



(51) International Patent Classification:

B41F 13/20 (2006.01) B41F 27/10 (2006.01)

(21) International Application Number:

PCT/EP2017/025145

(22) International Filing Date:

24 May 2017 (24.05.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

20 2016 102 778.0

25 May 2016 (25.05.2016)

DE

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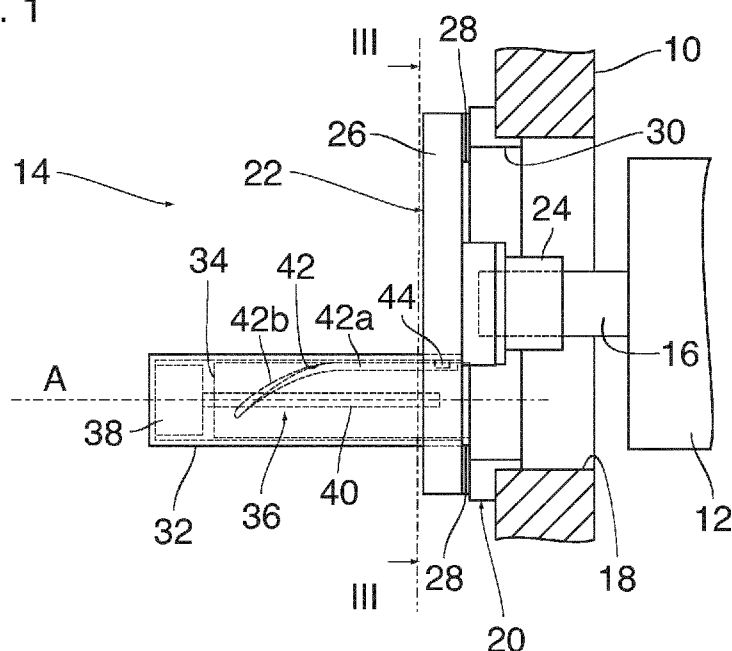
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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(54) Title: COVER BEARING SYSTEM

Fig. 1



(57) Abstract: The invention relates to a cover bearing system (14) to grip a sleeve (12) over a mandrel (16) in a printing press, in particular to how the gripper (24) is brought toward and away from the mandrel (16) and sleeve (12) assembly. The gripper (24) is disengaged from the sleeve (12), following first a straight path (42a) and then a helicoidal path (42b), thanks to an ad-hoc slot (42) machined on an axle (40). This allows to disengage the gripper (24) and set it out of the way for handling the sleeve (12), with a single motor (38) and a single instruction.

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *of inventorship (Rule 4.17(iv))*

Published:

- *with international search report (Art. 21(3))*

COVER BEARING SYSTEM

The invention relates to a cover bearing system for one end of a sleeve supported in a machine frame, with a bearing block, held on the machine frame, which forms a removal opening for the sleeve, a cover head that forms a bearing for the end of the sleeve and is displaceably supported on the bearing block in the axial direction of the sleeve, so as to be able to swivel about said axis of the sleeve and extending parallel to said axis, and an actuator system for moving the cover head.

10 A cover bearing system of this type is described, for example, in WO 2009/074295 A1.

In some rotary printing machines, interchangeable sleeves, such as printing cylinders, screen sleeves and the like, are each pushed onto a carrier bar which protrudes like a cantilever from one side of the mesh frame and on the free end is mounted in a cover bearing system of the type considered here, so that the cover bearing system indirectly also forms a bearing for the sleeve. When the sleeve should be replaced, the cover head of the cover bearing system can be pulled off axially from the carrier rod and then swivelled to the side so that the sleeve can be pulled off the carrier rod. The movements of the cover head can be automated using the actuator system.

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The object of the invention is to create a cover bearing system with a simplified actuator system.

