



SOLAR HYBRIDE AGRO MACHINE

Asst.prof. Vijay Kumar B.P (BE, MTech), Sugunendra B.J, Ankit .k , Sundeep kumar.G, k.Uday kumar

ABSTRACT

The Comfort coupled with safety and simplicity is what man strives for. Our design has been to bring about both. The capstone of our trouble has redounded in development of a new “ **Solar Hybrid Agro Machine** ”. The design present a introductory as well as veritably professional treatment of the subject in a veritably comprehensive, grounded on learning trouble and understanding capability of moment as per their situations. The device is simple and comfortable. introductory computation, drawing, designing is included in the design. The salient features of our machine can be listed as the medium used is veritably simple, easy for operation; no skill is needed to operate the machine.

COMPONET USED IN THIS MACHINE

Bearing, big pulley, small pulley, Shaft, grade distance, Bearings, belt, distance essence, Fasteners

INTRODUCTION

In moment's artificial world man's innovative ideas has taken him towards all direction about the product and safety in artificial establishments. Some instruments are of sheer excellence where as others are the result of long exploration and patient work, but it isn't the quantum of time and plutocrat spend in the invention of device or the complication of it operation is important, but its convenience, mileage and functional effectiveness that are important in considering the device. The being styles of sludge husking in husbandry assiduity correspond of breaking the grains by hand the pieces, both of which aren't effective and time- consuming expose. Safety being a high consideration, an innovative idea similar as this would go long way in working this simple but serious problem. Then's a device which is grounded on scientific principles of machines. It's simple, cheap and conservation free that's produced as a result of this design work. The sludge shucking machine can be used in areas like manufactories etc, where mortal labour is needed used at present. This device can cut the grains and separates the cub. As far as cost aspect is concerned it works much cheaper as compared to mortal labour, since the major element is only a teethed shaft. The size of machine is important point in considering the capacity of the device. The operating cost of the device is low as it requires only a single person to

LITERATURE

Shelke Amar et al(1): in this paper contains generally two types of styles in India to separate the groundnuts from the shops. One is manually means by hand cut the single groundnut from the factory and another bone is keeping the factory in sun for the 15 to 20 days and also put in automatic machine in bulk. But there's some limitations and problems to handling with these two ways. From one, Fritters get wears and damage due to continue working and also work isn't more effective. One person can maximum cut the groundnuts 20- 25 kg per day. This work is doing humans that means performance get reduced in coming day. From this all we can conclude that first system isn't dependable. Now let's talk about alternate system, first problem with this system is that machine is too big and premium, so

this isn't dependable for lower letter/ growers. Another problem is quality of groundnuts isn't too good. From this all we can say till now we weren't any dependable and quality mechanisms for separate the groundnuts from the factory. But Now Me and my mate founded new medium for separate the groundnuts from the factory manually. Medium is homemade machine, by using this medium we can cut groundnuts at time 3 shops. From the practical we get affair of this machine is minimal 500 kg per day. Only two people is need to operate this machine. This most dependable cost for everyone. Main effects is conservation costs is about negligible. In this machine we used the scarified wheel, which can attached to handle with gear and chain medium. All effects covered with proper metallic covering to insure the safety.

Palve Akshay et al(2) In this paper author mentioned Maize or sludge serves as a introductory element of beast feed and raw material for manufacturing of numerous artificial products. These products include sludge bounce, maltodextrins, sludge oil painting, sludge saccharinity and products of turmoil and distillation diligence. In order to reuse the sludge, the kernel should be separated from the cob. sludge threshing machines are popular in both granges and manufactories. For the traditional sludge threshers, the machine uses diesel or gasoline in order for it to operate, which incurs fresh charges. With this study, a solar powered sludge threshing machine will be used to separate the sludge kernel from the corncobs. The machine used a 1 Hp motor running at 1740 rpm, battery.

NikhilB. Patil et al(3) This paper describes how a new machine reduce mortal trouble for birth of seeds from sunflower, to removes from sunflower they're dried in sun light after rubbed over each other, the seeds that with which west material are collected and separated wind over which is homemade operation. The separation of seeds from sunflower held in manually beating with stick, bullock trampling and tractor traipsing these processes are clumsy time consuming process ant total process are clumsy time consuming and total losses are high which directly affects quality of produce. So we can develop a new machine which reduces mortal trouble and loss of the product. The end of the design is to fabricate a machine which will separate s seeds from the sunflower.

