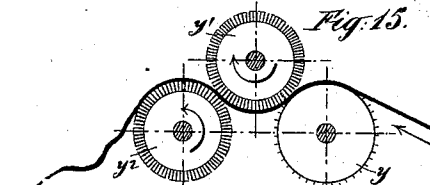
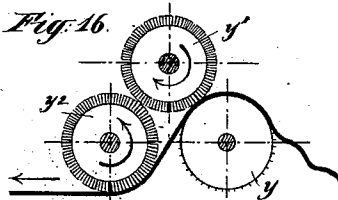
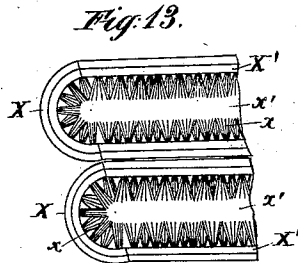
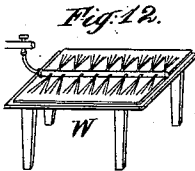
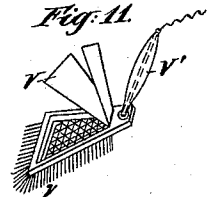
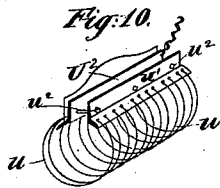
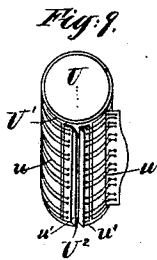
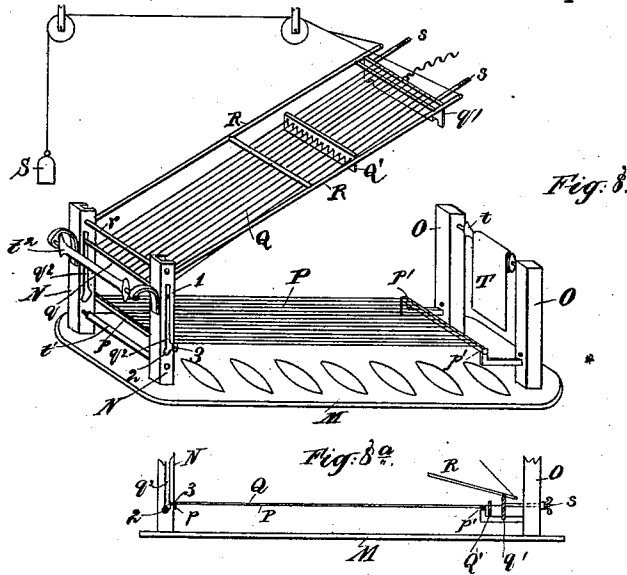


A. SÖHNER.

PROCESS OF RENOVATING GOLD AND SILVER LACE TRIMMINGS.

No. 349,535.

Patented Sept. 21, 1886.



Witnesses:
M. J. Ellison
M. S. Boyle

Inventor:
Andreas Söhner
John S. Brown

(No Model.)

