STUDIO CERAMIC TILES: LOCALLY CONTRIVED METAL CLAY CUTTERS AS INSTRUMENTS OF IMPROVISATION

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Abstract
Modernity in ceramic technology stands in sharp contrast with the pottery at the traditional level. The technology of that which is not listed in the traditional repertoire of products is considered by this paper as modern. Home-based inventions and improvisations, in spite of their lack of global spread and immediate acceptance, remain the basis for interrogating modernity in ceramics. This improvisation remains a fall-back resource for an economy such as ours where unavailability threatens creativity. It relies on its internalist and contextualist unity to make a survival sense. It also has resurrective resourcefulness as it impacts on the economy at personal and national levels. The man on the street is conversant with tiles at various contact points- either as a builder, architect or a designer, property owner, or as a tenant. The use of titles, which are products of modern ceramics, stretches from functions to aesthetics. This aesthetics should be given a personal touch by artists themselves. The pathway to this terrain is rigorous, rugged and sometimes lonely but only by determination can one get there. Personalized studio tile-making mortgages number but captures the spirit of one-of-a-kind which actually puts the artist's name on the list. Personalization manures the terrain and causes creativity to sprout and multiply. These locally contrived metal clay cutters are just one of the innumerable areas to explore. The products are evidences of a creative diplomacy which carries a slice of the spirit of the artist anywhere they are installed. If not already, one should get ready to explore modernity using modern but home-generated mechanical resource whose products should be socially relevant.

Introduction
Waetjen (1992) in his "Shaping the future of a Profession" challenged technology education to establish itself as an academic discipline. In other words, theoretical and machino-technical / practical solutions should marry each other. It is the (1985) admonition by Staudenmaire of the marriage of theory and practice that he referred to as the internalistic and contextualist approach to problem-solving. Onuzulike, (2005), against the background of this contextualism notes that within over 18 years of self-employment as a studio potter, this author, (Chris Echeta) "has researched, designed and fabricated almost all the machines and equipment he used and still uses". This is what this paper aspires to encourage through ceramic tile production in the studio.

The entire tile production techniques handled in this paper are far from being exhaustive in scope and approach. The paper is saddled also with the basic approach to some of the techniques realizable in a cottage ceramic studio. Because it is expected to equip young practitioners to employ themselves, and others within their limited financial base, the scope rules out capital-intensive tile production establishments. The words 'tiles' and 'slabs' are here used interchangeably but sometimes 'slab' is contextually used as a large tile.

In an economic environment where lack resists success, improvisation and ingenuity are expected to assert themselves as the only life-line to production survival. This is also what this paper aspires to instil into its readers. The techniques may not compete with high-profile tile industries in production volume, but they

definitely fulfil unique artistic vision and depopulate the unemployment market. The unique tile production approach is best sustained if it is taken as a line of studio production alongside other products -mugs, flower vases, tea sets etc. These other lines are like economic traps to attract more patronage and therefore finances.

The paper also aspires to 'titrate' the production of these tiles against the usual eight-hour working day. It is necessary to do this more so when such productions are hand-made, demanding personal attention of the artist-producer. Simple hand-held contrivances whose illustrations appear here are only entry points and not endpoints in the search for further mechanisms of customised studio tile production.

The locally metal clay cutters around which this paper centres, come in handy as such home-grown facilities of improvisation. They are locally-sourced contrivances for studio tile manufacture designed to expedite the rate of production, guarantee consistency in size, shape and form similarity and minimize warpage during cutting and drying. They are easy to fabricate and the materials for so-doing are common and are within reach. As cutting runs are manually made, tiles are extruded upwards as individual items sharing equality of size and form.

The Mechanics of Fabrication

Galvanized iron or steel pipes of various diameters provide the round shape background if round tiles are targeted. Square or rectangular pipes, on the other hand, are used to produce square or rectangular shapes of tiles. Other intermediate shapes can be realized when combinations of shapes are joined. If round tiles of about 1"-diameter are desired, a length of 1" -diameter pipe is procured and prepared and then out of it, rings of about 1/3" -width are sawed out. Single-chamber shapes are more straight-forward to fabricate but to make a two-chamber unit, two rings are placed side by side. Between them a metal rod of about 1/3"-diameter is welded some distance from the ground level up (See Figs.2a & b). This ground clearance is critical in the maintenance of tile thickness and evenness.

