

## **Features of A fabricated Potters' Throwing kick wheel**

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**Abstract:** The wheel is simple equipment that every studio potter desires. There is no complete ceramics studio or workshop without a potter's wheel. The potter's wheel is an indispensable ceramic equipment necessary in the ceramics processing. Although, observations in some established ceramic units in most of Nigerian tertiary institutions and some pottery homes today revealed the absence of some of the vital equipment for pottery making, in which the potter's wheel is one. This could be adduced to the high cost of procuring such equipment. Recently however, for independent reasons, most potters have taken to fabrication of local machineries and equipment, this paper therefore documents an illustrative step-by-step approach in the design and fabrication of a simple potter's kick wheel using the motor flywheel and other materials at a reduced cost. The fabrication was completed and the equipment was subjected to a vigorous tests using it to produce some ceramic wares, and it was found to be effective. This research will therefore serve as a call to potential potters from developing countries to attempt fabrication of equipment and tools necessary for use in ceramic studios.

**Keywords:** kick wheel, ceramics equipment, fabrication of equipment, flywheel, and wheel head.

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### **I. INTRODUCTION**

The contemporary global language revolves round technology. Technology is a contemporary tool in solving contemporary challenges in all fields of studies and works of life. Fine and Applied Arts has several historic-traditional tools being used to carry out creative works that serve aesthetical and functional values. Ceramic is a unit in Fine and Applied Arts which employs the use of equipment and tools such as, kilns, kiln furniture's, blunger, ball mill, pug mill, slab roller, jiggering-jollying, and throwing wheels; the focus of this paper. Potter's throwing wheel is a mechanical device used to make object in the round, such as cups, saucers, plates, pots and mugs to mention but a few. Potter's wheel is of two major types; the electric and manual. The electric is powered with electricity while the manual is manually operated using man power. Potter's wheel is a machine that has been in existence since time immemorial. According to Sungmin et al (2014) the horizontal rotating wheel has been in use since antiquity, the potter places a moist lump of clay on it and rotates it with a variable-speed controller. The potter then uses his or her hands or other tools to shape the clay. The potter's wheel became widespread not only because of potters' know-how and the simple shaping process but also because they can use it to materialize their ideas intuitively and straight forwardly. With this type of wheel potters were able to create complex and organic shapes.

### **II. EARLY TRADITIONAL POTTER'S WHEELS**

The earliest forms of the potter's wheels (called tourneys or slow wheels) were probably developed as an extension totournettes;Tournetteswere used around 4500BC in the Near East, these were turned slowly by hand or by foot while coiling a pot. Only a small range of vessels were fashioned on the tournette, suggesting that it was used by a limited number of potters. The introduction of the slow wheel (potters' wheel) increased the efficiency of hand powered pottery production. In the Mid to Late 3<sup>rd</sup> millennium BC the fast wheel was developed, which operated on the flywheel principle. It utilizes energy stored in the rotating mass of the heavy stone wheel itself to speed the process. This wheel was wound up and charged with energy by kicking, or pushing it around with a stick, providing a centrifugal force.

