

(19)



(11)

EP 2 000 303 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
28.04.2010 Bulletin 2010/17

(51) Int Cl.:
B41F 16/00 (2006.01)

(21) Application number: **08156953.5**

(22) Date of filing: **27.05.2008**

(54) **Machine for decorating metal plaquettes**

Maschine zur Verzierung von Metallplaketten

Machine pour la décoration de plaquettes métalliques

(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 MT NL NO PL PT
RO SE SI SK TR**

(30) Priority: **04.06.2007 IT VE20070036**

(43) Date of publication of application:
10.12.2008 Bulletin 2008/50

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Description

[0001] The present invention relates to a machine for decorating metal plaquettes.

[0002] Decorating machines for metal plaquettes are known consisting substantially of two heating plates hinged together along an edge. A removable template comprising a plurality of holes corresponding to the shape of the plaquettes to be decorated rests on one of the heating plates.

[0003] The decoration step involves resting on the lower plate a sheet on which the decorations to be transferred are printed, positioning the template on said sheet, placing the plaquettes in the template holes; applying a further sheet provided with decorations, and then rotating the other plate to transfer the decorations onto the plaquette coating.

[0004] However these known machines are designed for large production and are therefore unsuitable for decorating a small number of plaquettes, and consequently unsuitable for small activities such as shops.

[0005] These machines also present the drawback of unreliable precision during the closure of the heating plates due to the wide opening of the hinged plates.

[0006] Finally these machine are difficult to adapt to different plaquette thicknesses because of their hinging.

[0007] US-A-4 664 672 discloses a process for transfer printing onto solid substrates made of plastics or having a surface layer of varnish or plastic. A sheet dye carrier is pressed at a temperature suitable for dye transfer to a preferably preheated surface and/or to a limited area of the surface to be printed by means of superatmospheric gas pressure, in particular by means of a flowing gas. Additionally, the surface to be printed is maintained at a temperature below the thermoplastic range during the transfer process.

[0008] US 2002/069772 A1 discloses an imaging system having a housing with an interior chamber a press, and a door. The press has a base fabricated of a rigid material and with an upper surface and further has a raisable platen with a lower surface fabricated of a resilient material. A support plate is positionable on the upper surface of the base for the receipt of an object. A transfer sheet has printing material to be positioned upon the object. Drive mechanisms urge the platen downwardly into contact with the transfer sheet with the object, plate and base there beneath.

[0009] JP-A-54 033 113 describes a method of decorating by sublimation a substrate placed between the two edges of a folded transfer sheet containing the image to be reproduced.

[0010] An object of the invention is to eliminate the drawbacks cited above by providing a decorating machine for metal plaquettes which is of very simple use, including for small quantities.

[0011] Another object of the invention is to provide a decorating machine able to decorate plaquettes of different thickness.

[0012] These and other objects which will be apparent from the ensuing description are attained according to the invention by a decorating machine for plaquettes as described in claim 1.

[0013] A preferred embodiment of the present invention is further clarified hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a decorating machine according to the invention during application of the decorative sheet,

Figure 2 shows it in the same view as Figure 1 during application of the plaquette,

Figure 3 shows it in the same view as Figure 1 during decoration.

[0014] As can be seen from the figures, the decorating machine of the invention comprises substantially a base 2 provided with a column 4 supporting a first heating plate 6 via a rack device (not shown in the figures) and operable vertically by a lever 8. A second heating plate 10 is provided in a position below the heating plate 6 to form a gap 12 with the overlying heating plate 6.

[0015] A support panel 16 comprising two pegs 20 on its upper surface is hinged to the base 2 about a pin 14 and is provided with an operating handle 18 for its insertion into the gap 12.

[0016] The invention also comprises a template 22 provided with two elliptical seats 24 provided on its edge with protuberances 26 the function of which is clarified hereinafter.

[0017] The template 22 is provided with holes 28 spaced apart by a distance corresponding to the distance between the pegs 20 of the panel 16 and comprises an operating handle 30.

[0018] The invention uses a sheet of sublimation paper 32 with a pre-creasing line 34 forming two portions 36, 36', each of which is provided with two pairs of holes 38 which, when the two portions face each other, are coaxial, their distance apart corresponding to the distance between the pegs 20.

[0019] One of the surfaces of the sheet 32 is provided with pairs of images 40 obtained by sublimation image printing techniques and positioned relative to the holes 38 in the same manner as the elliptical seats 24 are positioned relative to the holes 28 in the plate 22.

