B Tech Project

Mahatma Gandhi Missions College of Engineering & Technology,Noida

Department of Mechanical Engineering

COMPARATIVE STUDY OF FSW AND TIG JOINTS OF AA 6082 ALUMINIUM ALLOY

Mahatma Gandhi Missions College of Engineering & Technology

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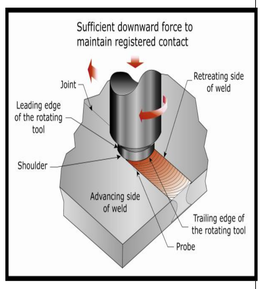
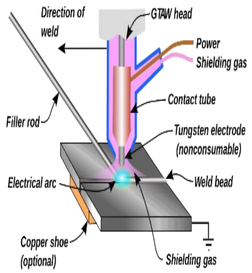
Department of Mechanical Engineering

Introduction

Friction Stir Welding (FSW), a solid state joining process was developed and patented by the Welding Institute (TWI) in 1991. FSW is the potentially useful solid state welding technique in which welding is done below the melting point of the work piece material.



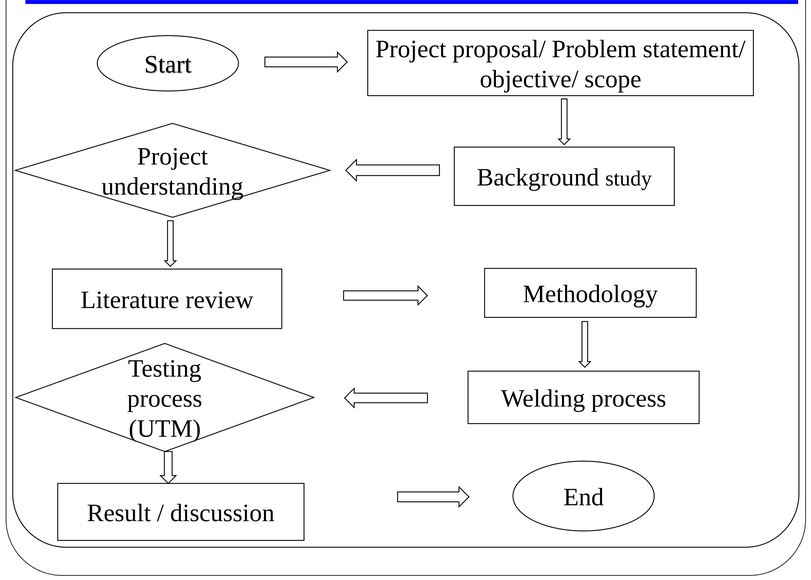
- TIG was originally developed for welding aluminum and other non-ferrous materials in the 1940s
- TIG is a gas welding process also known as Gas tungsten arc welding (GTAW)



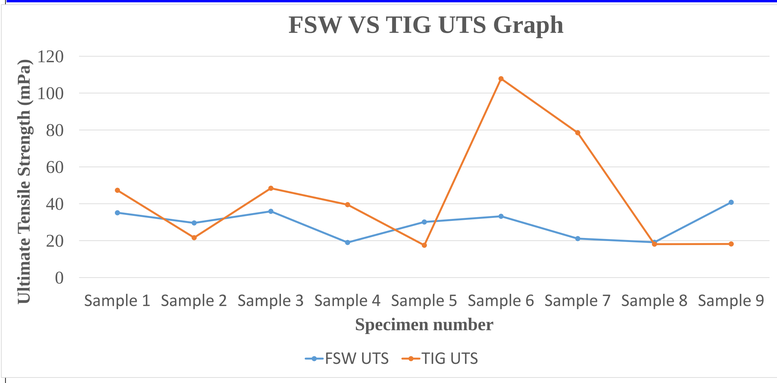
Project Objectives

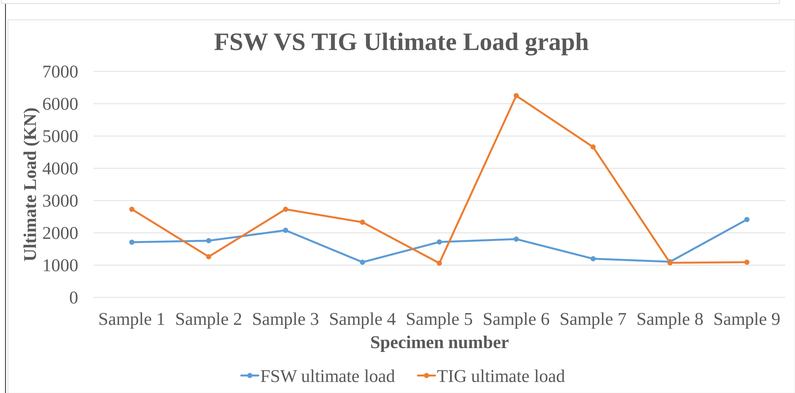
- To prepare the welding joints by TIG and FSW.
- To conduct visual inspection for TIG and FSW welded joints.
- To compare mechanical properties (Tensile strength) of welded joints.
- To prepare the graph based on results obtained.
- To use Taguchi method for optimization of Tensile strength with 3 parameters of TIG and 3 parameters of FSW.

Methodology



Results and Discussion





- The predicted value of tensile Strength on Minitab software Obtained by regression analysis is 17.928 and optimum parameters are Spindle speed is 1500 rpm, pin length 2.2mmTilt angle 2 degree for FSW.

After performing final run at optimum parameters obtained from the lab reports the result came is 18.7 for FSW

- The predicted value of tensile Strength on Minitab software Obtained by regression analysis is 18.5 and optimum parameters are current is 120 Amp, Gas flow rate is 10L/min, Tool pin diameter is 2.5 for TIG.

After performing final run at optimum parameters obtained from the lab reports the result came is 19.1 for TIG.

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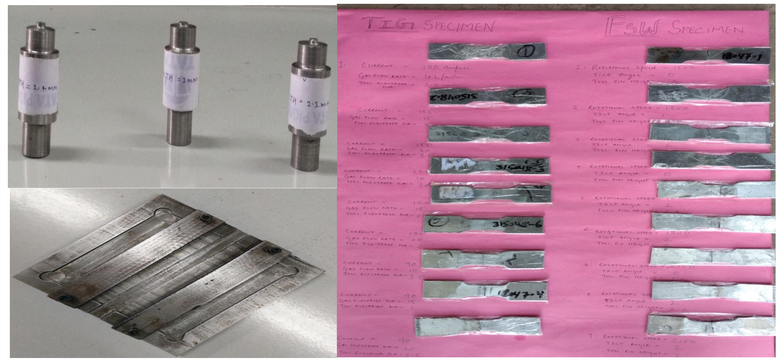

Conclusions

- Tilt angle is the most dominant factor for tensile strength is spindle speed and pin length respectively for FSW.
- For the given set of parameterand optimum parameters are and optimum parameters are current is 120 Amp, Gas flow rate is 10L/min, Tool pin diameter is 2.5 for TIG.
- Gas flow rate is the most dominant factor for tensile strength is current and Tool pin diameter respectively for TIG.

