This invention relates to the electrolytic treatment of metallic elements secured in spaced relation on a non-metallic carrier.

The primary object of the invention is to generally improve apparatus for electrolytic treatment, and more especially the electrolytic treatment of discrete metallic elements secured in spaced relation on a non-metallic carrier.

A more particular object is to provide apparatus for the electrolytic treatment of slide fastener elements secured on a fabric tape. The electrolytic treatment may for example, be electrocleaning, anodizing, electrolytic coloring, or electroplating, etc. The specific form of the invention here illustrated and described is for electroplating.

One main problem is to maintain contact with individual fastener elements during the electrolytic treatment or electroplating operation. If the contact is broken, the metal element acts as a bi-polar electrode, with consequent stripping of previously deposited metal at one end. Accordingly, an object of the invention is to ensure positive contact with each fastener element even though the elements are separated from one another on the tape. For this purpose, a metal surface (often in the form of a band or wire) is disposed on one side of the chain of elements, and a porous, non-conducting web is disposed on the other side, and these parts are all squeezed together and moved in unison. The elements tend to embed themselves in the web, and the natural elasticity of the web presses the individual elements into contact with the metal surface regardless of possible variation in dimension or irregularity in shape of the individual elements. Moreover, the arrangement results in the web, the fastener elements, and the metal surface all moving together in unison, without relative sliding or brushing movement. Since sliding movement would result in imperfect contact as well as some inevitable abrasive action, partial stripping would take place.

Other objects of the invention are to provide apparatus which will electrolytically treat both sides of the slide fastener chain; which will strip any deposit tending to accumulate on the metal band; and in one form of the invention, which will minimize loss of the electrolyte in the tape of the slide fastener, and prevent contamination of the electrolyte by substances or impurities found in the tape. This latter form of the invention is of best value when a thin coating on the element is adequate, although the same method and apparatus may be employed in a series of stages to build up a heavier coating.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, our invention resides in the apparatus for electrolytic treatment, and the inter-relation of the elements thereof, as are more particularly described in the following specification. The specification is accompanied by drawings, in which:

Fig. 1 is an elevational view schematically showing one form of apparatus embodying features of our invention;
Fig. 2 is a section taken approximately in the plane of the line 2—2 of Fig. 1;
Fig. 3 is a section taken approximately in the plane of the line 3—3 of Fig. 1;
Fig. 4 is an enlarged section explanatory of the invention;
Fig. 5 is a partially sectional elevation schematically showing a modified form of apparatus;
Fig. 6 is a similar view through still another modified form of the invention; and
Fig. 7 is an enlarged view somewhat similar to Fig. 4, but applicable to the apparatus shown in Fig. 6.

Referring to the drawings, the invention in all of its forms comprises generally a tank T for an electrolyte; an endless web W of relatively soft porous material arranged to run with a part of itself immersed in the electrolyte, means to guide a chain C of metallic elements in relatively tight engagement with the web W so that the elements tend to embed themselves slightly in the web and move in unison therewith, and a metal band B tightly contacting the opposite side of the chain C, and also moving in unison with the chain and the web. With this arrangement, it will be evident that the individual metallic elements will be held in contact with the band B regardless of any slight variations in dimension or shape of the elements. The apparatus further includes a source of electric potential E, which is so connected to the apparatus that the band B acts as one electrode or electrode-contact for the electrolytic treatment. In the specific apparatus here disclosed, the chain C is a chain of metallic slide fastener elements or so-called "scoops" secured in spaced relation on a fabric tape, and the electrolytic treatment is assumed to be electroplating.

In the two species of the invention shown in Figs. 1 and 5, the web W runs about a metal cylinder M, and this cylinder acts as the other pole for the electrolytic treatment, the cylinder M and the band B being of opposite polarity. More specifically, the cylinder M is made positive and acts as an insoluble anode, and the band B is made negative and acts as a cathode. In the species of the invention shown in Fig. 6, the
band B runs about a non-metallic cylinder N, while the web W is on the outside of the chain C instead of being on the inside. In this case a soluble anode A is immersed in the electrolyte, the band B again acting as a cathode.

