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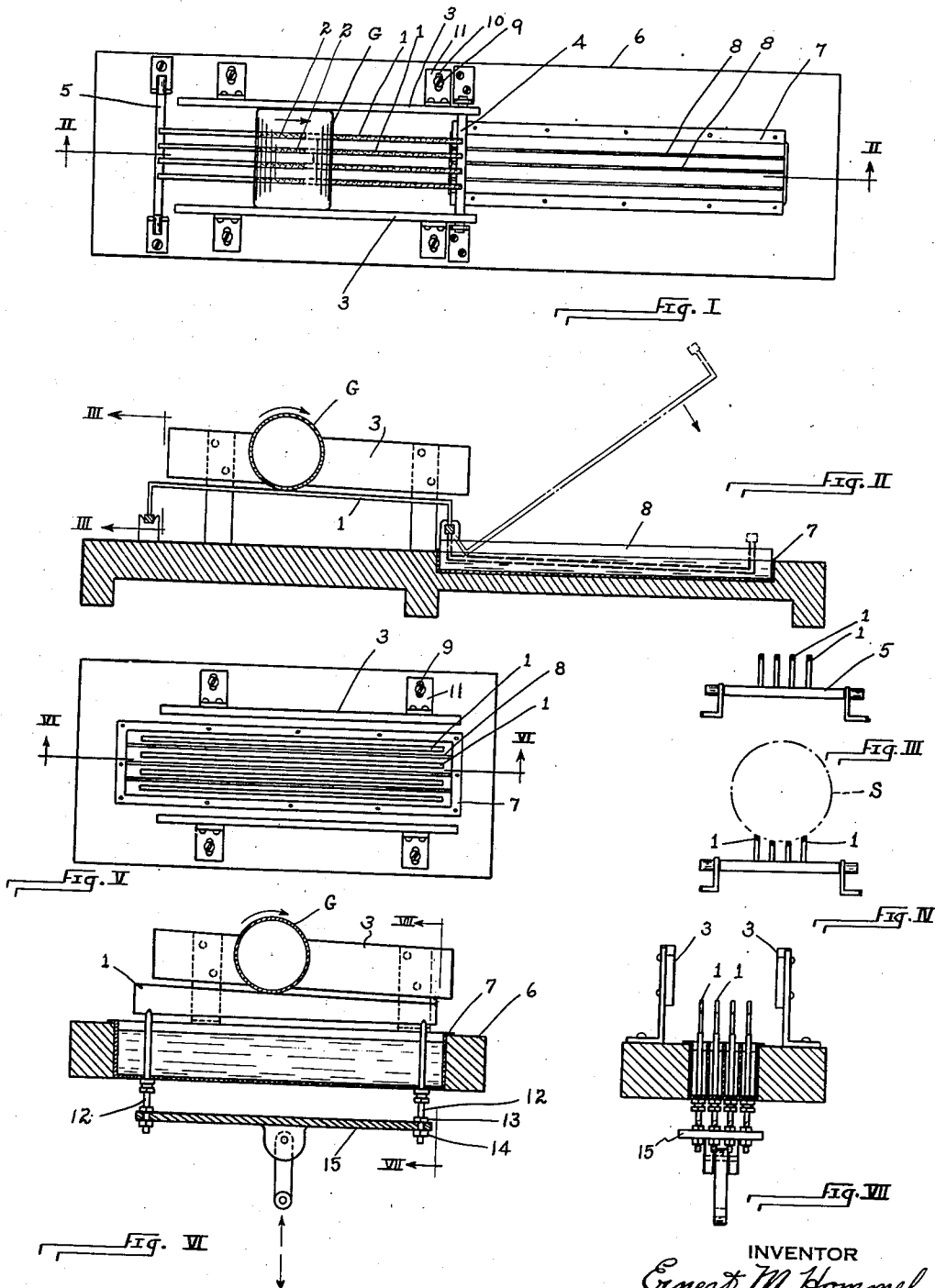
E. M. HOMMEL

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APPARATUS FOR DECORATING GLASSWARE

