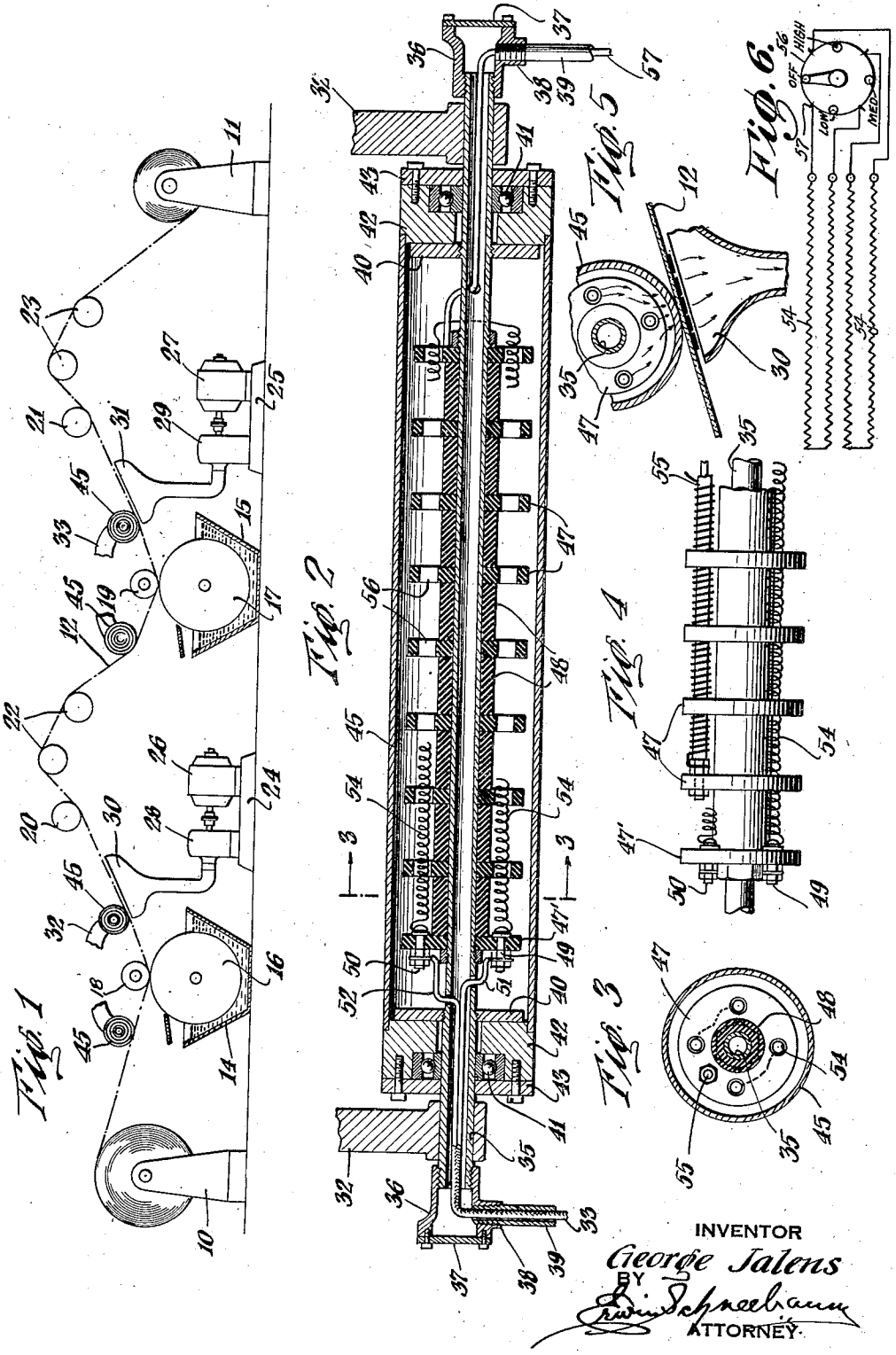
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APPARATUS FOR WELDING INK AND CELLULOSE TISSUE

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## APPARATUS FOR WELDING INK AND CELLULOSE TISSUE

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1 Claim. (Cl. 34—48)

This invention relates to apparatus and processes for drying sheets of freshly printed fabrics, whereby offsetting and smutting is prevented when applying differently colored ink thereon in quick succession, and has particular reference to sheets of non-absorbent material such, for instance, as cellulose tissue, glassine etc.

In printing on ordinary paper, any excess moisture in the ink is quickly absorbed by the paper and its bibulous character is commonly enhanced by passing the sheets through a heated zone, produced by electricity or a gas flame, and eventually deposited in a container in such a manner that a film of air intervenes the successive sheets. Inasmuch as only the printed surface of the paper is dry and not the paper itself, sheets of absorbent material must be inserted between printed sheets to prevent blurring.

A thorough drying of print and web is particularly important where a condition of complete dryness must exist, as in multi-colored printing before the sheets reach the next printing cylinder.

However, when printing on non-absorbent material other means must be found to dissipate the moisture in the ink, so that only the pigment remains on the surface in a completely dry condition, and it is the principal object of this invention to accomplish that effect.

