improve on various ways in which peanuts are coated, there is need to develop simple machine to address the problem and this brought about the design and fabrication of peanut coating machine (Charles, 1861) in which the mixing operation is automated. Peanut is nutritionally rich and is of high oil and protein content. Peanut kernel is a rich source of food that can be eaten without harm to human, and suitable for consumption edible fruit oil about (43 – 55%) and protein (25-28%) and the outer cover of the seed is a good raw material for insulation, fuel and fertilizer. Peanut is currently grown on a worldwide total production of (35 million) tones. Peanut is known by many others as earth nuts, groundnut, monkey nut and pig nut (Harto, 1998). Recognition of physical and mechanical properties of designing machine and optimizing performance related machinery of peanut is importance in engineering (Palatel.al, 2006), (Bins and Cheathan, 2002).Acquiring such information provides necessary data for designing peanut processing equipment in order to reducelosses in the stress of operation (FAO, 1989) major handling, farris, (1991) brought the peanut coating making machine to reduce stress and tine management also to minimize the labor input.

The problems affecting technology development and in deed an agricultural development in Nigeria is that peanut making or coating machine is highly expensive and cannot be made easily.

Hammos (1994) notice that the present agricultural processing machine are very expensive. Although there are several design on peanut coating machine to be more and expensive hence, they can be affordable by many small medium enterprise (SMEs). It is also very laborious and enervating since the use of locally design and constructed peanut coating machine can reduce the hard work and stress of coating peanut. This brought about the improvement of designing and fabricating the peanut coating machine to assist small and medium enterprises (SMEs)

This study on peanut coating making machine using locally sourced materials will be very beneficial to the peanut coating makers, vocational education entrepreneurs student. This peanut coating machine is special equipment for processing peanut surface sugar or flour wrapping products which can reach the standard export processing, has the characteristics of the smooth movement, low noise, no pollution.

HISTORICAL BACKGROUND

Groundnut (*Arachishypogaea*) also known as peanut, earthnut and ground bean is an annual legume which falls into oil seed crops. Groundnut is used in many food products because of its high nutrition density (Shahzad, et al 2011). There are different types of groundnut which are grown and these include Runaer, Spanish and Valencia. According to Gujarat Agro Industries Corporation, peanut contain high percentage of protein and low calorie product that possesses high nutritional value. It is used in developing countries as a healthy alternative to dairy. The demand for peanut butter is increasing because it is used as a substitute for milk, due to increase in cost and shortage in supply of milk. Traditional methods are failing to meet the demand for peanut butter because they are laborious and slow. This project is geared towards improvement in the quality of peanut butter and also the efficiency of the machine through the design of an automatic peanut buttermixing that crushes peanut into paste and automatically processes them. International (Beaco learning center, 2003) states that peanut butter was first made in 1904 at war to hill wounded soldiers. Due to high nutrition density, peanuts were crushed into paste for making stews and porridge mostly. These factors made peanut butter to become a valuable product within the world and demand of peanut butter increased world-wide. These prompted scientists to mechanize the production of peanut butter which increased the supply of peanut butter in a short period of time. (Katz, 1997) state that initially other people used manual operated meat grinder to make peanut so as to feed people with poor health. Studies showed that peanut butter was used as source of proteins to heal up wounds and mainly was used in battles.

Peanut also called (*Arachishypogaea*) is a crop with fruit produced underground or below the surface (Prasad, et al, 2011). Groundnut was originated by south American. The groundnut plant can grow to height of 60 centimeter and can spread up to 100 centimeters, depending on variety and conditions. The plant is different in that it flower above ground and the once pollinated, produce it fruit below the soil surface. Usually flower are yellow in color and self-pollination occur in plants. Most of the groundnut is used in making peanut butter because of high Beaco learning center, 2003, state that peanut butter was first made in 1904 at war to hill wounded soldiers. Due to nutrition density of peanut butter and low costs, people grinded peanuts into past for making stews and porridge mostly. These factors made peanut butter to becomes a valuable product within the worldand the demand of peanut butter increased world wide.