Filed Aug. 28, 1934

3 Sheets-Sheet 1



INVENTOR  
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 BY  
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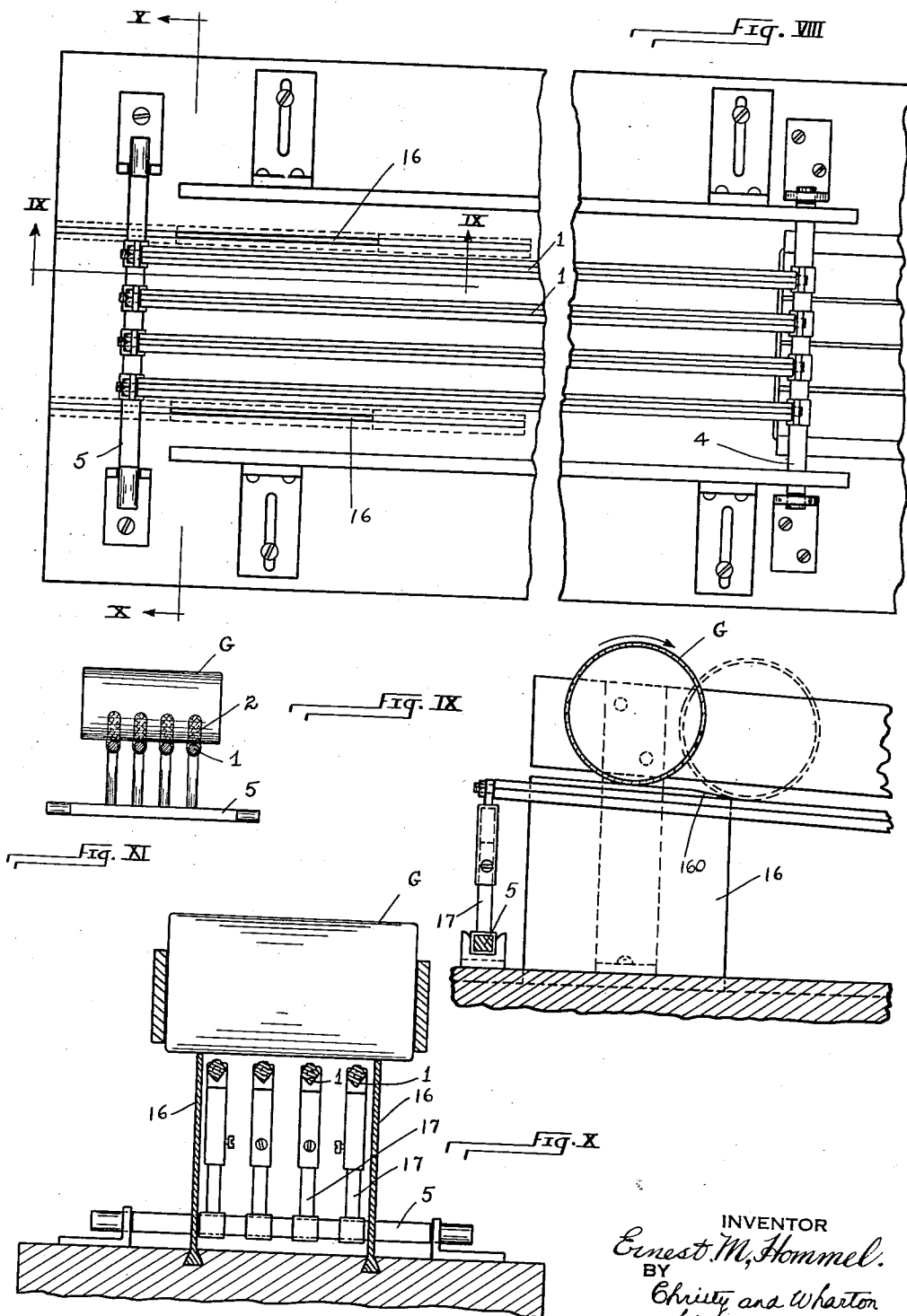
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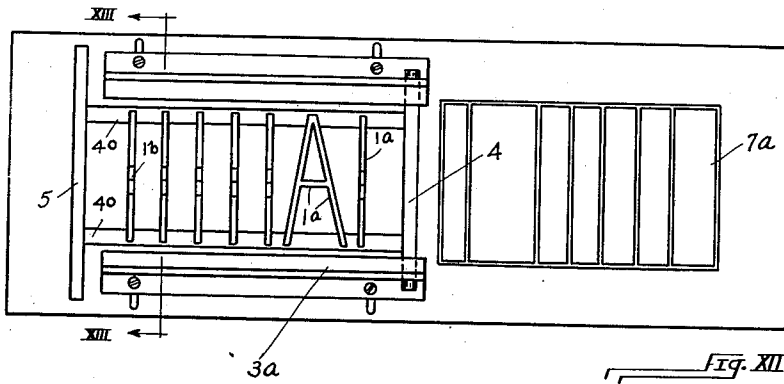
