DAMPENING SYSTEM FOR LITHOGRAPHIC AND ANALOGOUS PRESSES
Filed Jan. 20, 1938

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This invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to one of any royalty thereon.

This invention relates generally to the art of lithography and particularly to the dampening of the printing surface of lithographic and analogous presses.

One of the objects of the invention is to provide a fluid interface dampening system for dampening the printing surface of lithographic and analogous presses whereby true surfaced rubber or composition dampening rollers may be used against the printing surface.

Another object of the invention is to provide wicks in the form of endless loops or belts for supplying a dampening fluid by capillary action from a source of fluid supply to a dampening fluid carrying roller included in a fluid interface system for dampening the printing surface of lithographic and analogous presses whereby flexible loop portions may be formed on the wicks for contacting with the dampening roller to maintain a continuous feed of dampening fluid from the source of supply to the roller from above and below the point of contact of the loop portions of the wicks, without appreciable wearing or fraying at the line of contact of the loop portions with the dampening roller and permitting the use of any section of the endless wicks for forming the loop portions thereon.

Another object of the invention is to provide a system, for dampening the printing surface of lithographic and analogous printing presses, which comprises a dampening fluid carrying roller, a source of dampening fluid supply, means for transmitting the dampening fluid from said supply to the dampening fluid carrying roller, absorbent or non-absorbent printing surface dampening rollers contacting with said dampening fluid carrying roller and said printing surface, and a dampening fluid control roller contacting with said dampening fluid carrying roller, whereby a head of dampening fluid is caused to be formed at the surface contact of the dampening fluid carrying and control rollers and a constant dampening fluid interface is maintained between and at the surface contact of the rollers in the system.

Heretofore in the dampening of printing surfaces of lithographic and analogous printing presses it has been considered necessary to make the printing surface dampening rollers of cotton fabric due to the fact that the feed for the dampening fluid was accomplished by a doctor roller composed of an absorbent material and the printing surface dampening rollers being composed of an absorbent material they could not be molded and trued for maintaining an even pressure on the printing surface through their full length, when aligned and set in contact with the printing surface as compared to this invention.

It is therefore the principal aim and purpose of this invention to provide a fluid interface dampening system for lithographic and analogous presses which permits the use of true surfaced rubber or composition dampening rollers running against the printing surface of the press and which composition dampening rollers may be of an absorbent or non-absorbent material.

With the above and other objects and advantages in view, the invention consists of certain features of construction and arrangement of parts which will hereinafter appear.

For purposes of illustration the invention will be claimed with reference to the accompanying drawing in which like members distinguish like parts and in which—

Fig. 1 is a side elevation partly in section of a printing press embodying the invention, and

Fig. 2 is a fragmentary perspective view partly in section thereof.

In the illustrative embodiment characterizing the invention, 1 indicates a plate cylinder of a lithographic or analogous press containing the design 2 to be printed, which is dampened by rollers 3 in contact therewith. The rollers 3 may be composed of rubber or similar composition whereby they may be molded and trued so that when aligned and set in contact with the plate cylinder an even pressure is possible through their full length. These dampening rollers, however, in this system may be made of an absorbent or non-absorbent material. The dampening rollers 3 also contact with a non-absorbent dampening fluid carrying roller 4, which is supplied with dampening fluid by means of a plurality of wicks 5 that are supported on a plate 6 contained within a trough 7, having a supply of dampening fluid provided therein. The wicks 5 are made of absorbent material in the form of endless loops or belts which are collapsed or closed upon themselves to lie flat on the supporting plate 6 within the trough and are held in place thereon by a cover plate 8.

The supporting and cover plates 6 and 8 respectively are provided with an inclined portion 10 for directing the inner ends of the wicks 5 upwardly from the trough 7, to contact with the roller 4 and are of a shorter length than the wicks, whereby the inner and outer ends of the wicks...
may extend outwardly from both ends of the plates.

When forming the wicks in the shape of endless loops or belts, loop portions 11 and 12 may be formed on any portion of the endless loops or belts, and an upper and lower layer 13 and 14 respectively provided thereon, which gives the effect of two layers of wick for feeding the dampening fluid from the trough by capillary action and at the point of contact 15 of the loop portions 11 with the roller 4, the dampening fluid is coming from two directions in the loop portions. The elasticity of the loop portions 11 causes a light contact with the surface of the roller 4, thereby permitting the wicks to continue in service for a considerable period without fouling. And as the wicks are in the form of endless belts they are easily moved to permit the use of any section of the wicks for forming the loop portions in case they become fouled with ink, which may accumulate on the surface of the roller 4.

While the dampening fluid carrying roller 4 is rapidly rotating a constant stream 16 of the dampening fluid is maintained from the line 17 on the roller 4, to the line 18 of contact of a non-absorptive dampening fluid control roller 17, with which the roller 4 is in close contact. The stream 16 of the dampening fluid from each wick spreads to form a head 18 of dampening fluid at the line of surface contact 19 of the rollers 4 and 17. At the line of surface contact 19 of the rollers 4 and 17, the head 18 of the dampening fluid is constant while the rollers rotate. Due to capillary action and rotational force of the rollers 4 and 17, a spreading effect results in a uniform film across these rollers. The amount of dampening fluid necessary for the operation of the press is correctly metered from the head 18 of dampening fluid by the contact pressure of the rollers 4 and 17 with each other and is carried by the roller 4 to the surface contact of the plate dampening rollers 20 whereby it passes as an interface, and an even film of the dampening fluid is carried in the surface contact of the plate dampening rollers 20 to the surface contact 21 of these rollers with the surface of the plate cylinder 1. A water interface is constant at the surface contact of each plate dampening roller 3 and plate cylinder 1, and as they revolve in the direction as indicated by the arrows a film of dampening fluid which is even and unchanging is carried away on the surface of each.

