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

(11) EP 2 218 574 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.08.2010 Bulletin 2010/33

(21) Application number: **09425050.3**

(22) Date of filing: **12.02.2009**

(51) Int Cl.:
B30B 1/10 *(2006.01)* ***B41F 16/02*** *(2006.01)*
B65C 5/00 *(2006.01)* ***B65C 9/36*** *(2006.01)*

(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 MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

(71) Applicant: **Transmatic S.R.L.**
20020 Lazzate (MI) (IT)

(72) Inventor: **Albanese, Pietro**
20020 Lazzate (MI) (IT)

(74) Representative: **Leone, Mario et al**
Studio Associato Leone & Spadaro
Viale Europa, 15
00144 Roma (IT)

(54) Heat transfer press

(57) A press (1) for heat transfer comprising a lower plate (7) and an upper plate (9) horizontally disposed, allows to house even a small sized motor above the arm (2) supporting the upper plate, with the possibility of multiplying the force exerted from the motor through the leverage, wherein the motor (12) is rotatably articulated to an arm (2) distal portion and provided with an operating stem (13) reciprocating in a a direction substantially concordant to the arm (2) one, operating on a leverage (10, 18) connected to a proximal portion of said arm (2) for exerting a predetermined pressure on said upper plate (9).

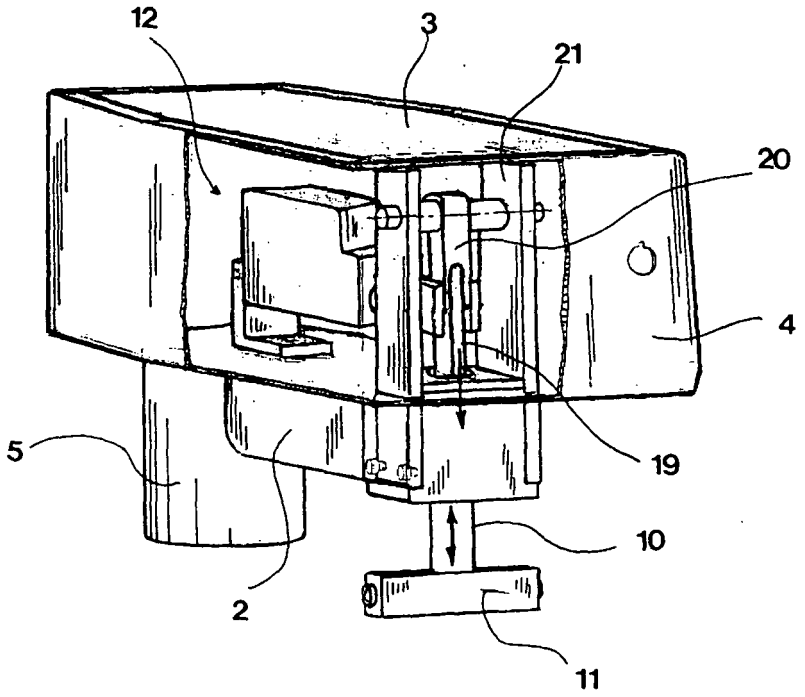


FIG.3

EP 2 218 574 A1

Description

[0001] The present invention is directed to a heat transfer press, of the type used to print or transfer images by applying pressure and heat from a media to a fabric, or to another receiving surface.

[0002] A typical example of use can be found in images printing on T-shirts or other garments. Such printing could take place in a specialized workroom or even directly in a retail shop, in order to personalized the garment according to the client's instructions.

[0003] Another example of use is related to the printing of images, writings or number on T-shirt for playing sports, where single players are thus identified by the T-shirt they are wearing. Therefore, the printing could also be related to sponsorships, personalized writings and so on.

[0004] The term images will refer either to the ones transferred from a decalcomania media or the like, or even to images on a media thermally glued on the final surface. Moreover, it is intended that the application is not limited to the textile field but could also concern other type of surfaces.

[0005] In presses normally used for the above mentioned objects, it is normally programmed a timed cycle during which pressure is exerted at a temperature. The media comprising the image and the receiving surface are placed on a lower plate onto which an upper plate operates, providing said preset pressure. The press upper plate or both the plates could be heated, e.g. by means of thermistors, for assuring the processes the correct temperature.

