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(54) Offset printing machine

(57) It comprises feed means, drive means, a chassis (4) containing a plate roller (1), a blanket roller and a counter roller, with the plate roller (1) located above the blanket and the blanket roller above the counter roller, characterised in that:
- the plate roller (1) can be changed and its axis is not adjustable in position with respect to the machine,
- the blanket roller can be changed and its axis is adjustable in position with respect to the plate roller guide axis, and
- the counter roller is not exchangeable and its axis is adjustable in position with respect to the plate roller guide axis.

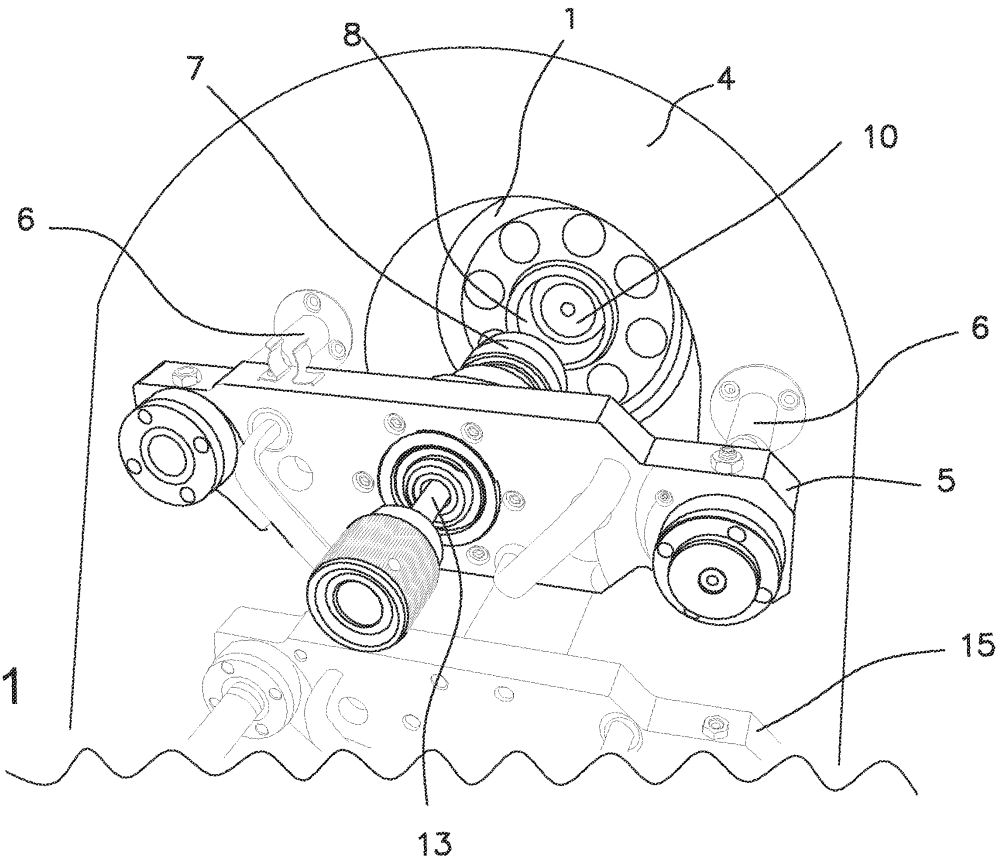


FIG. 1

EP 2 239 140 A1

Description

[0001] Offset print machine, of the type that comprises feed means, drive means, a chassis containing a first roller or plate a second roller or blanket and a third roller or counter roller (printing cylinder), with the first roller located above the second and the second above the third, **characterised in that** the first roller can be changed and its shaft is fixed with respect to the machine, the second roller can be changed and its shaft is movable with respect to the first roller guide shaft and the third roller is fixed and its shaft is mobile with respect to the first guide shaft, and because it comprises at least one support bracket on the exterior of the chassis, at least two guide elements fixed to the chassis, which cross and guide the referred support bracket, and a first centring device, per end and per roller, conical or truncated-cone shape, which is inserted inside a first cavity in the respective roller, thus centring and fixing each of the two referred rollers to the chassis.

BACKGROUND OF THE INVENTION

[0002] Several patents are known in the state of the art referring to offset print machines.

[0003] Thus, the applicant company holds Utility Model No 200601782 (ES16065654), "CYLINDERS WITH BEARING RINGS FOR OFFSET PRINT MACHINES" from 2006 that refers to a roller with rolling rings for offset print machines of the type in which said machines comprise at least a first roller for the printing plate, a second transfer roller and a third print of counter roller, with said first and second rollers are hollow, through the interior of which passes a shaft belonging to the machine and **characterised in that** said hollow lightweight material rollers comprise rigid rolling rings located at the ends of the referred rollers with the same or notably greater diameter than the blanket or printing plate, taking said diameter from the roller shaft.

[0004] Patent US 7272342 also belongs to the state of the art, in the name of the Japanese company RICOH KK, which describes an image-forming apparatus, comprising a detachable cartridge and includes a photoconductive drum with one that has a minimum rotational-type of eccentricity.

