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(54) **DOCTOR-BLADE DEVICE FOR INKING UNIT IN A FLEXOGRAPHIC PRINTING MACHINE**

RAKELVORRICHTUNG FÜR EIN FARBWERK IN EINER FLEXODRUCKMASCHINE

RACLE POUR GROUPE ENCREUR DANS UNE IMPRIMANTE FLEXOGRAPHIQUE

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- **PASQUET, Pierre**
17457 Riudellots de la Selva (ES)
- **ESPARCH MARTÍ, Luis**
17457 Riudellots de la Selva (ES)

(30) Priority: **16.11.2006 ES 200602914**

(74) Representative: **Gislon, Gabriele**
Torner, Juncosa i Associats, S.L.
C/Gran Via de les Corts Catalanes, 669bis 1è 2º
08013 Barcelona (ES)

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(73) Proprietor: **COMEXI GROUP INDUSTRIES, S.A.**
17457 Riudellots de la Selva (ES)

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(72) Inventors:
• **PUIG VILA, Jordi**
17457 Riudellots de la Selva (ES)

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Description

Technical Field

[0001] The present invention generally relates to a doctor-blade device forming part of an inking unit in a flexographic printing machine, and in particular to a doctor-blade device adapted so that it can be disposed of together with bands installed therein when the bands need to be replaced after use.

Background of the Invention

[0002] Flexographic printing machines generally comprise a support on which a material to be printed is supported, and several printing units arranged to print different colors thereon. Each printing unit comprises a printing roller carrying the printing plate with the motifs to be printed arranged to make contact with the surface of the material to be printed on the support, an inking roller arranged to make contact with the printing plate assembled on the printing roller, and a doctor-blade device arranged to apply ink to the surface of the inking roller. The printing roller, the inking roller and the doctor-blade device are assembled on a frame of the printing machine by means of mechanisms allowing approximation and separation movements therebetween for tasks of regulating the printing conditions, changing the liners of the rollers, changing the bands in the doctor-blade device, or maintenance.

[0003] A common construction in doctor-blade devices for inking units in flexographic printing machines of this type comprises a base body defining a groove in the longitudinal direction flanked by two bands provided with respective cantilevered portions ending in free sharp parallel edges arranged to make dynamic contact against a surface of the inking roller in a working position. At the longitudinal ends of said base body lateral sealing means are arranged to also make dynamic contact against said surface of the inking roller in said working position. When the doctor-blade device is in the working position, a surface of the mentioned groove, the two bands, a part of the outer surface of the inking roller encompassed by the two bands and said lateral sealing means delimit a chamber. The device incorporates at least one inlet port and one outlet port in communication with said chamber and in connection with ink-circulation means for continuously feeding ink into and discharging it from the inside of the chamber, such that the ink circulating through the chamber is applied to the surface of the inking roller. This surface of the inking roller, also called "anilox" roller, is very hard and comprises cells or pits which are filled with ink when they are in contact with the ink inside the chamber while the pits move from one band to the other when the inking roller rotates. The band located in the front position with respect to the rotation direction of the inking roller acts to collect the excess ink from the surface of the inking roller and to leave only the ink filling the pits.

[0004] Document WO 96/34751 describes an example of a doctor-blade device of the type described above.

[0005] The continued dynamic contact of the free edges of the bands with the pitted surface of the inking roller causes a wear of the bands, therefore they must be replaced with a certain frequency, and the mentioned lateral sealing means, which are also subjected to wear, can optionally also be replaced in the same operation. The substitution of the bands involves removing the base body from its support in the printing machine, cleaning the ink off it, disassembling the worn bands, installing the new bands and again installing the base body in the printing machine. This operation is laborious and requires a considerable labor time, with a labor cost added to a cost due to the time in which the printing machine is stopped. Generally, to prevent having the printing machine stopped the entire time that the operation lasts, there are several doctor-blade devices to have a doctor-blade device operatively installed in the printing machine while the band-changing operation is carried out in another, which involves an added equipment cost. When the color of the ink used in the inking unit is to be changed it is also necessary to remove the base body from the printing machine to thoroughly clean it before installing it again in the printing machine and connecting it to the ink-circulation means of the new color. In addition, due to the wear, the free edges of the worn bands are extraordinarily sharp; therefore the operation of cleaning and/or changing the bands of the device entails a considerable risk for the user of being cut.

Disclosure of the Invention

[0006] An objective of the present invention is to provide a doctor-blade device for an inking unit in a flexographic printing machine which allows a quick operation of substituting bands and/or lateral sealing means subjected to wear, prevents cleaning operations, and minimizes the risk for the user of being cut.

[0007] The present invention contributes to achieving the previous and other objectives by providing a doctor-blade device for an inking unit in a flexographic printing machine of the type comprising an elongated frame, assembled in said inking unit such that it can be moved close to an inking roller or moved away from the same. The mentioned frame is formed by a base body and a removable body which can be secured to said base body by securing means, for example, by snap fit coupling or by means of configurations of ribs sliding in slots. The mentioned removable body defines a chamber-forming surface facing said inking roller and comprises support configurations to support two bands arranged so as to flank said chamber-forming surface. The mentioned bands comprise respective free longitudinal edges arranged parallel to the axis of the inking roller to make dynamic contact against a cylindrical surface of the inking roller when the frame is moved close to the inking roller into a working position. The device also includes lateral

sealing means preferably supported on the removable body and arranged adjacent to opposite ends of the bands, limiting the chamber-forming surface at its longitudinal ends, to make dynamic sealing contact with said cylindrical surface of the inking roller between the two bands when the frame is in said working position. When the frame is in the working position, a chamber is formed delimited by the two bands, the mentioned lateral sealing means, the chamber-forming surface of the removable body and an area of the cylindrical surface of the inking roller encompassed by the two bands and the lateral sealing means. On the chamber-forming surface of the removable body there are arranged inlet and outlet ports adapted to be connected to ink-circulation means for feeding ink into and discharging it from said chamber during the operation of the printing machine.

[0008] The removable body can be a part obtained by extrusion, deep drawing or molding of a variety of materials including different plastics and aluminium alloy, among others. In a preferred embodiment, the removable body is a molded part of a plastic material, with the bands and optionally the tight-fitting plates partially embedded as integrated parts; therefore it is relatively inexpensive to produce, and is configured and arranged so that it can be disposed of together with the bands and replaced with a new removable body when the bands need to be replaced after use or when the color or type of ink used in the device must be changed.

[0009] With this construction, the worn bands can be substituted quickly and safely, the need to clean the chamber to change the bands and/or the lateral sealing means, or when a change of ink must be required, is avoided, and the risk for an operator of being cut by the bands is minimized.

Brief Description of the Drawings

[0010] The previous and other features and advantages will be more fully understood from the following detailed description of exemplary embodiments with reference to the attached drawings, in which:

Figure 1 is a cross-sectional view of a doctor-blade device for an inking unit in a flexographic printing machine according to a first embodiment of the present invention, in a working position in relation to an inking roller;

Figure 2 is an enlarged view of detail II of Figure 1;

Figure 3 is an enlarged view of detail III of Figure 1;

Figure 4 is a perspective view of the doctor-blade device of Figure 1 assembled;

Figure 5 is an exploded perspective view of a base body and a removable body forming the doctor-blade device of Figure 1;

Figure 6 is an exploded perspective view of the removable body of Figure 5;

Figure 7 is a cross-sectional view of a doctor-blade device for an inking unit in a flexographic printing

machine according to a second embodiment of the present invention, in a working position in relation to an inking roller;

Figure 8 is an exploded perspective view of a base body and a removable body forming the doctor-blade device of Figure 7 partially assembled; and

Figure 9 is an exploded perspective view of a variant of the doctor-blade device of Figures 7 and 8.

