THE SLAVE AND MASTER THROWING WHEEL: MERIT AND DEMERIT

OKEWU, E. J.
Department of Visual and Creative Arts,
Federal University Lafia, Nasarawa State
jonathan.okewu@gmail.com

Abstract
This is a review study which tends to analyse the introduction of the "slave and master throwing potter's wheel" and how effective it is in Nigeria. History of the potter's wheels was critically looked at along the innovations that have occurred on the potters wheels as time went on so as to have a base for discussion. The meaning of invention and innovation is defined to be able to critically conclude. The analyses of the potter's wheel in question, a brief look at the kick wheel, advantages and disadvantages of the kick wheels and the slave-master potters wheels was looked at which was followed by conclusions and recommendations. The central issue is the wheel in question is an invention that is inefficient in an era of technological advancement. The slave and master potter's wheel is an invention that is not appreciable and therefore cannot be reliable in this era of technological advancement

Introduction
A case for the manual potters kick wheel was earlier made in an article titled; Manual Potter's Wheel Efficiency in Ceramics Production in Nigeria by Jonathan (2014). This was against the backdrop of epileptic power supply being experienced in the country. This is not to say the use of a "super manual" type of potter's wheel which is in use in some ceramic studios in Nigerian institutions today be encouraged. The super manual potter's wheel in question is usually referred to as the Slave and Master Potter's Wheel. This type of potter's wheel which requires the effort of two people for it to be operational has not only proofed to be inefficient but also retrogressive in an era of technological advancement.

History of the Potter's Wheel
Before the invention of the wheel, pots were shaped by coiling clay and turned repeatedly by hand. The disadvantage of this method is that a single vessel could take quite awhile to create. As societies grew and traded with one another, the demand for clay vessels also grew. The old method for making pots gradually became ineffective for keeping up with the demand. The wheel was invented in ancient Mesopotamia (present-day Iraq) around 3,000 B.C. Within a short time, the Sumerians adapted the wheel concept as a faster method of turning and shaping pottery. These first turntables were slow, but they were a remarkable improvement over the previous methods of shaping pots (Morris, 2014).

Eventually a small turntable or "tournette" was developed. With this a pot could be turned around much more easily and quickly. The pot making technique in Mesopotamia now gradually changed during the third millennium BC as the more potters adopted the turntable for making and decorating pots. However, it took a long time for free running steady turntables to be developed. "Throwing", as we understand the technique today, was not a very old development. It would be more accurate to describe this turntable making process as "fast coiling" (Bryant, 2012**).** The original potter's wheel of the orient was a circular pad of woven matting that the potter turned by hand- and wheel known in Japan as the ''rokuro''. But with the arrival of the ''te-rokuro'' or "hand

wheel," the mechanics of throwing developed into a more subtle art. The wheel head was a large, thick, circular piece of wood with shallow holes on the upper surface around the periphery of the disc. The potter kept the wheel in motion by inserting a wooden handle into one of the holes and revolving the wheel head on its shaft until he got the speed he desired. The hand wheel is always turned clockwise, and the weight of the large wheel head induces it, after starting, to rotate for a long period of time (Wikipedia, 2012).

The development of the slow or hand-turned wheel as an adjunct to pottery manufacture led eventually to the introduction of the kick wheel, rotated by foot. By the 18th Century the wheel was no longer turned with the potter's foot but by small boys apprenticed to the potter, and since the 19th century the motive power has been mechanical (Hellmold, 2001). Soon the techniques were adopted to make the wheel faster and smoother, thus increasing the potter's ability to make finer clay vessels with sterns, smooth spirals and true circles.

In the 19th century the concept of thrown pottery as we know it today flourished due to potter's wheel that could achieve higher spinning speed. This is partially due to the French development of momentum wheel; a wheel that took advantage of low friction and high weight to achieve speed. Today the potter's wheel has been fitted with ball bearing and is run by electricity but the basic principle remains the same (Datta, 2012).

After going through the history of the potter's wheel by different authors, it is a deliberate attempt so as to be able to figure out the rightful position in time to place the " slave and master potter's wheel" which is trying to surface in this present age of technological advancement. It is evident that in the course of inventions, there had never been a time when two individuals had to concentrate on building a common ware on one wheel, with one rolling and turning the wheel while the other builds.

The history of the potter's wheel has seen the developmental changes from one stage to the other in an improving manner with the passage of time. It is important to note that the development of the potter's wheel as time went by had been better with greater efficiency. The slave and master wheel in question is a super - manual one that can be termed retrogressive and obsolete in this present age. If one is to place the slave and master wheel in time, then it should have occurred long - time ago. It might not be wrong to place this kind of wheel invention in between the Turntable and Hand wheel era in the figure.

Invention and Innovation

According to BusinessDictionary. com (2014), invention is a new scientific or technical idea, and the means of its embodiment or accomplishment. To be patentable, an invention must be novel, have utility, and be non-obvious. To be called an invention, an idea only needs to be proven as workable. An innovation must also be replicable at an economical cost, and must satisfy a specific need. That is why only a few inventions lead to innovations because not all of them are economically feasible. While according to Core77 (2014), innovation is defined merely as "introducing something new." There are no qualifiers of how ground-breaking or world-shattering that something needs to be; only that it needs to be better than what was there before.