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[2] Lakshminarayanan A.K. and Balasubramanian V., “Effect of welding processes on tensile properties of AA6061 Aluminium alloy joints". International Journal of Advanced Manufacturing Technology, vol 40, pp 286-296, 2009

Guided by:
Mr. S.R. Jambhale
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FABRICATION OF CROP HARVESTER

Mahatma Gandhi Missions College
of Engineering & Technology

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Department of Mechanical Engineering

Introduction

Agriculture forms the backbone of our country economy; about 55% of citizen is depending on agriculture. Thus developing our country means providing our farmers with more “Sophisticated” and “Advanced Tool” which would decreases overall time required for the task and the task will become more easy and convenient. In India harvesting is generally done manually. Crop harvesting is last stage in farming which takes maximum time of farmer among all farming process.

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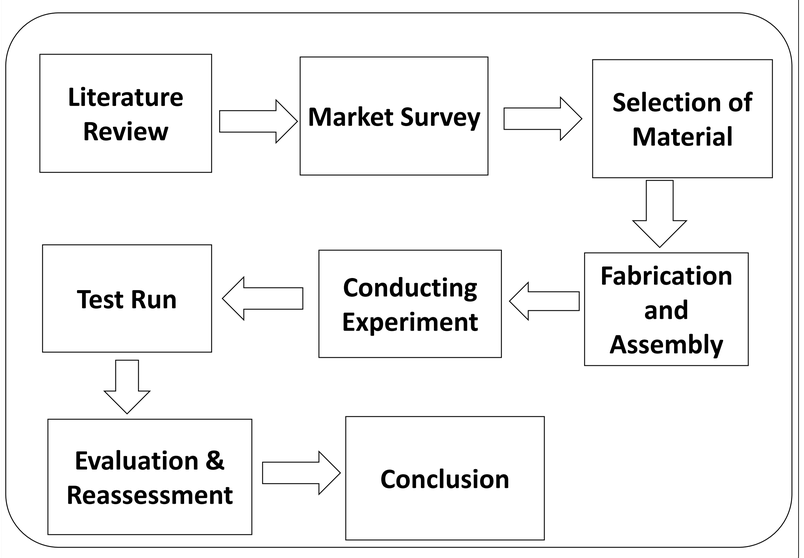
Project Objectives

1.To study principle of crop harvester.
2.To study the design structure of crop harvester.
3.To study and calculate the power transmission.
4.To assemble the crop harvester.
5. To perform the experimentation.
6. To check performance of the crop harvester

Methodology



Results and Discussion

From the working of this demo crop harvester, the following results are obtained:

1. We have successfully fabricated Crop harvester.
2. The engine runs at 3600 rpm and the blades rotate at 900 rpm in theory. But it was found that the belts and pulley were not able to sustain that high amount of power so the engine and blades were reduced to around 3000 and 700 rpm respectively.
4. The cutters cut 4.5 inches from the base of the crop

The HCS(High Carbon Steel) blades were found to be ideal for the fabrication of this harvester. They were cheaper and nearly as effective as the higher priced HSS(High Speed Steel) blades

5. The crops are cut in a single smooth rotational motion
6. The harvester was found to be effective in running nonstop for long time without any major issues like overheat and high fuel consumption
7. It has low maintenance cost and is user friendly
8. This harvester cannot be used for cutting grass and weeds. It is so because they do not have the required thickness and mass required. For the crop harvester to be effective the crop stalks should not be very thin and have very less mass. And also, the blades are not effective in cutting very thick sized crops like sugarcane. It can be used for cutting tuar, bajra maize etc

IMAGES

Conclusions

From this project-Fabrication of Crop Harvester, certain conclusions can be drawn effectively.
This is a simple mechanical machine. It is uncomplicated, easy to use very economical, does not require much manpower and can easily be operated by unskilled labour. Apart from that it is reasonably safe too. Thus certain criteria have to be fulfilled by this machine to reach the farmer’s goal. The quality of the stalks of crop cut, per hour running cost of the machine, the per hour cutting capacity of the harvester, manpower required, wastage if any, low maintenance cost.

References

[1]. “Design and Development of manually Operated Reaper” Mr. P. B. Chavan, Mr. D. K. Patil, Mr. D. S. Dhondg.(IOSR-JMCE)
[2]. “Fabrication and performance test of an Ultraportable Crop cutter” Mr. G Maruthi Prasad Yadav, GMD JaveedBasha IJRSET

Guided by: Mr. ABHIJIT KULKARNI
(Asst. Prof.)

FABRICATION OF QUAD BIKE

Mahatma Gandhi Missions College of Engineering & Technology

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Department of Mechanical Engineering

Introduction

An all-terrain vehicle (ATV), also known as a quad, quad bike, four-wheeler vehicle that travels on low-pressure tires, with a seat that is straddled by the operator, along with handlebars for steering control

It is designed to handle a wider variety of terrain (an area of land) than most other vehicles.

Rider sits on and operates these vehicles like a motorcycle, but the extra wheels give more stability at slower speeds.

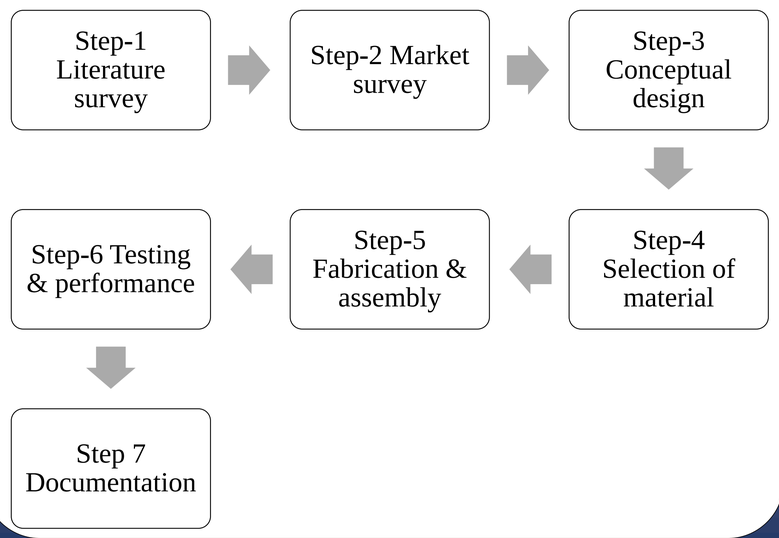
ATVs are intended for use by a single operator, although some companies have developed ATVs intended for use by the operator and one passenger. These ATVs are referred to as tandem ATVs

Project Objectives

In response to the incidence of fatal and serious injury rollovers involving ATV's we install CPD (crush protection device)

- Design of chassis frame for an All-Terrain Vehicle.
- To maintain proper wheel alignment.
- To reduce the overall weight of quad.
- To maintain the effective ground clearance.
- Protect the vehicles from damage and wear from force of impact with obstacles

Methodology



Results and Discussion

- **Suspension Test:** Suspension system work properly on off road track. (1 inch travel).
- **Steering Test:** Steering system work properly (both the front wheel simultaneously steer during steering) at high speed.
- **Brake Test:** Proper locking of the tyres (both rear wheels) when applying brakes.
- **Tilt Test:** In this test vehicle will be tilted at different angles to check any fluid leakage from it.

