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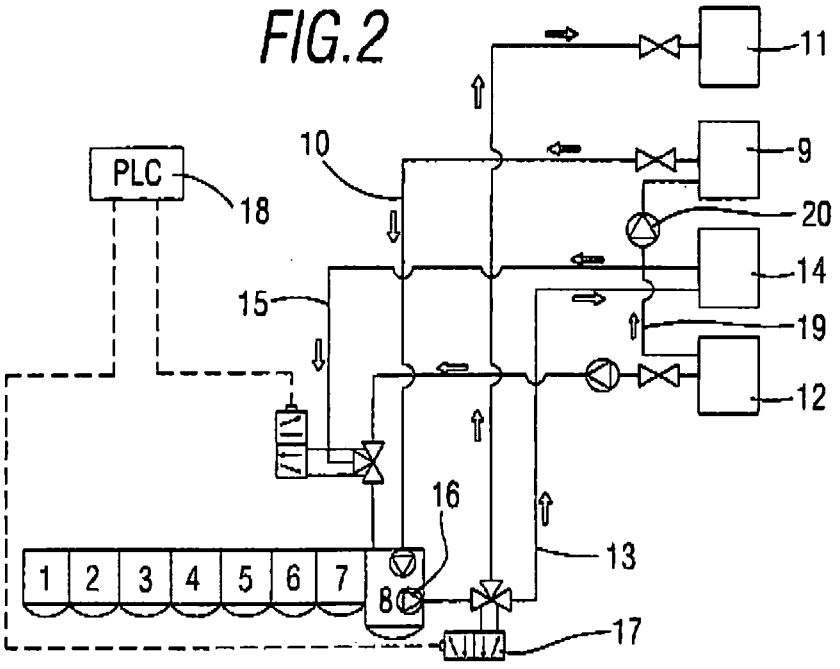
(54) Ink re-use system for printing machines

(57) An ink re-use system for printing machines wherein a plurality of individual tanks (1, 2, 3, 4, 5, 6, 7, 8) is provided for the differing colours, one tank with a clean cleaning agent (9) and one tank for the collection of the dirty cleaning agent (11), which comprises at least one additional tank (14) for the collection of the ink that has been diluted and transferred, in such a way that it establishes a bi-directional relationship between at least one additional tank (14) and one of the individual tanks filled with coloured ink. In this way an appreciable reduction of the quantity of dark diluted ink is achieved with the consequent saving in the amount to be distilled.

FIG.2



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Description

OBJECT OF THE INVENTION

[0001] The object of the present invention is an ink re-use system for printing machines that incorporates appreciable innovations and advantages.

[0002] More specifically, the invention is related to a system for the re-use of diluted ink coming from the cleaning processes for printing machines, in particular flexographic and rotogravure types of printing machines.

BACKGROUND OF THE INVENTION

[0003] At the present time the flexographic and rotogravure printing machines are provided with automatic cleaning systems for the inking assemblies. These systems allow the circulation of a solvent across the inking circuits that acts as a cleaning element that is then discharged into a common tank, in such a way that if the printing has eight colours, the liquid obtained from the cleaning of each one of the printing assemblies and which hereafter will be called diluted ink "DI", is going to end up in a common tank where a dark coloured "DI" is obtained due to the mix of the "DI" of differing colours, as can be seen in figure 1.

[0004] Subsequently this DI is subjected to a distillation process obtaining the solvent and the ink sludge which is then sent to a waste treatment company so as to be dealt with in an incineration process.

[0005] On the other hand the printing machine has automatic viscosity control systems which, during the printing process, add solvent to the ink.

DESCRIPTION OF INVENTION

[0006] The present invention has been developed for the purpose of providing a DI ink re-use system that solves the above-mentioned disadvantages, in addition contributing other additional advantages that will become clear from the description that is given below.

[0007] Therefore, it is the object of the invention to provide an ink re-use system for printing machines wherein a plurality of individual tanks is provided for the differing colours, one tank with a clean cleaning agent, one tank for the collection of the dirty cleaning agent, and which is characterised in that it includes at least one additional tank for the collection of the ink that has been diluted and transferred, in such a way that it establishes a bi-directional relationship between at least one additional tank and one of the individual tanks filled with coloured ink.

[0008] Thanks to these characteristics, an appreciable reduction of the amount of diluted dark ink is achieved with the consequent saving of the amount to be distilled (which means a saving of time and energy) likewise the amount of waste sent to the waste companies for their subsequent incineration as a certain amount of the diluted ink can be re-used.

