



Modeling of Leg Elevator using Sugarcane Bagasse

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Abstract

The most significant thing after the surgery in angle and leg, the incision part should be in immobilize state and shielding it from optional injury of thrashing around. That's why individuals enthusiastically suggested this leg elevator. The leg elevator in this paper made of sugarcane bagasse. The sugarcane bagasse is a crude material which is of biodegradable. By using molding process the crude material made into a solid leg elevator. It is of minimal effort and sound contrasted with the current item made of synthetic substances. This is generally useful to recuperate rapidly from leg, point and thigh surgery. This paper proposes that sugarcane bagasse can be one of the elective crude materials which can be applied for bundling reason to decrease the ecological dangerous items in clinical supporting medium for leg.

Keywords: Sugarcane Bagasse, Pulp, Leg Elevator, Patients

1. Introduction

Nowadays, nature wrecking and plastics advancing and other harmful materials are expanding. Consequently a little method to make mindfulness about it is sugarcane bagasse. Sugarcane bagasse was its dry solid formation which persists once the sugarcane has also been extracted. After Brazil, India has been the second largest producer of sugarcane. The major sugarcane producing state in India were Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, Bihar, Andhra Pradesh, Gujarat, Uttarakhand, Haryana, Punjab and Madhya Pradesh.. Uttar Pradesh, India's largest sugar beets growing district, was reported to be have 23.60 lakh hectares of sugar beets field, comparison to 24.12 lakh hectares. It's used for biofuel, manufacture of pulp, paper making, building material, furniture and other ceramics. The leg elevator made of sugarcane bagasse will support the patient's leg acquire rest and ensure a harmed region. It will reduce further swelling and pain in leg. This is likewise for the most part viewed as eco inviting and contamination free sort of creation.[1-4].

1.1 Existing Model Analysis

Prashant O. Modani & M R vyawahare, 2013 has presented a paper titled "utilization of bagasse ash as a partial replacement of fine aggregate in concrete". In this paper sugarcane bagasse can be utilized to deliver expected mortars and cement what's more, add ingrain constrained filler sand polymer networks from the remains framed by consuming of sugarcane bagasse for above 500°C. Technique used are Collections of crude materials, Crystallography, Loss of flaming, Adding supplement, Crystalline silica planning, Melt exacerbating, Insuti polymerization, Solution projecting. At last Cellulose nanocrystal are utilized in aviation, development, car for changing the surface. Z. liyana, F Malek, H. Nornikman & N.A.M. Affendi, 2012 has presented a paper titled "Investigation of sugarcane bagasse as alternative material for pyramidal microwave Absorber design"[1-3]. Throughout this paper, non-food waste material such as sugarcane bagasse is used as a precaution for high - power applications as just a pyramid - shaped furnace. Approach are

Assortment and pounding of sugarcane bagasse, Combination of tar and hardener operator, Pyramidal example for dielectric properties estimation, Measure dielectric properties and Plan and reenact pyramidal microwave safeguard. As a result Sugarcane bagasse is utilized for elective for microwave safeguard thought about business safeguard is eco-accommodating. Dharmendra D. Sapariya, Prof. Nilesh R. Sheth, 2014 has presented a paper titled “Sugarcane bagasse is turned to major source or nonconventional energy”. In this paper utilizing significant side-effect in sugar manufacturing plant can be utilized for power utilization and decrease of oxide. Methods are Bagasse briquetting measure, Age of warmth from bagasse, Creation of bioethanol and Gasses produced from bagasse. Non-food biodegradable misuse of sugarcane can be utilized nonconventional wellspring of energy. Dr. M. Vijaya Sekhar Reddy, K. Ashalatha, M. Madhuri, P. Sumalatha, 2015 [4-6] has presented a paper titled “Utilization of sugarcane bagasse ash (SCBA) in concrete by partial replacement of cement”. [3] In this paper Common Portland concrete is perceived as a significant development material all through the world. Researchers everywhere on the present reality are zeroing in on methods of using either mechanical or farming waste as a wellspring of crude material for industry. Materials used are Concrete, aggregates, Water and Bagasse debris. The outcomes show that the SCBA is mixed cement had altogether high compressive quality contrast with that of the controlled cement. Sirlene, M. Costa, Silgia A. Costa, Richard Pahl, Priscila G. Mazzola, Joao Paulo P. Marcicano & Adalberto Pessoa JR, 2013 has presented a paper titled “Textile Fiber Produced from Sugarcane Bagasse Cellulose: An Agro-Industrial Residue”. [6-10] In this paper the bagasse mash without or with hydrolysis and business combinations of these materials in various extents were utilized for the creation of material filaments. Material and strategies are Commercial cellulose, Sugarcane bagasse, Acid hydrolysis of sugarcane Bagasse and Soda/AQ pulping of Bagasse without and with Acid hydrolysis Substance examinations of bagasse without and with hydrolysis and mash are basic for organization assurance and potential changes in tests subsequent to pulping and order measure. [11-16].