[0020] The plates 6 and 10 are protected by a protection grid 44.

[0021] At the rack there is also provided a screw adjustment system (not shown in the drawings) to define the position of a lower stop for the upper heating plate, in this position a switch being provided for activating the heating plates.

[0022] In using the decorating machine of the invention, the panel 16 is rotated about the pin 14 to position it outside the range of action of the plates 6 and 10, then the sheet is applied to it with the two portions 36, 36' at 180° apart by inserting the pegs 20 into the holes 38 of

the portion 36. The template 22 is then mounted on the portion 36 by inserting the pegs 20 into the holes 28, and the plaquettes 42 to be decorated, previously treated with a special coating, are inserted into the seats 24.

[0023] The portion 36' is then rotated through 180° so that the portions 36 and 36' face each other. Then after rotating the lever 18 to insert the panel 16 into the gap 12 the plate 6 is lowered by the lever 8, then as soon as the plate 6 interferes with the activation switch both the plates 6, 10 are heated.

[0024] As a result of the heating action of the plates 6 and 10 the images 40 impressed into the sheet 32 are transferred by sublimation onto both surfaces of the plaquettes 42, the ink also being transferred onto the plaquette edges by virtue of the presence of the protuberances 26 present on the edge of the seats 24 which create an empty annular space.

[0025] From the foregoing it is apparent that the decorating machine of the invention presents certain advantages, and in particular:

- it enables metal plaquettes such as key fobs, key heads etc. to be decorated in a personalized manner,
- it enables reliable centering,
- it enables the plaquette edges to be decorated,
- it is of high reliability during use,
- it enables plaquettes of different thickness to be decorated.

Claims

1. A machine for decorating metal plaquettes by sublimation comprising:

- a base (2),
- a substantially horizontal first heating plate (10), mounted on said base (2),
- a substantially horizontal second heating plate (6), mounted on said base (2) and vertically movable in respect to said first plate (10) between an upper and a lower position, in correspondence to which the two plates (6, 10) form a gap (12),
- a panel (16) movable horizontally between a position outside said gap (12) and a position housed inside said gap, a sheet (32) of sublimation paper and a template (22) removably securable to said panel (16), **characterized in that**
- the sheet (32) of sublimation paper presents a pre-creasing line (34) and carries impressed on each portion (36, 36'), separated by said pre-creasing line, at least one image (40) to be transferred onto plaquettes (42) to be decorated, the corresponding images, obtained on said portions (36, 36') of said sheet of paper, resulting to be facing one another when the sheet itself is completely folded along said pre-creasing line

(34), **in that** the machine further comprises

- reference means, consisting of a couple of pegs (20) extending from the upper surface of said panel (16), and spaced apart a distance equal to that of two holes (38) provided in end of the two portions (36, 36') of said sheet of paper and equal to that of two holes (28) provided in the template for the correct positioning on it of one (36) of the two portions of said sheet (32), as well as on the other (36') portion of the sheet, in the condition of being folded over the first one, whereby

- the template (22) is removably securable to said panel (16) in correspondence to the same reference means and provided with at least one seat (24) for housing the plaquette (42) to be decorated, said seat (24) resulting to be facing the corresponding images (40) obtained on the two portions (36, 36') of said sheet (32) when said template (22) is positioned in between them on the same reference means (20).

2. A machine according to claim 1 **characterized in that** said second plate (10) is associated with movement means in respect to said first plate (6), constituted by a rack operable by a lever (8).

3. A machine according to claim 2 **characterized in that** said movement means include a screw adjustment system for defining a lower stop for said second heating plate (10).

4. A machine according to claim 1 **characterized in that** said panel (16) is hinged to the base (2) about a pin (14).

5. A machine according to claim 4 **characterized in that** said panel (16) is provided with an operating handle (18) for its insertion into said gap (12).

6. A machine according to claim 1 **characterized in that** said seat (24) of said template (22) presents protuberances (26) on its edge.