Detailed Description of Exemplary Embodiments

[0011] First referring to Figures 1 to 7, a doctor-blade device for an inking unit in a flexographic printing machine according to a first embodiment of the present invention is described below. The mentioned doctor-blade device comprises an elongated frame 1, prepared to be assembled in said inking unit such that it can be moved close to an inking roller 5 or moved away from the same. The figure 1 shows said frame 1 in a working position, moved close to the mentioned inking roller 5. Throughout this specification, a "longitudinal direction DL" is referred to with respect to the frame 1, or any of its components, which is parallel to the axis E of the inking roller 5 when the frame 1 is operatively installed in the printing machine, and "transverse direction DT" is taken to mean a direction substantially perpendicular to said longitudinal direction DL.

[0012] The frame 1 comprises a base body 21, adapted to be linked to a frame of the printing machine (not shown), and a removable body 15, adapted to be secured to said base body 21 by securing means 20 which will be described in greater detail below in relation to Figure 2. The mentioned removable body 15 defines a chamber-forming surface 2 facing the inking roller 5, and comprises first support configurations 16, 17 adapted to support two bands 3, 4 arranged so as to flank said chamber-forming surface 2 in the longitudinal direction DL thereof. The mentioned bands 3, 4 have cantilevered portions ending in respective free longitudinal edges 3a, 4a arranged parallel to the axis of the inking roller 5 to make dynamic contact against a cylindrical surface of the inking roller 5 when the frame 1 is moved close to the inking roller 5 in the mentioned working position. The base body 21 defines a concave receiving surface 35, and the removable body 15 has a convex rear surface 39, opposite to said chamber-forming surface 2. The mentioned rear surface is shaped to fit in said receiving surface 35 of the base body 21.

[0013] As better shown in Figures 5 to 7, the doctor-blade device includes lateral sealing means 11, 12 supported in the removable body 15. The mentioned lateral sealing means 11, 12 comprise tight-fitting plates 24, 25 housed in second support configurations 18, 19 of the removable body 15 and arranged adjacent to opposite ends of said bands 3, 4 transversely to the longitudinal direction DL of the removable body 15, such that said tight-fitting plates 24, 25 limit the chamber-forming surface 2 at its longitudinal ends. Each of said tight-fitting

plates 24, 25 has an edge 36 adapted to make dynamic sealing contact with said cylindrical surface of the inking roller 5 between the two bands 3, 4 when the frame 1 is in said working position. A resistant plate 32, 33 housed in the mentioned second support configurations 18, 19 of the removable body 15 is preferably placed between each tight-fitting plate 24, 25 and the chamber 6. In the first embodiment of Figures 1 to 7, the tight-fitting plates 24, 25 and the mentioned resistant plates 32, 33 are laterally secured by end covers 13, 14 fixed to the removable body 15, for example, by the snap fit coupling of lugs 42 formed in said end covers 13, 14 in holes 43 formed at the ends of the removable body 15. The tight-fitting plates 24, 25 will typically be made from an elastic material, such as, for example, elastomeric polymer foam, the resistant plates 32, 33 can be metal, and the end covers 13, 14 can be made from a plastic material.

[0014] When the frame 1 is in the working position shown in Figure 1, the two bands 3, 4, the tight-fitting plates 24, 25 of the lateral sealing means 11, 12, the chamber-forming surface 2 and an area of the cylindrical surface of the inking roller 5 encompassed by the two bands 3, 4 and the lateral sealing means 11, 12 delimit a chamber 6. Inlet and outlet ports 7, 8 open up on the chamber-forming surface 2 of the removable body 15, which ports in the operative position are connected to ink-circulation means for feeding ink into and discharging it from the mentioned chamber 6, causing a continuous circulation of ink through the inside of the chamber 6. The mentioned inlet and outlet ports 7, 8 comprise connection sleeves 44 (only one of which is visible in Figure 1) connected to conduits (not shown) of said ink-circulation means and in communication with openings 37, 38 formed in the receiving surface 35 of the base body 21 (Figure 5). Passages 30,31 are formed in the removable body 15 between the chamber-forming surface 2 and said rear surface 39, which passages are located so that they face said openings 37, 38 formed in the receiving surface 35 of the base body 21 when the removable body 15 is secured to the base body 21 in the working position.

[0015] Figure 3 shows sealing means arranged to seal the connection between the openings 37, 38 formed in the receiving surface 35 of the base body 21 and the openings of the passages 30, 31 on the rear surface 39 of the removable body 15 against possible ink leakages. These sealing means comprise deformable sealing rings 40 (only one of which can be seen in Figures 1 and 3), arranged in respective ring-shaped slots 41 formed around the openings 37, 38 on the receiving surface 35 of the base body 21. The mentioned sealing rings 40 tend to project from the slots 41 to press against corresponding ring-shaped surface areas around the openings of the passages 30, 31 on the rear surface 39 of the removable body 15 when the removable body 15 is secured to the base body 21 in the operative position. It must be pointed out that these sealing means are optional and can be omitted in alternative embodiments.

[0016] In the first embodiment shown in Figures 1 to

7, the mentioned securing means 20, best shown in Figure 2, comprise snap fit coupling conjugated configurations 22, 23 formed in the removable body 15 and in the base body 21, respectively. The mentioned snap fit coupling configurations 22 formed in the removable body 15 comprise surfaces formed along the entire length of outer longitudinal edges of the removable body 15, inclined at a slight angle A with respect to a transverse coupling direction DT, substantially perpendicular to the longitudinal direction DL of the frame 1, and convergent outwardly from the housing of the base body 21. In a similar way, the snap fit coupling configurations 23 formed in the base body 21 comprise surfaces formed along entire inner longitudinal edges of the base body 21, inclined the same angle A with respect to said transverse coupling direction DT, and also convergent outwardly from the housing of the base body 21. Inclined surfaces 45 formed in the removable body 15 adjacent to the snap fit coupling configurations 22 and convergent inwardly of the housing of the base body 21 allow installation and removal of the removable body 15 on/from the base body 21 by snap fit coupling in the mentioned transverse direction DT.

[0017] The base body 21 includes end stops 34 adapted to hold the removable body 15 against movements in the longitudinal direction DL when the removable body 15 is secured to the base body 21 in the operative position. Slots 46 intersecting with the corresponding configuration 23 for snap fit coupling are formed in one of said inner longitudinal edges of the base body 21. These slots 46 serve to allow the introduction of a lever-like tool to decouple the removable body 15 from the base body 21 when both are coupled in the operative position shown in Figure 4.

[0018] The removable body 15 is configured and arranged so that it can be disposed of together with the bands 3, 4 and the lateral sealing means 11, 12 when the bands 3, 4 need to be replaced after use, or when the color of the ink used in the inking unit must be changed, and to be replaced with a new removable body 15 with similar features. To that end it is enough to separate the frame 1 of the inking roller 5 using conventional movement means in the printing machine to then decouple the removable body 15 from the base body 21 in the way described above and dispose of the removed removable body 15, and finally to couple a new removable body 15 to the base body 21 by means of a light pressure exerted on the removable body 15. This operation can be carried out in a few seconds and with a minimal risk for the operator.

[0019] The removable body 15 is advantageously a molded part of a plastic material which can be manufactured with the bands 3, 4 partially embedded in their corresponding first support configurations 16, 17 as integrated parts. Although in the first embodiment shown in Figures 1 to 7 the lateral sealing means 11, 12 are adapted to be installed to the removable body 15 after being manufactured, optionally the tight-fitting plates 24, 25 and the resistant plates 32, 33 can also be included in the process

of molding the removable body 15 to be partially embedded in their corresponding second support configurations 18, 19 as integrated parts. Optionally, the removable body 15 can be manufactured by other techniques, for example by extrusion or by deep drawing, and the bands 3,4, the tight-fitting plates 24, 25, and where appropriate the resistant plates 32, 33, can later be installed on the removable body 15.

