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(54) Method for controlling a balance between dampening solution and ink in a wet-offset printing press and system for carrying out the method

(57) There is described a method for controlling a balance between dampening solution and ink in a wet-offset printing press comprising (a) providing a test area (M) on a selected portion of a wet-offset printing plate (8), which test area (M) extends along a selected test direction, (b) applying dampening solution in the test area (M), (c) gradually vaporizing the dampening solution in the test area (M) along the selected test direction, (d) applying ink in the test area (M) thereby creating an emulsion of ink and dampening solution with gradually-decreasing dampening solution concentration, and (e) detecting occurrence of smearing either directly in the test area (M) of the wet-offset printing plate (8) or indirectly in a corresponding measurement area transferred from the wet-offset printing plate (8) onto a subsequent blanket or onto printed material. Also described is a system for carrying out the method.

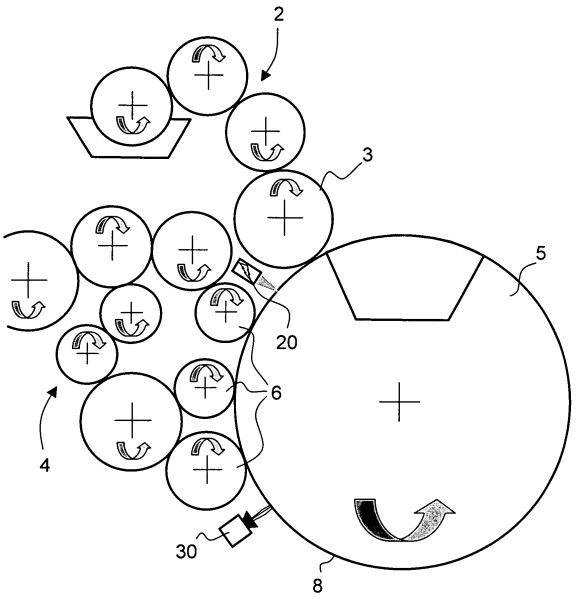

Fig. 2

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Description

TECHNICAL FIELD

[0001] The present invention generally relates to wet-offset printing where a dampening solution is applied on the surface of a printing plate having oleophilic water-repellent (that is hydrophobic) ink-accepting areas defining printing areas and oleophobic water-accepting (that is hydrophilic) areas defining non-printing areas. More precisely, the present invention relates to a method and system to control, and possibly adjust, a balance between the dampening solution and the ink.

BACKGROUND OF THE INVENTION

[0002] In wet-offset printing, the printing and non-printing areas of the printing plate are practically on one level. The printing areas of the printing plate are oleophilic/ink-accepting and water-repellent, that is, hydrophobic. The non-printing areas of the printing plate are hydrophilic, consequently oleophobic in behaviour. Prior to inking of the printing plate, dampening solution is applied on the surface of the plate by means of a dampening system so as to cover the non-printing areas of the printing plate with a thin film of dampening solution. Dampening solution is mainly constituted of water and additives. These additives typically include preservative agents, wetting agent, isopropyl alcohol (IPA), buffer substances and anti-microbe additives.

[0003] One of the main problems in wet-offset printing is to be able to appropriately control and adjust the balance between dampening solution and ink. Too much or too little dampening solution may in particular degrade the printing quality. It is however very difficult to measure the balance between dampening solution and ink directly as the mixture of dampening solution and ink forms an emulsion. In practice, this balance is measured manually by the printer by performing trial-and-error measurements around the so-called "smearing limit", i.e. by adjusting the amount of dampening solution so that smearing does not occur on the prints. This process is rather complicated and time-consuming. There is therefore a need for an improved solution enabling the printer to adjust the dampening solution/ink balance of a wet-offset printing press in a more efficient manner.

SUMMARY OF THE INVENTION

[0004] An aim of the invention is thus to provide a method and system enabling the printer to efficiently control and adjust the balance between dampening solution and ink in a wet-offset printing press.

[0005] This aim is achieved thanks to the method and system as defined in the annexed claims.

[0006] Thus the invention provides a method for controlling a balance between dampening solution and ink in a wet-offset printing press comprising :

a) providing a test area on a selected portion of a wet-offset printing plate, which test area extends along a selected test direction ;

b) applying dampening solution in the test area ;

c) gradually vaporizing the dampening solution in the test area along the selected test direction ;

d) applying ink in the test area thereby creating an emulsion of ink and dampening solution with gradually-decreasing dampening solution concentration; and

e) detecting occurrence of smearing either directly in the test area of the wet-offset printing plate or indirectly in a corresponding measurement area transferred from the wet-offset printing plate onto a subsequent blanket or onto printed material.

[0007] According to another aspect, the invention provides a system for carrying out the above method in a printing press comprising a wet-offset printing unit with at least one plate cylinder carrying at least one wet-offset printing plate, a dampening unit for applying dampening solution onto the surface of the wet-offset printing plate and an inking unit placed downstream of the dampening unit with respect to a direction of rotation of the plate cylinder for applying ink onto the surface of the wet-offset printing plate, wherein the system comprises a vaporizing device for gradually evaporating the dampening solution in a test area of the wet-offset printing plate and a detection device for detecting occurrence of smearing.

[0008] Advantageous embodiments of the invention are the subject-matter of the dependent claims.

[0009] For instance, according to one embodiment of the invention, dampening solution is gradually evaporated by means of energy emitted by a radiation source directed towards said test area, which radiation source is preferably a device emitting a light beam towards the test area, such as a laser device, or a device emitting microwaves towards the test area, such as a microwave magnetron.

