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DEVICE FOR PLATE CHANGING

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AU 644616 67635/90 B41F 027/12 033/00

(57) Claim

1. A device for inserting a rear edge of a printing plate on a plate cylinder of a printing press, said device including a roller disposed parallel to said plate cylinder and said roller being adapted to be pressed against said plate cylinder by actuating elements and by means of which roller, an angled rear edge of a printing plate is insertable into a tensioning device, wherein said roller is displaceably held at its ends by means of guides, said guides extending in the insertion direction of said rear edge of said printing plate and being permanently connected to a frame of said printing press and said guides being displaceable by said actuating elements and said actuating elements having a permanent connection to the printing press frame.

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Invention Title:

DEVICE FOR PLATE CHANGING

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The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

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The present invention relates to a device for plate changing with a roller disposed parallel to the plate cylinder, said roller being adapted to be pressed against the plate cylinder by an actuating element and by means of which roller the angled rear edge of a printing plate can be inserted into a tensioning device.

The mounting of a printing plate on the plate cylinder of a printing press generally has been an operation to be carried out manually by the operator. This was done by means of printing plate clamping devices which received the front edge and the rear edge of the printing plate and which could be opened and closed by means of a wrench or a thorn. Into these devices the printing plate was inserted by hand.

The initial further developments in this field included devices for clamping printing plates which could be opened and closed by pressing a button. By means of these devices the printing plate is automatically clamped at its front and rear ends and then tensioned. The insertion of the printing plate front edge into the device for clamping it can be effected either by hand, semi-automatically or fully automatically. For the insertion of the rear edge of the printing plate there is required a device of the kind as mentioned hereinabove.

Such a device for plate changing is known from JP-PO Sho 63-191636. In said device, the insertion of the angled rear edge of the printing plate into the tensioning device of the impression cylinder is effected by a roller which is held on swivellable levers connected to a stem. It is provided that, once the front edge of the printing plate has been clamped, the roller presses the printing plate against the surface of the plate cylinder in order then, at the end of the printing plate, to insert its rear edge into the tensioning device of the plate cylinder. During this operation, the stem with the levers and the roller is displaced on a guide rail extending tangentially with respect to the plate cylinder by means of a cylinder which actuates a rod connected to the levers.

Said device is of complex construction. It has many parts and requires a large installation space, something which is undesired given the already restricted amount of space

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between the printing units. Because of the requirement of large installation space it is difficult to combine the device with a device for semi-automatic or fully automatic printing plate feed. However, the advancement in automation necessitates such a combination whereby, for economic reasons, a combination of standardized components is desirable. Apart from the roller, the stem is also situated directly in front of the printing unit, which should always be accessible, for example if hickies need to be removed from the printing plate or if, for other reasons, the operator needs to make a manual intervention. Also, the device is not simple to remove in order to gain better access to the printing unit.

It is the object of the invention to make available a device for plate changing, said device preferably being of simple construction, taking up little space, impairing access to the printing unit as little as possible and, as a standardized element, being combinable with a semi-automatic as well as a fully automatic printing plate feed.

According to the present invention there is provided a device for plate changing as previously described, in which a roller is displaceably held at its ends by means of guides, said guides extending in the insertion direction of the rear edge of the printing plate and being permanently connected to the printing-press frame - and which are adapted to be displaced by two actuating elements, said actuating elements having a permanent connection to the printing-press frame.

One advantage of the invention is in its simple construction and good access to the printing unit and also by its high operational reliability. The device has very few parts and can therefore be manufactured at low cost. The roller is the only component that is situated in front of the printing unit. This, however, does not normally obstruct the printer. It is easily possible to combine the device with a device for semi-automatic or fully automatic printing plate feed without the device having to be changed in design for that purpose. Such combination with standardized components is especially economical.

A further development of the invention may be of such

design that the roller can be removed by the operator without tools and in one manual operation.

This is achieved in that the roller is held by means of two bearings, said bearings being displaceable in the guides, and in that the roller can be removed from said bearings.

Such bearings may consist, for example, of journals and journal mounts, with it being possible to join the journals to the shaft and to arrange the journal mounts in the guides, or vice versa. It is also possible to provide different arrangements on the left-hand and right-hand sides. It is essential that the roller can readily be removed from the bearings. This can be achieved, for example, in that a journal mount consists of two halves, with one of the halves being adapted to be hinged away by a simple manual operation, or a device is provided by means of which it is possible to reduce the length of the shaft between the bearings or by means of which the bearing parts joined to the printing-press frame can be moved apart. This can be achieved in that at least one journal is held in such a manner as to be displaceable axially against a spring to such an extent that, through the axial displacement of the roller, the opposite journal is no longer in the journal mount, and in that a spherical and spherical-cup-shaped design, respectively, of the still engaged, displaceable journal and of the associated journal mount allows the shaft to be swung out. A further possibility consists in that at least one journal mount is held in such a manner as to be displaceable axially against a spring to such an extent that, through the axial displacement of the roller, the opposite journal is no longer in the journal mount, and in that a spherical and spherical-cup-shaped design, respectively, of the still engaged journal and of the associated displaceable journal mount allows the shaft to be swung out.

The displaceable journal or the displaceable journal mount may be provided on one or both bearings, with this being possible both on the roller and also on the guides.

