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(54) **Distribution inking unit**

(57) Distribution inking unit for use with printing groups, and particularly rotoprint printing groups comprising a printing cylinder (2), a pan (1) containing the ink or another fluid for said printing cylinder (2), a container (8) for the working ink or other working fluid, and pump means for pumping the ink or other fluid from said container (8) to said pan (1) and vice versa, characterized

by the fact that the said pumping means is a unidirectional hydraulic pump (11) and that in the circuit between the suction side and the delivery side of said pump (11) a four ways and two positions valve (10) is inserted which, in a first switching position direct the fluid from the container (8) to the pan (1) and which in a second switching position is sucking the fluid from the said pan 1, sending it to said container (8)

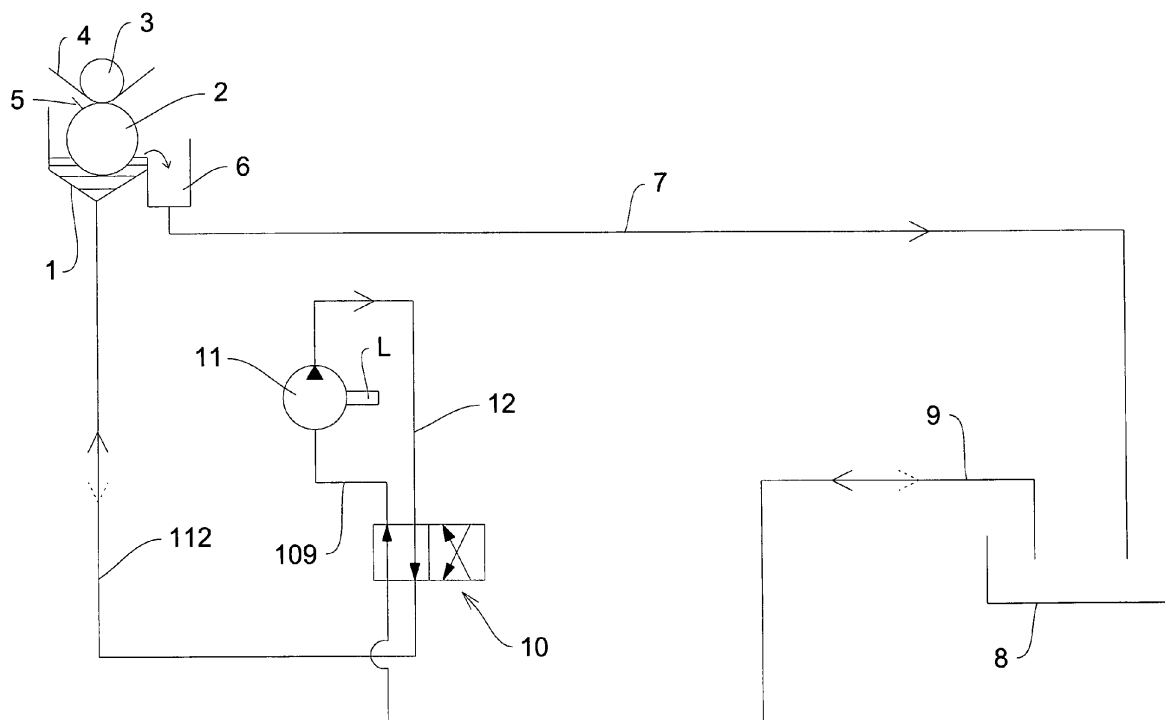


Fig. 1

Description

Technical Field

[0001] The present invention relates to the distribution inking units for use with rotating print cylinders, in particular print cylinders of gravure or rotogravure printing presses.

Background Art

[0002] Distribution inking units are known in the field of printing apparatuses, in particular rotogravure printing presses in which a gravure printing roller, pressed by a pressing roller, applies ink or the like onto a film or web material to be printed. A blade, called doctor blade, is arranged adjacent and substantially parallel to the rotation axis of the printing roller, and said blade is aimed at wiping off the excess of ink from the engraved surface of the printing roller before it contacts the material to be printed. A pan containing the ink or other substances to be applied to the material to be printed is usually provided beneath the printing roller, in such a position that the printing roller can be wet by the ink or the substance in the pan during its rotation.

