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C. A. HEYNE

2,218,451

STENCIL SCREEN CONSTRUCTION

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Fig. 1.

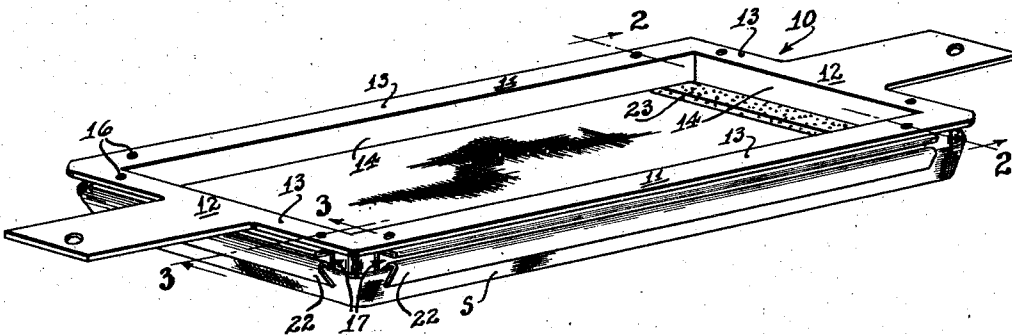


Fig. 2.

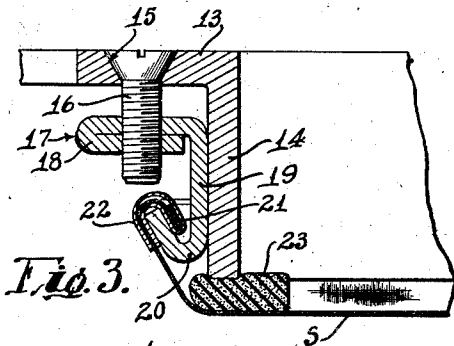
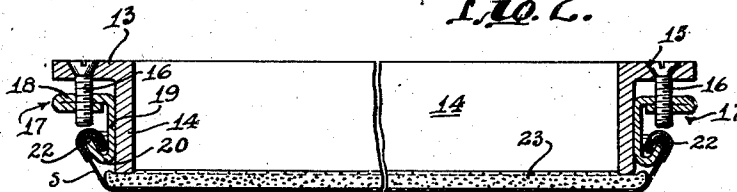


Fig. 3.

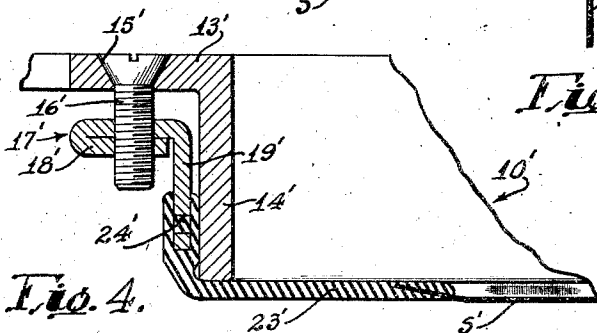


Fig. 4.

Fig. 5.

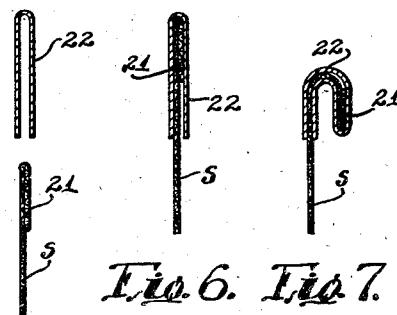


Fig. 6. Fig. 7.

INVENTOR.
C. A. HEYNE

BY *Rule & Hoge*
ATTORNEYS.

UNITED STATES PATENT OFFICE

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STENCIL SCREEN CONSTRUCTION

Clarence A. Heyne, Alton, Ill., assignor to Owens-Illinois Glass Company, a corporation of Ohio

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5 Claims. (Cl. 101-127)

The present invention relates to a stencil screen construction and more particularly to a screen unit adapted for use either by a hand operation, or in a machine of the type in which the stencil screen is caused to move in tangential rolling line contact with the curved surface of an article undergoing decoration while at the same time a vitreous enamel composition is forced through the pervious portions of the screen by the spreading action of a squeegee. The screen unit comprising the present invention is also adapted for use in the decoration of the flat surfaces of articles by the usual process wherein the screen is placed in stationary contact with the flat surface and the squeegee is caused to traverse the pervious portions of the screen.

