Aug. 7, 1928. 1,679,770

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METHOD AND APPARATUS FOR STENCILING

Filed Feb. 26, 1926

Fig. 1.

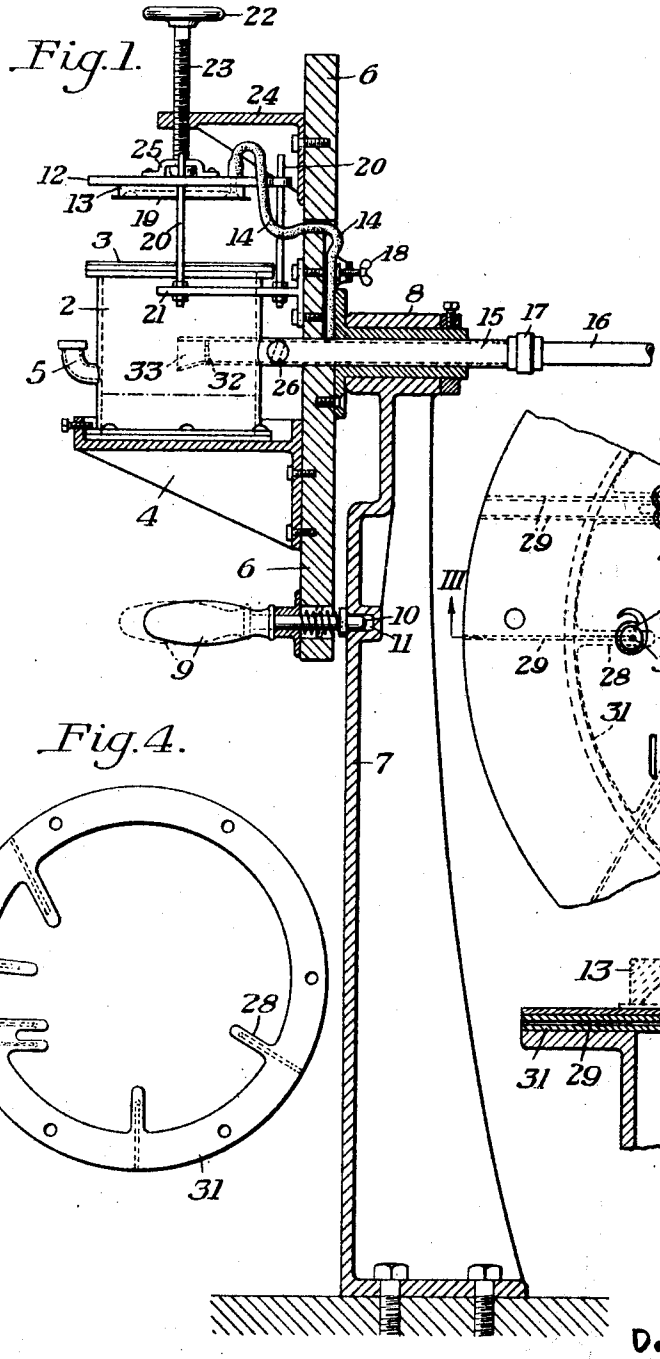
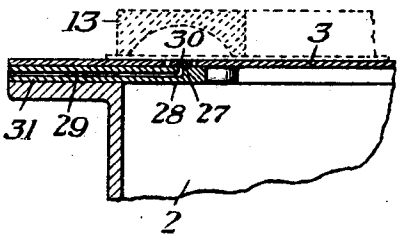


Fig. 2.

Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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METHOD AND APPARATUS FOR STENCILING.

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This invention relates to a method and apparatus for stenciling and is particularly useful for the application of raised luminous figures or numerals on clock or watch dials or the like, where the material used is a rather thick paint, but it will be understood that certain features of the invention are not limited to such application thereof.

The luminous paint which is used for clocks, watch dials or the like is of a peculiar nature, the solid materials in the paint tending to separate from the liquid and, therefore, necessitating frequent agitation to secure proper results. However, the solid material is of such nature that if stirring of such paint is resorted to, the luminosity of the paint is materially reduced. I, therefore, provide for stenciling a blank, such as a clock dial, by placing the stencil and a blank over a paint container and tilting the container. Preferably, the stencil is formed in the wall of a containing vessel over which the blank is clamped. The containing vessel is then rotated to bring the paint into contact with the blank through the stencil and, at the same time, to effect the agitation required to keep the paint mixed. It is found that by this method, the loss of luminosity which is occasioned by stirring is not encountered.

Preferably the paint container is provided with means for regulating the air pressure therein as it is found desirable to apply suction to the container at certain stages of the operation. The suction not only removes the air bubbles from the paint, but also removes air from the stencil openings and insures the stenciling of a commercially satisfactory figure, letter or other character.

