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(54) **PAD PRINTING MACHINE**

TAMPONDRUCKMASCHINE

MACHINE POUR TAMPOGRAPHIE

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Description**OBJECT OF THE INVENTION**

[0001] The present invention relates to a pad printing machine which enables the rotary application of the pad printing onto objects, minimising the appearance of cuts in the continuity of the printing performed.

BACKGROUND OF THE INVENTION

[0002] Pad printing is a reproduction process that is performed by means of pad printing machines comprising a frame with a supporting element (flat, or cylindrical usually) wherein a metal or plastic image plate can be mounted, precisely where the image to be pad printed is engraved configuring a rotogravure. Ink is applied to this image plate by means of an inkwell, usually provided with a doctor blade, followed by a silicone pad or a pad made of similar material, usually cylindrical, that presses onto the engraving of the plate collecting the ink from the rotogravure and transferring it to the part to be pad printed. It is a highly used system for marking objects.

[0003] The image plates are usually made of photopolymer or steel, the photopolymer plates being more common since they are easier to create, even being internally developed, while those made of steel frequently require the intervention of specialised companies.

[0004] However, the results from the printing of current machines have cuts in the printing of objects with volume which require printing on several sides, such as for example platforms or soles of footwear. This implies a drawback that is remedied with the use of the pad printing machine of the invention

[0005] US 2009/120311 A1 discloses a roller pad printer for printing on an associated object, including a frame, a flat cliché operably mounted to the frame and a resilient roller pad operably mount to the frame for rolling contact, at a first location and in a first direction along the cliché, to receive ink transferred from the cliché. The roller pad is adapted for rolling contact with the object, at a second location and in a second direction, to transfer the ink from the roller pad to the object.

DESCRIPTION OF THE INVENTS

[0006] A pad printing machine according to the present invention as defined in claim 1 is provided.

[0007] Further preferred embodiments are defined in the dependent claims.

[0008] The pad printing machine of the invention has a configuration which enables a continuous application of the pad printing, minimising or directly preventing the appearance of any type of joint, cut or discontinuity in the printing performed. It is applicable to any object to be pad printed which has a volume, for example soles or platforms of footwear, bottles, toys, etc.

[0009] The machine is of the type comprising a frame

with a supporting element for an image plate, supporting element being understood as an element or support that enables the interchangeable assembly. It also comprises a rotary pad and an inkwell for inking the pad, which, according to the invention, further comprises a rotary support provided with rotary means for securing the object to be pad printed.

[0010] Thus, the combined rotary movement of the pad and the object to be pad printed is achieved, obtaining a printing that is continuous and with a minimal number of cuts in the printing on the three-dimensional outline of the object in the area in contact with the pad.

DESCRIPTION OF THE DRAWINGS

[0011]

Figure 1.- Shows a perspective view of the machine of the embodiment of the invention.

Figure 2.- Shows a side view of the machine of the embodiment of the invention.

Figure 3.- Shows a detailed view of the machine of the embodiment of the invention.

PREFERRED EMBODIMENT OF THE INVENTION

[0012] The pad printing machine (1) of the preferred embodiment of the invention is of the type that comprises: a frame (2) with a supporting element (3) -in this case a flat sheet- for an image plate (4) -made of photopolymer in this specific case-, a rotary pad (5) - a silicone roller in this case- and an inkwell (6) for inking the pad (5) the machine (1) of which, according to the embodiment of the invention, also comprises a rotary support (7) (see figs 1 and 2) provided with a rotary means for securing the object (8) to be pad printed.

[0013] The rotary support (7) comprises a rotation shaft (7a) parallel to the rotation shaft (5a) of the rotary pad (5), which is cylindrical, such that a cylindrical printing is performed. Alternatively, although it is not shown in the figures, the rotation shaft (7a) of the rotary support (7) can be not parallel to the rotation shaft (5a) of the rotary pad (5), such that printing of other shapes may be performed, adapted to the contour of the object (8) (for example conical if the shafts are convergent and the pad (5) is conical). Furthermore, it has been envisaged that the rotary support (7) preferably comprises a last (9) for securing the object (8) to be pad printed in order to improve the securing thereof.

