United States Patent [19]

Quinn

[11] **3,724,420**

[45] **Apr. 3, 1973**

[54] **COMPRESSIBLE STENCIL WITH HIGH WALLS AND NARROW BRIDGES**

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[52] **U.S. Cl.** **118/505,** 40/136

[51] **Int. Cl.** **B05b 15/04**

[58] **Field of Search** ..... 118/504, 505; 117/38, 8.5, 117/48, 5.5, 6; 101/128.2; 40/125 A, 125 E; 33/174 B; 20/135, 136; 51/310, 311, 312

[56] **References Cited**

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495,000	4/1893	Evans	51/312
1,684,431	9/1928	Behee, Jr.	51/312
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Primary Examiner—Morris Kaplan
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[57] **ABSTRACT**

A unitary strippable stencil having an upper layer of thin, flexible, sheet material raised to a substantial height, above the surface to be stencilled by a relatively thick, resilient, compressible, distortable lower layer, which accommodates itself to a rough, or ribbed, surface. Those letters and numerals which have islands, have the islands connected by integral, narrow "bridges" at stencil height so that paint spray may pass thereunder. The stencil includes integral, down-turned flanges encompassing the upper part of the high walls of the compressible layer and includes a pressure sensitive adhesive coating which holds the underface of the thick resilient lower layer in place. The resilient layer may be a polymeric foam.