DISCLOSURE OF THE INVENTION

[0005] This invention is an advance within the field of offset print machines.

[0006] Within the line of continuous improvement and advances in the offset sector, the inventor develops this machine that improves performance over those currently existing on the market, both in facilitating the securing or fitting of the parts and operativity.

[0007] On the one hand, this is a new machine in which the first roller is replaceable and its shaft is fixed with respect to the machine, the second roller is replaceable and its shaft is mobile with respect to the guide shaft of the first roller and the third roller is fixed and its shaft is mobile with respect to the first guide shaft.

[0008] This is combined with a new centring system comprising a first centrer in the form of a cone or truncated cone preferably, located on the support shaft that is fixed to the bedplate and a second centrer located on a support bracket that moves in relation to the machine chassis. Said cones or truncated cones of the centrers fit into the apertures in the roller, which they centre and fix in place. At the same time, the second centrer fits into the aperture in the first centrer.

[0009] At the same time, the bracket incorporates guidance elements that permit its separation with respect to the chassis of the first and second centrers and thus facilitate the detachment of the rollers.

[0010] A hydraulic system permits simple, safe securing of the mobile rollers, the second and third, in a given position.

[0011] It also includes rolling rings at the ends of the first and second rollers, comprising the plate, the blanket and withstanding a added pressure comprising 20% of the initial contact pressure of the rolling rings to prevent printing failures.

[0012] One objective of this invention is an offset print machine of the type comprising feed means, drive means, a chassis containing a first roller or plate, a second roller or blanket and a third roller or counter roller, with the first roller located above the second and the second above the third, **characterised in that** the first roller is replaceable and its shaft is fixed with respect to the machine, the second roller is replaceable and is fixed with respect to the first roller guide shaft and the third roller is fixed and its shaft is mobile with respect to the first shaft guide roller and because it comprises at least one support bracket on the outside of the chassis, at least two guidance elements, fixed to the chassis, that pass through and guide the referred support bracket and a first centrer, per end and per roller, conical or truncated cone shape, which is inserted inside a first cavity in the respective roller, centring and fixing in place each of the two referred rollers to the chassis.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] In order to facilitate the description, this report is accompanied by six sheets of drawings that represent a practical exemplary embodiment, which is cited as a non-limiting example of the scope of this invention:

- Figure 1 is a partial upper frontal view of the objective of this invention,
- Figure 2 is an enlarged view of Figure 1,
- Figure 3 is an enlarged view of Figure 1 from an angle of opposite vision,
- Figure 4 is a lateral view of the arrangement of the machine cylinders.
- Figure 5 is a front perspective view of the machine

with various elements removed for better display of the interior, and

- Figure 6 is a rear perspective view of the machine with various elements removed for better display of the interior.

SPECIFIC EXEMPLARY EMBODIMENT OF THE PATENT

APPLICATION

[0014]

Figure 1 shows a chassis 4, a first roller 1, brackets 5, 15, guidance elements 6, a screw 13, a first centrer 7, a first cavity 8 and a second centrer 10.

Figure 2 represents the first roller 1, the first centrer 7, the first cavity 8 and a shaft 21 with the second centrer 10.

Figure 3 illustrates the first centrer 7, the screw 13 and a second cavity 9.

Figure 4 shows the first roller 1, a second roller 2, a third roller 3, the first centrer 7, the second centrer 10, rolling rings 11, 12, the first shaft 21, a second shaft 22 and a third shaft 23.

Figure 5 illustrates the chassis 4, brackets 5 and 15, the guidance shafts 21 and 22, the third roller 3 and a mobile bedplate 30.

[0015] Lastly, Figure 6 shows the chassis 4, bracket 5, the guidance shafts 21 and 22, the third roller 3 and a mobile bedplate 31.

[0016] Thus, before putting this machine into operation in this specific exemplary embodiment, the first 1 and second 2 rollers are arranged inside the machines, which are also called the plate and blanket respectively, in order for them to rotate on shafts 21, 22. Unlike of the third roller 3, said rollers 1, 2 are replaceable or detachable.

[0017] On the contrary, first roller 1 is fixed with respect to the machine, in other words, it always maintains the same position and, on the other hand, the other two rollers, the second 2 and the third 3 are mobile in relation to first roller 1, in other words, they move towards and away from each other in order to adapt the various paper or material formats that pass between them to be printed.

[0018] When installation is complete, bracket 5, 15 (two are illustrated in this embodiment) approach the corresponding roller 1, 2 by means of the guidance elements 6, which are two in this embodiment (however, the number may vary without affecting the aim of the invention), which are fixed to chassis 4 and pass though bracket 5, 15 so that the bracket moves along said shafts 6.

[0019] When it has approached sufficiently, it turns screw 13, which fits first centrer 7, with a conical or truncated cone form, inside first cavity 8, which also has the same form as first centrer 7, as if it were a mould, in this case, arranging the larger cone or truncated cone base in the exterior aperture of first cavity 8.

[0020] Thus, the same centrer 7 facilitates the fitting and the fixing and at the same time, of screw 13, which passes through first centrer 7 and screws onto second centrer 10, allowing it to be blocked.