[0014] The rotary support (7) is mounted in the frame (2) through collapsible means over the actuation area of the pad (5). Specifically, in the example shown in the figures, the rotary support (7) comprises arms (11) facing each other and a joint (12) for attaching to the frame (2) in order to enable the collapsing thereof, the collapsible means linking the rotary support (7) and the frame (2). Two semi shafts (14, 14a) (see fig 1) for securing the object (8) are arranged in said arms (11) (in this case

through the last (9)), at least one of which comprises a rotary actuation (15). This configuration is simple, since it only requires two support points for the object (both semi shafts) and the collapsing joint (12). The rotary actuation (15) ideally comprises a first motor (15a) and a first belt (15b), also being a simple configuration. In turn, the collapsible means comprise, in this non-limiting example of the embodiment of the invention, cylinders (10), pneumatic and/or hydraulic, which enables a suitable actuation speed.

[0015] The supporting element (3) for the image plate (4) in this example comprises a flat sheet (16) (see fig 3) which is mounted in a carriage (17) provided with back-and-forth linear actuation means along guides (25) in the actuation area of the inkwell (6) (underneath it). Said back-and-forth linear actuation means comprise a second motor (18) and a second belt (23) (see fig 2). This configuration facilitates the changing of the image plate (4) with respect to cylindrical supporting elements, and a better inking.

[0016] The inkwell (6) is preferably arranged in a fixed support (19) on the carriage (17) which carries the sheet (16) of the supporting element (3) of the image plate (4), such that it starts to prime the image plate (4) with the back-and-forth movement of the carriage (17). This causes the ink to be deposited by gravity.

[0017] The arrangement of a cleaning roller (20) for the pad (5) has also been envisaged in the machine (1) (see fig 1 and 3). Said cleaning roller (20) is made of drying material and is in contact with the pad (5) following from the application area of the printing in order to dry the paint residues after the printing and before the next inking. The pad (5) and/or the cleaning roller (20) are mounted in the frame through adjustable sliders (21) (see fig 3) in order to precisely adjust the position and contact pressure thereof during the operations through linear actuators (22).

[0018] The machine is complemented by an obvious electronic and/or electromechanical controller, not shown, which controls the operations of the different elements.

Claims

1. A pad printing machine (1), of the type comprising a frame (2) including a supporting element (3) for an image plate (4), a rotary pad (5), and an inkwell (6) for inking the pad (5); wherein comprises a rotary support (7) provided with rotary means for securing an object (8) to be pad printed, **characterised in that** the rotary support (7) is mounted in the frame (2) through collapsible means over an actuation area of the pad (5) wherein the rotary support (7) comprises arms (11) facing each other and a joint (12) for attaching to the frame (2) for collapsing, the collapsible means linking the rotary support (7) and the frame (2); comprising in said arms (11) two semi

shafts (14, 14a) for securing the object (8), at least one of which comprises a rotary actuation (15).

2. The pad printing machine (1) according to claim 1 **characterised in that** the supporting element (3) comprises a flat sheet (16).
3. The pad printing machine (1) according to any of the preceding claims **characterised in that** the rotary support (7) comprises a rotation shaft (7a) parallel to a rotation shaft (5a) of the rotary pad, said pad (5) being cylindrical rotary.
4. The pad printing machine (1) according to any of claims 1 or 2 **characterised in that** the rotary support (7) comprises a rotation shaft (7a) not parallel to a rotation shaft (5a) of the rotary pad, said pad (5) being cylindrical rotary.
5. The pad printing machine (1) according to any of the preceding claims **characterised in that** the rotary support (7) comprises a last (9) for fastening the object (8) to be pad printed.
6. The pad printing machine (1) according to claim 1 **characterised in that** the rotary actuation (15) comprises a first motor (15a) and a first belt (15b).
7. The pad printing machine (1) according to claim 6 **characterised in that** the collapsible means comprise pneumatic and/or hydraulic cylinders (10).
8. The pad printing machine (1) according to any of the preceding claims **characterised in that** the supporting element (3) for the image plate (4) comprises a flat sheet (16) that is mounted in a carriage (17) provided with back-and-forth linear actuation means in an actuation area of the inkwell (6).
9. The pad printing machine (1) according to claim 8 **characterised in that** the back-and-forth linear actuation means comprise a second motor (18) and a second belt (23).
10. The pad printing machine (1) according to any of claims 8 or 9 **characterised in that** the inkwell (6) is arranged in a fixed support (19) over the carriage (17) which carries the sheet (16) of the supporting element (3) of the image plate (4).
11. The pad printing machine (1) according to any of the preceding claims **characterised in that** it comprises a cleaning roller (20) for the pad (5).
12. The pad printing machine (1) according to claim 11 **characterised in that** the pad (5) and/or the cleaning roller (20) are mounted in the frame through adjustable sliders (21) and linear actuators (22).

