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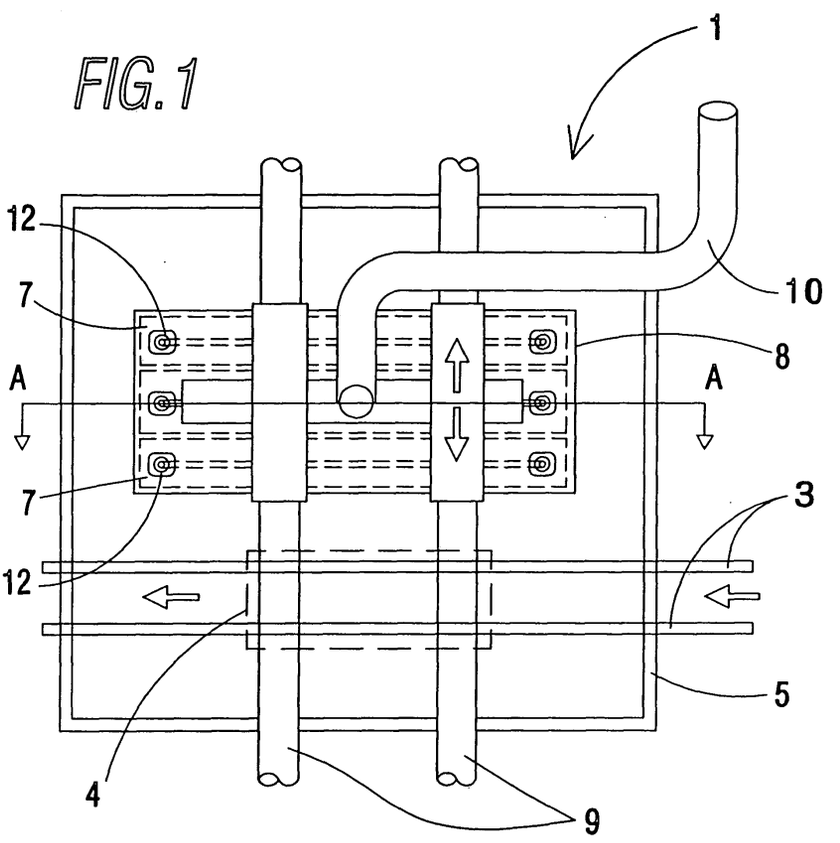
(54) Device for the silk screen printing of pottery articles

(57) This invention consists of a device (1) for silk screening onto pottery articles and particularly, onto the front surface with a relief that have a bed (2) on which the pottery pieces are moved, a means of injecting the paint or dye onto the front surface and a template or screen (5) that outlines the painted shapes onto said front surface by means of lines or connecting points, characterised in that in addition it includes a means for the creation of an air flow curtain (6) under pressure that is arranged noticeably vertically and above the template or screen (5), for the transfer of the paint or dye from the screen onto the item, without there being any physical contact between the front surface of the pottery item (4) and any other element of the device.

FIG. 1



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Description

OBJECT OF THE INVENTION

[0001] The object of this Patent Invention is a device for the silk screening onto pottery articles that incorporates significant innovations and advantages compared to the present devices and systems used for the same purpose.

[0002] More specifically the new invention consists of a device for the silk screen printing onto pottery items or materials having similar properties, and particularly, the front surface with a relief or curved surfaces that have a bed on which the pottery pieces are moved, a means of injecting the paint or dye onto the front surface and a template or screen that outlines the painted shapes onto said front surface.

BACKGROUND TO THE INVENTION

[0003] At the present time the silk screen printing process for pottery items is carried out by means of making contact between the parts by two spatulas or similar devices activated hydraulically in which by the inertia of the process chain, one of the spatulas spreads the paint onto the template on which there is a decoration determined by the drawing on the surface of the template, meanwhile the other spatula transfers the dye onto the part and removes the excess paint. In this procedure, the surface of the pieces must be flat so that the spatulas spread the paint in a homogeneous way over the whole surface.

[0004] In the case of carrying out silk screen printing on pottery pieces with a relief, the use of the machinery for smooth pieces is not possible as it would not paint the internal surfaces of the relief. Because of this the silk screen printing operations on pottery items with a relief are carried out in a manual way and so, the process is slow, costly and requires a specific number of operatives which increases the silk screen process costs.

DESCRIPTION OF THE INVENTION

[0005] The present invention has been developed for the purpose of providing a device for the silk screen printing of pottery items that finds a solution to the previously mentioned disadvantages, in addition providing other additional advantages that will be clear from the description that is attached below.