7. A machine according to claim 1 **characterized in that** it comprises a protection grid (44) for the plates (6, 10).

Patentansprüche

1. Eine Maschine zum Dekorieren von Metallplaketten mit Hilfe von Sublimationsdruck, bestehend aus:

- einer Grundplatte (2),
- einer im wesentlichen horizontalen ersten Heizplatte (10), die auf die besagte Grundplatte (2) montiert ist,

- einer im wesentlichen horizontalen zweiten Heizplatte (6), die auf die besagte Grundplatte (2) montiert ist und die gegenüber der besagten ersten Platte (10) zwischen einer oberen und einer unteren Position auf der vertikalen Ebene bewegt werden kann, wodurch eine Lücke (12) zwischen den beiden Platten (6, 10) entsteht,
 - einer Platte (16), die sich horizontal zwischen einer Position außerhalb der besagten Lücke (12) und einer Position innerhalb der besagten Lücke bewegen kann,
 - [1] einem Blatt Sublimationspapier (32) und einer Vorlage (22), die abnehmbar an der besagten Platte (16) gesichert werden und sich **dadurch** auszeichnen, dass das Blatt (32) Sublimationspapier eine vorgefaltete Linie (34) umfasst und auf jeder Seite (36, 36'), getrennt durch die vorgefaltete Linie, mindestens ein eingepprägtes Bild (40) enthält, das auf die zu dekorierenden Plaketten (42) übertragen werden soll. Die entsprechenden Bilder, die auf den Seiten (36, 36') des besagten Blatt Papiers enthalten sind, stehen einander gegenüber, wenn das Blatt selbst entlang der vorgefalteten Linie (34) komplett gefaltet ist; des Weiteren besteht die Maschine aus
 - Referenzmarken, bestehend aus zwei Stiften (20), auf der Oberseite der besagten Platte (16), [2] in einem Abstand gleich dem zweier Löcher (38) auf beiden Seiten (36, 36') des besagten Blattes Papier und ebenso gleich dem Abstand zweier Löcher (28) in der Vorlage. Stifte und Löcher dienen der korrekten Positionierung auf der Platte von einer (36) der beiden Seiten des besagten Blatts (32), ebenso wie für die andere Seite (36'), sofern die zweite Seite über die erste Seite gefaltet wird. Hierbei wird die Vorlage (22) abnehmbar an der besagten Platte (16) gesichert, in Übereinstimmung mit der gleichen Referenzmarke, und mit mindestens einer Auflagefläche (24) versehen, um die zu dekorierende Plakette (42) aufzunehmen. Die besagte Auflagefläche (24) liegt den entsprechenden Bildern (40) auf den beiden Seiten (36, 36') des besagten Blattes (32) gegenüber, wenn die besagte Vorlage (22) zwischen ihnen auf den gleichen Referenzmarken positioniert wird.
2. Eine Maschine basierend auf Anspruch 1, **dadurch gekennzeichnet, dass** die besagte zweite Platte (10) mit Bewegungsmitteln gegenüber der ersten Platte (6) verbunden ist, die aus einem mit einem Hebel (8) steuerbaren Gestell bestehen.
 3. Eine Maschine basierend auf Anspruch 2, **dadurch gekennzeichnet, dass** die besagten Bewegungsmittel ein Schraubverstellsystem zum Definieren der Stoppposition der besagten zweiten Heizplatte um-

fassen (10).

4. Eine Maschine basierend auf Anspruch 1, **dadurch gekennzeichnet, dass** die besagte Platte (16) durch einen Stift (14) gelenkig an der Grundplatte (2) befestigt ist.
5. Eine Maschine basierend auf Anspruch 4, **dadurch gekennzeichnet, dass** die besagte Platte (16) mit einem Bediengriff (18) ausgestattet ist, um sie in die besagte Lücke (12) einzuführen.
6. Eine Maschine basierend auf Anspruch 1, **dadurch gekennzeichnet, dass** die besagte Auflagefläche (24) der besagten Vorlage (22) einen Vorsprung (26) an den Kanten aufweist.
7. Eine Maschine basierend auf Anspruch 1, **dadurch gekennzeichnet, dass** sie ein Schutzgitter (44) für die Platten (6, 10) umfasst.