[0006] The two plates are placed horizontally, and the upper plate is supported by a substantially horizontal arm, that could be movable, in particular rotatable, for moving away and nearer the upper plate relative to the lower one. Alternatively, the lower plate could be movable.

[0007] In some simplified devices the pressure is manually provided, by means of a leverage. Alternatively, a pneumatic or oleodynamic system is commonly used to exert pressure.

[0008] Nevertheless, both systems are not completely satisfactory. The first one requires a remarkable strength to the operator, and the applied pressure is not constant from case to case.

[0009] In the second case, the press requires a compressor or a pump for providing the required pressure, which are bulky devices, not easily manageable and expensive, also in terms of power consumption.

[0010] The technical problem underlying the present invention is to provide a heat transfer press allowing to overcome the above-mentioned drawbacks. Such problem is solved by a press as mentioned above, **characterized in that** it comprises, at said arm, a motor rotatably articulated to an arm distal portion and provided with an operating stem reciprocating in a direction substantially concordant to the arm one, operating on a leverage connected to a proximal portion of said arm, for exerting a predetermined pressure on said upper plate.

[0011] The main advantage of the press according to the present invention consists in allowing to house even a small sized motor above the arm, with the possibility of multiplying the force exerted from the motor through the leverage, e.g. with a toggle arrangement.

[0012] Accordingly, it is not required an high power motor. Thus, it possible to use an electric motor.

[0013] The present invention will be hereby described according to a preferred exemplificative embodiment thereof, given by way of a non-limiting example, with reference to the annexed figures, wherein:

- figure 1A shows a sectional perspective view of the arm of a press according to the present invention, in a first operative configuration;
- figure 1B shows a sectional perspective view of the arm of figure 1A, in a second operative configuration;
- figure 2 shows an enlarged side perspective view of the arm of figure 1A;
- figure 3 shows an enlarged front perspective view of the arm of figure 1A; and
- figure 4A, 4B and 4C show perspective views of three different exemplificative embodiments of the press according to the present invention, comprising an arm as shown in the previous figures.

[0014] With reference to the figures, a heat transfer press is overall shown with the reference number 1, and an upper arm thereof, comprising the press drive motor which will be shown in the following, is overall shown with the reference number 2 and it represents substantially the press 1 upper portion.

[0015] A casing 3, housing said drive motor, is located above the arm 2, having a front portion 4 where display and operating controls are provided.

[0016] The arm 2 projects substantially horizontally from a upright 5. In an exemplificative embodiment of the press 1, the joint between arm 2 and upright 5 could be formed by a hinge, so as to allow the rotation of the arm 2 on a substantially horizontal plane.

[0017] Said upright 5 is supported by support base 6 which is in turn supported by a press 1 lower plate 7.

[0018] With reference to figure 4A, such lower plate 7 is horizontally movable according to a substantially drawing-like arrangement. Accordingly, the lower plate 7 could be pulled out for allowing to place a print media, and subsequently retracted in an operative position. In this example, the arm 2 is fixed.

[0019] With reference to figure 4B, the support base 6 holds two sided lower plates 7' and 7", and the arm 2 can rotate for alternatively hanging over the former or the latter, allowing to place a print media on the lower plate

unconstrained from the arm which is then rotated in an operative position.

[0020] With reference to figure 4C, the support base 6 holds a single lower plate 7, and the arm 2 can be rotated away therefrom, for allowing to place a print media on the lower plate 7, and then approached back, in an operative position.

[0021] The arm 2 can be manually rotated by means of apposite handles 8 on the casing 3. With this regard, limit stops will be provided (not shown) so that the arm 2 assumes a correct operative position.

[0022] The arm 2 comprises a distal or rear portion, i.e. next to the upright 5, and a proximal or end portion, in correspondence of which the press 1 comprises a vertically movable upper plate 9, apt to exert pressure on the lower plate 7 during the printing step.

[0023] The upper plate 9 is heated by means of appropriate thermistors (not shown) held in its thickness and electrically supplied.

[0024] It is held hanging by a supporting stem 10 provided with a fixing bracket 11 for fixing it on the plate 9. The supporting stem 10 is operated to a vertical reciprocating motion according to a way that will be detailed in the following.