2. Sugarcane Bagasse

Sugarcane bagasse is the sinewy buildup staying after sugarcane tail has been squashed and the juice eliminated. Since of its sinewy nature, sugarcane bagasse has been most generally utilized as a fuel, paper and pulp, auxiliary materials, furthermore, horticultural employments. New sugarcane bagasse from the factories contained about half dampness and the dry issue contained about half cellulose, 28% hemicellulose, and 15% lignin. The fiber segment of the bagasse contained more cellulose though the substance partition contained more cell-solvent matter and lignin. Characteristic strands have minimal effort, low thickness and low strength as contrast with engineered filaments. For every 10 tons of sugarcanes squashed, a sugar industrial facility delivered almost 3 tons of wet bagasse.

2.1. Design

AutoCAD has been used to build the element. AutoCAD is a PC-aided design programme developed by the organization Autodesk. It enables users to design and modify automated 2D and 3D designs more quickly and effectively than you could through design.

2.2 Properties and Constituents of Sugarcane Bagasse:

Significant constituents of sugarcane bagasse are lignin, cellulose and hemicelluloses.

Table.1. Properties and Constituents of Sugarcane Bagasse.

Physical properties	Chemical properties	Mechanical properties
Dia (µm) 10-34	Cellulose(%) 45-55	Rigidity (Mpa) 180-290
Length(mm) 0.8-2.8	Hemi cellulose(%) 20-25	Youthful's Modulus (Gpa) 15-19
Perspective Ratio(l/d) 76	Lignin(%) 18-24	Disappointment Strain (%) 1-5
Dampness content (%) 49	Gelatin(%) 0.6-0.8	Thickness (Kg/m3) 880-720
	Debris(%) 1-4	
	Extractives(%) 1.5-9	

3. Methodology

To make this elevator in this paper we used some designing software to make the model. Leg lift with an etched leg channel forestalled moving of the leg, and 45° calculated incline for thigh uphold.

3.1 Definition

32L x 13W x 9.5H in. 9.5 inches is a sufficient length to reduce fluid accumulation and pressure increase, and to also alleviate the pressure after medical procedures and also provide a Zero-Gravity rest for the entire leg. It's great for spawning throughout the car and resting when lying in bed or even on the sofa.

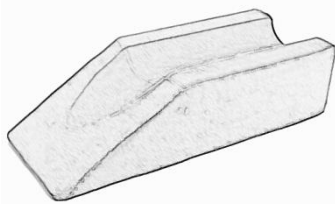


Fig.1: leg elevator model

This accelerator is far more secure and convenient than stacking armrests. It can be used as a hang tool for foot, lower leg, fragile, ACL medical procedure recovery, including knee replacement.

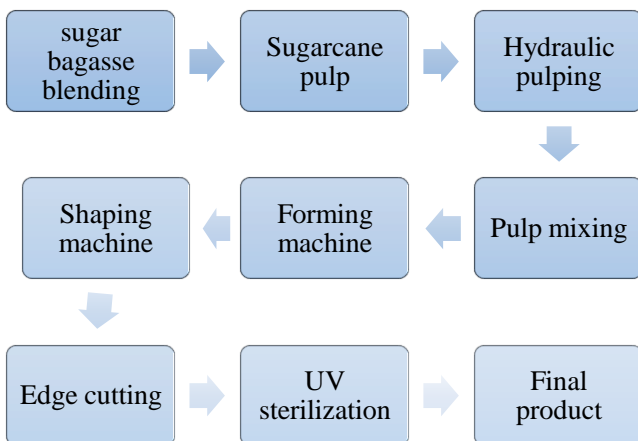


Fig.2 Sugar bagasse process.

