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⑤④ **Printing unit.**

⑤⑦ A printing unit comprises back pressure cylinder (1), a printing cylinder (5) and an inking roller (7) adjustably spaced from one another. The printing cylinder (5) and the inking roller (7) are rotatably mounted in bearing brackets (4, 6) carried on a machine frame arm (3) and urgeable, by interposition of exchangeable guide blocks (12, 13), against a machine frame surface (11) and the bearing brackets (4) of the printing cylinder (5) by means of a power unit (14). The power unit comprises one or more Fleyer chains (15) adjustably clamped at one end in the machine frame (1) by means of an eccentric lock (16). At the other end, the chains are connected via a lever (17) to a pneumatic or hydraulic cylinder (18). Between their ends, the chains (15) are passed around the bearing brackets (4, 6) via guide pulleys (19, 20) rotatably mounted on the bearing brackets (6) of the inking roller (7), at least one (20) of said guide pulleys being eccentrically mounted for tensioning said chains (15).

EP 0 132 246 A2

PRINTING UNIT

The present invention relates to a printing unit mounted on a machine frame and comprising a back pressure cylinder, a printing cylinder adjustably spaced from said back pressure cylinder, and an inking roller included in an inking device and adjustably spaced from said printing cylinder, said printing cylinder and said inking roller being mounted in bearing brackets resting upon an arm on the machine frame and urgeable, by interposition of exchangeable gauge blocks, into pressure contact with a machine frame surface and the printing cylinder bearing brackets, respectively, by means of a power unit.

One such printing unit is disclosed in DE Patent 27 46 878 where the pressure contact is established during operation of the printing unit by means of a cylinder assembly hingedly connected to the machine frame arm and actuating a lever which, in its turn, is pivotally mounted in said arm and hingedly connected to a guide. The guide can be clamped by means of a clamping device to a bar connected to the rear ends of the bearing brackets of the inking roller.

When the cylinder assembly via the said transfer elements exerts its contact pressure against the bearing brackets of the inking roller, the machine frame arm is subjected to a flexural torque, as a result of which the arm must be dimensioned with due regard to this torque and therefore will be unnecessarily heavy and expensive. Furthermore, there is the risk that the said flexural torque may cause canting of the bearing brackets resting on the machine frame arm, such that the contact pressure against the machine frame surface and the printing cylinder bearing brackets, respectively, will be unevenly distributed, whereby the spacing between on the one hand the printing cylinder and the back pres-

sure cylinder and, on the other hand, the inking roller and the printing cylinder may be difficult to maintain.

It is the object of this invention to design the printing unit referred to above in such a manner that
5 the machine frame arm is not affected by the contact pressure but is entirely relieved of this pressure, and that the bearing brackets will be entirely independent of any support from the machine frame arm.

According to the invention, this object is achieved
10 in that the contact pressure exerted by the power unit has its contact points in the machine frame within the region of the machine frame surface.

The invention will be described in more detail below, reference being had to the accompanying drawing
15 which is a schematic and lateral view of a presently especially preferred embodiment of a printing unit according to the invention.

A back pressure cylinder 1 is rotatably mounted in a machine frame 2 which has an arm 3 carrying bearing brackets 4 for a printing cylinder 5 rotatably mounted in said bearing brackets 4. Further bearing brackets 6 are mounted on the machine frame arm 3 to carry the inking device of the printing unit. The printing unit comprises an inking roller 7 cooperating with the printing cylinder 5 and engaging, in its turn, a fountain roller which dips into an ink container 9. The fountain roller 8 is mounted in the bearing brackets 6 by means of swivel arms 28. The web of material 10 travels between the back pressure cylinder 1 and the printing
20 cylinder 5.
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The machine frame 2 has a frame surface 11 against which the bearing brackets 4 of the printing cylinder can be urged by interposition of gauge blocks 12 corresponding to the diameters of the cylinders 1 and 5,
30 said bearing brackets 4 being displaceably carried on the machine frame arm 3. The bearing brackets 6 of the inking roller 7, on their part, can be urged against
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the bearing brackets 4 by interposition of gauge blocks 13 corresponding to the diameters of the printing cylinder 5 and the inking roller 7, said bearing brackets 6 also being displaceably carried on the arm 3.

5 During operation of the printing unit, the contact pressure is established by means of a power unit generally designated 14 and consisting in the embodiment illustrated of one or more juxtaposed chains 15, preferably Fleyer chains. Each chain 15 is adjustably
10 clamped at one end in the machine frame 2 by means of a self-locking eccentric lock 16. The other end of each chain 15 is connected to one arm of a lever 17 pivotally mounted in the machine frame 2 and having its other
15 arm hingedly connected to the piston rod of a pneumatic or hydraulic cylinder 18, the cylinder end of which is hingedly connected to the machine frame 2.

Between its ends, each chain 15 is passed around the bearing brackets 4 and 6 via upper and lower guide pulleys 19 and 20 rotatably mounted on the bearing
20 brackets 6 of the inking roller 7. The lower guide pulley 20 is mounted in an eccentric bush 21 which can be rotated to permit adjustable tensioning of the associated chain 15.

Upon activation of the cylinder 18, the chain 15
25 is tensioned via the lever 17 around the guide pulleys 19 and 20. With the cylinder 18 and its associated lever 17 and eccentric lock 16 located in the manner described above and illustrated in the drawing, the contact pressure exerted by the cylinder 18 has its con-
30 tact points in the machine frame 2 within the region of the frame surface 11, such that the arm 3 is entirely relieved of the contact pressure, and the bearing brackets 4 and 6 will be entirely independent of any support by the arm 3.