Design parameters

S.no	Vehicle Specifications	Targets	Achieved
1	Wheel base	At least 42 inches	42"
2	Front track	Max 60" at its widest point.	46"
3	Rear track	Must be At least 80% of wheel base.	31"
4	Ground clearance	Minimum 7 inches	8"
5	Engine	4- stroke (not exceed 250 cc)	4- stroke (150 cc)
6	Brake type	Double Disc brakes	Single Disc brake
7	Suspension	Suspension should be able to provide at least 1 inch of bounce and re-bounce.	1 inch travel
8	Longitudinal direction of wheel	4 wheels that cannot be in a straight line in longitudinal direction.	Rear track is smaller than front track.

IMAGES

Conclusions

- In the fabrication of quad first of all we have successfully design our roll cage and after that we have done mathematical analysis of our front roll cage
- Fabrication of the wishbones which is also a challenging one so we have completed in specified time limit.
- We have successfully check the traveleness of the suspension system i.e. 1 inch travel.

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1. Deep Srivastava, Designing Of All Terrain Vehicles (ATV), International Journal of Scientific And Research Publications, Volume 4, Issue 12, December 2014.

2. Deepak Raina, Rahul Dev. Gupta, Rakesh Kumar Phanden, Design And Development For Roll Cage Of All-terrain Vehicle, International Journal For Technological Research In Engineering (Ijtre) Volume 2, Issue 7, March-2015

3. J.W. Zellner .A. Kebschull R.M. Van Au ken updated injury risk/benefit analysis of quad bar crush protection device (CPD) for all-terrain vehicles (ATVs.) DRI-TR-12-06-2 Second Revision, 29 October 2014

GUIDED BY : MR. UMESH YADAV
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KINEMATIC DESIGN AND DEVELOPMENT OF AUTOMATIC PAPER STAMPING MACHINE BY USING CAM & FOLLOWER MECHANISM

Mahatma Gandhi Missions College of Engineering & Technology

Raj Kumar Sharma, Rakesh Patwal, Rakesh Kumar Yadav, Vijay pratap

Department of Mechanical Engineering

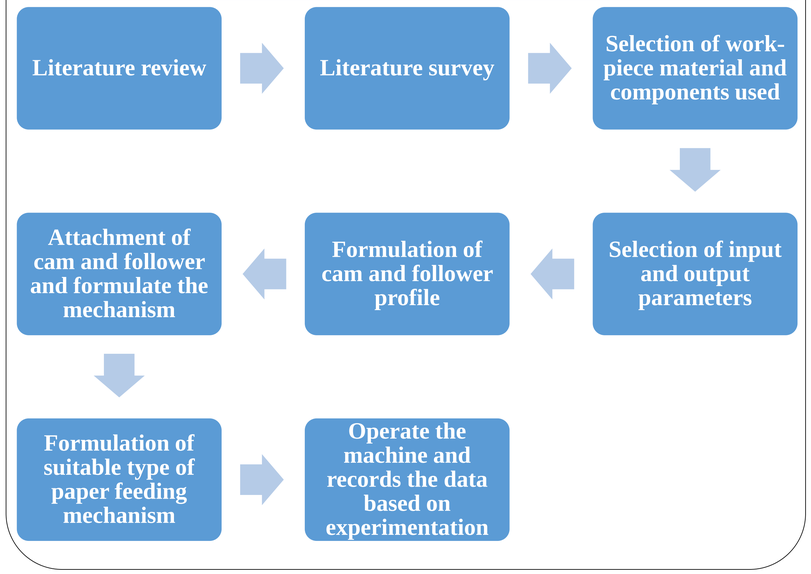
Introduction

This project is basically an automation based control system. The project is done by integrating cam and follower driven stamping machine. This machine will run on several steps of process that is paper feeding, and stamping. The purpose of this project is to generate the correct sequence of events for a stamping machine by designing the cam and follower and by controlling the motions of cam, conveyor and printer which is used for paper feeding with the help of some circuit mechanisms such as relays, electronic timers etc.

Project Objectives

This project will focus only on one goal that is to design a stamping machine for the purpose of automatic Stamping Operation. And to overcome the lack of time and manual work. This may help to stamp in a quicker time and reduce waste of time.

Methodology



Results and Discussion

RESULT

- Automatic paper stamping machine has been fabricated successfully.
- This machine can stamp 4-5 paper in a minute.
- Machine takes 3 times more time as compared to man.
- Cost of Stamping 1000 papers by this machine is 0.50 rupees only.

DISCUSSION

The cost of stamping paper by the machine is very less as compare to the man. Time taken by the machine to stamp is more as compare to man. Our machine can stamp only A4 sheet (It depend upon printer) but man can stamp any size of paper. Machine can work for long hours without break but man needs break. Speed of machine to stamp is constant but the speed of man is decrease with time. Our machine required electricity to operate while man doesn't. Our machine can stamp only at specified position but man is flexible, so it can Stamp any position.

IMAGES

Conclusions

This stamping machine which we made is very easy to use and it have high efficiency. We have attached the stamp in the follower and its operation is automatic. We have used DC motors to run the cam and conveyor. And the electronic circuit timer makes the process an easy task. At last, we have successfully made the "automatic paper stamping machine using cam and follower mechanism". On this machine we can stamp on A4 size papers continuously and this is the big advantage of this machine over manual stamping by hand.

References

- S.S Ratan, "cams", "Theory of machines", Tata McGraw Hill publication, 3rd edition, PP. 209-223, 2010.
- V.B Bhandari, "Springs", "Design of machine elements", Tata McGraw Hill publication, 3rd edition, PP. 393-405, 2015.