In addition to being used for the insertion of the angled rear edge of a printing plate into the tensioning

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device of the plate cylinder, the device can also be employed in that, when a printing plate is being mounted on the plate cylinder, the roller rolls the printing plate onto the plate cylinder. The result of this is that the printing plate hugs the surface of the plate cylinder particularly tightly. The roller may also be used, at a distance from the plate cylinder, as a guide when the printing plate is being inserted.

It is advantageous for the actuating elements to be designed in the form of pneumatic cylinders. This is of advantage, since the printing press generally has a compressed-air supply, pneumatic cylinders are easy to control and simultaneous and fast actuation is possible. Owing to the fact that pneumatics has an elastic quality, it is guaranteed that the roller will lie parallel against the plate cylinder and, consequently, will insert the plate precisely into the clamping and tensioning device over the entire width.

Since such pneumatic cylinders are able to absorb axial forces only to a limited extent, it is advantageous that, in order to absorb the axial forces of the roller, the bearings comprise supports on the printing-press frame, said supports being displaceable with the bearings. In order to minimize the friction during adjustment, said supports preferably are furnished with rotatable balls, said balls running on a surface of the printing-press frame.

An embodiment of the invention provides that the bearings are in sleeves, said sleeves being displaceable by the actuating elements, and that the sleeves are guided by means of guide elements in the insertion direction of the rear edge of the printing plate.

In order to prevent accidents, a further development of the invention provides that the sleeves contain springs, with the bearings being displaceable outwardly (viewed from the plate cylinder) against the force of the springs, and that the spring force is so dimensioned that the risk of injury to a hand coming between plate cylinder and roller is as slight as possible.

Additional safety is achieved in that a lever transmits the displacement of the bearing in the sleeve to a switch,

with the printing press being stopped by the signal from said switch.

An advantageous design of the roller provides that the roller consists of an inner and an outer tube, with the inner tube accommodating the roller-held parts of the bearings and with the outer tube being held on the inner tube with rolling contact bearings.

This design of the roller ensures that it is easily rotatable and that, consequently, damage as a result of the printing plate sliding on the roller is prevented. In order to treat the printing plate as gently as possible, it is further advantageous for the roller to be provided with rings, said rings projecting beyond the surfaces of the roller and being made of elastic material. The distance between said rings must be so small that a uniform force is exerted on the printing plate over its entire width. It is advantageous for the rings used to be rubber rings.

The device according to the invention can be employed in such a manner that printing plates being fed manually to the clamping device for clamping the printing plate front edge and being wound around the plate cylinder, with their angled rear edge, are automatically inserted into the device for clamping the printing plate rear edge by means of the roller.

It is also possible to employ this device in printing units which feed the printing plate to the plate cylinder by means of a semi-automatic device. Thereby, the front edge of the printing plate is still inserted manually into the clamping device for clamping the printing plate front edge, but the printing plate is held and guided while it is placed around the plate cylinder. During the feeding of a printing plate end region not guided any more by the semi-automatic device the roller serves as guide of the printing plate. Then, the roller automatically inserts the printing plate rear edge into the device for clamping it.

Likewise, the device according to the invention can be combined with a fully automatic device which feeds the printing plates to the plate cylinder or removes them therefrom by means of suction cups and transport means.

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Thereby, a controlling device effects the sequential handling of the printing plate feed, the removal, the clamping and unclamping as well as the actuation of the roller for inserting the printing plate rear edge.

The invention will now be described with reference to the following drawings. However, it is to be appreciated that the following description is illustrative only and should not be taken as restrictive on the generality of the preceeding description of the invention.

~~Thereby, a controlling device effects the sequential handling~~ of the printing plate feed, the removal, the ~~clamping~~ and unclamping as well as the ~~actuation~~ of the roller for inserting the printing ~~plate~~ rear edge.

The ~~invention~~ is described on the basis of a specimen ~~embodiment with reference to the drawings, in which:~~

Fig. 1 shows a schematic illustration of the device;

Fig. 2 shows the precise design of one end of the roller with bearing, guide and actuating element;

Fig. 3 shows the device as the angled rear edge of a printing plate is being inserted into the tensioning device;

Fig. 4 shows the combination of the device for inserting the angled rear edge of the printing plate with a device for semi-automatic printing plate feeding; and

Fig. 5 shows the combination of the device for inserting the angled rear edge of the printing plate with a device for fully automatic printing plate feeding and printing plate removal.

Fig. 1 shows a schematic representation of the device for the changing of printing plates, with the roller 1 being arranged parallel to the plate cylinder 14. The representation shows the roller 1 and the plate cylinder 14 to be much shorter than they actually are. The roller 1 is held in bearings 9, 10 at its ends and is displaceable by means of guides 5, 6 in the insertion direction of the rear edge 3 of the printing plate 2. The guides 5, 6 consisting of the guide elements 21, 21', 22'', 21''', 22, 22', 22'', 22''' are permanently connected to the side walls of the printing press frame 4. The displacement of the roller 1 is effected by actuating elements 7, 8. The bearings 9, 10 are in sleeves 19, 20, which are guided by the guide elements 21, 21', 21'', 21''', 22, 22', 22'', 22'''. For this purpose, the sleeves 19, 20 are designed, for example, in the form of squares, with the guide elements 21, 21', 21'', 21''', 22, 22', 22'', 22''' running on the side surfaces. Each of the sleeves 19, 20 is furnished with two pairs of such guide elements, with,