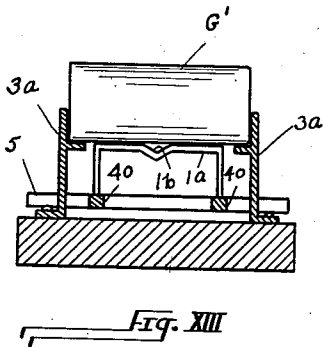
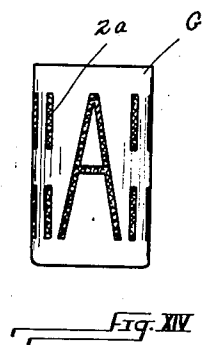
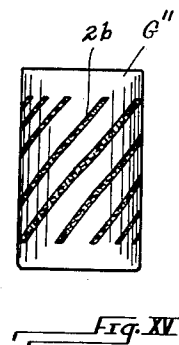
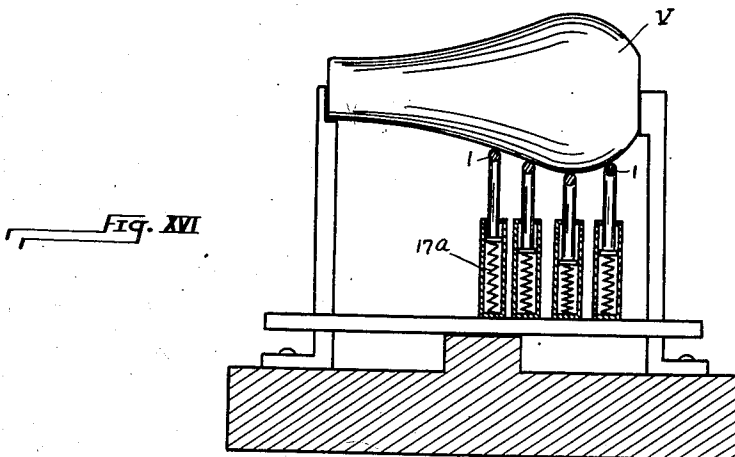
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APPARATUS FOR DECORATING GLASSWARE