[0021] Just as shown in Figures 2 and 3, there is a second centring mechanism comprising second centrer 10, located inside first cavity 8 and second cavity 9 in the first centrer so that when first centrer 7 is fitted inside first cavity 8, second centrer 10 is also fitted inside second cavity 9 producing correct centring and leaving double-cone centring.

[0022] Screw 13 complies with a triple function, on the one hand, screwed, it forms a support for the respective roller and, on the other, it applies force to centrers 7 and lastly, it works as a tensioning element.

[0023] Rollers 1, 2 (Figure 4) comprises rolling rings 11, 12, which are located at the roller ends. As shown in same Figure 4, said roller rings 11, 12 are facing each other, two by two, in other words, those of the upper cylinder over the lower ones.

[0024] Prior to operating the machine, the initial contact pressure between rolling rings 11, 12 is determined. This is achieved through movement of second roller 2, which is moveable or mobile, since first roller 1 is fixed with respect to the machine.

[0025] First roller 1 or plate, which is replaceable, is mounted on guide roller 21 secured to chassis 4.

[0026] Moreover, the second roller or blanket carrier, which is mounted on guide shaft 22, is fixed at one end to mobile bedplate 31 and the other end is secured to another bedplate on guides containing bracket 15 and centrer 7.

[0027] Third roller 3, which is fixed, is similarly mounted on two mobile bedplates on guides.

[0028] The mobile bedplates are driven by a hydraulic system and synchronised by a mechanical system comprising a shaft with pinions on racks that maintain an adjustable pressure and maintain their respective positions immobile during operation, supporting the rolling tracks that incorporate each of the two rollers between them.

[0029] The rollers have the following technical specifications:

Regarding first roller 1, the outside diameter of first roller 1 plate is greater than the outside diameter of its rolling rings 11, 12.

In second roller 2, the outside diameter of the second roller 2 blanket is smaller than the outside diameter of its respective rolling rings 11, 12.

Finally, referring to third roller 3, the outside diameter of third roller 3 is greater than the outside diameter of its end.

[0030] This is so that it permits third roller 3 is arranged between rolling rings 11, 12 of second roller 2, because the second roller 2 is narrower than its rolling rings and third roller 3 is as wide as roller 2 rolling rings. The product to be printed, paper, for example, would remain between

second roller 2, or blanket and third roller 3 or counter roller.

[0031] In order to prevent the over-pressure on the paper or any irregularities in the same or other type of happening may affect the quality of printing, the inventor applies at least an additional 20% of the initial contact pressure, at least on the first 1 and second 2 rollers. The amounts can vary upwards depending on the type of paper and irregularities etc.

[0032] This additional pressure allows that, even when such irregularities exist, there is always sufficient pressure for printing and prevents the paper or other product to be printed does not contain printing errors.

[0033] This patent application describes a new offset print machine. The mentioned examples do not limit this invention and thus, could have various applications and/or adaptations, all of which are within the scope of the following claims.

Claims

1. Offset print machine, of the type that comprises feed means, drive means, a chassis (4) containing a first roller (1) or plate a second roller (2) or blanket and a third roller (3) or counter roller, with the first roller (1) located above the second (2) and the second (2) above the third (3), **characterised in that**:

   - first roller (1) can be changed and its shaft (21) is fixed with respect to machine,
   - the second roller can be changed and its shaft (22) is movable with respect to guide shaft (21), of first roller and
   - the third roller (3) is fixed and its shaft (23) is mobile with respect to the first guide shaft (21), and **in that** comprises
   - at least one support bracket (5, 15) on the exterior of chassis (4),
   - at least two guide elements (6) fixed to chassis (4), which cross and guide the referred support bracket (5, 15), and
   - a first centrer (7), per end and per roller (1, 2), conical or truncated-cone shape, which is inserted inside a first cavity (8) in the respective roller, thus centring and fixing each of the two referred rollers (1, 2) to the chassis (4).

2. Machine, in accordance with claim 1, **characterised in that** it comprises a double-cone centring system, one at each end, in which the first centrer (7) comprises a second cavity (9) inside and **in that** the first (21) and second (22) guide shafts comprise a second centrer (10) inside the first cavity (8) leaving the first centrer (7) inserted inside the first cavity (8) and the second centrer (10) inserted inside the second cavity (9).

3. Machine, in accordance with claim 2, **characterised in that** the first roller (1) or plate, which is replaceable, is mounted on the fixed guide shaft (21) and secured to the chassis (4).

4. Machine, in accordance with claim 2, **characterised in that** the second roller (2) is mounted on two mobile bedplates (30, 31), with the guide shaft (22) on the mobile bedplate (31) and the other end on the support bracket (15) containing the centrer (7).

5. Machine, in accordance with claim 2, **characterised in that** the third roller (3), which is fixed, is mounted on the two mobile bedplates (30, 31).

6. Machine, in accordance with claims 4 and 5, **characterised in that** the mobile bedplates (30, 31) are driven by a hydraulic system and synchronised by a mechanical system comprising a shaft with pinions on racks that maintain an adjustable pressure and also maintain the second (2) and third (2, 3) roller shafts immobile in their positions during operation, maintaining rolling tracks (11, 12) supported, which each of the two rollers (1, 2) incorporates at their ends, between them.

