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METHOD OF PRODUCING ORNAMENTAL MESH FABRIC.


This invention relates to the manufacture of metal mesh fabric and is concerned more particularly with the production of ornamental mesh in which selected portions have an appearance different from that of other portions so that the finished product resembles a colored textile fabric, tapestry, or the like. In accordance with this invention, the desired ornamental effect may be secured in numerous ways, as, for example, by the application of coloring material, such as enamel, to selected links of the fabric, and if desired, the entire fabric may be given a ground coloring by means of such enamel, and selected links may thereafter be given other colors in accordance with the desired pattern. The invention is of particular utility in the application of ornamentation to mesh of the "fish-scale" type which consists of longitudinal and transverse alternate rows of rings and cruciform links, and a method and apparatus involving the principles of the invention and suitable for that purpose are herein illustrated and described by way of example.

In the ornamentation of mesh fabric by the application of enamel or other coloring materials, it is desirable to apply the coloring substance by spraying or other similar operations, since such methods of application increase the operator's output to a considerable extent. In such treatment, certain portions of the mesh are shielded or masked by suitable stencil plates, and enamel is applied by spraying upon such portions of the mesh as are exposed through openings in the plates. The use of a stencil or similar plate, while reducing the amount of labor involved, presents numerous difficulties in the production of an ornamental mesh of the highest grade, due primarily to the necessity of applying the color in exactly determined areas. In using a stencil plate, the plate must be placed exactly in position with respect to the mesh, so that only the desired links are exposed, and the mounting of the mesh in position to be treated is a difficult operation which cannot be performed except with the utmost attention and skill on the part of the operator. As the mesh is highly flexible, it is difficult to hold the piece of mesh with the fabric fully extended, and unless the mesh is thus disposed and held in relation to the stencil plate, the coloring material will be improp-

erly applied, the pattern in the finished mesh will be distorted, and a clean-cut and distinct pattern cannot be secured.

In fish-scale mesh the flat surfaces of the cruciform links lie in a plane somewhat raised above the plane of the rings, and I have found that the most desirable effect in ornamentation is secured by applying the ornamentation to the flat surfaces of the cruciform links. This mesh, however, is particularly difficult to handle on account of the fact that the legs of the cruciform spiders in the finished mesh, which pass through the rings, terminate outside of the plane of the links and consequently when the mesh is to be placed in juxtaposition to the stencil plate, difficulties are encountered in supporting the mesh, since if it is laid on a flat surface, the cruciform links supported by the points of their legs have a tendency to tilt, so that the flat surfaces of these links do not lie in a plane.

I have discovered that the ornamentation of mesh fabric and particularly that of the fish-scale type can be readily carried on and a product of the highest grade produced at a high output rate by anchoring substantially all parts of the mesh fabric and then applying a shield over the face of this fabric, through which such portions as are to receive coloring substance are exposed. Preferably the anchoring device is so arranged that the mesh to be held by it may be readily placed in position and the masking or stencil plate may be attached to the anchoring device in such manner that a fixed relation between the mesh held by the support and the plate is secured. The mesh is anchored by the support at a multiplicity of places throughout its extent and all the links which are to receive ornamentation are held in fixed position. The consequence is that when the coloring material is applied, there can be no slippage of any of the links out of position, and as the mounting of the mesh on the support is a simple operation, the difficulties heretofore encountered and resulting in imperfect or distorted ornamentation are entirely overcome.

For a better understanding of the invention, reference will be made to the accompanying drawings, in which

Fig. 1 is a plan view and Fig. 2 a sectional view on the line 2–2 of Fig. 1, of a piece of fish-scale mesh,
Fig. 3 is a plan view of one form of supporting device. Fig. 4 is a fragmentary view of the device with a piece of mesh in position thereon to be treated. Fig. 5 is a sectional view on the line 5—5 of Fig. 4. Fig. 6 is a plan view of a masking plate, Fig. 7 is a sectional view on an enlarged scale showing the plate in position over the piece of mesh on the support and taken on the line 7—7 of Fig. 8. Fig. 8 is a plan view on an enlarged scale showing a piece of mesh in position on the support and coloring material applied, and Fig. 9 is a sectional view on an enlarged scale showing the application of color to a single link of the fabric. In the production of ornamental mesh as herein illustrated, the fabric is made on machines of any standard type, of metal of the desired kind, and after the mesh has been produced in a sleeve or web in suitable amounts, the fabric is removed from the machine and frequently given a surface plating of another metal, such as a precious metal, by suitable electrolytic plating operations. The mesh is now cleaned and made ready for the application of the ornamentation. Ordinarily, this involves the application of a ground color to the mesh and for this purpose the mesh may be sprayed with or immersed in the desired coloring material, so that all the mesh has a coating of coloring compound. Enamel, which may be baked hard, is frequently employed for the purpose and it is applied to the mesh in any suitable manner, as by a spraying operation. In the case of fish-scale mesh, the enamel is applied so that it coats all of the exposed portions of the cruciform links and portions of the rings by which these links are connected. This preliminary treatment provides the mesh with a ground color or field and the final ornamentation is now produced by applying enamel of other colors to selected portions of the fabric.