[0010] According to a first variant of the invention, the radiation source is operated in a continuous manner and a power output of the radiation source is gradually increased along the selected test direction.

[0011] According to a second variant of the invention, the radiation source is operated in a pulsed manner with gradually increasing pulse duration along the selected test direction.

[0012] Detection of the occurrence of smearing is advantageously detected optically by means of a camera directed towards the test area.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Other features and advantages of the present invention will appear more clearly from reading the following detailed description of embodiments of the invention which are presented solely by way of non-restrictive examples and illustrated by the attached drawings.

- Figure 1 is a partial schematic side view of a printing press equipped with a wet-offset printing unit;
- Figure 2 is a schematic side view illustrating an embodiment of the system according to a the invention
- Figure 3 is a schematic front view of a wet-offset printing plate with a test area according to one embodiment of the invention;
- Figure 4 illustrates three exemplary situations where the test area is indicative of three different relative concentrations between ink and dampening solution; and
- Figure 5 is a schematic illustration of microwave magnetron.

EMBODIMENTS OF THE INVENTION

[0014] The invention will be described hereinafter in the context of a printing press equipped with a wet-offset printing unit, as illustrated by Figures 1 and 2. Figure 1 is a partial schematic side view of such a printing press. A more detailed description of the printing press may for instance be found in European patent application EP 0 949 069 A1 in the name of the present Applicant, which is incorporated herein by reference. This European patent application discloses an offset printing press for simultaneous recto-verso printing of sheets or of a web as used in particular in the context of the printing of security documents. It shall however be understood that the invention is applicable to any printing press equipped with a wet-offset printing unit, including the more conventional wet-offset printing presses used for commercial applications. For an overview of possible wet-offset printing press configurations, one may for instance refer to the "Handbook of Print Media", H. Kipphan, Springer Verlag, 2001, ISBN 3-540-67326-1.

[0015] The printing press illustrated in Figure 1 comprises two blanket cylinders 10, 10* which contact each other so as to form a printing nip therebetween where the sheets or web to be printed are/is conveyed. Only part of the printing group, namely the printing unit associated with blanket cylinder 10, designated generally by reference numeral 1, is illustrated in Figure 1. It shall be understood that, in the context of the printing press depicted in Figure 1, a similar printing unit is associated with blanket cylinder 10*, this other printing unit being the mirror image of the printing unit depicted in Figure 1. Both printing units are designed to print a corresponding one of the two sides of the sheets or web conveyed between the blanket cylinder 10, 10*. This configuration is again to be considered as being not limiting, other configurations being possible.

[0016] The printing unit 1 is designed as a wet-offset printing unit and comprises a plurality of sub-units (four in this example) each designed to form a corresponding printing pattern in a desired colour. More precisely, each subunit comprises an inking unit 4 for inking a plate cylinder 5 carrying a wet-offset printing plate 8, which inking unit 4 includes a dampening unit 2 for dampening the surface of the wet-offset printing plate 8 prior to the application of ink. In the illustrated configuration, each plate cylinder 5 contacts the circumference of the blanket cylinder 10 and transfers its corresponding printing pattern on the surface of the blankets carried by the blanket cylinder 10. In this particular example, each blanket cylinder 10, 10* carries three blankets, the length of each of which along the circumference of the cylinder being equal to the length of the printing plates 8 carried by the plate cylinders 5. In other configurations, the plate cylinders might carry more than one printing plate.

[0017] As is usual in the art, the inking unit 4 comprises an inking train including a plurality of inking rollers for appropriately distributing the ink which is supplied by one or more ink fountain (not referenced), each inking unit 4 being provided with two such ink fountains in the illustrated example. As shown, ink is applied on the circumference of the plate cylinder 5, i.e. on the printing plate 8, by means of a plurality of ink application rollers (not referenced in Figure 1) contacting the surface of the plate cylinder 5. As mentioned, the dampening unit 2 applies dampening solution onto the printing plate 8 prior to the application of ink by said ink application rollers. In Figure 1, it shall be understood that the plate cylinders 5 of the printing unit 1 rotate in a counter-clockwise direction, while the rollers which contact the plate cylinders 5 rotate in a clockwise direction (see also Figure 2).

[0018] Figure 2 is a schematic side view illustrating in a more detailed manner one of the sub-unit of the wet-offset printing unit 1 of Figure 1. For the sake of illustration, blanket cylinder 10 is not illustrated and only part of the inking unit 4 is shown in Figure 2. As mentioned, the dampening unit 2 is adapted to apply dampening solution on the circumference of plate cylinder 5, prior to the application of ink by ink application rollers, designated by reference numeral 6, of the inking unit 4. To this end, the dampening unit 2 is provided with a dampening roller 3 contacting the surface of the plate cylinder 5 upstream of the ink application rollers 6 with respect to the direction of rotation of the plate cylinder 5, which direction is indicated by the corresponding arrow in Figure 2.

[0019] According to the invention, a radiation source (or vaporizing device) 20 is provided downstream of the dampening unit 2 and upstream of the inking unit 4 for gradually evaporating dampening solution in a selected test area of the printing plate 8 by means of energy emitted towards the surface of the printing plate 8 by the radiation source 20. The radiation source 20 can be any type of radiation source suitable for gradually evaporating dampening solution. As discussed below, this radiation source 20 is preferably a device emitting a light beam, such as a laser device, or a device emitting microwaves, such as a microwave magnetron.

