

EcoFlame: Clean Bio–Coal Energy from Waste with a Smart Stove and Power Generator



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The Problem



140 Million have no access to clean cooking fuels and cooking technology



Cooking gas is expensive



Fuelwood: desertification, emission of CO₂ and eventual global warming

The Solution



**Providing Clean
Energy for Cooking
and Heating and
saving money**

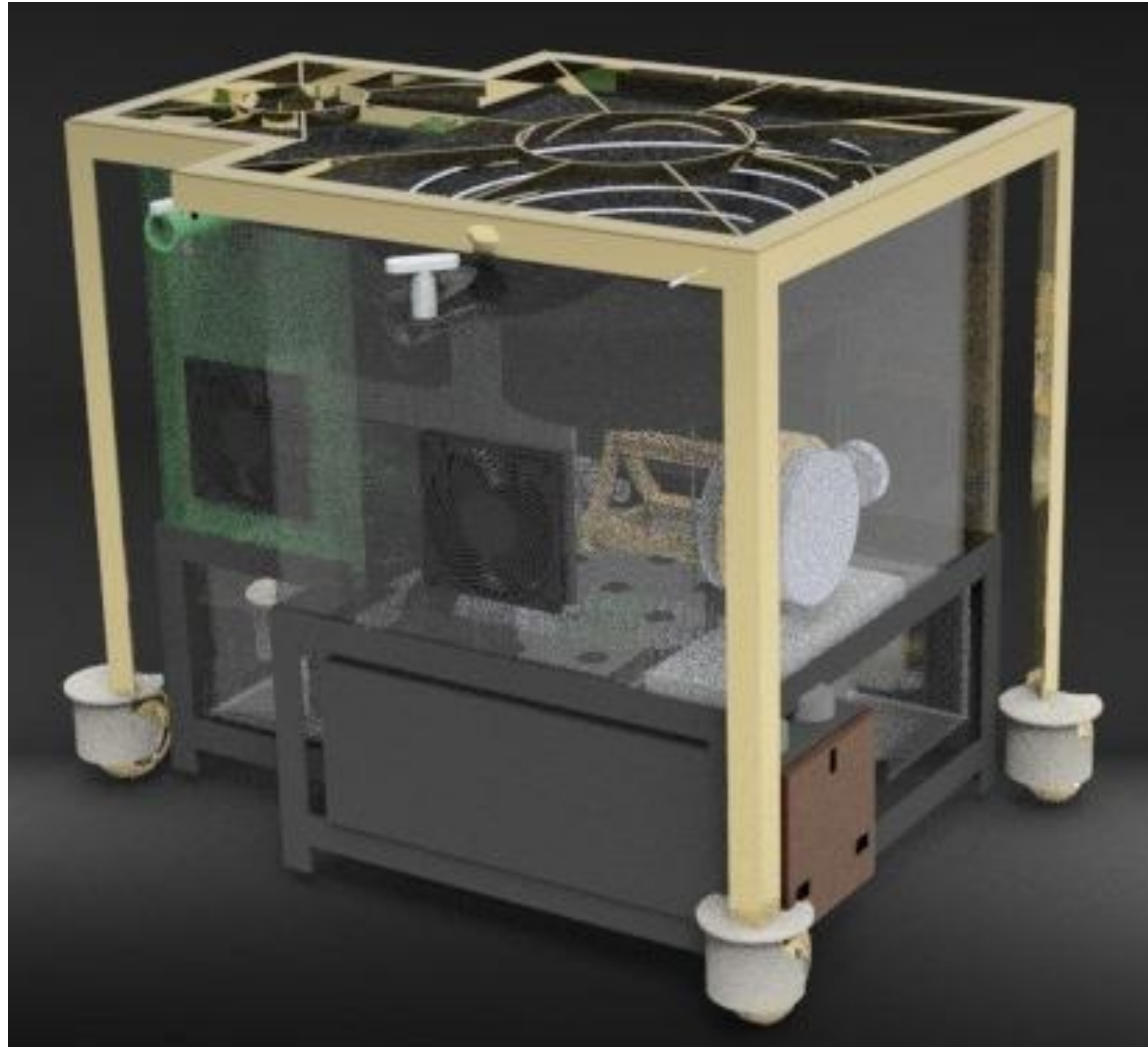


Smokeless & Ashless Bio-coal

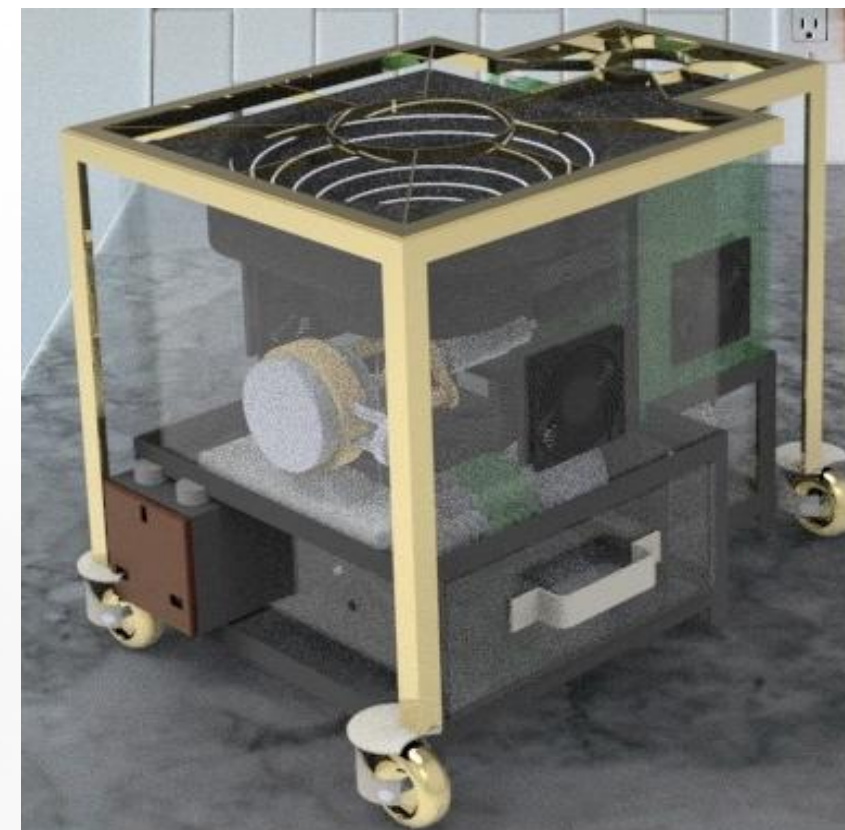
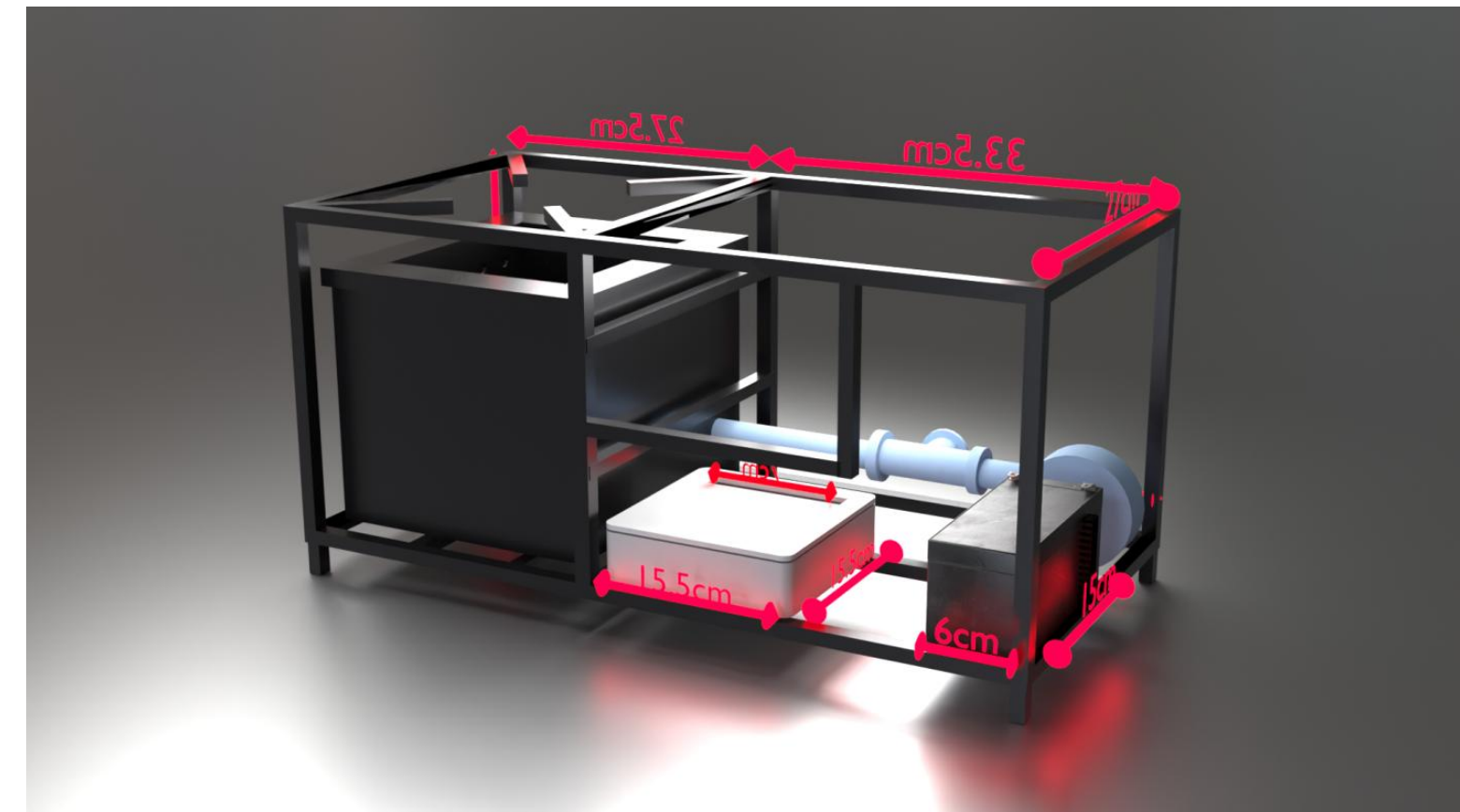
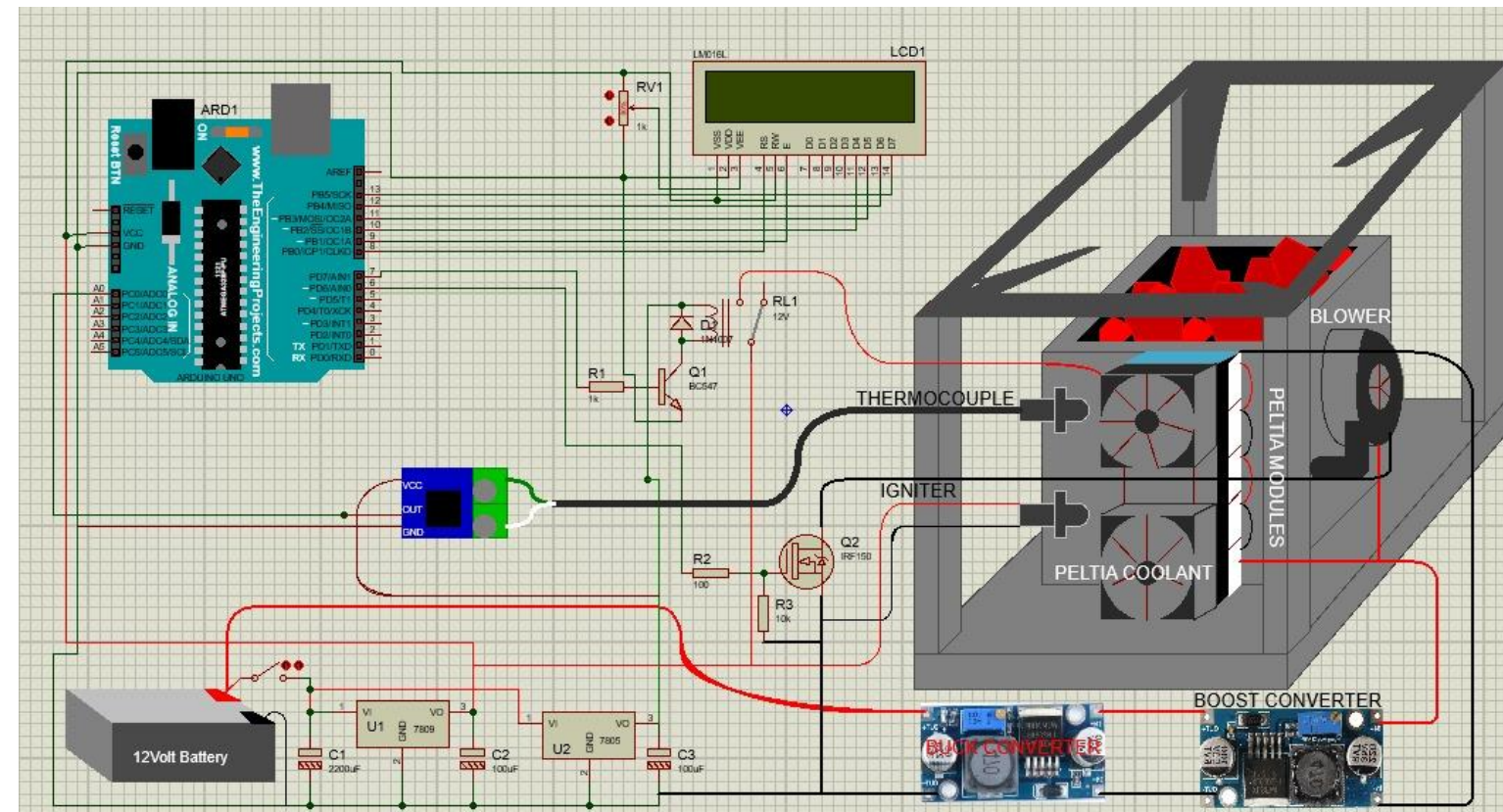