Rajashekar. M et al(4) In this paper Groundnuts have been used since the origin of humanity. It's rich in oil painting and protein and has a high energy value. oil painting birth from groundnut is more common at will in utmost of the developing countries. Ground nutis veritably common and comestible item and its oil painting is used as a cuisine medium. Also, the derivate groundnut cutlet after oil painting birth also contains 43 to 65 percent protein and 6 to 20 percent fat which is substantially used as food for cows and scapegoats. At present there's a lack of workers in the field of husbandry and due to further cost in harvesting. Due to the below factors, growers aren't involved in groundnut civilization. The removing of groundnut capsules is a time- consuming process and cost precious. Temperature is veritably high at harvesting time so people find delicate to work. To overcome these difficulties groundnut thresher is used in groundnut cover removing process which minimize the time and cost.

A B Nidagundi et al(5) This paper goes for out lining and manufacturing a solar based paddy sifting frame to void the cocoon and the grain layers from paddy rice to deliver entire white rice corridor that are adequately reused, free of profanations and contain a base number of broken pieces. The processing yield and nature of rice is subject to the nature of the paddy, the processing tackle employed and the aptitude of the plant director. The real corridor of the machine.

Richard Aries F et al (6) : This paper presents increasing seed and oil yields is the top priority of most sunflower breeding programs. Getting benefit from use of heterosis is the main purpose in sunflower hybrid breeding. The objectives of this study were to determine performance of sunflower varieties and to measure the vigors of sunflower hybrids. In 2000 and 2001, sunflower hybrids were evaluated for four important yield components, yield performance, standard and regular heterosis, and heterobeltiosis, in Edirne-Turkey conditions. Based on observations in this research, seed yield of hybrids was changed between 37 and 245 kg ha¹ , oil yield between 17.6 and 118.8 kg ha⁻¹ , oil content between 38.0 and 50.8% and hull rate between 19.2 and 27.1%. The highest heterosis (288.3%) and heter-obeltiosis (98%) were found for oil yield. The

Loftiest standard heterosis(21.2) was reckoned for seed yield. The smallest heterosis(-19.3) and heterobeltiosis (-22.4) were observed for housing rate. The smallest standard heterosis(-22.0) was measured for oil painting yield. Regarding the studied traits, utmost favourable performances were shown by the 11 th cross(2453- A × 2644R). Among ingrained lines, the womanish 2453- A and the manly 2644- R displayed advanced hybrid vigoro than the others.

ThangeR.Bet.al (7) in this paper author bandied that the available of automatic machines are imported from foreign countries. The imported machines aren't only bulk in size but also going around rupees one Lakh. In this design an attempt has been made for the design and fabrication of conservation free multipurpose agrarian outfit simply for small growers at cost not exceeding rupees 20000 per unit. The modelled factors are fabricated and assembled together to form a complete machine.

