

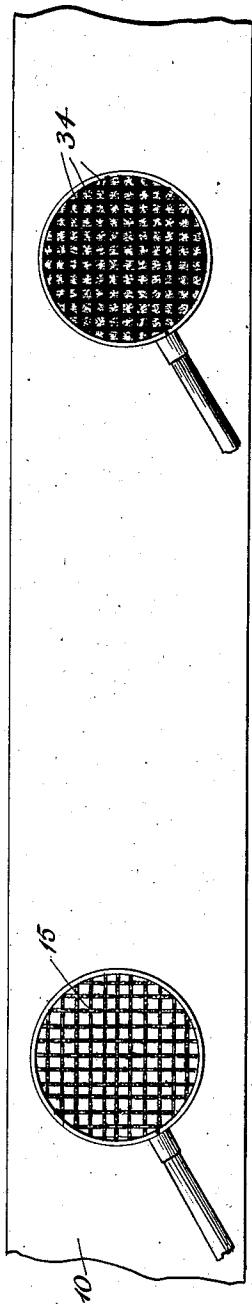
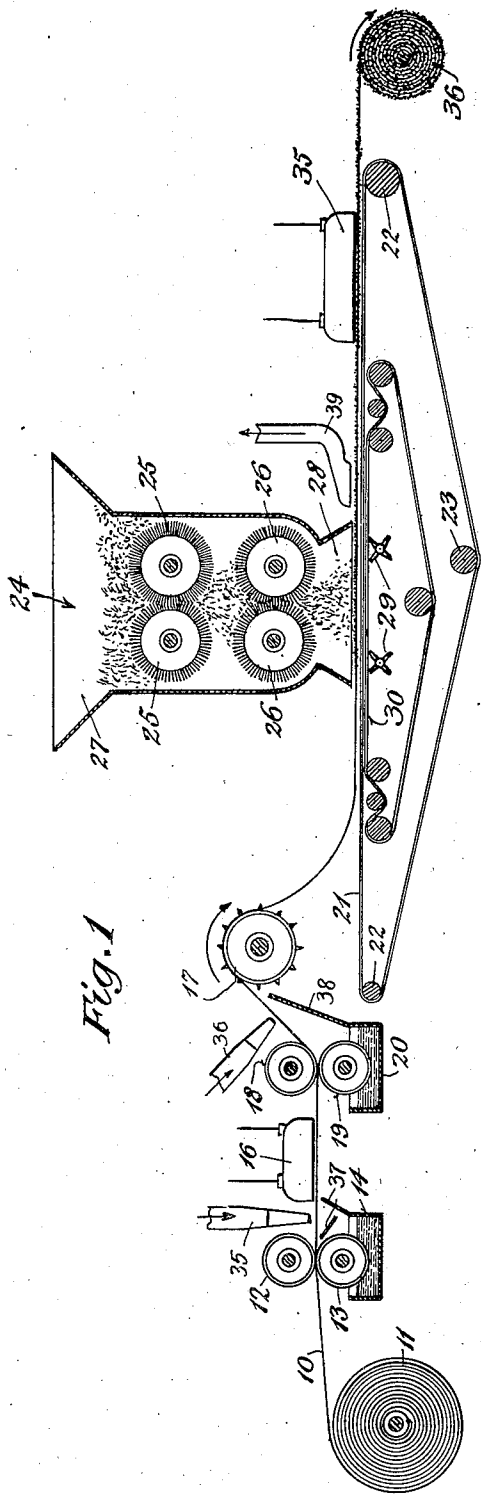
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J. FERRANTE

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METHOD FOR MAKING FLOCKED MATERIAL

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INVENTOR
John Ferrante
BY Johnson & Kline
ATTORNEYS

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METHOD FOR MAKING FLOCKED MATERIAL

John Ferrante, Johnstown, N. Y., assignor to
Kenlea Manufacturing Company, Johnstown,
N. Y., a corporation of New York

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This invention relates to the method and apparatus for flocking open mesh material, and has particular utility in connection with applying flocking material to woven wire screening.

Such flocked open mesh material may be advantageously used in many ways. For instance, it may be used for targets, particularly tow targets for airplanes, or it may be used for concealing things, as screens and camouflage nets. Another use to which it may be put is that of a filter, particularly an air filter.