In screen units of this type, the screen is usually held taut on an open rectangular screen frame formed of wood or other material to which the edges of the screen are glued, stapled or otherwise fastened, the whole forming a rectangular box-like structure and the screen forming the bottom thereof. The stencil screen material for screen units of the type just mentioned is usually a specially woven imported silk fabric, the normal life of which is relatively short. Efforts have been made to employ a specially woven metal screen mesh in a construction of this nature because of the far longer screen life attendant upon the use of the metal material. However, experience has proven that in such a construction, if the screen comes into contact with the article undergoing decoration, or with the article-supporting chuck or other part of the decorating apparatus along the edge of the frame over which the screen is stretched, the transverse strands of the metal mesh will be come severed, thus necessitating a new screen.

It has been proposed to remedy the above objectionable conditions by the application of a sponge rubber or other resilient lining to the underneath side of the frame on all four sides thereof over which the metal screen may be stretched in the usual manner. Such a remedy is not entirely satisfactory in that there is a tendency for the transverse strands of the screen mesh to become severed along the lines described by the extreme ends of the squeegee moving relative to the screen or vice versa. This phenomenon is attributed to the sharp bends in the transverse strands which are under relatively high tension because they are stretched across the sides of the frame.

The above noted limitations are present to a lesser degree where silk screen and other fabric

screen mesh material is employed in connection with a stencil screen frame.

The present invention is designed to overcome the above mentioned objectionable characteristics of stencil screen unit design, particularly where a metal screen mesh is employed, by the provision of a mounting for the stencil screen wherein the tension in the short transverse strands of the screen material may be relieved to avoid severing thereof by the squeegee. This being the principal object of the invention, it is another object to provide a stencil screen construction wherein the tension of the screen both laterally and transversely may be adjusted at will. A still further object is to provide a stencil screen unit of the type set forth above in which means is provided for permanently anchoring the ends of the longitudinal and transverse strands of the mesh in fixed position against unraveling or becoming frayed. Yet another object of the invention is to provide such a stencil screen construction in which the screen may be readily removed and replaced at will.

The provision of a stencil screen unit which is relatively simple in its construction, one which may be set up for use and assembled in a stenciling machine with a minimum of effort, one which may be manufactured at a low cost, and one which is rugged and durable and which consequently is unlikely to get out of order are further desiderata that have been borne in mind in the production and development of the present invention.

Other objects and advantages of the invention will become apparent hereinafter.

In the accompanying drawing:

Fig. 1 is a perspective view of a stencil screen unit constructed in accordance with the principles of the present invention;

Fig. 2 is a sectional view taken along the plane indicated by the line 2-2 of Fig. 1;

Fig. 3 is a sectional view taken along the plane indicated by the line 3-3 of Fig. 1;

Fig. 4 is a sectional view similar to Fig. 3 showing a modified form of attaching means for the stencil screen; and

Figs. 5, 6 and 7 are fragmentary sectional views, diagrammatic in their representation, illustrating the manner in which the stencil screen is reinforced at the edges thereof.

The stencil screen unit involves in its general organization a closed substantially rectangular metal frame 10 which is angular in cross-section and including longitudinal side bars 11 and transverse end bars 12. The side and end bars 11 and 12 are each provided with a horizontal out-

wardly directed flange 13 and a vertical flange 14, the latter being formed with a plurality of apertures 15 therein for the reception of the tapered heads of a like number of suspension screws 16.

5 Suspended from the suspension screws and individually adjustable vertically of the frame 10 are a plurality of sub-frame members 17 which are substantially coextensive with the various res-
10 pective side bars and end bars of the frame 10. Each of the sub-frame members 17 is formed with a horizontally extending flange 18 which is re-
15 versed upon itself to provide a wall of double thickness in which the suspension screws 16 are threadedly received. Each sub-frame member 17
20 also includes a vertical attachment flange 19 adapted to bear against the vertical flange 14 of its respective side bar 11 or end bar 12 as the case
25 may be when the screen unit is assembled. The lower edge of each sub-frame member 17 is turned
30 outwardly as at 20 and is adapted to receive there- over the curved and reinforced edges of a stencil
35 screen S which is thus stretched across the open frame 10 and forms the bottom of the open rec-
40 tangular box-like structure.

Referring now to Figs. 3, 5, 6 and 7 wherein the manner of reinforcing the screen edges is dis-
45 closed, each edge of the screen S is reversed upon itself as indicated at 21 in Fig. 5. A metal rein-
50 forcing strip 22 which is U-shape in cross-section and which is coextensive with the edge to which
55 it is to be applied is applied over the edge as shown in Fig. 6 and subsequently the edge and
60 reinforcing strip are bent into curved form as shown in Fig. 7.