3.2 Blending

The crude material is absorbed water and blended until the ideal mash consistency has been accomplished. Added substances, for example,

estimating specialists or fillers are acquainted with produce the necessary capacities.

3.3 Pulping

Soaping the mash sugarcane baggase and put into hydraulic pulper. In the wake of pulping, mash will go into blend tank and add water and oil added substance, at that point goes to mash gracefully tub for shaping machine, vacuum dewatering and framing.

3.4 Forming

Forming is the vital cycle underway line. The cycle is quantitative mash gracefully, back flushing power flexibly, vacuum dewatering and framing. With advance innovation to eliminate openings, lopsided thickness during creation, in order to diminish blemished products. The semi-completed item will be moved into drying mold for strength.

3.5 Shaping and drying

At this cycle, steam is utilized for heat drying. Contrast with electrical warming, 70% energy will be spared, meeting cleanliness necessities of food bundling, improve asset use. Qualified creation rate is up to 99%.

3.6 Edge cutting and cleansing

The item taken out from the shaper will be moved into edge cutting machine, where the additional edge will be managed. UV disinfection is applied to ensure creation meeting with cleanliness prerequisite.

3.7 Physical Features

Because of its surface properties, higher moisture retention, high water quality, water absorption index, and low lignin, sugarcane bagasse were chosen as a container.

3.8 Chemical Features

Bagasse is half water and dry bagasse mass piece is viewed as 39% cellulose, 37% hemicelluloses, 21% lignin and 3% debris. Sugarcane bagasse made out of 5.6% Hydrogen, 45.5% carbon, 45.2% oxygen and 0.3% nitrogen. Also, sugarcane bagasse contains 3.89% aluminum, 3.87% Calcium, 1.32% Magnesium, 0.9 % sodium and 27.0 % Silicon. It ought to be noticed that the presence of these metals in the strands builds their fragility.

4. Ecological Impact

Non-food biodegradable wastes like sugarcane bagasse are extracted from sugarcane after extracting juice. India is one of the largest country in cultivating Sugarcane. 90% of sugarcane can be

used for production of alcohol and sugar. 10% sugarcane can be used for other purpose. There is a chemical compound like cellulose, hemicellulose, and lignin are present in the bagasse. There is a major solid waste is bagasse of sugar. It is mainly used for burning in the factory for other purpose. It finally turns into ashes and they can be disposable by major water ways like river. It is creating water pollution in major source of India. Sometimes it is directly thrown on roadside. Because of that any reinforced fillers can be added to it chemical components it take long time for decay. So we are trying to use the bagasse for alternate source of any other material. We are preparing the comfortable cushion or elevator for patient. Because taking rest is important medicine for any diseases or accidents for a person. We are trying to create a cushion or elevator for comfortable rest for patients. Elevator is particularly for leg. By using bagasse for create an elevator it becomes major source for elevator. Because of that solid waste of sugarcane can be used in better manner. And it will be easily disposal in future.

4.1 The Advantage of Supporting Leg Using Bagasse Elevator

- Utilized in days when medical procedure
- Can diminish torment drug utilization
- Settles the whole leg
- Successfully control your edema
- The leg lift fits effectively in a standard bed
- Gives delicate rise permitting knee flexion and foot rise over the heartAccelerate recuperation time.

Conclusions

Hence the execution of sugarcane bagasse is made which are possible specialists for organic deterioration. The extraction of bagasse fiber prompts gathering of bagasse squanders and ecological contamination. Hence bio debasement of sugarcane bagasse is decreased by this strategy. Through assessment of the leg lift and the help of leg lift of the biomass, pleasing for the patients.

Future work

In this project we are interfacing IOT based accelerometer with Arduino UNO. We are controlling a buzzer and also receive email according to the output of the accelerometer. Whenever the patient shake the leg unknowingly. The staff will receive email when they were far

and buzzer alarms when they were near to the patient.

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