In Fig. 1 there is shown a portion of a piece of fish-scale mesh including links 10 of cruciform shape and rings 11, the legs 12 of the links being inserted through the rings and bent inwardly to secure the rings together, as illustrated in Fig. 2. By the preliminary coloring operations above referred to, the flat surface 13 of each cruciform link and the portions 14 of the rings which lie exposed between adjacent cruciform links will be given the desired ground color. Preferably a contrasting color which is to produce the desired pattern effect, is applied only to the flat surfaces of the cruciform links, and as the legs 13 of the links are turned inwardly through the rings and thus give the piece of mesh a rough under surface, it will be apparent that if the mesh is laid on a flat support, difficulties will be encountered in confining the contrasting color to the surfaces 18 since each link will have a tendency to tilt on the points of its legs, and disarrangement may easily take place.

According to my new process, I provide an anchorage for the piece of mesh at a multiplicity of points throughout its extent, and preferably I anchor each cruciform link against lateral movement. For this purpose I employ a supporting plate 15 made in accordance with the kind of mesh to be treated and having a plurality of recesses 16 in its upper face. These pockets are of such size and spacing that when a piece of mesh is laid flat upon it and fully extended, each cruciform link 10 will lie above a recess with its legs 12 entering the recess and engaging the walls thereof firmly. The recesses are of sufficient depth to receive the downwardly projecting ends of the legs and the connecting rings 11 of the mesh then lie on the portions of the plate which separate the recesses. Since mesh varies in the size of its links, different plates will be employed with fabrics of different kinds, but each such plate will support the piece of mesh securely in position and preferably in a plane and will also provide anchorage against lateral movement of the mesh at a multiplicity of points. I prefer to employ a support with a recess to receive each cruciform link, so that a piece of fish-scale mesh placed on this support and consisting of alternate rows of rings and links will be supported throughout its entire extent and the links placed in alternate rows will be anchored.

With the mesh placed in position in the support as illustrated in Fig. 5, it will be evident that each ring is supported on a portion 17 of the plate and lies substantially horizontal, while each cruciform link lies over a recess and is supported by the contact of its legs with the walls of the recess. The flat upper surfaces 18 of the cruciform links then lie substantially in a horizontal plane. The placing of the piece of mesh in the support is a simple operation, since the plate is constructed to receive mesh of a particular link size, and consequently the piece of mesh is simply spread out flat on the support with the flat surfaces of the cruciform links uppermost and then quickly smoothed out by hand, so that each link is anchored in position. After this operation has been completed, a mask or shield 19 of the desired construction is laid over the top of the flat sheet of mesh.

The plate 18, which may be of metal or any other suitable material, is provided with apertures 20 at spaced points through which project pins 21 extending upwardly from the upper face of the plate 15. Two such pins are all that are required and they...
are placed in opposite sides of the plate 15 and serve to anchor it securely with reference to the support and the mesh. The plate 18 is provided with apertures 22 arranged in different positions in the plate and disposed in accordance with the pattern with which the mesh is to be ornamented. These apertures preferably have an area slightly less than the area of the flat portion 13 of each cruciform link, and when the plate is in position, each aperture preferably lies directly above a link. The apertures may have different configurations, but as illustrated are circular and when the plate 18 is in position, each aperture is disposed directly over the center of a link. With the plate in this position the coloring material is applied by a spraying operation and the material projected against the plate passes through the apertures and coats the surfaces of the links exposed through them. When the application of the coloring material is completed, each exposed link has received coloring material on its flat upper surface and the coating is applied in accordance with the arrangement of the apertures in the plate. With the plate illustrated in Fig. 6, the mesh carries the pattern shown in Fig. 8. In the piece of mesh illustrated in that figure, the links 23 may have been given a ground color in the preliminary operation, or the surface metal may have been allowed to remain uncoated while the links 24 have received a round spot of color on their flat upper surfaces.

In Fig. 9 there is shown a cross-section of a cruciform link on an enlarged scale, this link having been given a ground color 25 by a preliminary operation, over which is applied a spot of contrasting color 26 by means of the mask.

In the vent that a mesh is to be produced in which the pattern includes several colors, plates 18 of different types will be employed, these plates having apertures exposing different links. After the first plate has been placed in position and enamel applied to the portions of the mesh exposed through the plate, the plate is removed and after the enamel has dried, another plate may be placed in position, masking such portions of the mesh as have previously been exposed and exposing other portions. Enamel of a different color may now be applied to the newly exposed portions, and by the successive use of plates of different types, a mesh having ornamentation involving the use of several colors may be readily produced.

