

March 8, 1949.

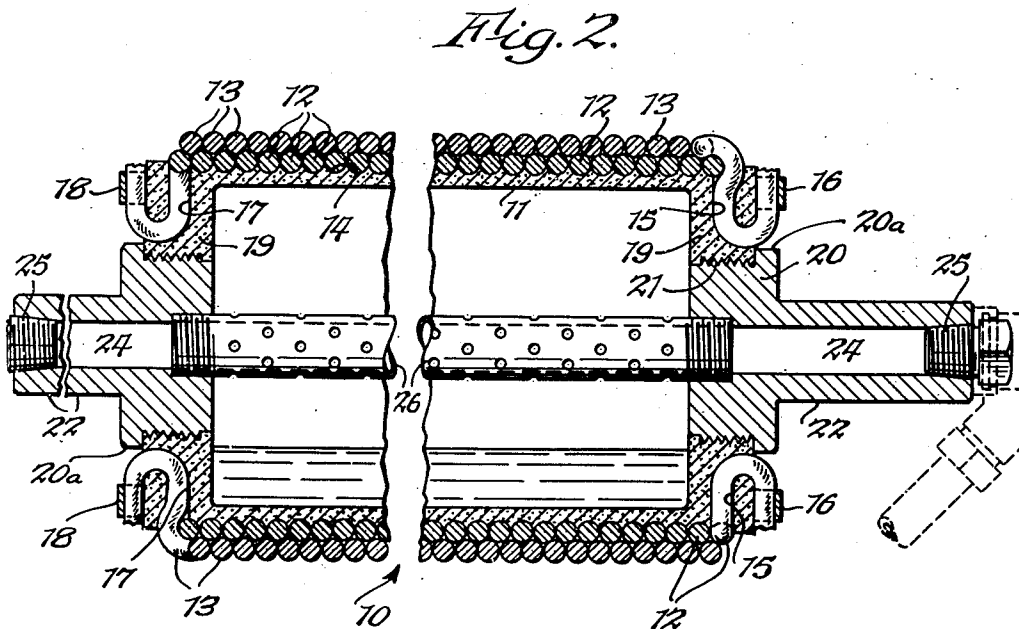
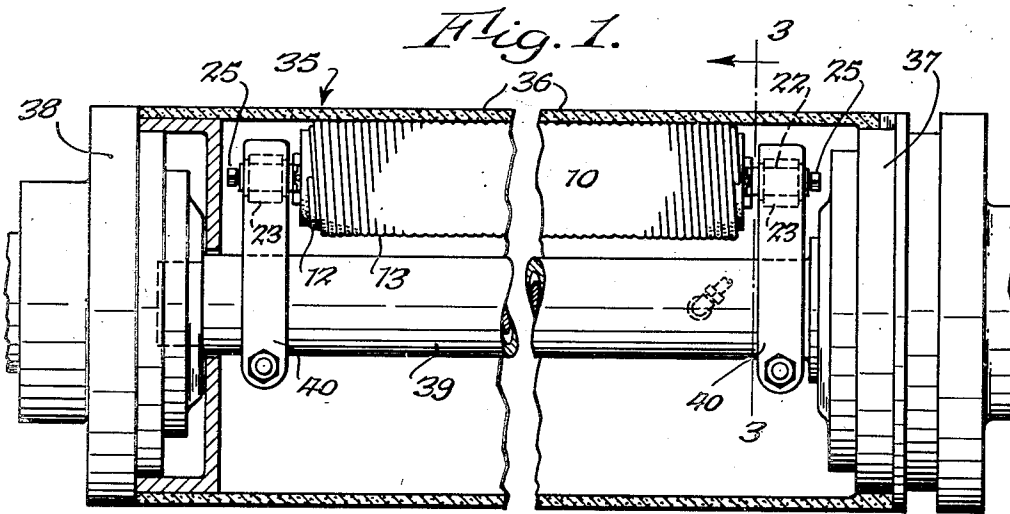
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2,464,040