[0020] Referring now to Figures 7 and 8, a doctor-blade device below for an inking unit in a flexographic printing machine according to a second embodiment of the present invention is described, which is in all similar to the first embodiment except in the securing means 20 to secure the removable body 15 to the base body 21. In both first and second embodiments the same reference numbers have been used to designate equal or equivalent elements. The doctor-blade device of the second embodiment shown in Figures 7 and 8 thus comprises a frame 1 formed by a base body 21 and a removable body 15 provided with first support configurations 16, 17 in which two bands 3, 4 are arranged and second support configurations 18, 19 in which tight-fitting plates 24, 25 and resistant plates 32, 33 are arranged. Also in this embodiment, when the frame 1 is in the working position shown in Figure 7, the two bands 3, 4, the tight-fitting plates 24, 25 of the lateral sealing means 11, 12, the chamber-forming surface 2 and an area of the cylindrical surface of the inking roller 5 encompassed by the two bands 3, 4 and the lateral sealing means 11, 12 delimit a chamber 6, and inlet and outlet ports (only one of which can be seen in Figure 7 and is indicated with reference number 7) connected to ink-circulation means open up on the chamber-forming surface 2 of the removable body 15. These inlet and outlet ports are of a construction similar to that of the inlet and outlet ports 7, 8 of the first embodiment, and their detailed description will be omitted. Although in this second embodiment the sealing means to seal the connection between the openings 37, 38 formed in the receiving surface 35 of the base body 21 and the openings of the passages 30, 31 on the rear surface 39 of the removable body 15 have been suppressed, sealing rings 40 housed in respective ring-shaped slots 41 could be included as in the first embodiment.

[0021] In this second embodiment, the securing means 20 comprise conjugated rib 26 and slot 27 configurations formed in the removable body 15 and in the base body 21, respectively. A reverse construction would obviously be possible, with the ribs formed in the base body 21 and the slots formed in the removable body 15 with an equivalent result. The mentioned rib 26 and slot 27 configurations are formed such that the ribs 26 can be inserted into the slots 27 only in a longitudinal direction DL with respect to the axis of the inking roller 5, and once coupled they hold the removable body 15 secured to the base body 21, preventing any relative movement in the transverse direction DT. Thus, by virtue of rib 26 and slot 27 configurations, the removable body 15 can be installed

or extracted on/from the base body 21 by sliding in the longitudinal direction DL. In this second embodiment, for the purpose of holding the removable body 15 against movements in the longitudinal direction DL when the removable body 15 is secured to the base body 21 in the operative position, the end covers 13, 14 laterally securing the tight-fitting plates 24, 25 and the mentioned resistant plates 32, 33 in the second support configurations 18, 19 are adapted to be fixed to the base body 21 rather than to the removable body 15. These end covers 13, 14 can be fixed, for example, by the snap fit coupling of lugs 47 projecting from the ends of the base body 21 in holes 48 formed in the end covers 13, 14.

[0022] As in the first embodiment, in this second embodiment the removable body 15 can be a molded part of a plastic material with the bands 3, 4 partially embedded in said first support configurations 16, 17 as integrated parts. The tight-fitting plates 24, 25 and the resistant plates 32, 33 can also alternatively be included in the process for molding the removable body 15 to be partially embedded in their corresponding second support configurations 18, 19 as integrated parts.

[0023] The removable body 15 of the frame 1 of the second embodiment is obviously also configured and arranged so that it can be disposed of together with the bands 3, 4 and the lateral sealing means 11, 12 when the bands 3, 4 need to be replaced after use, or when the color of the ink used in the inking unit must be changed, and to be replaced with a new removable body 15 with similar features.

[0024] Figure 9 shows a variant of the embodiment described above in relation to Figures 7 and 8, in which the chamber-forming surface 2 of the removable body 15 comprises a third support configuration 49 in which there is supported a third band 50 having a free longitudinal edge 50a arranged parallel to the axis of the inking roller 5 to make dynamic contact against the cylindrical surface of the inking roller 5, between the free longitudinal edges 3a, 4a of the two bands 3, 4, when the frame 1 is moved close to the inking roller 5 in the working position. This third band divides the chamber 6 into first and second half-chambers, which are communicated to one another. Furthermore, in this embodiment variant, the inlet and outlet ports 7, 8 comprise plug connection means arranged in facing surfaces at contiguous ends of the base body 21 and of the removable body 15, respectively, to communicate the ink-circulation means with the mentioned first and second half-chambers when the removable body 15 is coupled to the base body 21 by means of sliding in the longitudinal direction DL of the frame 1.

[0025] For example, the inlet port 7 comprises a first connection sleeve 51 fixed to an end cover 14 joined to the base body 21. This first connection sleeve 51 is connected on the outer side to a conduit of the ink-circulation means and on the inner side to a first plug nipple 52 projecting inwardly from the end cover 14. The mentioned first plug nipple 52 is in a position facing a first socket opening 53 formed at an axial end of the removable body

15 and in communication with the first half-chamber. The outlet port 8 comprises a second connection sleeve 54 fixed to the end cover 14 joined to the base body 21 and is connected on the outer side to a conduit of the ink-circulation means and on the inner side to a second socket opening 55, whereas a second plug nipple 56, which is in communication with the second half-chamber and located in a position facing said second socket opening 55, projects outwardly from the mentioned axial end of the removable body 15. When the removable body 15 is coupled to the base body 21 by means of sliding in the longitudinal direction DL of the frame 1, the first and second plug nipples 52, 56 are automatically coupled to the first and second socket openings 53, 55. In the embodiment of Figure 9, and for the purpose of communicating the first and second half-chambers to one another, the third band 50 is shorter than the chamber-forming surface 2, such that it provides a passage between the first and second half-chambers at the end of the removable body 15 opposite to the plug connection means. However, the mentioned communication could likewise be carried out by other means, such as, for example, through holes formed in the third band or communication channels formed internally in the removable body (15).

Claims

1. A doctor-blade device for an inking unit in a flexographic printing machine, of the type comprising:

an elongated frame (1), assembled in said inking unit such that it can be moved close to an inking roller (5) or away from the same;
 a chamber-forming surface (2) associated to the frame (1) and facing the inking roller (5);
 at least two bands (3, 4) supported in said frame (1) flanking said chamber-forming surface (2), said bands (3, 4) comprising respective free longitudinal edges (3a, 4a) arranged parallel to the axis of said inking roller (5) to make dynamic contact against a cylindrical surface of said inking roller (5) when the frame (1) is moved close to the inking roller (5) in a working position;
 lateral sealing means (11, 12) supported in the frame (1) and arranged adjacent to opposite ends of said bands (3, 4) limiting the chamber forming surface (2) to make dynamic sealing contact with said cylindrical surface of the inking roller (5) between the two bands (3, 4) when the frame (1) is in said working position; and
 inlet and outlet ports (7, 8) adapted to be connected to ink-circulation means for feeding ink into and discharging it from a chamber (6) delimited by the two bands (3, 4), said lateral sealing means (11, 12), said chamber-forming surface (2) and an area of the cylindrical surface of the inking roller (5) encompassed by the two

bands (3, 4) and the lateral sealing means (11, 12) when the frame (1) is in the working position,

characterized in that said frame (1) comprises a base body (21) and a removable body (15) that can be secured to said base body (21) by securing means (20) that comprise conjugated rib (26) and slot configurations formed in the removable body (15) and in the base body (21) respectively, or vice versa, such that the ribs (26) can be inserted into the slots (27) only in a longitudinal direction DL with respect to the axis of the inking roller (5) and once coupled they hold the removable body (15) secured to the base body (21) preventing any relative movement in the transversal direction, so that the removable body (15) can be installed or extracted on/from the base body (21) by sliding in the longitudinal direction with the frame in operative position, and wherein the base body (21) includes end stops (34) adapted to hold the removable body (15) against movements in the longitudinal direction (DL) of the frame (1) when the removable body (15) is secured to the base body (21) in the operative position, wherein said removable body (15) defines the chamber forming surface (2) and comprises first support configurations (16, 17) to support the two bands (3, 4), the removable body (15) being configured and arranged so that it can be disposed of together with the bands (3, 4) when the bands (3, 4) need to be replaced after use.

