(No Model.)

R. F. NENNINGER.

ELECTROPLATED FABRIC.

No. 344,397. Patented June 29, 1886.

Fig. 1.

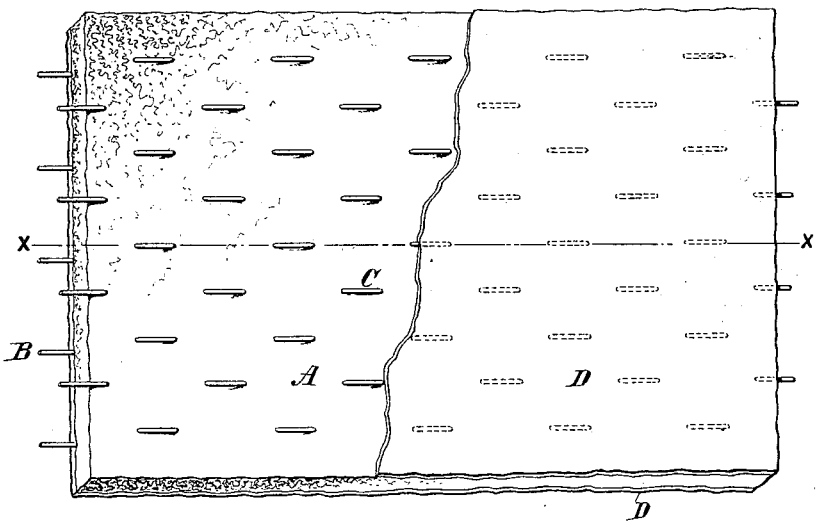


Fig. 2.

Fig. 3.

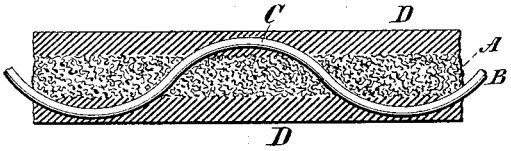
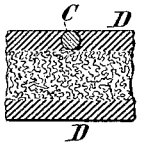


Fig. 4.



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ELECTROPLATED FABRIC.

SPECIFICATION forming part of Letters Patent No. 344,397, dated June 29, 1886.

Application filed January 18, 1886. Serial No. 189,019. (No model.)

To all whom it may concern:

Be it known that I, ROBERT F. NENNINGER, of Newark, Essex county, New Jersey, have invented a new and useful Improvement in Electroplated Fabrics, of which the following is a specification.

My invention relates to a flexible material having its surface or surfaces electroplated with metal. The invention consists more particularly in the construction of said fabric whereby it is adapted to receive and hold the metal deposit, and in the electroplated fabric, made, as herein set forth, as a new article of manufacture.

In the accompanying drawings, Figure 1 is a plan view showing the electroplating partly removed. Fig. 2 is a longitudinal section on the line *x x* of Fig. 1. Fig. 3 is a portion of said section enlarged. Fig. 4 is a transverse section enlarged.

Similar letters of reference indicate like parts.

A is a body or sheet of flexible material. Such composition may be paper-pulp formed into sheets of suitable thickness and dried, and then saturated with the gummy residue of linseed-oil, obtained by heating said oil. The said residue is dissolved in naphtha or other volatile hydrocarbon, and applied to the sheet of paper-pulp, which readily absorbs the liquid. The naphtha is then expelled by heat, leaving, apparently, every fiber of the pulp sheet coated with the gummy substance. This last, on drying, agglutinates the pulp into a tough strong water-proof substance. Into the sheet of material thus prepared I pass metal wires B, the said wires going through the sheet from one side to the other, the loops C appearing like stitches on the opposite surfaces. These wires may be placed at intervals of from a quarter to half an inch apart, and may extend lengthwise the sheet, as shown. The loops C may also alternate on the surface. Either or both surfaces may then be covered with plumbago in the usual way, to enable the metallic deposit to form upon them, and the material is then placed in an electroplating-bath until a coating, D, of metal, of sufficient thickness is produced upon said surface or surfaces. If the wires B were not present, this coating D would not permanently adhere to the material, but would easily crack or scale off when said material was bent or rolled. The object of the wires is primarily to prevent this non-adherence of the deposit. The plating will adhere very firmly to the loops C, not only on their upper but on their under surfaces, so that, as is represented in Fig. 3, each loop will become embedded in the coating. As the loops C are thickly scattered all over the surfaces of the material, the metallic coating is firmly held at a great number of points, so that it cannot become detached from said surfaces under any ordinary conditions of wear or use.

The wires B, in addition to their function, as above described, tend greatly to strengthen the fabric as a whole, so that any felted material, which alone might not be of sufficient strength to stand much tension, may be safely employed. So, also, inasmuch as they pass through and through the fabric from side to side, they bind all parts firmly into a compact mass.

An electroplated fabric such as is above described is susceptible to many useful applications, and may serve numerous purposes to which sheet metal is now applied. Thus it may be employed for floor or wall covering, for roofing, for the sheathing of ships, for the lining of refrigerators, for the manufacture of trunks, and so on for a variety of uses.

It should be understood that it is not necessary that the loops C should be raised above the surface of the material, so that there is an open space under them. The wire being circular in cross-section, the deposit forms beneath it—that is, beneath its place of greatest width—so that the deposit becomes locked in place by reason of the shape of the wire embedded in it. Of course, if it be considered desirable, the loops can be left slightly open, so that the deposit can form wholly beneath them, as well as above them; but for practical purposes the loops can be laid closely upon the surface, when the deposit will form around them, as represented in Fig. 4.

I claim—

1. The means of firmly attaching a metallic electro-deposit to an object of non-conducting material, substantially as herein set forth, which consists in metallic bodies passing into said object and forming projections on the sur-

face thereof to be electroplated, the said projections being of such shape (as circular in vertical cross-section) that the said metallic electro-deposit may form beneath their widest portion and between said portion and the surface of the object, and thereby be locked or fastened in place.

2. The means of firmly attaching a metallic electro-deposit to an object of non-conducting material, substantially as herein set forth, which consists in metallic wires passing into said object and forming loops on the surface or surfaces to be electroplated, the said wires being of such cross-sectional shape (as circular) that the said metallic electro-deposit may form beneath their widest portion and between said portion and the surface of the object, and thereby be locked or fastened in place.

3. The combination of a flexible material in sheet form, metallic bodies passing through the same and forming projections on a surface thereof, and a metallic electro-deposit on said surface, the said projections being of such shape (as circular in vertical cross-section) that the said metallic electro-deposit may form beneath their widest portion and between said portion and the surface of the object, and thereby be locked or fastened in place.

4. The combination of a flexible material, A, in sheet form, metallic wires B, passing through the same and forming loops C on opposite sides thereof, and a metallic electro-deposit on one or both of said sides or surfaces, substantially as described.

5. As a new article of manufacture, a flexible fibrous water-proof material in sheet form, having continuous metallic wires passing through it from surface to surface and forming loops on said surfaces, and upon said surfaces, or upon one of them, a metallic electro-deposit, substantially as described.

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