(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 816 072 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.01.1998 Bulletin 1998/02

(51) Int Cl.[6]: **B41C 1/14**, B41F 15/38, B41N 6/02

(21) Application number: **97830130.7**

(22) Date of filing: **21.03.1997**

(84) Designated Contracting States:
CH DE ES FR LI NL PT

(30) Priority: **28.06.1996 IT MO960086**

(71) Applicant: **Serigrafica Tosi S.r.l.**
41059 Sassuolo (MO) (IT)

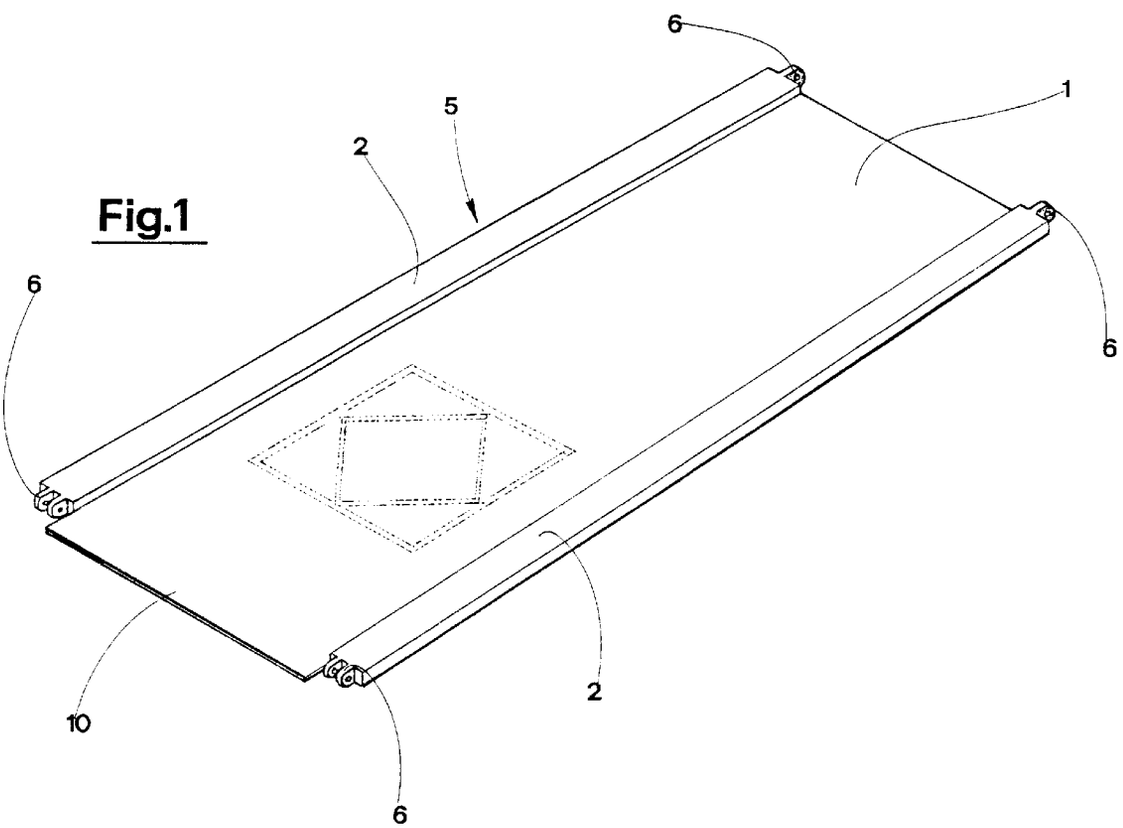
(72) Inventor: **Tosi, Sergio**
41049 Sassuolo (MO) (IT)

(74) Representative: **Gotra, Stefano**
BUGNION S.p.A.
No. 25, Via Emilia Est
41100 Modena (IT)

(54) A process for realising rotary silk screens

(57) The invention relates to a process for making rotary silk screens. A parallelogram of textile material (1) is predisposed and stretched on a flat frame. The silk screen matrix is then prepared on said parallelogram. Two parallel strips are then applied on said parallelogram at a predetermined reciprocal distance. Two thin metal rods (2) are then glued on said strips. Any excess material extending beyond said rods (2) is trimmed away giving rise to a silk screen (5) which is ready to be mounted by winding about circular flanges (4) provided with cylindrical surfaces (40) arranged so that said rods (2) are singly wound about and fixed thereon.

