

A PROCESS FOR MAKING A PRINTING SCREEN PLATE AND
THE DEVICE THEREFOR

The present invention relates to a process for making a printing screen plate by exposing a pattern-drawn transparent film and a photoresist-coated screen to the sun. The present invention further relates to a device for performing such a process.

Screen plate printing method is a method to use a screen plate for printing the desired pattern on an object. Because it is suitable for printing a pattern on an uneven surface of an object, it is commonly used for printing marks and patterns on commercial and consumer products. Several printing screen plate making processes have been known. However, expensive hardware equipment shall be used in making printing screen plate according to the known methods. Although expensive hardware equipment is suitable for mass production, the manufacture cost for a printing screen plate is relatively increased. Operating and maintaining an expensive printing screen plate making machine are not easy. According to conventional methods, much electric energy will

be consumed during the production of a printing screen plate. Further, conventional processes for making printing screen plate are not practical for making special printing screen plates of special sizes or anywhere outdoors.

It is therefore desirable to eliminate the aforesaid disadvantages and an object of the present invention is to provide a process for making printing screen plate which is easy and inexpensive to achieve and suitable for flexible printing requirement.

According to one aspect of the present invention there is provided a process of making a printing screen plate comprising drawing a desired pattern on a transparent film with an ink or paint which is arranged to block light rays, coating a screen of a screen holder with a uniform layer of photo-resist material, placing the transparent film, screen and screen holder inside a portable box, locating the said transparent film firmly between a bottom wall and the said screen and securing said screen firmly in place in the box; transporting the box to a location at which the sun's rays fall upon the box, turning the box over to expose the layer of photo-resist material to the sun by permitting direct sunlight to pass through the said bottom wall and said transparent film; removing said screen from the said box and washing said screen in clean water to wash out the photo-resist material not exposed to the sun.

Therefore there is provided a process of making a printing screen plate which utilizes solar energy and eliminates the use of electric power.

The device for making the screen plate is inexpensive to manufacture and easy to produce.

Conveniently, the device for making a printing screen plate is suitable for making a special size of printing screen plate.

After having drawn the desired pattern on the transparent film and covered the screen on the screen holder with a layer of photo-resist, the transparent film, the screen holder and rubber pads are set in the box and exposed to the sun. Six minutes after exposure to the sun under the light intensity of 10^6 the screen holder is removed from the box and dipped into a clean water to wash out the photo-resist which was not exposed to the sun. A blank area corresponding to the pattern on the transparent film is formed in the screen of the screen holder, and therefore, a printing screen plate is made.

According to another aspect of the present invention there is provided a device for making a printing screen plate utilising the sun's rays, the device comprising: a portable box being movable to a position at which the sun's rays fall upon the box, the box including a bottom side wall which is of a transparent material; a transparent film locatable in the said box, said transparent film having a surface for drawing a pattern thereon; a screen holder locatable in said box and comprising a rectangular frame, a screen stretched on the said rectangular frame, and means for retaining the screen in place in the portable box; and a rubber pad tightly set in said rectangular frame and locating in said box so that the film and rectangular frame are maintained in position and

relative to the other when the box is inverted to expose the film to sunlight.

Preferably the box has two compartments connected by hinges in which the bottom wall in one compartment is transparent for allowing sunlight to pass therethrough.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1 is an exploded perspective view of a device for making a printing screen plate constructed according to the present invention; and

Fig. 2 is a perspective view of the screen holder showing the construction of a spring screen of the device according to the present invention.

Referring to the various drawings attached herewith, a detailed description of the structural features of a process for making a printing screen plate and a device therefor in accordance with the present invention is as follows:-