Every metal pipe is of some thickness. This thickness is invariably inherited by the rings cut from them. Whatever the tile shape desired from each cutter, there are some basic measures that should be taken to ease the tediousness of such production. For these contrivances to cut out clay tiles fairly easily, some pressure must be mounted. More effort (in terms of pressure) will be exerted to cut any surface with a blunt or thick-edged instrument. The converse is also true – less effort will be required for cutting when the cutting surface area is narrow or sharp. The above principle also governs the concept upon which these cutters operate. The cutting surfaces of the rings must therefore be sharp if more work is expected to be achieved with less energy. This cutting surface reduction, otherwise known as sharpening is done with electric stone file or other metal sharpening facilities, even hand file. For better surface presentation, the sharpening should be carried out before individual rings are sawn out.

The arm or handle of the cutter (see Fig 2b), should be at least six inches in height and the end curved or padded in such a way as to provide some measure of comfort for the hand in the cause of tile cutting.

Some Metal Cutter Designs

Apart from Figs 2a & b, there are numerous possibilities of cutter designs. Some of them are here illustrated (Figs. 4 - 7)

Cosentino, (2002) endorses the intervention of the process of forcing clay through pre-determined shapes for form realisation when he stated that extrusion is a "clay-forming technique forcing clay through dies…"

Clay Consistency for Tile Manufacture

Studio tile production demands a consistency in clay which is neither too soft nor too hard - that consistency which lies between a good throwing clay and that which is considered too hard for the same purpose. It will however be stressed that this is for the slab - making consistency and NOT the consistency of slab cutting. Any slab or tile, cut, sliced, or harvested from moulds at this making stage is bound to be sloppy, uneven, and warpy. Such tiles cannot nearly be referred to as the best of tiles or slabs.

Tiles may be designed, *ab initio*, to be large. Whichever way, the clay for such production

must be open if successful handling is expected. Grogging brings about this openness. While advising on percentage grog input, Rhodes, (1973), suggest the right grog profile to be used—'coarse or smooth' subject to effect desired. They must also be allowed enough time to air and cure after making. The correct stage to slice, pierce, carve, or cut studio tiles of this nature is when the clay starts experiencing more stiffness ahead of just setting. At this stage tile edges will be seen to be 'clean' and sharp devoid of smudges when cut. Design impressions can also be stamped very easily on such tiles without sticking. Woody, (1979), addresses this stage of leather-hard. He goes on to state that it is 'the stage between plastic and bone-dry'. Brookshaw, (1967) authenticates the leather-hard cutting stage in her discussion on turning, which is a type of cutting.

Estimated Production Capacity

Barring human progressive weakness in tile-cutting performance, a two -chamber, one-inch diameter metal cutter can produce sixty-two tiles in thirty-one cutting runs per minute. On a non-stop basis an eight-hour working day therefore, will produce fourteen thousand, eight hundred and eighty (14,880) runs. This will come to twenty-nine thousand, seven hundred and sixty (29,760) tiles per worker using a double-chamber cutter.

The above statistics is however unrealistic. It will only be possible if there is no diminutive production capacity in submission to the law of diminishing return. Again, the projection was silent on the pre-cutting slab production because without the slabs, no cutting runs are possible. Time must, therefore, be allocated to their making which will remarkably deplete the overall tile quantity. As unrealistic as it is, however, it provides a basis for further numerical argument and streamlining of production. A more realistic production estimate will be a steep departure from the above. Perhaps a 50% cut-back will be approaching a practicable estimate take-off point. In actual fact, a further reduction may be necessary depending on studio peculiarities. One-man studio work-force presents a precarious situation and makes numerical estimation more difficult. This is because that lone worker is likely to be doubling as both a slab maker and a fireman charged with kiln management. In fact, the same worker may also be in charge of clay preparation which further complicates matters. The consequence of energy dissipation in these various areas is bound to rub off on the overall average daily production estimate. In the long run, each studio may have to work out its production target and overall capacity-not just with regards to tiles, but also in other areas of production interest.

Drying and Firing of Tiles

As previously mentioned, open clays lend themselves to easier drying and firing. Channels for moisture transport and loss are facilitated by grogging thereby minimizing or ruling out the possibilities of warping. Large tiles present more management difficulties than small tile tablets and clay buttons. Soon after tiles are sliced or cut and harvested, they should be turned upside down (inverted), and gentle palm pressure exerted on them to guarantee flatness at that stage. From the very point of slab-making to the time of cutting and slicing, slabs usually lose moisture faster from the top side than the bottom surface. This trend establishes a moisture gradient causing the slab or tile to initiate a warping or buckling tendency which if not corrected, (by the said inversion), may threaten its flatness. This is moreso if the tiles are beyond thumb size in surface area.

Turning the slabs benefits the production process in three significant ways so long as correct timing is adhered to. The timing will exploit the time-bound malleability of clay.

