

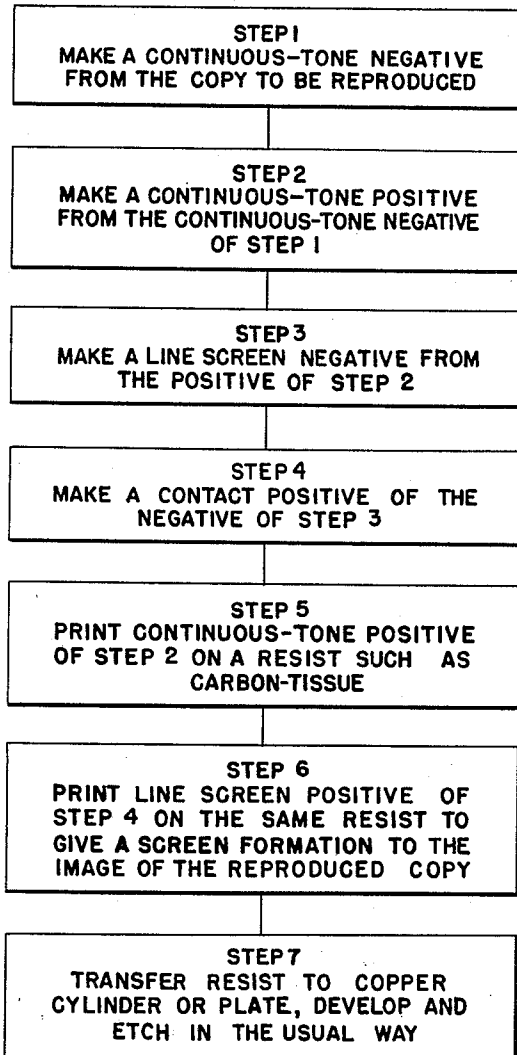
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METHOD OF GRAVURE REPRODUCTION

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## METHOD OF GRAVURE REPRODUCTION

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4 Claims. (Cl. 96—38)

This invention relates to improvements in a method of gravure reproductions.

Photogravure, as now more commonly termed "gravure," is a photomechanical intaglio printing process by which prints are obtained, either in multicolor or monochrome, from etched copper-coated cylinders or plates, of the copy or subject to be reproduced. Cells or wells are etched in the surface of the cylinders or plates to varying depths to receive and contain the ink. The amounts of ink contained therein define the tonal range produced in printing.

The present method differs, among other respects, from conventional gravure in that the cells or wells formed to hold the ink are variable both in size and depth according to the tone required.

Among the objects of our invention is to provide an improved method that will produce prints having a more extended and better tonal range than heretofore produced.

Another object is to provide an improved method whereby a line screen negative is made from a retouched continuous-tone positive, thereby preserving all of the retouching that has been done on the positive.

A further object of the invention is to provide a method by which a line screen positive is made by contact from the line screen negative, thus resulting in sharp, hard, firm, opaque dots.

A still further object of the invention is to provide more screen wall area than is provided by conventional gravure procedure. Accordingly, it gives a longer life to the printing surface, and allows of a greater latitude in re-etching to correct any errors that may not have been detected when making the continuous-tone negative and the continuous-tone positive.

The conventional gravure method consists in making a continuous-tone negative of the copy or subject matter to be reproduced. A continuous-tone positive is made from that negative and is printed on a carbon-tissue resist. Both the negative and positive are formed without use of a half-tone screen. After the continuous-tone positive has been printed on the carbon-tissue, it is removed and an ordinary gravure screen is printed over the print made by the positive to form the image in dots or reticulations necessary for transfer to the printing surface. In the conventional gravure method the wells or cells produced on the printing surface are all of the same size and of different depths. Such printing surfaces are difficult to etch and will wear out faster than the printing surfaces produced by our method.

Another commonly employed process is that known as the Dultgen process such as disclosed in Patent No. 2,040,247 of May 12, 1936. In the practice of that process, the wells or cells on the printing surface are formed in checkerboard fashion and therefore they cannot be arranged in too close proximity to one another because in that event there is danger that the ink will leak or spill over from one well to another at their adjacent

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corners. This objection limits the permissible extent of the darker tonal range.

That objection is overcome by our improved method wherein the wells are separated by unbroken straight walls or lines that cross diagonally at right angles instead of being arranged in checkerboard fashion. This affords a greater tonal range, especially in the darker areas. It is well known that the darkness of the tone depends upon the size and depth of the wells that hold the ink.

Not only does our improved method overcome the defects of the prior art processes, but it also effects superior results both as to multicolor and monotone gravure reproduction. The invention will be readily understood from the following description thereof when read in connection with the accompanying drawing that illustrates a flow sheet on which the steps of the method are designated.