In order to produce a clean-cut design, I have found it desirable to confine the colors of the pattern to the flat portions of the cruciform links, and by practicing the present method, this result is easily attained, since each of the cruciform links is firmly anchored in the support and a masking plate may be constructed having apertures through which only the flat portions of these links are exposed. If desired, however, the portions of the mesh to be exposed through the plates may include rings by which the cruciform links are connected, but in any mesh produced in accordance with this invention, distortion and irregularities of the pattern are prevented, since the mesh is anchored at a multiplicity of points during the application of the ornamentation and may be readily placed in the desired anchored position in such manner that every link bears the same relation to its adjacent links throughout the piece of mesh.

I claim:

1. A method of ornamenting metal mesh fabric which comprises supporting the fabric and anchoring alternate links of the fabric against relative movement, masking all but selected portions of the fabric thus anchored, and treating the unmasked portions to change the appearance thereof.

2. A method of ornamenting metal mesh fabric which comprises supporting the fabric and anchoring a plurality of links throughout the fabric against relative movement, including links in portions of the fabric which are to receive ornamentation, masking all but selected portions of the fabric thus anchored, and subjecting the unmasked portions to a coloring treatment.

3. A method of ornamenting metal mesh fabric which comprises supporting the fabric in a plane, anchoring the fabric against movement in the plane by holding a plurality of links within its outline against relative movement, masking all but selected portions of the fabric thus anchored, and treating the unmasked portions including links held against movement to alter the appearance thereof.

4. A method of ornamenting mesh fabric made up of longitudinal and transverse rows of metal links which comprises supporting the fabric, anchoring the links of alternate rows of the fabric against movement, masking all but selected portions of the fabric, and treating the unmasked portions to alter the appearance thereof.

5. A method of ornamenting mesh fabric made up of rings and cruciform links connecting a plurality of rings, which comprises supporting the fabric, anchoring the cruciform links against movement, masking all but selected portions of the fabric, and applying coloring material to the unmasked portions.

6. A method of ornamenting mesh fabric made up of a multiplicity of rings and cruciform links connecting a plurality of rings, which comprises supporting the mesh, anchoring the cruciform links against movement, masking all of the fabric except se-
selected cruciform links, and applying coloring material to the said exposed links.

7. A method of ornamenting metal mesh fabric, which comprises placing the mesh on a support having recesses for the reception of a plurality of links throughout the extent of the fabric, exposing selected portions of the mesh while shielding the remaining portions, and applying a coloring material to the exposed portions of the mesh.

8. A method of ornamenting mesh fabric which comprises supporting the mesh, anchoring selected links throughout the extent of the fabric, and applying coloring material to selected anchored links.

9. A method of ornamenting mesh fabric which comprises altering the appearance of all the links in the fabric to form a field, supporting the piece of mesh and anchoring it at a multiplicity of points throughout its extent, and altering the appearance of selected links in the fabric thus supported and anchored.

10. A method of ornamenting metal mesh fabric which comprises supporting the fabric and anchoring it against movement by holding a plurality of links within the outlines of the fabric against relative movement, and altering the appearance of selected portions of the fabric so supported and anchored including links held against movement.

11. A device for use in ornamenting link mesh fabric comprising a support having a multiplicity of recesses adapted to receive links in the fabric and thereby to anchor the fabric against movement, a masking plate cooperating with the support and adapted to be laid over the mesh on the support, this plate having apertures to expose selected links, and means for holding the plate and the support against relative movement.

12. A device for use in ornamenting link mesh fabric comprising a support having a multiplicity of recesses in its surface arranged in longitudinal and transverse rows, these recesses being adapted to receive links of the fabric and to hold the links and thereby the fabric against movement, a masking plate adapted to be laid over the mesh on the support and having apertures through which portions of the mesh on the support are exposed, and means for holding the plate and support against relative movement.

13. A device for use in ornamenting link mesh fabric comprising a plane support having a multiplicity of pyramidal recesses in its face, these recesses being adapted to receive portions of links of the fabric, a flat masking plate adapted to be laid over the mesh on the support, and means for holding the plate and support against relative movement.

14. In a device for use in ornamenting link mesh fabric, a support for a piece of mesh to be ornamented having a flat face formed with a multiplicity of recesses in rows extending at right angles to each other and spaced to receive links in the piece of mesh.

15. A method of ornamenting mesh fabric which comprises supporting the fabric, anchoring a plurality of links throughout the fabric against relative movement and altering the appearance of selected links by the application of coloring material or the like thereto.

16. A method of ornamenting mesh fabric which comprises supporting the fabric, anchoring a plurality of links throughout the fabric against relative movement, and altering the appearance of selected links including certain of those so anchored by applying thereto coloring material or the like.

In testimony whereof I affix my signature.

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