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## UNITED STATES PATENT OFFICE

2,067,447

APPARATUS FOR DECORATING  
GLASSWAREErnest M. Hommel, Pittsburgh, Pa., assignor to  
The O. Hommel Company, a corporation of  
Pennsylvania

Application August 28, 1934, Serial No. 741,761

9 Claims. (Cl. 91—12)

This invention is found in apparatus for applying surface decoration to round articles. I have made practical use of the invention in applying to drinking glasses and to other substantially cylindrical articles of glassware lines of vitrifiable decorative material, adapted by firing to be integrated with the underlying glass and to form ornamental bands upon the finished article. In such use I shall describe the invention, and then indicate its general applicability.

Fig. I is a view in plan of the apparatus of the invention, showing an article in course of receiving the desired application. Fig. II is a view in vertical and longitudinal section, on the plane indicated by the line II—II, Fig. I. Fig. III is a fragmentary view in end elevation; and Fig. IV is a similar view, illustrating a variation. Figs. V and VI are views corresponding to Figs. I and II and illustrating a modification. Fig. VII is a view of the modified machine of Figs. V and VI in vertical and transverse section, on the plane indicated at VII—VII, Fig. VI. Fig. VIII is a fragmentary view in plan and to larger scale, but otherwise corresponding to Fig. I, and illustrating certain features of elaboration. Fig. IX is a view in vertical and longitudinal section, on the plane indicated at IX—IX, Fig. VIII, and showing, additionally, a piece of work in place in the apparatus. Fig. X is a view in vertical and transverse section, on the plane indicated at X—X, Fig. VIII; and here also a piece of work is shown in place. Fig. XI is a fragmentary view in transverse and vertical section, and illustrates a further variation in detail. Fig. XII is a view comparable with Fig. I, illustrating another modification in the apparatus. Fig. XIII is a sectional view, taken on the plane XIII—XIII of Fig. XII. Figs. XIV and XV each show a drinking glass in side elevation, and illustrate several forms in which the decoration may be applied. And Fig. XVI is a view comparable with Fig. X, illustrating still another variation in detail.

The apparatus includes one or more bars formed conveniently of metal—ordinarily two or more—adapted to receive and carry a coating layer of the decorative material to be applied. The article to which application is to be made is rolled in contact with the coated bars, and as it so rolls the material is transferred and lies in lines around the circumference of the article. Firing follows, the lines of decoration are vitrified and integrated with the underlying glass, and the article on cooling carries the desired bands of ornament.

In the apparatus as shown in Fig. I, four such

bars 1 are shown; and, comparing Figs. I and II, it will be seen that they extend in approximately horizontal position. They are, however, inclined slightly downward from left-to-right, to facilitate the rolling of the article when resting upon them. The article itself is indicated at G; it is shown in left-to-right progress, and in Fig. I appear the lines 2 of material that are picked up from the bars 1 as the article progresses, and gradually laid around the circumference of the article.

The article is here shown to be truly cylindrical, and in such case, if only it be kept in direct course, the line 2 will be laid with precision, in a plane exactly perpendicular to the axis of the article. Such articles, however, are commonly of slightly tapering form (drinking glasses, for example), and in any case stops 3 are conveniently provided, to prevent longitudinal displacement of the rolling article; and, the article being so restrained, the lines 2 will be laid with precision. Inasmuch, however, as the bands, in case the article is of tapering form, and in case there are more bands than one, will be unequal in circumferential extent, there will necessarily be slippage between the article and one or more of the bars as the article rolls. Such slippage, however, will not defeat the end in view nor prevent the attainment of the desired result.

The bars 1 are in the organization of the apparatus associated with a container for a quantity of material to be applied, and the organization is such that by manipulation the faces of the bars may be repeatedly coated with the material. The material may be understood to be a dispersion in water of finely powdered glass, or mixture of materials, of which the chief component is lead borate, and the dispersion may be understood to possess the consistency of a thick soup—of slow fluidity.

As seen in Fig. I, the bars 1 are secured at their ends to cross-bars 4, 5 and form with these cross-bars a rigid frame. The cross-bar 4 at one end of the frame is trunnioned upon a horizontal bed-plate 6; in the bed-plate is set a tank 7, adapted to contain a pool or bath of coating material of proper surface extent; and the arrangement and organization are such that the trunnioned frame may be swung, as indicated in Fig. II, from the full-line, erect, and operative position on the left, to the broken-line inverted position on the right—a position of immersion in the bath of coating material.

The tank 7 may by partitions 8 be divided into compartments adapted to contain separate baths of coating material of different colors, with 55

which separately colored baths the bars severally cooperate.

The stops 3 already mentioned, for preventing longitudinal displacement of the article when being rolled upon the bars, are conveniently mounted upon bed-plate 6; and may be made adjustable, for accommodating the apparatus to articles of different sizes. Adjustability is indicated by bolts 9, securing the stops in place, that pass through elongate slots 10 in the plates 11 from which the stops rise.

Operation consists in the alternate coating of the bars with material to be applied, by swinging them to positions of immersion in the bath of material, and then, after restoring them to normal position (that indicated in full lines, Fig. II), rolling of articles from left-to-right along the coated bars.