According to the present invention, such flocked open mesh material may be made in sheets or continuous strips, and the quantity of material needed for each particular purpose may be cut from such sheets or strips.

In order to increase the utility of such material and improve its efficiency in use, according to my invention the intersecting strands making up the material are preferably locked or secured together against casual relative movement by applying to the material a cementitious product which forms blobs at the intersections and holds the strands of wires or threads from shifting relative to each other. Thus the screening may be cut into sections or may be cut into or slit without the usual danger of unraveling.

After the strands are thus anchored together, if the cementitious material is also serviceable as a flock adhesive, flocking material is directed to opposite sides of the screen so that the fibres are caught onto the adhesive surface to be anchored thereby when the adhesive has set. If desired, the cementitious material may be caused to set and then an additional coating may be applied to the open mesh material to anchor the flocking material thereto.

The invention claimed herein is concerned with the apparatus and method of making such material.

The apparatus, according to the present invention, for making the flocked open mesh material may include means for coating the mesh with the cementitious material and causing the same to set, means for applying adhesive to the open mesh material (if an adhesive material in addition to the cementitious material is employed), means for directing toward the open mesh material a quantity of flock to be anchored to the open mesh material by the adhesive thereon, and finally

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means for causing the adhesive to set and winding up or otherwise delivering the flocked strip or sheet.

In the preferred form of this invention, the flock is directed preferably by gravity toward one side of the open mesh material so that the fibres fall upon and are adhered to that side of the strip. The flock is deposited in such quantity that there is an excess of material which passes through the interstices of the mesh where it falls upon a support, preferably in the form of a traveling belt or conveyor, which, by means of suitable beaters, is agitated to cause the flock deposited thereon to be propelled back against the other side of the open mesh material or screening. In this way, each strand making up the open mesh material, whether the latter be woven, braided or knitted, is covered not only on one side but on its entire surface with flocking material, and the fibres of the flock project into interstices of the mesh more or less depending upon the size of the mesh and the length of the fibres of the flocking material.

In some cases, of course, it is not necessary or desirable that both sides of the open mesh material be covered with flock, and in other cases it may not be necessary or desirable to provide for anchoring the intersecting strands of the wire together. Hence, it will be understood that the present invention is not limited in all its aspects to the entire apparatus or all of the steps of the method therein disclosed.

Other features and advantages will hereinafter appear.

In the accompanying drawings—

Figure 1 is a schematic view showing the apparatus and the operations of producing flocked open mesh fabric.

Fig. 2 is a plan view of a strip of material showing, as through a magnifying glass, the coated and flocked portions of the strip.

Fig. 3 is a schematic view showing the cross wires of a woven strip with the wire securing, cementitious material and the flocking material on the wires.

As shown in the accompanying drawings, the strip of open mesh material 10, which may be supplied in the form of a roll 11 or may be supplied in sheet form, is passed between rollers 12 and 13, the latter being immersed in a tank 14 of cementitious material and carrying up to or

on the strip 10 a quantity of this material which, as illustrated in Fig. 2, forms blobs 15 at the intersection of the strands making up the mesh.

In the illustrated embodiment of the invention, the mesh is woven, and thus the blobs 15 anchor together the warp and weft strands or wires so that the web 10 can be cut into pieces of the desired size and shape or can be slit or cut into without danger of the mesh unraveling.

As shown in Fig. 1, the cementitious material is set by passing the web 10 under a bank of infra-red lamp 16, but it should be understood that any suitable means for setting the material, depending upon the particular kind of cementitious material employed, may be used, or no special means may be used if the cementitious material is air hardened.

If certain cementitious materials are employed, especially if they are slow drying and also adhesive, the web 10 may then be passed directly to a pin roller 17 to be advanced to the flocking station.

However, if an adhesive separate and in addition to the cementitious material is to be employed, the web 10 is passed between coating rollers 18 and 19. The latter are immersed in a tank 20 of adhesive material so that the latter will be applied to and form a coating on the strands making up the open mesh fabric. The web would then be passed to the pinwheel 17 as shown.