DAMPENING OR MOISTENING ROLLER

Filed Jan. 23, 1945

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

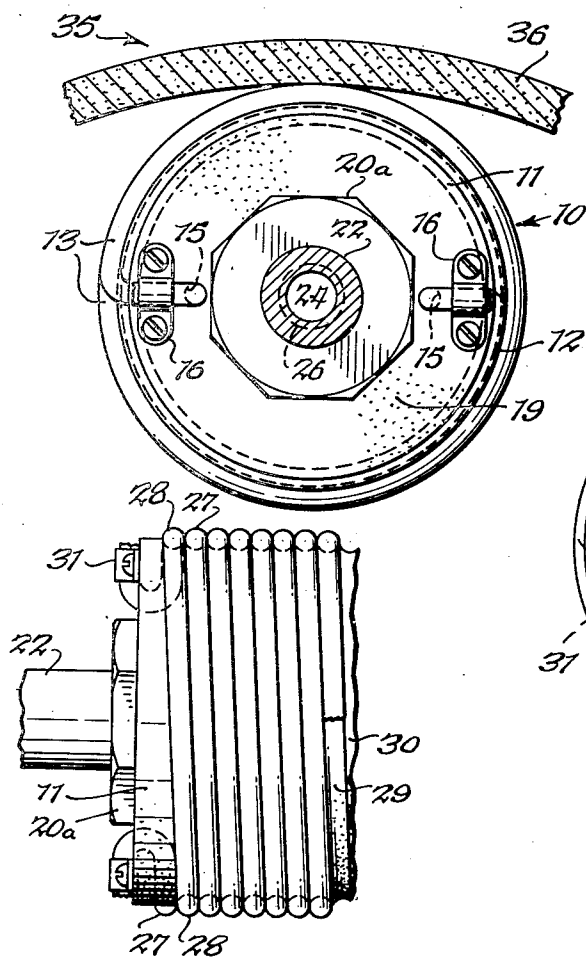


Fig. 4.

Fig. 3.

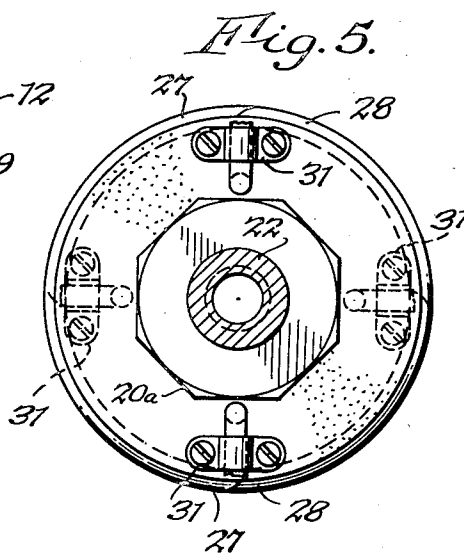


Fig. 5.

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DAMPENING OR MOISTENING ROLLER

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2 Claims. (Cl. 91—67.8)

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This invention relates to dampening or moistening rollers of the sort used in printing processes or apparatus for dampening or moistening bare or non-printing surface areas of printing cylinders, plates or elements. Such rollers as commonly constructed comprise a cylindrical core provided with a moisture-absorptive covering heretofore usually consisting of molleton or analogous sheet material capable of conveying moisture by absorption or capillary action and sewed in the form of a stocking or sleeve which is pulled over a metal core or cylinder.

One of the useful purposes of the improved dampening roller of this application is to provide a practical and desirable device for applying moisture to the inner surface of a tubular printing cylinder having a cylindrical wall of plastic, ceramic or other suitable material which is porous or permeable to adapt the liquid or moisture to permeate through said wall to and moisten the outer printing surface thereof. Such printing surface may be formed, for example, by a light-sensitive coating formed either directly on the outer surface of the said wall or on a hardened but permeable gelatinous layer applied externally on said cylindrical wall. The light-sensitive coating, after development, would provide light-hardened printing surface areas or images conditioned to make them receptive to greasy ink, whereas the bare or non-printing areas of the surface would be of a nature adapted to retain and be dampened by the moisture supplied to them by permeating through said cylindrical wall from its inner surface which is wetted by the dampening roller.

While the improved dampening roller herein disclosed is especially desirable for use in wetting the inner surface of the porous or permeable cylindrical wall of a tabulator printing cylinder, in which use the roller does not roll over the printing surface but supplies moisture only through the permeable wall to the bare or non-printing areas of the printing surface, nevertheless the roller is also adapted for use with other printing processes or apparatus such as used in offset or direct lithographic printing where the exterior printing surface of the printing plate, cylinder or element is dampened, as by rolling contact of the dampening roller with the printing areas as well as the bare or damp areas of the printing surface.

Other objects or purposes of the invention are to provide a roller with a dampening surface which is continuous or unbroken by seams or ridges such as occur in previous rollers having

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surface coverings in the form of sewed stockings or sleeves of absorptive materials; also to construct the device so that provision is made for the quick and easy removal of an old surface covering and its replacement with another perfectly uniform covering free from objectionable seams; also to provide a dampening roller having a surface covering formed by one or more absorptive cords wound helically upon a core or cylinder and seated or cradled in a helical surface groove or grooves in the core which prevents or prevent uneven crowding or lateral shifting of the convolutions of the cord or cords; also to provide the roller with effective securing means for a surface covering formed by a helically wound single cord or plurality of parallel cords; also to provide a dampening roller in which the supporting core for the absorptive covering is hollow and has a cylindrical wall of porous or permeable material through which water or an especially prepared solution introduced into the hollow core can permeate to moisten the absorptive covering, so that a whole edition can be printed or the roller used for dampening the printing surface so long as any liquid remains in the roller.