[0003] The material to be printed is generally fed to the printing roller by a pressing roller, which is in close proximity of the printing roller so that the material can contact a generating line of the printing roller downstream of the ink pan and can be printed according to the pattern engraved on the printing roller.

[0004] In order to supply the ink to the printing roller, distribution inking unit are generally used that pumps the ink or other substances for printing to the inking pan.

Disclosure of Invention

[0005] The aim of the distribution inking unit according to the invention is to permit a smartly management of the ink or the other substances used in a gravure printing unit.

[0006] The distribution inking unit has the following purposes:

- supply ink or other printing substances to the ink pan;
- recovery of unused ink of the working process at the end of printing;
- recovery of the ink used that you no longer want to use;
- recovery of the solvent used for the cleaning of the printing cylinder and the ink pan.

[0007] In accordance with the purposes described above, an object of the invention is the reduction of the time management of the ink between the various printing phases.

[0008] A further object is the reduction of waste and residues of the inks used in printing processes.

[0009] Further characteristics and advantages of the

present invention will become better apparent from the following description of some embodiments thereof, shown only by way of non-limitative examples in the accompanying drawings.

Brief description of the drawings:

[0010]

Figure 1 shows the functional layout of the distribution inking unit according to a first embodiment of the invention with the four-way two-position valve switched in a first operating position.

Figure 2 is a view similar to that of Figure 1, with the four-way two-position valve switched in a second operating position

Figure 3 shows the functional layout of the group distribution inking unit according to a second embodiment of the invention.

Figure 4 shows the functional layout of the distribution inking unit according to a third embodiment of the invention.

Best Mode for Carrying Out the Invention

[0011] With reference to Figure 1, numeral 1 denotes the ink pan of printing apparatus, in particular a rotogravure printing press. Number 2 denotes the printing roller, which is wetted by the ink contained in the pan 1. 3 is a pressing roller, which presses the web material 4 against the printing roller, and 5 is a doctor blade, which cooperates with the printing roller upstream of the printing station to remove excess of ink from the printing roller.

[0012] Numeral 6 is a pan receiving excess of ink from the ink pan 1. The pan 6 is connected through line 7 to the main container 8. Number 9 is denoting a line connecting the working ink container 8 to the four-way two-position valve 10. With the valve 10 in the state shown in Figure 1 (inlet state) the ink from line 9 is fed through valve 10 and line 109 to the suction side of the unidirectional pump 11, from which it is pumped through line 12, valve 10, line 112 to the ink pan 1.

[0013] The operation of the described device will be evident. With the pump 11 in operation, and with the valve 10 in the inlet state, the ink will be sucked from the container 8 and pumped to the pan 1, and from this pan through pan 6 and line 7, it will be returned to container 8.

[0014] When the valve 11 is switched to the outlet state via a hand lever L, as shown in Figure 2, the flow of the liquid is reversed with the pump still working in the same direction, and the ink is sucked from pan 1, through line 112, valve 10, line 109, pump 11, line 12, valve 10, line 9 and is discharged in the container 8.

[0015] In Figure 3 a second embodiment of the invention is shown. According to this embodiment, a three-way two position valve 13 is inserted in line 9, and this valve 13 allows to decide how to handle the discharge coming from the ink pan 1. If the valve is in the condition shown

in this figure, the ink from the ink pan 1 is discharged back to the working ink container 8 in equal way as described with reference to the embodiment of Figure 2.

[0016] If however the valve 13 is switched via a manual lever, the flow of liquid is diverted from line 9 to line 14 up to a second container 15.

[0017] This can be very useful in the ink management; the ink used in pan 1, for several possible reasons, can be deposited in a different container instead as to be returned to the same container where it was aspirated.

[0018] The use of the valve 13, and therefore the ability to divert the exhaust fluid is useful in the cleaning phase of the ink pan and of the printing cylinder during the changing work phase.

[0019] In this way, using only solvent for the cleaning, it can be recovered to obtain several advantages: cost savings, improvement of working conditions and respect for environment by entering into atmosphere less harmful gases (all solvent recovered dopes not evaporate decreasing the percentage of gases derived from evaporation)

[0020] According to a third embodiment of the invention, shown in Figure 4, a refrigerating system, in the form for instance of the evaporator or heat exchanger 16 of a refrigerating circuit (not shown), is provided for the refrigeration of the body of the valve 10, thus maintaining the temperature of the ink circulating through said valve at a desired value useful for improving the printing process.