### III. FEATURES OF THE MANUAL THROWING KICK WHEEL

Looking at the early traditional potter's wheels, one would agree that there should be improvement and upgrade, hence, technological innovation would have been a waste in the field of ceramics if there is no adoption of the principles, practices and application of modernism to ceramics arts. Nevertheless, the contemporary need for assessing modern equipment (such as electric throwing wheels, kilns and pug mills to mention a few) that had been in existence over decades must be acknowledged but the current challenge of electricity (power supply) and economic situation in Nigeria particularly and Africa at large make modern ceramics production inadequate. Hence, the fabrication of the indigenous manual potters kick wheel for a beginner (prospective studio ceramic). In this work, a manual kick wheel is preferable due to its efficiency and non use of electricity. Agberia (1999) buttresses the fact that manual wheel is more suitable because it provides efficiency even in the absence of electricity, making it a dependable source for production of pottery wares. A throwing wheel is a simple machine made of a circular frame with a solid disc that can rotate on a shaft or axle; hence manual potter's wheel is a mechanical device with a revolving wheel head on which round wares are being formed by man power. Etuokwu and Uzzi (2016) posit that simple manual wheel may have, just the wheel head and a flywheel, suspended on a rigid wooden or metal stand and is being operated with the hand or foot. The wheel head as a matter of necessity have to be heavy to enable the machine gather enough momentum for the required speed during the operation. According to Leach (1976), the manual wheel consists of a wheel-head, or disk, which revolves with considerable momentum and smooth control of speed and is driven by hand or foot, or by gear and momentum is obtained from either a heavy wheel-head or from a fly wheel. However, manual throwing wheels have always been associated with one problem or the other, so is the electric wheel; in spite of its effectiveness has not been a total solution to the potter's problem in Nigeria because of the erratic power supply experienced in most communities today. Although manual throwing wheel in the 21st century may be considered as old fashioned and backwards but its efficiency where there is shortage of power supply becomes a welcomed and appreciated means especially those whose livelihood is depended on it. In this regard, a half bread is better than none! At least, a potter will able to produce his/her round shape pieces within a short period of time. Norton (1956) affirms that the wheel is the tool of the potter which allows him to use his skill to quickly produce beautifully shaped pieces, so that they have the freshness and vitality of quick sketches. Therefore, manual wheel becomes an indispensable and useful tool in ceramic studios in Nigeria. In the new design, the foot pedal has been incorporated in a position that allows easy operation of the machine. In so doing, the coordination between the leg, the hand and the brain of the user is assured. The fly wheel used in this design is able to control the function of both the shaft and the wheel head. Because of this, a little kicking of the foot pedal could register a speed high enough for the wheel to gain the required momentum for the potter to work with. Primmer (1974) posits that the weight of the flywheel gives the necessary momentum and the potter is able to vary the speed with his foot, and it is difficult to achieve the necessary speed and pressure if the weight of the flywheel is insufficient. Therefore, the weight of the flywheel plays a very vital role in the functioning of the potter's kick wheel. The introduction of the foot pedal in this work makes it possible for a potter to operate the wheel at a determined speed. The efficiency of the wheel with its high speed control makes it possible for an experienced thrower to produce a good number of pots within at a stipulated time.

#### Components And The Assemblage:

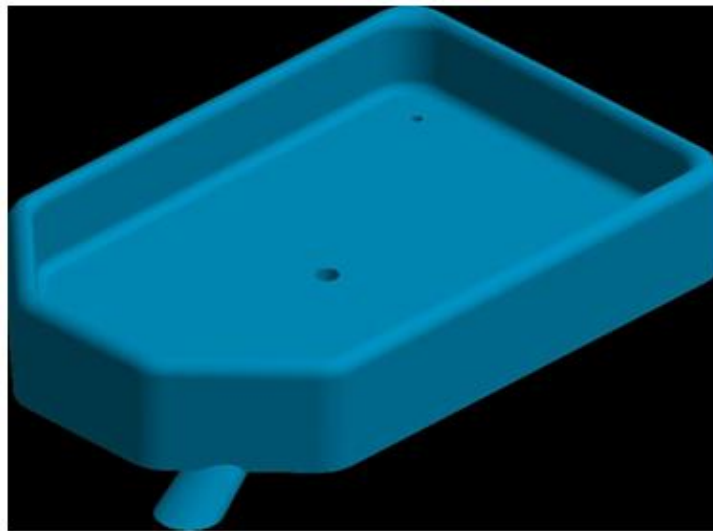
The features required for the fabrication of the manual kick wheel are itemized as follows:

1. 38mm angular iron bar
2. 10mm thick galvanized metal plate
3. Trough (splash basin) 10mm thick metal plate
4. Wheel head 10mm thick
5. Shaft
6. 20mm thick Motor flywheel
7. Pedal

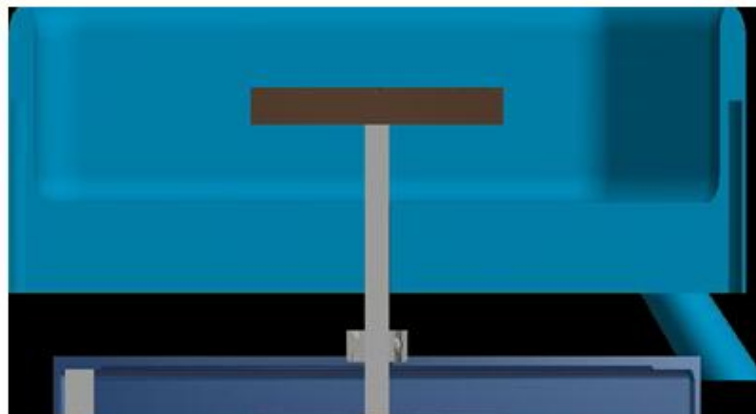
The fabricated manual wheel is a four footed machine. It is constructed with an angular steel bar and galvanized plate. The size of the frame is 667.7mm long by 482.3mm wide and 642.2mm high. At the base is 482.3mm angular steel which was used to partition the frame work, on which a mid-hole for the shaft with 30.71mm is positioned (*see fig.1 showing the mid-hole*). The Galvanize plate of 547mm long and 408mm wide is welded to the frame to support the frame and the trough, being fastened down to the galvanized plates (Fig. 1). Then the through was fixed on to the frame (fig.2) The wheel head (of 10mm thick metal plate and 260mm diameter) was then fixed onto the shaft from inside the trough (Fig. 3); The assembling of the shaft to the wheel head has a top spinning flywheel head of 20mm thick and 260mm diameter with two bearings (to facilitate easy turning of the wheel head) that was directly placed under the trough (Fig.4). Then, the foot pedal that kicks the wheel is attached to the shaft (Fig. 5).