Guided by:
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(Associate professor)

EXPERIMENTAL INVESTIGATION ON EFFECT OF PROCESS PARAMETERS ON MATERIAL REMOVAL RATE IN TURNING OF ALUMINIUM-6061 T6 USING TAGUCHI METHOD

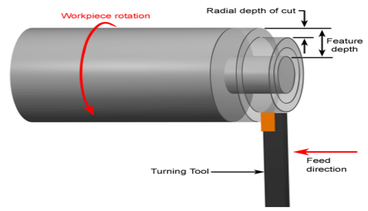
Mahatma Gandhi Missions College of Engineering & Technology

Students name: **VARUN KR. GAUR , SUMIT SHARMA , SIDHANT KR. SINGH , SATYAM RAI**

Department of Mechanical Engineering

Introduction

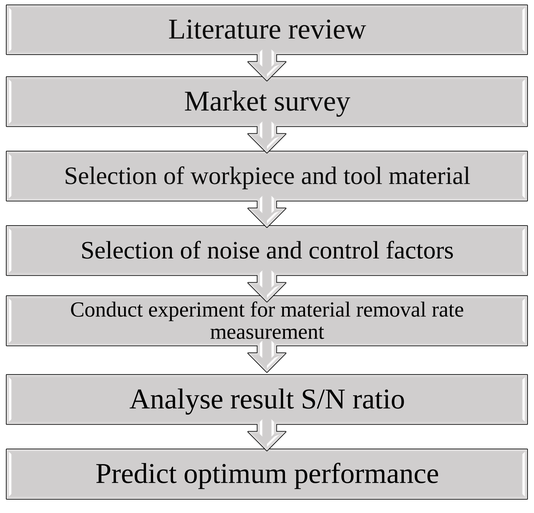
- In any machining process like turning, apart from obtaining the accurate dimensions, achieving a high material removal rate is also desirable.
- A machining process involves many process parameters which directly or indirectly influence the MRR of the product in common.
- MRR may be influenced due to various parameters involved in the operation.
- This study aims at analysis of cutting parameters spindle speed, feed, depth of cut in CNC machine of Aluminium 6061 T6.



Project Objectives

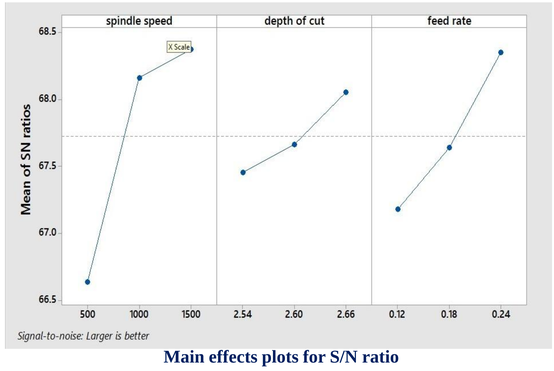
- The objective of this work is to obtain the optimum process parameters spindle speed, feed and depth of cut used in CNC machining on Aluminium 6061 workpiece.
- The optimal parametric combination using Taguchi method have been found.
- The prime objective of our work is to find best optimum value of input parameters for finding best parametric value of MRR (Material removal rate).

Methodology



Results and Discussion

Effects of input parameters (Spindle speed, Depth of cut & Feed rate) on Material removal rate:



Main effects plots for S/N ratio

Level	Spindle speed	Depth of cut	Feed rate
1	-53.60	-52.61	-52.95
2	-51.99	-52.52	-52.55
3	-51.68	-52.14	-51.77
Delta	1.92	0.47	1.19
Rank	1	3	2

Response table for S/N ratio

Source	DF	Adj SS	Adj MS	F-value	P-value
Spindle speed	2	0.0000003	0.00000035	26.70	0.036###
Depth of cut	2	0.0000007	0.00000012	1.20	0.454#
Feed rate	2	0.00000009	0.00000031	9.48	0.095##
Error	2	0.0000005	0.00000095		
Total	8	0.000001			

Analysis of variance

Validation of result

Variables	Optimal value of responses	Optimal setting level	Predicted optimal value	Optimal value of MRR	Experimental values	Error%
Spindle speed(A)	1500	A3	0.0028	0.0019<MRR >0.0028	0.0027375	2.23%
Depth of cut(B)	2.66	B3				
Feed rate(C)	0.24	C3				

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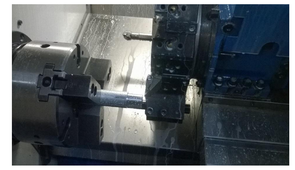

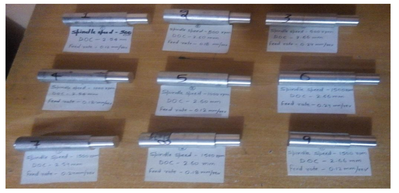

Conclusions

➢From the analysis of variance results, it is found that none of the turning parameter other than spindle speed has the effect on material removal rate of about 40.2% effect.

➢Main effects plots revel that spindle speed and feed rate are the factors which has considerable influence on material removal rate. Depth of cut has smaller or lesser influence.

➢Confirmation test is confirms the improvement of the MRR which also indicates the validity of the present optimisation procedure by Taguchi methodologies.

References

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- Sujit Kumar Jha and Pramod K Shahabadkar "Experimental investigation of CNC turning of aluminium using Taguchi method" Volume: 02 Issue: 03 | June-2015, e-ISSN: 2395-0056 p-ISSN: 2395-0072.
- Ranganath M S , Vipin, R S Mishra "Optimization of Surface Roughness and Material Removal Rate on Conventional Dry Turning of Aluminium (6061) Volume 1 (2014) 62-71 ISSN 2347 – 3258.

Guided by:

Mr S.R Jambhale

(Head of Department)

Tribological Studies Of Laser Textured Tool Inserts In Turning Operation

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Department of Mechanical Engineering

Introduction

Manufacturing is a very important component of any engineering realization. It is worth noting here that high percentage of GDP of many nations comes from the manufacturing sector. It is worth noting here that setting up of large manufacturing industries for boosting the GDP and providing the employment can harm the nature through its emissions and effluent disposals. Thus a need arises for development of energy efficient green manufacturing for protecting the environment. Even a small energy saving per ton of manufacturing saves huge amount of resources and money.