Considering the invention in greater detail, and referring to Fig. 1 of the drawings, the metal cylinder M is located above tank T, and the web W is arranged about the cylinder with its lower part immersed in the electrolyte. The chain C and band B are guided around the upper half of the cylinder outside the web W. The cylinder might be made large enough, for its lower portion to be immersed in the electrolyte, while the upper portion is out of the electrolyte, but in the present case a roller 22 is floatingly mounted on vertically movable bearings 14 within the tank beneath the cylinder M. This gives greater freedom in design when arranging the guide rolls for the chain C and band B, and also provides a greater length of web, which has the advantage of increasing the useful life of the web before it is worn out.

The chain C is fed between guide rollers 16 and 18, and thence upwardly around the cylinder M and downwardly to a pair of feed rollers 20 and 22. At least one of these, in this case the roller 22, is driven by a suitable drive motor 24 through a belt 28 and pulley 48.

The band B is an endless band which is guided about idle rollers 30, 32, 34 and 36. The band is preferably kept taut by means of a take-up roller 38 carried at the end of an arm 40 pivoted at 42 and urged downward by means of a suitable spring 44. It will be evident that with this arrangement the movement of the chain C through the apparatus will produce a simultaneous movement of the web W and the band B, for all of these parts are held in relatively tight engagement, and the web and band are designed for free movement in order to accurately follow the movement of the chain. Thus there is the benefit first, that the elements are each kept individually in contact with the band, and second, that there is little and ordinarily no relative movement between the elements, the web, and the band, thus avoiding abrasion and further insuring good continuous electrical contact with each of the elements.

It is evident that either the band B or the cylinder M, or both, must be insulatedly mounted on the machine. In the present case, the band B is insulatedly mounted, and for this purpose, the guide rollers 32 through 36 may be constructed as is best shown in Fig. 3. In this figure, it will be seen that the roller 36 has an insulation hub 45 and is held between insulation discs 48 and 50. This assembly may be carried on a metal pin 52 shouldered at 54 and appropriately mounted on the frame upright 56, as by means of nuts 58 received on threaded end 60 of pin 52. It will be understood that while not shown in the drawing, appropriate anti-friction bearings may be employed, if desired. The periphery of roller 36 is recessed at 52 to receive the metal band. The negative potential from source E may be applied to the band in any desired fashion, as by means of a brush bearing directly against the band, but in the present case, the potential is applied through the spring-pressed take-up roller 38. Referring to Fig. 2, it will be seen that the roller 38 is insulated as well as rotatably mounted on pin 64 secured to the frame 34 and referred to. It will also be seen that the roller 38 has a collector ring or slip-ring 66 and that a brush 68 is in contact with slip ring 66. This brush is in turn connected by conductor 70 to the negative terminal of the source E.

The cylinder M is similarly provided with a slip ring 72 engaged by a brush 74 which in turn is connected by a conductor 76 to point B.

It will be understood that the web W absorbs a quantity of the plating solution 78 and carries it up to the fastener elements. The metal cylinder M acts as an insoluble anode, and is accordingly made of appropriate material (for example, nickel). The band B is in a cyanide solution, for steel is insoluble in such a solution.

It will be understood from the nature of the apparatus that only the lower side of the fastener elements is plated. To plate both sides, the apparatus may be duplicated, and the slide fastener tape twisted a half-turn between the two treatments. This twisting operation will be seen in Fig. 5, which shows a dual apparatus. It may be mentioned that with the form of the invention shown in Fig. 1, only thin coating may be applied to the element, because the metal content of the electrolyte carried in the porous belt is relatively limited. However, the arrangement of Fig. 1 has a number of advantages arising from the fact that the chain C is not immersed directly in the electrolyte 78. One such advantage is that there is no substantial loss of electrolyte due to what would be taken out by saturation of the tape.