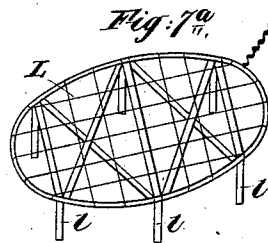
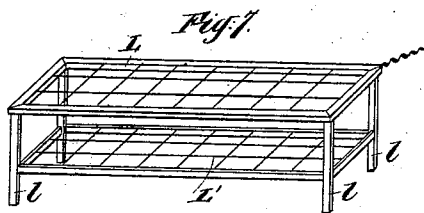
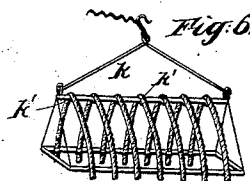
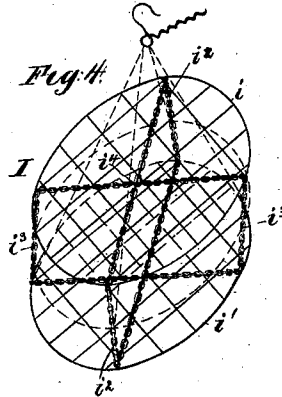
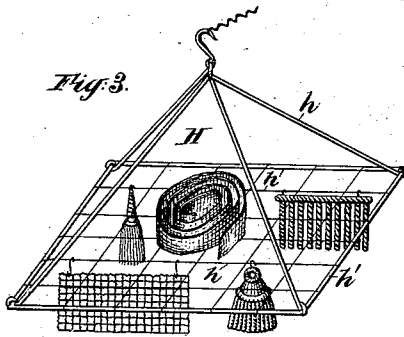
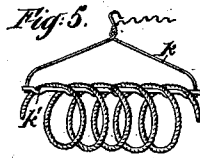
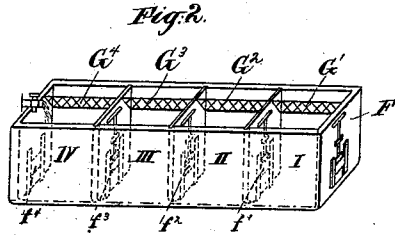
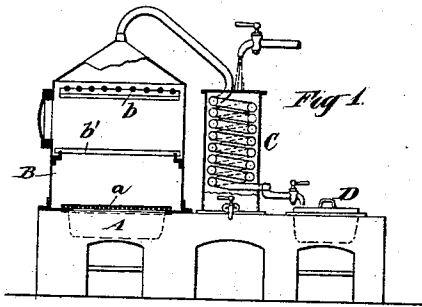
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A. SÖHNER.

PROCESS OF RENOVATING GOLD AND SILVER LACE TRIMMINGS.

No. 349,535.

Patented Sept. 21, 1886.



Witnesses:
Manierre Collins
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Inventor:
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by his attorney
Thomas Spear Stetson

UNITED STATES PATENT OFFICE.

ANDREAS SÖHNER, OF CARLSRUHE, BADEN, GERMANY.

PROCESS OF RENOVATING GOLD AND SILVER LACE-TRIMMINGS.

SPECIFICATION forming part of Letters Patent No. 349,535, dated September 21, 1886.

Application filed October 21, 1885. Serial No. 181,341. (No model.) Patented in Belgium September 3, 1885, No. 70,111, and in Italy September 30, 1885, No. 238.

To all whom it may concern:

Be it known that I, ANDREAS SÖHNER, of Carlsruhe, in the Duchy of Baden, in the Empire of Germany, have invented certain new and useful Improvements in Processes of Renovating Gold and Silver Lace Trimmings, Braids, and the like, of which the following is a specification.

This invention has for its object the regilding or resilvering of real or imitation metal threads, wires, &c.; in a wrought state—that is to say, spun, woven, plaited, or embroidered metallic fabrics. In order to obtain this metallic restoration in a complete and thorough manner, if they are composed of different parts they are previously separated into their components—for instance, military scarfs are separated into the bandnets, upper and lower fringes, &c. Subsequently they are sorted according to their nature—for instance, into woven and embroidered fabrics. Gold and silver laces are coiled up or rolled, fringes are held by wires, embroideries are mounted. Then any dirt, fat, or oxide is removed by the action of steam, whereby the articles are treated and the impurities softened so that such impurities are readily separated without damaging or weakening the underlying fiber of silk, cotton, &c. This treatment leaves the pieces loose, soft, and flexible. They are brought into their original form—that is to say, the depressed portions are raised, &c. Then, for loosening and removing still more effectually dirt and sweat, the pieces are separated according to their metal. The silver articles—that is, those with a white ground—are drawn to and fro for about half an hour in a lye heated to 80° centigrade, and consisting of two (2) kilos of soda in one hectoliter of water, and the gold articles—that is, those with yellow or other colored ground—are similarly treated in an equally hot lye consisting of three (3) kilos of soda in one hectoliter of water for about twenty (20) minutes. Afterward, all traces of soda and water being removed from the articles, the latter are cautiously stirred in a boiling solution of two (2) kilos of Panama bark in one (1) hectoliter of water, and again carefully washed with water, whereby any remainder of greasy substance is removed. Then the articles are heated in a bath contain-