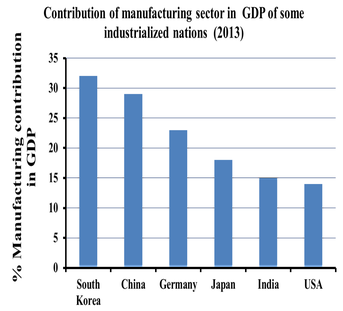
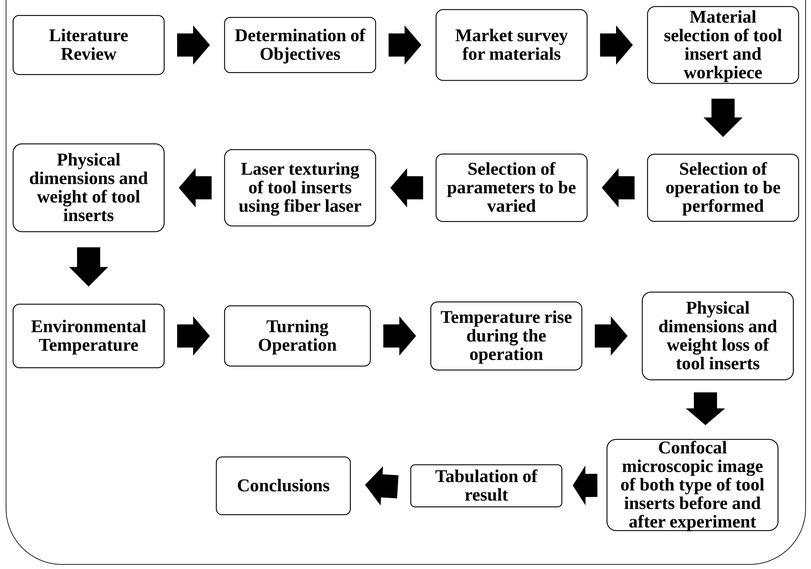


Figure 1: Contribution of manufacturing in GDP of top 6 countries in 2013

Project Objectives

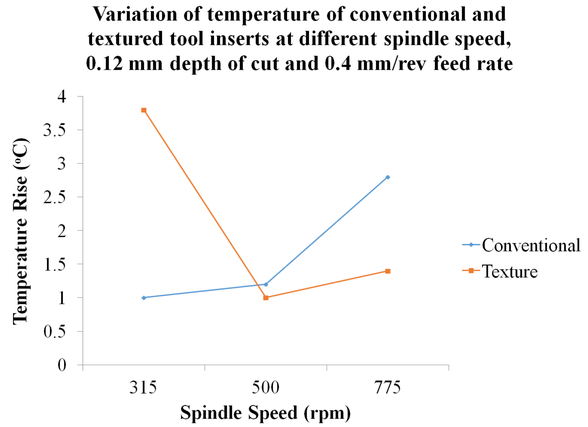
- Tribological studies of **conventional tool inserts** employed in the turning process of carbon steel (C-20) at various operating parameters for dry condition.
- Tribological studies of **textured tool inserts** employed in the turning process of carbon steel (C-20) at various operating parameters for dry condition.
- Comparisons of tribological parameters achieved with conventional and textured inserts.

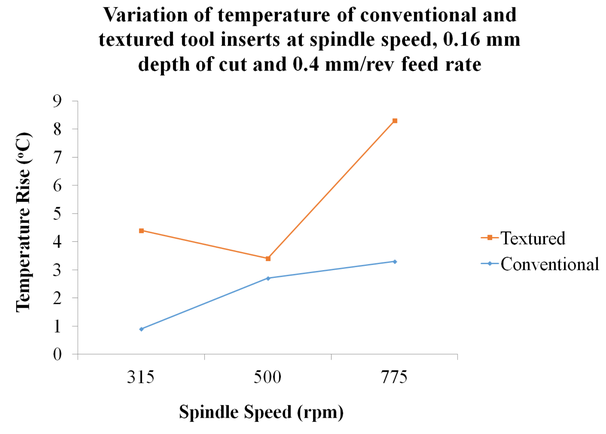
Methodology

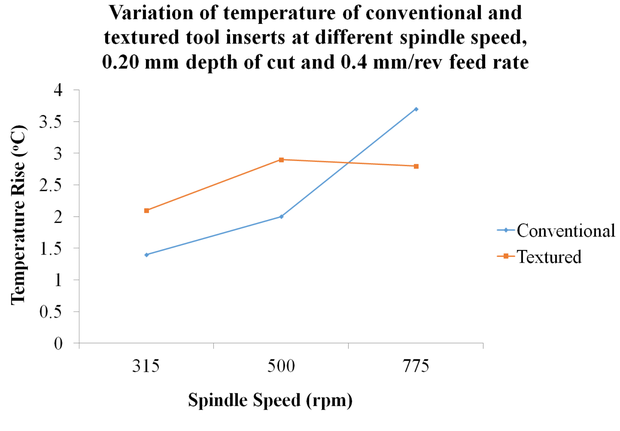


Results and Discussion

1. Rise in temperature for both type of tool inserts at various parameters.







2. Wear in conventional and textured tool inserts.

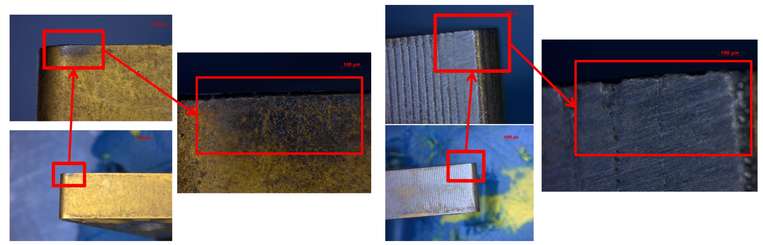


Figure 3: Confocal microscopic image of conventional and textured tool insert.

Conclusions

- Temperature rise is in increasing order when the spindle speed, feed rate and depth of cut is increased for both textured and conventional tool insert. The rise in temperature of textured tool insert is less in comparison to conventional tool insert.
- Weights of conventional tool inserts have decreased after the turning operation. Whereas the weight of textured tool inserts has increased because the chips of workpiece and tool insert articles gets trapped inside the texture.
- Wear of conventional and textured tool inserts changes with change in parameters like spindle speed, feed rate and depth of cut. Wear is more for conventional tool inserts in comparison to textured tool inserts.

References

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2. M. A. El Hakim, M. D. Abad, M. M. Abdelhammed, M. A. Shalaby, S. C. Veldhuis, Wear behavior of some cutting tool materials in hard turning of HSS, Tribology International, Vol 44, 2011, PP. 1174-1181.
3. D. Jianxin, Wuze, L. Yunsong, Q. Ting, C. Jie, Performance of Carbide tools with Textured rake face filled with solid lubricants in Dry cutting processes, Refractory & Hard Materials, Vol 30, 2012, PP. 164-172.

