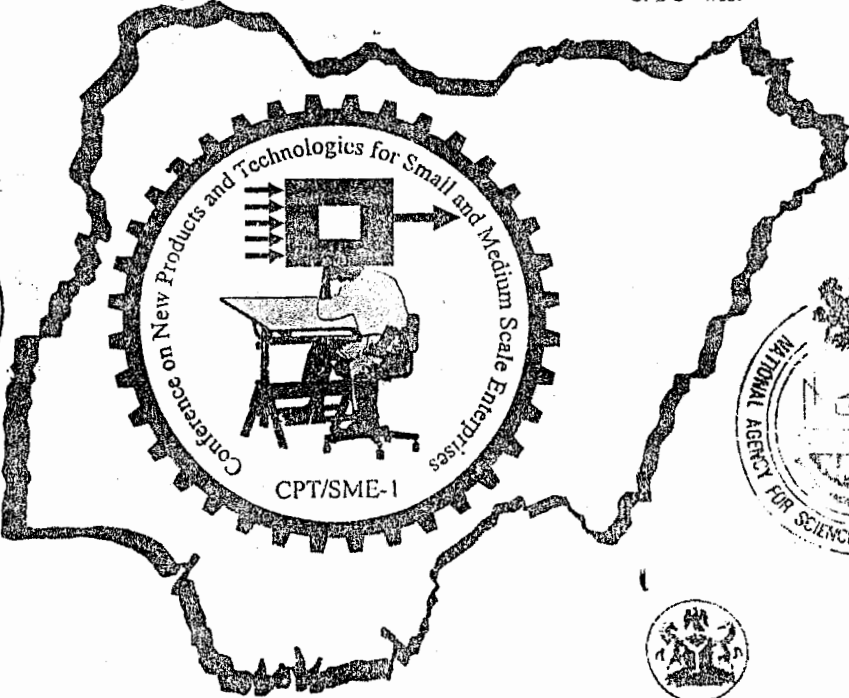


CONFERENCE PROCEEDINGS

CONFERENCE ON NEW PRODUCTS AND TECHNOLOGIES FOR SMALL AND MEDIUM ENTERPRISES

CPT/SME - I



Federal Ministry of Science & Technology

SPDC - west

NOTAP

University of Benin

Raw Materials Research & Dev. Council

Egor Local Govt. Council

PATASD

NATIONAL AGENCY FOR SCIENCE & ENGINEERING

UNIVERSITY OF BENIN, UGBOWO, BENIN CITY

May 21 - 23, 2001

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DESIGN AND FABRICATION OF BRIQUETTE COMPRESSING MACHINE FOR USEFUL PRODUCT FROM AGRO-AND WOOD WASTE

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1. FUNCTION
The main function of the Briquette comprising machine is to product six (6) briquettes of about 300mm long at a time. The shapes of the products are rectangular.

The product is shown in Fig.1. It is produced from agro-waste such as rice husks and wood waste (saw dust).

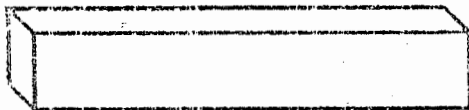


Fig.1 Briquette product made from agro and wood waste.

2. PROPERTY
The product has a high caloric value.
Table 1: The caloric value of the product

Property	Value
Caloric	3055.0 Cal/g (12.83KJ/Kg)

3. BENEFITS
The products and production process have the following benefits:-

- Ease of forming products,
- Adhesive to make the products
- Can be found locally, starch, gum arabic and bentonite.
- Fine finish of products
- Products are used in the as-formed condition without post-forming operations, between 24-48 hours, before they can be used.
- Readily available raw materials all over the country, both in the rural and urban areas where saw mills, rice milling stations, and the raw materials are.
- Generates wealth from waste.
- Promotes environmental cleanliness.
- The products can be used in place of firewood, kerosine, gas and other energy for cooking and baking.

- The products can be roused as many times as one wants.

4. LIMITATIONS
The configuration of the product cannot be changed due the design limitation.

5. STAGE OF DEVELOPMENT
The product development for the shape and size as shown in fig 1 has been accomplished.

6. PRODUCTION REQUIREMENT AND INVESTMENT
The fabrication of the Briquette compressing machine were based on the locally found raw materials. The major parts of the machine, the press, ejector components housing and crankshafts, were made of the steels that are easily found in every part of the country.