If the articles be cylindrical in form or conical, the transverse arrangement of the bars as shown in Figs. I-III suffices; but if the article be of a contour that is curved in three dimensions and three or more bands of decoration are to be formed upon it, the bars 1 will be grouped to afford multiple points of contact along such curved contour. In Fig. IV the bars 1 are shown grouped transversely of their extent to a trough-like assembly, adapted to carry a spherical article S, and to lay circumferential lines of decorating material upon the surface when the sphere is rolled upon them, in the direction of the line of sight, Fig. IV. In this case, too, it will be understood, there will be slippage between the rolling sphere and some or all of the bars 1,—but, again, without disadvantage.

In the modification shown in Figs. V-VII the tank 7, instead of being arranged to one side, is arranged directly beneath the position of bars 1 when being rolled upon by the work G; and the bars are mounted in or form part of a frame that, instead of swinging to one side, has vertical movement, to effect repeated submergence and repeated coating of the faces of the bars. The bars are carried on vertically reciprocable rods 12 that rise through the tank.

In this case the bars are indicated to be adjustable vertically in their individual positions in the assembly. Such adjustability is indicated in the nuts 13, 14, by which the rods 12 are secured to a reciprocable cross-head 15. By such means either the transversely level assembly of Fig. III or the transversely trough-shaped assembly of Fig. IV, or any other particular grouping may be established at will.

In Figs. VIII-X rails 16 are shown which, organized with the parts already described, support the article G during the initial part of its range of rolling through the apparatus. These rails at their delivery ends are tapered, as indicated at 160, Fig. IX, so as to bring the rolling article smoothly and easily to contact with the bars 1. The rails are widened at their bases and are set in grooves in the bed of the machine, and are adjustable in such setting in the direction of the extent of the bars. By such means the particular point in the extent of bars 1 at which the rolling article actually makes contact with the bars may be accurately determined; and the distance from that point to the farther ends of bars 1 being by adjustment made precisely equal to the circumferential extent of the article, the line of applied material may be exactly a complete ring, with neither gap nor overlap at the meeting of the ends.

Figs. IX and X show that the bars 1, rising

upon legs 17 from cross bars 4 and 5, may, by making the legs telescopic, be capable of such variety in transverse groupings as is indicated in Figs. III and IV, or any grouping suited to articles of particular and special shapes. Indeed, as shown in Fig. XVI, the telescopic mounting of the bars 1 may include springs 17a in such organization that the bars 1 are severally adjustable against spring tension, whereby, upon bringing the article to position against the bars, they severally adapt themselves to the configuration of such article. The bars 1 in Fig. XVI have in such manner adapted themselves to the figure of the vase V.

Figs. VIII and X further show that the bars 1 may be made rotatable in their mountings in the frame assembly. They are shown to be polygonal in cross section, and to be provided each with a plurality of faces of different widths. Thus strips of material of different widths may be laid at will upon the articles that pass through the apparatus.

In Figs. XI and XVI, I have shown the bars to be of circular cross section. I have found that from round bars (the coating material having been properly prepared) strips 2 may be laid on the article with precision, and of uniform width; and I have further found that, by using circular bars of different sizes, strips of different widths may be laid down.

In applying narrow bands, the decorating bars 1 are made of correspondingly small cross-section, and in very fine work the bars become wires, drawn taut between the frame elements 4 and 5. In case relatively wide bands are desired, two or more of the bars 1 may, advantageously, be arranged in close side-by-side arrangement, instead of providing a single bar of the required width. Thus, many variations in the width of the bands applied may be made without the need of a great number of interchangeable bars.

Figs. XII-XIV serve to show that vertical bands 2a of decoration may be applied. The bars 1a in such case extend transversely of the apparatus, and the tank 7a is correspondingly partitioned. The several bars 1a are united at their feet to the spaced-apart beams 40, which beams are integrated at their opposite ends by the cross arms 4, 5, already described. The guides 3a afford horizontal and lateral support for the glass G', and, as the glass is rolled along the supports, its surface in successive intervals makes contact with the coated bars 1. Longitudinal bands 2a, rather than the circumferential bands 2, are thus applied. It will be observed that the bars 1 or 1a may be fashioned in the form of letters—in Fig. XII I have indicated how the bars 1a may be fashioned, to provide the letter A on the glass G'. The bands marked upon the glass need not be continuous, but may be interrupted, as shown in Fig. XIV; to such end the surfaces of the bars 1a are recessed at 1b. Again, the bars 1a may be arranged obliquely of the path which the article to be decorated follows through the apparatus, and such arrangement is effective to provide helical bands upon the article, the bands 2b on the glass G'', Fig. XV, being illustrative.