Guided by: Umesh Yadav

Design and Fabrication of Pedal Powered Threshing Machine

Mahatma Gandhi Missions College of Engineering & Technology

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Department of Mechanical Engineering

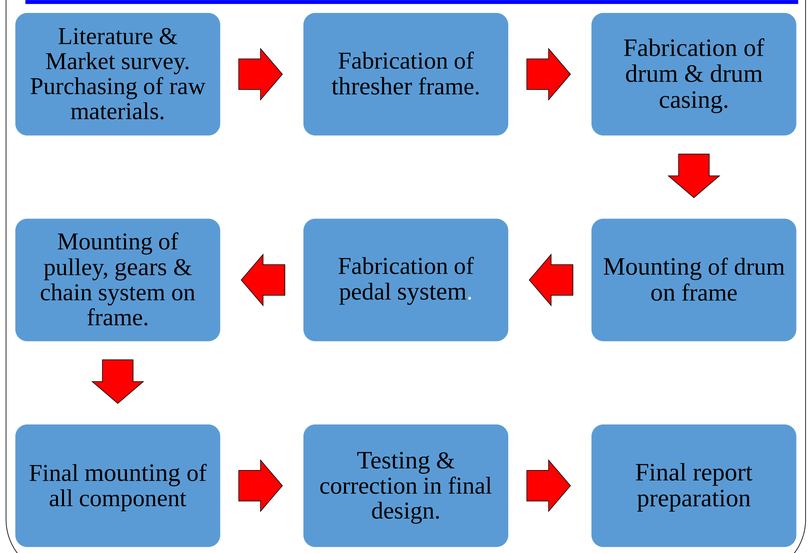
Introduction

- A pedal-driven machine and methods for processing grain using the physical exertions of two person.
- It works on pedalling mechanism for driving both the thresher and the winnower.
- The winnower include a squirrel cage fan ,a grate, disposed in a path of upwardly flowing air, for expelling chaff and collecting grain.

Project Objectives

- Fabrication of pedal powered threshing machine to avoid the use of energy like petrol, diesel, and electricity etc.
- The device should be suitable for local manufacturing capabilities.
- The attachment should employ low-cost materials and manufacturing methods.

Methodology



Results and Discussion

Since, we are providing 100 watts, which is equal to 0.1341-horse power. by the physical exertion of person by pedaling, but we are using a flywheel having diameter 393.70 mm, so it will give power output of 500 watts (0.60 horse power). By comparing our machine with modern paddy-wheat thresher which operate at 5 horse power with 650 rpm by an electric motor and gives 1500 rpm with tractors P.T.O. having capacity of 1000-1200 kg per hour (maharashtradirectory.com/catalog/dagobaengineering). The effort provided by us is 8.33 times less than the power thresher so our machine can produce 144.05 kg/hr.

We have measured the rpm of drum of pedal powered threshing machine by tachometer and we get following result:

SL. NO.	ATTACHMENT OF BLOWER	RPM
1.	Without Blower	913
2.	With Blower	552

SL. NO.	THRESHER	RPM	HORSE POWER	OUTPUT Kg/hour	LINK
1.	Paddy-wheat thresher	1500	5	1000-1200	maharashtradirectory.com/catalog/dagobaengineering).
2	Paddy wheat thresher S1100	2800	16	1500-2200	coconutmachine.in/paddy-thresher.html
3.	Pedal powered thresher	552	0.60	90-100	

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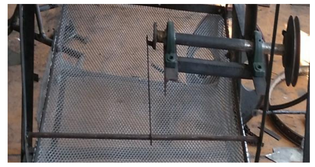

Conclusions

- We have done various manufacturing processes during the making of threshing stand and drum with shaft .

we have got following result:

- We have got 913 rpm of drum without using blower
- We have got 552 rpm with blower
- The output of pedal powered threshing machine is 90-100 kg/hr.

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Guided by: Mr. Ravindra Ram (Asst. Prof.)

DESIGN AND FABRICATION OF AIR CONDITIONING SYSTEM

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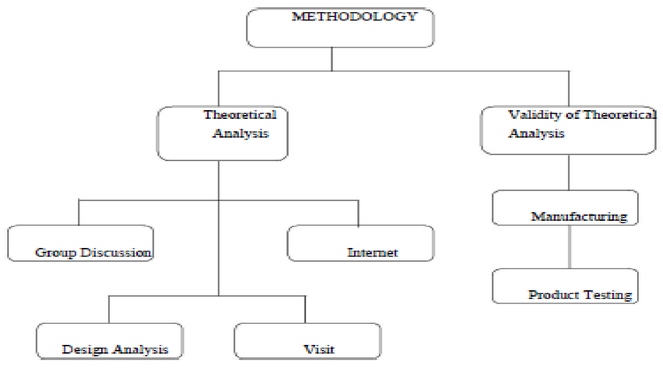
Introduction

Optimised and Portable air conditioner is an innovation product originally from standard air conditioner that is limited to be used in room or inside building. Then, it is design to make it easier to move from one place to another. This portable air conditioner is equipped with ultrasonic sensor that can sense the existence of people in front of it and it will automatically switch off if there is no people and it will turn on back if it detect people crossing or standing in front of it. This will make people easier rather than switching on or off manually especially in the busy event. It is also economize the electricity when the usage is continuously without people using it which lead to waste the energy.

Project Objectives

I. Design and manufacturing of an air conditioner with high efficiency and low power input.
II. Low cost air conditioning system.
III. Portable and easily installable.

Methodology



Results and Discussion

$R.E$ = {4.5 × ($enthalpy\ of WBT at\ suction$ -$enthalpy\ of WBT at\ discharge$) × CFM}/ 12000 ton

R.E= 4.5×(51.5−47.5)×368.93/ 12000 ton

Refrigeration effect = 0.55 ton = 1.9329 kW

Power consumption by air conditioner

Power = voltage × current

= 220 × 2.136 = 470 W = 0.47 kW

Coefficient of performance (COP)

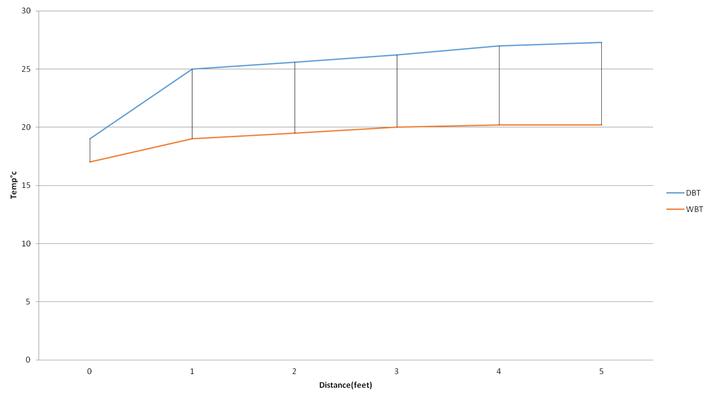
$COP = refrigeraton\ effect/power\ input$

COP = 1.9329 /0.47 = 4.1125

Theoretical COP ,

COPcarnot = Ql /(Qh-Ql)= Tl /(Th-Tl)= 289.5 /(318−289.5) = 10.15789

Graph no. 1 Temperature v/s Distance



Image

Overview of Air-Conditioner

Figure 1: 0.5 ton AC

Conclusions

we can conclude that a cheap portable air conditioner is achievable and can be marketable in reality. The portable air conditioner made satisfies the basic air conditioner functions for cooling purpose.

Reference

1. J. Paul Guyer, 2009, Introduction to Air Conditioning Systems.
2. Air Conditioning and Refrigeration by P L baloney.
3. Thermodynamics by A.Boles.
4. Refrigeration and air-conditioning by R.K Rajput.