Revendications

1. Machine de décoration de plaquettes métalliques par sublimation comprenant :
 - une base (2),
 - une première plaque chauffante (10) sensiblement horizontale, montée sur ladite base (2),
 - une deuxième plaque chauffante (6) sensiblement horizontale, montée sur ladite base (2) et mobile verticalement par rapport à ladite première plaque (10) entre une position supérieure et une position inférieure, ce qui permet aux deux plaques (6, 10) de former un espace (12),
 - un panneau (16) mobile horizontalement entre une position située à l'extérieur dudit espace (12) et une position logée dans ledit espace,
 - une feuille (32) de papier de sublimation et un gabarit qu'on peut fixer de manière amovible audit panneau (16), **caractérisée en ce que** la feuille (32) de papier de sublimation présente une ligne de pliage préalable et porte au moins une image (40) imprimée sur chaque partie (36, 36') et séparée par ladite ligne de pliage préalable, à transférer sur les plaquettes (42) à décorer, les images correspondantes, obtenues sur lesdites parties (36, 36') de ladite feuille de papier, se faisant finalement face quand la feuille elle-même est complètement pliée le long de ladite ligne (34) de pliage préalable, **en ce que** la machine comprend en outre
 - des moyens de référence, constitués d'un couple de chevilles (20) s'étendant à partir de la surface supérieure dudit panneau (16), et espacés d'une distance égale à celle de deux trous (38) aménagés dans chacune des deux parties

- (36, 36') de ladite feuille de papier, et égale à celle de deux trous (28) prévus dans le gabarit, pour le bon positionnement de celui-ci sur une (36) des deux parties de ladite feuille (32), ainsi que sur l'autre (36') partie de la feuille, à condition d'être pliée sur la première, moyennant quoi - le gabarit (22) peut être attaché de manière amovible audit panneau (16) en correspondance au même moyen de référence et est doté d'au moins un siège (24) permettant de loger la plaquette (42) à décorer, ledit siège (24) se retrouvant face aux images correspondantes (40) obtenues sur les deux parties (36, 36') de ladite feuille (32) quand ledit gabarit (22) est positionné entre elles sur les mêmes moyens (20) de référence.
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- 10
- 15
2. Machine selon la revendication 1, **caractérisée en ce que** ladite deuxième plaque (10) est associée au moyen de mouvement par rapport à ladite première plaque (6) constituée d'une crémaillère qu'on peut actionner par un levier (8).
- 20
3. Machine selon la revendication 2, **caractérisée en ce que** lesdits moyens de mouvement comprennent un système d'ajustement de vis permettant de définir une butée pour ladite deuxième plaque chauffante (10).
- 25
4. Machine selon la revendication 1, **caractérisée en ce que** ledit panneau (16) est articulé à la base (2) autour d'un axe (14).
- 30
5. Machine selon la revendication 4, **caractérisée en ce que** ledit panneau (16) est doté d'une poignée (18) de fonctionnement de fonctionnement (18) pour une insertion d'IP dans ledit espace (12).
- 35
6. Machine selon la revendication 1, **caractérisée en ce que** ledit siège (24) dudit gabarit (22) présente des protubérances (26) sur son bord.
- 40
7. Machine selon la revendication 1, **caractérisée en ce qu'elle** comprend une grille (44) de protection destinée aux plaques (6, 10).
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FIG. 1