[0020] A detection device 30 is further provided downstream of the ink application rollers 6 of the inking unit 4 for detecting occurrence of smearing in the said selected test area. Within the scope of the present invention, "smearing" is to be understood as a state where the

amount of dampening solution becomes insufficient to properly dampen the non-printing areas of the printing plate and leads to ink starting to "blur" into the non-printing areas of the printing plate, thereby degrading the quality of print. In this context, the "smearing limit" shall be understood as the limit at which smearing occurs. It is understood that the "smearing limit" corresponds to a non-null transition zone between an acceptable dampening state and an unacceptable dampening state.

[0021] The detection device 30 can be any suitable detector adapted to detect occurrence of smearing. It is preferably an optical detector such as a camera (e.g. a CCD or CMOS image sensor, etc.), the sensitivity of which is adjusted to the desired application. The detection device 30 could be something else than an optical detector provided it can appropriately detect the occurrence of smearing.

[0022] In case the radiation source 20 is a device emitting a light beam, such as a laser-emitting device, the wavelength and power of the light beam shall be selected so that the energy thereof is substantially absorbed by the dampening solution. An infrared emitting device would be preferable in this context.

[0023] In case the radiation source 20 is a device emitting microwaves, such as a microwave magnetron (i.e. a device similar to those used in microwave ovens), the radiation frequency thereof shall be selected so that it causes appropriate local evaporation of the dampening solution. In this context, tests have shown that local evaporation of the dampening solution (which solution is mainly constituted of water) can advantageously be achieved with a radiation frequency of 1 to 20 GHz, preferably of 2 to 3 GHz. Successful tests have in particular been carried out at a radiation frequency of 2.455 GHz. Indeed, while the relaxation frequency (or resonant frequency) of water is much higher (approximately 22 GHz), radio frequencies (RF) of approximately 2 to 3 GHz are sufficient.

[0024] An advantage of using radio frequencies of the order of 2 to 3 GHz resides in the fact that this frequency band is more or less freely usable in the ISM Band (i.e. the Industrial, Scientific and Medical Band). Merely some requirements regarding radio frequency disturbances in neighbourhood bands have to be fulfilled.

[0025] In the embodiment shown in Figure 2, the radiation source 20 is set in a fixed position and directed to a side portion of the printing plate 8 near the edge thereof, where a selected test area, designated M, is defined, as schematically illustrated in Figure 3. Since the plate cylinder 5 is rotating, the test area M is a strip-shaped area extending along the length of the printing plate 8, i.e. along the direction of rotation of the plate cylinder 5 (the "test direction"), which direction is indicated by the arrow in Figure 3. The test area M is treated as the other non-printing areas of the printing plate 8, i.e. so as to be oleophobic water-accepting (that is hydrophilic). This test area M is preferably located outside of the effective printing area of the printing plate 8 (i.e. where the desired non-printing and printing areas of the printing plate 8 are defined), advantageously in a location of the printing plate 8 corresponding to margins of the printed sheets or web. The test area M can be a couple of millimeters wide and extend along a length of several tens of millimeters (a adequate length being for instance at least 100 mm).

[0026] As already mentioned, dampening solution is deposited in the test area M by the dampening unit 2 and this dampening solution is gradually evaporated by means of energy emitted by the radiation source 20 which is directed towards this test area M. As a result, following the application of ink on the test area M by the downstream-located inking unit 4, an emulsion of ink and dampening solution is created in the test area M with gradually-decreasing dampening solution concentration. This gradual decrease is schematically illustrated in Figure 3 (and Figure 4) as a pattern ranging from black (zero evaporation) to white. Depending on the initial amount of applied dampening solution, smearing will occur at a different location along the length of the test area M and at a different point in time. This smearing is detected by means of the detector 30 directed towards the test area M at a downstream location with respect to the inking unit 4.

[0027] The detector 30 could alternatively be directed towards a different location. For instance, provided the test area M is located on a portion of the printing plate 8 such that it is transferred to blanket cylinder 10 and possibly onto a margin portion of the printed sheets or web, the detector 30 could be disposed so as to detect the occurrence of smearing on the blanket of the blanket cylinder 10 or on the margin portion of the printed sheets or web. Detection on the surface of the printing plate 8 as illustrated in Figure 2 is however preferred.

[0028] Preferably, a level of energy generated by the radiation source 20 is gradually increased along the selected test direction (i.e. along the direction of rotation of the plate cylinder 5). This can be achieved by operating the radiation source 20 in a continuous manner and gradually increasing a power output of the radiation source 20 along the selected test direction. Alternatively, this can be achieved by operating the radiation source 20 in a pulsed manner with gradually increasing pulse duration along the selected test direction.

[0029] Detection of the smearing limit can be performed in basically two ways. According to a first variant, detection is performed by detecting a position along the test direction where smearing occurs, a length between a start of the test area and the detected position of smearing along the test direction being indicative of the dampening solution concentration. Alternatively, according to a second variant, detection is performed by detecting a time interval after which smearing occurs along the test direction, the time interval after which smearing occurs being indicative of the dampening solution concentration.

[0030] In both situations, it is advantageous and desirable to carry out an adjustment of the amount of damp-

ening solution in dependence of the detected occurrence of smearing. According to the above-mentioned first variant, such adjustment would include (i) increasing the amount of dampening solution if the length between the start of the test area and the detected position of smearing is shorter than a determined length corresponding to a desired balance between dampening solution and ink, and (ii) decreasing the amount of dampening solution if the length between the start of the test area and the detected position of smearing is longer than the determined length corresponding to the desired balance between dampening solution and ink. According to the above-mentioned second variant, adjustment would include (i) increasing the amount of dampening solution, if the time interval is less than a predetermined time interval corresponding to a desired balance between dampening solution and ink, and (ii) decreasing the amount of dampening solution, if the time interval is greater than the predetermined time interval.