Guided by: MR. NEETRAJ SINGH (ASSISTANT PROFESSOR)

DESIGN AND FABRICATION OF BICYCLE POWERED REFRIGERATION SYSTEM

Mahatma Gandhi Missions College of Engineering & Technology

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Department of Mechanical Engineering

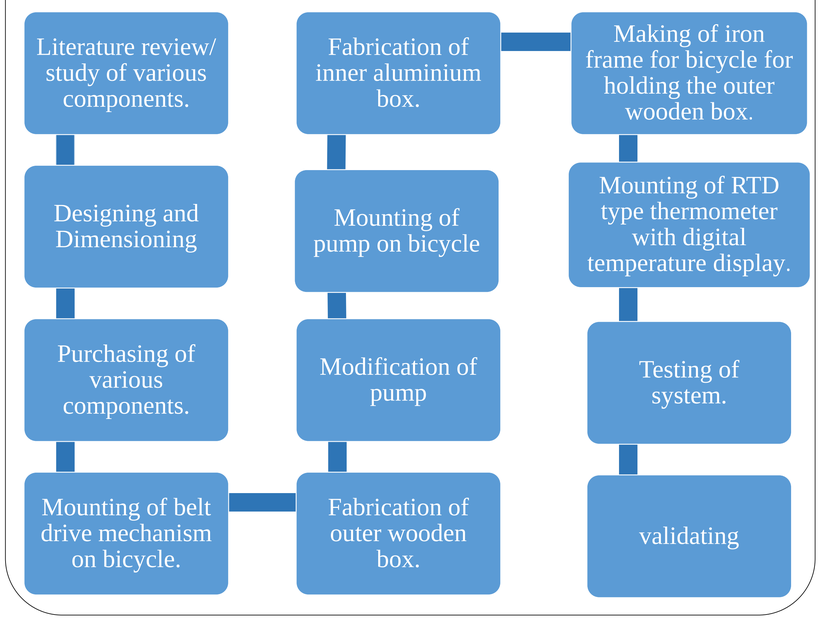
Introduction

- Refrigeration may be defined as the process of achieving and maintaining a temperature below that of the surroundings, the aim being to cool some product or space to the required temperature
- Our project is using vacuum cooling process for obtaining the cooling effect. Vacuum cooling is the most rapid cooling technique for any porous product which has free water and works on the principle of evaporative cooling. Evaporative cooling works by employing water's large enthalpy of vaporization. The temperature of dry air can be dropped significantly through the phase transition of liquid water to water vapour (evaporation), which can cool air using much less energy than refrigeration. .

Project Objectives

1. Production of cooling effect by evaporation of water done by utilization of mechanical energy of bicycle.
2. Making a compact refrigeration system for mobility.
3. Making a chemical refrigerant free refrigeration system.

Methodology

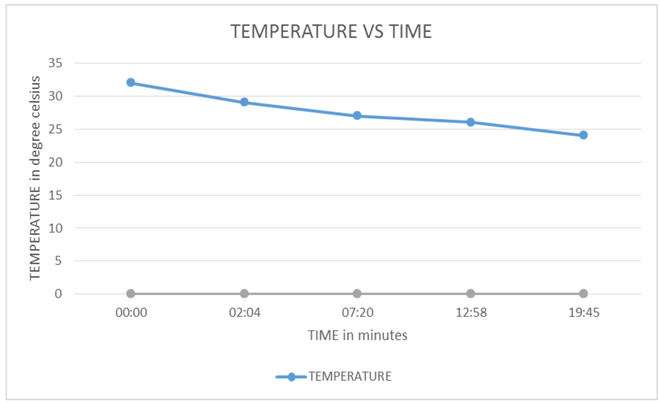


Results and Discussion

After performing the experiment and testing we came to following results:-

- A final temperature of 24˚C was able to achieve form the initial temperature which was 32˚C.
- The above fall of temperature shows that cooling effect was able to produce upto some extent
- The coefficient of performance obtained was 0.0954.

With the help of testing we obtained following graph:-



Validation was done by comparing the above result by the result which was taken using pump connected via electricity as we had done it by connecting the pump by a bicycle . By validation we came to following result:-

- Coefficient of performance by running the pump via electricity is 0.2031.
- Coefficient of performance when running the pump via electricity is more than that obtained when running the pump via mechanical effort.
- This basically happens due to the fact the speed of the pump obtained by electricity is much more than that by bicycle.
- Also the material of the refrigeration box used while pump is connected to the electricity was different one.

IMAGES

Conclusions

- Production of cooling effect by evaporation of water by utilizing the mechanical effort of bicycle was achieved.
- A compact refrigeration system was made for mobility.
- A chemical free refrigerant system was established

References

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2. S.W Zhang1, A.R Abu Talib1,*, A.S Mokhtar1 “DESIGN IMPROVEMENT IN VACUUM COOLING SYSTEM” in International Journal of Engineering and Technology, Vol. 6, No. 1, 2009, pp. 51-59

Guided by: Neetraj Singh
(Asst. Professor)

Design and Fabrication of Moto Drift Trike

Mahatma Gandhi Missions College of Engineering & Technology

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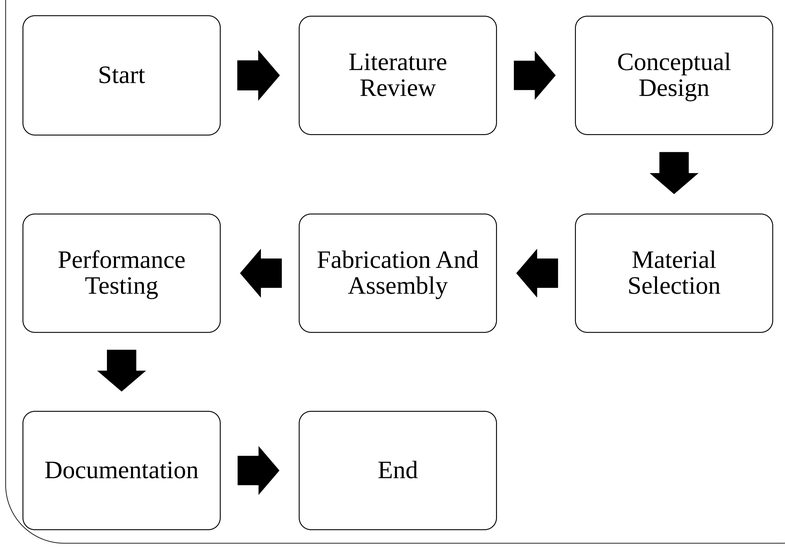
Introduction

- Tricycles are the 3-wheeled vehicles that has two wheels either at the front end or rear end.
- These kind of vehicle can be manually operated or automatically operated powered at front or rear end.
- A three Wheeled vehicle comprises a frame with a rear axle assembly that mounts a pair of spaced rear Wheels.
- Drift trikes are like three wheeled go karts with smooth rear wheels that allow the trike to slide sideways around corners.
- Drift trikes are tricycles that have slick rear wheels, normally made from a hard plastic, often PVC.
- Motorized trikes can be powered by motorcycle engines, smaller automatic transmission scooter motors, or electric motors.
- They are designed to drift, by intentionally initiating loss of traction to the rear wheels and counter-steering to negotiate corners. They are usually ridden on paved roads with steep downhill gradients, with corners and switchbacks.