Another is that there is little or no danger of contaminating the electrolyte by means of soluble compounds which may be present in the tape. Still another advantage is that any possible attack by the electrolyte on the fabric tape is minimized because of the limited amount of electrolyte present in the web and the slight contact, if any, between the web and the tape. In Fig. 4 the embedding of the elements in the web is exaggerated, and need not be as great as shown there.

If a heavier coating is wanted, the chain may be run through a series of treatments such as that described in connection with Fig. 1, or, in the alternative, the chain may be immersed in the electrolyte. An arrangement of the latter character is shown in Fig. 5, referring to which the chain 83 is run around the lower half of cylinder 82, the latter being partially immersed in electrolyte 84. Here again, the web 86 may be disposed directly around the cylinder 82, but it is preferred to employ an auxiliary roller 88 located well above the cylinder 82, thus providing a substantial length of web with consequent longer wear. The chain 90 is run around guide rollers 90 and 92. The metal band 94 is run around guide rollers 96 and 98. As before, the positive terminal of source E is connected by means of wire 100, brush 102 and slip-ring 104 to the cylindrical arm 106. The negative terminal of source E is connected by means of wire 108 and brush 110 to roller 98 and band 94.

The tank 110 is in this case made large enough to serve for two units, and the chain 86 is twisted a half-turn between the two units. This is most simply done by a forked arm (14 series of rollers) which is so oriented as to twist the tape about for the desired half-turn, following which the chain is guided beneath cylinder 110 by means of guide rollers 120 and 122. The arm 124 is supported by auxiliary cylinder 126. The band 94 is guided beneath the band by means of guide rollers 128 and 130.
The band is kept taut by means of a take-up roller 132 carried on an arm 134 pivoted at 136 and tensioned by means of a pull spring 138. The cylinder 118 is polarized by means of conductor 140 working through the usual brush and slip-ring. The chain is fed by pull rollers or feed rollers 142 and 144, at least one of which is driven by a suitable motor (not shown), as was previously mentioned in connection with Fig. 1.

With the arrangement of Fig. 5, the cathode contact band 85 is immersed in the electrolyte 70, and at least some metal is deposited on it. In order to prevent metal from being built up excessively on the band, an auxiliary tank 145 is provided for stripping the deposited metal from the band. For this purpose, the band is guided into the electrolyte by suitable guide rollers 148, 150, 152 and 154. An auxiliary source of potential 156 is provided, the positive terminal of this source being connected, as shown, to the metal band 85. The negative terminal of source 156 is connected to an electrode 158 which is immersed in the electrolyte 160. The metal stripped from the band 94 is collected on the electrode 160.

Still another form of the invention is shown in Fig. 6 of the drawing. This differs from the arrangement of Fig. 5 primarily in using a solvable anode indicated at A, and connected to the positive terminal of potential source 162. Anode A is immersed in the electrolyte 164 of the main tank 165. The partially immersed cylinder 168 is in this case non-metallic, and a metal band 170 runs directly about the cylinder. Endless web 172 is run beneath the cylinder 168 and is thereby immersed in the electrolyte 164. The slide fastener chain 174 is guided between the metal band 170 and the web 172, it being guided around rollers 176 and 178, and being pulled by appropriate feed rollers 180 and 182, at least one of which is driven by a suitable motor (not shown).

The web 172 is tensioned by means of a take-up roller 184 operated by means of a compression spring 186. Thus the web, the chain, and the band are all held in relatively tight engagement so that the elements tend to embed themselves slightly in the web and move in unison therewith.

An auxiliary tank 188 may be provided for stripping the positive metal from the band 170. For this purpose, appropriate guide rollers 190 are used to immerse the band in the electrolyte 192 of tank 183. A cathode 194 is also immersed in the electrolyte 192 and is connected to the negative terminal of potential source E by means of conductor 196. While only a single source 182 is shown, it will be understood that separate potential sources may be used for each of the tanks, as in Fig. 5.

It will be understood that metal is gradually stripped from the anode A and that metal is gradually built up on the cathode 194, but, of course, not as fast as it is being stripped from the anode A, for the metal is largely deposited on the elements of the chain.