[0031] Figure 4 illustrates exemplary measurement results. The horizontal line in Figure 4 schematically illustrate the location where smearing should start occurring in case of proper balance between ink and dampening solution. On the left-hand side is illustrated a situation where there is a proper balance between ink and dampening solution. In the middle portion of Figure 4 there is illustrated a situation where there is an insufficient amount of dampening solution (smearing occurring before the desired "smearing limit"). On the right-hand side of Figure 4, there is illustrated a situation where there is too much dampening solution (smearing occurring after the desired "smearing limit"). It will again be understood that a certain tolerance around the "smearing limit" will be defined, i.e. strict compliance with the smearing limit is not as such required. It suffices that occurrence of smearing is detected sufficiently close to the smearing limit. This tolerance will be defined and adjusted depending on the operator's requirements.

[0032] From the above, one will understand that the radiation source (or vaporization device) 20 shall be provided with adequate control means so as to adjust its energy output, i.e. either by adjusting the power output thereof (in case of a continuously-operated device) or by adjusting its pulse duration (in case of an intermittently/pulsed-operated device). Such control means are available to those skilled in the art and do not need to be discussed in detailed here. These may for instance be an electronic controller for continuously adjusting the power output of the radiation source 20 or a pulse-width controller for continuously adjusting the pulse duration of the radiation source 20.

[0033] Preferably, the energy output of the radiation source 20, i.e. the rate at which the dampening solution is evaporated, is adjusted to the speed at which the printing press is operating. For instance, let us consider a machine speed of the order of 10'000 sheets per hour, which amounts to a rotational speed of the plate cylinder 5 of 2.78 Hz. Considering that the diameter of the plate cylinder 5 is of 280.20 mm, this amounts to a circumferential speed of approximately 2.45 m/s. In other words, considering a length of the test area M of the order of 100 mm, this means that the energy output of the radiation source 20 shall be capable to vary from a minimum energy output (e.g. zero) to a maximum energy output within a time span of approximately 40 ms.

[0034] Still according to a preferred embodiment, the energy output of the radiation source 20 shall be adjustable in dependence of the machine speed of the printing press so that a desired balance between dampening solution and ink yields to occurrence of smearing at a same position along the test area M or after a same time interval. For instance, in the above example, if the machine speed is increased to 12'000 sheets per hour, the energy output of the radiation source shall be increased by a factor of 1.2.

[0035] In addition, operation of the radiation source 20 shall be controlled as a function of the rotational position of the plate cylinder 5 so that progressive evaporation of the dampening solution starts at the same location on the printing plate 8.

[0036] Furthermore, smearing typically disappears after only a certain number n of printing cycles (which printing cycles correspond, in the illustrated example where the plate cylinder 5 carries only one printing plate, to full rotations of the plate cylinder 5), for instance after three or four cycles. It is accordingly preferable to carry out the method only every n printing cycles. Alternatively, the test area could be systematically wiped clean after each measurement, so that a new measurement can start during the subsequent printing cycle.

[0037] In the context of the present application, a controlled power output of approximately 700 to 1'000 W has been found to be necessary and sufficient to achieve the desired evaporation efficiency. Such a power output is for instance achievable using the aforementioned microwave magnetrons. Such magnetrons are available for generating microwaves ranging typically from 0.3 to 300 GHz and with power outputs ranging from 0.1 kW to 10 MW.

[0038] Figure 5 is a schematic illustration of a microwave magnetron, designated globally by reference numeral 20*, which could be used as vaporizing device 20 in the above described system. A microwave magnetron (or cavity magnetron) is a high-powered vacuum tube that generates coherent microwaves. They are commonly found in microwave ovens, as well as in various radar applications. As schematically illustrated in Figure 5, all magnetrons basically consist of a hot filament (cathode) 23 which is supplied or pulsed to a high negative potential by a high-voltage dc power supply 21. The cathode 23 is built into the centre of a cavity 22 forming an anode where vacuum is created, this cavity being typically designed as a circular chamber with lobed regions forming a resonant cavity. By applying a magnetic field across the cavity (e.g. by means of a permanent magnet not illustrated), electrons which are attracted by the positive

outer part of the anode-forming cavity 22 are caused to spiral outward in a circular path past the lobed regions of the cavity 22 thereby inducing a high-frequency radio field. A portion of the thus created field is extracted with a short antenna constructed as a wave guide 25 (typically of rectangular cross-section) which is coupled to the cavity 22 by means of a connector plate 24. Coupled at the extremity of the wave guide 25 is a beamer head 26 intended to direct the outputted microwaves towards the desired zone, namely the test area M on the wet-offset printing plate 8.

[0039] A magnetron is a fairly efficient device with an efficiency factor that can be as high as 80%. As magnetrons are standard components in microwave ovens, they are available as mass products at a relatively low cost. Accordingly, in the context of the present invention, magnetrons are particularly advantageous as the impact on the costs of the system is limited.

[0040] It will be understood that various modifications and/or improvements obvious to the person skilled in the art can be made to the embodiments described hereinabove without departing from the scope of the invention defined by the annexed claims. For instance, while laser and microwave devices have been described as examples of vaporizing devices, any other suitable device might be used as long as it fulfils the function of gradually vaporizing the dampening solution as explained hereinabove.

[0041] Furthermore, it will be understood that the specific arrangement of the dampening and inking units illustrated in the Figures shall not be construed as limiting the scope of the invention. Other types of dampening and inking unit known in the art might be used.