1. The inversion will expose the underbelly of the slabs causing moisture to be lost from that up-turned side. This counters the warping tendency earlier established.
2. It also goes to cancel the previously established superior moisture loss rate which is likely to have instituted a gradient.
3. Turning the tiles enables the artist or slab-maker to inspect the reverse side and, if need be, correct any blemish or tile-making faults. Such corrections are only possible at the malleable stage of clay.

Tiles demand high frequency of supervision, more so, when they are fairly big and soon after slicing and cutting. Buttons and tablets of tiles, like mosaic tiles, present minimal drying and firing problems by virtue of their sizes. This is so when firing, especially firing of

biscuit, is carried out within the framework of technical guidelines. Flatter and wider tiles call for more caution even at the kiln- loading stage. Their load-bearing capacity is next to nothing at that green stage if flatly loaded. Such sizes also tend to warp during firing once there is a slightly steep thermal differential in the kiln. These weaknesses ought not to be discouraging. They, on the other hand, go to highlight areas of concern which ought to be given more attention.

Sometimes, to avert some the above problem areas, tiles are bisqued in sand beds. This method, to a reasonable extent, guarantees some level of flatness. At other times, depending on the size, they may be inclined at a slight angle leaning on furniture to form rows. Cranks and stilts are also employed as stands while firing tiles. Whatever size or design of tiles the ultimate aspiration of the maker is to have tile production results that meet his design/function target.

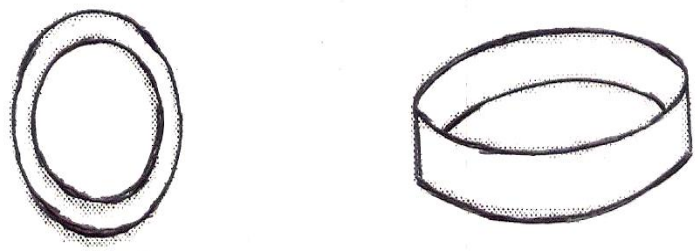
Studio tiles can be designed to be finished either as glazed pieces or as biscuits (terracotta). Engobe can also be used in their finish. The major difference is that while terra cotta and engobe-painted tiles can be fired in contact with each other, glazed ones dare not touch for obvious reasons.

Tiles can be called to aesthetic duty. They can be positioned next to each other individually or in groups. Their various colour characteristics can be aggregated to form pictorial images.
Plate 1 below represents one of the writer's own studio-produced engobe/terracotta – surfaced mosaic works. Different shapes and sizes lie next to each other. Plate 2, on the other hand, shows the contrived cutters used to cut the tiles for plate 1.

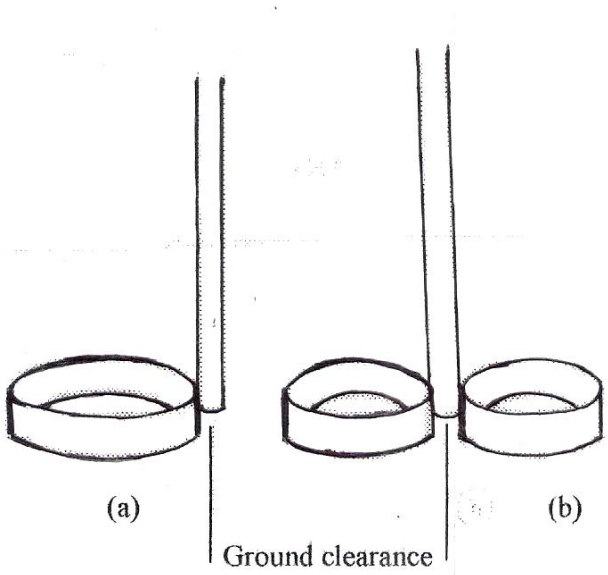
Conclusion

One of the advantageous fallouts of modern technology is the enablement of faster production which is generally referred to as mass production. Tile manufacture is not listed in the traditional ceramic/pottery environment. This tile production line, having now been seen as a possibility only in the modern ceramic terrain, is one of the most meticulously tended lines because of its numerous wayward possibilities. In the studio tile process, which is more of one-of-a-kind production, waywardness can be accommodated within aesthetic framework to a large extent. This may manifest in terms of warpage, cracks and breakages. These can be exploited to produce uniqueness, never-to-be-reproduced designs. This authenticates the place of "accidents" in design articulation. Having said this, technical mastery can also be exercised to a point of hitting almost every design target. This is the ultimate endorsement for effective studio management. The mastery comes to play especially when studio lines of production include utilitarian objects as mugs, plates, etc, where accidental inputs may be a function of distraction.