[0025] Above the arm 2, the press 1 comprises an actuating motor 12 which, in the present exemplificative embodiment, includes a driving rotating pinion gear portion (not shown) and an operating stem 13 projecting from a housing 14 containing the other parts.

[0026] The driving rotating portion is substantially formed by an electric motor, conventionally supplied, so as to be able to reverse the rotation.

[0027] The operating stem 13 could be of the rack type or could be formed by a worm gear, with a not shown appropriate thread engaged in the rack.

[0028] The actuating motor 12 is substantially articulated to the arm distal portion 2, in correspondence to a hinge 15, so as to be rotatable relative to the arm 2.

[0029] In its turn, the operating stem 13 has a projecting end 16 comprising an articulating element 17. The connection between the articulating element 17 and the projecting end 16 is realized by a not shown bearing, in the case of the stem 13 is formed by a rotating shaft.

[0030] At the arm 2 proximal end, the press comprises a leverage 18 connected to a said supporting stem 10.

[0031] In the present example, the leverage 18 is formed by a toggle lever, comprising a first lever element 19, articulated to said supporting stem 10, and a second lever element 20, articulated on an arm 2 fixed element 21, placed on the vertical of the supporting stem and of the upper plate 9 center.

[0032] The articulating element is rotatably connected to the articulated joint between said lever elements 19, 20 so that the force transmitted by the operating stem 12 is multiplied by the leverage 18 on the upper plate 9.

[0033] In this way, the motor 12 could operate the upper plate 9, lifting it or lowering it, allowing the latter to exert a predetermined pressure on the lower plate 7 and on the print media.

[0034] Moreover, by means of the hinge 15, the motor 12 and its housing 14 could rotate for following the motion of the articulating element 17 joining the motor 12 to the leverage 18.

[0035] This drive motor system is supported on the arm 2 upper face and thus it can be rotated together with it in the embodiments of figures 4B and 4C. It is intended that the so-realized press does not comprise further external driving elements, but only electrical connections to supply the motor 12 and the thermistors on the upper plate 9.

[0036] In this way, once the print media and the respective image are disposed on the lower plate 7, the operator can conjugate the plates 7, 9 and begin the printing cycle, re-setting temperature, cycle timing and, in case, pressure to be exerted.

[0037] The latter is influenced by the print media thickness, but it could be accordingly controlled by adjusting the stroke of the operating stem 13.

[0038] It is intended that, when a predetermined pressure is attained, the motor effort could be electronically detected, so that the pressure exerted by the press is independent to print media thickness.

[0039] To the above-described heat transfer presses, a person skilled in the art, in order to satisfy further and contingent needs, could effect several further modifications and variants, all however encompassed in the protective scope of the present invention, as defined by the appended claims.

Claims

1. A press (1) for heat transfer comprising a horizontally disposed lower plate (7) and upper plate (9), the upper plate (9) being supported by a substantially horizontal arm (2), **characterized in that** it comprises, at said arm (2), a motor (12) rotatably articulated to an arm (2) distal portion and provided with an operating stem (13) reciprocating in a a direction substantially concordant to the arm (2) one, operating on a leverage (10, 18) connected to a proximal portion of said arm (2) for exerting a predetermined pressure on said upper plate (9).

2. The press (1) according to claim 1, wherein the motor (12) includes a driving rotating portion, a rack and said operating stem (13).

3. The press (1) according to claim 2, wherein said driving rotating portion is substantially formed by an electric motor conventionally supplied so as to be able to reverse the rotation.

4. The press (1) according to any of the preceding claims, wherein the operating stem (13) has a projecting end (16) comprising an articulating element (17) and a bearing, said operating stem (13) being

formed by a rotating shaft.

5. The press (1) according to any of the preceding claims, wherein the leverage comprises a toggle lever (18) having a first lever element (19), articulated to a supporting stem (10) of the upper plate (9), and a second lever element (20), articulated to a fixed element (21) of the arm (2) above the upper plate (9).

6. The press (1) according to any of the preceding claims, wherein the motor (12) is supported on the upper face of the arm (2).