2. The device according to claim 1, wherein the removable body (15) further comprises second support configurations (18, 19) to support the lateral sealing means (11, 12), the removable body (15) being configured to be disposed of together with the bands (3, 4) and the lateral sealing means (11, 12).
3. The device according to claim 1, wherein the lateral sealing means (11, 12) comprise tight-fitting plates (24, 25) arranged in said second support configurations (18, 19) of the removable body (15), each of said tight-fitting plates (24, 25) including an edge (36) adapted to make dynamic sealing contact against the cylindrical surface of the inking roller (5).
4. The device according to claim 3, wherein a resistant plate (32, 33) housed in the second support configurations (18, 19) of the removable body (15) is placed between each tight-fitting plate (24, 25) and the chamber (6).
5. The device according to claim 4, wherein said tight-fitting plates (24, 25) and said resistant plates are laterally secured by end covers (13, 14) fixed to the removable body (15) or to the base body (21).
6. The device according to claim 1, wherein the base

body (21) defines a receiving surface (35) and the removable body (15) has a rear surface (39) opposite to said chamber-forming surface (2) and shaped to fit in said receiving surface (35) of the base body (21), and said inlet and outlet ports (7, 8) comprise connection sleeves in communication with openings (37, 38) formed in the receiving surface (35) of the base body (21) and passages (30, 31) formed between the chamber-forming surface (2) and said rear surface (39) of the removable body (15) and arranged to be facing said openings (37, 38) formed in the receiving surface (35) of the base body (21) when the removable body (15) is secured to the base body (21) in the operative position.

7. The device according to claim 6, wherein sealing rings (40) are arranged in ring-shaped slots (41) formed around the openings (37, 38) in the receiving surface (35) of the base body (21) to press against corresponding ring-shaped surface areas around openings of said passages (30, 31) in the rear surface (39) of the removable body (15) when the removable body (15) is secured to the base body (21) in the operative position.
8. The device according to claim 1, wherein the chamber-forming surface (2) of the removable body (15) comprises a third support configuration (49) to support a third band (50) provided with a free longitudinal edge (5a) arranged parallel to the axis of the inking roller (5) to make dynamic contact against a cylindrical surface of said inking roller (5) between the free longitudinal edges (3a, 4a) of the two bands (3, 4) when the frame (1) is moved close to the inking roller (5) in the working position, said third band (60) dividing the chamber (6) into first and second half-chambers communicated to one another when the frame (1) is in the working position.
9. The device according to claim 6, wherein said inlet and outlet ports (7, 8) comprise plug connection means arranged in facing surfaces of contiguous ends of the base body (21) and of the removable body (15) and adapted to communicate said ink-circulation means with said first and second half-chambers when the removable body (15) is coupled to the base body (21) by means of said sliding in the longitudinal direction (DL) of the frame (1).
10. The device according to claim 1, wherein the removable body (15) is a part comprising a material selected from a group comprising a molded material, a deep-draw material, and an extruded material.
11. The device according to claim 1, wherein the removable body (15) is a moulded part made of a plastic material with the bands (3,4) partially embedded in their corresponding support configurations (16, 17)

as integrated parts.

12. The device according to claim 11, wherein said moulded part further includes the tight-fitting plates (24, 25) as integrated parts.

Patentansprüche

1. Rakelvorrichtung für ein Farbwerk in einer Flexodruckmaschine, der Art umfassend:
- einen länglichen Rahmen (1), welcher in dem genannten Farbwerk montiert ist, so dass er an eine Farbwalze (5) heranbewegt oder von derselben entfernt werden kann;
 - eine Kammerbildungsoberfläche (2), welche mit dem Rahmen (1) verbunden und zur Farbwalze (5) gerichtet ist;
 - zumindest zwei Streifen (3, 4), welche von dem genannten Rahmen (1) getragen sind und die genannte Kammerbildungsoberfläche (2) flankieren, wobei die genannten Streifen (3, 4) jeweilige freie, longitudinale Ränder (3a, 4a) umfassen, welche parallel zur Achse der genannten Farbwalze (5) angeordnet sind, um einen dynamischen Kontakt gegen eine zylindrische Oberfläche von der genannten Farbwalze (5) herzustellen, wenn der Rahmen (1) an die Farbwalze (5) in einer Arbeitsposition heranbewegt wird;
 - seitliche Abdichtungsmittel (11, 12), welche von dem Rahmen (1) getragen sind und an gegenüberliegenden Enden der genannten Streifen (3, 4) benachbart unter Eingrenzung der Kammerbildungsoberfläche (2) angeordnet sind, um einen dynamischen Abdichtungskontakt mit der genannten zylindrischen Oberfläche der Farbwalze (5) zwischen den beiden Streifen (3, 4) herzustellen, wenn sich der Rahmen (1) in der genannten Arbeitsposition befindet; und
 - Eintritts- und Austrittsöffnungen (7, 8), welche dazu angepasst sind, an Farbflussmittel angeschlossen zu werden, um Farbe in eine Kammer (6) zuzuführen und diese von derselben abzuführen, wobei die Kammer (6) von den beiden Streifen (3, 4), den genannten seitlichen Abdichtungsmitteln (11, 12), der genannten Kammerbildungsoberfläche (2) und einen von den beiden Streifen (3, 4) und den seitlichen Abdichtungsmitteln (11, 12) umschlossenen Bereich der zylindrischen Oberfläche der Farbwalze (5) begrenzt ist, wenn sich der Rahmen (1) in der Arbeitsposition befindet,
- dadurch gekennzeichnet,**
dadurch gekennzeichnet, dass der genannte Rahmen (1) einen Grundkörper (21) und einen lösbaren