ing hydrochloric acid, for the purpose of bleaching the thread, and of loosening any calcareous matter adhering thereto, and of pickling the metal. The bath consists of a solution of chloride of tin in cold distilled water with the addition of hydrochloric acid until the solution is from 0.25 to 0.50 Baumé. In this bath the articles are agitated. They are then passed again through the rinsing-trough, and are completely cleaned with running water. In order to further increase the capacity of the article for being gilded, silvered, or colored, also to give the metal plating a uniform fresh color, the articles, after having been brushed by means of hair brushes and tartaric powder, which may be either tartaric acid or cream of tartar, are subjected to the action of polishing-cylinders or metal brushes, then again slightly brushed with tartaric powder, and rinsed with water. They are then ready for plating in the galvanic bath.

The embroideries are somewhat differently treated, inasmuch as they are, after coming out of the steam apparatus, treated cold. They are brushed clean (having been previously fastened on boards, wooden cylinders, &c., in a highly stretched state) with a fine hair brush and rather strong solution of soda in distilled water, then rinsed and, like the other articles, polished by hand with fine metal brushes, again slightly brushed with tartaric powder, and finally rinsed. Now the articles are sufficiently prepared for the galvanic silvering or gilding, which is effected as follows:

Two kinds of silver or gold baths—such as the ordinary cyanide baths—are employed, according to the required thickness of silvering or gilding, and the strength of the current is regulated according to the presence of fine metal threads or solid metal articles. For silvering heavy double laces, strong strands, &c., which can be reached at all points, and for silvering light and sensitive objects—such as wire-ribbons, &c.—a solution of seventy-five grams of chemically pure nitrate of silver and forty grams of ninety per cent. cyanide of potassium in fifty liters of distilled water at 40° centigrade is used. To obtain a brilliant white precipitate more rapidly on the articles thus silvered, the same are again ex-

posed to the galvanic current in a second solution of thirty grams of chemically pure nitrate of silver and one hundred grams of ninety per cent. cyanide of potassium in fifty liters of distilled water of 70° centigrade.

For gilding cords, light tassels, fringes, or wire ribbons in light gold color, I employ a solution of fifty grams of fine gold and five hundred grams of ninety per cent. cyanide of potassium in fifty liters of distilled water at 80 to 85° centigrade; and for gilding wire laces, embroideries, &c., I use a solution of fifty grams of fine gold, four hundred grams of bicarbonate of soda, and seven hundred grams of yellow ferrocyanide of potassium in fifty liters of distilled water at 40° to 45° centigrade. The articles, suitably sorted according to their weight and nature, are laid or hung on proper frames, hooks, &c., and placed in the baths. The articles, after having been silvered or gilded, are washed with water, in order to recover any excess of gold or silver. They are then polished, either by hand or by mechanically-driven polishing-cylinders, and frequently rinsed in clean water. They are again slightly brushed with tartaric powder, rinsed, and quickly dried, after which they may be smoothed or plaited, as required. The separated parts are then put together and made ready for use.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a partial side elevation and vertical section of the steaming apparatus. Fig. 2 is a perspective view of the rinsing-trough. Figs. 3, 4, 5, 6, 7, 7^a, 8, 8^a, 9, and 10 are perspective views of frames or carriers for holding the different fringes, tassels, embroideries, &c., in the plating-bath. Fig. 11 is a perspective view of a retouching-brush. Fig. 12 is a perspective view of a rinsing-table. Fig. 13 is a plan of a cylindrical brush. It shows the brush open. Fig. 14 is a transverse section of the same. It shows the brush closed. Figs. 15 and 16 are cross-sections of the polishing-rolls. Fig. 15 shows the material being treated on both sides, and Fig. 16 shows the material being treated on one.