7. Machine, in accordance with claim 6, **characterised in that** the third roller (3) is adjustable in height, depending on the material or support and the image to be printed.

8. Machine, in accordance with claim 1, **characterised in that** the first (1) and second (2) rollers comprise rolling rings (11, 12) arranged at the roller ends and facing each other, two by two, those of the upper cylinder over the lower ones, determining an initial contact pressure between the rolling rings (11, 12) between them, with the outside diameter of first roller (1) plate is greater than the outside diameter of its respective rolling ring, the outside diameter of the second roller (2) blanket is smaller than the outside diameter of its respective rolling ring and the outside diameter of third roller (3) is greater than the diameter of its end, similarly, the contact pressure between the rolling rings (11,12) of the second (2) and first (1) rollers between them, when the machine comes into operation is at least 20% more than the initial contact pressure.

9. Machine, in accordance with claim 2, **characterised in that** the first cavity (8) is cone or truncated-cone shaped, with the larger base of said cone or truncated cone being the one corresponding to the exterior aperture of its respective cavity.

10. Machine, in accordance with claim 2, **characterised in that** it comprises a screw (13) that passes through the support bracket (5) and the first centrer (7) and

is screwed to the centrer (10).

11. Machine, in accordance with claim 9, **characterised in that** it comprises two independent support brackets (5,15), one for the second roller (2) and one for the first roller (1).

