

TRANSLUCENT CERAMIC SANITARY WARE HAVING AN ILLUMINATING DEVICE

FIELD OF INVENTION

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The present invention relates to sanitary ware such as toilet bowls, urinals, bath tub, wash basins and washstands. More particularly, the invention relates to a sanitary ware integrated with an illuminating device for providing soft light in the bathroom.

10 BACKGROUND OF THE INVENTION

Lighting in bathroom is essential for safety of a user. Nowadays, lighting can be integrated into sanitary ware for aesthetic purpose as well as to enhance visibility in vicinity of the sanitary ware.

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There are several ways of integrating lighting with a sanitary ware. For example, United States Patent No. US 7228574 B2 disclosed a wash basin for rinsing and washing hair of the head, comprising an illuminating device having a plurality of light projectors for illuminating inner region of the wash basin. Particularly, the
20 illuminating device being arranged outside the wash basin in such a way that at least one partial region of an outer side of the wash basin can be subjected to light.

Besides, one preferred embodiment of United States Patent No. US 4875958 A disclosed vacuum-forming a bath from a translucent sheet of plastic material,
25 particularly from a light diffusing acrylic sheet, and then applying suitable mask such that it is possible to transmit light through various panels in the bath itself from lighting tubes underneath.

Alternatively, it is desired to develop a sanitary ware comprising an illuminating
30 device and a body having at least a translucent ceramic portion which allows the

sanitary ware to glow in soft light upon activating the illuminating device thereby providing sufficient lighting in the dim environment that could also serves as night lamp in the bathroom.

5 SUMMARY OF THE INVENTION

The term ‘sanitary ware’ used herein refers to an equipment used in the vicinity of rest rooms, specifically meaning toilets, urinals, strainers for urinals, toilet tanks, wash basins of wash stands, hand wash basins, etcetera.

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One object of the present invention is to provide a translucent ceramic sanitary ware which glows upon activating an illuminating means affixed therein.

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Another object of the present invention is to provide a sanitary ware comprising a vitrified body having at least a translucent portion made of a ceramic composition.

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Another object of the present invention is to provide a sanitary ware comprising a molded body configured with at least a channel or cavity for accommodating at least an illuminating device. Preferably, the illuminating device is positioned and enclosed inside the body.

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At least one of the preceding objects is met, in whole or in part, by the present invention, in which one of the embodiments of the present invention is a sanitary ware comprising: a body having at least a portion that is translucent; a water-receiving means; a water-discharging means; and an illuminating device connected to a power supply, a switch and wiring; wherein the translucent portion of the body being configured to accommodate the illuminating device, such that upon activation of the illuminating device the translucent portion is caused to glow and the translucent portion is produced from a ceramic composition comprising kaolin, ball clay, feldspar,

silica and talc, and has a light transmission level of 5 to 20 % at thickness of 6 to 11 mm.

Preferably, the body is further coated with a transparent glaze layer derived from a
5 glaze mixture comprising kaolin, feldspar, silica, calcium carbonate, zinc oxide, magnesium carbonate, barium carbonate and boron oxide.

Preferably, the ceramic composition comprises kaolin present in an amount of 25 to 45 wt% of the composition; ball clay present in an amount of 5 to 15 wt% of the
10 composition; silica present in an amount of 20 to 25 wt% of the composition; feldspar present in an amount of 25 to 35 wt% of the composition; and talc in less than or equal to 2.5 wt% of the composition.

Advantageously, the ceramic composition comprises silica present in an amount of 50
15 to 75 wt% of the composition; aluminium oxide present in an amount of 15 to 35 wt% of the composition; iron oxide present in an amount of less than or equal to 0.25 wt% of the composition; titanium dioxide present in an amount of 0.1 to 0.2 wt% of the composition; calcium oxide present in an amount of 0.6 to 1 wt% of the composition; magnesium oxide present in an amount of 0.6 to 2.1 wt% of the composition; sodium
20 oxide present in an amount of 1.5 to 2.2 wt% of the composition; and potassium oxide present in an amount of 0.5 to 0.9 wt% of the composition.

Preferably, the illuminating device is an array of light emitting diode.

25 BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of facilitating an understanding of the invention, there is illustrated in the accompanying drawing the preferred embodiments from an inspection of which when considered in connection with the following description, the invention, its
30 construction and operation and many of its advantages would be readily understood

and appreciated.

Fig. 1 is a top perspective view of a wash basin.

5 Fig. 2 is a side perspective view of Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

The invention will now be described in greater detail, by way of example, with
10 reference to the drawings.