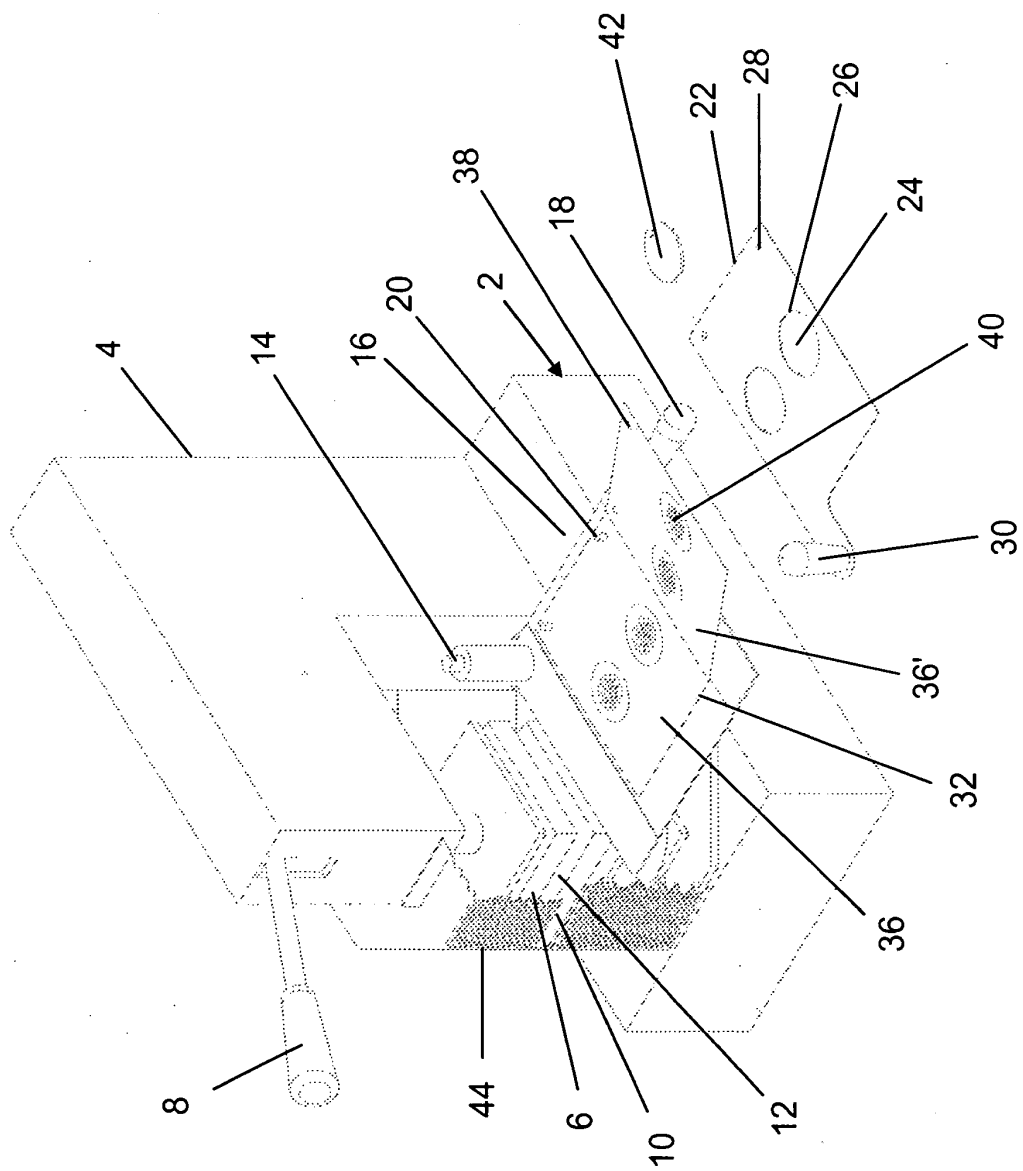


FIG. 2

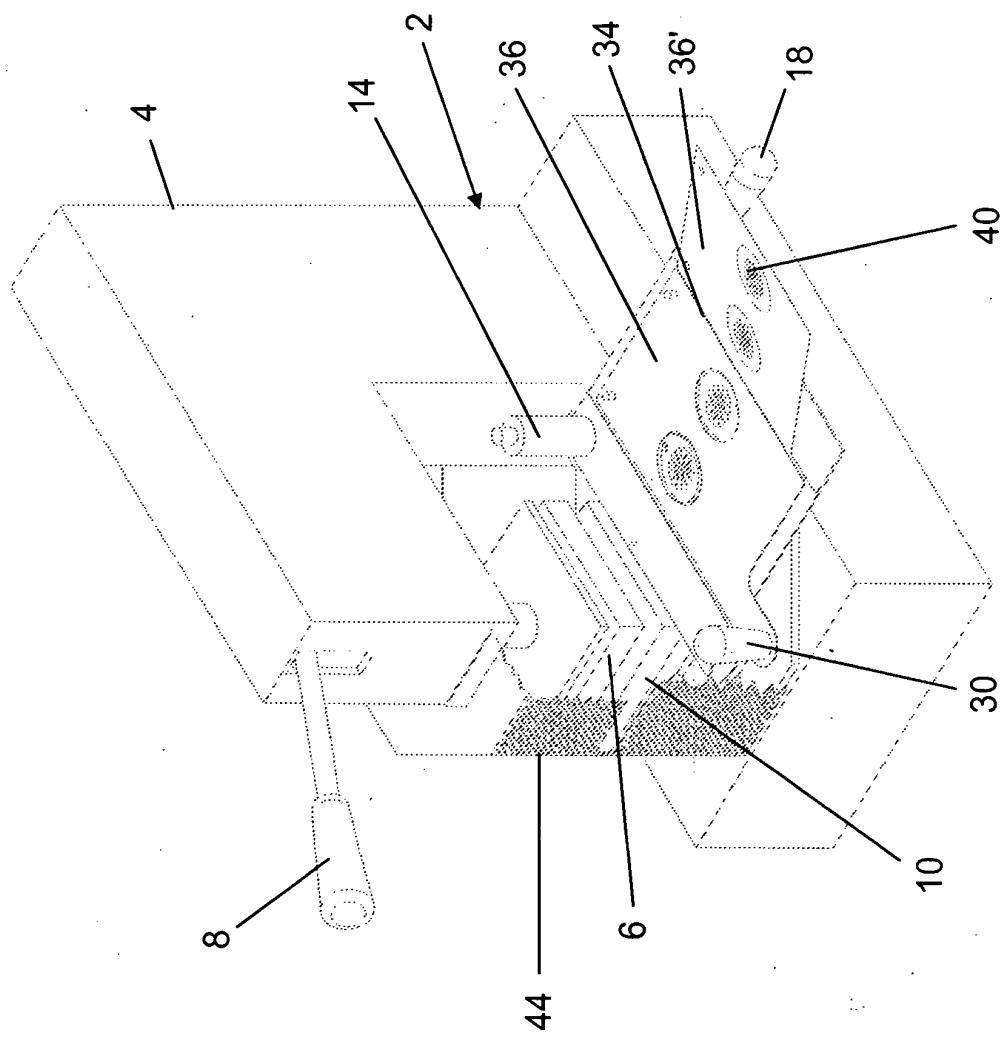
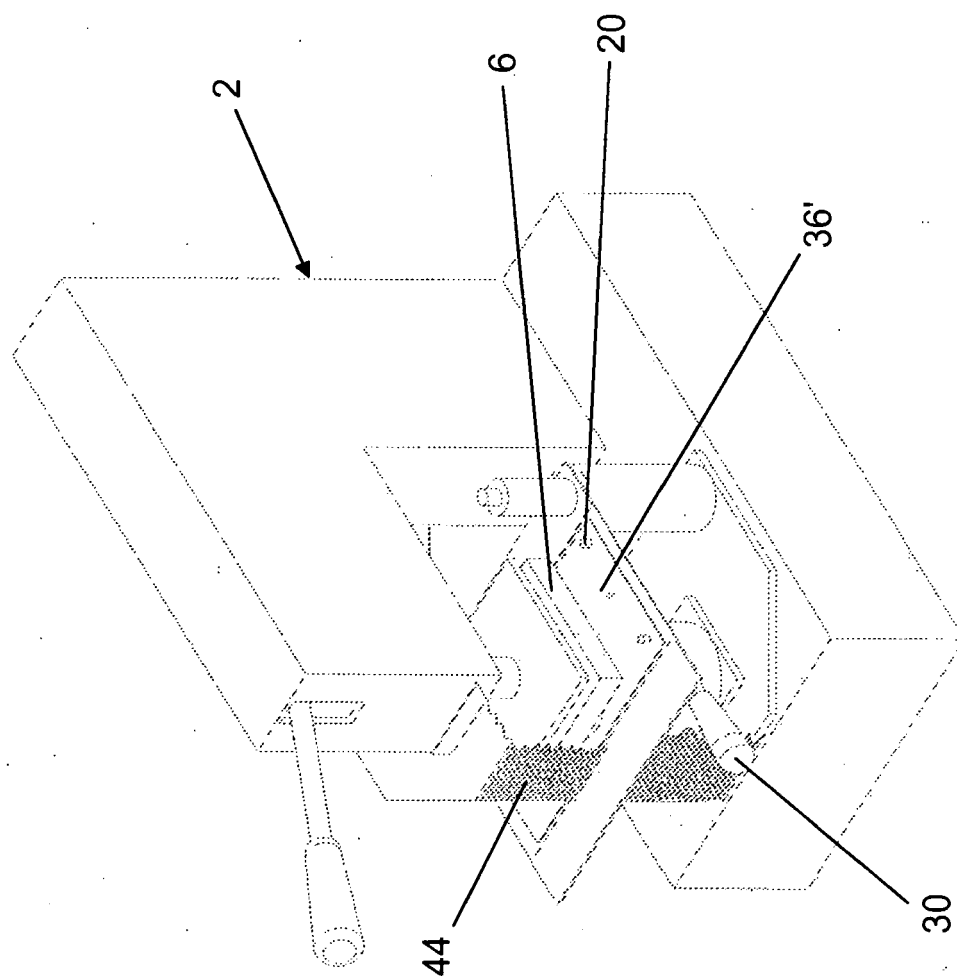


FIG. 3



REFERENCES CITED IN THE DESCRIPTION

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