[0009] In accordance with a preferred embodiment, it is provided with a pipe that sends the diluted ink from the individual tank full of ink to the additional tank and a second pipe that sends the diluted ink from the additional tank to the individual tank full of ink.

[0010] Advantageously, it is provided by-pass means that associates the additional tank to the diluted ink, the tank with the dirty cleaning agent and the tank full of ink for printing. By preference, said by-pass device consists of an electro-valve governed by a PLC ("programmable logic controller").

[0011] Additionally, the system can be provided with some means of colour detection associated to the by-pass means in such a way that in line with the colour detected it sends a signal to the PLC to open or close the passage defined between the tank full of ink and the additional tank.

[0012] Also, ink viscosity detection means associated to the by-pass means can be provided in such a way that depending on the viscosity level detected it sends a signal to the PLC to open or close the passage defined between the tank full of ink and the additional tank.

[0013] Other characteristics and advantages of the ink re-use system device object of the present invention will become clear from a description of a preferred embodiment, which is not exclusive, shown in the drawings by way of illustration but without being in any way limiting.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Figure 1. - This is an outline view of an ink re-use system for a flexographic printing machine of the prior art; and

Figure 2. - This is an outline view of an ink re-use system in accordance with the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0015] As shown in figure 2, an embodiment of the ink re-use system for flexographic printing machines in accordance with the invention is provided with a plurality of individual tanks 1, 2, 3, 4, 5, 6, 7, 8 for differing colours, one tank with clean cleaning agent 9 connected by means of a circulation pipe 10 to one of the individual tanks 8, in this case corresponding to the tank that stores the white ink, a tank for the collection of the dirty cleaning agent 11 and a tank with the solvent 12 that can be any type of suitable solvent that is known in the art hence greater detail is not going to be entered into.

[0016] This system is in addition provided with a pipe 13 that sends the diluted ink from the individual tank full of white ink 8 to an additional tank 14 with the help of a pump 16 and a second pipe 15 that sends the diluted ink from the additional tank 14 to the individual tank full of ink 8 in such a way that it allows the re-use of the diluted ink that was previously treated in an earlier cleaning

stage. Tank 9 and tank 12 are connected to each other by means of a pipe 19 and is provided with an impulsion pump 20 in order to supply solvent to the clean cleaning agent when it is thus required.

[0017] It is provided by-pass means which associates the additional tank 14, the tank with dirty cleaning agent 11 to a tank full of ink 8, said by-pass means being a membrane electro-valve 17 commanded by a PLC commander 18.

[0018] On the basis of the aforementioned and within the scope of the invention, it is obvious that other additional tanks can be added which are associated to other tanks to differing ink colours.

[0019] The details, shapes, sizes and other accessorial elements, likewise the materials used in the manufacture of the system of the invention can be appropriately substituted by others that are technically equivalent and do not stray away from the essentiality of the invention or the scope defined by the claims that are included below.

Claims

1. An ink re-use system for printing machines wherein a plurality of individual tanks (1, 2, 3, 4, 5, 6, 7, 8) is provided for differing colours, one tank with a clean cleaning agent (9) and one tank for the collection of the dirty cleaning agent (11), **characterised in that** it comprises at least one additional tank (14) for the collection of the ink that has been diluted and transferred, in such a way that it establishes a bi-directional relationship between at least one additional tank (14) and one of the individual tanks filled with coloured ink.

2. A system according to claim 1, **characterised in that** it is provided with a pipe (13) that sends the diluted ink from the individual tank full of ink (8) to the additional tank (14) and a second pipe that sends the diluted ink from the additional tank (14) to the individual tank full of ink.

3. A system according to claim 1, **characterised in that** it is provided with by-pass means that associates the additional tank (14) with the dirty cleaning agent tank (11) and a tank full of ink (8) for the printing.

4. A system according to claim 3, **characterised in that** the by-pass means consists of an electro valve (17) commanded by a PLC (18).

5. A system according to claims 1, 3 and 4, **characterised in that** colour detection means is provided associated to the by-pass means in such a way that depending on the colour detected it sends a signal to the PLC (18) to open or close the passage defined between the tank full of ink and the additional tank (14).

6. A system according to claims 1, 3 and 4, **characterised in that** it is provided ink viscosity detection means associated to the by-pass means in such a way that depending on the level of viscosity detected it sends a signal to the PLC (18) to open or close the passage defined between the tank full of ink and the additional tank (14).