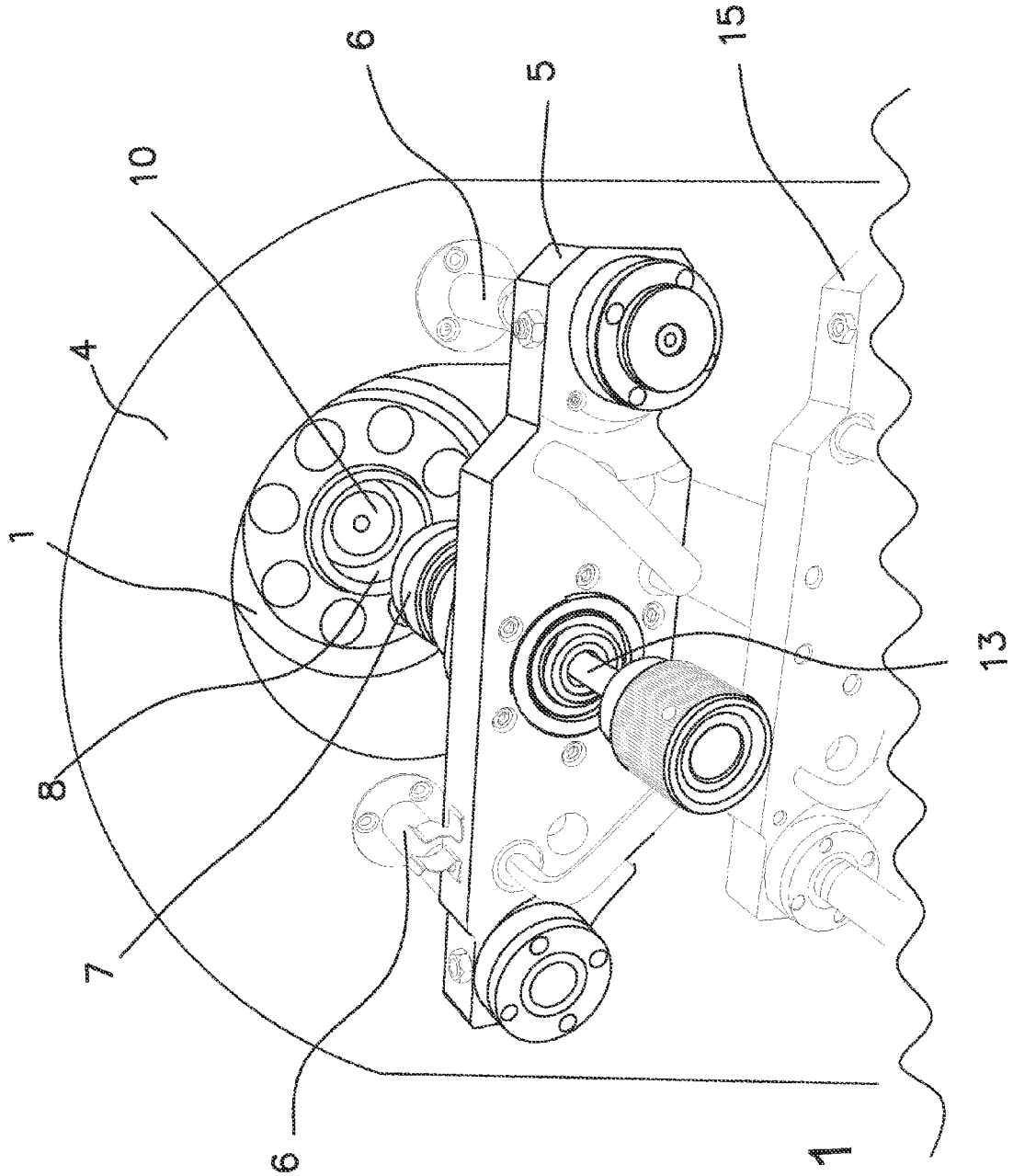


FIG. 1