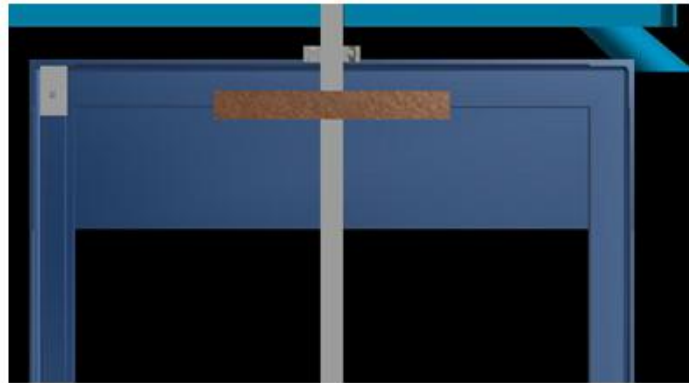
**Fig.1:** Frame work showing the Mid-hole



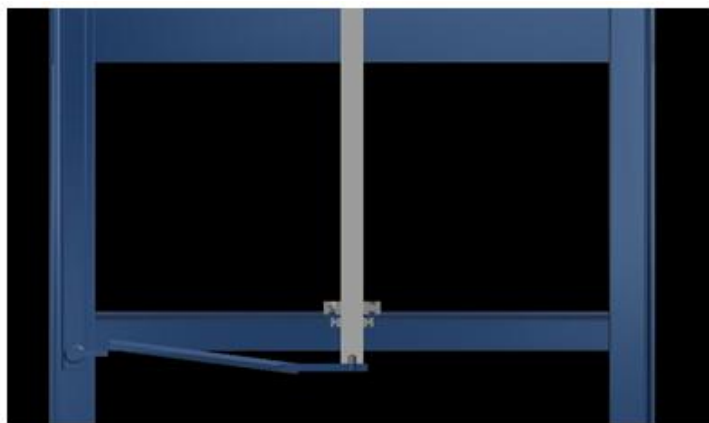
**Fig. 2:** The Trough



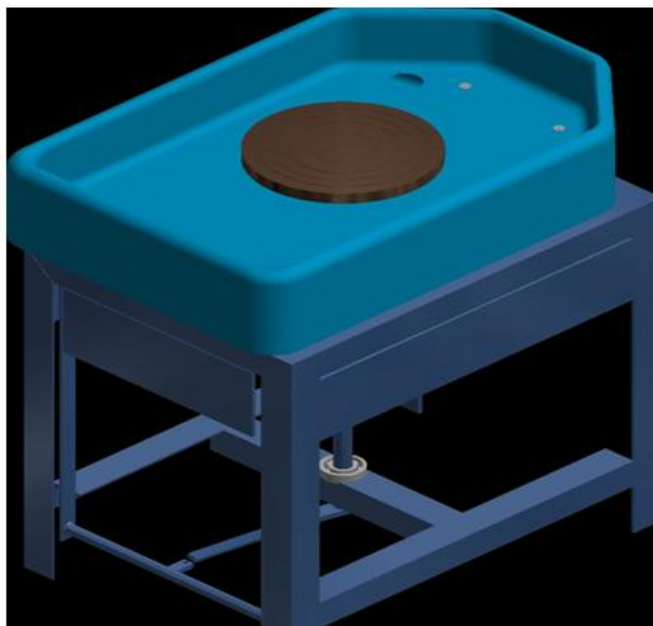
**Fig. 3:** Wheel Head (coffee brown)Fastened onto the Shaft from inside the trough