Patentansprüche

1. Tampondruckmaschine (1) des Typs, der ein Gestell (2) umfasst, das ein Stützelement (3) für eine Bildplatte (4), einen Drehtampon (5) und ein Farbreservoir (6) zur Farbübertragung auf den Tampon (5) beinhaltet, wobei eine Drehstütze (7) umfasst ist, die mit Drehmitteln zum Sichern eines Objektes (8), das einem Tampondruck unterzogen werden soll, versehen ist,
dadurch gekennzeichnet, dass die Drehstütze (7) in dem Gestell (2) durch zusammenklappbare Mittel über einer Antriebszone des Tampons (5) montiert ist, wobei die Drehstütze (7) zueinander weisende Arme (11) und einen Anschluss (12) zur Anbringung an dem Gestell (2) zum Zusammenklappen umfasst, wobei die zusammenklappbaren Mittel die Drehstütze (7) und das Gestell (2) verbinden und wobei in den Armen (11) zwei Halbwellen (14, 14a) zum Sichern des Objektes (8) umfasst sind, von denen wenigstens eine einen Drehantrieb (15) umfasst.
2. Tampondruckmaschine (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Stützelement (3) eine flache Platte (16) umfasst.
3. Tampondruckmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Drehstütze (7) eine Drehwelle (7a) umfasst, die parallel zu einer Drehwelle (5a) des Drehtampons ist, wobei der Tampon (5) drehzylindrisch ist.
4. Tampondruckmaschine (1) nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** die Drehstütze (7) eine Drehwelle umfasst (7a) umfasst, die nicht parallel zu einer Drehwelle (5a) des Drehtampons ist, wobei der Tampon (5) drehzylindrisch ist.
5. Tampondruckmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Drehstütze (7) einen Leisten (9) zum Befestigen des Objektes (8), das einem Tampondruck unterzogen werden soll, umfasst.
6. Tampondruckmaschine (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Drehantrieb (15) einen ersten Motor (15a) und einen ersten Riemen (15b) umfasst.
7. Tampondruckmaschine (1) nach Anspruch 6, **dadurch gekennzeichnet, dass** die zusammenklappbaren Mittel pneumatische und/oder hydraulische Zylinder (10) umfassen.
8. Tampondruckmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet,**

dass das Stützelement (3) für die Bildplatte (4) eine flache Platte (16) umfasst, die in einem Schlitten (17) montiert ist, der mit Rückwärts-Vorwärts-Linearantriebsmitteln in einer Antriebszone des Farbreservoirs (6) versehen ist.

9. Tampondruckmaschine (1) nach Anspruch 8, **dadurch gekennzeichnet, dass** die Rückwärts-Vorwärts-Linearantriebsmittel einen zweiten Motor (18) und einen zweiten Riemen (23) umfassen.
10. Tampondruckmaschine (1) nach einem der Ansprüche 8 oder 9, **dadurch gekennzeichnet, dass** das Farbreservoir (6) in einer festen Stütze (19) über dem Schlitten (17) angeordnet ist, der die Platte (16) des Stützelementes (3) der Bildplatte (4) trägt.
11. Tampondruckmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** eine Reinigungswalze (20) für den Tampon (5) umfasst ist.
12. Tampondruckmaschine (1) nach Anspruch 11, **dadurch gekennzeichnet, dass** der Tampon (5) und/oder die Reinigungswalze (20) in dem Gestell durch einstellbare Gleiter (21) und Linearantriebe (22) montiert sind.

Revendications

1. Machine pour impression en tampographie (1) du type comprenant un bâti (2) comprenant un élément de support (3) pour une plaque d'image (4), un tampon rotatif (5) et un encrier (6) pour encrer le tampon (5) ; dans laquelle elle comprend un support rotatif (7) prévu avec des moyens rotatifs pour fixer un objet (8) à tamponner, **caractérisée en ce que** : le support rotatif (7) est monté dans le bâti (2) par le biais de moyens pliables sur une zone d'actionnement du tampon (5), dans laquelle le support rotatif (7) comprend des bras (11) se faisant face et un joint (12) pour se fixer au bâti (2) pour le pliage, les moyens pliables reliant le support rotatif (7) et le bâti (2) ; comprenant, dans lesdits bras (11), deux demi-arbres (14, 14a) pour fixer l'objet (8), dont au moins l'un comprend un actionnement rotatif (15).
2. Machine pour impression en tampographie (1) selon la revendication 1, **caractérisée en ce que** l'élément de support (3) comprend une feuille plate (16).
3. Machine pour impression en tampographie (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le support rotatif (7) comprend un arbre de rotation (7a) parallèle à un arbre de rotation (5a) du tampon rotatif, ledit tampon (5) étant rotatif cylindrique.