- Körper (15), welcher an den genannten Grundkörper (21) mit Befestigungsmitteln (20) befestigt werden kann, umfasst, welche Befestigungsmittel (20) konjugierte Rippen- (26) und Aussparungsausbildungen umfassen, welche jeweils in dem lösbaren Körper (15) und in dem Grundkörper (21), oder umgekehrt, gebildet sind, so dass die Rippen (26) in die Aussparungen (27) nur in Längsrichtung (DL) in Bezug auf die Achse der Farbwalze (5) eingeführt werden können, und sobald sie gekoppelt sind den lösbaren Körper (15) am Grundkörper (21) befestigt halten, unter Vermeidung jeder relativen Bewegung in Querrichtung, so dass der lösbare Körper (15) auf den/von dem Grundkörper (21) durch Schieben in Längsrichtung mit dem Rahmen in der Betriebsposition installiert oder abgebaut werden kann, und wobei der Grundkörper (21) Endanschläge (34) aufweist, welche dazu angepasst sind, den lösbaren Körper (15) gegen Bewegungen in Längsrichtung (DL) des Rahmens (1) zu halten, wenn der lösbare Körper (15) an den Grundkörper (21) in der Betriebsposition befestigt ist, wobei der genannte lösbare Körper (15) die Kammerbildungsoberfläche (2) definiert und erste Stützausbildungen (16, 17) umfasst, um die beiden Streifen (3, 4) zu tragen, wobei der lösbare Körper (15) so ausgebildet und angeordnet ist, dass er zusammen mit den Streifen (3, 4) entsorgt werden kann, wenn die Streifen (3, 4) nach dessen Verwendung ausgewechselt werden müssen.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der lösbare Körper (15) zusätzlich zweite Stützausbildungen (18, 19) umfasst, um die seitlichen Abdichtungsmittel (11, 12) zu tragen, wobei der lösbare Körper (15) so ausgebildet und angeordnet ist, dass er zusammen mit den Streifen (3, 4) und den seitlichen Abdichtungsmitteln (11, 12) entsorgt werden kann.
 3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** die seitlichen Abdichtungsmittel (11, 12) eng sitzende Platten (24, 25) umfassen, welche in den genannten zweiten Stützausbildungen (18, 19) des lösbaren Körpers (15) angeordnet sind, wobei jede der genannten eng sitzenden Platten (24, 25) einen Rand (36) aufweist, welcher dazu angepasst ist, einen dynamischen Abdichtungskontakt gegen die zylindrische Oberfläche der Farbwalze (5) herzustellen.
 4. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** eine in den zweiten Stützausbildungen (18, 19) des lösbaren Körpers (15) aufgenommene widerstandsfähige Platte (32, 33) zwischen jeder eng sitzenden Platte (24, 25) und der Kammer (6) angebracht ist.
 5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die genannten eng sitzenden Platten (24, 25) und die genannten widerstandsfähigen Platten seitlich von Abschlussdeckungen (13, 14) befestigt werden, welche an den lösbaren Körper (15) oder an den Grundkörper (21) fixiert sind.
 6. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Grundkörper (21) eine Aufnahmeoberfläche (35) definiert und der lösbare Körper (15) eine hintere Oberfläche (39) hat, welche der genannten Kammerbildungsoberfläche (2) gegenüberliegt und so ausgebildet ist, dass sie in der genannten Aufnahmeoberfläche (35) des Grundkörpers (21) passt, und dass die genannten Eintritts- und Austrittsöffnungen (7, 8) Anschlussgehäusen in Verbindung mit Löchern (37, 38) umfassen, welche in der Aufnahmeoberfläche (35) des Grundkörpers (21) gebildet sind, und Durchgänge (30, 31), welche zwischen der Kammerbildungsoberfläche (2) und der genannten hinteren Oberfläche (39) des lösbaren Körpers (15) gebildet sind, und so angeordnet sind, um sich zu den genannten in der Aufnahmeoberfläche (35) des Grundkörpers (21) gebildeten Löchern (37, 38) zu richten, wenn der lösbare Körper (15) an den Grundkörper (21) in der Betriebsposition befestigt ist.
 7. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** Abdichtungsringe (40) in ringförmigen Aussparungen (41), welche um die Löcher (37, 38) in der Aufnahmeoberfläche (35) des Grundkörpers (21) gebildet sind, angeordnet sind, um gegen entsprechende ringförmige Oberflächenbereiche um Löcher der genannten Durchgänge (30, 31) in der hinteren Oberfläche (39) des lösbaren Körpers (15) zu drücken, wenn der lösbare Körper (15) an den Grundkörper (21) in der Betriebsposition befestigt ist.
 8. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Kammerbildungsoberfläche (2) des lösbaren Körpers (15) eine dritte Stützausbildung (49) umfasst, um einen dritten Streifen (50) zu tragen, welcher mit einem freien longitudinalen Rand (5a) versehen ist, der parallel zur Achse der Farbwalze (5) angeordnet ist, um einen dynamischen Kontakt gegen eine zylindrische Oberfläche von der genannten Farbwalze (5) zwischen den freien longitudinalen Rändern (3a, 4a) der beiden Streifen (3, 4) herzustellen, wenn der Rahmen (1) an die Farbwalze (5) in der Arbeitsposition heranbewegt wird, wobei der genannte dritte Streifen (50) die Kammer (6) in einer ersten und einer zweiten Kammerhälfte trennt, welche miteinander verbunden sind, wenn sich der Rahmen (1) in der Arbeitsposition befindet.
 9. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** die genannten Eintritts- und Austritts-

söffnungen (7, 8) Steckanschlussmittel umfassen, welche in gegenübergestellten Oberflächen von angrenzenden Enden des Grundkörpers (21) und des lösbaren Körpers (15) angeordnet sind, und dazu angepasst sind, die genannten Farbflussmittel mit der genannten ersten und zweiten Kammerhälfte zu verbinden, wenn der lösbare Körper (15) mit dem Grundkörper (21) durch das genannte Schieben in Längsrichtung (DL) des Rahmens (1) gekoppelt ist.

10. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der lösbare Körper (15) ein Teil ist, das ein Material ausgewählt aus einer Gruppe umfassend ein Formmaterial, ein Tiefziehmaterial und ein stranggepresstes Material umfasst.

11. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der lösbare Körper (15) ein aus Kunststoffmaterial hergestelltes Formteil ist, wobei die Streifen (3, 4, 50) teilweise in ihren entsprechenden Stützausbildungen (16, 17, 49) als integrierte Teile eingebettet sind.

12. Vorrichtung nach Anspruch 11, **dadurch gekennzeichnet, dass** die genannte Formteil ferner die eng sitzenden Platten (24, 25) als integrierte Teile umfassen.

Revendications

1. Dispositif à raclette pour mécanisme d'encrage dans une machine à imprimer flexographique, du genre comportant:

un bâti allongé (1) assemblé dans ce mécanisme d'encrage de sorte qu'il puisse être déplacé proche à un rouleau d'encrage (5) ou éloigné de celui-ci;

une surface formant une cavité (2) reliée au bâti (1) et faisant face au rouleau d'encrage (5);

au moins deux bandes (3, 4) supportées sur ce bâti (1) adjacentes à cette surface formant une cavité (2), ces bandes (3, 4) comportant des bords longitudinaux libres respectifs (3a, 4a) aménagés parallèles à l'axe de ce rouleau d'encrage (5) pour établir un contact dynamique contre une surface cylindrique de ce rouleau d'encrage (5) lorsque le bâti (1) est déplacé proche au rouleau d'encrage (5) en position de travail; des moyens d'étanchéité latéraux (11, 12) supportés sur le bâti (1) et aménagés adjacents aux extrémités opposées de ces bandes (3, 4) limitant la surface formant la cavité (2) pour établir un contact d'étanchéité dynamique avec cette surface cylindrique du rouleau d'encrage (5) entre les deux bandes (3, 4) lorsque le bâti (1) est dans cette position de travail; et

des ouvertures d'entrée et de sortie (7, 8) adaptés pour être reliés aux moyens de circulation de l'encre pour alimenter l'encre à l'intérieur et la décharger d'une cavité (6) délimitée par deux bandes (3, 4), ces moyens d'étanchéité latéraux (11, 12), cette surface formant une cavité (2) et une région de la surface cylindrique du rouleau d'encrage (5) qu'embrassent les deux bandes (3, 4) et le moyen d'étanchéité latéral (11, 12) lorsque le bâti (1) est en position de travail,

caractérisé en ce que ce bâti (1) comporte un corps de base (21) et un corps amovible (15) pouvant être fixé à ce corps de base (21) par des moyens de fixation (20), qui comprennent des configurations de nervure (26) et fente conjuguées formées dans le corps amovible (15) et dans le corps de base (21), respectivement, ou vice versa, de telle sorte que les nervures (26) peuvent être insérés dans les fentes (27) uniquement dans une direction longitudinale DL par rapport à l'axe du rouleau d'encrage (5) et, une fois couplés, ils maintiennent le corps amovible (15) fixé au corps de base (21) empêchant tout mouvement relatif dans le sens transversal, de sorte que le corps amovible (15) peut être installé ou extrait sur / à partir du corps de base (21) en coulissant dans la direction longitudinale DL du bâti en position de travail, et dans lequel le corps de base (21) comporte des butées d'extrémité (34) adaptée pour maintenir le corps amovible (15) contre les mouvements en direction longitudinale DL du bâti (1) lorsque le corps amovible (15) est fixé au corps de base (21) en position de travail, et dans lequel ce corps amovible (15) définit la surface formant la cavité (2) et comprend des premières configurations de support (16, 17) pour supporter les deux bandes (3, 4), le corps amovible (15) étant configuré et aménagé de sorte qu'on puisse l'enlever en même temps que les bandes (3, 4). lorsque les bandes (3, 4) doivent être remplacés après utilisation.