If desired, moisture may be supplied externally to the absorptive covering of the roller instead of from liquid contained within the hollow roller, as by arranging the roller to rotate while dipping into liquid contained in a trough exterior to the roller. In such case the roller core may be either a solid or tubular cylinder of brass or other suitable metal or solid, non-permeable material.

Further objects and advantages of the invention will appear from the following specification of the preferred embodiments of the invention shown in the accompanying drawings, and the novel features of the invention are set forth in the appended claims.

In said drawings:

Fig. 1 is a longitudinal, sectional elevation illustrating a dampening roller of a hollow liquid-containing construction embodying the invention arranged for moistening the inner surface of a tubular printing cylinder having a cylindrical or tubular wall of porous or permeable material.

Fig. 2 is an enlarged, longitudinal, sectional elevation of the dampening roller.

Fig. 3 is a transverse, sectional elevation of the dampening roller and printing cylinder on line 3—3, Fig. 1.

Figs. 4 and 5 are respectively a fragmentary plan view and end elevation of a slightly modified form of dampening roller embodying the invention, in which the absorptive covering is formed

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by two parallel cords wound helically in a single layer about the roller core.

A dampening roller according to my invention comprises a core or cylinder provided with a moisture-absorptive covering preferably formed by one or more cords of moisture-absorptive characteristics or construction wound helically in one or more layers about said core or cylinder, which core may be hollow having a porous or permeable cylindrical wall through which liquid passes from the interior of the core to the absorptive covering, or the core may be solid or made of solid material and its absorptive covering moistened from an exterior source.

Referring first to the construction illustrated in Figs. 1-3, 10 represents a roller, the core of which is in the form of a hollow cylinder adapted to contain water or a specially prepared moistening solution and having a cylindrical wall 11 made of plastic, ceramic or other suitable material which is porous or permeable to permit liquid within the cavity of the core to permeate through said wall to the absorptive covering surrounding and supported by said cylindrical wall. This covering as shown in these Figs. 1-3, comprises a single cord 12 wound helically in an inner layer on said cylindrical wall, and a single cord 13 wound helically in an outer layer about and upon said inner cord layer. The cords are made of suitable material or construction adapting them to absorb or convey moisture, as by capillary action. The inner cord 12 is seated or cradled in a shallow, helical groove 14 cut or formed in the outer surface of said cylindrical wall with the convolutions of the cord contacting side by side one with another, and the cord 13 of the outer layer is seated in the helical groove formed between adjacent convolutions of the cord 12 of the inner layer. The groove 14 in the surface of the core thus functions to oppose or prevent uneven crowding or lateral shifting or displacement of the convolutions of the cord of the inner layer. Likewise, crowding or shifting of the cord convolutions of the outer layer is opposed or prevented by the groove formed by the cord convolutions of the inner layer so that an absorptive covering for the roller is provided which forms an outer moistening or dampening surface which is uniform or even throughout, and continuous or unbroken by seams or ridges, such as occur in previous damping rollers in which the absorptive covering is formed by a sewed covering sleeve or tube. Such seams or ridges are detrimental to uniform or even dampening of the cylinder or other surface, as the seams or ridges cause friction wherever they contact with the surface which is being dampened by the roller.

Each cord of the covering is removably secured in place on the core, preferably by fastening the opposite ends of the cord as illustrated, to the opposite ends of the core. As shown, the starting end of each cord is inserted or passed through a hole 15 in the core, which extends inwardly from its outer periphery and out at the adjacent end of the core, with the protruding end of the cord fastened at the end of the core, as by a clip or fastening device 16 secured by screws on the end of the core. The opposite or final end of the cord is passed through a similar hole 17 in the opposite end portion of the core and is fastened by a similar clip 18 on this end of the core. Thus, each cord is securely but releasably fastened in place on the roller core in such a manner that the cords can be quickly

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and easily removed and replaced by new cords. The fastening holes 15 and 17 for the opposite ends of the cords are formed in inwardly extending end flanges 19 of the cylindrical walls of the core.