A further feature of this invention resides in the provision of means for imparting heat directly to the surface of a freshly printed web during its travel by drawing the ink through the fabric, and means whereby the solvents in the ink are withdrawn by suction pumps, the suction heads of which are arranged directly opposite the heat producing rolls.

Another purpose of the invention is the provision of a drying apparatus consisting of a stationary heating element in a rotatable housing of heat conductive material and light weight.

Another aim of the invention is the provision of an apparatus of this character which can be used in connection with ordinary printing presses of the cylinder or flat bed type.

Another feature of the invention is to provide means for printing on moisture-proof cellulose tissue, where it is necessary for the ink to penetrate the wax coating of the paper, to form a firm weld between ink and paper.

A yet further aim is the provision of an apparatus of this character consisting of few and simple parts, being simple and effective in operation and highly durable.

These several consequential and characteristic features are achieved by the novel and practical construction of parts hereinafter described and shown in the accompanying drawing, constituting an essential part of this disclosure, and in which:

Figure 1 is a schematic view of an embodiment of the invention, certain parts being inside elevation and others in section.

Figure 2 is a longitudinal sectional view of the heat engendering roll.

Figure 3 is a transverse sectional view, taken on line 3—3 of Figure 2.

Figure 4 is a fragmentary side elevational view of the heating roll and heat controlling element, the housing being removed.

Figure 5 is an enlarged sectional view illustrating the relation of parts when in operation.

Figure 6 is a diagrammatic view of the heat control element.

In Figure 1 of the drawing, two stands, respectively designated by the numerals 10—11 are shown, these stands being secured in spaced relation on a floor, to support freely rotatable rolls, on which are mounted a coiled web 12.

This web is the material on which the printing is to be received, and it is to be understood that one of the rolls, as that in the stand 11, is provided with a driving means (not shown) and the other is actuated by movement of the web as it is drawn from it.

Spaced intermediate the stands are ink containers 14—15, having mounted in them dispensing cylinders 16—17 and thereabove, in vertical registration with their axis are impression rolls 18—19, the web being between the rolls and the cylinders, one set of which supplies ink of one color and the other another color.

The web 12 is directed upwardly from the rolls 18—19 to pass under guide rollers 20—21 and over similar rollers 22—23, whereby the web is subject to atmospheric drying. The guide rollers may be eliminated however, as atmospheric drying becomes unnecessary since the heating element leaves the web in a thoroughly dry condition.

Rearwardly adjacent the ink containers 14—15 are platforms 24—25 on which are fixed motors 26—27 directly geared to suction pumps 28—29 having expanded inlet heads 30—31 suited in shape and disposed closely adjacent the under surface of the web which is inclined upwardly after leaving the printing cylinders 16—17.

Pairs of support arms 32—33 are secured to the frame of the apparatus (not shown) and fixed to

extend between each pair of arms is a tube 35 provided at its extending ends with expanded caps 36 having removable covers 37. These caps also have lateral bosses 38 in which are set tubes 39.

Fixed on the tube 35 adacently inward of the arms 32 are rigid washers 40 of low heat conductivity to prevent the heat from penetrating the housing of the roller laterally. Also fixed on tube 35 are the inner elements of annular ball bearings 41 their outer elements being set in collars 42 provided with caps 43.

The collars or heads 42 are clear of the tube 35 and are held from longitudinal movement by the washers against which they make contact at their inner sides.

A tubular housing 45 is fixed in annular recesses at the inner ends of the collars 42 to extend therebetween, this tube being of light weight, heat conductive material and of very small diameter. Aluminum is one of the materials suitable for the housing. Due to its mounting the housing is readily rotatable by the web with which it makes frictional contact on the side opposite the freshly inked face of the web.

Mounted on the tube 35, intermediate the heads 42, and locked in position by clamp nuts 46, are a series of dielectric discs 47, such as mica, having between them spacers 48 of like material.

Set in one of the outer discs 47' are a pair of binding posts 49—50 to which are secured electric conductors 51—52 passing out through the tube and pipe 39 after being encased in the housing 36.

In Figure 6 is illustrated a simple heat control means comprising a switch 56 to which are connected the heating coils 54. It will be apparent that the pointer 57 on switch 56 may be turned to "off", "low", "medium" or "high" selectively, and that the temperature within the roller will vary accordingly.

In order to print upon waxed or moisture-proof fabric it is necessary to melt the wax coating upon the cellulose tissue before printing is done thereon. If this is not done, the ink will not penetrate the waxed surface, and the impression will not last. In order to obtain the desired result, a heating element without suction pump, is secured forwardly adjacent each printing cylinder. Thus the waxed cellulose tissue will be heated before ink is applied thereon.

While certain preferred embodiments of this device have been shown and described, it will be understood that changes in form, arrangements, proportions, sizes and other details thereof may be made without departing from the scope of the invention as defined in the appended claim.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

An apparatus for drying moisture-proof cellulose tissue comprising a pair of stands provided with means for supporting a web therebetween, means for making an ink impression on said web when moving from one stand to the other; two heated rollers of small diameter and light weight in direct frictional contact with and actuated by said web, one arranged to heat the web before an ink impression is made thereon, and the other to dry the web after the ink impression has been made, and manually operable means for selectively controlling the degree of heat in said rollers.

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