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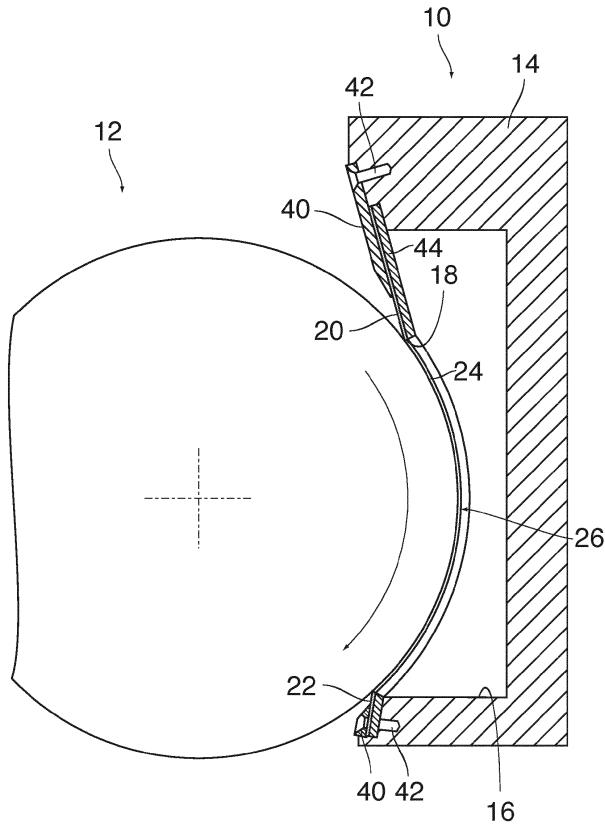
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### (54) Ink Fountain

(57) An ink fountain for inking a roller (12), the fountain (10) comprising an ink chamber (16) extending along the roller (12) and having an opening (18) that opens out towards a peripheral surface of the roller (12), said opening (18) being bounded by doctor blades (20, 22) in cir-

cumferential direction of the roller (12) and by seals (24) in axial direction of the roller, characterized in that the seals (24) and at least one of the doctor blades (20, 22) are formed by a one-piece sheet (26) that is angled at an edge of the doctor blade (20, 22).

Fig. 1



## Description

**[0001]** The invention relates to an ink fountain for inking a roller, the fountain comprising an ink chamber extending along the roller and having an opening that opens out towards a peripheral surface of the roller, said opening being bounded by doctor blades in circumferential direction of the roller and by seals in axial direction of the roller.

**[0002]** In the printing industry, ink fountains are used for inking a roller in a rotary printing press or in a so-called proofer apparatus that is used for making a colour proof prior to actual printing. For example, the roller to be inked may be a gravured inking roller or an anilox roller.

**[0003]** A conventional ink fountain has a body that forms the ink chamber, and two separate blade members made of metal are clamped to the body so as to form the doctor blades. Separate seal members are mounted on both axial ends of the body.

**[0004]** It is a drawback of this known construction that there is a risk of ink leaking out at joints formed between the doctor blades and the seal members, especially when, after a certain period of use, the doctor blades and the seals have been subject to differential wear. In order to prevent the leakage of ink, complicated and expensive mounting structures for the doctor blades and expensive seal designs are required.

**[0005]** It is an object of the invention to provide a low-cost ink fountain that can reliably prevent ink from leaking out.

**[0006]** According to the invention, in order to achieve this object, the seals and at least one of the doctor blades are formed by a one-piece sheet that is angled at an edge of the doctor blade.

**[0007]** As the seals and the doctor blade are formed in one piece, there is no joint between them, and consequently there is no risk of ink leaking out. Moreover, problems with differential wear of the doctor blade and the seals are mitigated because the seals and the doctor blade are made of the same material, e.g. metal.