[0006] The device for the silk screen printing onto pottery items of the present invention in particular, with the front surface with a relief that has a bed on which the pottery pieces are moved, a means of injecting the paint or dye onto the front surface and a template or screen that outlines the painted shapes onto said front surface by means of lines or connecting points, and is characterised by the fact that in addition it includes a means for the creation of an air flow curtain under pressure that is arranged noticeably vertical and above the template or screen, without there being any physical contact between the front surface of the pottery item and any other element of the device, using said air curtain to transfer the ink from the template to the pottery item.

[0007] Thanks to these characteristics, an easily constructed device is obtained that allows the automation of the silk screening process for pottery items with relief, for example, decorative types, or roman or curved pieces, in such a way that the production costs and the number of employees necessary are reduced as the device can be installed on a production line for the pottery items or other materials having similar characteristics. The type of silk screening obtained has the same degree of quality as that obtained for flat pieces.

[0008] In addition, by virtue of the fact that there is no contact with the pottery piece, possible breakages of same are avoided; at the same time all the points to be silk screened are covered on as much of the relief as the pottery item may have.

[0009] In accordance with another aspect of the invention, the machine also has spatulas to spread the paint or dye onto the template and to eliminate the excess paint or dye remaining. In this way the machine can silk screen items with or without a relief patterns without having to have two production lines for each type of piece. By preference there are two spatulas so that painting can be carried out in two directions.

[0010] An advantage is to have a means of regulating the air flow and the size of the curtain. In this way the air flow curtain can be adapted to different sized pieces to be silk screened.

[0011] By preference, said means of regulation would be made up of a multitude of pistons.

[0012] Preferably, the means of creating the air flow curtain under pressure, the means for regulating the flow rate and the spatulas are arranged on a mobile support.

[0013] Other features and advantages of the device for the silk screening of pottery pieces object of the present invention will be evident from the description of the preferred embodiment, but not by way of being exclusive, that which is shown in the attached drawings is by way of example and not limitation:

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Figure 1 shows a diagrammatic plan view of the device for the silk screening of pottery items of the present invention.

Figure 2 shows a side view across the line A-A carried out on the previous drawing.

Figure 3 shows a diagrammatic plan view of a second embodiment of the silk screening device of the present invention.

Figure 4 shows a side view across the line B-B car-

ried out on the previous drawing.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0015] As shown in figures 1 and 2, the device (1) for the silk screening of pottery items of the present invention can be located on a production line for pottery items or materials having similar characteristics (being by preference prior to the firing stage of the pottery items), it is made up of a base (2) which has a section of conveyor belt or belt guide elements (3) for the item (4) (shown by broken lines) along which the pottery items (4) are moved, a means for the injection of paint or dye of a known type (not shown as it is not the object of the invention) in order to apply the paint onto the front surface of the item (4) and a template or screen (5) (shown by broken lines) that outline the painted shapes on said front side. For the purpose of silk screening items (4) with their front side having a relief pattern or with rounded or roman shapes, the stated device (1) additionally has some means for the creation of an air flow curtain under pressure (6) arranged in an appreciably vertical manner and above the template or screen (5), without there being any physical contact of the front surface of the pottery item (4) with any other element of the device being necessary in order to carry out the silk screening. The flow of air is provided by means of a tube (10) connected at one end to an air supply source whilst the other end is fixed to a platform (11) that releases said air flow curtain.

[0016] In this memorandum floor tiles, wall tiles, flooring and similar elements of pottery or materials having similar characteristics are understood to be 'pottery items' (4).

[0017] The device (1) is also made up of at least one conventional type spatula (7) to spread the paint or dye onto the template (5).

[0018] The device (1) for the silk screening object of the invention also comprises of some means of regulation for the air flow and the size of the curtain, said means being a multitude of pistons (12) arranged in such a way as to make a rectangular shape. As can be seen in the figures, the assembly formed by the spatulas and also the means for creating of the flow curtain (6) are situated on a support (8) that is moveable in a perpendicular direction to the direction of the movement of the pottery items (4) during the silk screening operation. Said movement is carried out by means of a pair of transfer bars (9) that allow the movement to take place in the direction of the black arrows shown on figure 1.

[0019] On the other hand, in figures 3 and 4, a second embodiment of the device of the invention is shown. The main difference in comparison to the first preferred embodiment is the fact that the support (8) moves in the same direction as the pottery item (4) as and how shown by means of the black arrows.