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WORKING PRINCIPLE OF PEANUT COATING MACHINE

This machine consists of main body worm wheel box, coating pan, heating device, hot air and common blower, electric equipment etc.

The transmission process that the motor device the worm wheel and worm via triangle belt to make the coating pan rotate. Then the material revolves up and down in the coating pan, so that even mixing, pelletizing and polishing can be completed well.

COMPONENTS/ FEATURES OF THE PEANUT COATING MACHINE

This stainless steel peanut coating machine is used for the special equipment for the surface coating of peanut. The surface of peanut processed by this equipment is smooth and meets the exports processing standard. Such as chocolate polishing, peanut coating, sugar coating, seasoning etc

FEATURE OF PEANUT BURGER COATING MACHINE

1. The tilt angle is adjustable
2. Heat can be adjustable
3. Stable rotating, low noise and no pollution
4. Can be equipped with frequency control, dust removal system
5. Can be fully enclosed, equipped with a spray gun system to meet GMP requirements

DESIGN PARAMETERS/ CALCULATIONS

Technical specification that will guide in attaining the objective.

Power required = 1.1kw

Average speed = 150 r.p.m

Output capacity = 56kg/hr

Bulk density of peanut = 300kg/m²

Plate diameter = 100 mm

Angle diameter = 12x4 = 48mm

Work index of peanut = 13.17kj/kg⁻¹

Height = 40kg

Hopper holding capacity = 10kg

COMPONENTS AND DESIGN SPECIFICATION

A. MACHINE STAND/BASE

material: 1 ½ inches mild steel Angle bar

Dimension: H=50cm, W= 45cm, L=45cm

B. GEAR MOTOR

single phase induction motor power rating

power rating -35 Watts

Voltage -240V

Speed – 60 revolution per minutes(rpm)

C. SPHERICAL DISH/ BASIN

Material: stainless steel

Dimension: 55cm

D. BASE PLATE WITH BUSHING

Material: 3mm huck mild steel plat

Dimension: Diameter 23cm

E. BUSHING

Material: mild steel rod

Dimension: Diameter 5cm

Length = 3cm

DESIGN OF INTERMEDIATE SHAFT

The equivalent twisting moment can be determined using the following equation.

$$T = \frac{16}{x} d^2$$

$$T_e = [(K_m \times M) + (K_t \times T)]^{0.5}$$

Determination of the vertical load acting on the shaft. The first load is caused by the drum pulley and second load caused by the motor pulley.

The vertical load caused by the motor pulley can be calculated by

$$\frac{T_1}{T_2} = e^{\mu\theta} \text{ Type equation here.}$$

$$\mu = 4$$

$$\theta = 180 + 2 \sin^{-1} \frac{D-d}{2c}$$

$$\theta = 180 + 2 \sin^{-1} \frac{450-75.89}{2 \times 488} = 132.57 = 2.313 \text{ rad}$$

$$\frac{T_1}{T_2} = e^{4 \times 2.313}$$

$$\frac{T_1}{T_2} = 2.53$$

$$T_1 = 2.53 \quad T_2 \text{-----(1)}$$

$$T = (T_1 - T_2) \times r = F \times R \times N = 62.144 \times 25 \times 23 = 357.328 \text{ N.M}$$

$$(T_1 - T_2) \times r = 357.328 \text{ NM, } R = 250 \text{ M}$$

$$(T_1 - T_2) = 938.4 \text{-----(2)}$$

From equation (1) and (2)

$$T_1 = 1551.73 \text{ N} \quad T_2 = 613.33 \text{ N}$$

$$FV = T_1 + T_2 = 613.33 + 1551.73 = 2165.33 \text{ N}$$

The vertical load caused by the drum pulley can be calculate by

$$\frac{T_1}{T_2} = e^{\mu\theta}$$

$$\mu = 4$$

$$\theta = 180 + 2 \sin^{-1} \frac{D-d}{2c}$$

$$\theta = 180 + 2 \sin^{-1} \frac{465-77.5}{2 \times 488} = 131.85 = 2.29 \text{ rad}$$