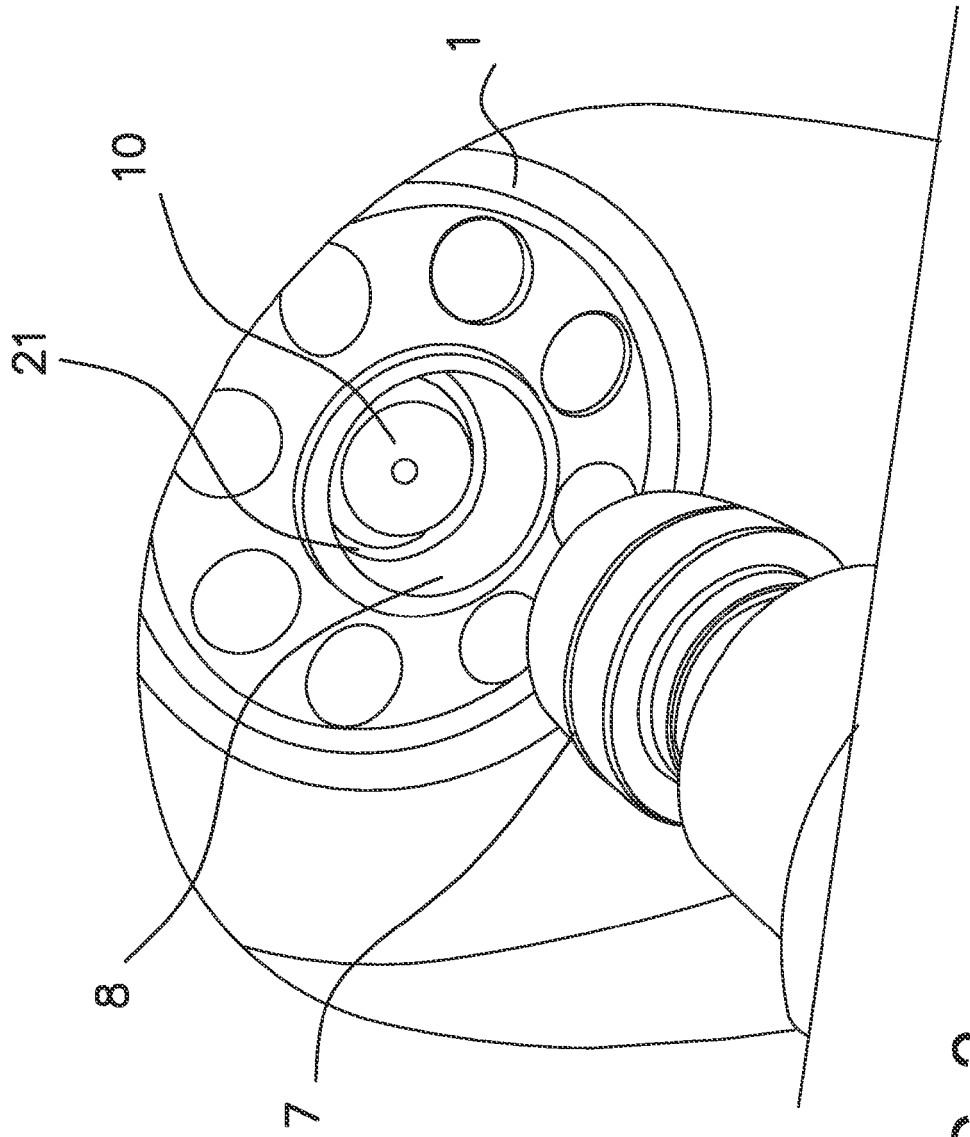
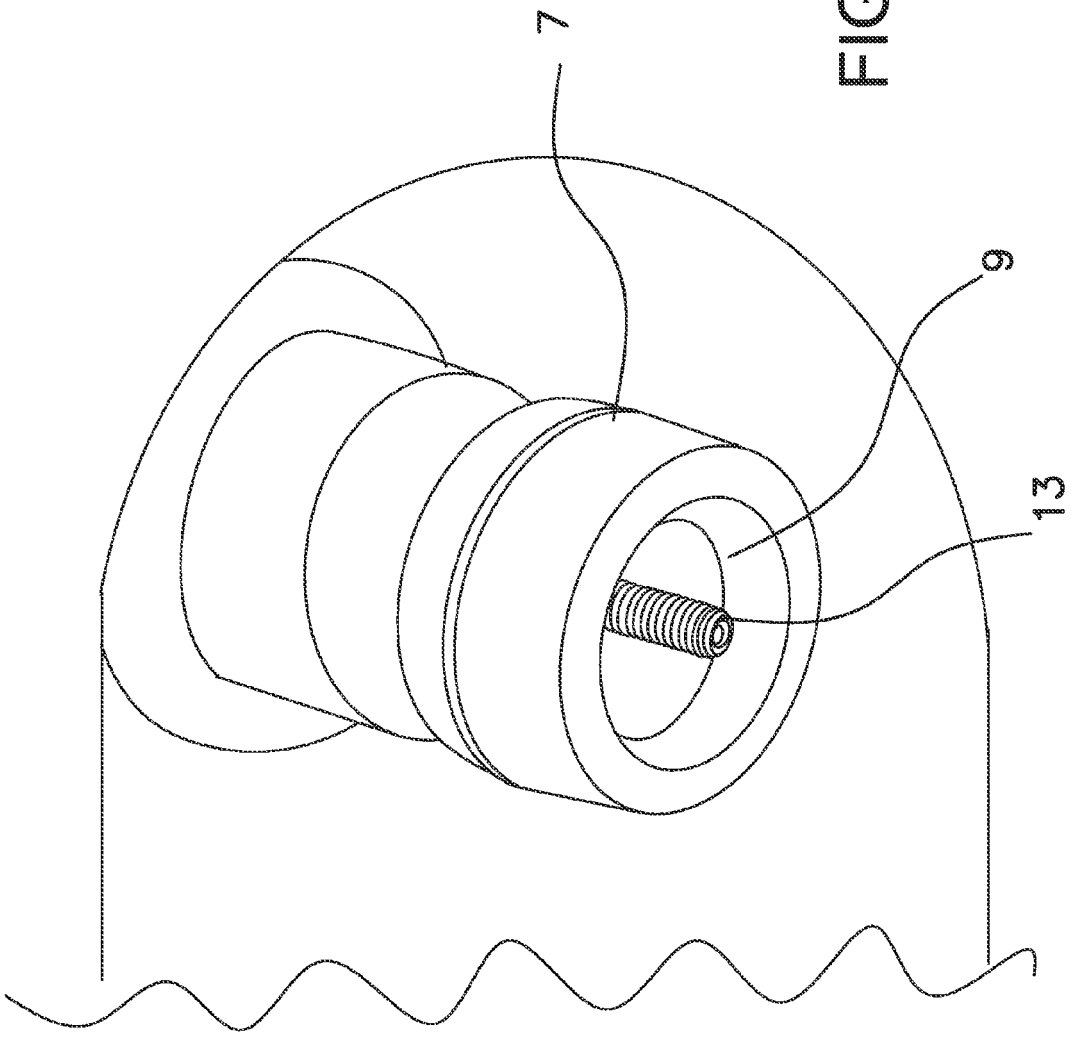