7. The press (1) according to any of the preceding claims, wherein the pressure to be exerted is controlled by adjusting the stroke of the operating stem (13).

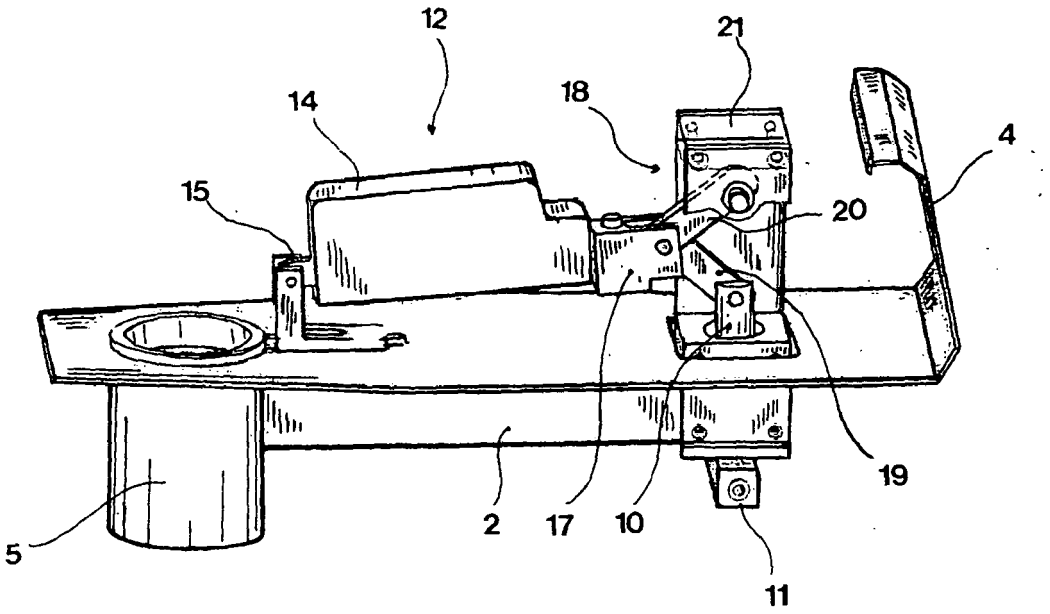


FIG.1A

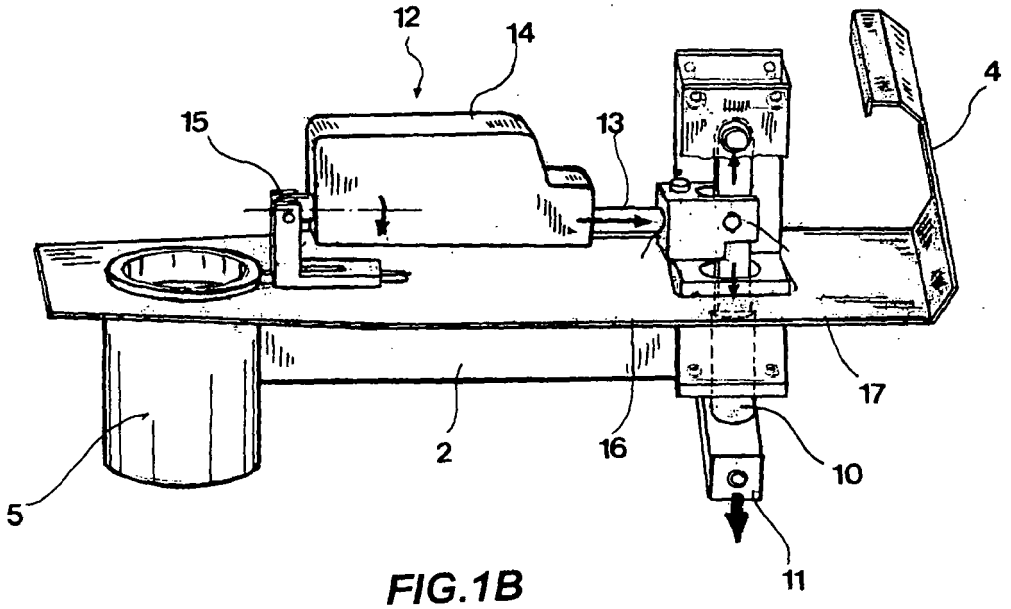


FIG.1B

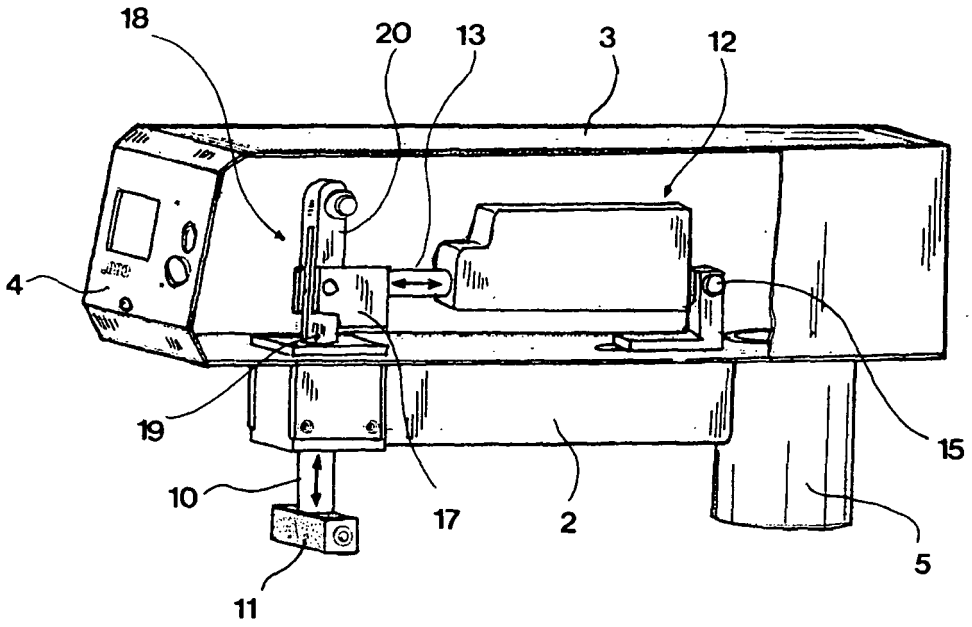


FIG.2

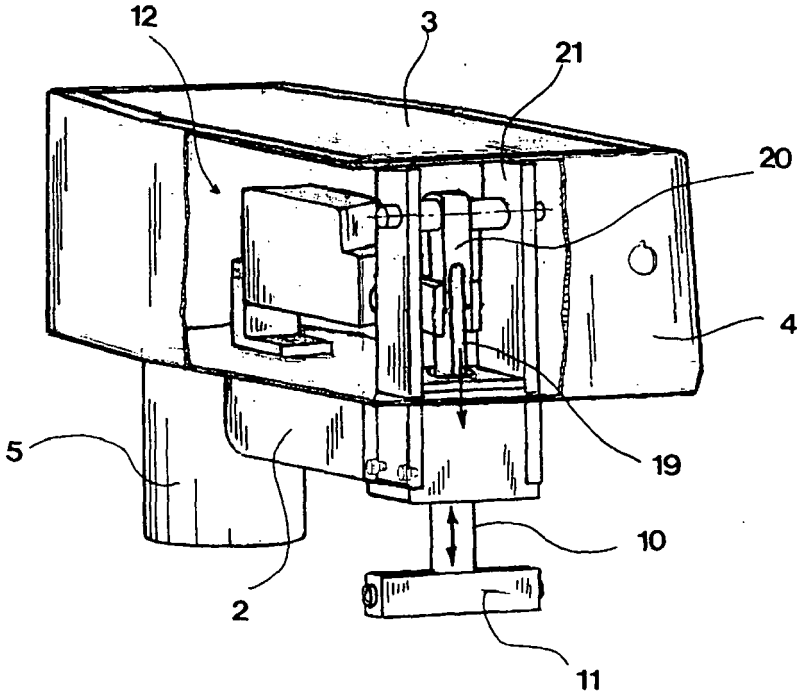


FIG.3

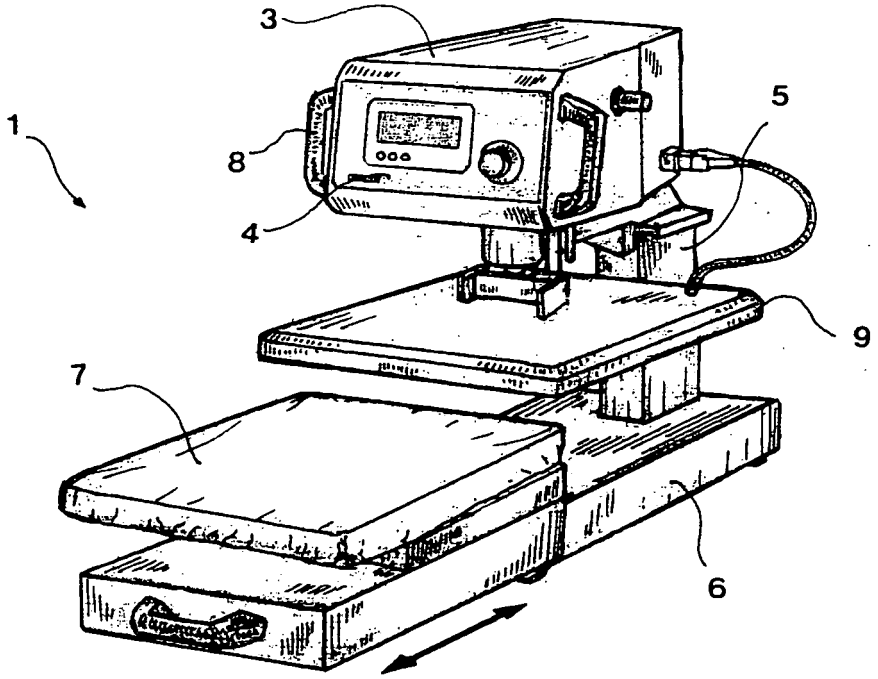


FIG.4A

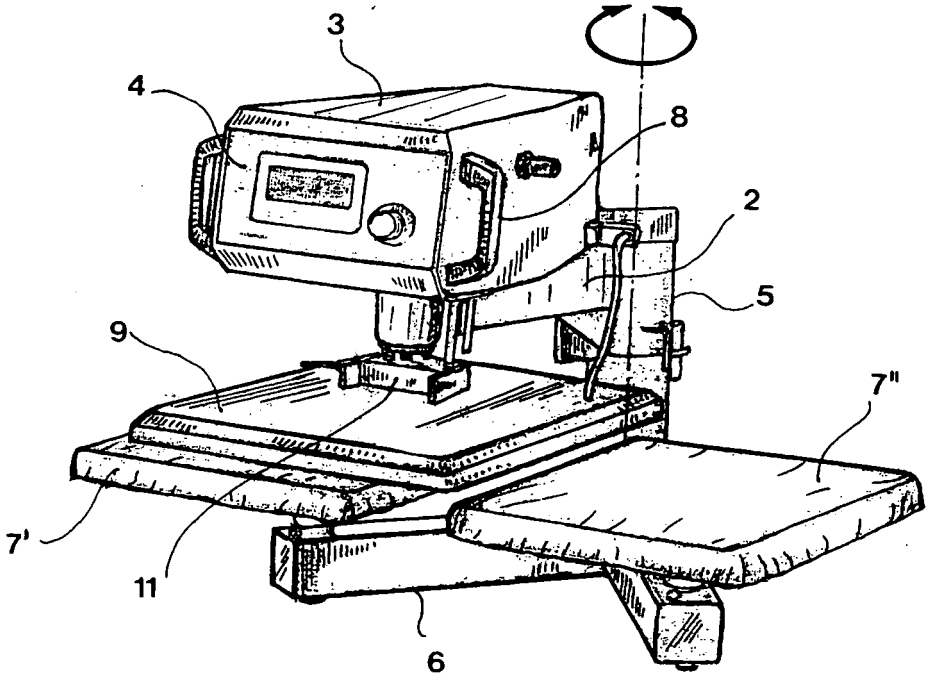


FIG.4B

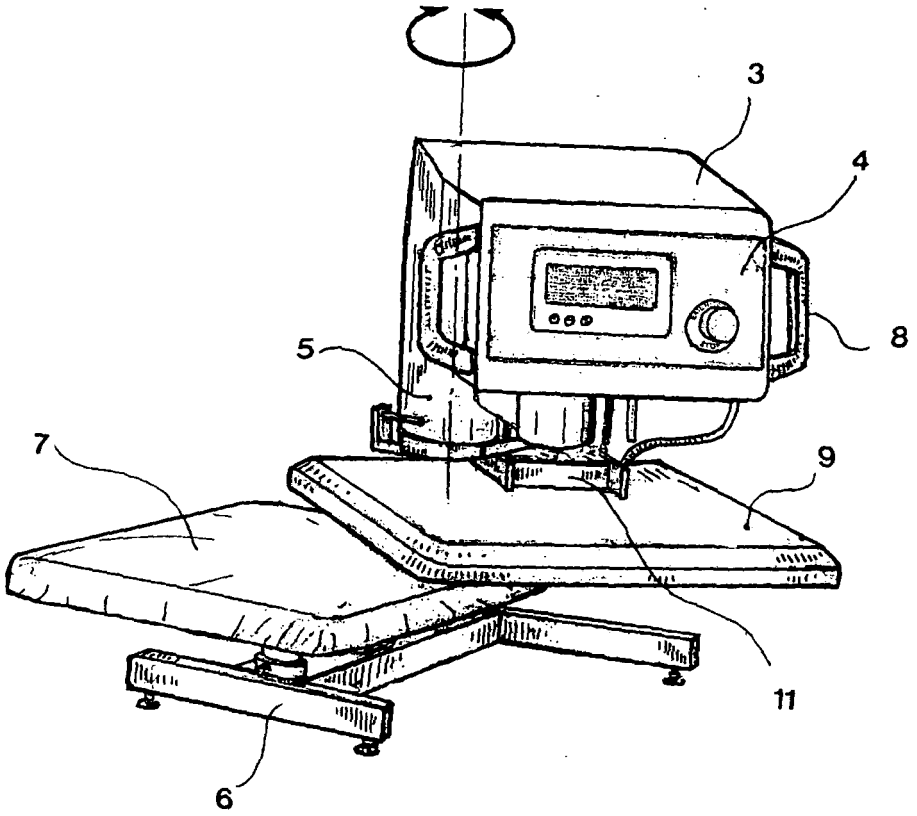


FIG.4C