$$\frac{T_1}{T_2} = e^{4 \times 2.290}$$

$$\frac{T_1}{T_2} = 2.51$$

$$T_1 = 2.51 \quad T_2 \text{-----(1)}$$

$$r = (T_1 - T_2) \times r = F \times R \times N = 62.144 \times 25 \times 23 = 357.328 \text{ N.M}$$

$$(T_1 - T_2) \times r = 357.328 \text{ NM, } R = 250 \text{ M}$$

$$(T_1 - T_2) = 156.4 \text{-----(2)}$$

$$T_1 = 259.97 \text{ N} \quad T_2 = 103.57 \text{ N}$$

$$FV = (T_1 + T_2) = 259.97 + 103.57 = 163.55 \text{ N}$$

$$R_2 = 2318.95 \text{ } 363.55$$

$$M_p = 100900.8 \text{ N.MM}$$

$$M_1 = 29244.72 \text{ N.MM}$$

$$D^3 = \frac{16}{\pi \times \pi \times \pi \times \max} \times \sqrt{(1.5 \times 100900.8)^2 \times 29244.72^2} = 27$$

$$D = 27$$

DESIGN OF KEY

Since the shaft (C1045) has a diameter of 25mm and the shaft pulley (1045) has a diameter of 445mm

Assuming the key is rectangular from the table

The dimensions of key

Width W = 6mm

Height H = 6mm

By choosing A1S1 1020 CD steel with SY = S1 100psi

A check of the yield strength of the three material in the key, the shaft and pulley indicates that the key is weakest material.

the minimum required length of the key

$$L = \frac{4 \times T \times N}{D \times W \times S Y}$$

T = transmitted torque N.mm

N = 3

D = diameter of the shaft, mm

W = width of the key mm

Sy = yield strength of the mpa

$$L = \frac{4 \times 317.4242 \times 23 \times 60 \times 3}{2 \times 44.48 \times 21 \times 6 \times 331} = 90 \text{ mm}$$

DESIGN CALCULATION

According to Kicks law, the energy required to coat a multiple seed such as groundnut soya bean and peanut may be determined as follows,

$$E = k \times FC \times IN (L1/L2)$$

E = energy required to coat peanut 5/kg

K = kick co-efficient (k = 1.2)

L1 = average length of uncoated peanut mm

L2 = average length of coated peanut mm

DETERMINATION OF THE POWER REQUIRED FOR COATING PEANUT

$$P_s = W \times K \times FC \times In (L1/L2) \text{ -----(2)}$$

Ps = power required to coat peanut kw

W = coating capacity kg/hr

$$L2 = L1 (2 \times X)$$

X = the thickness of the hull mm

For small sample

$$L1 = 31.499 \text{ mm}$$

$$L2 = 31.499 - 2 \times 1 = 29.499 \text{ mm}$$

Assume the capacity = 185kg/hr

$$P_s = 185 \times 1.2 \times 77381.77 \times h \frac{3.149}{2.949} = 313.4242 \text{ W}$$

For large samples

From equation (2)

$$P_s = 185 \times 1.2 \times 11482.45 \times In \frac{3.7022}{3.5022} = 160.569 \text{ W}$$

DETERMINATION OF THE TOTAL POWER REQUIRED TO OPERATE THE MACHINE.