**[0008]** More specific optional features of the invention are indicated in the dependent claims.

**[0009]** In a preferred embodiment, the one-piece sheet forms two doctor blades that are connected by the seals. For example, the doctor blade and seal structure may be formed by cutting or punching a rectangular opening into a blank of sheet metal so as to obtain a sheet metal frame the longitudinal legs of which will form the doctor blades whereas the shorter legs will form the seals.

**[0010]** At least one of the doctor blades may have a sharpened edge for engaging the roller.

**[0011]** In order to provide a perfect seal between the sheet and the body forming the ink chamber, and in order to be able to evenly bias the doctor blades and the seals against the surface of the roller, a resilient cushion may be provided between the sheet and the body of the ink fountain.

**[0012]** The ink fountain according to the invention is particularly suited for use in a proofer apparatus, e.g. a

proofer apparatus of the type described in applicant's co-pending European patent application EP 11 155 963.9 filed on February 25, 2011.

**[0013]** A preferred embodiment of the invention will now be described in conjunction with the drawings, wherein:

Fig. 1 is a schematic cross-sectional view of an ink fountain according to an embodiment of the invention;

Fig. 2 is a perspective view of a sheet forming doctor blades and seals of the ink fountain; and

Fig. 3 is an enlarged cross-sectional view of an edge of a doctor blade and an adjoining seal portion.

**[0014]** As is shown in Fig. 1, an ink fountain 10 is set against a peripheral surface of an a gravured inking roller 12 of a proofer apparatus, so that ink may be applied to the surface of the inking roller. The ink fountain 10 has a body 14 defining an ink chamber 16 that extends in axial direction along the inking roller 12 and has an opening 18 that opens out towards the surface of the inking roller. The ink chamber 16 may be filled with liquid ink via a supply passage that has not been shown in the drawing.

**[0015]** The opening 18 of the ink chamber 16 is bounded in circumferential direction of the inking roller 12 by an upstream doctor blade 20 and a downstream doctor blade 22. The terms "upstream" and "downstream" refer to the direction of a rotation of the inking roller 12 that is indicated by an arrow in Fig. 1.

**[0016]** In axial direction of the inking roller 12, the opening 18 is bounded by arcuate seals 24 that engage the peripheral surface of the inking roller and interconnect the two doctor blades 20, 22. In the cross-sectional view in Fig. 1, only one of the seals 24 is visible.

**[0017]** As is shown in Fig. 2, the doctor blades 20, 22 and the seals 24 are formed by a one-piece sheet 26, e.g. a thin sheet of spring steel which may have a thickness in the order of magnitude of 0.15 mm.

**[0018]** The doctor blade 20 forms an edge 28 that delimits the opening 18, and it is angled from the seals 24 along a straight line 30 that coincides with the edge 28. Similarly, the downstream doctor blade 22 has an edge 32 and is angled from the seals 24 along a straight line 34 that coincides with the edge 32.

**[0019]** In the mounted position shown in Fig. 1, the angle formed between the doctor blade 20 and the peripheral surface of the inking roller 12 (or, more precisely, the tangent thereto) is approximately 23°. When the inking roller 12 rotates in the direction of the arrow in Fig. 1, the edge 28 wipes over the surface of the inking roller, so that the doctor blade 20 retains the ink in the ink chamber 16.

**[0020]** The edge 32 of the downstream doctor blade 22 forms an angle of approximately 39° with the surface

of the inking roller 12. The doctor blade 22 projects towards the surface of the inking roller 12 in the direction opposite to the direction of movement of that surface, so that the edge 32 scrapes over the surface of the inking roller. Typically, the inking roller has a pattern of minute pits which are filled with ink when the surface of the inking roller passes through the ink chamber 16. Then, when the surface passes the edge 32, the ink is scraped off from the surface of the inking roller, so that ink remains only in the pits thereof.

**[0021]** The configuration of the doctor blades 20, 22 and the seals 24 shown in Fig. 2 may be obtained by cutting or punching the rectangular opening 18 out of a flat blank for the sheet 26 and pressing the sheet into the shape shown in Fig. 2. As a result, the sheet 26 takes the configuration of a rectangular frame with the doctor blades 20 and 22 as longer (longitudinal) legs and the seals 24 as shorter legs.