Slave and Master Potter's Wheel and its Operation

The slave and master potter's wheel or two-man wheel as it is fondly called is a kind of wheel that is quite different from the conventional pottery wheels. It also comes with a wooden or metal frame. The wheel has the normal wheel head for throwing but differs in the powering area that is responsible for the rotation of the wheel head. Instead of the normal heavy fly wheel for the kick wheel or the horse power motor for the electric wheels, a physical human strength is required to manually propel the shaft with an iron spinner by turning, which in turn rotates the wheel head for a different person to do the production on it. It is just like starting a Lyster generator. The person turning the wheel is usually referred to as the "slave" while the person throwing on the wheel is called the "master". This kind of wheel must as a matter of fact be operated by two individuals who will always be at the opposites facing themselves, whether it is a tiny ware that is to be produced or not.

Kick Wheel and its Operation

According to Okewu (2014), the kick wheel works by kicking the flywheel in a specific rhythm. This powers the wheel head. It utilizes a heavy flywheel that stores energy as it speeds up when propelled by your foot, while the treadle wheel utilizes a lever and cam mechanism that turns a shaft with a weighted fly- wheel. Operating a foot-powered wheel takes a little practice and coordination, but potters who use them does so by the relaxed rhythm and pace of their throwing as well as their intimate connection to the throwing process. The main components of most kick wheels are as follows:

- A steel frame
- An adjustable seat
- Reinforced cast concrete or wooden flywheel
- Cast metal wheel head
- Wood, metal or composite working surface.
- Even though you can power the wheels with the foot, some models come with an electric motor option. With a weight of about 120 to 140 pounds, the flywheel easily maintain momentum after turning

Advantages and Disadvantages of the Slave - Master Potter's Wheel and Kick Wheel

The manual wheels are easy to maintain and will usually last a lifetime. Many that come with motors to assist with getting the flywheel to speed, easily allows for both counter-clockwise and clockwise rotation of the wheel head for both right-handed and left-handed throwing and for some potters, kick wheels gives a better "feel" for the throwing process. While the disadvantage of the manual potters wheels are; extremely difficult to move and transport, injuries can occur if the flywheel is used as a step and long-term use may result in knee problems and aggravate arthritis. (About.com Pottery 2014).

From the comparative study of the slave - master potter's wheel and the kick wheels, it is evident that the former is just a mere invention with very little efficiency. The advantages against the disadvantages of the slave and master potter's wheel could be said to be in the proportion of 1: 99. This is to say that it has far greater percentages of disadvantages than the advantages.

Conclusion

The slave and master potter's wheel is an invention that is not appreciable and therefore cannot be reliable in this era of technological advancement. The use of the slave and master potter's wheel for beginners will be a difficult and unpleasant way to learn in an era where virtually everything is becoming simplified. A potter's wheel is better and more efficient than five of slave and master potter’s wheel

Recommendation

The slave and master potter's wheel in the pottery tradition should be discouraged as this is retrogressive to the practise of the art in Nigeria. Institutions where ceramics are being taught should focus more on the kick wheels, even if it is locally fabricated. The electric wheels and the motorised kick wheels are also good options to those who can afford them.

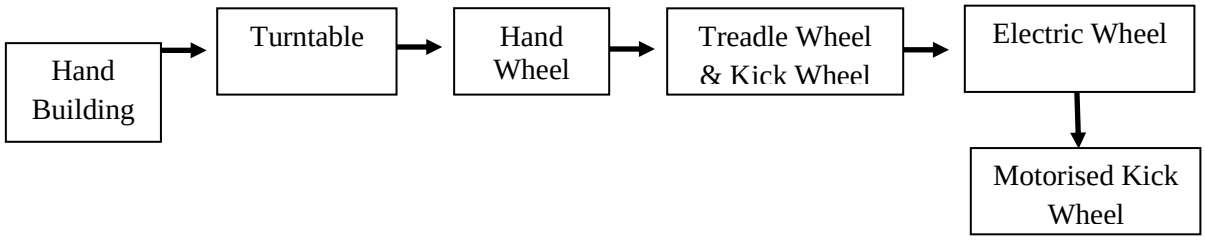

Figure 1: Technology of pottery development from inception to date as made out from the History of the potter's Wheel



Plate 1: Wooden slave and Master potter's Wheel
Source; Anonymous



Plate 2: Operation of the Wheel by two individuals
Source; Anonymous



Plate 3: Kick wheel
Source: Anonymous

Table 1: Kick Wheel

	Advantages	Disadvantages
1.	Easier to control speed for a beginner	Lacks the speed and strength to centre heavy clay
2.	Kick wheels are very rugged and long lasting	They are very heavy
3.	The manual wheels are very low maintenance	
4.	Easily allows for both anti-clockwise and clockwise rotation of the wheel head for both right-handed and left-handed throwing	Injuries can occur if the legs are not properly positioned and long-term use may result in knee problems and aggravate arthritis.
5.	Kick wheels gives a better "feel" for the throwing process	

Source; Okewu (2014)

Table 2: Slave and Master Wheel

	Advantages	Disadvantages
1.	It does not work with electricity	It is time and energy consuming It takes two people to work on it It limits the size of clay that can be thrown on it. An individual cannot work independently on it. It is not a beginner friendly wheel because it does not permit a private time practise Could cause serious injury if the spindle is not properly inserted before turning

Source; Okewu (2014)

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