

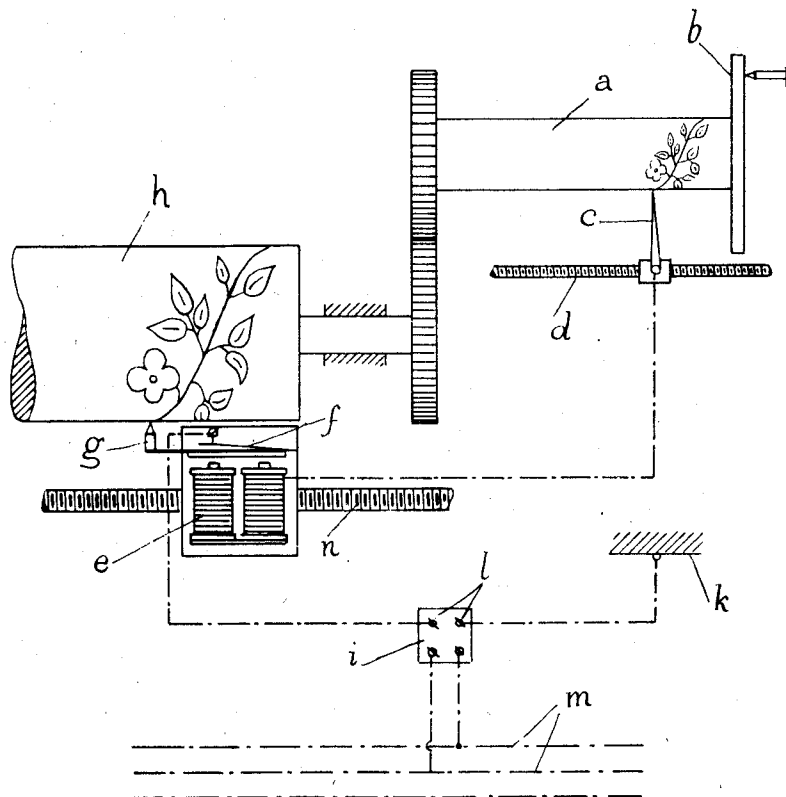
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PROCESS OF AND APPARATUS FOR ENGRAVING PRINTING CYLINDERS

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PROCESS OF AND APPARATUS FOR ENGRAVING PRINTING CYLINDERS.

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The present invention relates to a process of engraving cylinders for producing multi-color impressions on fabrics, paper, and other material.

One of the processes at present employed for this purpose consists in reproducing the model design by pantographic engraving or tracing. This process requires the preliminary preparation of a metal template which already carries the sunk engraving of the design to be reproduced. This process is very expensive owing to the difficulty of the preparation of the template, which constitutes an often very long and tedious manual operation requiring all the care of a specialized artistic engraver.

Another process just as delicate and expensive as the former, although often applied, consists in making the imprint of the design on a copper cylinder by means of a knurling tool. This operation requires the preliminary preparation of a tempered steel cutting wheel, carrying the sunk engraving of the model design. The necessity of using a fresh wheel each time for each type of design the very high costs of providing the wheel, and its rapid wear conducing to defects of clearness in the details or effects, sufficiently condemn the method.

Another process, photo-engraving, has from the point of view of printing on fabric the serious drawback that it is difficult to connect the impressions on the cylinder and that much retouching is required. This last drawback also exists in the case of litho-engraving, as this process does not produce a clear design and therefore renders very considerable retouching necessary.

The process according to the invention makes it possible to obtain rapidly a perfect engraving produced directly from a model design drawn on paper and does not require any retouching. The preliminary preparation of a metal template is eliminated.

The design is according to the present process drawn on opaque or transparent paper by means of an ink or color capable of transfer by mere application on a metal surface good conductor of electricity. The impression left by the ink on the conducting surface is passed over with an insulating varnish. The said surface is connected to one of the poles of any suitable source of electricity. If a metal needle or pointer insulated from the mass and connected to the second pole of the source of electricity is caused

to travel over the whole conducting surface, the circuit is interrupted or closed according to whether the travelling needle or pointer passes over a conducting metal portion or a varnished insulated portion of the surface.