Fig.1



EP 0 816 072 A1

(Cont. next page)

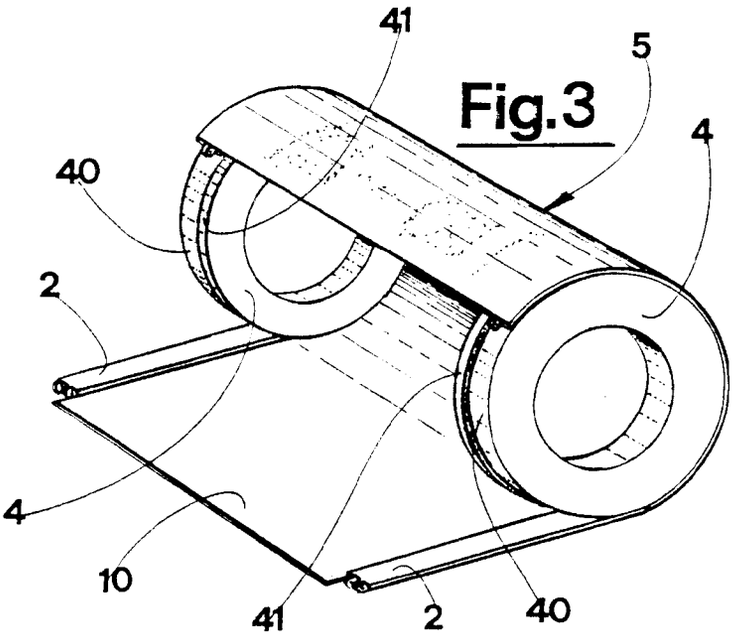


Fig.3

Description

The invention relates to a process for realising rotary silk-screens. Specifically though not exclusively it is intended for application in the ceramics industry for silk-screening ceramic products such as tiles and the like.

Cylindrical rotary silk screens are used for making designs on ceramic tiles. In this type of application the screen, cylindrically-set, is set in rotation about a horizontal axis and caused to roll undraggingly in contact on underlying tiles transiting along a transport line. The screen is constituted by a matrix screen supported by a structure guaranteeing that it maintains a cylindrical shape. This structure usually comprises two flanges, arranged in diametrically opposite positions, on which the screen is stably fixed. In such embodiments the two flanges can be at the same time united and kept apart by fixed or mobile hoops. In any case, the realisation of the screens, according to the prior art, is such that the formation of the printing matrix is performed on the screen when it is already perfectly-fixed and mounted on the structure, that is, when the screen has already acquired a cylindrical shape. This makes the matrix-forming operation rather a laborious and complex task, as it has to be performed on a cylindrical surface.

A further drawback in the prior art is that using cylindrical silk screens means that the whole screen is considerably voluminous, which renders transport and stocking thereof extremely wasteful of space.

A further drawback in prior-art screens is that for each screen a normally metallic structure has to be predisposed.

An aim of the present invention is to obviate the drawbacks and lacks in the prior art by providing a process for making rotary silk screens in which the making of the design can be done with the screen flat, fashioning the screen into a cylindrical shape only after the matrix-designing process.

An advantage of the present invention is constituted by the considerable simplification, with respect to the prior art, of the whole process concerning the making of the design on the screen.

A further advantage of the present invention is constituted by the fact that the screens can be stacked and transported in a very contained space, much smaller than the space occupied by screens made according to prior-art methods.

Further characteristics and advantages of the present invention will better emerge from the detailed description that follows of a preferred but non-exclusive embodiment of the invention, illustrated purely by way of nonlimiting example in the accompanying figures of the drawings, in which:

figure 1 shows, in perspective view, a silk screen obtained according to the invention;

figures 2 and 3 schematically represent some phases of actuation of the invention.

With reference to the figures, 1 denotes a rectangular parallelogram having predetermined dimensions. The screen tissue of which it is composed has a certain elastic deformability.

