METHOD AND APPARATUS FOR THE PRODUCTION OF SCREEN-PRINTING FORMS WITH A PATTERN HAVING A MOTIF REPEATED AT LEAST IN THE DIRECTION OF THE LINE

3 Claims, 2 Drawing Figs.

ABSTRACT: Scanning means scans a pattern area and the analog output signal thereof is converted to digital form. This digital signal is employed for causing an engraving means to produce a first pattern area on a screen printing form and is also employed through the intermediary of a writing means to provide output information on a magnetic storage means. Readout means associated with a storage means utilizes this output information to cause the engraving means to repeat the first pattern area on the screen printing form and the readout means is interconnected with the writing means to reproduce the output information on the storage means so that the pattern area can be reproduced a plurality of times on the screen-printing form.
METHOD AND APPARATUS FOR THE PRODUCTION OF SCREEN-PRINTING FORMS WITH A PATTERN HAVING A MOTIF REPEATED AT LEAST IN THE DIRECTION OF THE LINE

The invention relates to a method for the line-by-line preparation of screen printing forms with a pattern having a motif repeated at least in the direction of the lines, by means of an electromagnetically controlled engraving member, photoelectric means for the line-by-line scanning of the pattern, and an electric circuit for converting the analog signals received by the scanning means into discrete signals which are fed to a control circuit consisting of separate circuits for the electromagnetic control, at different strengths, of the engraving member, and apparatus for performing the method.

Photographic means are used in the prior art method for producing a screen printing form with a pattern having a repeated motif. In this method the pattern is copied and the resulting photographic plates are disposed on a plate or a roller of an engraving apparatus and scanned by photoelectric means, the electric signals obtained being used to control an engraving member which cuts the printing form.

A disadvantage of the prior art method is that photographic copying is time wasting and expensive; moreover, reproducibility is not satisfactory, since each motif on the printing form is produced to a different pattern. Apart from the faults caused by photographic copying, another disadvantage is the variations in the scanning, which is also photoelectric.

It is an object of the invention to provide a method which obviates these disadvantages by enabling the motifs of the printing form to be produced merely by the pattern being scanned once by photoelectric scanning means.

To this end, according to the invention, use is made of a store which is disposed in the connection between the scanning means and the control circuit for the engraving member and has a member for writing information into the store and a member for reading information out of the store, and the corresponding lines of the repeated motifs are written successively in a row extending in the direction of the line into the store and are again read out of the store, and the control circuit of the engraving member is operated without the intervention of the store for the engraving of the particular line of the first motif to be produced on the printing form, and is operated with the intervention of the store for the engraving of the corresponding line of each subsequent motif, while the information which is written in member for the first line of the row is supplied by the circuit between the scanning means and the engraving member and the information fed to the writing-in member for each subsequent line of the row is supplied by the reading-out member.

To this end, a line of the pattern is scanned once, these signals are used for controlling the engraving member, the signals also being received in the store, and the engraving member for engraving the particular line of the following motifs is controlled by the information from the store.

A very satisfactory result is obtained if the analog information received by the scanning means concerning the first line of the particular row is fed, after conversion into discrete signals, to the writing-in member of the store. By converting the information into discrete, for instance digital form, disturbances are avoided in reading out of the store and writing into the store.

The invention also relates to an engraving apparatus having an electromagnetically controlled engraving member, photoelectric means, an electric circuit for converting the analog signals received by the scanning means into discrete signals, and a control circuit which can be connected to the conversion circuit and consists of separate circuits for the electromagnetic control, at different strengths, of the engraving member. An engraving apparatus of this kind is more particularly suitable for the performance of the method as set forth in claim 2 if the apparatus has a store which is disposed between the scanning means and the control circuit for the engraving member and has a member for writing information into the store and a member for reading information out of the store, the apparatus also having changeover members by means of which the control circuit of the engraving member can be connected either to the scanning means or to the reading-out member of the store, and the writing-in member of the store can be connected either to the scanning means or to the reading-out member. To obtain a satisfactory signal to noise ratio, the information concerning the pattern is preferably written into the store in the form of digital information. This can be done if the store is disposed between the changeover circuit and the control circuit for the engraving member.

The invention also relates to screen printing forms produced according to one of the methods described.

An embodiment of the invention will now be described with reference to the accompanying drawings, wherein:

FIG. 1 is a block circuit of an engraving member according to the invention, and
FIG. 2 shows diagrammatically a disc store.
A pattern disposed on a roller 1 is scanned by photoelectric means 2, the resulting signals being fed to an analog-digital converter 3. The discrete signals produced by the converter 3 are converted in a coding member 4 to a code word which can be fed, in dependence on the condition of changeover means 5, either to a control circuit 6 for an engraving member 7, or to a disc store 8, or both. The information read out of the store can also be fed to the control circuit 6.

FIG. 2 shows diagrammatically a store disc 8. The angle A enclosed by the radius connecting a reading-out head 10 to a pivot 11, and the radius connecting a writing-in head 12 to the pivot 11 can be manually adjusted and must correspond to the distance occupied by the pattern along the periphery of the scanning roller 1.

The reading-out head 10 and the writing head 12 can be electrically connected to one another by means of a switch 15. During the engraving of a line of the first motif to be produced on the printing form switch 13 and switch 14 are closed, while switches 9 and 15 are open. For the engraving of the particular lines of the subsequent motifs, switches 13 and 14 must be opened, while switches 9 and 15 are closed.

In this way a pattern scanned by the reading-out head 10 of the disc 8 is fed to both the writing-in head 12 and the control circuit 6. Consequently, each pattern read out by the reading-out head 10 is written in by the writing head 12 on the disc 8, so that when the disc has rotated through an angle A in the direction shown by the arrow, the reading-out head 12 can again read the same information from the disc.

We claim:
1. Apparatus for preparing screen printing forms having successively repetitive pattern areas, comprising in combination,
scanning means for scanning a pattern area and having an output related to the localized intensity of the pattern area as it is scanned,
engraving means for producing a first pattern area of varying local intensity on a screen printing form in response to the output of said scanning means,
magnetic storage means,
writing means for writing into said storage means the output information supplied by said scanning means to said engraving means during said production of the first pattern area,
readout means associated with said storage means arranged to encounter the output information in said storage means when the output information concerning said first pattern area is completely written into said storage means,
and switch means for disconnecting said scanning means from said engraving means and said writing means, and for connecting said readout means to said engraving means and said writing means whereby a second pattern area is produced by said engraving means from said output information written into said storage means and said
3. Output information is reproduced in said storage means during said production of the second pattern area.

2. Apparatus according to claim 1 wherein scanning means is a photosensitive device having an analog output signal varying in amplitude according to the localized intensity of the pattern area being scanned and an analog-to-digital converter for converting said analog output signal to digital form whereby

3. Apparatus according to claim 2 wherein said storage means comprises a roller, said writing means and said readout means being spaced circumferentially with respect to said roller.

4. The output information written into said storage means is in digital form.