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(71) Applicant: **Todeschini, Danilo**
20010 Casorezzo (MI) (IT)

(72) Inventor: **Todeschini, Danilo**
20010 Casorezzo (MI) (IT)

(74) Representative:
Zavattoni Gusmeroli, Maria Chiara et al
Racheli & C. s.r.l.,
Viale San Michele del Carso, 4
20144 Milano (IT)

(54) **Artefact with a superficial image or pattern obtained through thermal transfer from a printed paper surface**

(57) An artefact is obtained having an image or pattern on its surface, by applying a paper surface printed with sublimable dyes and by applying heat thereto.

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Description

This invention concerns an artefact, coated or impregnated with synthetic, oleosynthetic, or natural resins, with a superficial image or pattern obtained through a process of thermal transfer from a paper surface.

Printing by means of thermal transfer is an already known technique: it is possible, using sufficiently sublimable colouring agents, to print on paper of a suitable kind (as described, for example, in European patent application no. 0020292 of 10/12/80) and, by holding it in contact with a synthetic fabric having a melting point compatible with the temperature for thermoprinting, to induce through heat the transfer as well as the fixing of the colouring agents from the paper to the fabric.

This method of transfer is highly effective when the supporting media is a surface based on synthetic fabrics having a melting point that is compatible with the temperature for thermoprinting.

At present, so that cotton, too, can be printed on using the transfer method (notwithstanding the poor compatibility of this material) a suitable solution or emulsion is added to the fabric in such a way that on this fibre equally the conditions conducive for printing are re-created. The aim of this invention is to obtain artefacts in marble or in composite materials based on lime and cement, suited - following mixing, impregnation, or coating with compounds based on synthetic, oleosynthetic, or natural resins - to the transfer onto their surface of images and patterns using the technique of thermal transfer from a paper surface printed on with suitable colouring agents.

This invention comprises, too, the procedure for obtaining the following artefacts:

- transfer of reproductions of various frescos, paintings, friezes, decorative work, or patterns onto the plastered or filled surface of building construction artefacts in order to obtain perfect imitations of the originals;
- transfer of images of marble onto cement artefacts in order to obtain memorial tablets that are an alternative to traditional ones and imitative of marble materials;
- transfer of sacred images, graphics, and photographs onto marble or cement surfaces.

Since at present the reproduction onto artefacts of frescos, paintings, friezes, decorative work, and patterns, etc. can be done only manually, this invention takes its place as a leading development because it enables a reduction both in production time and costs.

The sequence of stages in the transfer of images is summarised in the points below:

A) - Forming the lithographic plate image or silk-screen stencil of the object that has been photographed and is to be transferred.

B) - Preparing the surface of the artefact onto which the image printed on transfer paper is to be transferred.

For this purpose use may be made of any solution, emulsion, fixative, paint, distemper, adhesive, coating, enamel, filler, or compound based on resins of a synthetic, oleosynthetic or natural, polyacrylic, polyester, polyvinyl, silicon, polyamide, polyacrylnitril, epoxy, or polyurethane type, or any other resin or compound having a melting point that is compatible with the thermoprinting technique.

These resin-based compounds, depending on the nature of the surface of the artefact (plaster, filler, cement, marble, etc.) may be applied or used employing any technique, including being mixed with the materials making up the artefact, as well as application in the normal manner with a brush, roller, or in a spray.

C) - Positioning on the surface of the artefact of the transfer paper reproducing the image, followed by heating of the paper and of the supporting surface.

After the transfer paper has been positioned on the surface of the artefact, the paper may be heated using compression-plate presses heated electrically or by thermofluid, possibly provided with silicon sponges, polytetrafluoroethylene padding, or other heat-resistant material on the surface in contact with the paper, so that the paper pressed by the plate onto the supporting surface can conform to all of the latter's slightest imperfections and the heat can spread evenly, in this way transferring the image.

As an alternative to this technique, the transfer paper can be positioned and glued to the surface of the artefact with a suitable heat-resistant glue so as to remain fixed to the surface even in the absence of the thermal plate.

After the glue has solidified, the glued image can then be heated with a hot-air blower or electric gun of the type used in paint stripping or, alternatively, with a gas blowtorch the flame of which is to be held at a safe distance, or with other methods of heating, provided that a temperature is attained of approximately 200 °C for at least 30-40 seconds or which is in any case compatible with the thermoprinting process, so as to enable the images to be transferred.

D) - Removal of the transfer paper

If the procedure adopted was that of gluing the paper to the surface, its removal when the operation is complete may be undertaken using hot or lukewarm water together with a brush or sponge.

When the image has dried it could be protected with a transparent protective coating. Provided below is a description of a number of examples, which are non-restrictive:

1) - Newly plastered building construction artefact with a surface reproducing a fresco. After leaving the perfectly smoothed plaster to solidify for at least 3-4 weeks, and before the resin-based solution is applied, some preliminary work may be needed to clean the surface, for example removing all particles that are in any way coming loose and brushing the surface free of dust.

At this point the surface of the plaster is given two coatings of "Capaplex", produced by "Caparol Italiana", a firm at Gaggiano (Milan province), possibly mixed or substituted with "Ducotone", a white mural paint produced by "Duco", diluted with water in a proportion determined by the degree of absorption or coarseness of the surface, and the primer is allowed to dry thoroughly. The length of time necessary will depend on the air temperature and humidity but is, broadly, less than 12 hours.