The preparation of the matrix, that is, the operation normally known as the design-making, is carried out with the screen flat. The parallelogram of silk material is stretched out and fixed on a flat frame 3.

The normal design-making operations are then carried out as for flat silk screens.

In particular, the design-making operation comprises, apart from the realisation of the matrix destined for the silk-screen printing operation, the making of two straight and parallel strips 20 which are located at the sides of the material parallelogram 1, at a predetermined reciprocal distance.

Once the design has been made, two longitudinally-flexible thin rods 2 are glued on to the two said lines. The rods 2 are made of a non-extensible material.

Then the flat frame 3 is detached, and at least the redundant material external of the rods is cut away. Thus the screen achieves its definitive shape, denoted by 5 in the figures.

The screen 5 is now ready for application on a special metal structure which will give it a cylindrical shape.

Before it is applied on the structure, the screen 5 can easily be stacked and transported as it occupies little space.

The final cylindrically-shaped rotary silk screen can be made very simply by applying a silk screen 5 on two circular flanges 4 and causing the rods 2 to wrap contactingly about the cylindrical surfaces 40 of the flanges 4. Two fasteners 6 are provided at the ends of the rods 2, by means of which the rods 2 can be precisely tightened on the cylindrical surfaces 40. The two flanges 4 can then be mounted, with or without the help of movable hoops located inside the screen, on the drive heads of a silk screen machine predisposed to operate in a ceramic tile line.

In a further embodiment, not illustrated in the enclosed figures, the two circular flanges 4 can be reciprocally united and distanced at a predetermined distance by fixed internal hoops.

In both case the correct tension of the screen is guaranteed by the interaction of the reciprocally-facing edges of the rods and the annular strikers predisposed on the circular flange 4 and projecting with respect to the external cylindrical surfaces 40.

To enable a continuous cylindrical surface to be made, the material of the screen 5 can be provided with an overlap 10 which can be used to close the screen in the cylindrical configuration. To this end the overlap 10 is glued when the screen 5 is mounted on the circular flanges 4.

The invention enables the screen matrix to be prepared with the screen flat, while the cylindrical rotary silk

screen is formed only at the moment of use. This means that the screens, already prepared, can be stacked and stored in the smallest possible space, and additionally means that each cylindrical screen does not have to be provided with a dedicated structure.

Preparing the matrix with the screen flat and only thereafter mounting the screen on a structure to create the cylindrical screen is made possible essentially by the presence of the rods 2 fitted to the material of the screen.

Claims

1. A process for making rotary silk screens, characterised in that it comprises:

   setting out a parallelogram of elastic textile material (1) on a flat frame (3) and stretching said material (1) to a predetermined tension;
   preparing a screen matrix on said parallelogram of material (1); said preparation comprising the realisation of two straight parallel strips positioned laterally at a predetermined reciprocal distance on said parallelogram of material (1);
   gluing two longitudinally-flexible metal rods (2) on said two strips;
   detaching said flat frame (3);
   trimming of extra material reaching externally beyond said rods (2) to give rise to a prepared silk screen (5);
   applying said silk screen (5) on two circular flanges (4), of predetermined size, provided with cylindrical surfaces (40) arranged so that said rods (2) can be singly wound and fixed thereon;
   locating said flanges (4), coaxially-disposed, at a predetermined reciprocal distance.

2. A process as in claim 1, characterised in that said strips (2) are practically longitudinally non-extensible.

3. A process as in claim 1, characterised in that said circular flanges (4) are provided with annular strikers (41), projecting with respect to said cylindrical surfaces (40), predisposed in such a way that opposite and reciprocally-facing lateral edges of said strips (2) interact there-with.

4. A silk screen characterised in that it comprises a parallelogram of textile material at two opposite ends of which two thin rods (2) are fixed, which rods are longitudinally flexible and practically non-extensible.

5. A silk screen as in claim 4, characterised in that said two rods (2) are of a length which is equal to a length of the cylindrical surfaces (40) of the circular flanges (4) about which said two rods (2) are wound to form a cylindrical silk screen.