METHODOLOGY

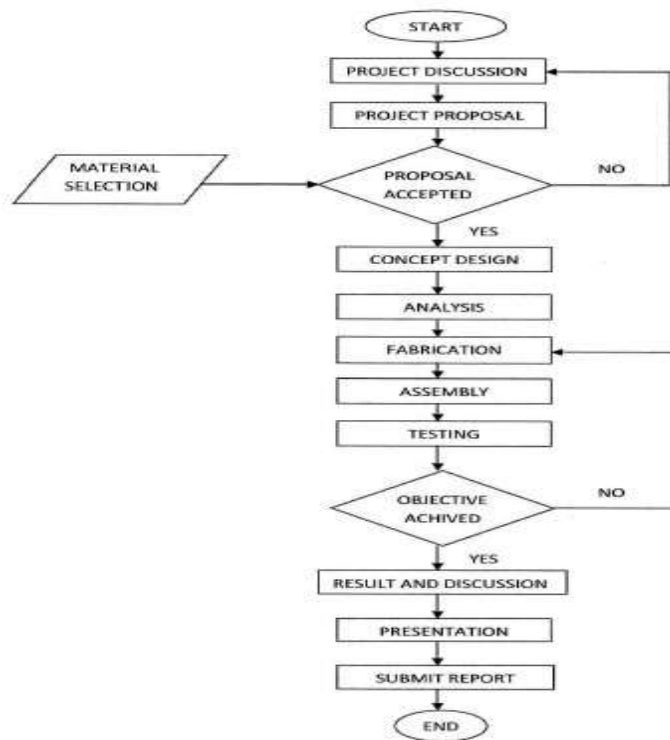


Fig 1 : Methodology

Working process : This machine fully works on both motor and pedal as the medium used in sewing machine in this machine we can conduct colourful operations as citation in the operation below we've prepared this machine in order that planter can use this machine for whole time and no season wise the specialty of this machine is that it can conduct colourful operation in this machine. we've made a special arrangement of medium by which the barrel rotate as we've used 2 pulleys one big and one small in order to drop the speed of the affair shaft the medium is shown in block illustration. The speed and increase in order that to gain the requires affair. For the peddling.



Fig 2: Design Machine model

mechanism we have used the gear the big and small gear this machine can carry different works so it is called as multi and it is also hybrid technology in which 2 means of main source can be given to it.

Motor Mechanism :

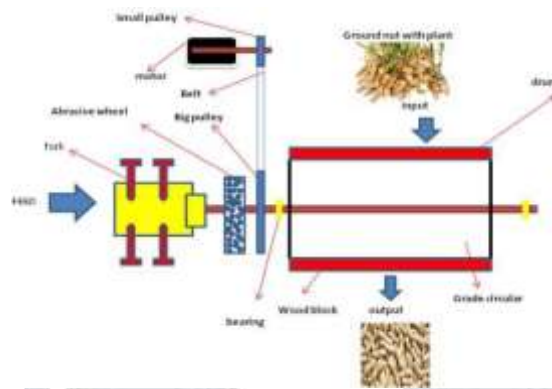


Fig 3: Motor mechanism

Pedal Mechanism :

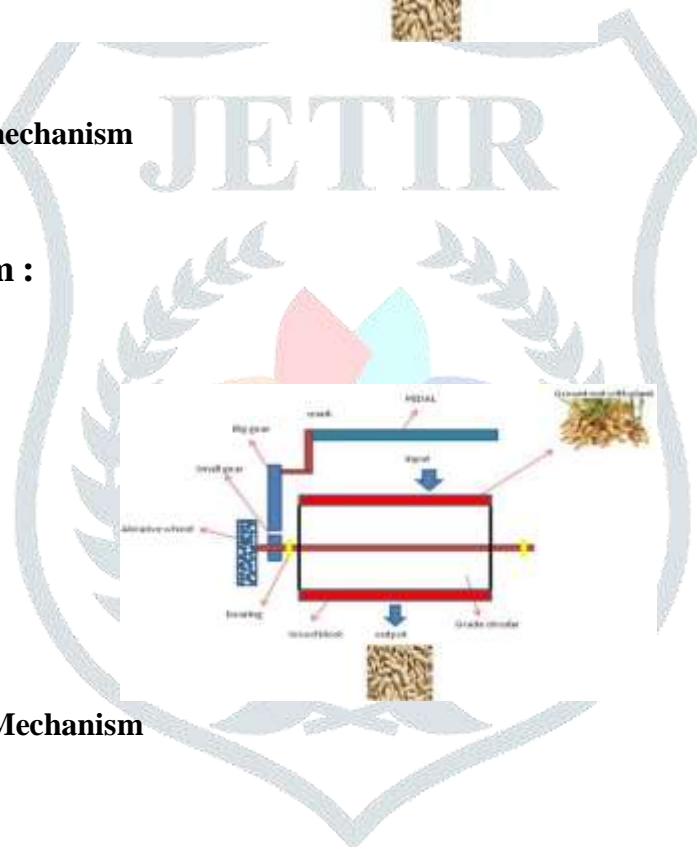


Fig 4 : Pedal Mechanism

Advantages :

USED for different applications multi operation

- 1) Compact in size
- 2) Portable
- 3) Less power consumption
- 4) Ease in manufacturing
- 5) Save in time

CALCULATION:

Checking the strength of the welded joints for safety

The transverse fillet weld welds the side plate and the edge stiffness plates,

The maximum cargo which the plate can carry for transverse fillet weld is

$P = 0.707 \times S \times L \times ft$ Where,

S = factor of safety,

L = contact length = 35 mm

The cargo of shear along with the disunion is 50 kg = 500N Hence, $500 = 0.707 \times 3 \times 35 \times ft$

Hence let us find the safe value of 'ft' thus $ft = 500/0.707 \times 3 \times 35 = 6.73536 \text{ N/mm}^2$

Since the advised value of the tensile cargo is veritably lower than The admissible value as $ft = 56 \text{ N/mm}^2$.