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 42 5050

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 473 365 A (SCHWARTZBACH MORTON) 21 October 1969 (1969-10-21) * column 2, line 32 - column 3, line 22; claims; figures * -----	1-7	INV. B30B1/10 B41F16/02 B65C5/00 B65C9/36
X	US 2 318 814 A (STRONG GEORGE F) 11 May 1943 (1943-05-11) * claims; figures * -----	1-7	
X	GB 709 443 A (SETRIGHT REGISTERS LTD) 26 May 1954 (1954-05-26) * page 2, left-hand column, line 16 - line 50; claims; figures * -----	1-7	
X	JP 07 195197 A (CHICHIBU FUJI KK) 1 August 1995 (1995-08-01) * abstract; figures * -----	1-7	
A	GB 513 437 A (MARKS SPENCER LTD; JACK ARTHUR SHENFIELD) 12 October 1939 (1939-10-12) -----	1-6	
			TECHNICAL FIELDS SEARCHED (IPC)
A	DE 100 59 635 A1 (FRITZ MASCHB GMBH [DE]) 6 June 2002 (2002-06-06) * figures * -----	2,3	B30B B41F B65C
A	US 2 757 266 A (MANWARING JOSHUA G D) 31 July 1956 (1956-07-31) * figures * -----	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	9 July 2009	Baradat, Jean-Luc

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)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 42 5050

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-07-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3473365 A	21-10-1969	NONE	
US 2318814 A	11-05-1943	NONE	
GB 709443 A	26-05-1954	FR 1060393 A	01-04-1954
JP 7195197 A	01-08-1995	NONE	
GB 513437 A	12-10-1939	NONE	
DE 10059635 A1	06-06-2002	NONE	
US 2757266 A	31-07-1956	NONE	

EPO FORM P0459

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