The hollow core of the roller in this construction is provided at its ends with means for rotatably mounting the roller and for the introduction of the water or solution into its cavity. These means, as shown in Fig. 2, comprise screw threaded end plugs 20 which are screwed into threaded central openings 21 in the ends of the core and form liquid-tight closures for the openings. The plugs 20 have non-circular portions 20a suitable for engagement by a wrench for turning the plugs to close and open the end openings 21, and are provided with outwardly projecting, axial, cylindrical extensions or journals 22 adapted to turn in suitable bearings, as indicated at 23, in Fig. 1, for rotatably mounting the roller. The plugs 20 shown are formed with axial filling holes 24 closed at their outer ends by suitable screws or stoppers 25, so that the moistening liquid may be introduced into the roller by removing one of these stoppers.

As shown in Fig. 2, the dampening roller also has a perforated tube or pipe 26 extending axially through the core and connected to the opposite end plugs 20, as by threading the ends of the pipe 26 which screw into threaded central holes in the plugs 20. This perforated pipe 26 permits the introduction of the moistening liquid into the roller through the filling holes 24 in the end plugs but serves to tie or join together the end plugs of the core and thus strengthens and stiffens the hollow core.

As before indicated, the absorptive covering of the roller may comprise a single or multiple superposed layers each formed by a single cord or two or more parallel cords wound about the roller core or cylinder. Figs. 4 and 5 illustrate a roller in which two parallel cords 27 and 28 are wound helically in a single layer on the cylindrical wall of the core and seated in parallel helical grooves 29 and 30 formed in the outer surface of the cylindrical wall. Each of these cords is secured at its opposite end to the opposite ends of the cylinder in the manner before described, by passing the ends of each cord through holes leading inwardly from the periphery of the cylindrical wall to the exterior of the ends of the core and there secured by clips or fastening devices indicated at 31, which may be like the clips 16 and 18 before described.

The hollow roller of any of the constructions described may be suitably mounted with a hollow printing cylinder 35, for example, as shown in Fig. 1, with the roller journaled in suitable bearings 23 at its opposite ends to adapt it to rotate in contact with the inner surface of the cylindrical tube or wall 36 of the printing cylinder, either by frictional contact of the roller with the cylindrical wall 36, or by driving the roller by any appropriate means. Said cylindrical wall 36 of this printing cylinder is made of porous or permeable plastic or other material so that moisture applied by the roller to the inner surface of the wall may permeate therethrough to moisten a printing surface, such as hereinbefore mentioned, provided on the exterior periphery of the printing cylinder. The printing cylinder may be of a construction such as illustrated in Fig. 1, in which its cylindrical wall 36 is detachably mounted at opposite ends on heads or elements 37 and 38 journaled to rotate on bearings surrounding a

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stationary central shaft 38, so that by removing one of the end heads, as 38, the cylindrical wall 36 can be removed endwise from the other rotary head to afford access to the dampening roller, the bearings for which may be supported by bearing brackets or supports 40 clamped or secured on the central shaft 39 of the printing cylinder. Thus, the dampening roller is adapted to rotate in contact with the inner surface of the cylindrical wall of the printing cylinder to wet or moisten this inner surface rotation of the printing cylinder in the printing operation. When the tubular printing cylinder is removed the required quantity of moistening liquid may be introduced into the dampening roller, or if desired, the liquid may be introduced into the dampening roller without disturbing the printing cylinder, as by a supply tube which may lead from an axial pipe in the stationary printing cylinder shaft 39 and have a suitable swivel connection with the hollow journal at one end of the dampening roller, as indicated by broken lines in Fig. 2.

I claim as my invention:

1. A dampening roller comprising a hollow cylinder adapted to contain a liquid therein and having a cylindrical wall of liquid permeable material with a shallow helical groove in its outer surface, a moisture-absorptive covering for said wall formed by a cord extending helically around the cylinder and seated in said groove with adjacent convolutions of the cord contacting each other outwardly beyond the groove for absorbing liquid permeating through said permeable wall from the interior of the cylinder, said cylinder having screw-threaded central openings in its opposite ends, and threaded closure plugs screwed in said openings and having axial extensions forming journals for rotatably mounting said roller.

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2. A dampening roller comprising a hollow cylinder adapted to contain a liquid therein and having a cylindrical wall of liquid permeable material with a shallow helical groove in its outer surface, a moisture-absorptive covering for said wall formed by a cord extending helically around the cylinder and seated in said groove with adjacent convolutions of the cord contacting each other outwardly beyond the groove for absorbing liquid permeating through said permeable wall from the interior of the cylinder, said permeable wall having screw-threaded central openings in its opposite ends, threaded closure plugs screwed in said openings and having axial extensions forming journals for rotatably mounting said roller, at least one of said plugs providing a filling opening for said roller, and an axial perforated pipe which is secured to and connects said plugs and communicates with said filling opening.

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