however, merely the front guide elements 21'', 21''', 22, 22' being visible in Fig. 1. Supports 15, 16 with balls 17, 18 ensure the absorption of the axial forces by a support on the side walls of the printing press frame 4. The actuating elements 7, 8 are attached by angle brackets to the side walls of the printing press frame 4 and are connected by their adjustable parts to the sleeves 19, 20 in such a manner that only longitudinal forces can be transmitted. When they are actuated, the sleeves 19, 20 are moved in the direction of the plate cylinder 14 until the roller 1, with its rings 30, has caused the angled rear edge 3 of the printing plate 2 to be inserted into the tensioning device 31 of the plate cylinder 14. There is, in fact, a larger number of rings 30 than are shown; however, they are not visible, because merely the outer ends of the roller 1 are shown in the drawings.

Fig. 2 shows an end of the roller 1 with bearing, guide and actuating element. The bearing 10 consists of a journal 11, which is held in such a manner as to be displaceable axially in the inner tube 27 of the roller 1 and which is adapted to be pressed, against the force of a spring 13, into the inner tube 27. Said journal 11 is in a journal mount 12, which is inserted into the sleeve 20. The journal 11 can be pushed against the spring 13 into the inner tube 27 of the roller 1 to such an extent that the journal at the other end of the roller 1 can be moved out of the journal mount and, consequently, the roller 1 can be swung away from the printing unit. In order to guarantee this swinging movement, the journal 11 is provided with a spherical surface, and the journal mount 12 is of a matching spherical-cup-shaped design. The journal 11 is held in the tube 27 by a stop.

In the axial direction, the journal mount 12 is adjoined by a support 16, which comprises a rotatable ball 18 at its end, said ball 18 being able to run on a surface of the printing press frame 4. Said support 16 ensures that the axial forces are absorbed, with the other end of the roller 1 being provided with a further support 15 of identical design.

The sleeve 20 contains a spring 24 which presses the journal mount 12 against a wall 32 of the sleeve 20, said wall

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32 facing the plate cylinder 14. The journal mount 12 is displaceable radially (viewed from the plate cylinder 14) in the sleeve 20, with the mount opening for the journal 11 remaining open thanks to a cutout 33. The precise displaceability of the journal mount 12 in the sleeve 20 is accomplished by a piston-like sliding element 40, which carries the journal mount 12 and slides in the sleeve 20. The force of the spring 24 is dimensioned such that, if the roller 1 is used as intended, the force of the spring 24 holds the journal mount 12 against the wall 32, but, should a hand come between plate cylinder 14 and roller 1, the spring 24 is compressed and, consequently, the risk of injury is minimized. The sleeve 19 at the other end of the roller 1 is of similar design.

Fig. 2 further shows the construction of the roller 1. Said roller 1 consists of an inner tube 27 and an outer tube 28, with the inner tube 27 accommodating the roller-held parts of the bearings. That is, in this case, the journal 11. Between the outer tube 28 and the inner tube 27 there are disposed roller bearings 29 which ensure the easy rotatability of the outer tube 28. The surface of the outer tube 28 of the roller 1 is provided with grooves, into which rings 30 of elastic material are inserted in such a manner that they project beyond the surface of the roller. A multiplicity of such rings (not shown) is disposed over the length of the roller 1, with their number being such that the roller 1 is able, with a uniform force, to press the printing plate rear edge 3 into the tensioning device 31 or to press the entire surface of a printing plate 2 against the plate cylinder 14.

The actuating element 8 is screwed onto an angle bracket 34 which is permanently connected to the printing press frame 4.

The roller 1 is held in an identical manner at the opposite end (not shown), with it being sufficient, however, if, only at one end, the journal is held in such a manner as to be displaceable axially against the force of a spring. In such a case, it is not absolutely necessary for the non-displaceable journal and the associated journal mount to be of

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spherical and spherical-cup-shaped design, respectively. In order to prevent damage, however, such a design is advantageous.

Fig. 3 shows the device just before the rear edge 3 of the printing plate 2 is inserted. The representation shows a section between the actuating element 8 and the angle bracket 34, with the guide elements 22, 22', 22'', 22''' and the bearing of the lever 25 being shown in section. The viewing direction is onto the roller 1, with the parts of its bearing at the right-hand end being visible. In this representation the pair-wise arrangement of the guide elements is easily visible. In order to represent the advantageous construction of the guide elements, they are shown in section. They each consist of a screwed-in screw 35 and, slipped over it, a sleeve 36, which is easily rotatable. Holding disks 37 on each guide element ensure that the sleeve 20 is guided also in the direction of the axis of the roller 1. The holding disks 37 are held by the screw heads 38 (Fig. 1).

The printing plate 2 is shown in a position in which it is placed around the plate cylinder 14 and in which its rear edge 3 still has to be inserted into the tensioning device 31. By the actuation of the actuating elements 8 the sleeve 20 is displaced in the direction of the plate cylinder 14. Simultaneously, the sleeve 19 at the other end of the roller 1 is displaced. Consequently, the rear edge 3 of the printing plate 2 comes into the position 39 (shown by the broken line), in which it is in the tensioning device 31. Subsequently, the tensioning device 31 is closed, the rear edge of the printing plate is clamped and the printing plate around the plate cylinder 14 is tensioned by means of the tensioning device 31.

