

(19)



(11)

EP 2 149 656 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
30.04.2014 Bulletin 2014/18

(51) Int Cl.:
E04H 13/00 ^(2006.01) **B44C 5/00** ^(2006.01)
B41M 1/00 ^(2006.01)

(21) Application number: **09152473.6**

(22) Date of filing: **10.02.2009**

(54) Method of manufacturing a ceramic gravestone and gravestone thus produced

Verfahren zur Herstellung eines verbesserten Designer-Grabsteins aus Keramik und auf diese Weise hergestellter Grabstein

Procédé de fabrication d'une pierre tombale améliorée en céramique confectionnée et pierre tombale ainsi fabriquée

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK TR**

(30) Priority: **12.05.2008 ES 200801367**

(43) Date of publication of application:
03.02.2010 Bulletin 2010/05

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(56) References cited:
WO-A-2007/135207 AU-B2- 730 042
US-A- 2 215 595 US-A1- 2002 015 784

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Description

[0001] The aim of the present invention is to make use of the inherent properties of ceramics, stoneware, crystal glass, glass-ceramic, porcelainous stoneware or porcelain, in such a way that these materials can be used, starting from certain dimensions, in the production of gravestones that have the novelty of permanently displaying photographs of the loved ones, flower arrangements, borders, images of favorite saints of the deceased, landscapes particularly loved by the deceased, various typologies and textures of letters of the alphabet or any other detail of particular interest that reminds us of the life of the deceased in some way.

[0002] Concretely, said materials are used in the form of compacted slabs in a mold of ceramic, glass or other ceramic material that can take on a great many textures, including those that imitate marble in any of its forms or granite. However, it is also possible to produce textures of the most varied patterns, many of them being very suitable for achieving a beautiful background of fine material that sets off the photograph and ornamentation mentioned above. Once fired, a novel gravestone is obtained of the state of the art and specific to the object of the present invention, achieving a combination of factors, color and physical appearance that cannot be obtained with traditional gravestones, its esthetic effect being highly valued.

[0003] We thus obtain a standardized system for construction of gravestones, of simple assembly, versatile since it is applicable to various textures and colors on which photographs and ornamental motifs can be provided as desired and that takes advantage of the natural properties of hardness, strength and insulation, coloring and esthetic appearance of a material that until now has had numerous uses, but has never been used as a gravestone in cemeteries. In particular, it is a durable material, which displays very stable behavior against all variables, both physical and chemical, and is long-lasting.

[0004] Gravestones are known in various types of materials, generally of a stony character, among which the marbles and granites stand out, for insertion in the fronts of niches or for placing on tombs, which cannot be combined with the decorative elements of the gravestones according to the present invention, since they are constructed with very different materials, moreover specific structures and particular operations are required for each type of gravestone, as each has its own particular properties. Document ES 231346 U discloses the construction of a frame of crystal glass in the back of the gravestone for protecting the photographs and other ornamentation that are displayed between the crystal glass and the gravestone. Document ES 1044794 U relates to a gravestone for embellishing the closure of a niche, **characterized in that** it is made from a plate of rigid material of minimal thickness, on which a waterproofing sheet of paper is glued, bearing imprints of various funeral motifs, printed out by computer, resulting in a gravestone of poor

durability. Document ES 228291 U discloses a gravestone for niches and tombs constituted by a molding in ceramic material or porcelain, whose visible face has decorative bas-reliefs of motifs and patterns, enameled and fired, defining an unalterable surface, being provided on the back surface with a flat peripheral edge for fitting to the surface of the niche or tomb, but it is not possible to incorporate therein the ornamental motifs of the gravestone according to the present invention. Finally, the Spanish patent application ES 2300186 (or its family document WO 2007135207) discloses a gravestone wherein, using programs for digital and photographic retouching, the decorative elements that the client decides to choose for the gravestone are assembled. Among said decorative elements it is possible to choose a texture of granite or of marble or even a fancy texture, colours, grain size, orientation of the veins, size of the veins, a photograph of the deceased or of a favourite saint, landscapes, flowers, borders, decorated edges and corners, type of lettering with textures in gold, silver, bronze and any other element supplied by the client. Once the gravestone has been composed, printing is carried out on a transfer on a digital laser printer. If the dimensions of the gravestone are greater than those of the transfer, partitions are made and printing is done in as many parts as are required for the size of the gravestone, making up the latter by juxtaposition of the various parts. The transfer is enamelled and dried ready for application on the enamelled surface of the piece of porcelain-like material described above. With said application, an article is obtained with the final design, which will be fired in the kiln again, for fusion of the two enamels. A shiny gravestone is obtained, which is suitable for outdoor use. Instead of transfer by direct application, it can also be carried out by means of an ink-jet printer, obtaining the same result. However, both the shine and the outdoor performance of the gravestone obtained by this procedure can still be improved.