Project Objectives

- Design and fabrication of a single rider, automatically operated trike.
- To make the three-wheeled vehicle drift.

Methodology



Results and Discussion

Specification of Trike

s. No.	Vehicle Specification	Target	Actual
1	Wheel base	100-130 cm	111 cm
2	Track width	90-120 cm	110 cm
3	Ground clearance	Maximum 7 inches	5 inches
4	Engine	2-stroke (125cc)	2-stroke (98cc)
5	Brakes	double disc brakes	Single disc brake

Overall Performance

S. No.	Aspect	Value
1	Total mass	40 kg (approx.)
2	Maximum velocity	40 kmph
3	Turning radius	3 m

IMAGES

Conclusions

- The fabrication of the drift trike was completed with great satisfaction.
- Our prime motive was to limit the money invested in building the drift trike and this objective was well achieved.
- The following modifications can be implemented on the vehicle to improve its overall performance in the future:
  - ➢ An engine with the higher power rating can be used to increase the speed and overall performance of the trike.
  - ➢ The thickness of tubes can be increased so as to form a more rigid base and support heavier weights.
  - ➢ Double disc brakes can be installed to increase the braking effect.

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- Emma Braegen, Drift Trike Physics and Design
- Patrick Fenner, “On the Golden Rule of Trike Design”, Deffered Procrastination, 4 October 2010
- Rickey Horwitz, “The Recumbent Trike Design Primer”, Hell Bent Cycles, 2010

Guided by: Mr. Ram Prakash (Associate Professor)

FABRICATION OF BRIQUETTE MAKING MACHINE

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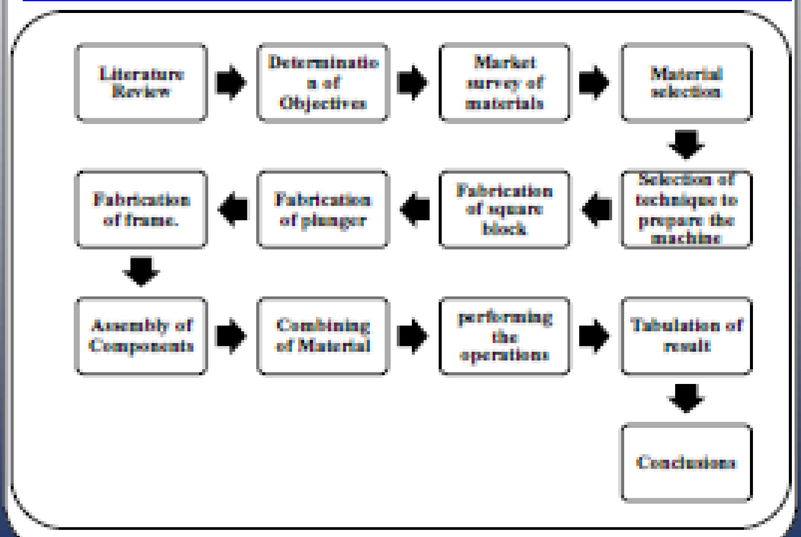
Introduction

Briquettes are a bio fuel substitute to coal and charcoal. Briquettes are mostly used in the developing world where cooking fuels are not as easily available. Briquettes are used to heat industrial boilers in order to produce electricity from steam. The briquettes are con-fired with coal in order to create the heat supplied to the boiler. People have been using briquettes since before recorded history. Briquettes are made from agriculture waste and are a replacement for fossils fuels such as oil or coal, and can be used to heat boiler in manufacturing plants. Briquettes are a renewable source of energy and avoid adding fossils carbon to the atmosphere. There is a tremendous scope to bring down the waste of convention energy sources to a considerable level through the development, propagation of non-convention briquettes technology i.e. briquettes machine ,briquettes plant, biomass briquettes plant for production of agro residue briquettes to meet thermal energy requirement .

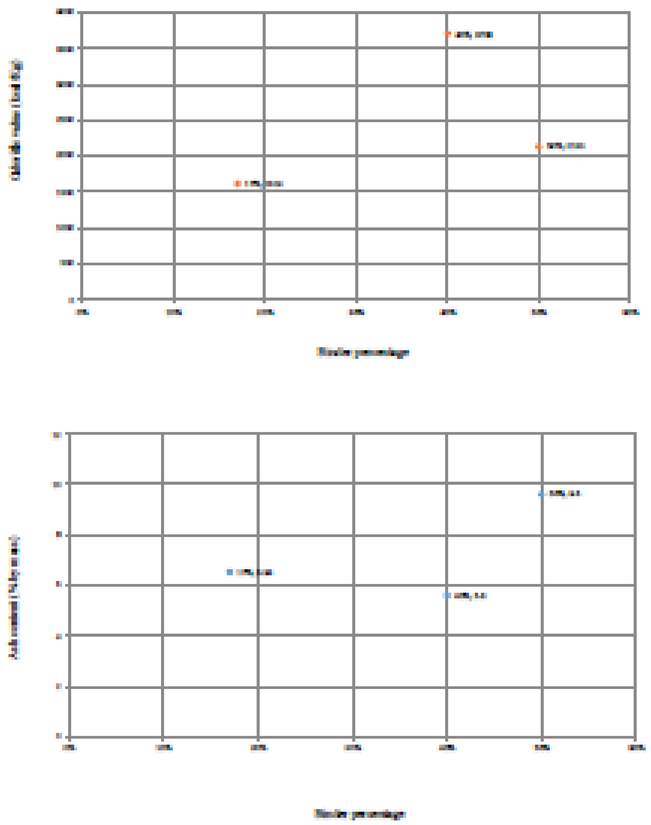
Objectives

- To build up a briquette without using electricity.
- To prepare a briquette of high calorific value.
- To create a briquette of less cost per unit.

Methodology



Results and Discussion



Images

Conclusions

- It can be concluded that waste material like dead leaves, dead grass, saw dust & cow dung is better binder for biomass briquetting. Among that sample 1 is better one rather than other samples.

- For an agrarian country like India that produces huge amount agriculture waste every year, use of these wastes as briquettes can be an economically viable, sustainable and environment friendly solution.

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Guided by: **Ms. Manuja Pandey (Asst. Prof)**