Fig. 3 shows the spring 24 in the sleeve 20 which holds the bearing 10 of the roller 1 in the position facing the plate cylinder 14. As already described above, the purpose of this design is to guard against injury to a hand coming between plate cylinder 14 and roller 1 in that the roller 1 is able to move out of the way against the spring 24. The swivellable lever 25 held in the printing press frame 4 is connected at one of its ends to the bearing of the roller 1

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and is of such design that, if the roller 1 moves out of the way as just described, a switch 26 at the other end of the lever 25 is actuated and the signal from the switch 26 causes the printing press to be stopped. For reasons of clarity, the lever 25 is not shown in Figs. 1 and 2.

In order to press the printing plate 2 against the plate cylinder 14 throughout the entire insertion operation, it is also possible for the roller 1 to be actuated by the actuating elements as soon as the front edge of the printing plate has been inserted, in order thus to guarantee full contact of the printing plate 2 against the plate cylinder 14. If this function is provided, then, just before the rear edge 3 of the printing plate 2 is reached, the roller 1 must be moved away from the plate cylinder 14, in order to thus to be able to insert the angled rear edge 3 of the printing plate 2 into the tensioning device 31 and so to convey it into the position 39.

Fig. 4 shows the combination of the device for inserting the angled rear edge of the printing plate with a device for semi-automatic printing plate feed. There is illustrated a printing unit 50 including a plate cylinder 14. This plate cylinder 14 is equipped with a device for clamping the printing plate front edge 41 and with a tensioning device 31 for clamping the printing plate rear edge. The semi-automatic printing plate feed consists of at least one roll 43 being arranged in such a manner that in the plate change position said roll 43, with its side facing the printing unit, essentially lies on a line extending parallel to the clamping surfaces 42 of the device 41 for clamping the printing plate front edge and leading through between said clamping surfaces 42 and diagonally upward out of the printing unit 50. The roller 1 is arranged so as to be situated at the lower end of said line showing a slight lateral dislocation from said line. The feeding of the printing plate 2 takes place in a manner that the operator leads the printing plate 2 at its front edge past the roll 43 on the side where said roll 43 faces the printing unit and inserts it into the clamping surfaces 42 for receiving the printing plate front edge. For exact positioning of the printing plate there are provided

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adjusting pins in the device 41 for clamping the printing plate front edge, said adjusting pins cooperating with U-shaped recesses of the printing plate. By pressing a button, the operator effects the closing of the device 41, said closing being followed by a turning of the plate cylinder 14 which causes the printing plate 2 to be placed onto the plate cylinder. After the printing plate rear edge has passed the roll 43, it falls down by its weight and is caught by the roller 1. The roller 1 guides the printing plate and then serves in the described manner to insert the printing plate rear edge. When the printing plate rear edge has been inserted into the tensioning device 31, the tensioning device 31 closes while clamping the printing plate, in order to subsequently tension it by a movement in circumferential direction.

The illustration of Fig. 4, however, is a representation of a further development of the device for semi-automatic printing plate feed. At least one roll 43, which is advantageously designed as an easily rotatable roller having the width of the printing plate, is arranged at a lower part of a two-part printing unit guard cover 46. Said roll 43 is spaced from the printing unit guard cover to an extent that the angled rear edge 3 of the printing plate 2 can move past the printing unit guard cover 46. The lower part of the two-part printing unit guard cover 46, in a lifted condition, takes a position in which it is situated parallel to the above-mentioned line. Consequently, the roll 43 can be brought into its plate-changing position by lifting of the printing unit guard cover 46. For printing plates of certain lengths a suction cup 44 is arranged at the upper end of said lower part of the two-part printing unit guard cover 46, and the printing plate 2 can be pressed onto said suction cup 44. The suction cup 44 is of such a design that the printing plate can slide on it. There is a borehole 45 in the printing plate 2 in front of its angled rear edge 3. Boreholes are present in this area of printing plates, because they are needed for the copying process as well as for punching out the U-shaped recesses. This present borehole 45 is made use of as an

exhaust for the suction cup 44. In this way it is achieved that the suction cup 44 lets loose the printing plate at the appropriate time, that said printing plate sinks slightly downward and that its rear edge 3 can slide through from under said suction cup 44. With this suction cup printing plates of various lengths can be handled. When the rear edge 3 of the printing plate moves from under the roll 43, the printing plate, again, falls a distance downward, and during its fall the printing plate is caught by the roller 1 and guided to the point of insertion of the printing plate rear edge 3 into the tensioning device 31. The insertion of said printing plate rear edge is effected by means of the roller 1 in the above described manner. In Fig. 4, there is further shown a hinge of the two-part printing unit guard cover 46, said hinge being swingably fastened at the printing unit 50 by means of an angle-shaped arm and guided by means of a guide 48 at the lower end of the printing unit 50. A gas pressure spring 47 or a pneumatic element disposed in this place serves to keep the printing unit guard cover in its lifted position and/or to move it into this position.