**Climate-friendly solid fuel Stove
and Electricity generator**

Climate Friendly Stove and Electricity Generator



One Technology: Three Sustainable Solutions for African homes



One Technology: Three Sustainable Solutions for African homes

Why This Solution?



Affordable Clean and efficient energy

- Burns longer than regular coal
- 80% More energy
- 20–30% reduced cost

Easy to use

- Does not require manual ignition from external sources
- Flexible Controlled & efficient fuel combustion

Safe and unharmed

- Safe and reliable cooking and heating solutions
- both indoor and outdoor applications
- Generate electricity

The business model



Our offering is a bundle deal plan comprised of 2 elements:

1. The eco friendly stove for ~~₦150,000~~–~~₦340,000~~ as at February 2024
2. Bio coal subscription plan according to weekly needs

While the cost of our stove is 15–30% higher than the non eco friendly alternative products, our bio coal is cheaper alternative to coal and cooking gas.

Profit per 1 ton of bio coal sales produced daily in pilot stage: ₦180,000

Monthly profit: ₦3,600,000

Year 1 profit: ₦43,200,000

Expected Benefits of the Research Outcome

- Improved Energy Efficiency: Reduced fuel consumption while delivering higher cooking performance compared to charcoal and fossil-based stoves.
- Cost Savings for Users: Affordable, clean alternative that lowers household energy expenses in both rural and urban settings.
- Enhanced Functionality: Combined clean cooking with in-built electricity generation, providing dual benefits for households and small businesses.
- Environmental Sustainability: Reduced deforestation, carbon emissions, and reliance on fossil fuels, supporting climate-friendly energy transitions.
- Versatility and Accessibility: Suitability for both indoor and outdoor use, making it adaptable to diverse lifestyles and communities.

Thank you for listening





PATENT FORM NO. 4

CRP:011172

FEDERAL REPUBLIC OF NIGERIA
Certificate of Registration of Patent
(Patents and Designs Act; CAP 344 Laws of the Federation of Nigeria 1990)

RP: F/PT/NC/2024/12844
Date of Patent: 14/06/2024
Date of Sealing: 01/07/2024

President of the Federal Republic of Nigeria and Commander-in-chief of the Armed Forces
BOLA AHMED TINUBU, GCFR.