4. Machine pour impression en tampographie (1) selon l'une quelconque des revendications 1 ou 2, **caractérisée en ce que** le support rotatif (7) comprend un arbre de rotation (7a) non parallèle à un arbre de rotation (5a) du tampon rotatif, ledit tampon (5) étant rotatif cylindrique. 5
5. Machine pour impression en tampographie (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le support rotatif (7) comprend une forme (9) pour fixer l'objet (8) à tamponner. 10
6. Machine pour impression en tampographie (1) selon la revendication 1, **caractérisée en ce que** l'actionnement rotatif (15) comprend un premier moteur (15a) et une première courroie (15b). 15
7. Machine pour impression en tampographie (1) selon la revendication 6, **caractérisée en ce que** les moyens pliables comprennent des cylindres pneumatiques et/ou hydrauliques (10). 20
8. Machine pour impression en tampographie (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** l'élément de support (3) pour la plaque d'image (4) comprend une feuille plate (16) qui est montée dans un chariot (17) prévu avec des moyens d'actionnement d'avant en arrière dans une zone d'actionnement de l'encrier (6). 25
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9. Machine pour impression en tampographie (1) selon la revendication 8, **caractérisée en ce que** les moyens d'actionnement d'avant en arrière comprennent un second moteur (18) et une seconde courroie (23). 35
10. Machine pour impression en tampographie (1) selon l'une quelconque des revendications 8 ou 9, **caractérisée en ce que** l'encrier (6) est agencé dans un support fixe (19) sur le chariot (17) qui transporte la feuille (16) de l'élément de support (3) de la plaque d'image (4). 40
11. Machine pour impression en tampographie (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'**elle comprend un rouleau de nettoyage (20) pour le tampon (5). 45
12. Machine pour impression en tampographie (1) selon la revendication 11, **caractérisée en ce que** le tampon (5) et/ou le rouleau de nettoyage (20) est/sont monté(s) dans le bâti par le biais de glissières (21) ajustables et d'actionneurs linéaires (22). 50
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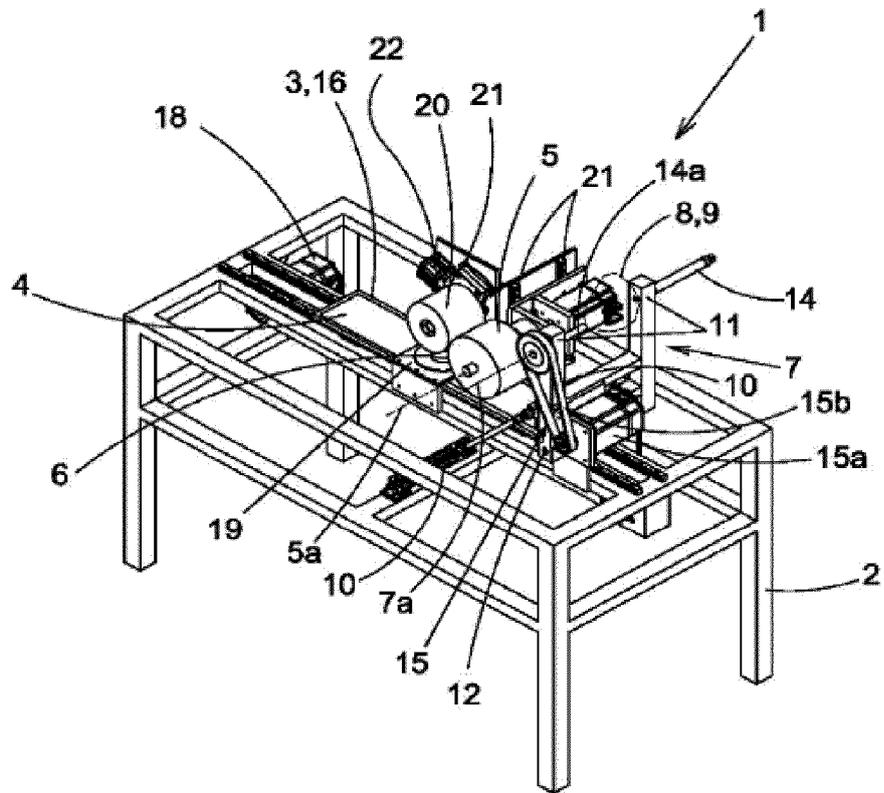