A strip 23 of resilient material, such as sponge
65 rubber, is received between the screen S and the lower edge of each of the end bars 12 to pre-
70 vent rupture of the strands of the screen should the latter contact any part of the decorating ma-
chine to which the screen unit is applied along
75 the regions which are in contact with the end bars 12. The strips 23 also serve to space the
80 screen in the regions of the longitudinal edges thereof from the side bars 11 and thus materially
85 reduce the tension of the transverse strands of the metal screen material.

It is to be noted that the suspension screws 16
90 are slotted to facilitate turning thereof in order that the tension of the screen which is stretched
95 in one direction over the resilient strips 23 may be adjusted so that any transverse slack existing in
100 the screen may be taken up.

In Fig. 4 wherein a modified form of screen sus-
105 pension is shown, an edge of the screen has vul-
110 canized thereto one edge of a strip 23' of rubber material while the other edge of the strip 23' is
115 vulcanized to one of the sub-frame members 17' at the lower edge of the latter, a series of aper-
120 tures 24' formed at the lower edge of the sub-
125 frame member 17' serving to increase the effec-
130 tiveness of the vulcanized joint. The strip 23 is stretched across the lower edge of the frame 10.
135 It is to be noted that the rubber strip 23' extends well into the open frame 10' and thus effects a
140 considerable saving in the relatively expensive screen material.

Modifications may be resorted to within the
145 spirit and scope of the appended claims.

I claim:

1. A stencil screen unit comprising a screen
150 frame, a sub-frame surrounding the screen frame

and connected thereto, the lower edges of the
155 screen frame projecting below the level of the lower edges of the sub-frame, a stencil screen
having its edges secured to the edges of the sub-
160 frame and extending across the screen frame, and a strip of yieldable material disposed between the
165 screen and lower edges of the screen frame at opposite ends of the latter.

2. A stencil screen unit comprising a screen
170 frame, a sub-frame suspended from and sur-
175 rounding the screen frame, the lower edges of the screen frame projecting below the level of the
180 lower edges of the sub-frame, a stencil screen having its edges secured to the edges of the sub-
185 frame and extending across the screen frame, a strip of yieldable material disposed between the
190 screen and lower edges of the screen frame at opposite ends of the latter and serving to space
195 the operative decorating portion of the screen be-
200 low the plane of the lower edges of the screen frame, and means for raising and lowering the
205 sub-frame relative to the screen frame.

3. A stencil screen unit comprising a rectangu-
210 lar screen frame including side bars and end bars,
215 a four-piece sub-frame surrounding the screen frame and including side members which are sub-
220 stantially coextensive with said side bars and end members and which are suspended from and are
225 substantially coextensive with the end bars, the lower edges of the screen frame normally project-
230 ing below the lower edges of the sub-frame mem-
235 bers, a stencil screen having its edges secured to the edges of the sub-frame members and extend-
240 ing across the screen frame, a strip of yieldable material disposed between the screen and the low-
245 er edge of each end bar, and means for individ-
250 ually adjusting the position of the sub-frame members relative to the screen frame.

4. A stencil screen unit comprising a rectangu-
255 lar screen frame including side bars and end bars,
260 a four-piece sub-frame surrounding the screen frame and including side members which are sup-
265 ported by and are substantially coextensive with the side bars and end members which are sup-
270 ported by and are substantially coextensive with the end bars, the lower edges of the screen frame
275 normally projecting below the lower edges of the sub-frame members, a stencil screen having its
280 edges secured to the edges of the sub-frame mem-
285 bers and extending across the screen frame, a strip of yieldable material disposed between the
290 screen and the lower edge of each end bar, and means for adjusting the position of the sub-frame
295 end members relative to the screen frame.

5. A stencil screen unit comprising a rectangu-
300 lar screen frame which is of right angle cross-
305 section and having vertical flanges and outwardly extending horizontal flanges at the upper end of
310 the former, sub-frame members adjustably sus-
315 pended from each of the outwardly extending horizontal flanges, each sub-frame member in-
320 cluding a lateral suspension flange and a verti-
325 cal attachment flange, the lower edges of said at-
330 tachment flanges being turned outwardly and up-
335 wardly, a rectangular stencil screen, and a sub-
340 stantially inverted U-shaped reinforcement member secured to each edge of the screen and
345 being receivable over the outwardly and upwardly turned lower edges of the sub-frame members.

CLARENCE A. HEYNE.