The articles to be plated are first treated by steam in the apparatus represented in Fig. 1, which consists of an open steam-generator, A, covered with a tinned wire grating, *a*, an adjoining steam-space, B, situated above the grating, and a condenser, C. The articles are placed in two compartments in the steam-space B, the embroideries and other delicate pieces being placed in the upper portion on a series of easily removable wooden rods, *b* *b'*, and exposed to the action of the steam for about an hour. The water of condensation is collected in the tank D. The articles thus steamed are loose and flexible. If the raised portions have become flattened, they must be restored to their original form. The

gold and silver articles are then separated. The silver articles are agitated in a bath of lye heated to 80° centigrade and consisting of two (2) kilos of soda in one (1) hectoliter of water, and the gold articles are similarly treated in a lye of the same temperature, consisting of three (3) kilos of soda in one (1) hectoliter of water for about twenty minutes. After all traces of soda are removed by rinsing the articles are gently stirred in a boiling solution of two (2) kilos of Panama bark in one (1) hectoliter of water. They are then again rinsed. The rinsing is effected by moving the articles by hand in the compartments I II III IV (see Fig. 2) of a trough, F. Each compartment may be closed, when desired, by slides *f'* *f''* *f'''* *f''''*. When the operator at compartment I has sufficiently rinsed the pieces, they are laid on the grating G² for the next operator, who in turn rinses them and places them on the grating G³, and so on for all the compartments. After the rinsing the articles are treated in a bath consisting of a saturated solution of chloride of tin in cold distilled water, to which has been added hydrochloric acid until the solution is from 25° to 50° Baumé. In this bath the articles are agitated, care being taken to remove them as soon as the thread appears white and the worn places of the metal appear bright. They are then again passed through the rinsing-trough F, and completely rinsed with running water in the compartment IV. To further increase their capacity for receiving the plating, the articles, after having been brushed with hair brushes and tartaric powder, are subjected to a preliminary polishing process by the cylinders, to be hereinafter described, then slightly brushed again with tartaric powder and rinsed in clean water. The embroideries are differently treated, inasmuch as they are, after steaming, treated cold. They are strained on boards, wooden cylinders, &c., and brushed with a fine hair brush and rather strong solution of soda in distilled water. They are then rinsed, polished with fine metal brushes, again slightly brushed with tartaric powder, and rinsed in clean water. The articles are now ready for the galvanic silvering and gilding, which is as follows:

For silvering heavy double laces, &c., which can be reached at all points by the current, and for silvering light and sensitive objects—such as wire ribbons, &c.—a solution of seventy-five grams of chemically-pure silver and forty grams of ninety per cent. cyanide of potassium in fifty liters of distilled water at 40° centigrade is used. To obtain a brilliant white precipitate more rapidly, the articles are exposed to the current in a second solution of thirty grams of silver and one hundred grams of cyanide of potassium in fifty liters of water at 75° centigrade.

For gilding cords, light tassels, fringes, or wire ribbons in light gold color, I employ as a solution fifty grams of fine gold and five hundred grams of ninety per cent. cyanide

of potassium in fifty liters of distilled water at a temperature of from 80° to 85° centigrade; and for gilding wires, laces, embroideries, &c., I use a solution of fifty grams of fine gold, four hundred grams of bicarbonate of soda, and seven hundred grams of yellow cyanide of potassium in fifty liters of distilled water at 40° to 45° centigrade. The baths must be kept standing two days after being prepared, and must then be filtered. The articles, suitably mounted, are placed in the baths.

Fig. 3 shows a wire frame, H, consisting of silvered or gilded brass or copper rods h h' h'' , on which are hung from below by means of small brass hooks small tassels, stars, nets, &c., and on the surface of the grating are laid loosely-rolled wire laces, cords, &c. These wire frames are hung in the bath and connected with the conducting-wire.