2. Le dispositif conformément à la revendication 1, dans lequel le corps amovible (15) comprend en plus des deuxièmes configurations de support (18, 19) pour supporter les moyens d'étanchéité latéraux (11, 12), le corps amovible (15) étant configuré et aménagé de sorte que l'on puisse l'enlever en même temps que les bandes (3, 4) et les moyens d'étanchéité latéraux (11, 12).

3. Le dispositif conformément à la revendication 1, dans lequel les moyens d'étanchéité latéraux (11, 12) comportent des plaques fermement raccordables (24, 25) aménagées dans ces deuxièmes configurations de support (18, 19) du corps amovible (15), chacune de ces plaques fermement raccorda-

- bles (24, 25) comprenant un bord (36) adapté pour établir un contact dynamique contre la surface cylindrique du rouleau d'encrage (5).
4. Le dispositif conformément à la revendication 3, dans lequel une plaque résistante (32, 33) hébergée dans les deuxièmes configurations de support (18, 19) du corps amovible (15) est placée entre chaque plaque fermement raccordable (24, 25) et la cavité (6).
5. Le dispositif conformément à la revendication 4, dans lequel ces plaques fermement raccordables (24, 25) et ces plaques résistantes sont assurées sur les côtés par des couvercles d'extrémité (13, 14) fixées au corps amovible (15) ou au corps de base (21).
6. Le dispositif conformément à la revendication 1, dans lequel le corps de base (21) définit une surface de réception (35) et le corps amovible (15) possède une surface arrière (39) en face de cette surface formant la cavité (2) et ayant une forme lui permettant de s'accoupler dans cette surface de réception (35) du corps de base (21), et ces ouvertures d'entrée et de sortie (7, 8) comprennent des manchons de connexion en communication avec les ouvertures (37, 38) formées dans la surface de réception (35) de la base de corps (21) et des passages (30, 31) formés entre la surface formant chambre (2) et cette surface arrière (39) du corps amovible (15) et aménagée pour être en regard de ces ouvertures (37, 38) formées dans la surface de réception (35) du corps de base (21) lorsque le corps amovible (15) est fixé au corps de base (21) en position de fonctionnement.
7. Le dispositif conformément à la revendication 6, dans lequel les bagues d'étanchéité (40) sont aménagées dans des fentes en forme d'anneaux (41) formées autour des ouvertures (37, 38) sur la surface de réception (35) du corps de base (21) pour les presser contre les régions à surface ayant la forme d'anneaux autour des ouvertures de ces passages (30, 31) sur la surface arrière (39) du corps amovible (15) lorsque le corps amovible (15) est fixé au corps de base (21) en position de fonctionnement.
8. Le dispositif conformément à la revendication 1, dans lequel la surface formant la cavité (2) du corps amovible (15) comprend une troisième configuration de support (49) pour supporter une troisième bande (50) pourvue d'un bord longitudinal libre (5a) aménagé parallèle à l'axe du rouleau d'encrage (5) pour établir un contact dynamique contre une surface cylindrique ledit rouleau d'encrage (5) entre les bords longitudinaux libres (3a, 4a) des deux bandes (3, 4) lorsque le bâti (1) est déplacé proche au rouleau d'encrage (5) en position de travail, cette troisième
- bande (50) divisant la cavité (6) en une première et une deuxième demi-cavités communiquées entre elles lorsque le bâti (1) est en position de travail.
9. Le dispositif conformément la revendication 6, dans lequel ces ouvertures d'entrée et de sortie (7, 8) comportent des moyens de connexion à insertion aménagés sur des surfaces en regard d'extrémités contiguës du corps de base (21) et du corps amovible (15) et adapté pour communiquer ces moyens de circulation d'encre à ces première et deuxième demi-cavités lorsque le corps amovible (15) est couplé au corps de base (21) au moyen de ce coulisement en direction longitudinale (DL) du bâti (1).
10. Le dispositif conformément à la revendication 1, dans lequel le corps amovible (15) est une partie comportant un matériau sélectionné d'un groupe comprenant un matériau moulé, un matériau embouti et un matériau extrudé.
11. Le dispositif conformément à la revendication 1, dans lequel le corps amovible (15) est une partie moulée faite en matière plastique les bandes (3, 4), étant intégrées en partie dans leurs configurations de support correspondantes (16, 17) comme parties intégrées
12. Le dispositif conformément à la revendication 11, dans lequel ladite partie moulée comporte en outre des plaques fermement raccordables (24, 25) comme parties intégrées.