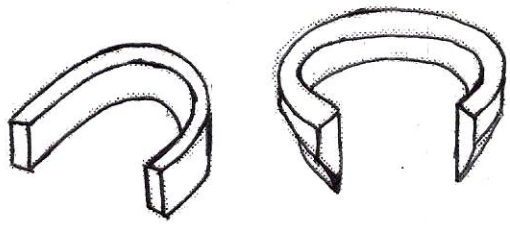
In the milieu of unstable and struggling economy, ceramic studio owners are encouraged to diversify their lines to accommodate both purely aesthetic pieces and indispensable utilitarian objects. Such objects, as the latter, can be made to house uniqueness of design, which, in any case, is the hallmark and signature of studio practice. This ingredient of uniqueness can be relied upon to broaden the clientele base which guarantees more income. It is expected that diversification should stabilize and sustain the studio in its modern inclination, provide profit, and make way for studio expansion programme. As a result of mass or elevated speed of production, it should have the capacity to mop up the distortions from ever-fluctuating petroleum product prices which infect our economy.



Figs 1a & b. Typical rings sawn out of round pipes



Figs 2 a and b. One and two – chamber metal clay cutters



Figs. 3a & b: Unsharpened and sharpened cutting surfaces

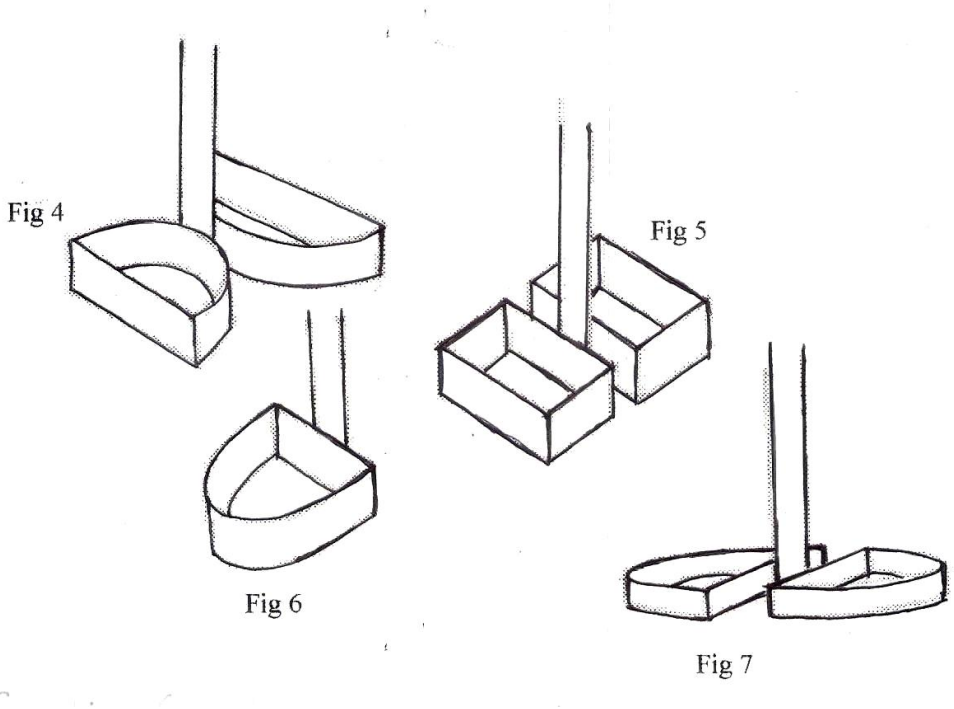


Plate.1"Nigeria Diversified;" 24" x 24"; (2002)

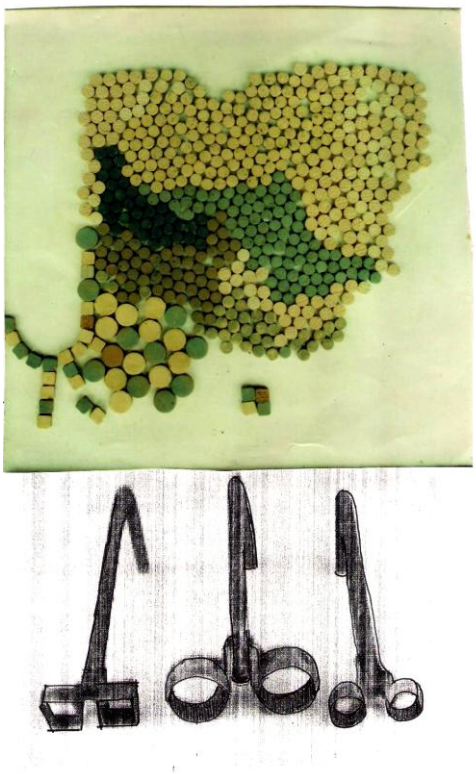


Plate 2: Double-chamber metal Clay Cutters

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