I contemplate that mechanical means may be employed, to roll the articles across or along the decorating bars; the art is familiar with such means, and their organization with my apparatus is simply a matter for the engineer.

The apparatus has been described as suitable

for use in the decoration of articles of glassware. Manifestly it is serviceable in applying decoration of any material responsive to the printing operation described, upon the surface of an article, of whatever material it may be, that is susceptible to being rolled in contact with such bars.

I claim as my invention:

1. Apparatus for applying a band of decoration to the surface of an article, including means presenting a supply of coating material and a bar movable between service position and a position of contact with such supply of coating material, the bar when in service position adapted to sustain the contact of an article rolled upon it.

2. Apparatus for applying a band of decoration to the surface of an article, including a container for fluid coating material and a bar movable between service position and a position of immersion in a bath of coating material in such container, the bar when in service position adapted to sustain the contact of an article rolled upon it.

3. Apparatus for applying a band of decoration to the surface of an article, including a container for fluid coating material and a bar swinging on a support between an upright service position and a position of inversion in a bath of coating material in such container, the bar when in upright service position adapted to sustain the contact of an article rolled upon it.

4. In apparatus for applying a band of decoration to the surface of an article, a bar adapted to receive a film of coating material and to sustain an article rolled upon it, and a track arranged adjacent the bar and adapted to sustain an article rolled upon it and forming with the said bar a continuous support for a rolling article, said track standing above said bar, and sustaining the rolling article free of contact with the bar until the rolling article advances beyond the end of the track, the said track being adjustable longitudinally of the bar, whereby the article-sustaining reach of the bar may be varied.

5. In apparatus for applying a band of decoration to the surface of an article, a frame, a bar rotatable in said frame adapted to receive a film of coating material and to sustain an article rolled upon it, said bar being provided with a plurality of faces of unequal width whereby an article rolled upon it may take from it by contact with it a band of coating material of one or another predetermined width.

6. In apparatus for applying to an article of glassware a band of decorating material, the combination of a container for a fluid body of said material, a frame including a bar mounted upon a support and adapted to swing between an upright service position and a position of inversion in a bath of decorating material in said container, said bar when in upright service position adapted to make contact with an article of glassware rolled upon it and to yield a coating of said decorating material to the so rolled article.

7. Apparatus for applying decoration to the surface of an article, including a way through which to roll such article, a plurality of bars extending transversely of said way and in spaced-apart relation longitudinally thereof, means presenting a supply of decorating material, said bars being movable relatively to said means, whereby to receive coatings of decorating material from said supply, said bars being adapted, upon the rolling advance of said article through said way, to transfer said decorating material in predetermined pattern to the surface of said article.

8. In apparatus for applying a plurality of bands of viscous material to the surface of an article, the combination of a frame, a plurality of rigid bars severally adjustable in the frame and adapted to form a support of variable cross-sectional contour for an article rolled upon such support, and means including a container for a supply of such viscous material mounted in definite relation with respect to said bars, said bars being movable relatively to said means for receiving flooded coatings of the material, whereby said bars deliver to an article rolled upon them heavy films of such material.

9. In apparatus for applying to an article a closed band of decoration, said apparatus including a rigid bar adapted to sustain the contact of such article rolled upon it, means including a container for a supply of viscous decorating material mounted in definite relation with respect to said bar, said bar being movable relatively to said means for receiving a flooded coating of the material, said bar being adapted to yield to the so-rolled article a closed band of such viscous material, and a stop extending adjacent said bar and adapted to be abutted by the article rolled thereupon and by such abutment to prevent transverse movement of said article as it is rolled upon the bar.

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