**[0022]** The process of punching and pressing may be performed in a single operation. Alternatively, the opening 18 may be cut out while the sheet is still in a flat shape, and the sheet is pressed into the desired shape in a subsequent separate step. This may have the result that the edge 32 engages the surface of the inking roller with an acute knife edge 36 as is shown in Fig. 3. This effect may be enhanced by forming minute incisions 38 (Fig. 2) at both ends of the edge 32. It should be noted that the depth of the incisions 38 has been exaggerated in Fig. 2 for illustration purposes. In practice, the depth of these incisions will be smaller than the thickness of the sheet metal forming the sheet 26.

**[0023]** As an alternative, the acute knife edge 36 may also be formed by post-processing the edge 32, e.g. by sharpening the same in a grinding or hammering process.

**[0024]** As is shown in Fig. 1, the sheet 26 is secured to the body 14 of the ink fountain by means of clamping plates 40 and bolts 42. A resilient cushion layer 44 is interposed between the sheet 26 and the body 14 of the ink fountain. The cushion layer 44 is congruent with the sheet 26 and consequently has a rectangular opening corresponding to the opening 18. When the bolts 42 are tightened, the clamping plates 40 press the doctor blades 20 and 22 against the body 14 and slightly compress the cushion layer 44. The cushion layer 44 serves a seal between the sheet 26 and the body 14 of the ink fountain and also permits to resiliently bias the edges of the doctor blades 20, 22 as well as the seals 24 against the surface of the inking roller 12, thus assuring a good line contact between the doctor blades and the inking roller and a good surface contact between the seals 24 and the inking roller.

5 the roller (12) and having an opening (18) that opens out towards a peripheral surface of the roller (12), said opening (18) being bounded by doctor blades (20, 22) in circumferential direction of the roller (12) and by seals (24) in axial direction of the roller, **characterized in that** the seals (24) and at least one of the doctor blades (20, 22) are formed by a one-piece sheet (26) that is angled at an edge (28, 32) of the doctor blade (20, 22).

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2. The ink fountain according to claim 1, wherein the sheet (26) is made of metal.

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3. The ink fountain according to claim 1 or 2, wherein the sheet (26) forms two parallel doctor blades (20, 22) that are interconnected at both ends by the seals (24).

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4. The ink fountain according to any of the preceding claims, wherein the edge (32) of at least one of the doctor blades (20, 22) is configured to engage the surface of the roller (12) with a sharpened knife edge (36).

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5. The ink fountain according to any of the preceding claims, wherein an elastic cushion layer (44) is interposed between the sheet (26) and a body (14) of the ink fountain (10).

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6. A proofer apparatus comprising an ink-accepting roller (12), **characterized by** an ink fountain (10) according to any of the preceding claims for inking the roller (12).

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## Claims

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1. An ink fountain for inking a roller (12), the fountain (10) comprising an ink chamber (16) extending along