3 Claims, 10 Drawing Figures

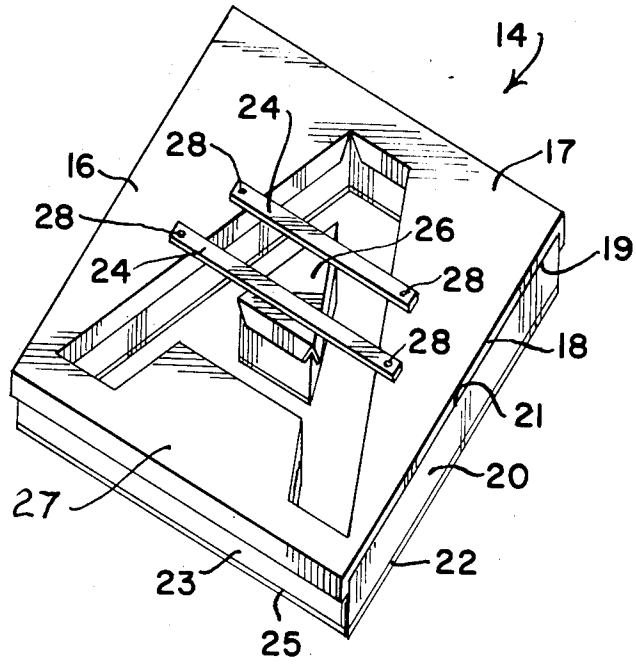


Fig. 1

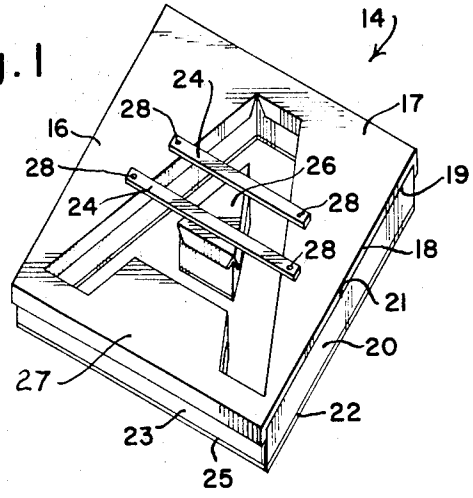


Fig. 2

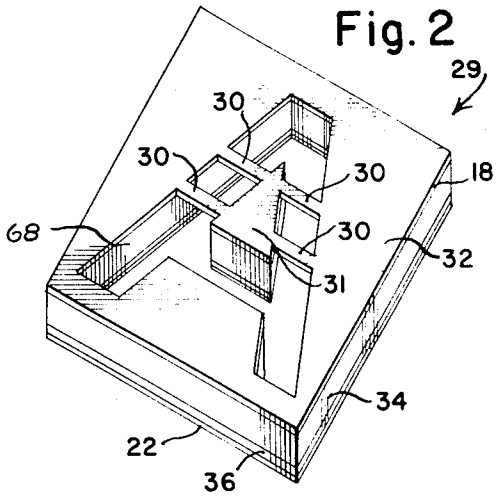


Fig. 3

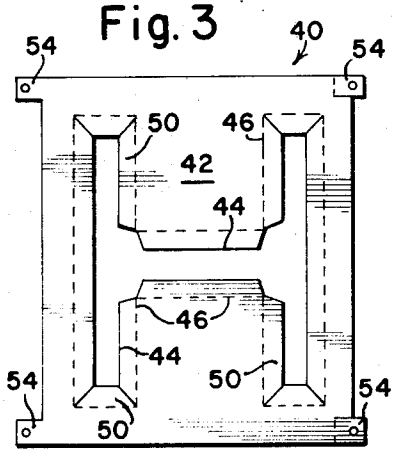


Fig. 5

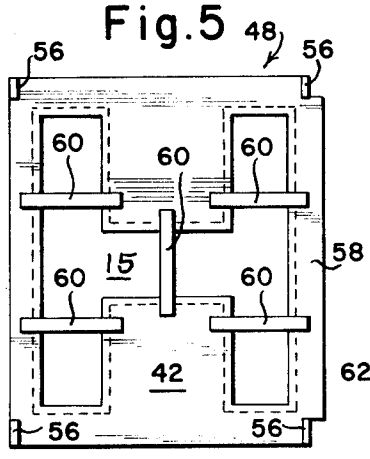
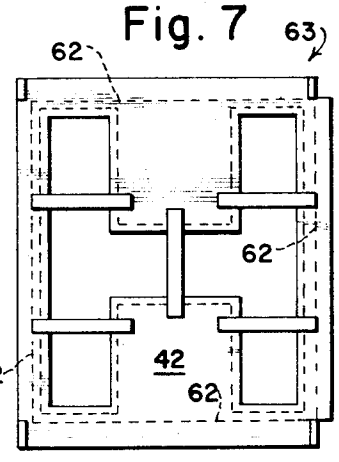