The total power required to operate the machine can be calculated by

$$P = P_s + P_s$$

P = total power required to drive the machine

$$P = 313.4242 + 0517 = 365.1242 \text{ watts}$$

Considering the transmission efficiency the required motor power (PM) is given as $p_m = \frac{p}{\text{efficiency}}$

Assuming the transmission efficiency of the motor is 80%, the value

$$P_m = 0.45641 \text{ kw}$$

Take the motor pulley diameter = 75.88mm

Take the motor speed = 1440 rpm

THE TOTAL REDUCTION

The total reduction needed to obtain the required speed of coating the peanut seeds is calculated by

$$P_s = F \times R = F \times \frac{2\pi n}{60} \times r$$

P_s = required power to cost the seeds w

F = coating force N

R = radius of the beater mm

N = the required speed rpm

$$N = 40.49 \text{ rpm}$$

Then the required reduction

$$\text{Reduction} = \frac{N_{\text{motor}}}{N_{\text{required}}}$$

Since the pulleys have a maximum reduction of 7, then we need two sets of pulley to get the required reduction

Assume first reduction = 6

Second reduction = 5.926

THE VELOCITY OF THE DRIVEN AND DRIVING PULLEY

Since there are two sets of pulley first reduction

The velocity ration of the driven and driving pulley is given as

$$\frac{d_2}{d_1} = \frac{n_1}{n_2} = 6$$

$$D_2 = 450 \text{ mm}$$

Second reduction

The velocity ration of the driven and driving pulley is giving as

$$\frac{d_2}{d_1} = \frac{n_1}{n_2}$$

D₁ = effective diameter of small puller mm

D₂ = effective diameter of large puller mm

N₁ = speed of intermediate shaft rpm

N₂ = speed of the machine shaft rpm

Assuming the intermediate shaft diameter = 77.5 mm and second reduction = 5.93

$$\frac{d_2}{77.5} = \frac{n_1}{n_2} = 5.93$$

METHODOLOGY AND MATERIAL SELECTION

The purpose of this design is to create an affordable peanut coating machine that is efficient and requires minimum human effort to operate. It is existing peanut coating machines that will be used to create some opportunity to the user. Peanuts are meant for human consumption hence the choice of materials for the fabrication is majorly determined by the safety of man. Materials with the tendency to corrosion cannot be used for it

TABLE 4.1 PARAMETER OF STAINLESS STEEL PEANUT COATING MACHING

MODEL	GGY200	GGY400	GGY600	GGY800	GGY1250
Pan diameter (mm)	200	400	600	800	1250
Capacity (kg/time)	1	5	15	30-50	80-150
RMP(R/MM)					
Power (kw)	46	46	36	36	28
Heating power	0.37	0.37	0.75	1.1	3
Dimension (mm)	0.75kw	0.75kw	1.kw	2kw	3kw
Weight (kg)					
	500x350x700	550x400x800	800x600x900	1000x800x1430	1230x1200x1333
	36	0	0	205	X1820
		38	85		350

OPERATING PRINCIPLE

The design concept for the peanut machine consist of the spherical basin or dish shown in diagram above. The basin has one and opened and the opposite and has a base plate 3mm mild steel plate bolted to it. The gear motor is attach to the base plate via a bushing and the whole assembly is mounted on the table with the slightly inclined to the horizontal. The components of the groundnut coating machine are set up as shown in diagram below. It has a simple operating principle. When switch on the gear motor begin to rotate the dish attached to it a low speed of 60rpm.

When a quantity of groundnut to be coated is put inside the dish, it rotates and spin around about it axis. As it does this, a solution of egg and other ingredients that primarily acts as a binder is poured on it. Then the flour is gradually continuous sprinkled on the groundnut till the groundnut is completely coated with the flour then the machine is stopped and the product discharged from the machine manually.

FUNCTIONS OF PEANUT COATING MACHINE

A small scale peanut coating machine has been successfully designed. The machine capacity was assumed to be 180kg/hour.

The developed machine has the following main component

1. Frame
2. Drum
3. Hopper
4. Coating machine housing
5. Motor

The power system consist of the electrical motor and bell are pulley device by which it was the peanut coating roller, the coating is achieved by the coating groundnut on the drum by both rubbing flows against a rotating plat or drum.

One of the function of peanut coating machine are

1. to help to give the peanut at circular shape with the act of the dish rotating and the peanut in it with it centrifugal force.
2. To coat the groundnut with flour or sugar and other ingredient.