Fig. 4 shows a wire frame, I, adapted to allow cords to be laid in it in coils. These cords will be less thickly plated at the points of contact. This frame I is formed by two gratings, i i' , connected by brass chains i'' i''' , extending loosely through both gratings, so that the entire frame, with its inclosed skeins or coils, may be withdrawn from the bath by seizing the chains at their crossing-point i'' , turned over, and again lowered into the solution in an inverted position, thus insuring that all parts are covered with a deposit of metal.

Figs. 5 and 6 show stronger and stiffer cords, parts of platings, &c., which are directly hung upon rods k , provided with recesses k' , to hold the articles in place.

For very heavy double webs with or without fringes, heavy tassels, and long heavy belts which are plaited their entire length, gratings L L', with feet l , Figs. 7 and 7^a, are employed. The articles which are lying on these gratings are now and then moved a little out of their position to avoid the formation of spots at the points of contact.

Fig. 8 shows an apparatus for plating wire, laces, borders, embroideries, &c., which possess considerable length, the metal threads of which do not directly touch one another, or which are worn away at the edge or torn, so that the current cannot flow from wire to wire in the body of the articles, and which are to be silvered or gilded on one side only. On a perforated enameled metal plate, M, are arranged two pairs of stands, N N and O O, between which a grating, P, made of strong brass wires, is stretched or mounted over the cross-bars p and p' . A second grating or flap, Q, movable up and down and made of fine brass wires, is mounted on the brass rods q and q' , and pivoted by means of the frame R, turning on the axle r and connected with q' . The rod q is adapted to slide in the slots q'' q''' from position 1 to 2 or 3, and vice versa. The flap must be laid down for use, as shown in Fig. 8^a, during which motion the rod q falls from position 1 to position 2. When not in action, the flap is

brought into position 1 by the aid of the weight S, whereby q is lifted from positions 3 and 2 to position 1.

For enabling the operator to stretch the wires Q tightly two screws, s s' , are applied, which in position 2 are situated in front of corresponding holes of the stands O O. The screws are drawn through these holes by pulling the grating Q toward the stands O O, and are subsequently tightened by means of screw-nuts. Thereby the rod q is brought from position 2 to position 3, slightly lifting the grate. An intermediate rod prevents the cross-bar q' from drawing back toward the stands N N. A perforated plate, Q', serves for setting the wires Q by being shifted to and fro along the same.

For silvering or gilding a long ribbon, T, the ribbon is placed upon the beam t , and thence on the wire grating P. The wire flap Q is lowered to its lowest position, 2. Then the comb Q', which has fallen in front of the stands N N, is drawn forward until it drops behind the cross-bar p' . The screws s s' are brought through the stands O O, drawing the grating from 2 to 3, and stretching its wires by means of the nuts, so that each part of the ribbon is in connection with the galvanic current after the whole has been lowered into the bath and the galvanic current has been admitted. After this part of the ribbon has been sufficiently treated the wire flap is opened, the finished part of the ribbon is conducted under a pulley, t' , to the beam t'' , and there wound up, and another length of ribbon is treated, and so on until the whole piece is finished. In the same manner the embroideries attached to the very thin boards are brought between the gratings Q P and treated in the bath. Should it, however, occur that one or more threads are but slightly brought into the electric circuit, or escape it entirely, the hereinafter described retouching-brush is applied.

To treat wire ribbons I employ a glass cylinder, U, provided with a partial felt cover, U', which leaves about one-sixth of the circumference of the cylinder uncovered. It is suitably fastened and provided with a closing device, U², consisting of two brass angle-pieces, u u' , situated on the edges of that part of the surface of the cylinder which is not covered by the felt. These angle-pieces are so connected by wires u u as to surround the felt cylinder. The wire ribbons are laid flat on the felt cover, tightened, and fastened by means of pins. The wire mantle u u' u' is placed over the same and tightened by means of the connecting-screws u'' u'' . The wires u must be arranged so as to touch all wires of the ribbons or to bring the same into the electric circuit. Then the whole is immersed in the bath, and the circuit is closed.