**Fig. 4:** Flywheel with Bearings (indicated in brown) to facilitate easy rotation of the wheel head



**Fig. 5:** Foot Pedal attached to the Shaft



**Fig.6:** The Assembled Manual Kick Wheel



Fig. 7:A Student demonstrating on the Fabricated Potters' Throwing Wheel

**Estimation of the Manual Kick Wheel**

Features	Materials	Quantity	Estimated cost in Naira (₦)
1	Frame	36ft	8,000
2	Galvanize plate	5ft x 5ft	5,000
3	Trough (splash tray)	1	25,000
4	Wheel head	1	4,000
5	Shaft	1	10,000
6	Flywheel	1	8,000
7	Pedal	Galvanize pipe ½ ft.	5,000
8	Miscellaneous	-----	5,000
	Total		₦77,000 Naira

Table 1

**Estimated Cost For The Manual Kick Wheel**

The total estimated cost of the kick wheel is shown in table one. This comprises the cost of materials the component was made, which does not include workmanship (time and manpower). This is estimated in Nigeria currency in September 2017; where three hundred and seventy three Naira (₦373) is equivalent to a USD.

**Conclusions and Recommendations**

The concept of the equipment designed is efficient, productive, faster, reliable, easy to operate and affordable especially in developing countries like Nigeria. This paper brought out values of indigenous innovation on technology. The paper was able to bring to fore the advantages itemized:

1. The maintenance cost is very affordable.
2. The wheel is well engineered for rapid and reliable mass production of ceramic wares.
3. The operating mechanism is reversible. It operates both clockwise or counters clockwise for both left hand and right hand throwers.

It is however acceptable that electrical throwing wheel is preferable to manual in the modern times where electricity is obtainable and manageable. But in a country like Nigeria where electricity is not consistent, the manual kick wheel is obviously preferable. Constructing and managing a kick wheel is a stimulating venture and most studio potters manage to improvise one for use. Apart from the personal income realized from constructing ones' equipment, like the potter's wheel, there is also the joy and satisfaction constructing a successful wheel and using it as well. 'There is nothing like getting on and doing it yourself; solving problems as you go along really helps you understand the equipment, its construction, functioning and maintenance the more'. (Etuokwu and Uzzi, 2016). The quality and ruggedness of the component parts and craftsmanship involved make the machine a worthwhile exercise. The machine has the capacity to "center upwards" 2kg of clay. It is designed for rigorous use in the studio, especially the beginners. The necessary materials for the construction of this wheel can be purchased within any local environment. Therefore, there is the possibility of fabricating high quality potter's wheels locally for the manufacture of pottery in ceramic studios. The wheel addresses the latest generation of machines production which is geared towards meeting a variety of important needs, including increased productivity, control and reduced energy consumption. For an individual running a

small pottery or a cottage ceramic industry, this machine will play an indispensable role. Products are made in few minutes with ease and for a good professional potter (thrower), he could produce quite a reasonable number of pots within a very short period, depending on one's throwing skill and speed. However, a great deal of thought, calculations and research has gone into the fabrication of this equipment, and hopefully, this will go a long way to alleviate the major challenge of epileptic power supply often encountered by potters. This wheel can conveniently compare with the electric wheel in performance as it takes very minimal effort and energy to operate. In summation, it is important for more research to be done in this field as to improve on the design.

#### REFERENCES

- [1] Adetoro, S.A. (1997). Research Techniques for Projects, Proposals Reports, Theses and Dissertations. Zaria:Ahmadu Bello University Press Ltd Nigeria.
- [2] Agberia J.T. (2007). LadiKwali.Ibadan: Kraft Books LtdNigeria.
- [3] Cardew, M. (1979). Pioneer Pottery. London: Longman Group Limited.
- [4] Clark, K. 1991. The Potter's Manual: Complete Practical Essential Reference for all Potters. New Jersey. Chart well Books, USA.
- [5] Etuokwu, A.O. andUzzi, F.S. (2016). Fabrication of Axel (Pottery) Kick Wheel for the Production of Ceramic Wares. International Journal of Art.
- [6] Hamer, F. and Hamer, J. (2005). The Potters Dictionary of Materials and Techniques. London. A &C Black Publishers Ltd.
- [7] Leach, B. 1976. A Potters Book.London: Faber and Faber Ltd.
- [8] Norton, F.N. 1956. Ceramics for the Artist Potter. U.S.A: Addison Wesley Publishing Company Inc.
- [9] Peterson, S and Peterson, J. 2003. The craft and Art of clay. London. Laurence King Publishing Limited.
- [10] Sungmin Cho, DongyoubBaek, Seung-YeobBaek, Kunwoo Lee, andHyunwoo Bang(2014). 3D Volume Drawing of a Potter's Wheel.South Korea: Published by the IEEE Computer Society,Seoul National University.

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