Fig. 5 shows the combination of the device for inserting the angled rear end of the printing plate with a device for fully automatic printing plate feed and removal. This device consists of a magazine 51 for receiving used printing plates removed from the machine, as well as for holding new printing plates to be fed to the machine. This magazine is advantageously designed in a manner that a cassette 52 for receiving a number of new printing plates is accommodated in one area of the magazine 51 and a cassette 53 for receiving a number of old printing plates is accommodated in another area of the magazine 51. Above the cassette 52 for the new printing plates, there is arranged a transport device 55 for new printing plates, said transport device 55 being provided with a number of suction cups 54 which serve to grip a new printing plate.

The feed of new printing plates takes place in a manner that the operator first inserts a cassette 52, containing a number of new printing plates, into the magazine 51. Then,

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the suction cups 54 are being lowered, they grip a printing plate, lift it and, by means of the transport device 55, insert it into the device 41 for clamping the printing plate front edge. Thereby, the suction cups 54 are movable on a line which leads through between the clamping surfaces 42, said clamping surfaces 42, for the purpose of receiving the printing plate front edge, are in a clamping position and form a gap for plate-receiving. After the printing plate has been inserted, it is clamped by the device 41 for clamping the printing plate front edge and is wound around the plate cylinder 14. The printing plate rear edge is inserted into the tensioning device 31 by means of the roller 1 in the manner described above.

In Fig. 5, the tensioning device 31 and the device 41 for clamping the printing plate front edge are merely symbolically illustrated. As the printing plates are removed, they are released by the tensioning device 31 and pushed into the lower part of the magazine 51. There, the printing plates are gripped by one or several suction cups 56 and transported by the transport device 57, until they can be deposited in the cassette 53 for receiving old printing plates.

Figs. 4 and 5 show how the device for plate changing as described in claim 1 - its further development features being set forth in the subsequent claims - can be combined with a device for semi-automatic printing plate feed as well as with a device for fully automatic printing plate feed and removal, without any changes needing to be made in its design. Thus, it is feasible to apply this device as a standardized element in semi-automatic and fully automatic plate feeding.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A device for inserting a rear edge of a printing plate on a plate cylinder of a printing press, said device including a roller disposed parallel to said plate cylinder and said roller being adapted to be pressed against said plate cylinder by actuating elements and by means of which roller, an angled rear edge of a printing plate is insertable into a tensioning device, wherein said roller is displaceably held at its ends by means of guides, said guides extending in the insertion direction of said rear edge of said printing plate and being permanently connected to a frame of said printing press and said guides being displaceable by said actuating elements and said actuating elements having a permanent connection to the printing press frame.

2. A device according to claim 1, wherein said roller is held by means of two bearings, said bearings being displaceable in said guides, and wherein said roller can be removed from said bearings.

3. A device according to claim 2, wherein said bearings consist of journals and journal mounts.

4. A device according to claim 3, wherein said journals are joined to said roller and said journal mounts are disposed in said guides.

5. A device according to claim 3 or claim 4, wherein at least one journal is held in such a manner as to be displaceable axially against a spring to such an extent that, through the axial displacement of said roller, the opposite journal is no longer retained within said journal mount, and wherein the still engaged displaceable journal is at least partly spherical and engaged within a spherical-cup-shaped journal mount which allows said roller to be swung out.

6. A device according to claim 3 or claim 4, wherein at least one journal mount is held in such a manner as to be displaceable axially against a spring to such an extent that, through the axial displacement of said roller, the opposite journal is no longer retained within said journal mount, and wherein the still engaged journal is at least partly spherical and engaged within a spherical-cup-shaped journal mount which allows said roller to be swung out.

7. A device according to any one of claims 1 to 6, wherein when a printing plate is being mounted on said plate cylinder, said roller rolls said printing plate onto said plate cylinder.

8. A device according to any one of claims 1 to 6, wherein said roller, at a distance from said plate cylinder, serves as a guide when said printing plate is being inserted.

9. A device according to any one of claims 1 to 8, wherein said actuating elements are pneumatic cylinders.

10. A device according to any one of claims 1 to 9, wherein for the absorption of the axial forces of said roller said bearings include displaceable supports on the printing-press frame.

11. A device according to claim 10, wherein said supports comprise rotatable balls, said balls running on a surface of the printing press frame.

12. A device according to any one of claims 2 to 11, wherein said bearings are located in sleeves, said sleeves being displaceable by said actuating elements and wherein said sleeves are both guidable radially with respect to the plate cylinder by guide elements and are displaceable.

13. A device according to claim 12, wherein said sleeves contain springs, with said bearings being displaceable

outwardly (viewed from the plate cylinder) against the force of said springs and wherein the spring force is so dimensioned that the risk of injury to a hand coming between said plate cylinder and said roller is minimised.

14. A device according to claim 13, wherein a lever transmits the displacement of said bearing in said sleeve to a switch, with said printing press being stopped by the signal from said switch.

15. A device according to any one of claims 1 to 14, wherein said roller consists of an inner and an outer tube, with said inner tube accommodating the roller-held parts of the bearings and with said outer tube being held on said inner tube with rolling contact bearings.

16. A device according to claim 15, wherein said roller is provided with rings, said rings projecting beyond the surface of said roller and being made of an elastic material.