In case all points are not exposed I employ the before-mentioned retouching-brush. This retouching-brush (see Fig. 11) consists of a brush composed of fine brass wires v , all of

which are electrically connected with each other by a brass cover-plate, V, so as to form a pole as soon as the conducting-wire, which is insulated in the handle V' and connected with V, is inserted. By treating the deficient surfaces with this brush the smallest spots of metal are brought in contact, and thus silvered or gilded. This brush is also of particular importance where small flowers, stars, &c., are separately embroidered into the respective articles.

The articles, after having been silvered or gilded, as described, are washed with water, in order to recover any excess of silver or gold. Subsequently the articles are polished, either by hand (by means of metal brushes) or by mechanically-driven polishing-cylinders, and continuous rinsing, for which purpose the table W (represented by Fig. 12) may be used, which table is furnished with a perforated pipe on its upper surface, bringing clean water from a source not represented.

The metal brushes have the shape of ordinary hair brushes, and are preferably made with corrugated brass wires. For long strings I employ a hollow brush, Figs. 13 and 14, composed of two halves, xx , hinged together, and covered inside with caoutchouc $x'x'$, and lined with tufts of brass wire, so that the two halves when folded together form a round hollow space, x' , into which is laid the string to be polished. By quickly drawing the brush to and fro and simultaneously turning the same the wire points act on the string from all sides. The shortness of the wires x prevent the same from being bent round and from sliding longitudinally, while the elasticity of the caoutchouc prevents them from being broken off, and gives the brush great flexibility and mobility.

For machine polishing I use rapidly-rotating polishing-cylinders $y'y'$, Figs. 15 and 16, formed of brass wires, in combination with a cylinder, y , provided with outwardly-projecting small steel pins, similar to the cylinder of a music-box, the cylinders $y'y'$ being set in rotation by means of gear-wheels in opposite directions, while the roller y is set in rotation by friction.

This apparatus enables me to polish an article twice on one side, as in Fig. 15, or a half-ribbon or a double-wire ribbon once on both sides, as in Fig. 16. In the former case the

half-ribbon is brought, with its metal threads upward, on the roller y , slightly pressed into the steel points, and guided from under the cylinders $y'y'$, which seize and polish it in contrary directions, for which purpose the ribbon must be drawn from the polished side, as indicated by Fig. 15. In the latter case the double-wire ribbon is in the same manner, but without strain, caused to pass over the cylinder y and between the cylinders $y'y'$, which draw it in automatically and polish it on both sides in the same direction. (See Fig. 16.)

According to the nature of the article to be treated, one or the other of the cylinders may be set out of action, and the operation performed with the remaining cylinder, which, for instance, may be in the case of wire ribbons, fringes, &c.

A jet apparatus (not shown) acting from above on the entire length of the cylinders, keeps the working-faces and the articles clean.

After the articles have received their polish in the above-described manner they are lightly brushed with tartaric powder, rinsed with clear water, and then quickly dried, after which they may be dyed, smoothed, or plaited, according to their nature. The separated parts are put together ready for use.

The apparatus for carrying out this invention is made the subject of a separate subsequent application, Serial No. 209,983, filed August 4, 1886.

I claim as my invention—

The process herein described of gilding and silvering real and imitation gold lace, the same consisting of the following steps, to wit: first, subjecting the parts to the action of steam, to soften and remove greasy and other impurities, then subjecting the articles to solutions of soda and Panama bark, to remove traces of grease, then to a solution containing hydrochloric acid, to neutralize and remove the alkali, then to a brushing with tartaric powder, then to the action of a silvering or gilding bath, and then to a final polishing, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ANDREAS SÖHNER.

Witnesses:

OSCAR RUNDSCHUH,
FRZ. MÜLLER.