35 The nominal spacings between the rollers and the cylinders 1, 5 and 7 can be set exactly by means of the gauge blocks 12 and 13 in combination with the con-

tact pressure of the bearing brackets 4 and 6 against one another and against the machine frame surface 11.

Care must also be taken that any deviations from the nominal diameters of the back pressure cylinder 1, the printing cylinder 5 and the inking roller 7, as well as any unevenness of the block etc. can be equalised exactly and without play.

To this end, the printing cylinder 5 and the inking roller 7 are mounted in eccentric bushes 22 and 23 connected each to one lever 24 and 25. The free ends of said levers 24 and 25 are hingedly connected to adjusting devices 26 and 27 with micrometer screws for precise adjustment.

When the printing unit is inoperative, it suffices to cancel, via the cylinder 18, the contact pressure of the bearing brackets against the frame surface 11 to such an extent that the inherent springiness of the bearing brackets on the one hand urges the bearing brackets 4 of the printing cylinder 5 away from the frame surface 11 and the gauge blocks 12, respectively, and on the other hand urges the bearing brackets 6 of the inking roller 7 and the gauge blocks 13, respectively, away from the bearing brackets 4 of the printing cylinder 5. In this manner, the printing cylinder 5 is detached from the web 10 and from the inking roller 7.

A further advantage of the printing unit according to the invention is that its printing cylinder can be readily exchanged for another printing cylinder of different diameter. To this end, the eccentric lock 16 is unlocked by means of a suitable tool, whereupon the chain 15 is slackened by the required amount.

The return movement made possible by the cylinder stroke can be adjusted by means of the eccentrically mounted guide pulley 20. Upon exchange, the so-called minus stroke of the cylinder 18 is set, via the guide pulley 20, to maximum value. When the cylinder 18 is in the position of the maximum minus stroke, the ec-

centric lock 16 is opened. The adjusting device 26 is removed from the machine frame 2, and the bearing brackets 4 and 6 can then be pulled back. If then also the adjusting device 27 is removed, the printing cylinder 5 with its bearing brackets 6 sits loosely on the machine frame arm 3 and can easily be dismounted. If the roller or cylinder diameter is changed, different gauge blocks must be mounted. After that, the bearing brackets are again moved together until the inherent springiness of the bearing brackets 4 begins to resist. The eccentric lock 16 is locked and the cylinder 18 is moved in the opposite direction. Also the eccentrically mounted guide pulley 20 is turned to tension the chain 15. Using this guide pulley 20 to limit the stroke of the cylinder 18 is expedient in order to ensure that the spring force in the released position of the printing cylinder 5, when the machine is inoperative, can keep the bearing brackets 4 in position.

Naturally, the invention is not restricted to the embodiment described above and illustrated in the drawing, but may be modified in various ways within the scope of the appended claims. For instance, it is possible to provide, instead of one or more chains 15, other suitable elongate means, such as ropes, wires etc. Machine elements other than chains etc. may also be used in order to achieve the desired contact pressure of the bearing brackets 4 and 6 against the machine frame surface 11, and furthermore the cylinder 18 may be replaced by some other power unit in order to achieve the desired tension of the chain 15 etc.

CLAIMS

1. A printing unit mounted on a machine frame (2) and comprising a back pressure cylinder (1), a printing cylinder (5) adjustably spaced from said back pressure cylinder (1), and an inking roller (7) included in an inking device and adjustably spaced from said printing cylinder (5), said printing cylinder (5) and said inking roller (7) being mounted in bearing brackets (4, 6) resting upon an arm (3) on the machine frame and urgeable, by interposition of exchangeable gauge blocks (12, 13), into pressure contact with a machine frame surface (11) and the printing cylinder (5) bearing brackets (4), respectively, by means of a power unit (14), c h a r a c t e r i s e d in that the contact pressure exerted by the power unit (14) has its contact points (16, 17) in the machine frame (2) within the region of the machine frame surface (11).

2. A printing unit as claimed in claim-1, c h a r a c t e r i s e d in that the power unit is formed of at least one elongate member (15) which is adjustably clamped (at 16) at one end in the machine frame (1), which is connected at its other end to a power device (18), and which is passed between its ends around the bearing brackets (4, 6).

3. A printing unit as claimed in claim 2, c h a r a c t e r i s e d in that the adjustable tensioning of the one end of said elongate member (15) is accomplished by means of a self-locking eccentric lock (16).

4. A printing unit as claimed in claim 2 or 3, c h a r a c t e r i s e d in that the other end of said elongate member (15) is connected to said power device (18) via a power transmission member (17).

5. A printing unit as claimed in any one of claims 2-4, c h a r a c t e r i s e d in that the elongate member (15) is passed around the bearing brackets (4, 6).

6) via guide means (19, 20) mounted on the bearing bracket (6) of the inking roller (7).

5 6. A printing unit as claimed in any one of claims 2-5, characterised in that the elongate member is a chain (15), wire etc.

10 7. A printing unit as claimed in any one of claims 2-6, characterised in that the power device is a pneumatic or hydraulic cylinder (18), and that the power transmission member is a lever (17) which is pivotally mounted in the machine frame and whose one arm is connected to the other end of said chain (15), wire etc., the other end of said lever being connected to said cylinder (18).

15 8. A printing unit as claimed in claim 5, characterised in that said guide means are in the form of guide pulleys (19, 20), at least one (20) of which is adjustable for tensioning said chain (15), wire etc.

