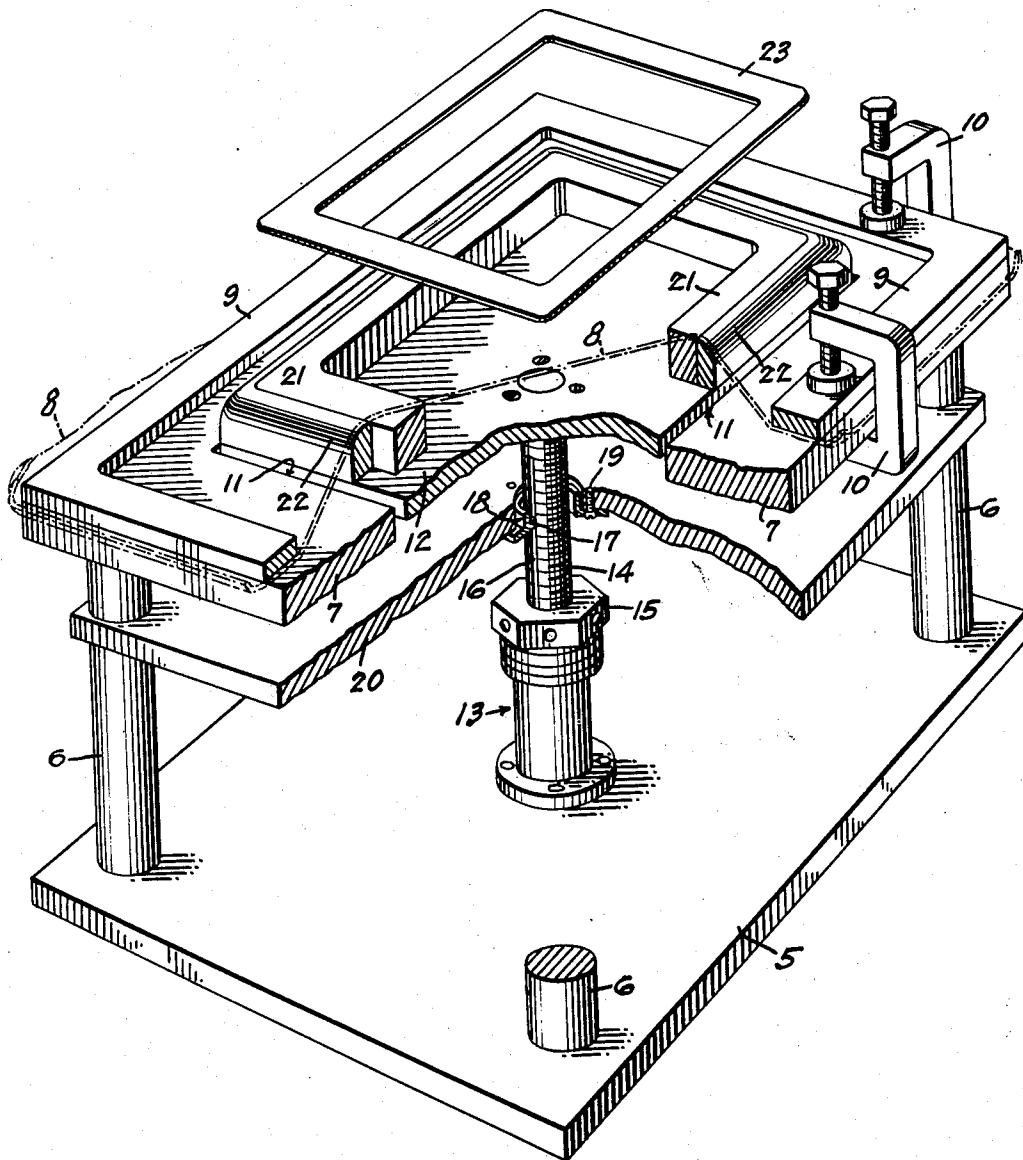


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E'LISE F. HARMON
SILK SCREEN STRETCHER

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2,844,172

SILK SCREEN STRETCHER

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1 Claim. (Cl. 140—109)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to a mechanism for stretching fabric materials to attain uniformity of tautness.

An object of the invention is to provide a device which will uniformly tension, in all directions, the entire body of a sheet of fabric.

Another object of the invention is to provide a device which will, in mass production, stretch fabric screens for use in printing electrical circuits or the like.

A further object of the invention is to provide a fabric stretching device which is simple in construction and effective in operation.

Other objects and advantages will be apparent from the following detailed description and the accompanying drawings, in which the single figure is a perspective view with parts broken away to show the interior structure, and showing a silk fabric screen being stretched.

In the art of printing the silk-screen process is well known. It consists of applying a tightly stretched silk screen to the surface to be imprinted, portions of such screen being masked to prevent the passage of ink or paint. The screen is fed with a supply of ink or paint, and this material is then pressed through the screen by means of a roller. The screen is then raised, leaving ink or paint on the portion of the surface which is unmasked.

Various methods of stretching the screens have been tried in the past. These have been more or less clumsy and time consuming. In the production of printed circuits and components greater uniformity of tautness over the surface of a single screen is required than can be obtained by the usual methods, and greater uniformity is also needed between screens used to produce the same circuits, in mass production.