ADVANTAGES OF PEANUT COATING MACHINE

1. The coating machine save time.
2. It is also save energy, because its automatic and highly efficiency.

3. It does not need much attention.
4. It is easy to operate.
5. High production capacity etc.

DISADVANTAGES OF PEANUT COATING MACHINE

1. It is operated electronically
2. It required electricity to function.

COATING EFFICIENCY

Coating efficiency is the percentage of the coating seeds calculated on the basis of the total seeds entering the coating mechanism. Beater speed is one of the most important variables affecting coating losses coating losses can be significance reduced by decreasing the beater speed changing the concave clearance ration(the ratio of the gap at the front to that at the rare of the beater) is done to facilitate crop feeding into the beater, but the effect of this variable on the coating efficiency is not consistent coating losses increase with material feed rate, which is generally expressed in terms of ton/hr of material other than grain (MOG) the ways of expressing material feed rate are peanut feed rate and total feed rate.

DRAWINGS

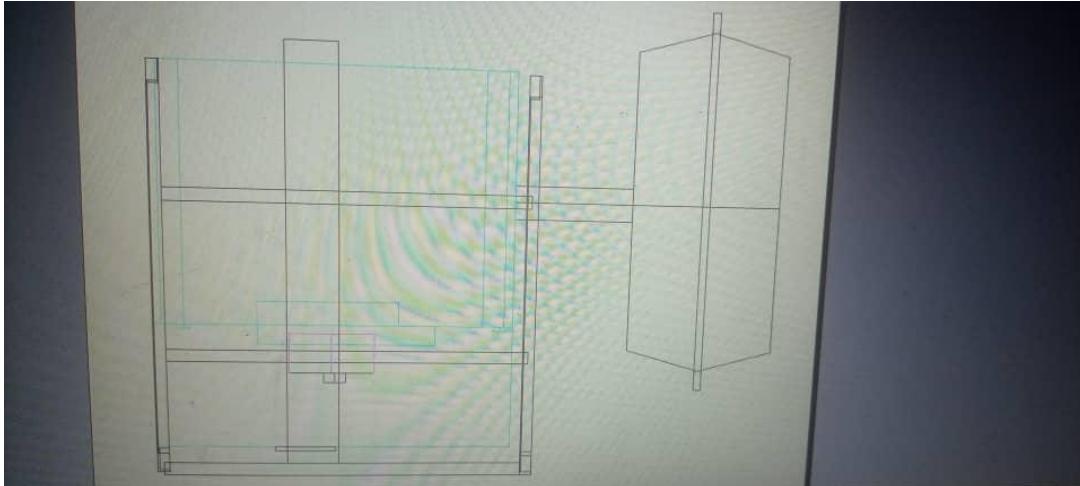


Fig. 4.1 Plan view of the peanut mixing machine

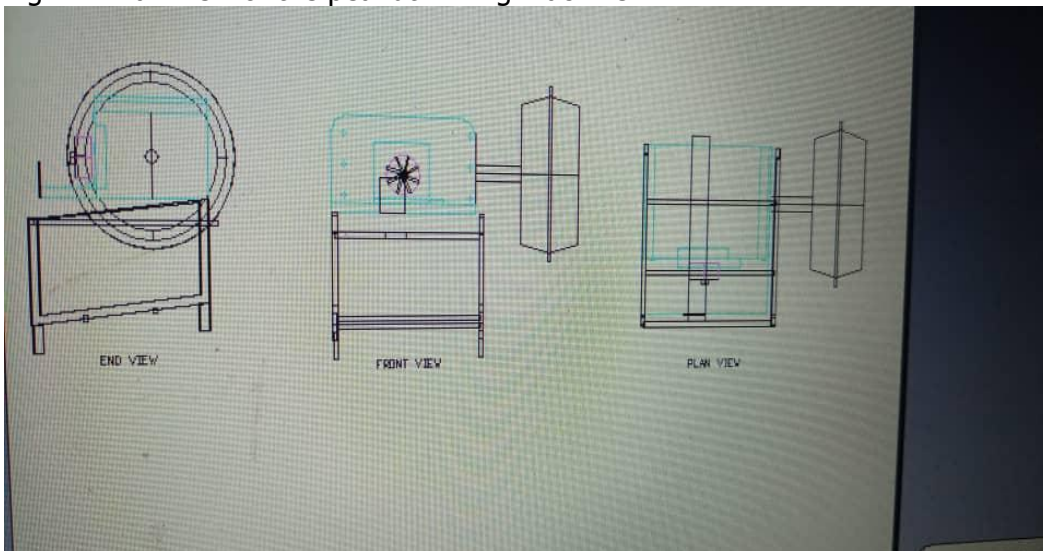


Fig. 4.2 Plan view, rear view and front view of the peanut mixing machine

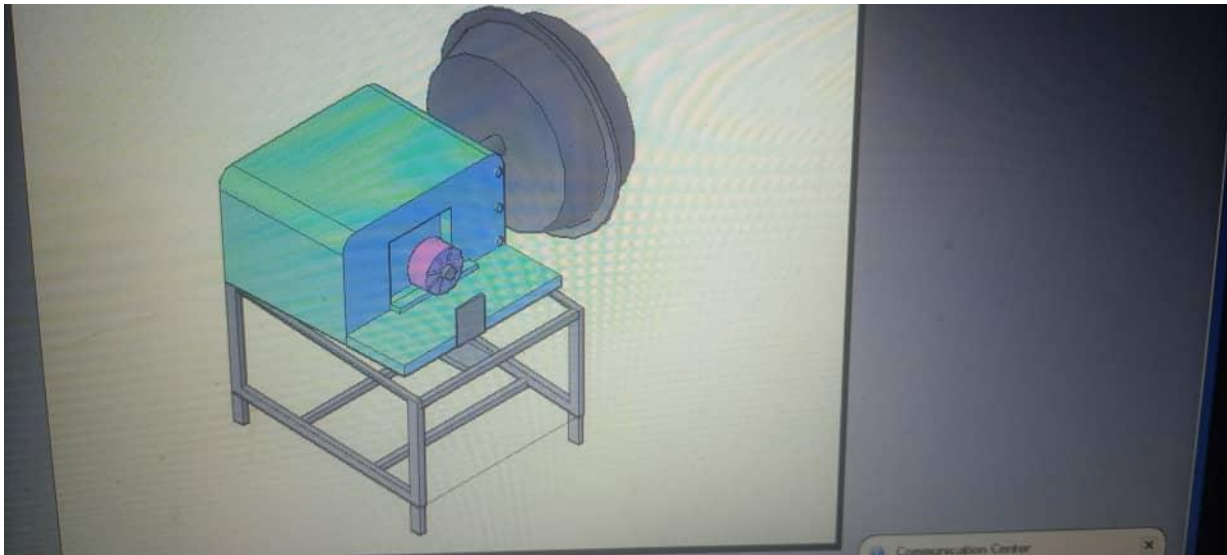


Fig. 4.3 Complete assembly of the peanut mixing machine showing drum, motor, and frame.