In practice of our improved method, all of the positives and negatives hereinafter described, whether of unlined or unscreened continuous tone, or of lined screen tone, may be made either on plates or film.

By the term "line screen" used in the specification and claims is meant the screen image, either negative or positive, that results from simultaneous exposure through both a half-tone screen, and an auxiliary screening device. The term "auxiliary screening device" as used hereinafter and in the claims means a screening device of the kind described in our Patent No. 2,703,281 of March 1, 1955. A chart setting forth the sequence of process steps is shown in the drawing.

The first step in the practice of our improved method is to make a continuous-tone negative of the copy or subject to be reproduced. A continuous-tone positive is then made from this negative in the usual way. Both the continuous-tone negative and the continuous-tone positive may be retouched as required. In the case of multicolor work the usual color separation negatives and positives are made. No invention or novelty is claimed as to these steps in themselves.

The continuous-tone positive is placed before a suitable camera and a line screen negative is made thereof. In making the line screen negative it is photographed through both a half-tone screen and an auxiliary screening device comprising a disk or stop having a plurality of circular openings arranged in two straight lines that cross each other at a right angle, which openings are centered with respect to the squares or reticulations of the half-tone screen. This results in a special screen formation, which we term a line screen formation, and creates a negative having greatly increased tonal range over one produced by any other method.

The next step is to make a contact positive of the said line screen negative. Following this the continuous-tone positive, previously made, is printed on a carbon-tissue resist. Thereupon the continuous-tone positive is removed and replaced by the line screen positive the screened image of which is exposed to and printed upon the same carbon-tissue directly over and in registration with the unscreened continuous-tone image that had already been produced thereon. Since the resultant image is the composite of printing first an unscreened continuous-tone positive of the copy on the resist, and then printing thereon a line screen continuous-tone positive of the same copy, there will be no loss of detail, and the image produced from the resist on the printing surface will result in a marked improvement in the quality of the gravure reproduction.

The resist is finally transferred to the surface of the printing cylinder or plate which is then developed and etched in the usual way.

What we claim is:

1. The method of gravure reproduction which com-

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prises the following steps in succession, making a continuous-tone negative from a copy to be reproduced, making an unscreened, continuous-tone positive from said negative, making a line screen negative from said continuous-tone positive by photographing the positive through a conventional half-tone screen and an auxiliary screening device comprising an opaque member having a plurality of spaced circular openings therethrough arranged in two straight lines that cross each other at a right angle and are centered with respect to the squares of the half-tone screen, making a line screen positive of said line screen negative by contact printing, printing the continuous-tone positive on a resist, printing the line screen positive on the same resist over and in registration with the print produced thereon by the unscreened continuous-tone positive, and transferring the resist to the printing surface, developing and etching said surface.

2. The method of gravure reproduction which comprises the following steps in succession, making a continuous-tone negative from the copy to be reproduced, making an unscreened, continuous-tone positive from said negative, retouching said continuous-tone positive, making a line screen negative from said retouched continuous-tone positive by photographing the positive through a conventional half-tone screen and an auxiliary screening device comprising an opaque member having a plurality of spaced circular openings therethrough arranged in two straight lines that cross each other at a right angle and are centered with respect to the squares of the half-tone screen, making a line screen positive of said line screen negative by contact printing, printing the continuous-tone positive on a resist, printing the line screen positive on the same resist over and in registration with the print produced thereon by the unscreened continuous-tone positive, and transferring the resist to the printing surface, developing and etching said surface.

3. In a method of gravure reproduction the steps which consist in making an unscreened continuous-tone positive of the copy to be reproduced, making a line screen positive of said copy by means of a conventional half-tone

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screen and an auxiliary screening device comprising an opaque member having a plurality of spaced circular openings therethrough arranged in two straight lines that cross each other at a right angle and are centered with respect to the squares of the half-tone screen, exposing a carbon-tissue resist first to the unscreened continuous-tone positive and then to the line screen continuous-tone positive with the images of the copy on the two positives in registration with each other.

4. The method of gravure reproduction which comprises making a continuous-tone negative of unscreened copy to be reproduced, making an unscreened, continuous tone positive from said negative, making a line screen negative from said unscreened positive by photographing the positive simultaneously through a half-tone screen and an auxiliary screening device comprising an opaque member having a plurality of spaced circular openings therethrough arranged in two straight lines that cross each other at a right angle and are centered with respect to squares of the half-tone screen, making a line screen positive of said line screen negative by photographic contact printing, printing the unscreened positive on a carbon-tissue resist, printing the line screen positive on the same resist over and in registration with the print produced thereon by the unscreened continuous-tone positive, and transferring the resist to the printing surface, developing and etching said surface.

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