FIG. 2

FIG. 3



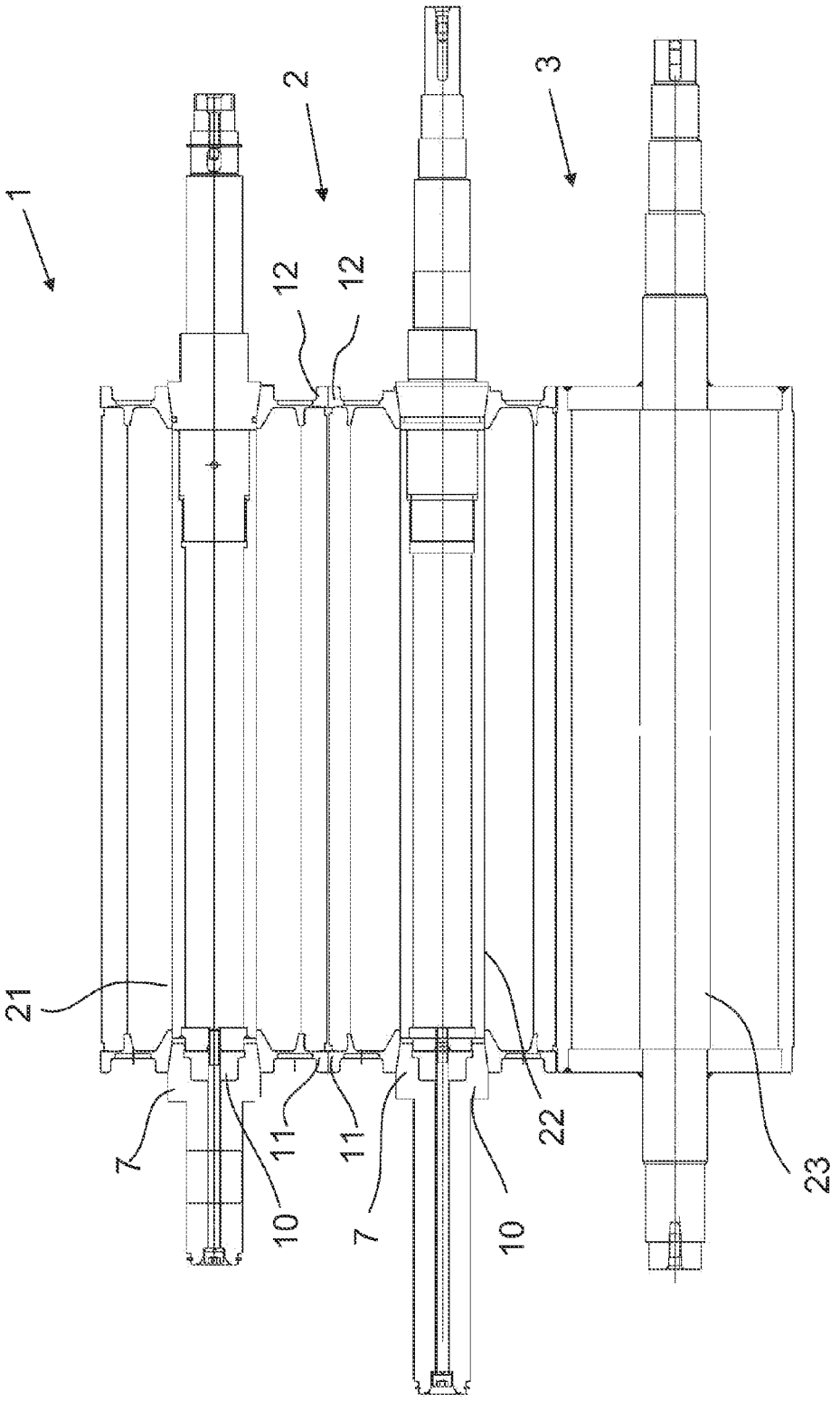


FIG. 4

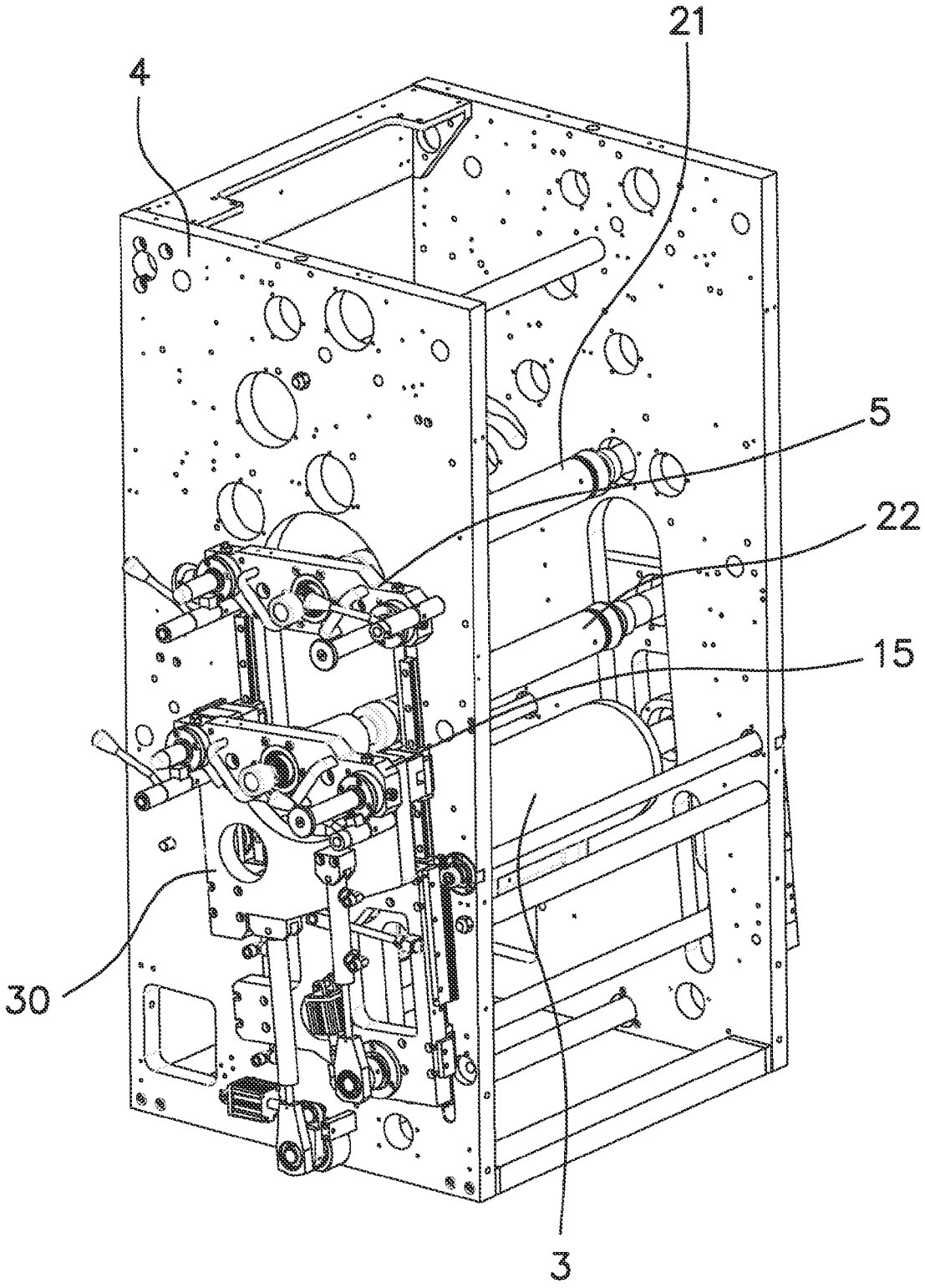


FIG. 5

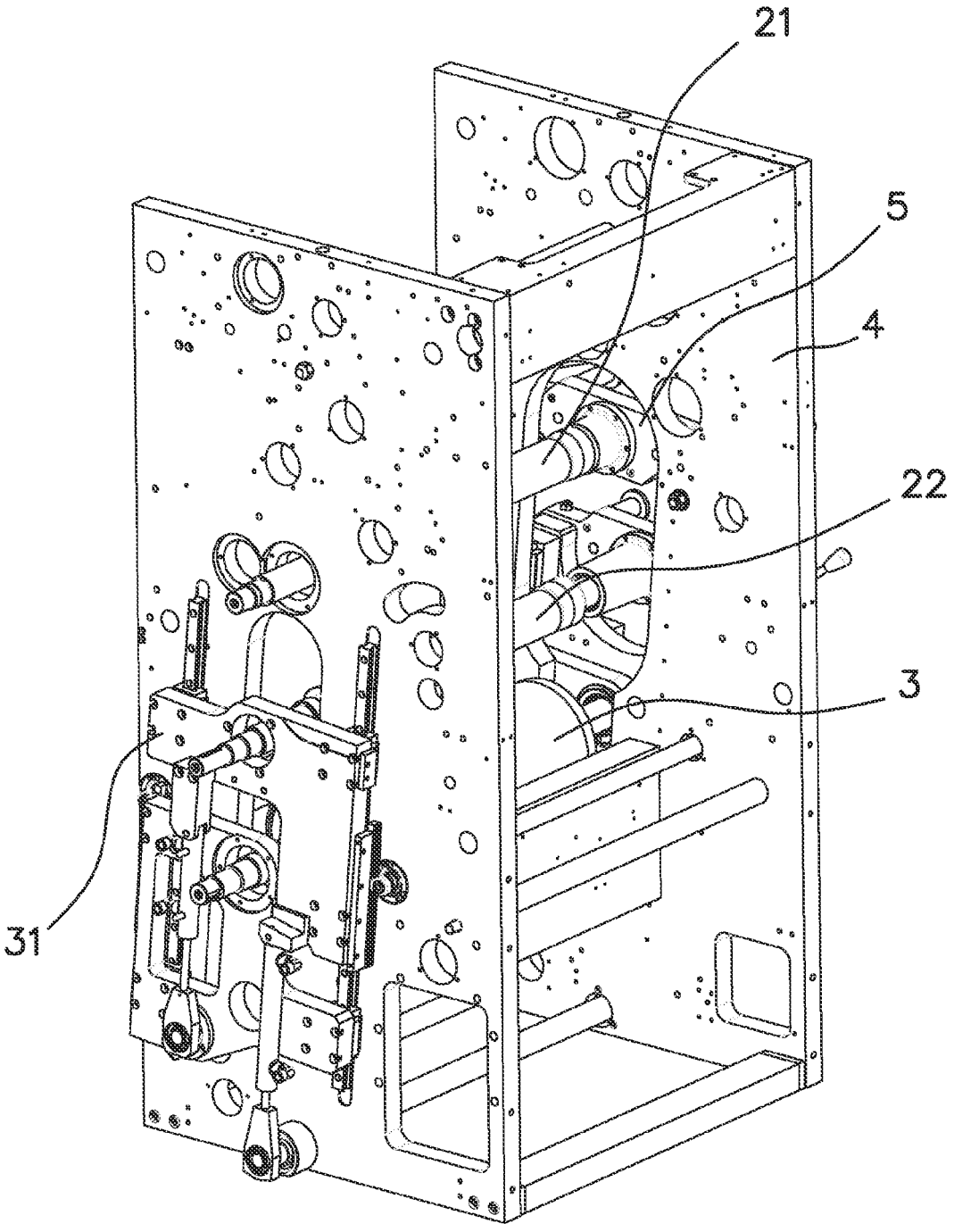


FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 09 38 2047

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 December 2009	Bellofiore, Vincenzo

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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EPO FORM 1503 03.82 (P04C01)

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EUROPEAN SEARCH REPORT

Application Number
EP 09 38 2047

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 December 2009	Bellofiore, Vincenzo

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EPO FORM 1503 03.82 (P04C01)

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Application Number
EP 09 38 2047

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 09 38 2047

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-7, 9-11

   Offset printing machine with replaceable plate and blanket rollers. The centring of the shafts of said rotating rollers is achieved by means of a double-conical centring system. Supporting bedplates, which can slide with respect to the chassis of the machine, allow the adjusting and lifting of blanket and impression rollers according to the format to be printed.

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2. claims: 1, 8

   Offset printing machine with replaceable plate and blanket rollers, whereby the centring of the shafts of said rotating rollers is achieved by means of conical or frusto-conical centrers, comprising bearer rings with adjustable contact pressure between them at the ends of said plate and blanket rollers.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 38 2047

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

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