3. Distribution inking unit according to any one of the claims 1 or 2, **characterized by** the fact that it further comprises means for the refrigeration of the body of the said valve (10) in order to refrigerate the fluids circulating through said valve, avoiding in this way to add additional heat exchanger surfaces.

Claims

1. Distribution inking unit for use with printing groups, and particularly rotoprint printing groups comprising a printing cylinder (2), a pan (1) containing the ink or another fluid for said printing cylinder (2), a container (8) for the working ink or other working fluid, and pump means for pumping the ink or other fluid from said container (8) to said pan (1) and vice versa, **characterized by** the fact that the said pumping means is a unidirectional hydraulic pump (11) and that in the circuit between the suction side and the delivery side of said pump (11) a four ways and two positions valve (10) is inserted which, in a first switching position direct the fluid from the container (8) to the pan (1) and which in a second switching position is sucking the fluid from the said pan 1, sending it to said container (8)
2. Distribution inking unit according to claim 1, according to which in the hydraulic circuit between said valve (10) and said container (8) a three way two position valve (13) is inserted which in a first switching position is establishing again continuity the of the fluid course between said pump (11) and said container (8), whilst in a second switching position it divert the flux of fluid from the pump (11) to a second auxiliary container (15).

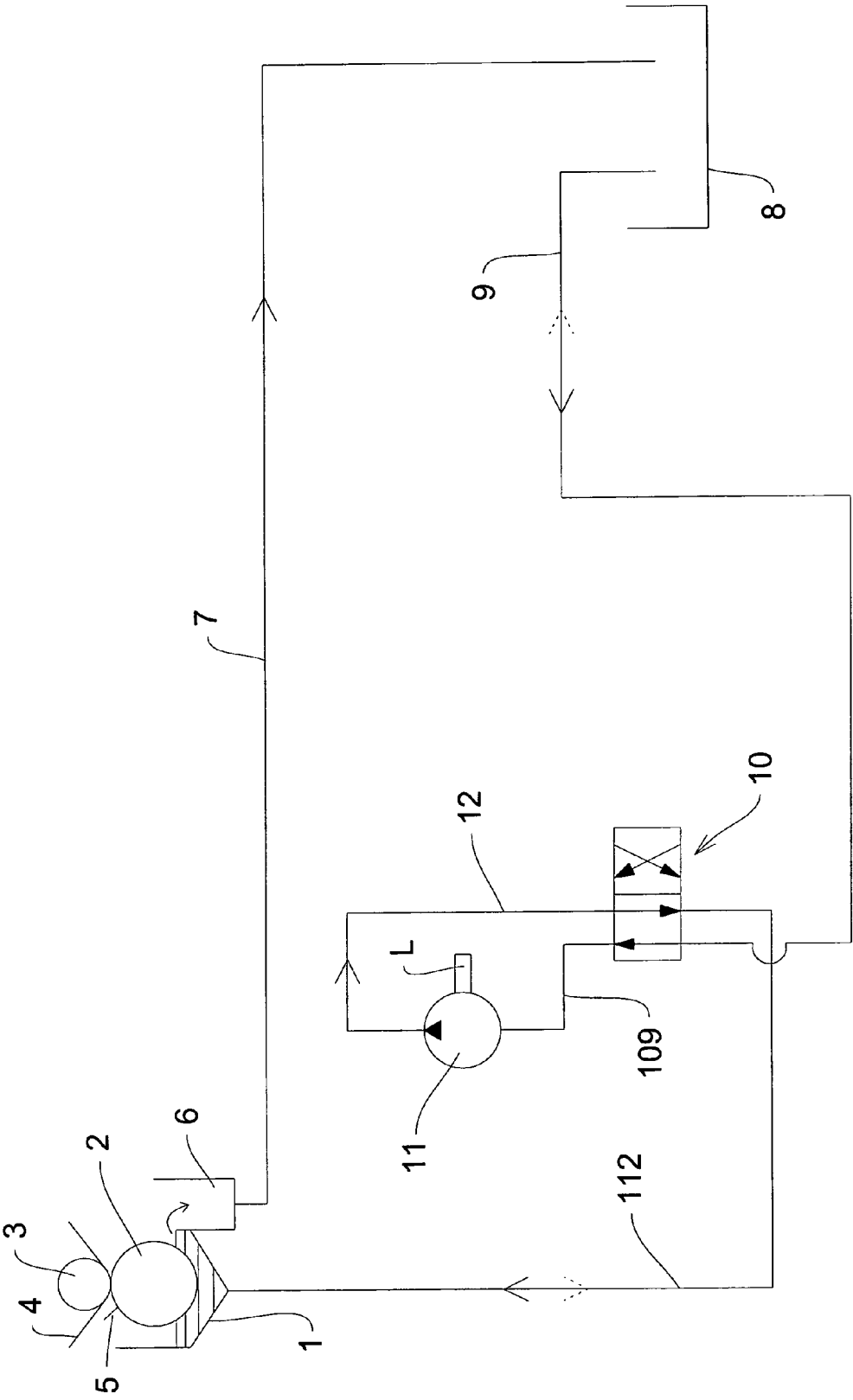


Fig. 1

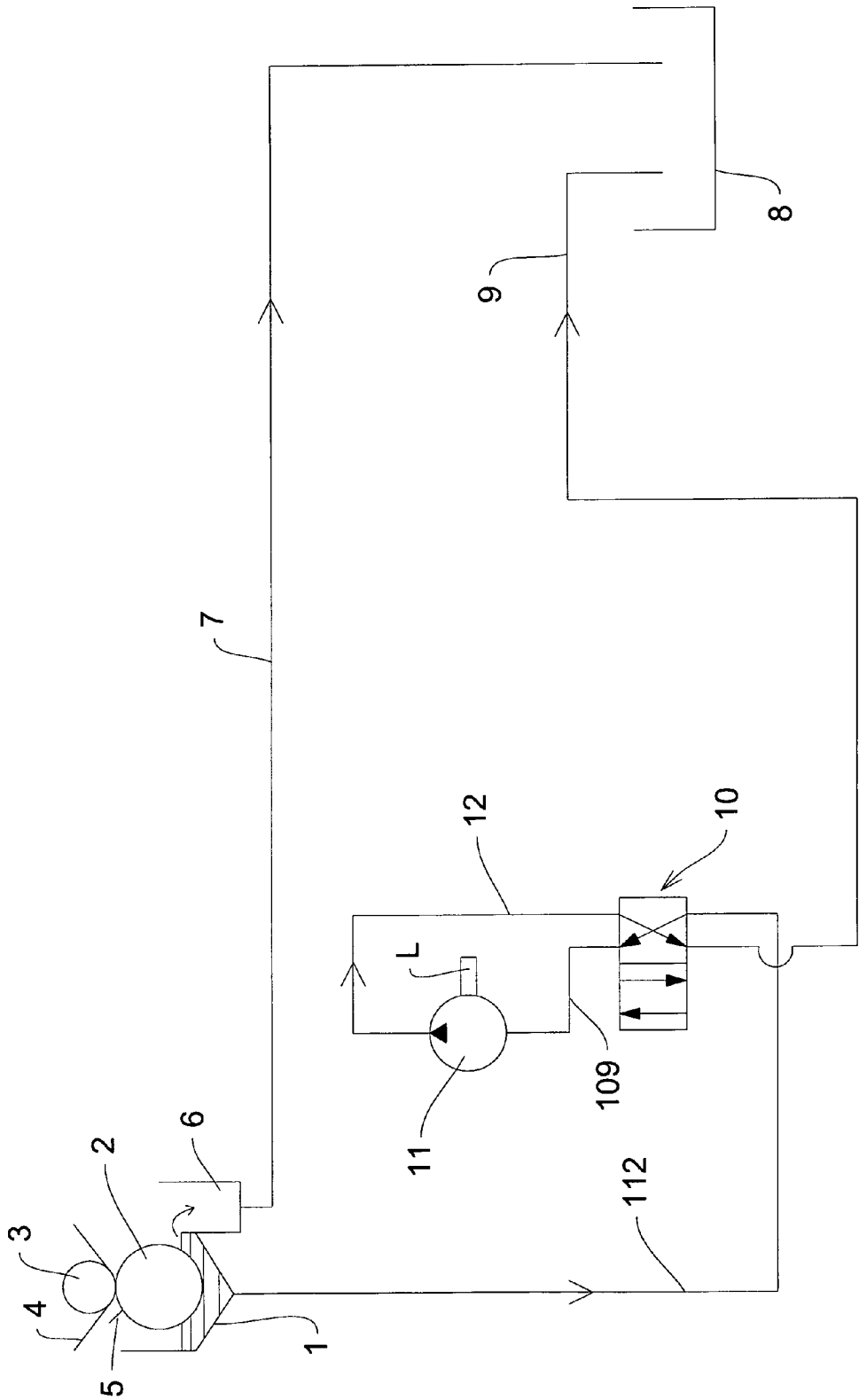


Fig. 2