In this system the dampening fluid carrying roller 4 and the dampening fluid control roller 17 are aligned horizontally and rotate in the direction of the arrows in contact with each other and must be of non-absorptive material so that where the surfaces of these rollers contact a dam is formed at the head 18 of the dampening fluid.

The rotational force of the rapidly rotating rollers 4 and 17 draws the dampening fluid from the head 18 thereof and forces it to pass the surface contact 18 of the rollers as an interface, regardless of the close contact of the rollers. This is due to the interfacial surface tension of the dampening fluid interface, which will withstand greater pressure than will ever exist between the rollers of a system of this kind. When this fluid interface dampening system is used with plate dampening rollers of non-absorptive material the dampening fluid operation is aided and made possible by a slight coating distributed on the rollers of the assembly of a substance which is composed of beeswax and potassium carbonate.

This coating is obtained by simply touching the surface of any one of the rollers with a slight amount of the substance and permitting the rollers to rotate a few revolutions before the actual press operation is started.

It will thus be seen that there is provided a highly novel and useful fluid interface system for dampening the printing surfaces of lithographic and analogous presses. Even though there has been herein shown and described certain features of construction and operation of parts, it is nevertheless to be understood that various changes may be made therein without departing from the spirit or scope of the invention, such as supplying the dampening fluid to the system by other means than illustrated, as it is possible to supply the dampening fluid thereto by drip or spray.

Having described my invention, what I claim as new and wish to secure by Letter Patent is:

1. The method of dampening printing surfaces of lithographic and analogous printing members, which consists in feeding a dampening fluid from a source of supply in two directions through an endless path to a dampening system, and transmitting said dampening fluid to said printing surface through said dampening system.

2. The method of dampening printing surfaces of lithographic and analogous printing members, which consists in feeding a dampening fluid by capillary action from a source of supply in two directions through an endless path to a dampening system, causing said dampening fluid to be formed into a head, metering said dampening fluid from said head and transmitting said metered dampening fluid to said printing surface through said dampening system.

3. In a printing press, the combination with a printing member; mechanism for applying a dampening fluid to said member, said mechanism comprising a dampening system, including a source of dampening fluid and a plurality of collapsed endless wicks for feeding said dampening fluid from said source to said dampening system.

4. In the plate dampening system comprising a dampening system including a dampening fluid carrying roller, printing member and said dampening fluid carrying roller, a dampening fluid control roller contacting with said dampening fluid carrying roller, a source of dampening fluid and a plurality of collapsed endless wicks for feeding the dampening fluid from said source to said dampening fluid carrying roller.

5. In a printing press, the combination with a printing member, a dampening system for applying a dampening fluid to said member, said dampening system comprising a dampening fluid carrying roller, dampening rollers contacting with said printing member and said dampening fluid carrying roller, a dampening fluid control roller contacting with said dampening fluid carrying roller, a source of dampening fluid, a plurality of collapsed endless wicks for feeding the dampening fluid from said source to said dampening fluid carrying roller, and loop portions formed on said wicks at the contacting portions thereof with said dampening fluid carrying roller.

6. In a printing press, the combination with a printing member, a dampening system for applying a dampening fluid to said member, said dampening system comprising a dampening fluid carrying roller, dampening rollers contacting with said printing member and said dampening fluid carrying roller, a dampening fluid control roller contacting with said dampening fluid carrying roller, a source of dampening fluid, a plurality of collapsed endless wicks for feeding the dampening fluid from said source to said dampening fluid carrying roller, and loop portions formed on said wicks at the contacting portions thereof with said dampening fluid carrying roller.
carrying roller, dampening rollers contacting with said printing member, a dampening fluid control roller contacting with said dampening fluid carrying roller, a trough, a source of dampening fluid provided in said trough, a plurality of collapsed endless wicks for feeding the dampening fluid from said trough to said dampening fluid carrying roller, loop portions formed on said wicks at the contacting portions thereof with said dampening fluid carrying roller and supporting and cover plates for said wicks mounted in said trough.

7. In a printing press, the combination with a printing member, a dampening system for applying a dampening fluid to said member, said dampening system comprising a dampening fluid carrying roller, dampening rollers contacting with said printing member, a dampening fluid control roller contacting with said dampening fluid carrying roller, a trough, a source of dampening fluid provided in said trough, a supporting plate mounted in said trough, a plurality of collapsed endless wicks mounted on said supporting plate for feeding the dampening fluid from said trough to said dampening fluid carrying roller, loop portions formed on said wicks at the contacting portions of said wicks with said dampening fluid carrying roller, a cover plate mounted on said collapsed endless wicks and inclined portions on said supporting and cover plates for directing the said wicks from said trough to the said dampening fluid carrying roller, said rollers of said dampening system including absorbent and non-absorbent rollers.

8. The method of dampening printing surfaces of lithographic and analogous printing members consisting in forming a loop of absorbent material, collapsing the loop, contacting one end of the collapsed loop with a distributing roller, immersing the greater part of the remaining portion of the loop in a dampening fluid to convey the dampening fluid by capillary action through the loop in two directions to the distributing roller, and transmitting the fluid on the distributing roller to said printing surface.

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