Claims

1. A method for controlling a balance between dampening solution and ink in a wet-offset printing press comprising :

a) providing a test area (M) on a selected portion of a wet-offset printing plate (8), which test area (M) extends along a selected test direction ;
b) applying dampening solution in said test area (M) ;
c) gradually vaporizing said dampening solution in said test area (M) along the said selected test direction ;
d) applying ink in said test area (M) thereby creating an emulsion of ink and dampening solution with gradually-decreasing dampening solution concentration ; and
e) detecting occurrence of smearing either directly in said test area (M) of the wet-offset printing plate (8) or indirectly in a corresponding measurement area transferred from the wet-offset printing plate (8) onto a subsequent blanket or onto printed material.

2. The method according to claim 1, wherein said test area (M) is a strip-shaped area of said printing plate (8) extending along a direction of rotation of a plate cylinder (5) carrying said printing plate (8).

3. The method according to claim 1 or 2, wherein said dampening solution is gradually evaporated by means of energy emitted by a radiation source (20) directed towards said test area (M).

4. The method according to claim 3, wherein a level of energy generated by the radiation source (20) is gradually increased along the selected test direction.

5. The method according to claim 4, wherein said radiation source (20) is operated in a continuous manner and a power output of said radiation source (20) is gradually increased along the selected test direction.

6. The method according to claim 4, wherein said radiation source (20) is operated in a pulsed manner with gradually increasing pulse duration along the selected test direction.

7. The method according to any one of claims 3 to 6, wherein said radiation source (20) is a device emitting a light beam towards said test area (M), such as a laser device.

8. The method according to any one of claims 3 to 6, wherein said radiation source (20) is a device emitting microwaves towards said test area (M), such as a microwave magnetron.

9. The method according to claim 8, wherein said device emitting microwaves emits microwaves at a frequency of 1 to 20 GHz, preferably of 2 to 3 GHz.

10. The method according to any one of the preceding claims, wherein occurrence of smearing is detected optically by means of a camera (30) directed towards said test area (M).

11. The method according to any one of the preceding claims, further comprising the following step:

f) adjusting the amount of dampening solution in dependence of the detected occurrence of smearing.

12. The method according to any one of claims 1 to 11, wherein step e) includes detecting a position along said test direction where smearing occurs, a length between a start of said test area (M) and the detected position of smearing along said test direction being

indicative of the dampening solution concentration.

13. The method according to claim 12, further comprising the following step:

f) adjusting the amount of dampening solution in dependence of the detected occurrence of smearing, and wherein step f) includes :

- increasing the amount of dampening solution if the length between the start of said test area (M) and the detected position of smearing is shorter than a determined length corresponding to a desired balance between dampening solution and ink ; and
- decreasing the amount of dampening solution if the length between the start of said test area (M) and the detected position of smearing is longer than the determined length corresponding to said desired balance between dampening solution and ink.

14. The method according to any one of claims 1 to 11, wherein step e) includes detecting a time interval after which smearing occurs along said test direction, the time interval after which smearing occurs along said test direction being indicative of the dampening solution concentration.

15. The method according to claim 14, further comprising the following step: f) adjusting the amount of dampening solution in dependence of the detected occurrence of smearing, and wherein step f) includes :

- increasing the amount of dampening solution, if said time interval is less than a predetermined time interval corresponding to a desired balance between dampening solution and ink, and
- decreasing the amount of dampening solution, if said time interval is greater than said predetermined time interval.

16. A system for carrying out the method according to any one of the preceding claims in a printing press comprising a wet-offset printing unit (1) with at least one plate cylinder (5) carrying at least one wet-offset printing plate (8), a dampening unit (2) for applying dampening solution onto the surface of said wet-offset printing plate (8) and an inking unit (4) placed downstream of said dampening unit with respect to a direction of rotation of the plate cylinder (5) for applying ink onto the surface of the wet-offset printing plate (8),
wherein said system comprises a vaporizing device (20) for gradually evaporating said dampening solution in a test area (M) of the wet-offset printing plate (8) and a detection device (30) for detecting occurrence of smearing.

17. The system according to claim 16, wherein said vaporizing device (20) is disposed between a position where said dampening unit (2) contacts the plate cylinder (5) and a position where said inking unit (4) contacts the plate cylinder (5).

18. The system according to claim 16 or 17, wherein an energy level generated by said vaporizing device (20) is adjustable.

19. The system according to claim 18, wherein the energy level generated by said vaporizing device (20) is adjustable in dependence of the speed of the printing press so that a desired balance between dampening solution and ink yields to occurrence of smearing at a same position along the test area (M) or after a same time interval.

20. The system according to any one of claims 16 to 19, wherein said vaporizing device (20) is a radiation source directed towards said test area (M) which emits a light beam or microwaves.

21. The system according to any one of claims 16 to 20, wherein said detection device (30) is an optical camera located downstream of said inking unit (4), which optical camera is directed towards said test area (M) on the wet-offset printing plate.