17. A device according to claim 16, wherein said rings are rubber rings.

18. A device according to any one of claims 1 to 17, including a semi-automatic printing plate feed.

19. A device according to any one of claims 1 to 17, including a fully automatic printing plate feed.

20. A device according to claim 1 substantially as herein described with reference to any one of Figures 1 to 3.

DATED: 26 September 1994
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ABSTRACT

The invention relates to a device for plate changing in which, by means of a roller (1), the angled rear edge (3) of a printing plate (2) can be inserted into the tensioning device (31) of a plate cylinder (14).

Said device is intended to be of simple construction, to take up little space and to impair access to the printing unit as little as possible.

The roller (1) is held at its ends in guides (5,6) and is displaced by actuating elements (7,8), said actuating elements (7,8) being permanently connected to the printing press frame, with the roller (1) pressing in the insertion direction against the rear edge (3) of the printing plate (2). A further development of the invention provides that the roller (1) is removable, without tools and by a manual operation, from the bearings.

(Fig. 3)

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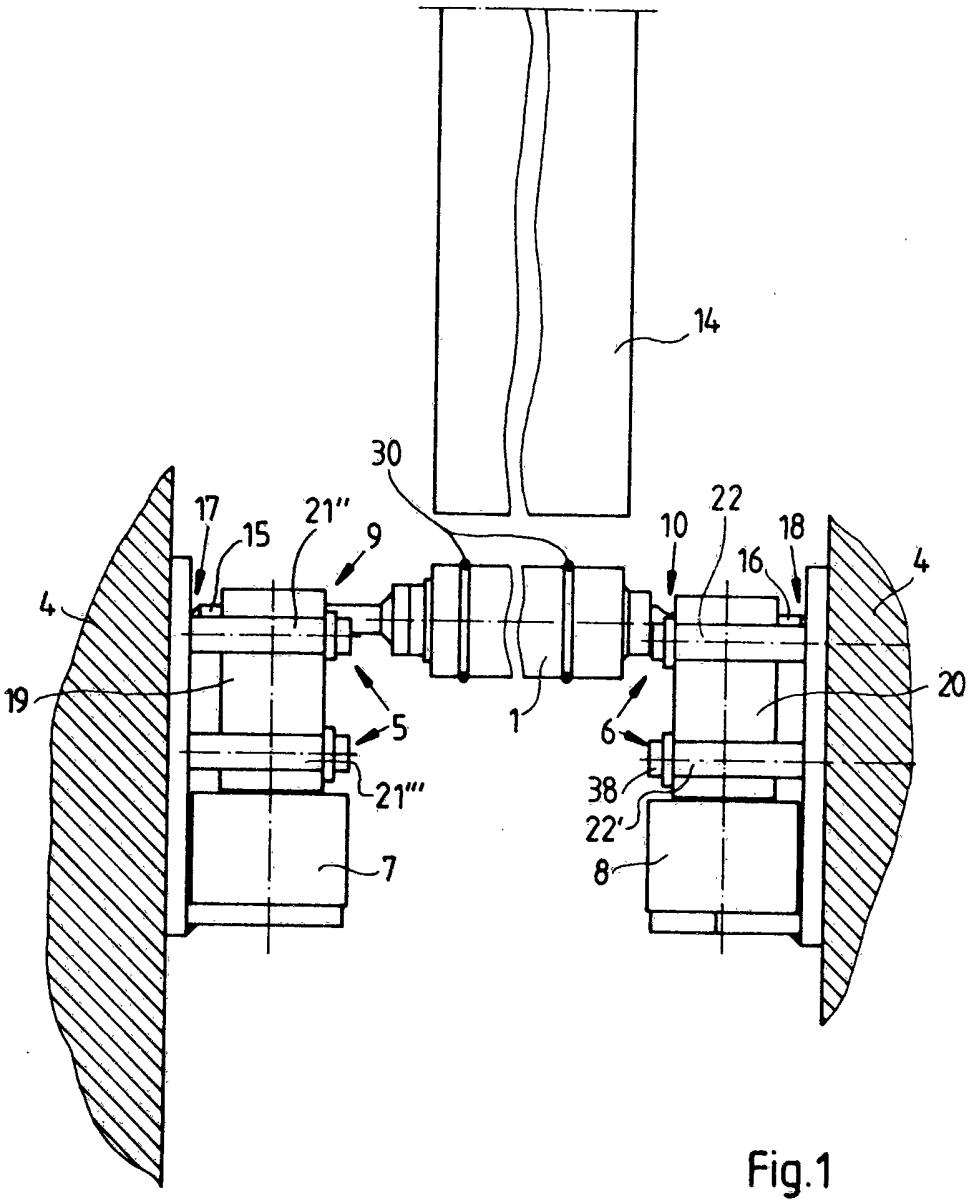