In practicing the present invention, particulate batch of materials of kaolin, ball clay, silica, feldspar and talc are proportionate according to composition as shown in Table 1 in order to yield a fired ceramic body consisting essentially of: 50 to 75 wt% of
15 silica; 15 to 35 wt% of aluminium oxide; less than or equal to 0.25 wt% of iron oxide; 0.1 to 0.2 wt% of titanium dioxide; 0.6 to 1 wt% of calcium oxide; 0.6 to 2.1 wt% of magnesium oxide; 1.5 to 2.2 wt% of sodium oxide; and 0.5 to 0.9 wt% of potassium oxide.

20 Table 1. Preferable Compositions for the Translucent Ceramic Body

Material	Preferable range of the material (weight %)	More preferable range of the material (weight %)
Kaolin	25 to 45	25-35
Ball clay	5 to 15	5-10
Silica	20 to 25	20-25
Feldspar	25 to 35	30-35
Talc	≤ 2.5	≤ 2.5

In the preferred embodiment, the foregoing materials are first mixed and milled. Particularly, at least 70 to 80 % of the materials are milled to an average particle size

of approximately 10 microns. Further, water is added therein to produce a liquid slip having proper flow consistency, whereupon the slip is cast into plaster of Paris moulds in the form of a wash basin body. Excess slip is preferably removed via technique known in the art. Further, the cast piece, which is the body (10) of the wash basin, is
 5 further de-mould, drying, fettling and cleaning to be ready for glazing.

According to Fig. 1 and 2, the body (10) comprises holes (12) to accommodate water-discharging means (such as a sink and discharge pipe assembly) and water-receiving means (such as a faucet and supplying pipe assembly) of the sanitary ware. Besides,
 10 the body (10) may have cavities (14) to accommodate wall- or floor-mounting members such as screws, bolts and nuts. The body may also have apertures (not shown) for fixing external accessories, such as a hanger, thereon. Further, the body (10) may also have a channel (not shown) around its edges to accommodate an illuminating device (16). Alternatively, the cast piece/body (10) can be post-treated,
 15 such as drilling, to impart a channel for the same purpose. The dimension of the channel may vary according to the dimension of the illuminating device (16).

The illuminating device (16) can be an array of light emitting diode (LED) connected to an external power supply, a switch and wiring. The illuminating device (16) can
 20 also be battery operated to avoid extensive wiring.

The cast piece/body (10) is further coated with a transparent glaze layer derived from a batch of glaze mixture comprising kaolin, feldspar, silica, calcium carbonate, zinc oxide, magnesium carbonate, barium carbonate and boron oxide that are proportionate
 25 according to composition as shown in Table 2. Glazing method known in the art, such as spray coating or flow coating but not limited thereto, can be applied herein.

Table 2. Preferable Compositions for the Transparent Glaze Layer

Material	Percentage of the material (weight %)	More preferable range of the material (weight %)
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Kaolin	4- 12	6-10
Feldspar	20 - 35	25 - 30
Silica	20- 35	25 - 30
Calcium carbonate	8 -18	10 – 15
Zinc oxide	3 – 10	4-7
Magnesium carbonate	1 – 6	2-4
Barium carbonate	2 -8	4-6
Boron oxide	2 -8	3-6

Thereinafter, the glazed body is fired in a kiln under temperature of 1000 to 1300 °C for 9 to 20 hrs. In the preferred embodiment, the thickness of the fired glaze is approximately 0.3 to 0.8 mm. Light transmissivity level of the glazed and fired cast piece/body (10) is approximately 5 to 20 % at thickness of 6 to 11 mm. The glazed and fired cast piece/body (10) has a water absorption of less than 0.5% and it is able to withstand thermal shock at 150°C after heating for more than 30 mins.

The present disclosure includes as contained in the appended claims, as well as that of the foregoing description. Although this invention has been described in its preferred form with a degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangements of parts may be resorted to without departing from the scope of the invention.

CLAIMS

1. Sanitary ware comprising:
a body having at least a portion that is translucent;
5 a water-receiving means;
a water-discharging means; and
an illuminating device connected to a power supply, a switch and wiring;
wherein the translucent portion of the body being configured to accommodate the
illuminating device, such that upon activation of the illuminating device the
10 translucent portion is caused to glow and the translucent portion is produced from a
ceramic composition comprising 25 to 45 wt% of kaolin, 5 to 15 wt% of ball clay, 25
to 35 wt% of feldspar, 20 to 25 wt% of silica and less than or equal to 2.5 wt% of talc,
and has a light transmission level of 5 to 20 % at thickness of 6 to 11 mm.
- 15 2. Sanitary ware according to claim 1, wherein the body is further coated with a
transparent glaze layer derived from a glaze mixture comprising kaolin, feldspar,
silica, calcium carbonate, zinc oxide, magnesium carbonate, barium carbonate and
boron oxide.
- 20 3. Sanitary ware according to any one of the preceding claims, wherein the
illuminating device is an array of light emitting diode.

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