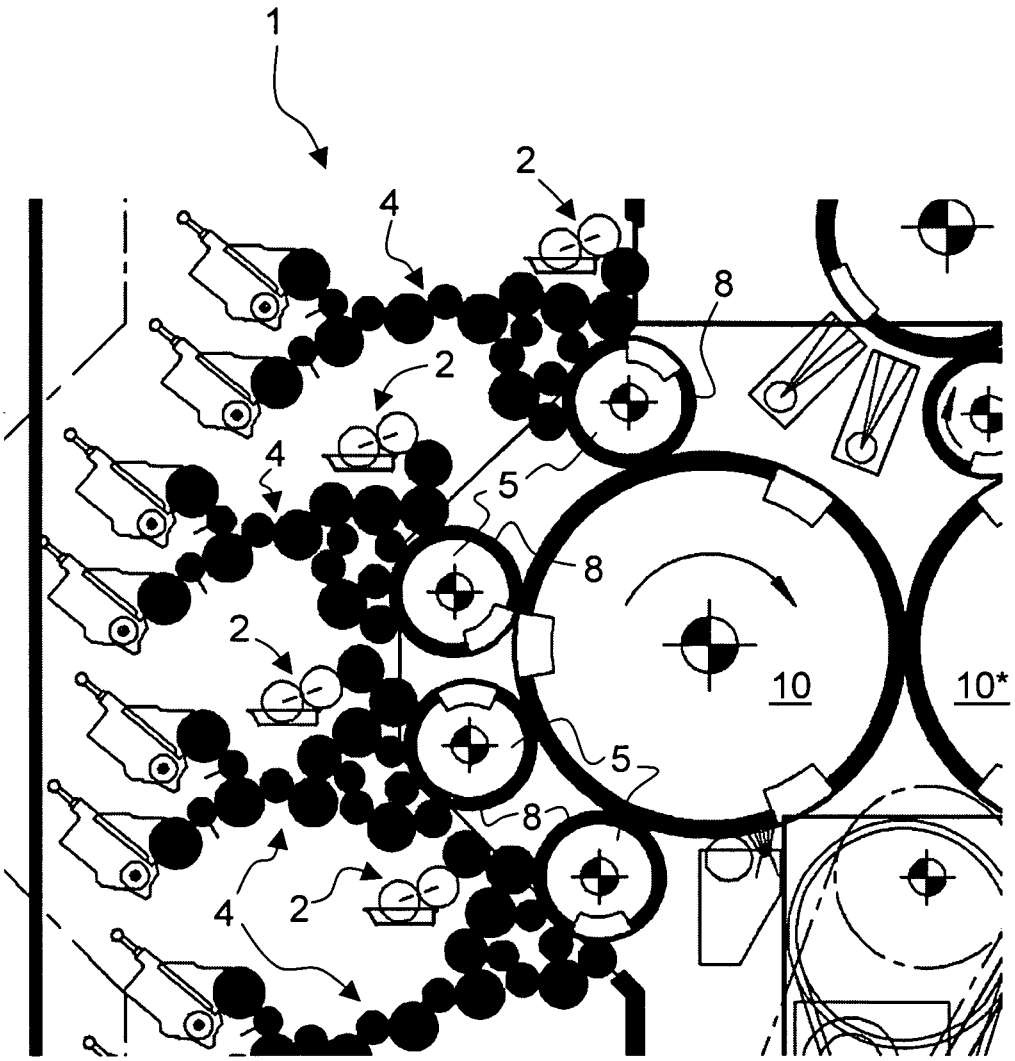

Fig. 1

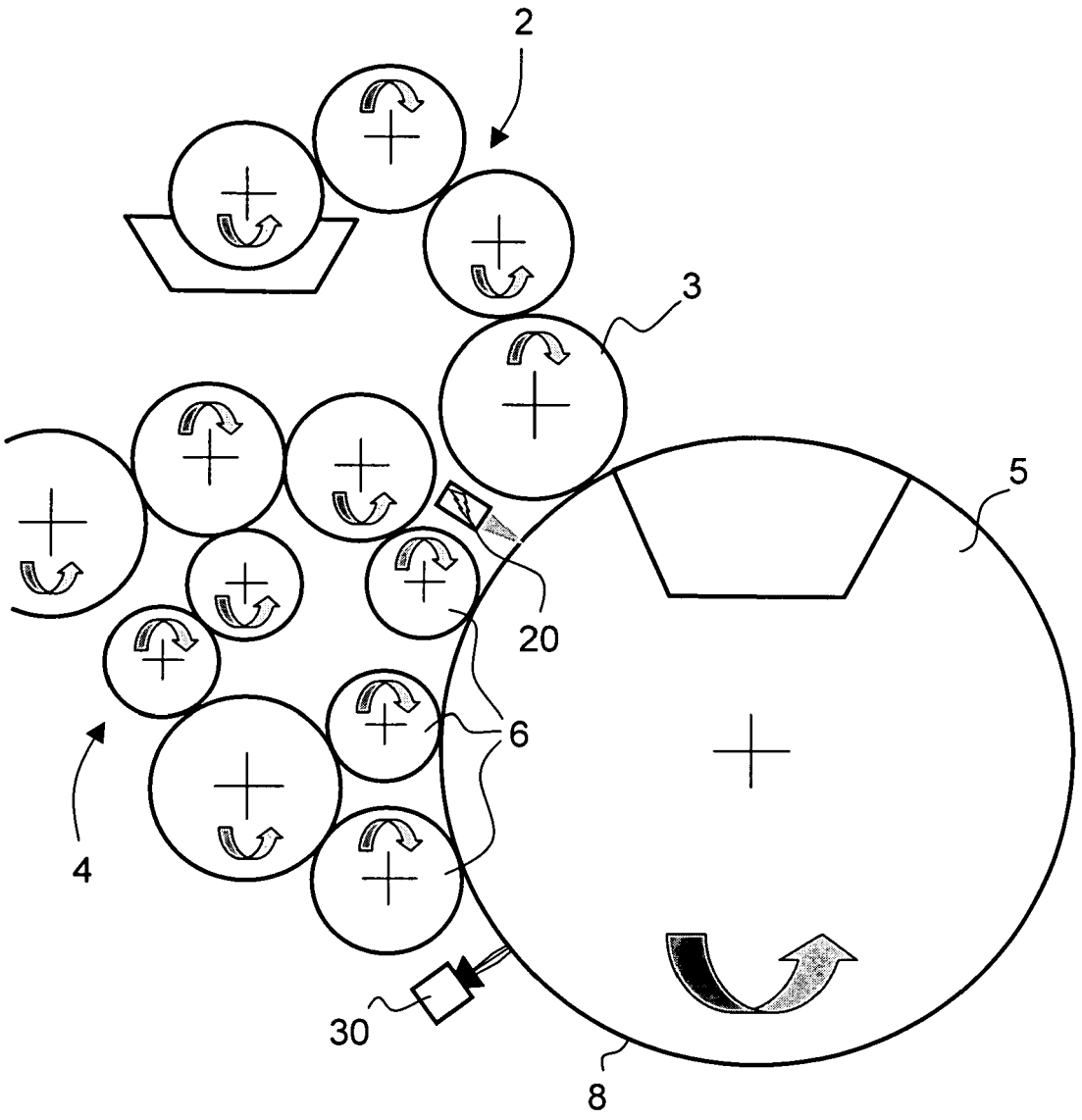

Fig. 2

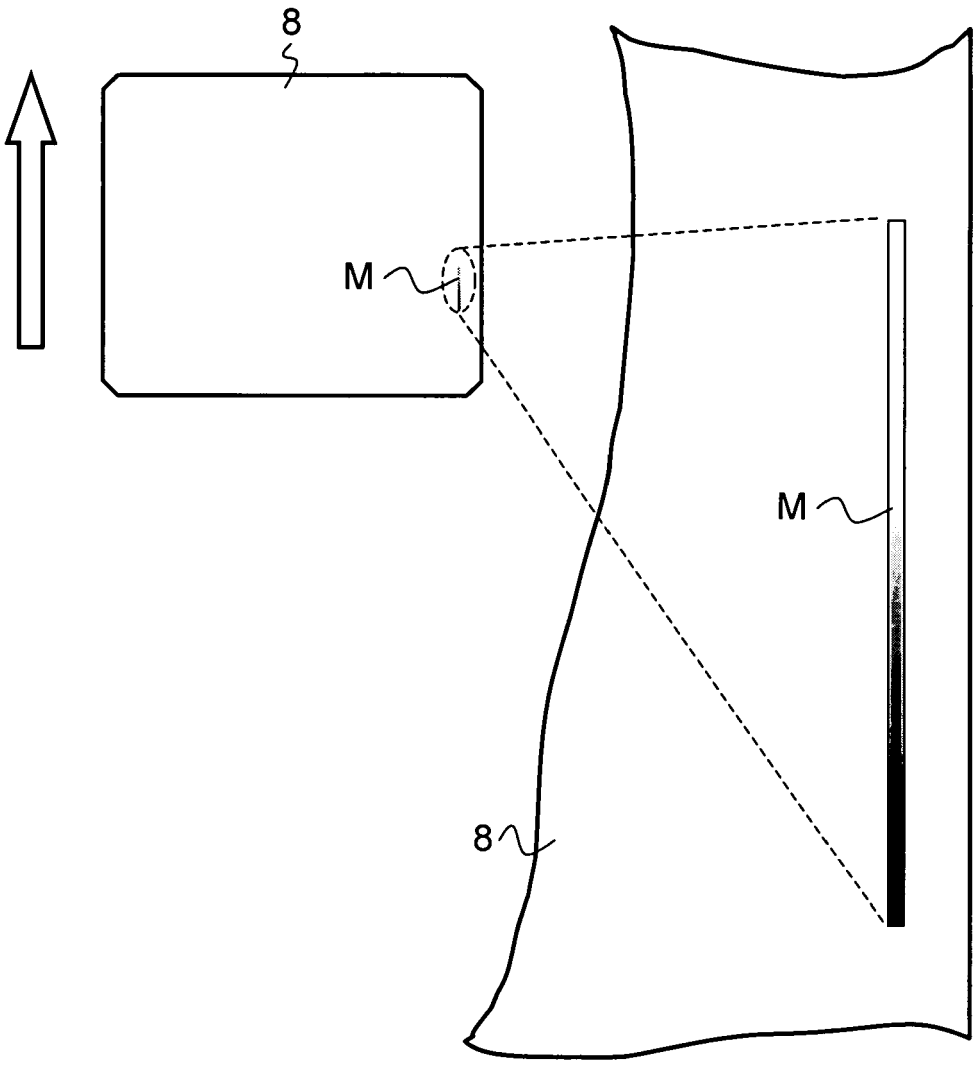

Fig. 3

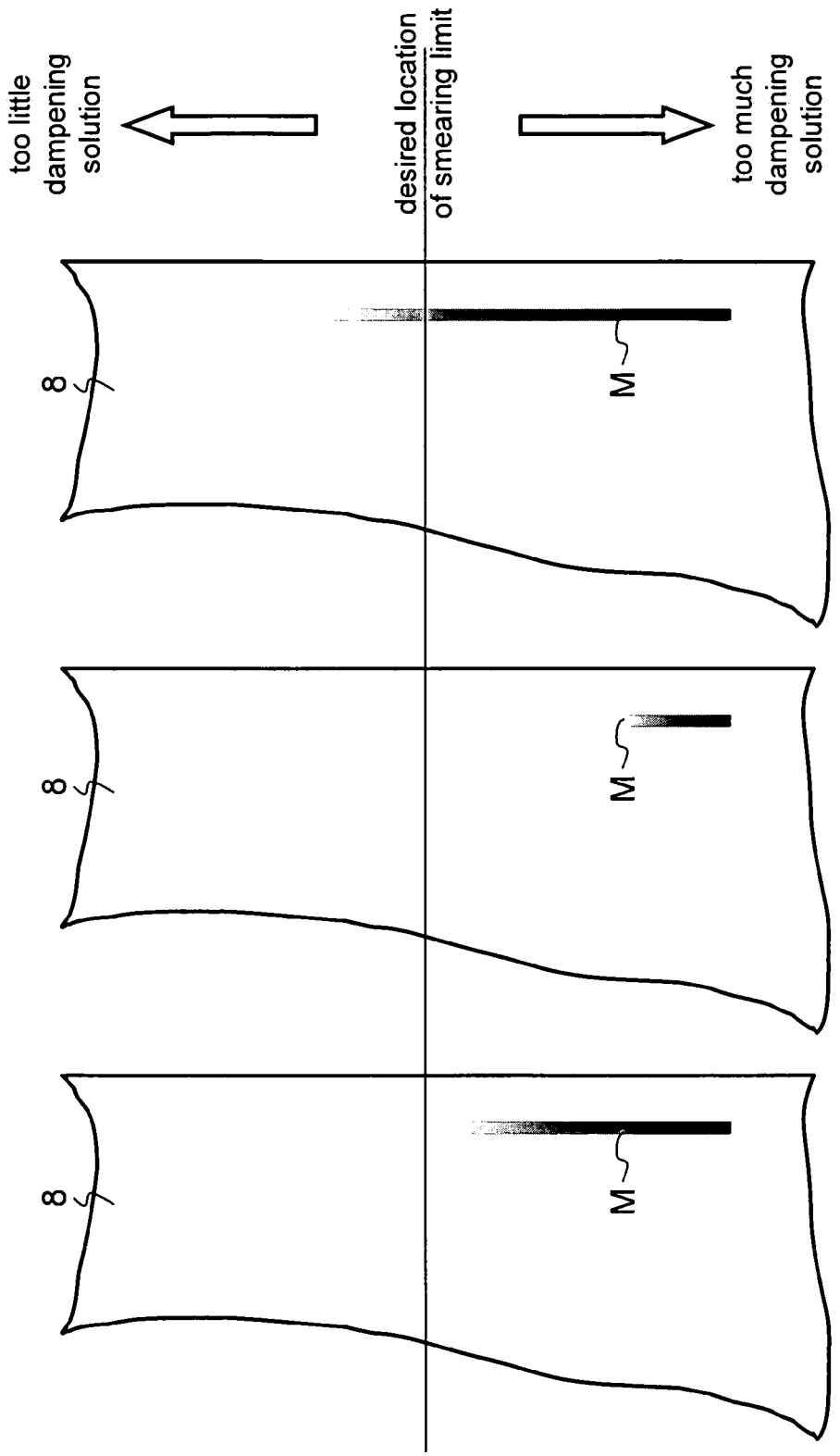
too little dampening solution