I have found that with apparatus of this character considerable difficulty is encountered in the stenciling of what may be termed "ring characters". For example, the figure 4 or a naught comprises a substantially continuous ring of paint with a clear opening in the middle thereof. I provide for stenciling these figures by placing a bridge across the back of the stencil, which bridge supports the central blanking section of the stencil, but I have found that in lifting the blank or card away from the stencil, the paint tends to run into the blank space in the middle of the figure and smear.

I have successfully overcome this difficulty by venting such space. The venting may be carried out in numerous ways, but preferably the bridge which supports the blanking portion is provided with a duct.

In the accompanying drawings which illustrate more or less diagrammatically a preferred embodiment of my invention,

Figure 1 is a side elevation, partly broken away, of an apparatus for stenciling clock dials or the like;

Figure 2 is a top plan view, to enlarged scale, of a portion of the stencil used in the apparatus of Fig. 1;

Figure 3 is a vertical section taken on the line III—III of Fig. 2; and

Figure 4 is an inverted plan view of a bridge ring having bridge portions and ducts therein for supporting and venting various portions of the stencil.

In the illustrated embodiment of my invention, there is shown a hollow vessel 2 having one end thereof provided with a stencil 3. The vessel is mounted on a bracket 4 and is provided with a filling opening 5. The bracket 4 is mounted on a frame 6, which is rotatably secured in a base 7 at 8. A handle 9 is provided for rotating the frame 6. The handle is movable as indicated in dotted lines, and is provided with a projecting pin 10 adapted to fit into a recess 11 in the base 7 for locking the frame 6 in the position shown.

Mounted above the opening 3, is a blank holder for holding the blank clock dial in place during the stenciling operation. This holder comprises a base plate 12 provided with a suction ring 13, the suction ring is connected by a hose 14 to a suction line 15, which is substantially co-axial with the journal 8. The conduit 15 is connected to a suction line 16 through a coupling 17 which permits rotation of the conduit 15. A pinch clamp 18 is provided for regulating the suction on the ring 13.

In the drawings, a dial or blank 19 is shown in position ready to be moved against the stencil 3. The plate 12 is provided with openings which accommodate guide rods 20, these guide rods being attached to a bracket 21. They accurately guide the plate against the stencil and prevent rotation thereof. The up and down movement of the plate is

accomplished by a hand wheel 22 secured to a screw 23 which is threaded through a bracket 24. The rear of the screw is secured to the plate 12 by a clip 25.

In operation, the blank 19 is placed against the suction ring 13 and held in place as shown. The hand wheel 22 is then operated to move the blank against the stencil 3. The handle 9 is then moved to its dotted line position and the frame 6 tilted. Preferably, it is rotated two or three times. This is found to properly agitate the paint without the deleterious effects of stirring and to insure suitable application of the paint to the blanks through the stencil openings.

During this operation, the air pressure within the container 2 is preferably reduced as by opening a valve 26. It is found that this reduction in pressure is effective for removing air bubbles from the stencil openings, thus securing stenciled characters of commercial quality.

Referring now to Figs. 2 and 3, I have shown a portion of the stencil 3 to illustrate the manner of supporting the central blanking portion of a ring character. The Figures 8, 9 and 10 are illustrated, as each of them comprises at least in part a substantially enclosed blank space on the dial. These blank spaces are formed by providing blanking portions 27 which fit into the opening cut in the stencil proper and provide a ring-like opening through which the paint may pass to the dial or blank.

In order to support these blanking portions, I provide bridge portions 28 of suitable material, which bridge portions are secured to the under or reverse side of the stencil and carry the blanking portions 27. As shown in Fig. 2, this arrangement provides an uninterrupted stencil opening at the face of the stencil and at the same time leaves ample room for the paint to pass through the stencil to the blank being stenciled. This arrangement is particularly valuable in connection with the reduction of pressure in the container 2, as the reduction in pressure eliminates any tendency for air bubbles to collect between the bridge and the face of the stencil.

I have found that unless some means for venting the blanking portions 27 is provided, the paint will tend to smear over the stenciled article when such article is lifted from the stencil. I, therefore, provide ducts 29 in the bridge portions 28, said ducts terminating in openings 30 formed in the blanking portions 27 of the stencil. The ducts 29 are preferably carried to the outside, and in order to conveniently arrange them thus, I connect all of the bridges 28 to a bridge ring or gasket 31, which fits between the top of the container 2 and the stencil 3. The bridge ring is shown in Fig. 4 and starting with the bridge 28 which is shown on the right-hand side of the figure, and proceeding clockwise, the bridges are respectively for the figures 4, 6, 8, 9 and 10 on a clock dial. It will be noted that a double bridge is provided for the character 8 as best illustrated in Fig. 2.