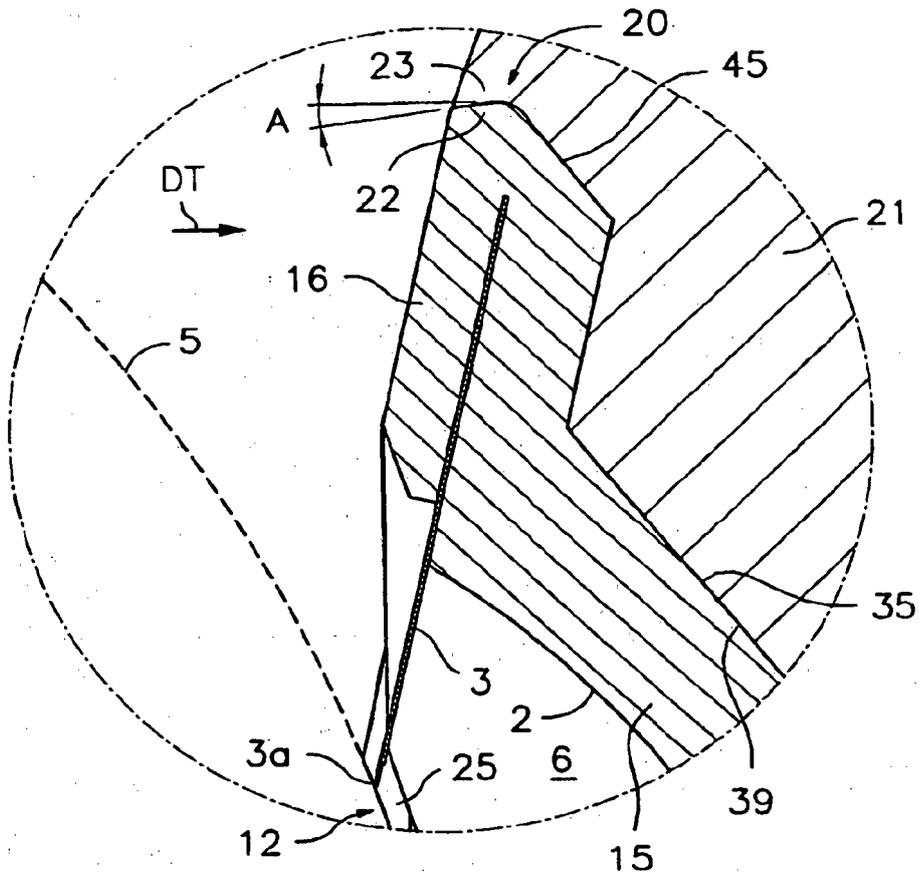


Fig. 2

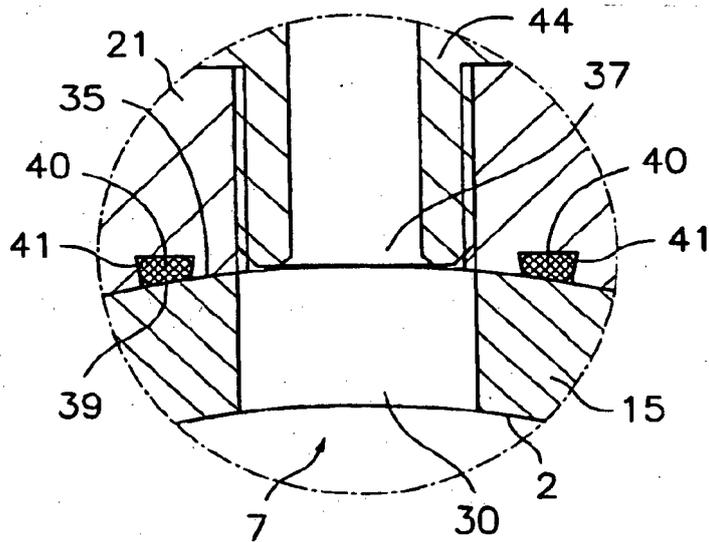


Fig. 3

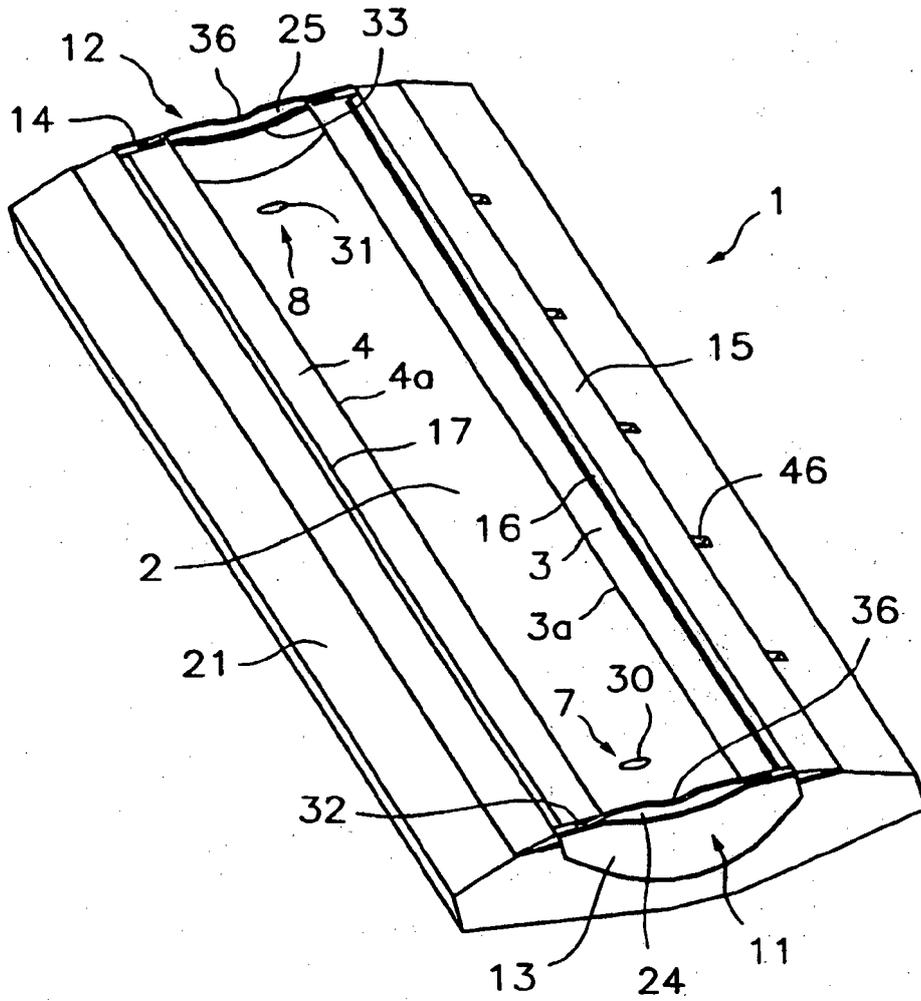


Fig. 4

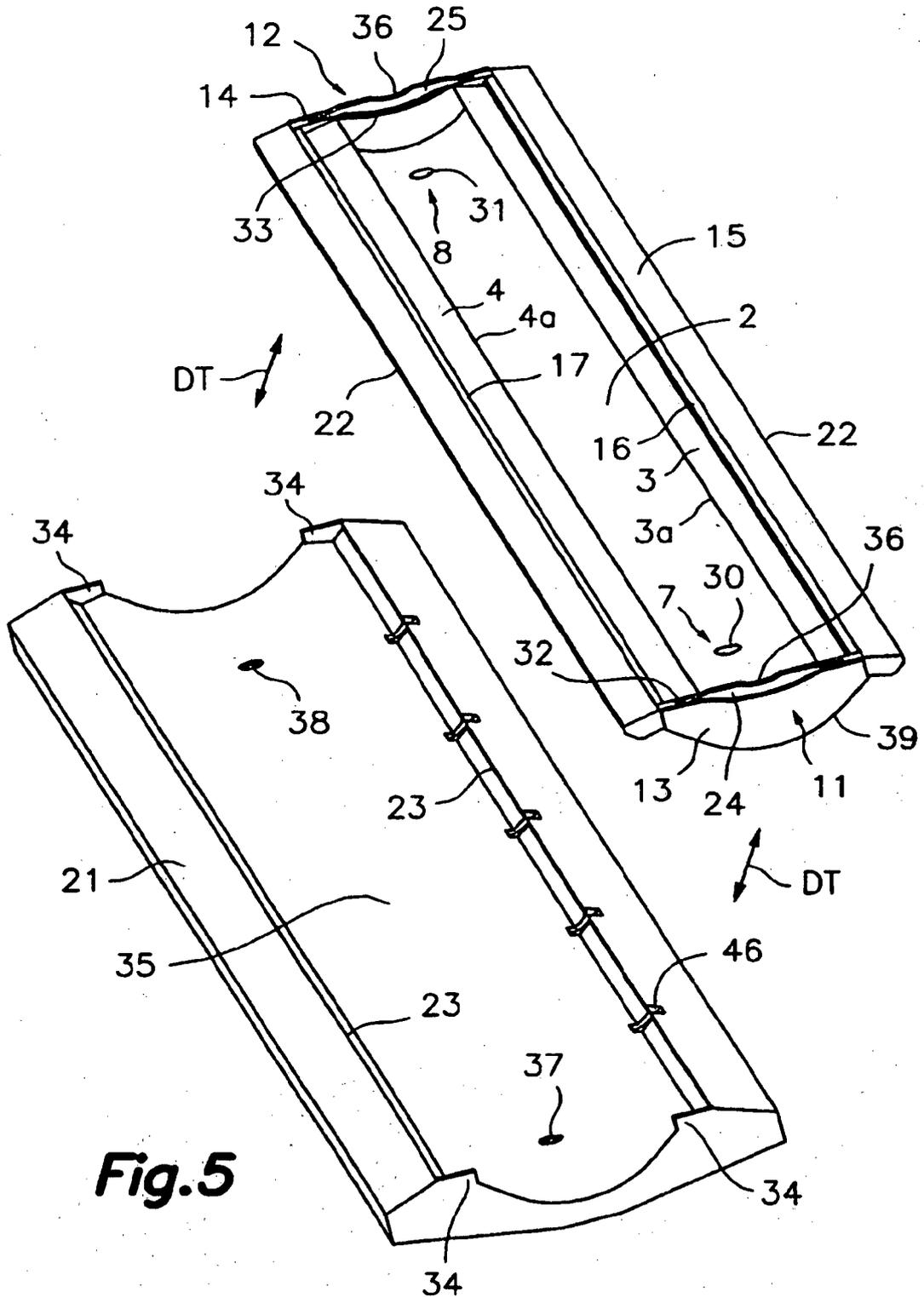