desired location of smearing limit
too much dampening solution
8
M
too much dampening solution
8
M
too little dampening solution
8
M
balance

Fig. 4

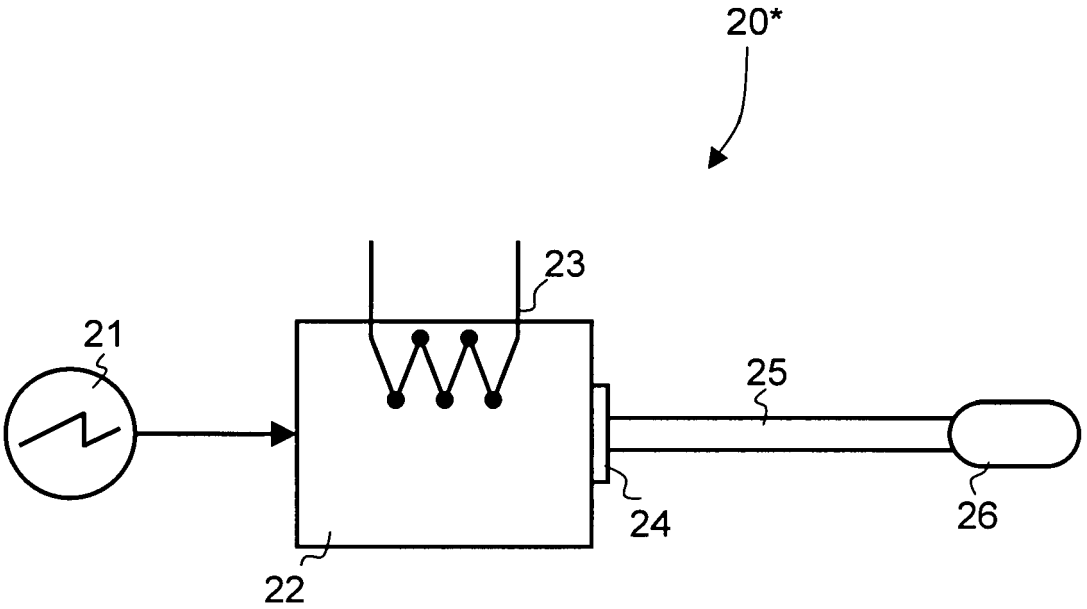

Fig. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 02 5790

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 May 2007	Vogel, Thomas

CATEGORY OF CITED DOCUMENTS

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