[0005] The object of the present invention is based on providing a set of technical improvements to said designer ceramic gravestones so that once fired in the kiln and enamelled, by means of programs for digital and photographic retouching, the decorative elements that the client selects for the gravestone are assembled, such as texture, photographs of the deceased, landscapes, flowers, decorative corners and borders, types of lettering with textures of gold, bronze, silver or any other element supplied by the client, extending the process for improving the end result, this latter being the novelty provided by the present addition. With the present invention, a gravestone is obtained that is shinier and more suitable for outdoor use than those of the prior art. The solution to this problem is an improved procedure for the manufacturing of gravestones from porcelainic materials as described below:

[0006] Once the gravestone has been composed following the procedure described in ES 2300186 (or in its family document WO 2007135207), that is, once it has been enamelled, fired in the kiln and the decorative ele-

ments that make it up have been assembled preferably using programs for digital and photographic retouching, the four colours of said decorative elements are filmed using special software in a cinecamera, thus obtaining four films, one of each colour (magenta, cyan, yellow and black). This film is insolated in an insulator on special paper or thermal transfer sheet provided with adhesive on its reverse, in which the information from each film is obtained. This process is repeated four times, once for each colour. On completion, the film is discarded and the process continues with the sheet. The corresponding pigment is applied to each of the sheets either by hand or using a special machine known as ATM. Once the sheets have been obtained with the information for each colour and with the corresponding pigment applied, they are arranged on base paper or tracing paper and are superimposed precisely so that once the four sheets are combined on the base paper, the image is obtained. Then it is immersed in water until the base comes away, and next it is applied on the ceramic for subsequent firing in the kiln, for which additional enamelling is not required, since the pigments and sheets used each contain a proportion of enamel, which once fired becomes shiny.

[0007] An example of a preferred embodiment of the invention will be presented below, this presentation being just one of the many designs that can be employed for development of the technique and configuration described previously.

[0008] The designer ceramic gravestone is formed on the basis of kiln firing of an enamelled porcelain-like article and assembling, by means of programs for digital and photographic retouching, the decorative elements that the client selects for the gravestone, such as texture, photographs of the deceased, landscapes, flowers, decorative corners and borders, types of lettering with textures of gold, bronze, silver or any other element supplied by the client, then extending the process in the following way: the four colours are filmed using special software in a cinecamera, thus obtaining four films, one of each colour (magenta, cyan, yellow and black). This film is insolated in an insulator on special paper or thermal transfer sheet provided with adhesive on its reverse, on which the information from each film is obtained. This process is repeated four times, once for each colour. Once completed, the film is discarded and the process continues with the sheet. The corresponding pigment is applied to each of the sheets, either by hand or using a special machine known as ATM. Once the sheets are obtained with the information for each colour and with the corresponding pigment applied, they are arranged on base paper or tracing paper and are superimposed precisely so that once the four sheets have been combined on the base paper, the image is obtained. Then it is immersed in water until the base comes away, and next it is applied on the ceramic, for which additional enamelling is not required, since the pigments and sheets used each contain a proportion of enamel, then firing is carried out, in which it melts with the previous enamel,

and becomes shiny.

Claims

1. Method of manufacturing a ceramic gravestone comprising the previous step of kiln firing of an enamelled porcelainic element, **characterised in that** the method further comprises the following steps:

- a) filming each one the four colours: magenta, cyan, yellow and black of the desired decorative elements in a cinecamera, thus obtaining four films, one for each colour;
- b) insolate each of the four films obtained in step a) with an insulator on special paper or thermal transfer sheet provided with adhesive on its reverse, obtaining four sheets containing the information from each film;
- c) apply the corresponding pigment to each of the four sheets, obtaining sheets with the information for each colour and with the corresponding pigment applied;
- d) arrange the sheets obtained in step c) on a base paper or tracing paper and superimpose them precisely so that once the four sheets have been combined on the base paper, the image is obtained;
- e) immerse the combination of the sheets and the base paper resulting from step d) in water until the base comes away;
- f) apply the base on the enamelled porcelainic element, and
- g) fire the enamelled porcelainic element with the base, so that the enamel of the porcelainic element is melted with the enamel of the base.

2. Method of manufacturing of ceramic gravestones according to claim 1, wherein the desired decorative elements of step a) have been previously assembled using programs for digital and photographic retouching.

3. Method according to claim 2, wherein the decorative elements comprises photographs of the deceased, landscapes, flowers, decorative corners and borders, types of lettering with textures of gold, bronze, silver or any combination thereof.

4. Method according to any one of previous claims 1-3, wherein, in step c), the application of the pigment is carried out by hand.

5. Method according to any one of previous claims 1-3, wherein, in step d), the application of the pigment is carried out using a special machine known as ATM.

6. Ceramic gravestone made through the method of

any one of previous claims 1-5.