Fig.1

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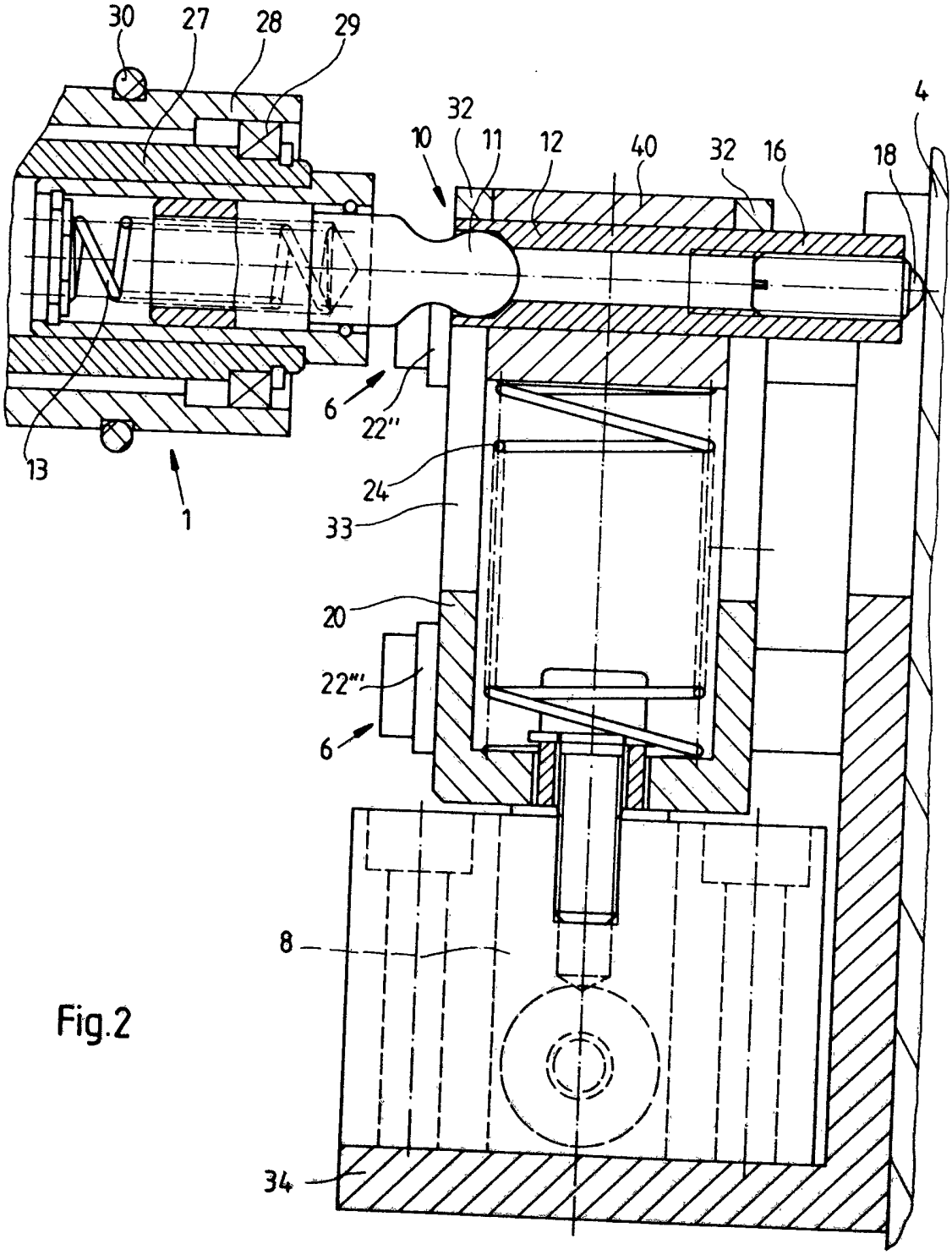