Referring to Fig. 1, a device for making a printing screen plate generally comprising a portable box 10 for containing a transparent film 17, a screen holder 18 and a rubber pad 24. The box 10 is comprised of two pivoted frames, namely, a bottom frame 12 for holding a sheet of transparent glass 11 and a top frame 14 for holding a flat bottom board 13. The top frame 14 has two opposite hooks 15 on the peripheral wall surface thereof at one side opposite to its pivoting side to the bottom frame 12. The bottom frame 12 has two opposite stub rods 16 on the

peripheral wall surface thereof at locations for hooking the hooks 15 respectively. The transparent film 17 is made in size fitting the internal space of the box 10 and provided for drawing patterns thereon. The screen holder 18 comprises a rectangular frame 19 having two retaining blocks 20, 21 attached thereto at two opposite sides of screws 22 to secure a screen 23 thereon. The screen 23 is made in a rectangular shape slightly larger than the screen holder 18 and tightly stretched on the screen holder 18, having two opposite side edges secured to the outer wall surface of the screen holder 18 at two opposite sides by the two retaining blocks 20, 21 and the other two opposite side edges secured to the outer wall surface of the screen holder 19 at the other two opposite sides by pins or nails. The rubber pad 24 is made in size fitting the space defined within the screen holder 18.

The process for making printing screen plate of the present invention is to use the aforesaid device. The process is outlined hereinafter. Draw the desired pattern on the transparent film 17 with an ink or paint which has a property to block light rays, and coat the screen 23 with a uniform layer of photo-resist. Then, place the film 17, the screen holder 18 and the rubber pad 24 in the box 10 with the film 17 firmly squeezed in between the sheet of transparent glass 11 and the screen 23. Then, close the box by hooking the hooks 15 on the stub rods 16 respectively, and put the box 10 on a flat surface under the direct sun light with the bottom frame 12 disposed at the top. It is most preferably to sun the device for 6 minutes at

high noon when the light intensity is at 10°. On this basis, the length of time in exposure may be increased or reduced one minute per every hour from high noon. After the aforesaid exposure procedure, the screen holder 18 is removed from the box 10 and swirl gently in clean water causing the screen 23 to shake off the photoresist which was not exposed to the light of the sun. After washing, a blank area 25 has a pattern thereon corresponding to the pattern on the film formed on the screen 23 (see Fig. 2), and therefore, a screen plate is made for printing.

As indicated, a printing screen plate can be inexpensively conveniently made within a short length of time by using a printing screen plate-making device of the present invention. Any desired size of printing screen plate which will fit in the box can be made without the use of any subsidiary machinery or equipment. Further, no electric energy is consumed during the production of a printing screen plate.



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CLAIMS:

1. A process of making a printing screen plate comprising drawing a desired pattern on a transparent film with an ink or paint which is arranged to block light rays, coating a screen of a screen holder with a uniform layer of photo-resist material, placing the transparent film, screen and screen holder inside a portable box, locating the said transparent film firmly between a bottom wall and the said screen and securing said screen firmly in place in the box; transporting the box to a location at which the sun's rays fall upon the box, turning the box over to expose the layer of photo-resist material to the sun by permitting direct sunlight to pass through the said bottom wall and said transparent film; removing said screen from the said box and washing said screen in clean water to wash out the photo-resist material not exposed to the sun.
2. A process as claimed in claim 1, wherein said photo-resist material is exposed to the sun for 6 minutes at high noon when the light intensity is at 10°.
3. A process as claimed in claim 2, wherein the exposure time is increased or reduced one minute per every hour from high noon.
4. A device for making a printing screen plate utilising the sun's rays, the device comprising: a portable box being movable to a position at which the sun's rays fall upon the box, the box including a first bottom wall which is of a



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transparent material; a transparent film locatable in the said box, said transparent film having a surface for drawing a pattern thereon; a screen holder locatable in said box and comprising a rectangular frame, a screen stretched on the said rectangular frame, and means for retaining the screen in place in the portable box; and a rubber pad tightly set in said rectangular frame and locatable in said box so that the film and rectangular frame are maintained in position and relative to the other when the box is inverted to expose the film to sunlight.

5. A device as claimed in claim 4, wherein the box comprises two hinged compartments.

6. A device as claimed in claims 4 or 5, wherein the retaining means comprises a plurality of retaining blocks attached to the rectangular frame for securing the screen in place.

7. A process of manufacturing a printing screen plate substantially as hereinbefore described with reference to, and as illustrated in the accompanying drawings.

8. A device for making, a printing screen plate substantially as hereinbefore described with reference to, and as illustrated in the accompanying drawings.