Fig 1

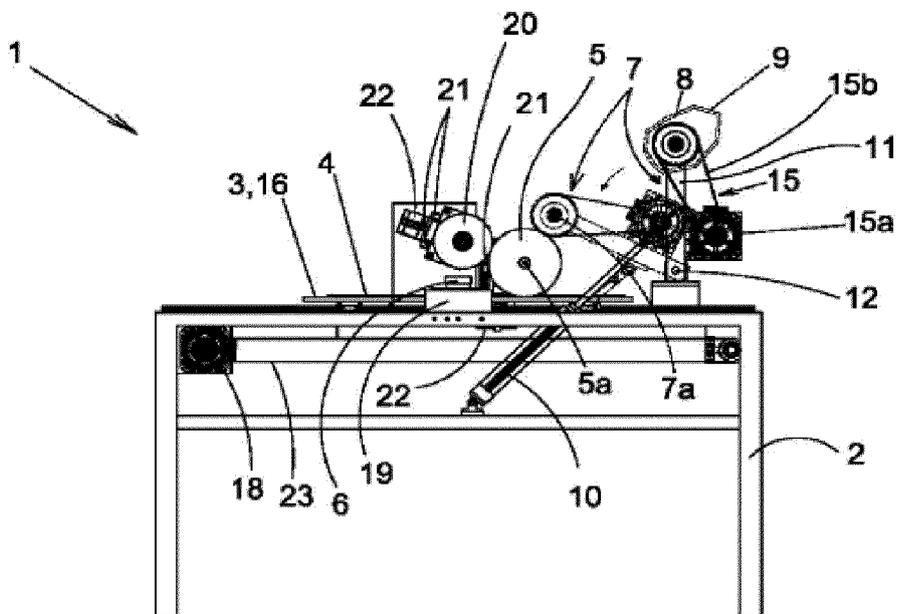


Fig 2

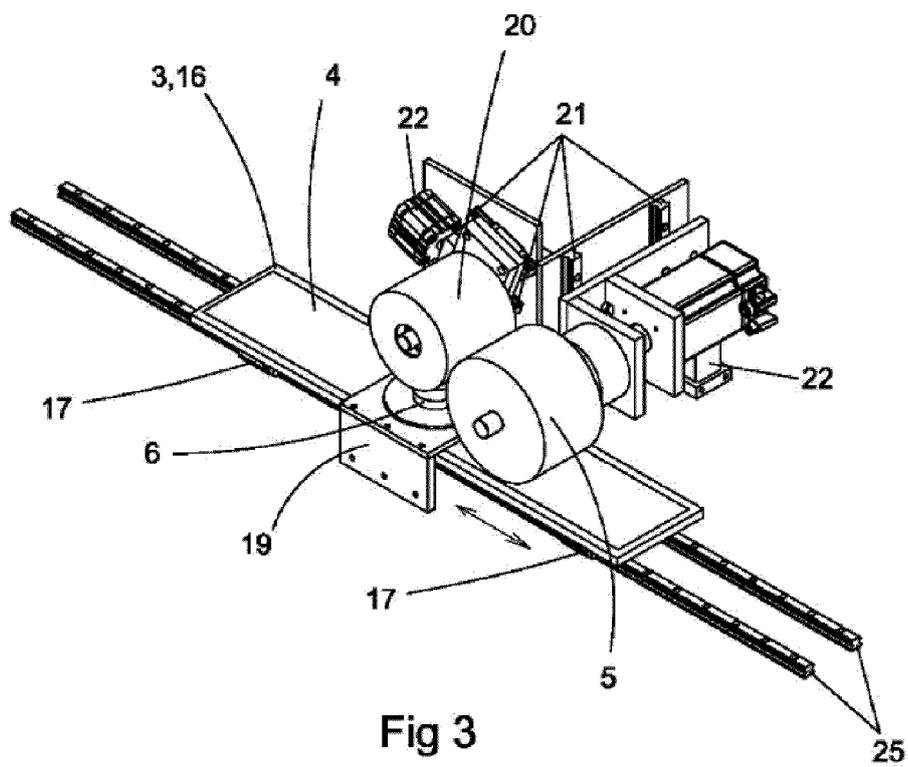


Fig 3

REFERENCES CITED IN THE DESCRIPTION

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