Hence welded joint is safe.

DC motor

The motor is being used of 12 volts and 50 watts. Since the motor is of 50 watts and from battery it requires the power of 50 watts hence the battery can deliver the power to the motor if it charged fully for 90 mins roughly to rotate the motor

Motor speed = N = 76rpm

Power = 50watts

$P = 2\pi NT/60$

$T = P \times 60 / 2\pi N = (50 \times 60) / (2 \times \pi \times 76)$

$T = 6.282 \text{ N-m}$ $T = 6.282 \times 10^3 \text{ N-mm}$

The material being used for the shaft is mild's word Yield stress $\sigma_y = 380 \text{ MPA}$ for M S Material Shear stress

$fs = \sigma_y / (2 \times \text{FOS})$ (FOS = factor of safety)

$fs = 380/242$ $fs = 95 \text{ Mpa}$

$T/J = G \Theta / L$

$= F S / R T / J$

$= F S / R T$

$= (\pi / 16) \times F S \times D^3 \times 10^3$

$= (\pi / 16) \times 95 \times d^3$

$d = 6.9574 \text{ mm}$

$d = 18 \text{ mm}$

Taking periphery of shaft as 18 mm for the motor

Hence the design of the motor shaft is safe.

Design of Angle

Then, The maximum cargo due to all factors = 450 kg(including disunion)

$F = 450 \text{ kg} = 450 \times 9.81 = 4414.5 \text{ N}$.

We know that he load on each link,

$F_1 = 4414.5 / 4 = 1103.63 \text{ N}$.

Assuming a factor of safety as 3,

the links must be designed for a buckling cargo of

$W_{cr} = 1103.63 \times 3 = 3310.9 \text{ N}$

Let t_1 = Consistence of the link

$b_1 =$ range of the link So, cross sectional area of the link $= A = t_1 \times b_1$

Assuming the range of the link is three times the consistence of the link, i.e. $b_1 = 3 \times t_1$

Thus $A = t_1 \times 3 t_1 = 3 t_1^2$

And moment of indolence of the cross section of the link, $I = 1/12 t_1 b_1^3 = 2.25 t_1^4$

we know that $I = AK^2$, where $k =$ compass of rotation. $K^2 = I/ A = 2.25 t_1^4/ 3 t_1^2 = 0.75 t_1^2$ Since for the buckling of the link in the perpendicular aeroplane

the ends are considered as depended, thus, the original length of the link

$L = l = 600$ mm.

And Rankin's constant,

$a = 1/ 7500$ Now using the relation,

$W_{cr} = F \cdot a / (1 + (L/K)^2)$

with usual notation, Here $f = 100$ N / mm²

$3310.9 = 100 \cdot 3 \cdot t_1^2 / (1 + (1/7500)(600^2/0.75t_1^2))$

$3310.9 = 300t_1^2 / (1 + 64/t_1^2)$

$300 t_1^4 - 3310.9 t_1^2 - 64 \times 3310.9 = 0$

$t_1^2 = 41.2$

$t_1 = 6.418$ mm

$b_1 = 3 \times t_1$

$= 3 \times 6.418$

$= 19.25$ mm.

But the standard angle available of $35 \times 35 \times 3$

FUTURE SCOPE OF THE DESIGN

We feel the design that we've done has a good future compass in sector. The main constraint of this device is the high original cost but has low operating costs. Savings performing from the use of this device will make it pay for itself with in short period of time & it can be a great companion in any field dealing with rusted and unused essence. The device affords plenitude of compass for variations, farther advancements & functional effectiveness, which should make it commercially available & seductive. If taken up for marketable product and retailed duly.

CONCLUSION

We've taken up this design as real challenge, as we weren't witness in the mechanical field. We started our work on this design facing new hurdles originally. The mane variability of the device is relatively good and the running is relatively simple. For marketable purpose bone can ameliorate the effectiveness of the device effectively by adding the size of the device.

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