Fig.2

21306/92

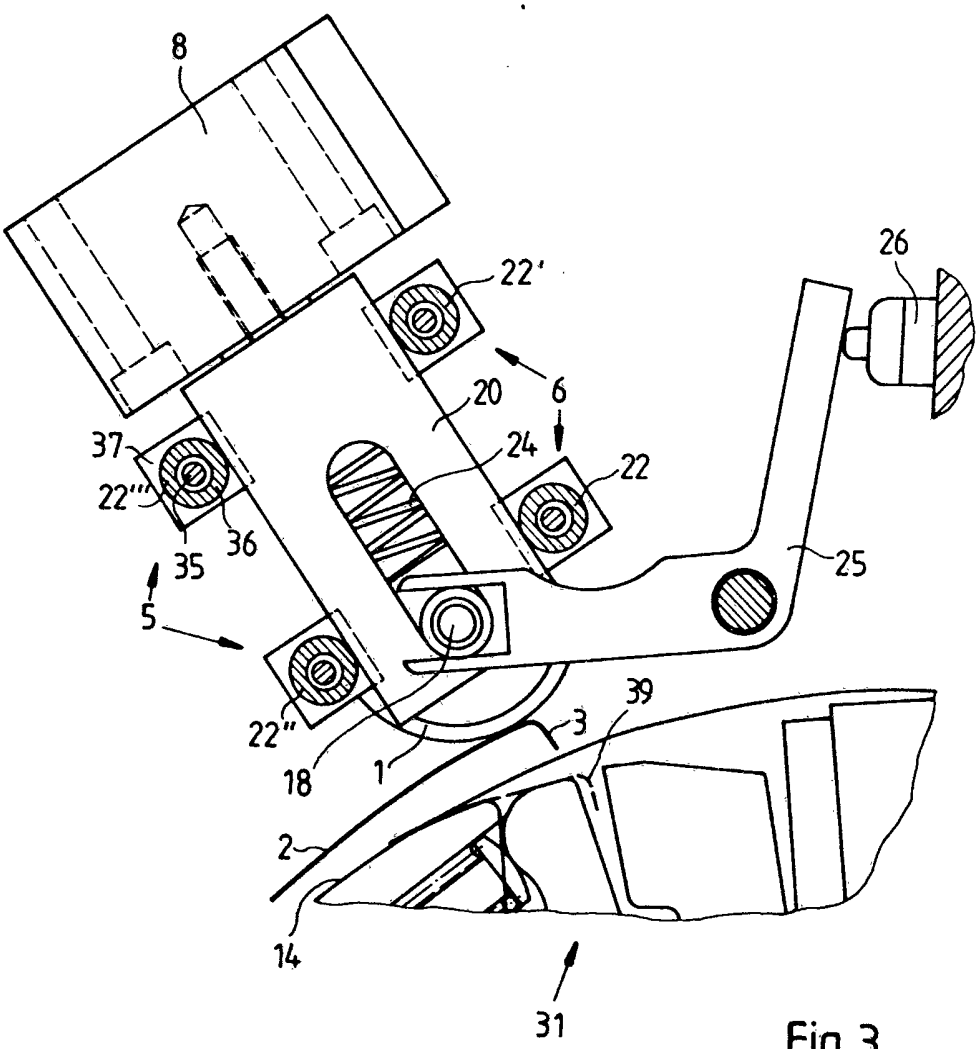

Fig.3

Fig. 4

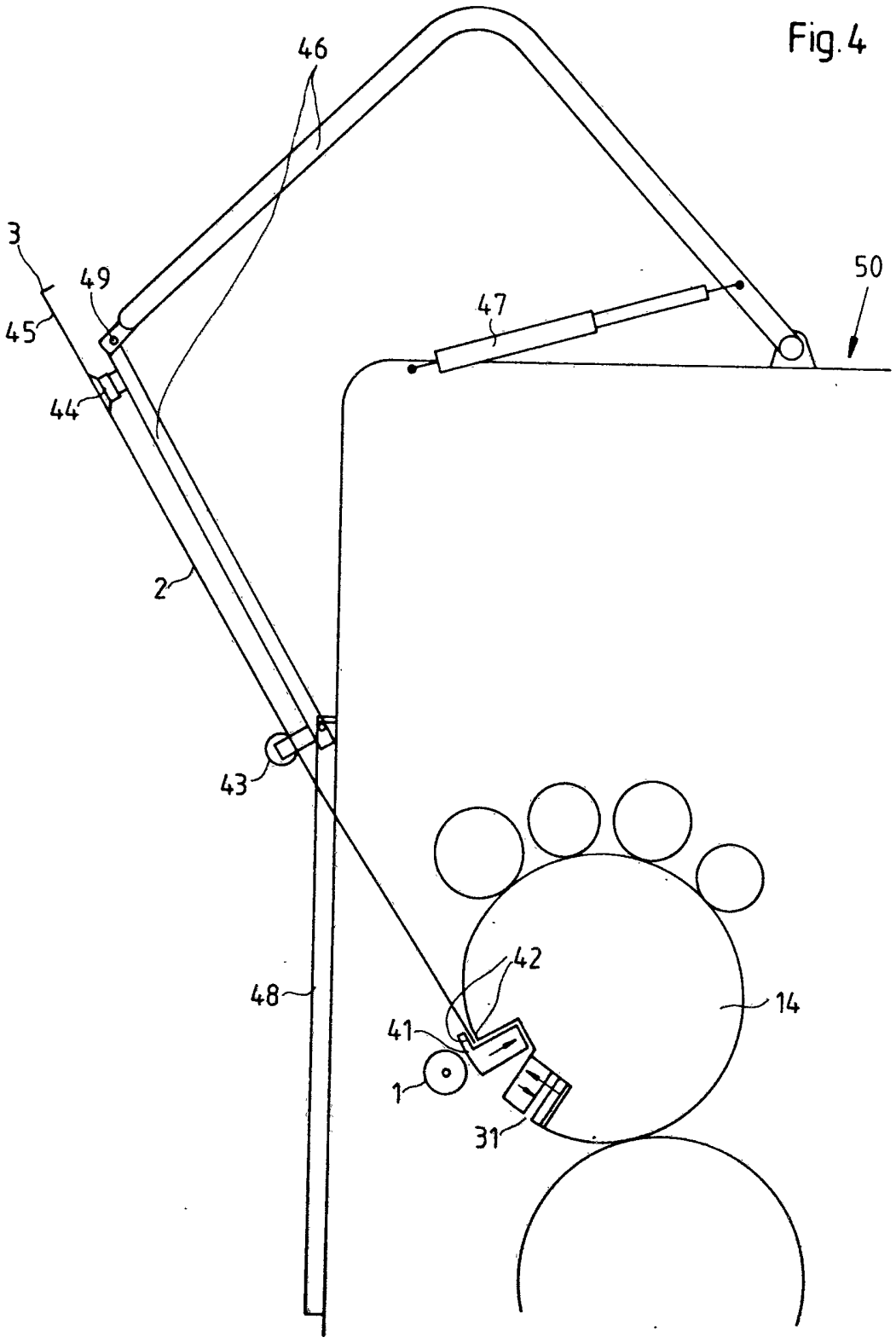

Fig.5