coiling as a linear value for making ceramic wall tiles

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Research Introduction:

Wall tiles vary from external to internal, as are the materials used in marble, granite and other materials. The ceramic tiles remain the best solution due to the material used in them, which is clay that has high flexibility, which makes it a rich material that reflects a diversity in formation and design, both for the external shape of the tile or its designs, as well as the methods of implementation on it from drawing with lining, glazed lining, liquid clay, under and above the paint glass, silk screen printing, carving, slitting and many methods of decoration of the ceramic surface.

"Ceramic cladding by a comparison among materials of cladding of different facades in terms of cost of installation, the total cost, the average age of the least cost compared to other materials and raise their value, taking into account the average age of the consumption of the material, which is up to 50 years. "(Issa, Sanaa Abdel-Gawad: 2012, p. 13)

Likewise, the methods of forming porcelain varied between manual and productive formation using modern technology until it reached the formation by using a three-dimensional printer, the manual formation remains the first in the technical formation for what the artist puts his hands in the clay expressing his thoughts and feelings, including coiling, which is not limited to form pots only, but also to decorate them with units formed from it, as the potter can use the rope instead of brushing for the photographer and express it through art drawings inspired by nature on a flat slab of clay to make wall claddings.

Research Problem:

The research problem is summarized in the following question:

How can ceramic wall tiles be enriched from the linear value of the coiling?

Research Hypotheses:

Ceramic wall tiles can be enriched from the linear value of the coiling.

The Study Targets:

The technical and artistic possibilities of coiling as a linear value for the enrichment of ceramic wall tiles.

The importance of the Research:

1- Increasing interest in ceramic wall tiles.

2- Shed more light on the aesthetics of ceramic tiles.

3- Trying to benefit from it in applications of porcelain material.

4- Provide an opportunity for art education students to work in the local market and open new horizons for work in this field.

The research limits:

The research is limited to its application:

1- In terms of the sample: Students of the fourth year of the Department of Art Education at the Faculty of Specific Education, Aswan University.

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2- In terms of materials: on clay, white glaze, and oxides of color (copper - manganese - chrome - cobalt), stains (red - yellow - purple).
3- In terms of the quality of wall coatings: it is limited to internal wall coatings.

Research Methodology:

- The experimental research on the fourth -year students at the Faculty of Specific Education, Aswan University, follows.

Firstly, the Conceptual Framework:

1- A brief history of the wall tiles.
2- coiling.
3- Line as an element of design.
4- coiling as a linear value.

Secondly: The practical framework:

The research is based on a student experiment to make ceramic wall tiles through the following:

• Creating designs inspired by natural and ancient Egyptian art, which can be expressed in coiling on ceramic tiles.

Make ceramic tiles 25 cm x 25 cm with coiling.

• Coloring the tiles with glass paints and colored glass bushings.

• Application of the graduation project for students in the fourth year of the Faculty of Specific Education, Aswan University, to produce murals.

• Application of wall coverings at the Nubian Museum in Aswan.

The mural is "everything that forms the wall, whether in color, or materials, or what is attached to it and is part of the building, and it can be external murals (outside the building) or internal (inside the building) and each type differs in its formation from the other due to the conditions of the surrounding environment and its external influences." (Hamza, Mona Sayed Ramadan: 2019, p. 608)

In this research, ceramic tiles are colorful interior ceramic wall tiles by coiling, which are intended to cover the walls for decoration and beauty.

Historical background about the wall tiles:

Egypt knew ceramic tiles in the era of the Old Kingdom, as it was used to cover the walls of the lower rooms of the Saqqara the step Pyramid (Khalifa, Rabee Hamid: 2004, p. 31). Figures numbers (1, 2), where the common method of decorating the walls was by using marble and stone for their availability in the country as for ceramic tiles in their known form, Egypt did not know them except in the Mamluk era and its use was very limited.

In the Islamic era:

The production of ceramic tiles in Iran was famous, as it was used in wall cladding through the artistic overlap between the shape of the ceramic tiles and the composition in the architectural design in rhythmic diversity and creative compatibility. (Al-Rifai, Ansar Muhammad Awad: 2010, p. 103)

As for the modern era:

a big boom occurred in the tiles industry that started in Italy in 1970 where single burner tiles and photocatalytic tiles were produced, as well as intelligent tiles, which consist of a smart

layer applied to the surface of the tile that has a thermal sensitivity as the degree of surface color changes with temperature changes, the gradient from blue to red, from cold to hot. (Issa, Sanaa Abdel-Gawad: 2012, pp. 9-12)

In this research, a coiling method was used, and it is one of the oldest methods used in the formation of ceramic, not only to form ceramic vessels but also using it as an aesthetic element of the building itself, as well as, using it as a structural element, this allows the ropes to retain their unique entity even if they become flat or compact. Its use in this research to form ceramic tiles.