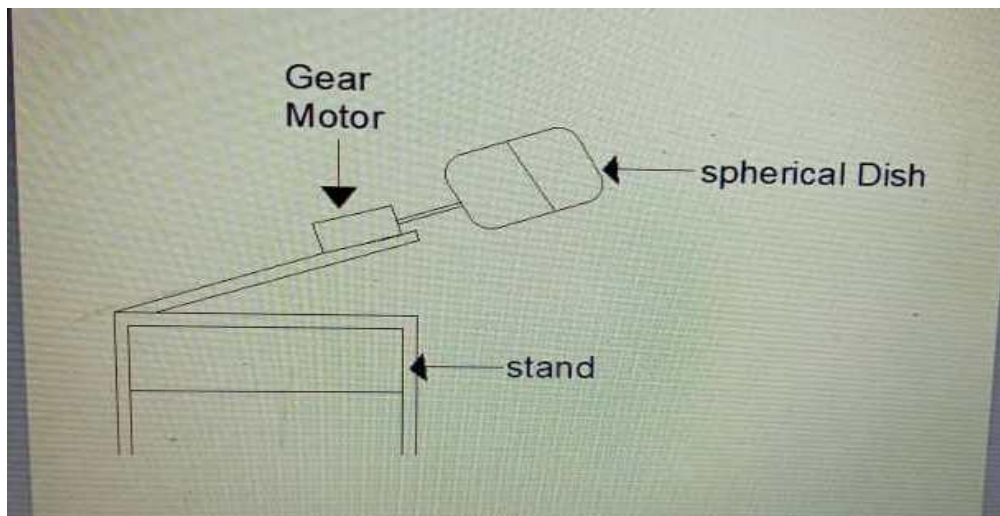


Fig. 4.4 Auxiliary pictorial view of peanut mixing machine



Fig 4.5: Picture showing the drum and part of the frame of the peanut mixing machine



Fig 4.6: The front view of the drum



Fig 4.7 : The rear view of the drum with the motor, the drum mounting and frame of the machine

THE POWER SOURCES

The power system consists of an A/C electric motor and belt and pulley driven by which runs the coating roller and the blower

THE FEED HOPPER

This structure is the unit in which material to be coated is regulated and channeled into the coating chamber. The coating hopper is mounted on the coating unit at an inclination of the angle of repose. It is used to obtain varying gate between opening the hopper and the coating unit.

THE FRAME

The frame supports the entire machine and its carries the prime mover, the coating unit the hopper and the blower.

RESULTS. TESTING AND DISCUSION OF RESULTS

The design of the peanut coating machine has been analysis before proceed to the fabrication and manufacturing process. The analysis purpose is to adopt the design match with the implementation environment and designing it for performance.

The product design has been applied to show the model of the peanut coating machine with actual dimension for fabrication

Parametric design calculate analysis is one of the method to given to gain the data accurately. The calculation that has been made is to determine the specification of the component that suit with other function for the machines.

The specification of the motor is 60 rpm output speed and 12v output voltage. The motor that have been used power window motor and torque were suitable, power window was chosen.

The engineering design drawing has been develop by considering the material selection and main component follow by the cost some of the manufacturing process applied at the frame is $1.765e + n/m^2$.

When the manufacturer designs and makes the portable peanut coating machine, there is a sieve-hole roller inside the machine when the film coating is carried out, the prepared film coating liquid is pumped out and sprayed into the roller from the side with minimal droplets. The solvent on the surface of the core in the roller evaporates rapidly and dries to form a film.

The side inlet air and side exhaust air do not affect the spraying mode of the coating liquid, so that the coating liquid can be uniformly coating on one side.

The analysis process is based on production that can be derived through manual and semi-automatic methods.

The average mass of production by using manual method is 3.2kg per hour. It increases into 5.5kg per hour by using semi-automatic method.

The portable peanut coating machine integrates strong electricity week electricity, hydraulic pressure and prismatic and is a new type of equipment which is informed on the basis of the ordinary peanut coating machine.

The peanut coating machine mainly ensure that material to form a logistics curve in the pot with stable linear speed, so as to meet the technological requirements of uniform thickness, uniform shape and bright color of the coating layer. Application scope of coating machine. In addition to peanut, this machine can also be process granular foods such as almonds, cashews and soybeans.

The features of peanut coating pan, the characteristic of automatic peanut coating machine is the titling angle of the coating pot is 30degree. An electric or gas oven or other heating equipment can be put under the coating pot.

5.1 BILL OF ENGINEERING MEASUREMENT AND EVALUATION (BEME)

The bill of engineering measurement and evaluation is sum of all cost incurred directly and indirectly in the construction of the project work.