Fig.5

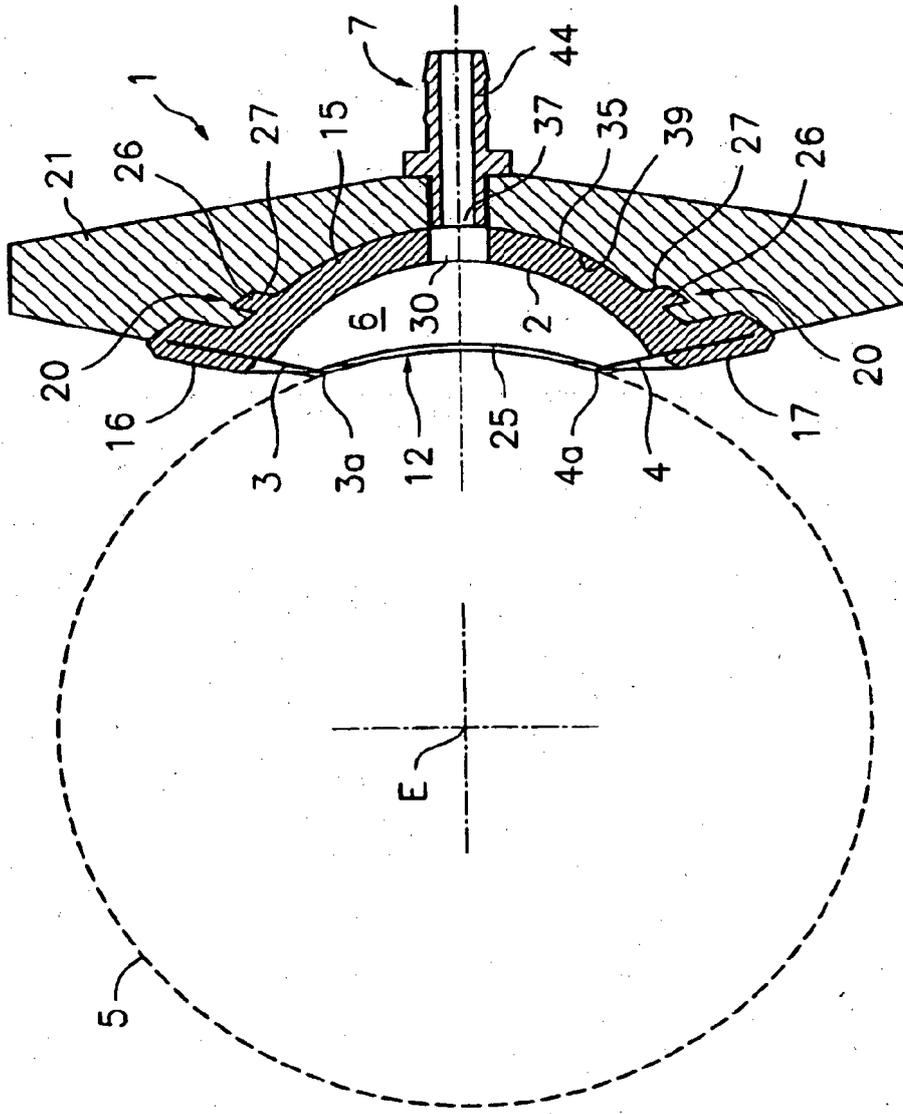


Fig. 7

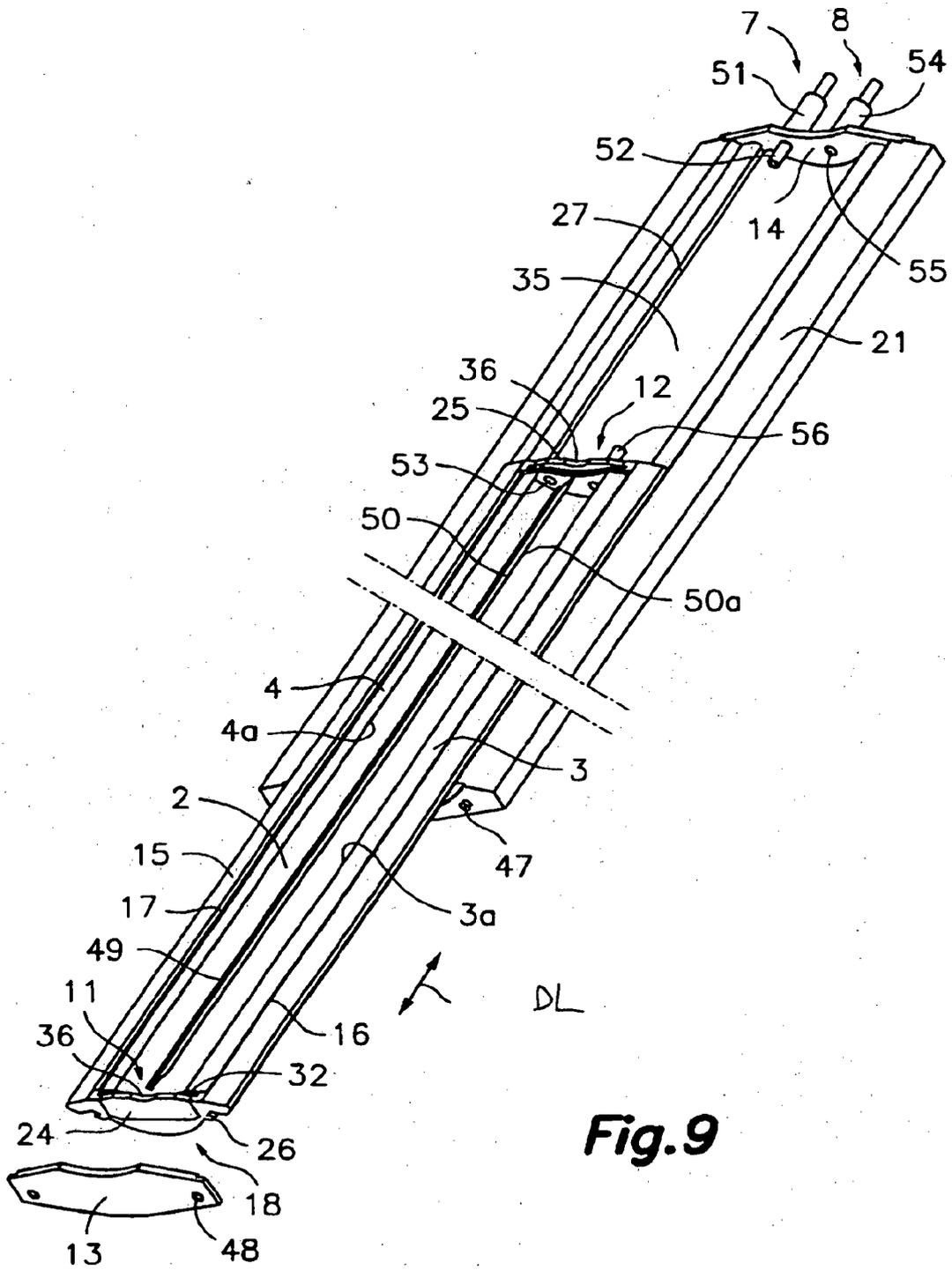


Fig.9

REFERENCES CITED IN THE DESCRIPTION

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