The paper on which the copy of the fresco is printed can now be glued to the plaster using "Ovalit T Perfax" by "Henkel", dissolved in water to give it greater fluidity. By then pressing with the brush or a sponge, excess glue can be forced out and the paper made to adhere perfectly to the surface.

When the glue and the paper are perfectly dry the latter, together with the plaster, can be heated with an electric hot-air gun or a gas blowtorch, the flame of which is to be held at a safe distance for at least 30-40 seconds at a temperature of about 200 °C, so as to cause the colours to sublime and the copy of the fresco to be transferred onto the plaster coated with the resin-based products.

When this procedure is complete the paper may be easily removed, possibly with hot or lukewarm water and using a brush or sponge.

2) - Cement artefact shaped like a memorial tablet and imitative of a marble surface. To transfer an image of marble printed on transfer paper with sublimable colours onto the surface of a cement artefact shaped like a memorial tablet, "Texapur 60", produced by Kem-Pa-Tex of Orio al Serio, or "Capaplex" once again, must be combined with the cement mix, through being added to the water for the mix in a proportion broadly ranging from a minimum of 1/30 to a maximum of 1/5.

When setting is completed, and at an interval of not less than 3-4 weeks, the paper may then be positioned on the surface, possibly by gluing, and the subsequent stages of heating and removing the paper may be undertaken.

When the operation is over, a coating suitable for providing bad-weather protection might be used on the image, now an integral part of the artefact.

3) - Stone artefact, with a sacred image transferred onto its surface.

To transfer a sacred image from the transfer paper to another, non-absorbent, surface, all traces of dust, grease, and moisture, etc. must be eliminated from the latter.

At this point (after possibly using a suitable foundation coat) the surface is enamelled with, for example, one or two layers of "60.3 K1" acrylic enamel, produced by "Siro" of Padua.

When hardening is completed (and at an interval of not less than 5/10 days) the paper can be positioned on the surface, and without necessarily gluing it. In the latter case, one of the compression-plate compresses etc. referred to above may be used. Subsequently, after removal of the paper, the entire surface may be coated to protect the image from bad weather.

Claims

1. An artefact with a superficial image or pattern obtained through thermal transfer from a printed paper surface.
2. An artefact as claimed in Claim 1, wherein the superficial image or pattern is obtained through thermal transfer from a paper surface printed with colouring agents sufficiently sublimable at a temperature of approximately 200 °C for at least 30-40 seconds, suitable for being absorbed onto the surface of the artefact treated with compounds based on synthetic, oleosynthetic, or natural resins.
3. An artefact as claimed in Claim 1, wherein the superficial image or pattern is obtained through thermal transfer from a paper surface printed with colouring agents sufficiently sublimable at a temperature of approximately 200 °C for at least 30-40 seconds, suitable for being absorbed onto the surface of the artefact mixed with solutions, emulsions, or various compounds based on synthetic, oleosynthetic, or natural resins added to the liquid used for the mix at the time of production.
4. Artefact as claimed in Claim 1 characterised in that the superficial image or pattern printed on suitable paper with sublimable colouring agents is positioned on the artefact and heated together with the surface by a compression-plate press heated electrically or by thermal fluid, possibly provided with silicon sponge, polytetrafluoroethylene cloth or padding, or other heat-resistant material on its contact surface pressed against the paper.
5. Artefact as claimed in Claims 2 and 3, characterised in that the image printed on the transfer paper with sublimable colouring agents is positioned and glued on the surface of the artefact with glue resisting at the temperature for thermoprinting and easily removable subsequently.

6. Artefact as claimed in the preceding claims, characterised by the fact that the source of heat applied to tile paper and to the surface of the artefact may be provided by a hot-air blower or electric thermal gun, by the flame of a gas blowtorch held at a safe distance, or by other sources of heat. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 97 10 2570

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP 0 014 901 A (KOLLOID CHEMIE) 3 September 1980 * page 2, line 1 - line 28 * * page 4, line 21 - line 38; claims * ---	1-6	B41M5/035
X	EP 0 070 643 A (METAL BOX PLC) 26 January 1983 * page 14, line 3; claims * ---	1,5	
X	FR 2 230 794 A (SUBLISTATIC HOLDING SA) 20 December 1974 * the whole document * ---	1-6	
X	EP 0 544 925 A (GE POLYMERTREND GMBH ;NETZSCH ERICH HOLDING (DE)) 9 June 1993 * claim 1 * ---	1-4	
X	FR 2 380 901 A (UNITED STATES GYPSUM CO) 15 September 1978 * the whole document * ---	1-3	
X	DE 26 42 350 A (POLYTRANSFER GMBH) 23 March 1978 * the whole document * ---	1-6	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B41M
X	FR 2 521 489 A (SCHUHL JEAN) 19 August 1983 * the whole document * ---	1	
X	US 4 294 641 A (REED KENNETH J ET AL) 13 October 1981 * column 9, line 15 - line 19; claim 14 * ---	6	
A	US 4 271 224 A (MIZUNO SHOGO ET AL) 2 June 1981 * column 20, line 57 * -----	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 June 1997	Examiner Rasschaert, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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