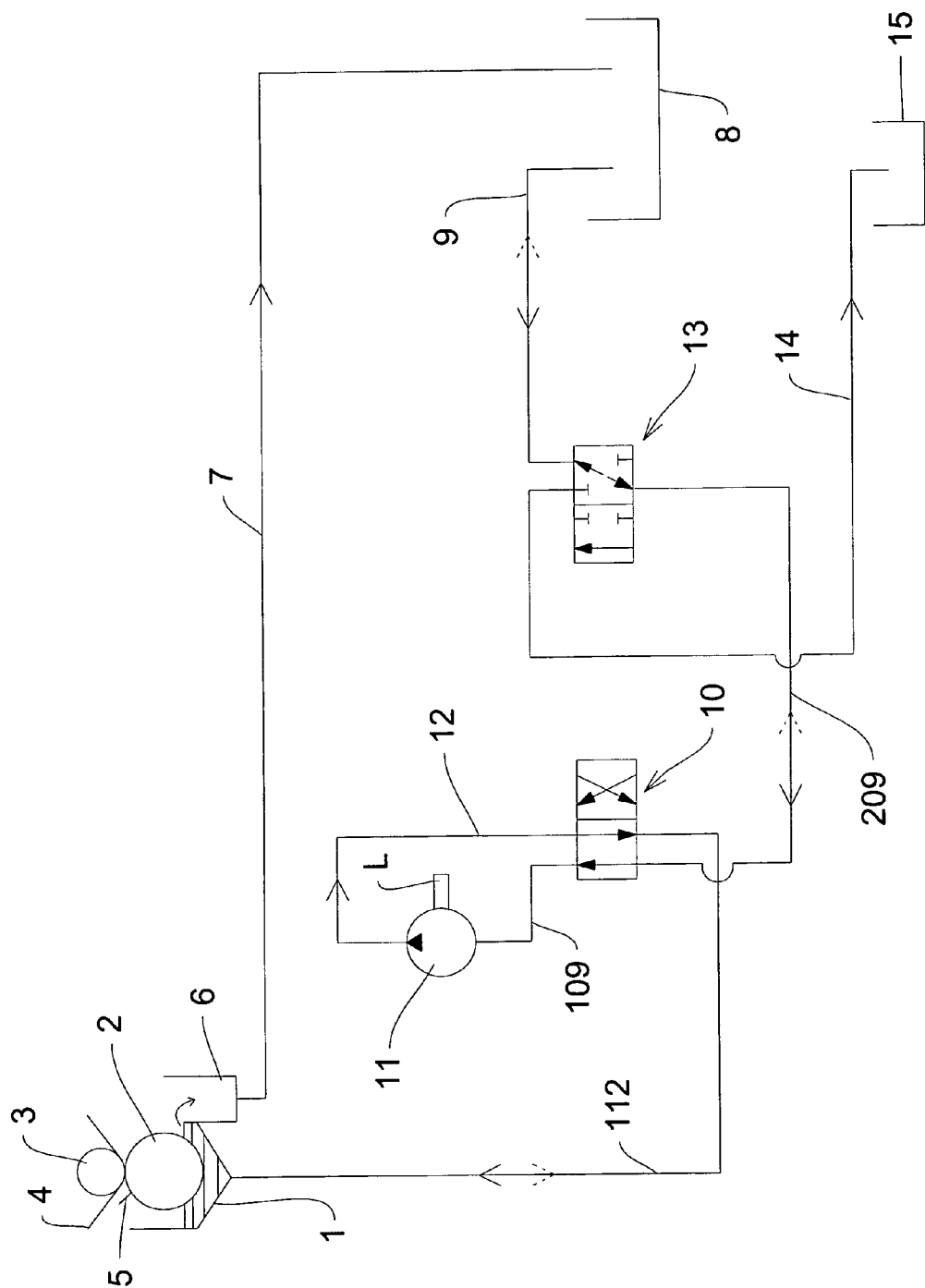


Fig. 3

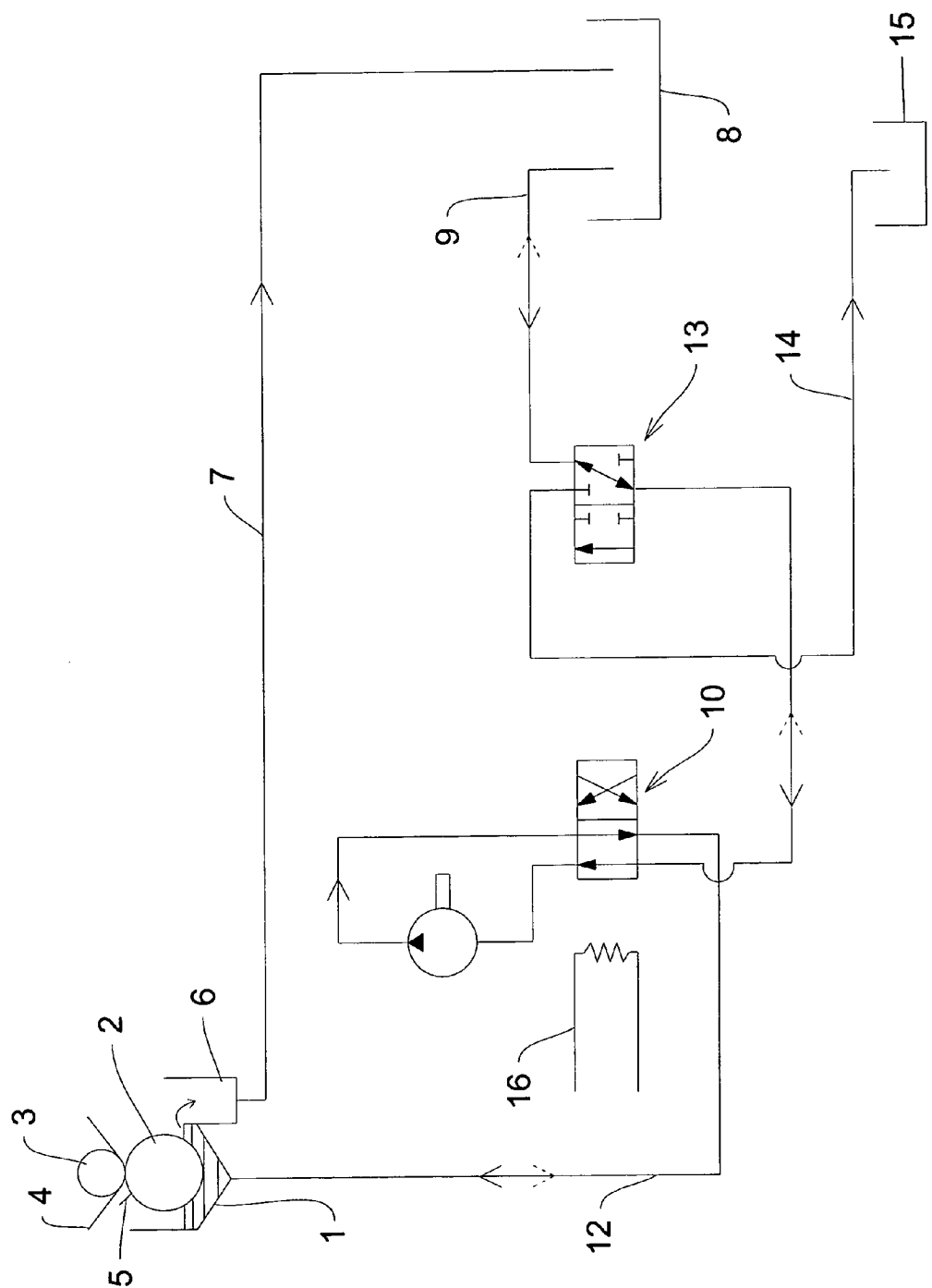


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 12 42 5077

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y	* page 12, line 5 - page 13, line 25; figures 6-9 *	2	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
Munich		18 October 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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 12 42 5077

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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