The machine can be produced in mass. The supply of the raw material input into the machine (rice-husk and saw dust), are guaranteed because they are the unwanted wastes from the production of rice and planks. They can be found in many rural and urban areas of the country.

- The cost of the raw materials is essentially that of collection from the mills, where they are found as environmental nuisance.
- The machine can be operated by two or three persons.
- The machine is almost maintenance free, needing, occasional greasing of the joints to reduce friction
- The possible cost of the machine is about N15,000.
- The machine can produce 48,640 briquettes annually in one shift operation.
- The possible cost of one briquette will be N3.
- The net gain from one shift operation annually will be about N132,000.



CONFERENCE ON NEW PRODUCTS AND TECHNOLOGIES FOR SMALL AND MEDIUM SCALE ENTERPRISES

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BACKGROUND

Small and Medium-Scale Enterprises (SMEs) are very important in national economies. This sector of the Nigerian economy is not well developed due to many factors, which include: poor information flow, absence of appropriate technology to cope with peculiar conditions, poor investment opportunities, and scarcity of capital. This conference is intended to help redress this situation.

The conference hopes to bring together over 400 participants including industrialists, manufacturers, investors, researchers, engineers, technologists, scientists, inventors, innovators and government officials. Information will be shared on new products, new technologies, investments, and funding for research projects.

CONFERENCE PHILOSOPHY

There are numerous new products and technologies developed by Nigerian scientists, engineers, researchers and inventors in the Universities, Polytechnics, Research Institutes and private enterprises which are tucked away in the laboratories to gather dust. CPT/SME-1 intends to bring exposure to these new products and provide a forum for constructive criticisms by investors, peers, and potential users. It is hoped that this will trigger off a chain-reaction, which ultimately will result in the commercialization of some of these new products and technologies.

CONFERENCE GOALS

The goals of CPT/SME-1 are to

- disseminate research and development results on new products and technologies to investors.
- provide the enabling environment for linkages between researchers, industries and funding agencies.
- create a forum for sharing new ideas
- create awareness on new products and technologies developed in Nigeria, and
- create a data bank of small and medium enterprises.



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CHEMICAL ANALYSIS OF THE PRODUCTS FROM A SHEABUTTER EXTRACTION MACHINE

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1. FUNCTION

The product has a variety of uses as a source of raw materials for pharmaceutical and cosmetics industries. It is also used as a cooking oil. The product is an extract obtained from the sheabutter extraction machines which was designed and constructed for small scale industries.

many industries such as cosmetics, pharmaceuticals and food.

- The product can be used in the as-produced condition.

2. CHEMICAL ANALYSIS RESULT

The extracted semisolid product from the designed machine, was analyzed and compared to the elemental contents of the extraction from Soxhlet apparatus and the traditional method of production of sheabutter.

The result showed that the amounts of Lead, Manganese, Iron, Aluminum, Copper, Calcium, Magnesium and Phosphorus present in the Sheabutter are almost the same from the three methods of extraction. The amounts of Ca, Fe, and Pb are as high as 22.50ppm.

4. LIMITATIONS

As sheabutter is a seasonal plant, the production may not be continuous. However proper storage of the seeds can enable production throughout the year.

5. STAGE OF DEVELOPMENT

The sheabutter extraction machine has been designed and constructed. The extractor which is portable and manually operated, can be used in both rural and urban areas.

3. BENEFITS

The product has the following benefits;

- There is more yield from the extracting machine than from the traditional method.
- The elements found in all the methods of extraction are good for health in agreement with World Health Organization (WHO) recommendations.
- The product will serve as a resource of raw materials for

6. PRODUCTION REQUIREMENT AND INVESTMENT

The major production equipment required are a power screw, housing adjuster, and cone. These equipment can be obtained locally. The supply of the sheabutter seed is guaranteed as it is widely available in the northern parts of the country.

The cost of the raw materials will essentially be that of transportation, because a basket full of the sheabutter seed costs between ₦10 and ₦20.

Two to three operators may be employed. From the analysis, the yield from a basket full of sheabutter seeds may fetch as much as a thousand Naira.

*Department of Mechanical Engineering

**Department of Chemistry

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