Fig. 7



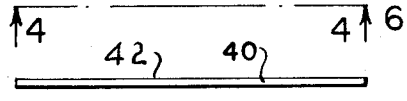


Fig. 4

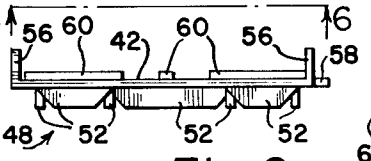


Fig. 6

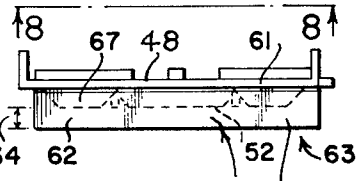


Fig. 8

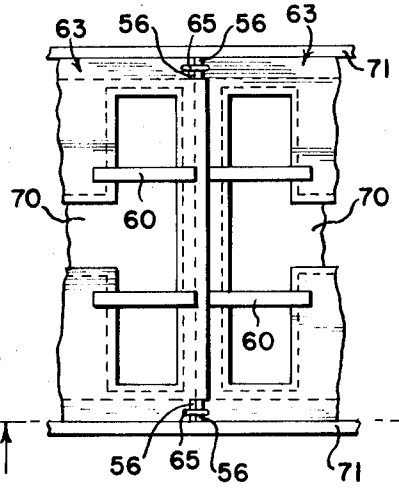


Fig. 9

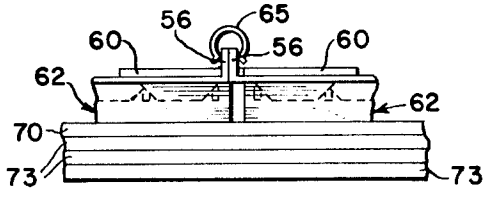


Fig. 10

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COMPRESSIBLE STENCIL WITH HIGH WALLS AND NARROW BRIDGES

BACKGROUND OF THE INVENTION

The art is replete with inventions whereby the stenciling art has been improved and adapted to special situations. Some such inventions are disclosed in U.S. Pat. No. 2,917,998 to Morgan, describing a pre-cut adhesive stencil, and in U.S. Pat. No. 2,156,279 to Drew, wherein a flexible stencil for use in spray-marking is disclosed.

Another stencil construction useful in spray coating, especially on somewhat curved surfaces, is that disclosed by Shapiro in U.S. Pat. No. 2,227,325. The Shapiro patent discloses a method for pre-positioning inserts, hereinafter called islands, as are desirably used in making stencils which form letters such as "O," "A," and the like. Shapiro locks his islands into the proper position using detachable locking bars, then fastens the islands with masking tape before removing the bars, then removes the bars and then proceeds with his stenciling operation.

In recent years stenciling processes have been under increasing competition from other marking processes, including the advent of embossed or vacuum-formed plastic signs, use of pre-cut letters, and the like. Thus it has become necessary for stencil-makers to improve the convenience with which stencils can be used in order to preserve a large part of the sign-painting business, which could be lost to competing marking processes.

It is one such improvement to which the present invention relates.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a novel stencil system which is characterized by its ability to form well defined letters on irregular surfaces by incorporating a relatively thick, compressible substrate into the structure of the stencils.

Another object of the invention is to provide a novel construction whereby the stencil incorporates a paint shield member useful in protecting the compressible substrate from contact with paint.

Still another object of the invention is to provide a stencil system whereby so-called bridges, webs, straps, or bars, which position islands in letters such as "A," etc., are maintained in non-interfering relationship with the symbol-defining capability of the stencils.

To those skilled in the art, other objects of the invention will be obvious on reading the instant invention.

The above objects have been substantially achieved by construction of a stencil of sufficient thickness that the island positioning strips (i.e., the "bridges") are raised sufficient a distance away from the surface being masked so that paint spray can diffuse under the bridges while they are still in place. This diffusion allows the finished work to appear free of any stencil-caused irregularities.

The means by which the stencil is raised from the work surface is advantageously a pressure-distortable, preferably a compressible, mat forming an integral part of the stencil structure. Such a mat allows the stencil to be placed flat with relation to an irregular surface. For example, stenciling symbols on ribbed surfaces, such as may be encountered in the vertical braces on the sides

of trucks, is facilitated because the compressible mat can be pressed to the surface in such a way that it envelopes and straddles any rib or brace, and still largely rest on the primary surface being painted.

Another advantageous aspect of the invention is the means by which the distortable character of the underlying mat is maintained. It will be understood that continued exposure to paint, with the consequent chemical attack and/or mechanical impregnation of the paint on the mat, would decrease its distortable characteristic. To avoid this, part of the stencil forms a downwardly projecting flange, which protects a major portion of the mat proximate to the painting area from impingement and deterioration by the paint. However, the relatively thick, resilient mat, while flange protected in the upper portion of its vertical walls, is preferably a porous cellular foam so that the lower portion may absorb stray paint spray without danger of smearing successive surfaces being stenciled.

ILLUSTRATIVE EMBODIMENT OF THE INVENTION.

In this application and accompanying drawings, there is shown and described a preferred embodiment of the invention and there are suggested various alternatives and modifications thereof, but it is to be understood that these are not intended to be exhaustive and that other changes and modifications can be made within the scope of the invention. These suggestions herein are selected and included for purposes of illustration in order that others skilled in the art will more fully understand the invention and the principles thereof and will be able to modify it and embody it in a variety of forms, each as may be best suited in the condition of a particular case.