If an electro-magnetic trembler is interposed on the electrical circuit and the point of the hammer of the said trembler is moved along a metal cylinder this point will be brought into contact with or away from the said cylinder as the electrical circuit is interrupted or closed.

By co-ordinating by suitable mechanical means the respective travels of the needle or pointer and of the point of the trembler, the impression produced on the cylinder by the latter will be in strict conformity to the design over which the needle or pointer has passed, except that proportions may vary.

The cylinder thus prepared is ready for printing.

A manner of carrying out the present invention is, by way of example, illustrated by the accompanying drawing.

The apparatus illustrated principally comprises:

1. A metal cylinder *a* to which a uniform movement of rotation is imparted, and which is connected to one of the poles of a suitable source of electricity. On this cylinder *a* is applied the drawing of the design in order to transfer thereon the design to be reproduced. All the portions of the design not intended to be colored are passed over with insulating varnish. *b* indicates the divider disc.

2. A metal pointer *c* connected to the other pole of the source of electricity and electrically insulating in relation to the mass of the apparatus. The pointer *c* is caused to travel along by the screw *d*. This last movement is combined with the revolution of the cylinder *a* to enable the pointer to pass successively over all the points of the surface carrying the transferred design.

3. An electromagnet *e* provided with a trembler *f* of any suitable construction, of which the point of the hammer *g* is capable of coming into contact with the surface of the cylinder *h* to be engraved either at the moment of the passage or at the moment of the interruption of the electric current, according to the combination adopted.

The electromagnet *e* is interposed in the electrical circuit. *i* is for instance a transformer, one of the poles of the secondary

winding *l* of which is connected to the mass *k*, the primary winding being fed from any suitable source of electricity such as *m*.

The electro-magnet *e* is caused to travel 5 along by the screw *m*, this movement being combined with the movement of rotation of the cylinder *k* to be engraved.

Each time the pointer *c* comes into contact with a conducting portion of the cylinder *a* 10 the electrical circuit is closed and the electro-magnet *e* acts in such a manner that the point of the hammer *g* traces on the cylinder to be engraved a design constituting an exact reproduction of the model design carried by 15 the cylinder *a*.

The engraving tool is removable: the fixed point used for acid engraving may be replaced by a milling cutter or a rotary engraving tool, thereby allowing a cylinder ready for use 20 to be obtained directly.

We claim:

1. The improved process of engraving printing rollers, consisting in providing a design composed of electric conducting and non-conducting surfaces upon a rotating pattern 25 roller of conductive material, in causing a needle controlling a tool operating electrical circuit to travel lengthwise along the pattern roller in unison with its rotary movement, in 30 positively rotating the roller to be engraved by means of a gear wheel transmission derived from the pattern roller, the ratio of transmission corresponding to the size of the repro-

duction to be obtained, and in reproducing the design on the roller to be engraved by 35 means of a hammering tool travelling lengthwise along the printing roller in relation with its proper rotary movement and operated by an electromagnet placed in said circuit, which is closed, respectively interrupted when the 40 said needle meets a conducting surface of the pattern design.

2. Apparatus for electrically engraving printing rollers, comprising a rotating pattern roller of conductive material and carry- 45 ing a design composed of electric conducting and non conducting surfaces, a rotating roller to be engraved positively driven by means of a gear wheel transmission derived from the pattern roller, a pointer in contact with the 50 pattern roller and moving lengthwise along this roller under action of a rotating screw, an electromagnet with trembler, a hammering tool carried by the said trembler and adapted to enter in contact with the rotary printing 55 roller, the electromagnet together with the said tool travelling lengthwise along the printing roller, under the action of a rotating screw, and an electrical circuit including the pattern roller, the pointer and the electromag- 60 net, substantially as described.

In testimony whereof we signed hereunto our names.

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