After the web leaves the pinwheel 17, it descends onto a conveyor 21. This may be in the form of an endless belt having guide rollers 22 and a tensioning roller 23. The web is carried by this belt past the flocking device 24. This device is made up of a series of brushes 25 and 26 so that flock from a hopper 27 is fed and deposited through a chute 28 in the desired quantity on the advancing adhesive-carrying web 10.

If the flock is to be applied on both sides of the web, an extra quantity of flock is deposited on the upper side, as by falling thereon by gravity, and the surplus, i. e., the quantity of flock which does not adhere to the adhesive carrying open mesh material, falls through the interstices thereof onto the conveyor 21. This additional quantity of flocking material is then propelled back against the web 10 by means of beaters 29 and an interposed belt 30, the fibres which fall through the interstices of the web 10 being beaten back against the underside of the web where they will be caught and anchored by the adhesive on the web.

The agitation of the conveyor 21 and the web 10 resulting from the operations of the beaters 29 not only propels the flock against the underside of the web, but also causes any flock which is only loosely held or trapped between the fibres and not adhered to the mesh to fall therefrom.

When the product is made as above described, the warp wires or strands 31 and the weft wires or strands 32 will have the fibres 33 of the flock extending all about them as shown in Fig. 3, and the fibres will extend into the interstices 34 of the wire as shown on the right-hand side of Fig. 2. The extent to which the fibres close the interstices 34 depends, of course, upon the dimensions of the interstices and the length of the flocking fibres.

After the web has received the flocking material, it may be conveyed under another bank of infra-red lamps 35 or other suitable apparatus for causing the adhesive to dry or set, or, if desired, the strip may be festooned and placed

in a drying or heating chamber to set the adhesive. After the adhesive on the web 10 is set, the web may be wound on a roll 36 for storage or other disposition.

In addition to the apparatus described, certain other means have been found desirable. For instance, in order to keep the interstices of the mesh from being filled or closed by a film of the cementitious material or the adhesive or both, blower nozzles 35' and 36' may be placed in the path of the mesh as it leaves the rollers 12-13 and 18-19. The blasts of air from these nozzles will blow off any surplus or film which might tend to close the interstices and such surplus will fall on the deflectors 37 and 38 and flow back to enter the tanks 14 and 20.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. The method of making a flocked open mesh strip fabric which includes the steps of applying a coating of adhesive material to both sides of the strands of the strip; directing toward one side of the strip a quantity of flocking material in excess of that which adheres to said one side so that the excess portion of the flocking material passes through the interstices of the strip; simultaneously propelling back against the strands of the strip the excess portion of the flocking material to cause the latter to adhere to the other side of the strip; and causing the adhesive material to be set.

2. The method of making a flocked open mesh strip fabric which includes the steps of applying a coating of adhesive material to both sides of the strands of the strip; removing excess adhesive from openings in the mesh strip; directing toward one side of the strip a quantity of flocking material in excess of that which adheres to said one side so that the excess portion of the flocking material passes through the interstices of the strip; simultaneously propelling back against the strands of the strip the excess portion of the flocking material to cause the latter to adhere to the other side of the strip; and causing the adhesive material to be set.

3. The method of making a flocked open mesh strip fabric which comprises the steps of applying to the strip cementitious material to form blobs thereof at the intersections of the strands constituting the mesh for holding the strands against casual relative movement; setting the cementitious material; applying a coating of adhesive material to both sides of the strip; directing toward one side of the strip a quantity of flocking material in excess of that which adheres to said one side so that the excess portion of the flocking material passes through the interstices of the strip; simultaneously propelling back against the strands of the strip the excess portion of the flocking material to cause the latter to adhere to the other side of the strip; and causing the adhesive material to be set.

4. The method of continuously making a flocked open mesh fabric strip which comprises the steps of continuously advancing the strip along a predetermined path and at a predetermined speed; applying a coating of heat-set adhesive material to both sides of the strip as it passes along a predetermined portion of said path; directing toward one side of the strip, at a subsequent predetermined portion of said path, a quantity of flocking material in excess of that which adheres to said one side so that the excess

portion of the flocking material passes through the interstices of the strip; simultaneously propelling back against the strands of the strip the excess portion of the flocking material to cause the latter to adhere to the other side of the strip; and thereafter setting the adhesive material and binding the flocking material to the strands of the mesh of the advancing fabric strip.

JOHN FERRANTE.

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