This object is achieved according to the invention by the fact that the actuator system has an actuator for the axial movement of the cover head, such that the bearing block and the cover head are engaged with one another by means of a hollow cylinder and a cylinder body displaceable therein, one of which has a guiding contour and the other a body guided by the guiding contour, and that the guiding contour extends linearly in a first section in axial direction and in a second section helically around the axis of the cylinder body.

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The linear movement of the cover head generated by the actuator is converted by the helically extending section of the guiding contour into a swivelling movement that is superimposed on the axial linear movement, so that no additional actuator is needed for swivelling the cover head.

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Advantageous embodiments and further developments of the invention are given in the subordinate claims.

10 In the following, an exemplary embodiment is explained in more detail with reference to the drawing.

Shown are:

15 Fig. 1 a view of a cover bearing system and an end of a sleeve supported therein;

Fig. 2 the cover bearing system according to Fig. 1 in a position allowing the removal of the sleeve;

20 Fig. 3 a sectional view taken along the line III - III in Fig. 1; and

Fig. 4 a front view of the cover bearing system in the open state according to Fig. 2.

25 In Fig. 1, a section of a part of a sidewall of a machine frame 10 of a rotary printing machine is shown. A sleeve 12 of the printing machine, for example a printing cylinder, is mounted in the machine frame in a rotatable manner by means of a cover bearing system 14. In this example, the sleeve 12 is axially pushed onto a carrier rod 16 that protrudes in a cantilever-like manner from the side of the machine frame 10 - not shown in
30 Fig. 1 - and the free end of which is mounted in the cover bearing system 14 so that the radial forces acting on the sleeve 12 can be introduced over the carrier rod 16 into the cover bearing system 14. The sidewall of the machine frame 10 shown in Fig. 1 has an

opening 18 in which a bearing block 20 of the cover bearing system 14 is held on the outside.

5 The cover bearing system 14 also has a cover head 22 that forms a bearing 24 for the end of the carrier rod 16. The bearing 24 is fixedly mounted on a disc-shaped base body 26 of the cover head 22 that, in the state shown in Fig. 1, rests against the bearing block on the outside and is fixed to the bearing block by means of neutral-point tightening devices 28. Such neutral-point tightening devices are known to a person skilled in the art and are described, for example, in EP 2 759 370 A1.

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When the sleeve 12 should be replaced, the cover head 22 can be removed from the bearing block 20 axially, i.e. in the axial direction of the carrier rod 16 and the sleeve 12, and then swivelled to the side so that the sleeve 12 can be removed axially from the carrier rod 16 and pulled out of the machine frame through the opening 18 and a removal opening 30 of the bearing block. The axially remote and swivelled position of the cover head 22 is shown in Fig. 2.

20 The cover head 22 and the bearing block 20 are in engagement with one another via a hollow cylinder 32 firmly attached to the base body 26 of the cover head and a cylinder body 34 firmly attached to the bearing block 20. The hollow cylinder 32 is displaceable coaxially on the cylinder body 34 and is rotatable about this cylinder body so that the common axis of the hollow cylinder 32 and the cylinder body 34 defines a swivel axis A for the swivel movement of the cover head 22 relative to the bearing block 20.

25 As shown in Fig. 1, the hollow cylinder 32 also accommodates an actuator 36, in the form of a linear drive, which drives the hollow cylinder 32 to move in the direction of the swivel axis A on the cylinder body 34. In the shown example, the actuator 36 has a motor 38 and a screw 40. The motor 38, for example a pneumatic rotary piston motor, is accommodated in an end section of the hollow cylinder 32 outside the cylinder body 34 and drives a spindle, of the screw 40, which extends coaxially through the cylinder body 34 and generates the axial movement of the hollow cylinder 32 relative to the cylinder body 34.