Patentansprüche

1. Verfahren zur Herstellung eines keramischen Grabsteins, umfassend die vorherigen Schritte des Brennens im Ofen eines emaillierten Porzellanelements, **dadurch gekennzeichnet, dass** das Verfahren weiter die folgenden Schritte umfasst:

a) Filmen jeder der vier Farben: Magenta, Zyan, Gelb und Schwarz der gewünschten dekorativen Elemente mit einer Filmkamera, wodurch vier Filme erhalten werden, einer für jede Farbe; b) Isolieren jedes der vier Filme, die in Schritt a) erhalten werden, mit einem Isolator auf Spezialpapier oder thermischer Übertragungsschicht, ausgestattet mit Klebstoff auf der Rückseite, wodurch vier Schichten erhalten werden, die die Information von jedem Film enthalten;

c) Aufbringen des entsprechenden Pigments auf jede der vier Schichten, wodurch Schichten mit der Information für jede Farbe erhalten werden, und wobei das entsprechende Pigment aufgebracht ist.

d) Anordnen der Schichten, die in Schritt c) erhalten werden, auf einem Basispapier oder einem Pauspapier und präzises Übereinanderlegen dieser, damit, nachdem die vier Schichten auf dem Basispapier kombiniert wurden, das Bild erhalten wird

e) Eintauchen der Kombination der Schichten und des Basispapiers, das sich aus Schritt d) ergibt, in Wasser, bis sich die Basis entfernt;

f) Anbringen der Basis auf das emaillierte Porzellanelement; und

g) Brennen des emaillierten Porzellanelements mit der Basis, so dass das Email des Porzellanelements mit dem Email der Base geschmolzen wird.

2. Verfahren zur Herstellung von keramischen Grabsteinen nach Anspruch 1, wobei die gewünschten dekorativen Elemente von Schritt a) zuvor unter Verwendung von Programmen zum digitalen und photographischen Retouchieren zusammengesetzt wurden.
3. Verfahren nach Anspruch 2, wobei die dekorativen Elemente Fotos der Verstorbenen, Landschaften, Blumen, dekorative Ecken und Ränder, Schriftarten mit Strukturen aus Gold, Bronze, Silber und jeder Kombination daraus umfassen.
4. Verfahren nach einem der vorhergehenden Ansprüche 1 - 3, wobei in Schritt c) das Anbringen des Pigments manuell erfolgt.

5. Verfahren nach einem der vorhergehenden Ansprüche 1 - 3, wobei in Schritt d) das Anbringen des Pigments unter Verwendung einer speziellen Maschine, bekannt als ATM, erfolgt.

6. Keramischer Grabstein, hergestellt durch das Verfahren nach einem der vorhergehenden Ansprüche 1 - 5.

Revendications

1. Procédé de fabrication d'une pierre tombale en céramique qui comprend une phase préalable de cuisson d'un élément en porcelaine et émaillé dans un four, **caractérisé en ce que** le procédé comprend les phases suivantes additionnelles:

a) filmer chacune des quatre couleurs: magenta, cyan, jaune et noire des éléments décoratifs souhaités avec une caméra pour obtenir ainsi quatre films, un pour chaque couleur;

b) insoler chacun des quatre films obtenus dans la phase a) avec un insolateur sur du papier spécial ou sur une lame pour le transfert thermique dotée d'une colle au verso, pour obtenir quatre lames contenant l'information sur chaque film;

c) appliquer le pigment correspondant sur chacune des quatre lames de façon à obtenir des lames avec des informations pour chaque couleur et avec le pigment correspondant appliqué; d) placer les lames obtenues dans la phase c) sur un papier de base ou sur du papier calque et les superposer de façon précise pour obtenir l'image lorsque les quatre lames seront combinées sur le papier de base;

e) submerger la combinaison des lames et du papier base résultante de la phase d) dans l'eau jusqu'à ce que la base se détache;

f) appliquer la base sur l'élément en porcelaine émaillé, et

g) cuire l'élément en porcelaine émaillé avec la base, de façon à ce que l'élément en porcelaine s'amalgame avec l'émail de la base.

2. Procédé de fabrication de pierres tombales en céramique selon la revendication 1, dans lequel les éléments décoratifs souhaités de la phase a) ont été montés au préalable en utilisant des logiciels de retouche numérique et photographique.
3. Procédé selon la revendication 2 dans lequel les éléments décoratifs comprennent des photographies du défunt, des paysages, des fleurs et des plinthes décoratives, des types de lettre et des textures en or, en bronze, en argent ou dans toute autre combinaison de ces derniers.

4. Procédé selon l'une des revendications précédentes 1-3 dans lequel l'application du pigment est faite à la main dans la phase c).
5. Procédé selon l'une quelconque des revendications précédentes 1-3 dans lequel l'application du pigment se fait en utilisant une machine spéciale connue comme ATM, pendant la phase d). 5
6. Pierre tombale en céramique fabriquée par le biais d'un procédé cité dans l'une quelconque des revendications 1-5. 10

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 231346 U [0004]
- ES 1044794 U [0004]
- ES 228291 U [0004]
- ES 2300186 [0004] [0006]
- WO 2007135207 A [0004] [0006]