To produce screens which will individually be uniformly taut, and to produce a plurality of screens which will all be of the same tautness, I have invented the silk screen stretcher herein disclosed.

Referring now to the drawing, the reference character 5 indicates a base plate. Secured to the base plate, preferably near each corner thereof, are posts 6. The posts extend upwardly from the base plate 5 and support a table 7 on their upper ends. A single sheet of silk fabric 8, shown outlined in dotted lines, is spread smoothly over the table top and secured to the edges thereof by a clamping frame 9. Screw clamps 10, in any required number hold the clamping frame and the silk fabric securely to the table 7. Centrally thereof and uniformly spaced from the side edges of the table there is formed an opening 11, through which a vertically movable platform 12 is raised to tension the silk fabric 8.

Centrally of the base plate 5 and the platform 12 there is positioned a lifting jack 13. A screw-threaded jack screw 14 is fixed to the platform 12 at its upper end and extends downwardly into the jack 13. In screw-threaded engagement with the jack screw 14 and rotatable there-

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around is a nut 15. Formed in the side surface of the jack screw and extending longitudinally thereof is a key slot 16 for slidably receiving a key 17. The key is formed on a collar 18 surrounding the jack screw and is secured by screws 19 to a sub-table 20, which is supported on the posts 6 intermediate the table 7 and the base plate 5.

Positioned on the platform 12 is a removable rectangular frame 21 to which the stretched fabric is finally secured to insure a properly stretched silk screen. A rounded molding 22 is secured to the platform 12 outside the frame so that the fabric does not encounter any sharp edges. Thus the molding 22 has the double function of protecting delicate fabric from damage when stretched, and also retaining the frame 21 in position. When not in use the platform 12 lies on sub-table 20. When the desired tension has been obtained, a frame 23 is placed over the silk fabric on the screen frame 21 and tacked tightly in place.

The operation of the invention is as follows:

The platform 12 is lowered by rotating the nut 15 on the jack 13 until the platform rests on the sub-table 20 or until the top surface of the screen frame 21 is slightly below the top surface of the table 7. A sheet of silk fabric 8 which is to form a screen is laid smoothly on the table 7 above the frame 21. The clamping frame 9 is placed on top of the silk fabric and firmly clamped in place by any number of screw clamps 10 as are found necessary. Thereafter the nut 15 is rotated in the opposite direction to raise the platform 12, the screen frame 21 and the bearing molding 22 until the silk has attained the desired degree of tautness. When the desired tension has been obtained the cardboard frame 23 is placed on the screen frame over the silk fabric and tacked tightly in place. The nut 9 is then rotated to lower the jack screw 14 and the platform 12 until tension on the fabric is relieved. Thereafter the clamps 10 and the clamping frame 9 are removed, and the silk is cut close to the outside of the frame 21. A silk screen is then ready to be used.

While I have disclosed a form of the invention presently preferred by me, various changes and modifications will occur to those skilled in the art after a study of the present disclosure. Hence the disclosure is to be taken in an illustrative rather than a limiting sense; and it is my desire and intention to reserve all modifications falling within the scope of the subjoined claim.

Having now fully disclosed the invention, what I claim and desire to secure by Letters Patent is:

A mechanism for stretching a sheet of fabric material comprising, a base plate having a rectangular configuration, a plurality of posts extending upwardly from and adjacent each corner of said base plate, a supporting table having an upper planar supporting surface and secured to the upper ends of said posts, said supporting table having the same external dimensions as said base plate, a detachable rectangular clamping frame received on said supporting surface, said clamping frame having the same external dimensions as said supporting table and provided with a lower planar gripping surface for gripping said material between said frame and said supporting surface on said table, a plurality of screw clamps for clamping said clamping frame on said supporting table, there being a centrally disposed rectangular opening in said supporting table and spaced uniformly from the inner edges of said clamping frame when in clamping position whereby said supporting surface provides a rectangularly disposed planar supporting surface between said opening and said clamping surface, means for imposing a predetermined stress on said material including a jack, comprising a tubular base secured centrally on said base plate, a jack screw having a longitudinal slot therein received in said tubular base,

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an operating nut carried by said tubular base and threadably engaging said jack screw, a rectangular platform secured on said jack screw, said platform having a peripheral dimension slightly less than said opening in said supporting table for translation therethrough, a rectangularly disposed rounded molding fixed on said platform and having external dimensions equal to the external dimensions of said platform, means preventing rotation of said platform during said translation through said opening in said supporting table comprising a sub table having external dimensions equal to the external dimensions of said base plate and said supporting table, said sub table having a centrally disposed opening receiving said jack screw, an annular collar rigidly secured to said sub table in said central opening, there being a key integral with said collar and normally riding in said slot in said jack screw, and means adapted to secure a portion of said material in stressed condition for cutting and removal from said

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mechanism comprising, a detachable rectangular stretching frame having external dimensions slightly less than the internal dimensions of said rounded molding adapted to be slidably received within said rounded molding and a rectangular clamping frame having external and internal dimensions corresponding to the external and internal dimensions of said stretching frame and adapted to be secured over said stressed material on said detachable rectangular frame.

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