IN THE DRAWINGS

FIG. **1** is a perspective view of one stencil embodiment constructed according to the invention.

FIG. **2** is a perspective view showing a different embodiment of the invention applied to the same general form of stencil shown in FIG. **1**.

FIG. **3** illustrates the plan of a blank from which the stencil face, according to the invention, may be formed.

FIG. **4** is an elevation of this blank.

FIG. **5** is a plan view of the stencil face formed from the blank of FIG. **3**.

FIG. **6** is an elevation of this blank.

FIGS. **7** and **8** show a plan and elevation, respectively, of the stencils in FIGS. **5** and **6** after they are integrally mounted with a pressure-distortable mat.

FIGS. **9** and **10** are plan and elevation views, respectively, of two adjacent stencils interlocked and spaced for use.

Referring to FIG. **1**, it is seen that the unitary flexible strippable stencil **14** has a body of generally rectangular outline with an upper stencil face **16** and an upper layer **17**, formed of thin flexible sheet material **18**. Upper layer **17** is permanently fastened, as by a permanent adhesive **19** to the upper face **21** of a relatively thick flexible lower layer **20** formed of resilient and compressible polyurethane foam **23**. A coating of pressure-sensitive adhesive **22** is attached to the lower face **25** of lower layer **20**, so that the stencil assembly **14** can

be securely positioned on, yet remain easily removable from, the surface being marked.

For indicia which have islands, such as the numeral "8," or the letter "A," at least one narrow, thin bridge member 24 is provided to properly position and support the triangular islands 26 and 27 of a letter such as "A" in the unitary stencil 14. The bridges 24 do not need to be removed during spray stenciling because they are of predetermined width, and the resilient mat 20 is of predetermined thickness to provide clearance therebelow. In FIG. 1, the bridges 24 are permanently adhered to upper layer 17 by adhesive 28, but, preferably, as in FIG. 2, in stencil 29, they are integrally formed in sheet material 18, as at 30.

Other differences between the stencil shown in FIG. 1 and the stencil 29 shown in FIG. 2 are the use of a rigid mat 34 in construction of stencil 29 and the use of a paper liner, or masking sheet, 36, beneath mat 34, to serve as a substrate for adhesive 22. However, in each of the embodiments of the invention shown in FIGS. 1 and 2, the bridges are narrow enough and the lower layer 20 or 34 is thick enough, i.e., at least about one-eighth of an inch thick, to provide clearance space under adhered bridges 24 or the integral bridges 30 to permit paint spray to be deposited thereunder onto the surface being painted.

Referring now to the embodiment of the invention shown in FIGS. 3 through 6, it is seen, in FIGS. 3 and 4, that a stencil blank 40 comprises a face portion 42 having marked thereon solid lines which are to be cut (hereinafter referred to as cut lines 44) and dotted lines which are to be bent (hereinafter referred to as bend lines 46). The blank is constructed of relatively thin gauge sheet, such as plastic sheeting, of about one-sixteenth inch in thickness.

FIG. 5 shows the stencil upper layer 48 formed from stencil blank 40 by cutting and bending the aforesaid cut lines 44 and bend lines 46. It is seen that flange areas 50 of blank 40 have been bent downwardly to form flanges 52 defining the aperture walls of the "H" symbol, or other indicia 15.

FIG. 6 also shows that elevated end tab areas 54 of stencil 40 are bent upwardly to form stop members 56. Moreover, a spacer member 58 is left exposed along the right edge of the stencil.

Bridges 60 may be fastened to face 42 of stencil 48, even when no island is involved, and the arrangement of FIG. 5 is sometimes desirable to maintain the plastic stencil face in a desirable position.