Using the coiling by a clay-like a line, in which line is an essential element of the design elements, but the line on the paper is two-dimensional visually perceived, whereas the rope is formed by clay concrete that has a diameter, the shape of which varies according to its formation is straight, refractive, curved, as well as its diameter changes and these changes dependent on the function required for the design that affects the characteristics of the line or the clay cord and its nature according to the shape resulting from the convergence of many lines, forming regular or irregular shapes, more than one type of line may participate in dividing the area to be designed into areas, geometric shapes or designs derived from nature or heritage.

The design principles such as rhythm, unity, and a balance must also be achieved through it, moreover, through diversity in the thickness of the rope, its length, and its movement in the ceramic design if it is horizontal, vertical, or circular, leaving a palpable texture and a set of visible shades, bonding and movement.

We see the line in nature represented by the lines of branches of plants, trees, and palms, a convergence of waves, swirling water, spiral plants such as ivy ..... etc.

To take advantage of the line in the design to translate it for coiling, to make ceramic tiles, you must take advantage of the line with its different types, conditions, directions to make designs inspired by nature and heritage such as the use of the curved line to create the water of the Nile and palm trees, plus some symbols from ancient Egyptian art and Nubian art achieving a dynamic rhythm, contrast and balance between the shape and the space.

We should not lose sight of the importance of color in the second stage after coiling, especially in wall tiles, as it contributes to highlighting the design and completes its artistic creations that have no limits. The methods of its application are among the most important factors for its success.

What is required:

1- Taking advantage of the linear values in making various designs derived from nature or heritage.

2- Use coiling in the implementation of the previous designs in an area of 25 x 25 cm, suitable for wall tiles, taking into account the shape and floor, and taking into account the possibility of coiling.

3- Coloring the resulting ceramic tiles with colored glass paints.

Search steps:

First: applying the experiment to the fourth-year students in the Department of Art Education, Aswan University.

Second: The work of producing many tiles and fixing them to a wall through the 16 students of the Graduation Project in Porcelain (from the fourth year).

First, applying the experiment to the fourth year students:

1- Explain the idea of the project to students, its goal and its importance in the labor market.
2- Make suitable designs for coiling to make ceramic tiles.
3- Choosing the appropriate designs for implementation, which is done through:

- Placing the design paper in the wood frame area (Picture No. 1).
- Executing the design by forming the cords with care to ensure contrast and harmony in the shape and diameter of the cords formed (Picture No. 2).
- Merging the ropes well on the visible surface and adding clay, making sure that the student does not press down so as not to blur the shape of the rope and turn it (Picture No. 3).
- Completing the height of the remaining wooden frame with mud, making sure that there are no air voids during the addition (Picture No. 4).
- Turning the wooden frame and removing the formed slab from it, where the shape of the design appears on the other surface (Picture No. 5).
- Make a gypsum template for each tile to clone a number of them, clean the gypsum mold, and allow it to dry well (Picture No. 6).
- Cloning the required number of each slab through the gypsum mold (Picture No. 7).
- Emptying small squares on the exposed surface to reduce the thickness of the slab and to help secure it to the wall (Picture No. 8).

4- Good drying of tiles.
5- Burning tiles, first burning and leveling at a temperature of 950 ° C.
6- Coloring the tiles with the glass lining.
7- Spray tiles with clear glass paint to ensure easy cleanliness and dust adhesion.
8- Settle the tiles at a temperature of 1000 ° C.


Picture No. (1)


Picture No. (2)


Picture No. (3)


Picture No. (4)


Picture No. (5)


Picture No. (6)


Picture No. (7)


Picture No. (8)

• Some pictures of the executed tiles (Picture No. 9)

(Picture No. 9)

Pictures of the final implementation and fixing the wall tiles in the Nubian Museum in Aswan (Figures 10:12)

(Picture No. 10)

(Picture No. 12)

(Picture No. 11)

Results:

The research goal has been achieved, which is enriching the wall claddings by forming ropes. By achieving this goal, it resulted in positive results for students, namely:

1- Students mastered the coiling through the ceramic slab, and this appeared in the implementation of designs inside the slab.

2- Students mastered the skill of using colored oxides and glass to apply to the surface of the ceramic slab.

3- Students gain the skill of making the ceramic slab and avoid the problems that arise during its formation and the stages of drought and fire.

4- Students gain a sense of teamwork and this is reflected in the results of the tiles.

5- Preparing students to work in the local market by acquiring the skill of forming ceramic tiles and how to employ them.

Recommendations:

1- Doing more research on ceramic tiles and diversity in the ways and methods of forming and employing them either horizontally or vertically.
2- Attention to making new, unconventional wall claddings.
3- Cooperation between specialists and ceramic companies to produce new, unrecognized, new wall claddings.
4- Opening new horizons for students through academic courses to help them work in the local market.

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