After the stenciling operation has been carried out as hereinbefore described, the bracket 6 is again locked in the position shown in Fig. 1, and the suction is taken off the container 2, or at least reduced in a material amount. The plate 12 and the stenciled dial 13 are then raised from the face of the stencil by operating the hand wheel 22. In certain cases, it may be advantageous to maintain a slight degree of suction on the container 2 at this time so that the inrush of air which occurs as soon as any part of the stencil openings is uncovered by the raising of the dial, will check any possible tendency of the paint to break off the dial or to smear over the face of the dial or the stencil. Whether or not suction is employed during the dial lifting operation, it is desirable to supply suction thereafter in order to clear the suction openings of excess paint. The dial 19 is then removed from the suction ring 13 and the operation may be completed.

It is decidedly important that the stencil be level when the stenciled article is removed therefrom, as otherwise the paint tends to run over the face of the article. The stencil is properly positioned for removal of the stenciled article by the handle portion 10 and the recess 11, while the screw 23 ensures that the movement of the stenciled article away from the stencil itself will be truly perpendicular. This does away with the tendency of the excess paint to run over the face of the article or the stencil, and causes such paint to run back through the stencil openings to the container proper.

In order to prevent the paint entering the conduit 15, I provide an internal flange 32, as shown in Fig. 1. This flange is preferably spaced a short distance from the end of the conduit so that a portion 33 lies beyond such flange. This portion is flared downwardly, as shown in Fig. 1, so that if any paint happens to get into the portion 33, it will drain out when the frame 6 is in the normal position of Fig. 1. The flange 32 effectually prevents the entrance of paint to the conduit proper.

The term "ring character", as herein used, is a term of definition and not of limitation, and is intended to include any figure wherein there is a substantially continuous ring of paint surrounding a blank space, regardless of the shape or contour of such ring or blank space. Similarly, the term "paint" is intended to include any fluid medium adapted to be used with a stencil.

I have illustrated and described a preferred

manner of carrying out my invention, but it will be understood that the invention is not limited to the illustrated embodiment since it may be otherwise embodied or practiced within the scope of the following claims.

I claim as my invention:

1. The method of stenciling, which includes placing a stencil and a blank over a paint container, the stencil having open paint passages therethrough and tilting the container.

2. The method of stenciling, which includes placing a stencil and a blank over a paint container, the stencil having open paint passages therethrough and rotating the container.

3. The method of stenciling, which includes placing a stencil and a blank over a paint container, reducing the pressure within the container, and tilting the container.

4. The method of stenciling, which includes placing a blank over a paint container having a stencil opening therein, reducing the pressure within the container, and tilting the container.

5. The method of stenciling, which includes placing a stencil and a blank over a paint container, tilting the container to apply the paint to the stencil, stripping the blank from the stencil and maintaining a reduced pressure within the container during the stripping operation.

6. The method of stenciling, which includes placing a blank to be stenciled against a paint container having a stencil opening formed therein, tilting the container to effect a stenciling operation, removing the stenciled blank and reducing the pressure within the container to clear the stencil opening of paint.

7. The method of stenciling a ring character, which includes placing a ring character stencil over a blank, applying a paint through the stencil, and venting the interior of the ring.

8. The method of stenciling a ring character, which includes placing a ring character stencil over a blank, applying a paint through the stencil, and venting the interior of the ring through the stencil.

9. The method of stenciling a ring character, which includes placing a ring character stencil over a blank, applying a paint through the stencil, and admitting air to the blank space within the ring character during removal of the stenciled article from the stencil.

10. Apparatus for stenciling, including a container, a stencil adapted to receive paint from the container and having an open paint passage therethrough, means for tilting the container and the stencil, and means for reducing the pressure within the container.

11. Apparatus for stenciling, including a container, a stencil adapted to receive paint from the container and having an open paint passage therethrough, means for tilting the container and the stencil, and means for controlling pressure conditions within the container.

12. Stenciling apparatus including a paint container, means for holding a blank to be stenciled in operative relation with the container, supporting means for the container and the blank holder, and means for tilting the supporting means.

13. A stencil for ring characters including a stencil blanking portion, and a bridge across the back of the stencil for supporting the same, the bridge having a venting duct therethrough.

14. Stenciling apparatus including a stencil adapted for the stenciling of a ring character, a paint container having an opening adapted to be substantially closed off by the stencil, and a member fitting between the container and the stencil proper, said member having a bridge adapted to support a blanking portion for the ring character.

15. Stenciling apparatus including a stencil adapted for the stenciling of a ring character, a paint container having an opening adapted to be substantially closed off by the stencil, and a member fitting between the container and the stencil proper, said member having a bridge adapted to support a blanking portion for the ring character, the bridge having a venting duct terminating outside the container.

16. The method of stenciling, which includes applying paint through a stencil to a blank, placing the stencil and the blank in such position that the blank is uppermost, and moving the stenciled blank from the stencil in a direction substantially perpendicular to the plane of the stencil.

In testimony whereof I have hereunto set my hand.

DALTON M. GOETSCHIUS.