FIGS. 7 and 8 disclose a further step in forming a stencil assembly 63 of the invention, wherein the stencil upper layer 48 of FIGS. 5 and 6 is fastened by adhesive layer 61 onto a compressible lower layer, or mat, 62, which is thicker than flanges 52 are deep. Distance 64, i.e., the distance mat 62 protrudes beneath flanges 52, is the optimum dimension wherein surface irregularities on a surface to be stenciled can be "absorbed" into the compressible foam mat without interference with flanges 52 and is preferably at least one-sixteenth of an inch. As is evident, the upper portion 67 of the upstanding walls 68 of mat 62 which is shielded by flanges 52 will be protected from paint encrustation and such protection will tend to maximize the life of the stencil.

The lower layer 20 may be of closed cell, plastic foam, but preferably it is open celled and porous, so that paint spray will be absorbed, rather than tend to run down the lower portion 69 of the walls 68, thereby permitting a new blank surface 70, to be stenciled, to be brought into position against the stencil rack 71 of upper and lower case letters or numerals.

FIGS. 9 and 10 show how upturned integral tab, or stop, members 56 abut one another to space two stencil assemblies 63 is alignment in rack 71. These stop members are upturned from area 54 and are conveniently used in conjunction with a simple spring-type clip fastener 65, although the pressure sensitive adhesive layer 22 holds the indicia against slippage.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which might be said to fall therebetween.

In operation, a font of unitary stencils 14 is prepared, including upper and lower case letters and numerals, such as at 15, and each stencil 14 having a thin flexible upper layer 17, a thick resilient, foam lower layer 20, a pressure sensitive adhesive coating 22, and preferably the downturned flanges 52 and integral narrow bridges 24 or 30 to any unsupported parts.

The message to be stenciled is assembled in suitable aligned stencils 14, in the rack 71 which may then be held against the side of a ribbed truck trailer or freight car, and uniform pressure applied to the rack so that the lower layer compresses and conforms while the pressure sensitive adhesive holds the stencils in position. If successive blank surfaced sheets 73 are to be stenciled, each successive sheet is adhered to the stencils in the rack 71 and stripped therefrom when painted. Paint is sprayed through the stencil apertures, against the walls 68 and under the bridges 24 or 30, the paint being quick drying in less than 5 minutes and the compressed edges of the lower layer 20 preventing leakage or smearing during spraying. One sheet 73 may be stripped and stored to dry while another is mounted on the rack for spraying. The flanges 52 maintain the bridges 24 and 30 at a uniform predetermined distance from the surface 73 even though the stencil is compressed against the surface.

What is claimed is:

1. A unitary, flexible, strippable, stencil for use in spray painting indicia on irregular surfaces, said stencil comprising:

a body of generally rectangular outline having:

a lower layer of relatively thick, flexible, resilient, compressible and distortable foam material, with an upper face and a lower face;

an upper layer of relatively thin flexible sheet material fixed to and covering the upper face of said lower layer;

a coating of pressure sensitive adhesive fixed to and covering the lower face of said lower layer;

said upper and lower layers of said body having registering cut-out apertures therethrough forming upstanding walls which define the indicia to be stenciled;

said cut-out apertures defining an indicia having at least one island therein of said upper and lower layers;

said upper layer including at least one narrow bridge, or web, integrally formed of said sheet material and connecting said island to the surrounding portion of the stencil;

each said bridge being of predetermined width relative to the height of said lower layer so that paint may be sprayed thereunder without removing said bridge;

said upper layer including a plurality of integral, downturned flanges lining the indicia apertures therein, said flanges being of uniform depth to encompass the upper portions of said upstanding walls; and

said lower face of said lower layer being adapted to conform to a ribbed, or rough, surface during stenciling to seal the edges of said stencil against leakage of paint thereunder.

2. A stencil blank as defined in claim 1, plus a plurality of integral attachment tabs upturned from said thin sheet material for connection with adjacent stencils.

3. A stencil blank as specified in claim 1, wherein said foam material of said lower layer has open pores to absorb stray spray-paint.

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