S/N	Parts	type	QTY	Unit cost (N)	Total cost (N)
1	Frame	Angular mild steel	2 length	3500	7000
2	Hopper	Mild steel 450mm diameter	2	5000	10,000
3	Coating machine	Aluminium material			
4	Coating main shaft	Mild steel 25.00mm dia	1	5000	5000
5	Bearing No (306) single with housing	900mm length	2	2000	4000
	Electric motor	Gear motor			
6	Screw	10,13,15 bolt	1	35,000	35,000
	Nut and bolts				
7	paint	spray	20	20	800
8	base (Angle iron roller		20	75	1500

9	balls)				
10	electrode		3	3000	4000
	cutting disc	mild steel		3000	5,500
	bushing				
11	Washer		1pk	2000	2000
12	Angle set		1	7000	7000
13	Cord		20	20	400
14	Socket		30	20	600
15	Total	13 Amps	2	1000	2000
16	Wire		1yd	1200	1200
			1	400	400
					N91,400

Potential mechanism

Function	Alternative 1	Alternative2	Alternative 3
Power supply	Electricity	Generator	Battery
Turn on	Push button	Toggle switch	Rotary switch
/off switch type			
Housing material	Aluminium	Stainless steel	Mild steel
Cover shape			
Caster frame joining	Square	Filletted square	Round
method	Screw	Rivet	Welding
Motor type	Direct current	Alternate current	servo
Speed controller	Knob control	Digital control	manual speed control

Function	Specification	Detail
Power supply	Electricity	3 phase electricity
Turn on/ off switch type		Excel power push button
Housing material	Aluminium	0.2mm thick
Cover shape caster type	Square	
Joining method motor trains	Welding	MIG/TIG
Speed controller	Direct current knob control	Power widow 2v-40v,10A

SUMMARY

The design and construction of peanut coating machine is a major feat in food mixing technology. It is an equipment that makes coating easy. It can be adjusted to suit the user. The project describes the methodology, procedure and equipment used during the construction. The materials used are steel, bolts and nuts, mild steel pipe and square pipe. Most joining processes were done by welding.

RECOMMENDATION

Having considered some of the factors that affected the design and construction of the peanut coating machine, and some of the factors that can encourage projects like this, it is hereby recommended as follows. The machine in its present form, is only capable of coating the peanuts with hand mixed ingredients. It is therefore my recommendation that further design should incorporate a separate section where the flour, eggs, margarine and other ingredients can be mixed before passing them on to the drum where the peanuts will be coated. This will enhance the performance of the peanut processing machine.

REFERENCES

- Abu-Bakr Mohammed and Abdulkadir B. Hassan reported that the traditional method of coating groundnut has proved to be inefficient.
- Patil V.M, Vildya, N A. Katkar, R.L and Pande, P.S (2015) type of conveyor system. A Review of international Journal for scientific research and development vol 2 (2015) pp 305-307
- Baciness and Management vol 5no6 (2010) pp27-28 chelliah S. Sulaiman Mand Yusoff Y, international and performance.
- Dong M. And Leo O. Research and application on energy saving of post belt conveyor procedia environmental science vol 10 (2011) pp 32-38. (shahzad, et-al -2011) said may food products because of high nutrition density.
Accessed on February 25th 2015 from <http://11wwwcifor.Org/publication/pdf-files/Envisief/04Enivforief.pdf>.
- A.A Atiku, N.A Aviara and M.H.Hague show that, the coating of peanut to obtain clean seed is one of the most tedious operation.
- Harto Collins (1998) Recognition of physical and mechanical prosperity of designing machine and optimizing performance. Burr and cheathan (2002) Acquired the necessary data for designing peanut processing equipment.
- F.A. Oluwole, A.T Abdulrahim and M.B onmarou (2007) Management Pretoria johnneshuringsouth African October 29th November 1st 2018.
- Refig it mohd Ramil (2003) reported that a peanut coating machine was designed and built to help improve the standard of living of people.