7. A system according to claim 1, **characterised in that** it includes a tank filled provided with a solvent, connected to a tank with a clean cleaning agent.

FIG.1

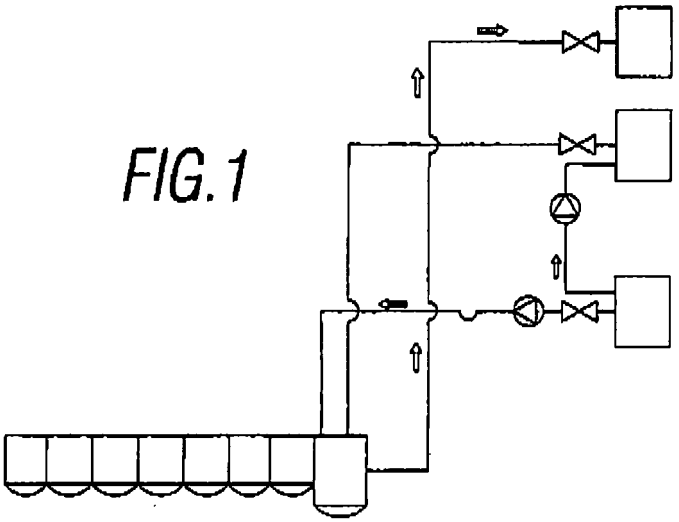
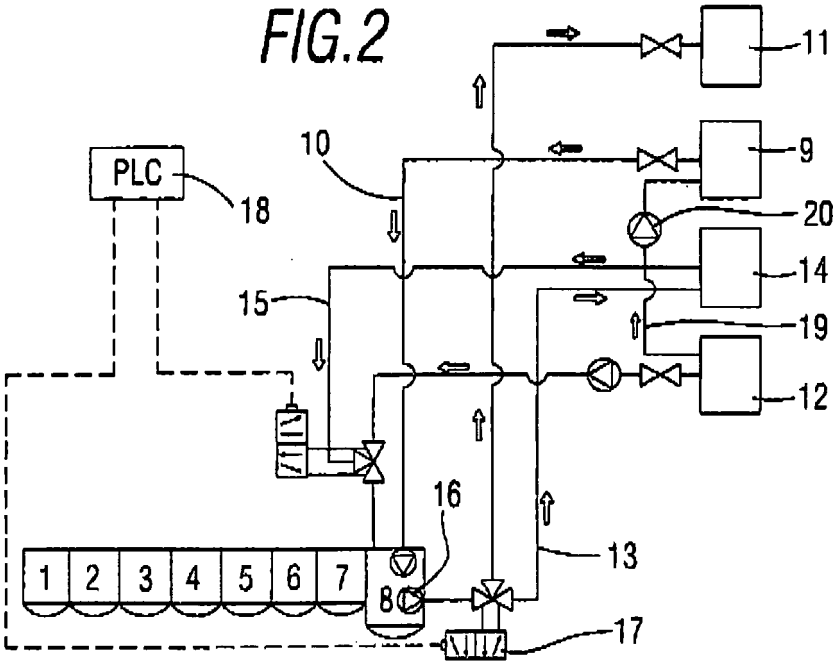


FIG.2



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EUROPEAN SEARCH REPORT

Application Number
EP 09 00 8190

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	EP 0 955 164 A (MARQUIP INC [US]) 10 November 1999 (1999-11-10) * figure 1 * * claim 1 * * paragraphs [0016], [0023], [0024] *	1-7	INV. B41F31/00 B41F35/00
Y	US 2006/061620 A1 (TANI MIHOKO [JP] ET AL) 23 March 2006 (2006-03-23) * figure 4 * * paragraph [0050] *	1-7	
A	EP 0 739 729 A (MITSUBISHI HEAVY IND LTD [JP]) 30 October 1996 (1996-10-30) * the whole document *	1-7	

TECHNICAL FIELDS SEARCHED (IPC)
B41F
B41J

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 October 2009	Hajji, Mohamed-Karim

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 00 8190

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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14-10-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0955164 A	10-11-1999	JP 2000006376 A	11-01-2000
		US 5967044 A	19-10-1999
US 2006061620 A1	23-03-2006	JP 2006088488 A	06-04-2006
EP 0739729 A	30-10-1996	AU 678932 B2	12-06-1997
		AU 5041896 A	02-01-1997
		DE 69614027 D1	30-08-2001
		DE 69614027 T2	21-03-2002
		JP 3592788 B2	24-11-2004
		JP 8295010 A	12-11-1996

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82