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As can be seen in the sectional view in Fig. 3, the cylinder body 34 has a guiding contour 42, in its circumferential surface, which is formed here by two guide grooves that are diametrically opposite one another and predominantly extend in the longitudinal direction of the cylinder body. Follower bodies 44, engage into these guide grooves, which protrude from the inner circumferential surface of the hollow cylinder 32 behind the cutting plane in Fig 3. For the sake of clarity, Fig. 1 shows only one of the two guide grooves of the guiding contour 42 and the follower body 44 engaged in this groove. In a first section 42a directly adjacent to the bearing block 20, the grooves of the guiding contour 42 extend in a straight line in axial direction, while they extend helically around the swivel axis A in a further outwardly located second section 42b. In Fig. 1, the follower bodies 44 lie on the right end of the hollow cylinder 32, at the same level as the base body 26 of the cover head.

When the screw 40 is rotated by the motor 38, the engagement of the follower bodies 44 in the grooves of the guiding contour 42 forms a rotational lock for the hollow cylinder 32 so that only the screw rotated by the motor 38 rotates and the cover head 22 moves from the position shown in Fig. 1 in the direction towards the position shown in Fig. 2, while the follower bodies 44 slide through the grooves of the guiding contour 42. When the follower bodies 44 reach the helical sections 42b of the guiding contour, the swivelling movement around the swivel axis A is superimposed on the axial movement of the cover head 22 due to the helical characteristic of the grooves. However, this swivel movement only begins when the bearing 24 has already emerged from the removal opening 30 of the bearing block 20.

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Fig. 4 shows the fully deployed position of the cover head 22. It can be seen, in this position, that the bearing opening 30 is completely open so that the sleeve 12 can be removed.

As can be seen in Fig. 4, the plate-shaped base body 26 of the cover head 22 has a reinforced outer peripheral edge 46 and, around the bearing 24 and the hollow cylinder 32,

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reinforced hub regions 48 that are connected to one another by spokes 50 and to the peripheral edge 46.

5 The neutral-point tightening devices 28 can be arranged adjustably on the bearing block 20, can be preloaded in a known manner by springs into the clamping position, and are pneumatically released by means of compressed air when the cover head 22 should be removed from the bearing block 20. The pneumatic actuation of the neutral-point tightening device 28 and the pneumatic drive of the motor 38 enable the cover bearing system 14 to be used also in the explosion-protected area of a printing press.

10

CLAIMS

1. Cover bearing system for one end of a sleeve (12) that is supported in a replace-
able manner in a machine frame (10), with a bearing block (20) that is held on the ma-
chine frame and forms a removal opening (30) for the sleeve (12), a cover head (22) that
5 forms a bearing (24) for the end of the sleeve (12) and is displaceable in axial direction
of the sleeve and is held in a swivelling manner on the bearing block (20) about a swivel
axis (A) parallel to the axis of the sleeve (12) and offset from this axis, and an actuator
system for moving the cover head, **characterised in** that the actuator system has an
10 actuator (36) for the axial movement of the cover head (22), that the bearing block (20)
and the cover head (22) are engaged via a hollow cylinder (32) and a cylinder body (34)
displaceable therein, of which one has a guiding contour (42) and the other has a fol-
lower body (44) guided along the guiding contour, and that the guiding contour (42)
extends in a first section (42a) linearly in the axial direction and in a second section
15 (42b) helically about the axis of the cylinder body (34).
2. Cover bearing system according to claim 1, wherein the cover head (22) has a
plate-shaped base body (26), which rests against the bearing block (20) in the operating
position and which can be fixed in a releasable manner on the bearing block by means
20 of clamping means (28).
3. Cover bearing system according to claim 1 or 2, wherein the hollow cylinder
(32) is arranged rigidly on the cover head (22) and the cylinder body (34) is arranged
rigidly on the bearing block (20).
25
4. Cover bearing system according to one of the preceding claims, wherein the
guiding contour (42) is formed by at least one groove and the follower body (44) is
formed by a projection engaged in this groove.
- 30 5. Cover bearing system according to claim 4, wherein the guiding contour (42) is
formed by two mutually diametrically opposite grooves.