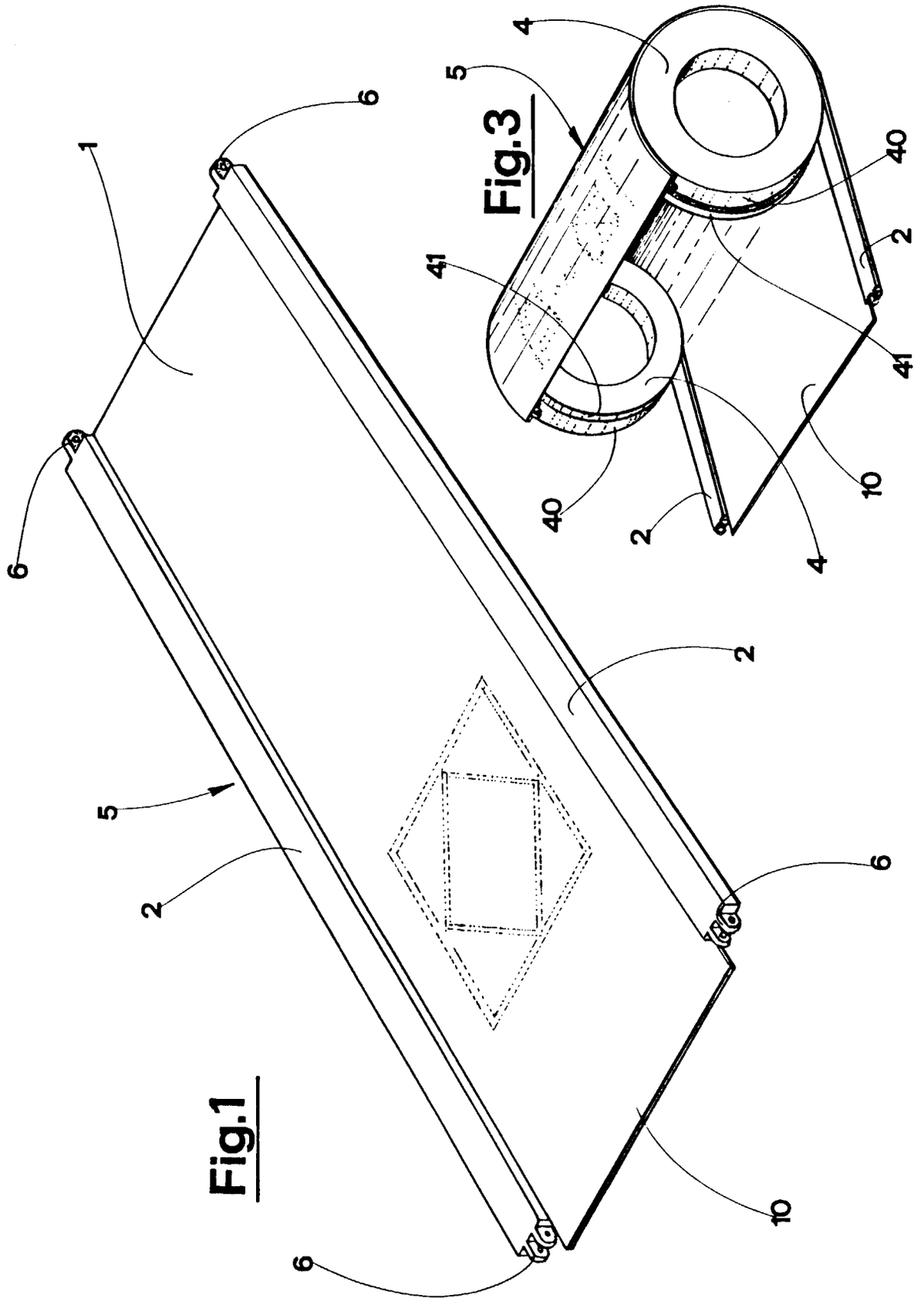


Fig.1

Fig.3

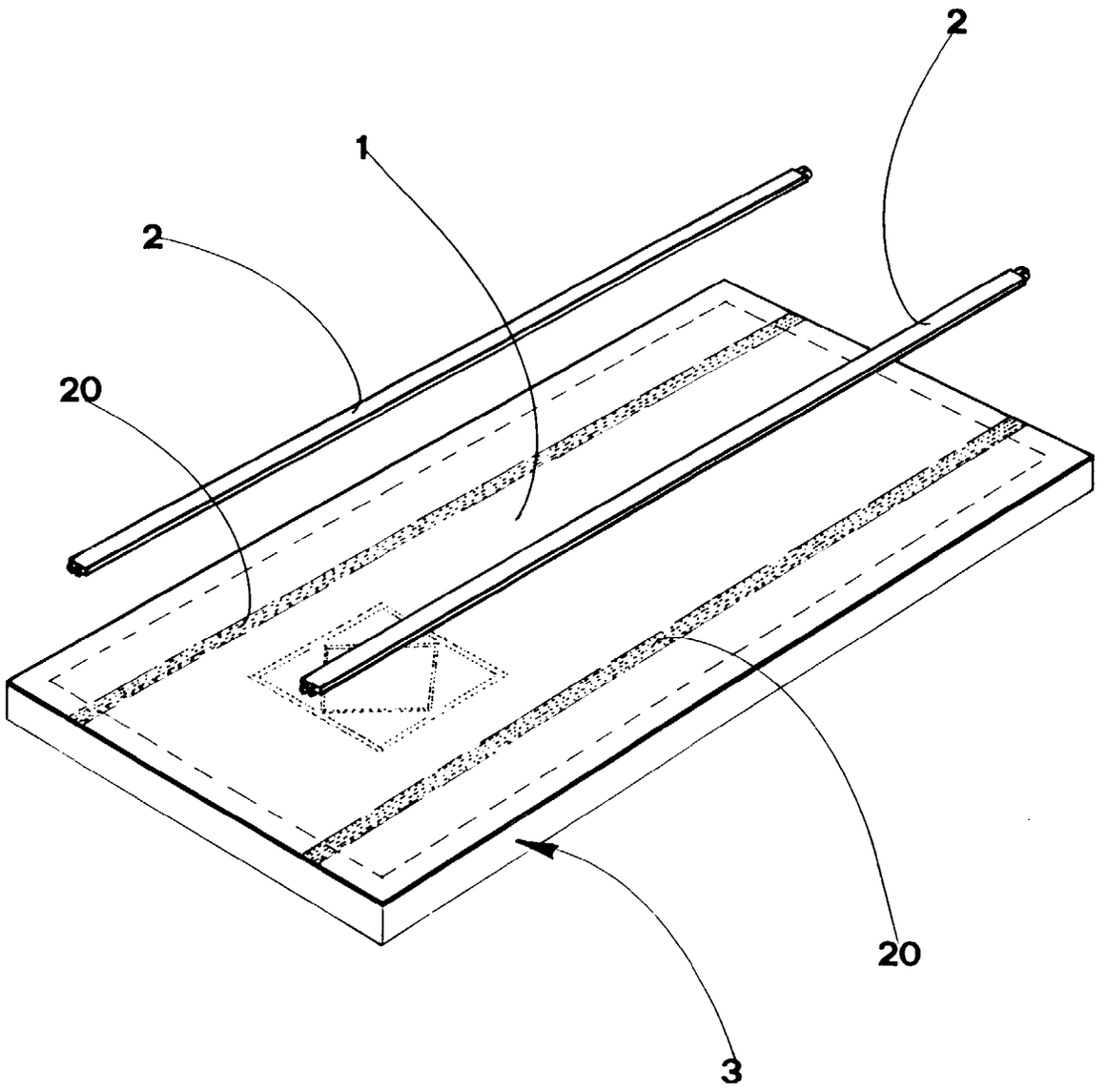


Fig.2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 83 0130

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)
A	US 4 702 783 A (MASON III WILLIAM H) 27 October 1987 * claims 1,11-13 * -----	1-5	B41C1/14 B41F15/38 B41N6/02

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
B41C B41L B41F B41N

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	24 July 1997	Martins-Lopes, L

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

EPO FORM 1503 03.82 (P04C01)