[0020] The details, shapes, sizes and other accessories, likewise the materials used in the manufacture of the device for the silk screening of pottery items of the invention can be suitably substituted by others that are technically equivalent and do not divert from the basic essence of the invention or from the scope outlined in the claims that are included below.

Claims

1. A device (1) for silk screening onto pottery articles and particularly, onto the front surface with a relief that have a bed (2) on which the pottery pieces are moved, a means of injecting the paint or dye onto the front surface and a template or screen (5) that outlines the painted shapes onto said front surface by means of lines or connecting points, **characterised in that** in addition it includes a means for the creation of an air flow curtain (6) under pressure that is arranged noticeably vertically and above the template or screen (5), for the transfer of the paint or dye from the screen onto the item, without there being any physical contact between the front surface of the pottery item (4) and any other element of the device.

2. A device (1) for silk screening onto pottery articles according to Claim 1, **characterised in that** there are two spatulas to spread the paint or dye onto the template (5) in such a way that it can paint in two directions.

3. A device (1) for silk screening onto pottery articles according to Claim 1, **characterised in that** there is some means for the regulation of the flow of the air and the size of the curtain (6).

4. A device (1) for silk screening onto pottery articles according to Claim 3, **characterised in that** said means have a multitude of pistons (12).

5. A device (1) for silk screening onto pottery articles according to any of the above Claims, **characterised in that** the means for the creation of the air flow curtain under pressure, the means for the regulation of the flow and the spatulas are arranged on a moveable support (8).