Whereas a request for the grant of a patent has been made by: **Isah Yakub Mohammed, Lawan Garba Abubakar, Mohammed Ahmed Bawa, Yousif Abdalla Abakr, Obiehi Obiajunwa, Haliru Liman and Nafisatu Abdulhamid Abubakar ALL OF Abubakar Tafawa Balewa University Bauchi, Nigeria c/o Uche Obiajunwa of Innov8 Technology Hub Airport Road Abuja**

For the sole use and advantage of an invention for: **An Ashless bio-coal from lignocellulosic biomass**

AND WHEREAS the Federal Government being willing to encourage all invention which may be for public good, is pleased to accede to the request:

KNOW YE THEREFORE, that I do by this Instrument give and grant unto the person(s) above named and any successor(s), executor(s), administrator(s) and assign(s) (each and any of whom are hereinafter referred to as the patentee) by special licence, full power, sole privilege and authority, that the patentee or any agent or licensee of the patentee may subject to the conditions and provisions prescribed by any statute or order for the time being in force at all times hereafter during the term of years herein mentioned, make, use, exercise and vend the said invention throughout the Federal Republic of Nigeria, and that the patentee shall have and enjoy the whole profit and advantage from time to time accruing by reason of the said invention during the term of twenty years from the date first above written on this Instrument: **AND** to the end that the patentee may have and enjoy the sole use and exercise of the full benefit of the said invention, I do by this Instrument strictly command all citizens of the Federal Republic of Nigeria that they do not at any time during the continuance of the said term either directly or indirectly make use of or put in practice the said invention, nor in anywise imitate the same, without the written consent, licence or agreement of the patentee, on pain of incurring such penalties as may be justly inflicted on such offenders, and of being answerable to the patentee according to law for damages thereby occasioned:

PROVIDED ALWAYS that this patent shall be revocable on any of the grounds from time to time by law prescribed as grounds for revoking patents granted by me, and the same may be revoked and made void accordingly:

PROVIDED ALSO that nothing herein contained shall prevent the granting of licences in such manner and for such considerations as they may by law be granted

MADE this: 1st DAY OF JULY, 2024


JANE IGWE
Registrar



PATENT FORM NO. 4

CRP:009395

FEDERAL REPUBLIC OF NIGERIA
Certificate of Registration of Patent
(Patents and Designs Act; CAP 344 Laws of the Federation of Nigeria 1990)

RP: F/PT/NC/2024/11944
Date of Patent: 18/04/2024
Date of Sealing: 19/04/2024

President of the Federal Republic of Nigeria and Commander-in-chief of the Armed Forces **BOLA AHMED TINUBU, GCFR.**

Whereas a request for the grant of a patent has been made by: **Isah Yakub Mohammed of Department of Chemical Engineering; Mohammed Aminu of Department of Mechatronics and Systems Engineering; Haliru Liman of Department of Electrical and Electronics Engineering all of Faculty of Engineering and Engineering Technology, Abubakar Tafawa Balewa University Bauchi c/o Isah Yakub Mohammed of Department of Chemical Engineering; of Faculty of Engineering and Engineering Technology, Abubakar Tafawa Balewa University Bauchi, Nigeria**

For the sole use and advantage of an invention for: **SELF-IGNITION SOLID FUEL STOVE**

AND WHEREAS the Federal Government being willing to encourage all invention which may be for public good, is pleased to accede to the request:

KNOW YE THEREFORE, that I do by this Instrument give and grant unto the person(s) above named and any successor(s), executor(s), administrator(s) and assign(s) (each and any of whom are hereinafter referred to as the patentee) by special licence, full power, sole privilege and authority, that the patentee or any agent or licensee of the patentee may subject to the conditions and provisions prescribed by any statute or order for the time being in force at all times hereafter during the term of years herein mentioned, make, use, exercise and vend the said invention throughout the Federal Republic of Nigeria, and that the patentee shall have and enjoy the whole profit and advantage from time to time accruing by reason of the said invention during the term of twenty years from the date first above written on this Instrument: **AND** to the end that the patentee may have and enjoy the sole use and exercise of the full benefit of the said invention, I do by this Instrument strictly command all citizens of the Federal Republic of Nigeria that they do not at any time during the continuance of the said term either directly or indirectly make use of or put in practice the said invention, nor in anywise imitate the same, without the written consent, licence or agreement of the patentee, on pain of incurring such penalties as may be justly inflicted on such offenders, and of being answerable to the patentee according to law for damages thereby occasioned:

PROVIDED ALWAYS that this patent shall be revocable on any of the grounds from time to time by law prescribed as grounds for revoking patents granted by me, and the same may be revoked and made void accordingly:

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MADE this: 19TH DAY OF APRIL 2024


JANE IGWE
Registrar