Fig. 1

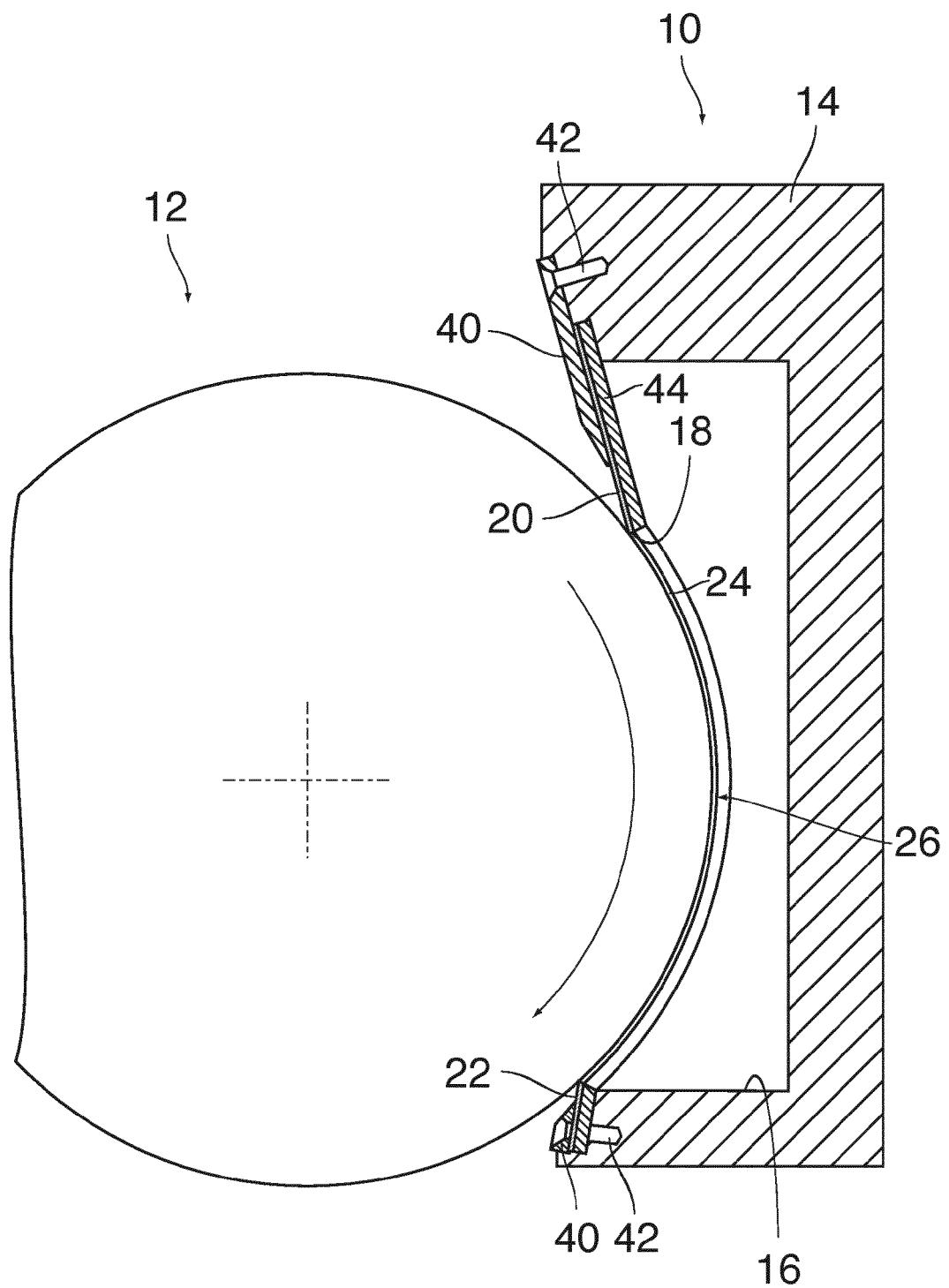


Fig. 2

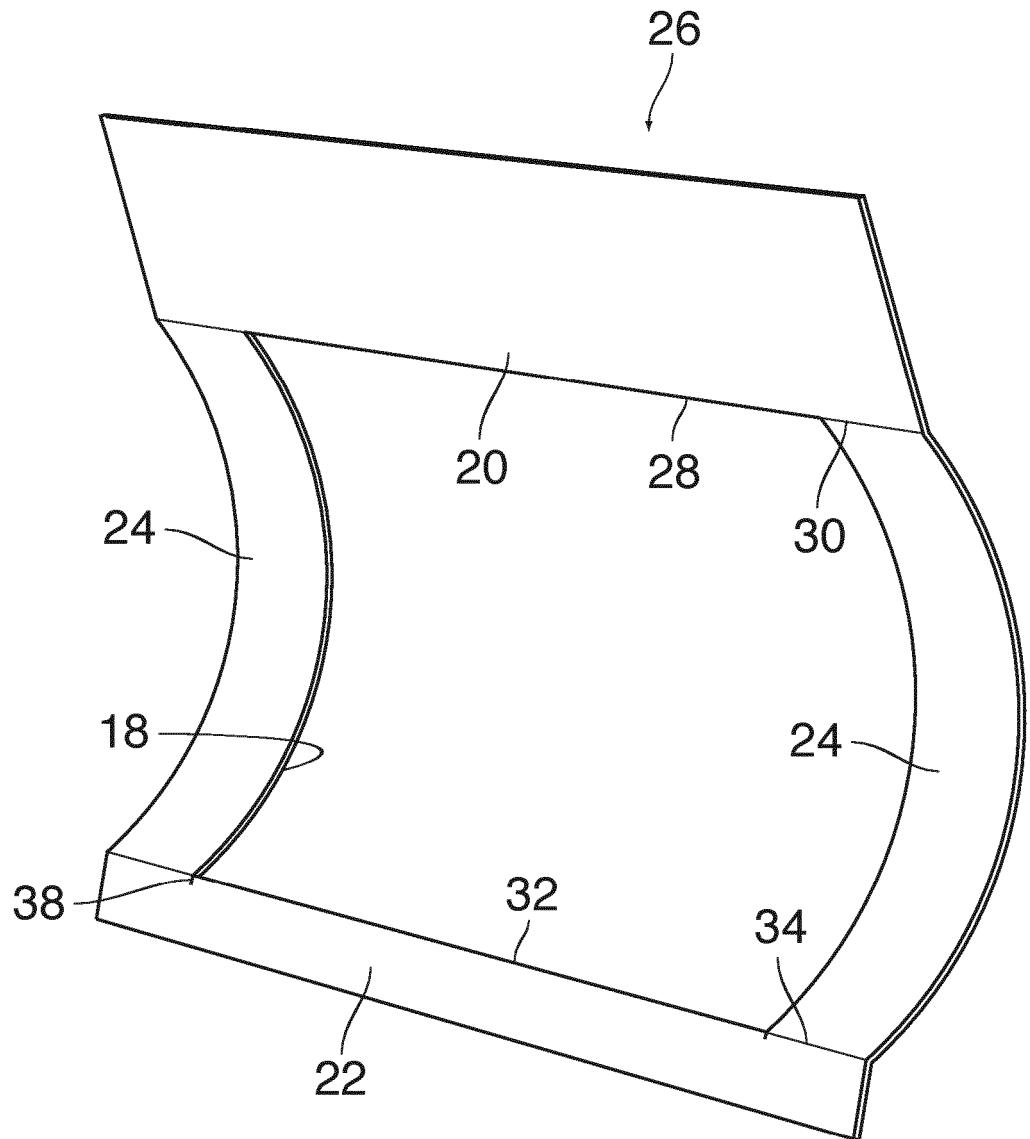
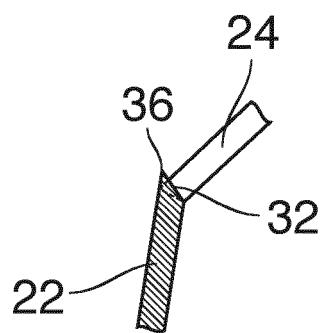


Fig. 3





## EUROPEAN SEARCH REPORT

Application Number  
EP 11 19 2758

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	US 2 595 070 A (EUGENE GARRAHAN) 29 April 1952 (1952-04-29) * the whole document * -----	1-6	INV. B41F9/06 B41F9/10 B41F31/06 B41F31/07
A	EP 0 374 710 A2 (ROLAND MAN DRUCKMASCH [DE]) 27 June 1990 (1990-06-27) * the whole document * -----	1-6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
1	Place of search	Date of completion of the search	Examiner
	Munich	22 May 2012	Fox, Thomas
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 19 2758

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22-05-2012

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**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- EP 11155963 A [0012]