FIG. 1

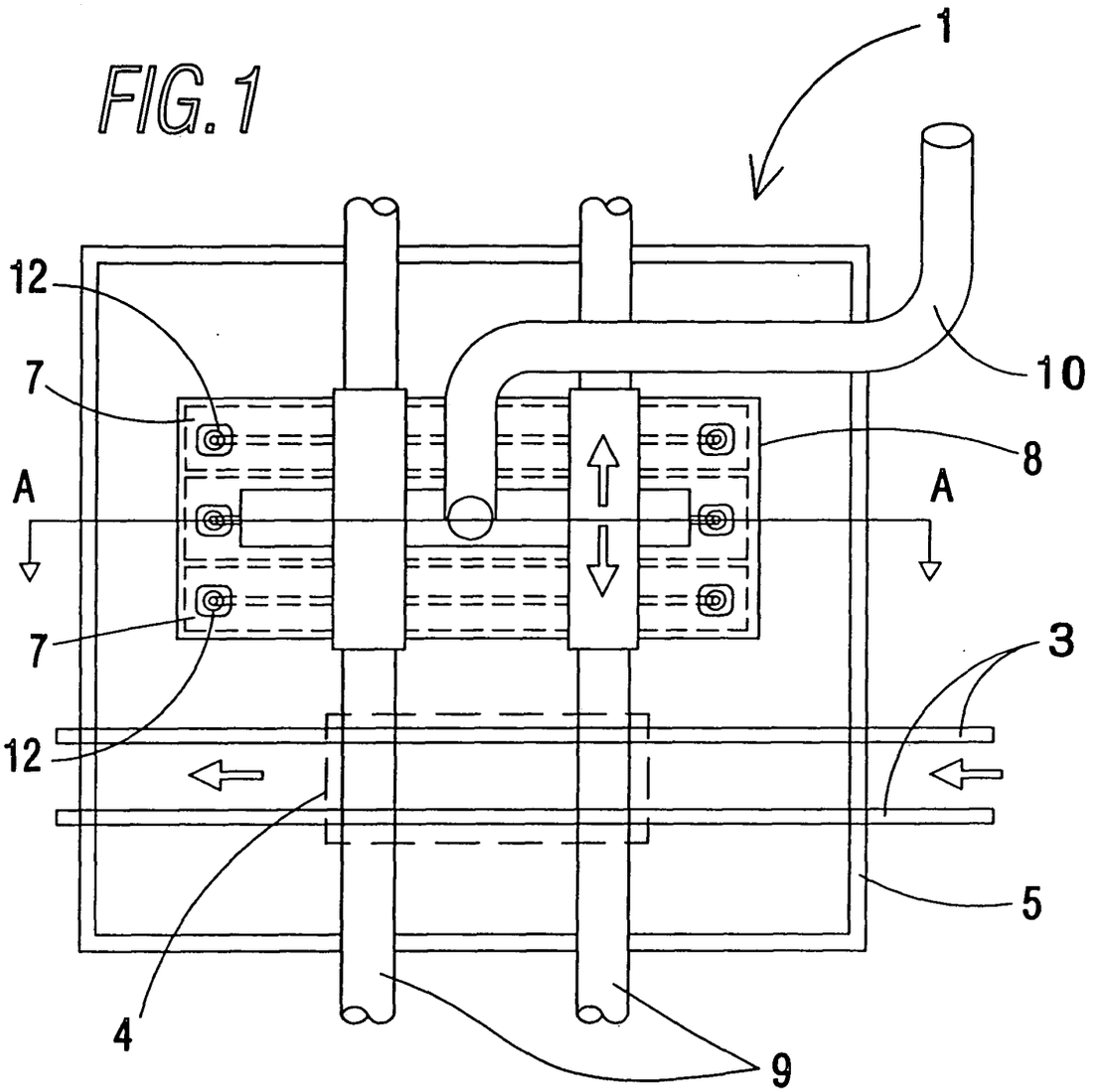


FIG. 2

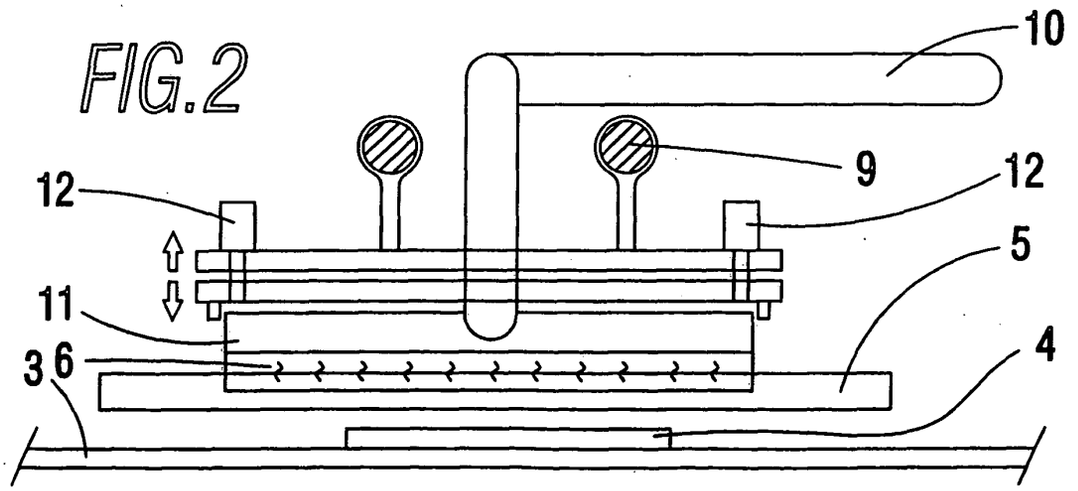


FIG.3

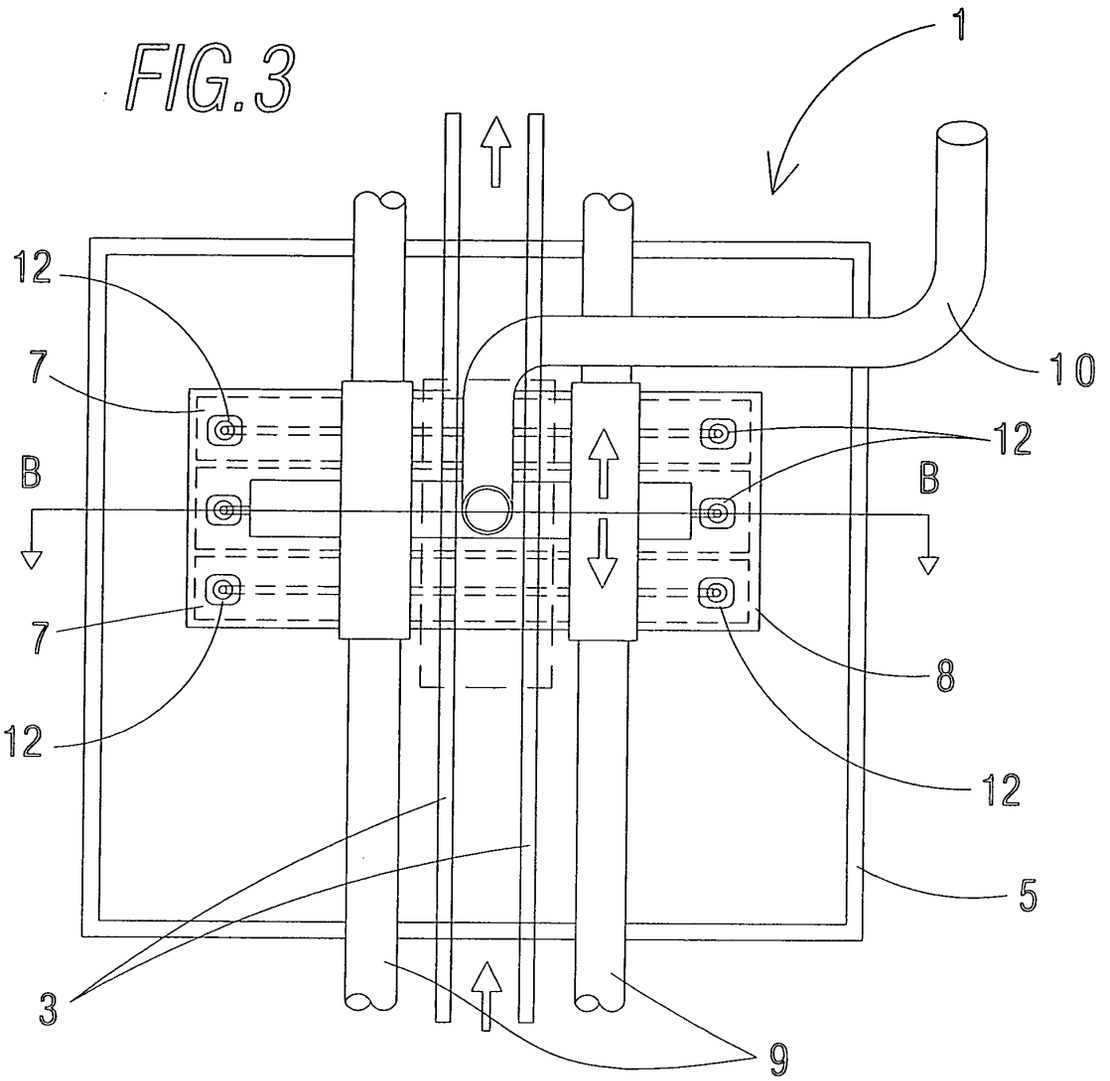
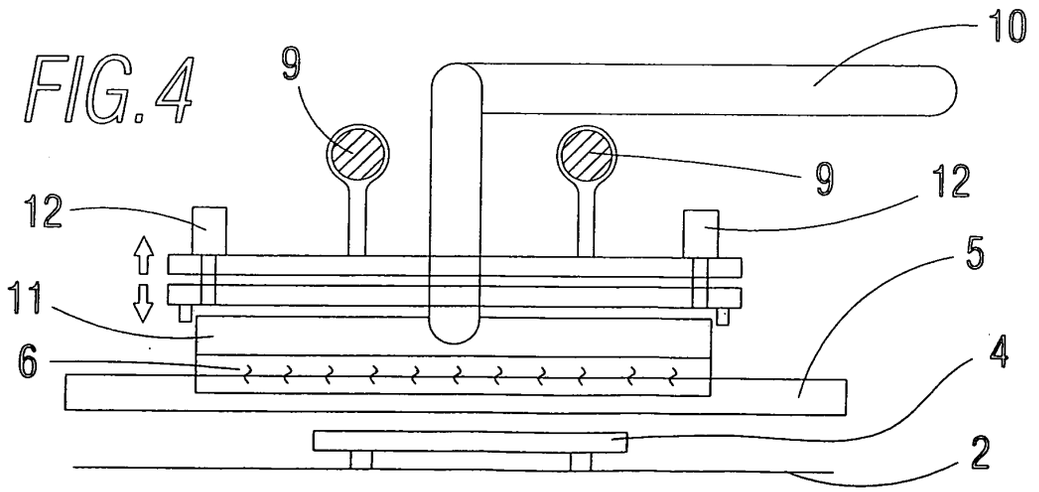


FIG.4



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EUROPEAN SEARCH REPORT

Application Number
EP 04 01 4800

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.7)
X	EP 1 336 480 A (GRUPPO CONCORDE) 20 August 2003 (2003-08-20) * the whole document * -----	1,3	B41F15/40

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B41F
B28B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 September 2005	Loncke, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 01 4800

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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07-09-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1336480 A	20-08-2003	IT FI20020029 A1	18-08-2003
		EP 1336480 A1	20-08-2003

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82