6. Cover bearing system according to claim 4 or 5, wherein the groove forming the guiding contour (42) is formed in the outer peripheral surface of the cylinder body (34), and the follower body (44) protrudes from the inner peripheral surface of the hollow cylinder (32).

5

7. Cover bearing system according to one of the preceding claims, wherein the actuator (36) has a screw (40) extending coaxially to the cylinder body (34) and the hollow cylinder (32) and has a motor (38) driving the screw (40).

10 8. Cover bearing system according to claim 7, wherein the motor (38) is a pneumatic motor.

9. Cover bearing system according to claim 7 or 8, wherein the motor (38) is housed in an end section of the hollow cylinder (32).

15

Fig. 1

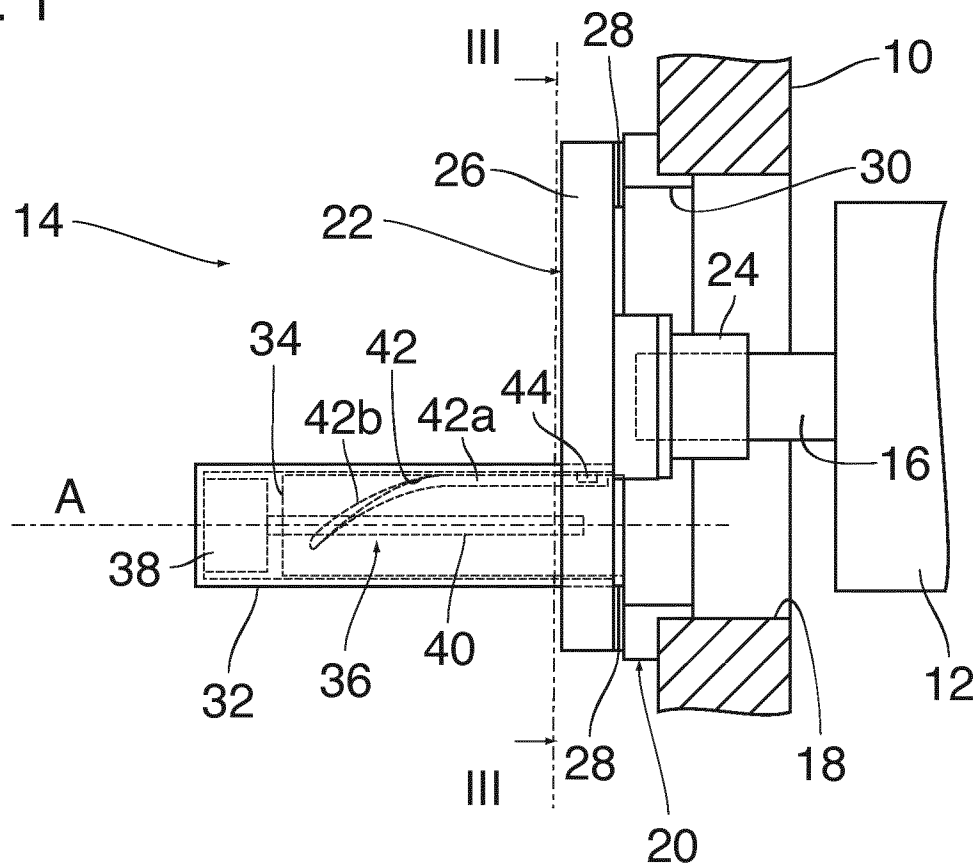


Fig. 2

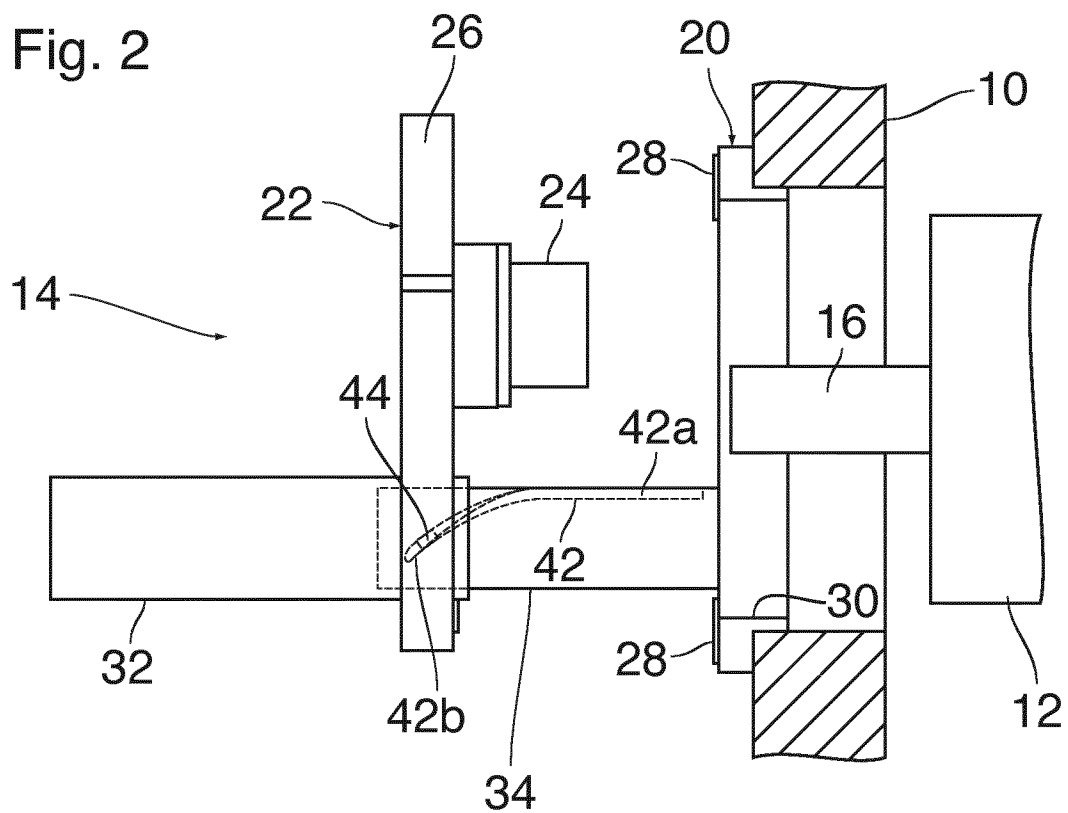


Fig. 3

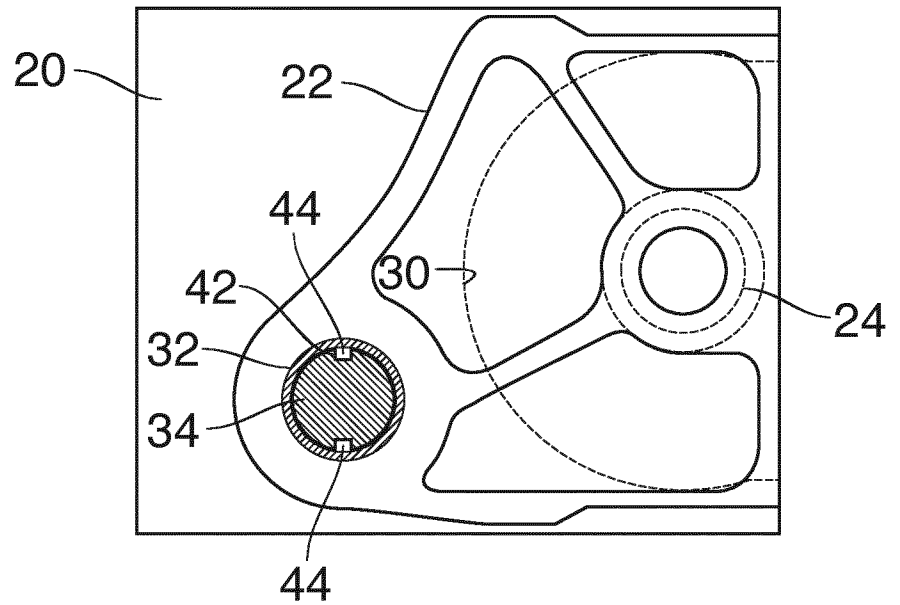
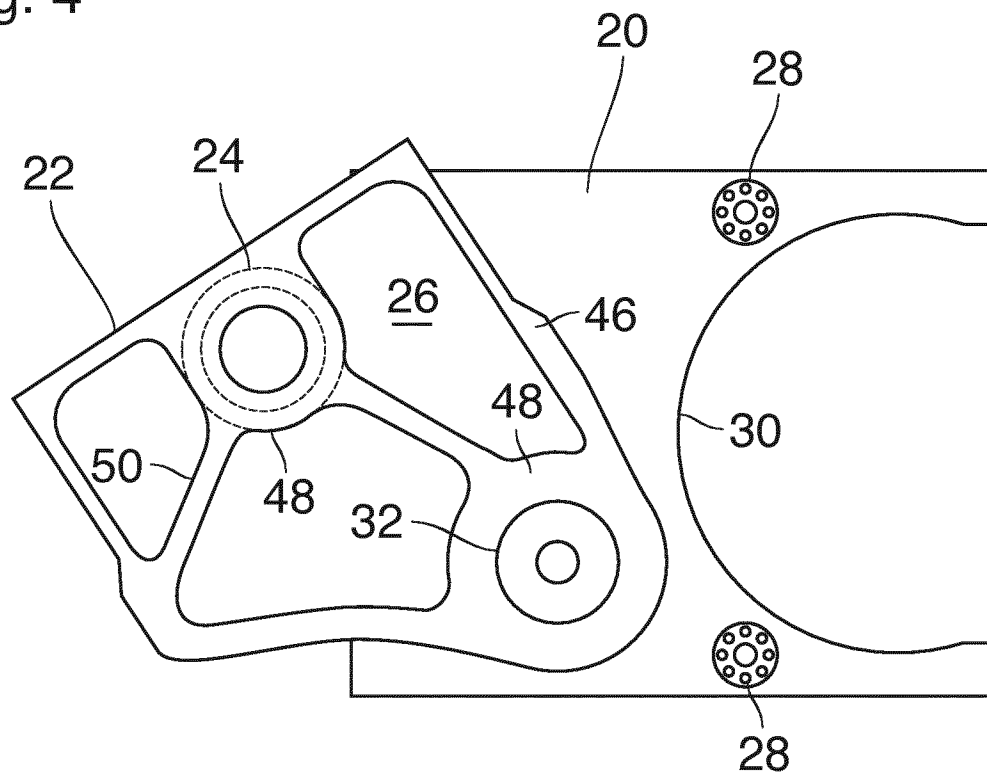


Fig. 4



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/025145

A. CLASSIFICATION OF SUBJECT MATTER
INV. B41F13/20 B41F27/10
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B41F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	WO 2009/074295 A1 (FISCHER & KRECKE GMBH [DE]; WHITELAW GORDON [AU]; HAECKER THOMAS [DE];) 18 June 2009 (2009-06-18) cited in the application abstract	1-9
A	----- EP 2 730 410 A1 (MIYAKOSHI PRINTING MACH [JP]) 14 May 2014 (2014-05-14) abstract paragraphs [0083] - [0099] figures 16-21	1-9
A	----- US 5 241 905 A (GUARALDI GLENN A [US] ET AL) 7 September 1993 (1993-09-07) abstract column 1 - column 7 figures 1-8 ----- -/-	1-9



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

25 August 2017

Date of mailing of the international search report

05/09/2017

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/025145

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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