The relation of the band, chain, and web in Fig. 6, as well as the insulation nature of the cylinder 168, are more clearly shown in Fig. 7.

It will be understood that both sides of the slide fastener elements may be plated by using two units in series, and twisting the slide fastener tape therebetween, much as was described in connection with Fig. 5.

While not shown in the drawing, it will be understood that the fastener chain may be guided through several units in series in order to produce heavier coatings or/and higher operating speeds, or to produce successive layers of different metals. It will also be understood that the fastener chain may be led around the same cylinder several times, instead of only once, as shown, but with suitable mechanical precautions to properly guide the tape.

It is believed that the construction and operation of our improved apparatus for electrolytic treatment of spaced metallic elements, as well as the many advantages thereof, will be apparent from the foregoing detailed description. An positive contact between each element and the cathode is secured throughout the entire period in which the scoop is in contact with the electrolyte.

For this purpose, the web presses each of the scoops against the metal band. There is no relative movement between the cathode surface, the scoops in contact therewith, and the porous web, at least not while the scoops are in contact with the electrolyte, and this is an important feature, for otherwise the resulting intermittent contact would cause partial stripping to take place. The web is a non-conducting porous material, permitting access of the electrolyte to the scoops.

It will be understood that in the arrangement of Fig. 6 the web may be guided downwardly, sidewardly, and upwardly in the electrolyte and inside the tank (the tank being made somewhat larger than the schematic showing in Fig. 6), instead of outside and beneath the tank as shown. It will also be understood that in Fig. 6 the cylinder 168 may be made of metal and the band omitted, when there is no need for depositing, as for example, in electrocleaning. It will also be understood that the term "band" is intended to include a wire, and that the wire need not be a flat wire, for we have employed a round wire. In fact, the band or wire need not be a short endless band, for a large reel of wire may be used, it being unwound from one reel and wound on another. Certain simplifications in the apparatus shown will be self-evident when the electrolytic treatment is not electrolyplating. For example, the depositing tanks shown in Figs. 5 and 6 may be omitted.

It will therefore be apparent that while we have shown and described our invention in several preferred forms, changes may be made in the structure disclosed, without departing from the spirit of the invention as sought to be defined in the following claims. In the claims, the term "band" is intended, where appropriate, to include the surface of a metal cylinder or a wire, or several wires arranged side by side. The wire may be round as well as flat, and it need not necessarily be an endless wire.

We claim:

1. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulated spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, an endless web of relatively porous material having a part thereof immersed in the electrolyte and mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said web so that the members tend to embed themselves slightly in the web, means for moving said web and chain of members in unison, a metal band having a portion thereof extending collaterally of the aforesaid portion of the web and tightly contacting the side of said
chain opposite the web, and means for applying a difference in electric potential between said metal band and said electrolyte-saturated web.

2. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, a metal cylinder, an endless web of relatively soft porous material having a part thereof immersed in the electrolyte and mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said web so that the members tend to embed themselves slightly in the web, a metal band having a portion thereof extending collaterally of the aforesaid portion of the web and tightly contacting the side of said chain opposite the web, means for moving said web and chain of members and metal band in unison, and means for applying a difference in electric potential between said metal band and said electrolyte-saturated web.

3. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, first and second endless webs of relatively soft porous material, each of said webs having a part thereof immersed in the electrolyte and mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said first web so that the members tend to embed themselves slightly in the web, a metal band having portions thereof extending collaterally of the aforesaid portions of said webs and tightly contacting the side of said chain opposite the web, means for moving said webs and chain of members and metal band in unison, and means for applying a difference in electric potential between said metal band and said electrolyte-saturated webs.

4. Apparatus for electroplating both sides of an elongated chain of metal slide fastener members secured in insulatedly spaced relation on a fabric tape, said apparatus comprising a tank for an electrolyte, first and second endless webs of relatively soft porous material, each of said webs having a part thereof immersed in the electrolyte and mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said first web so that the members tend to embed themselves slightly in the web, means to twist the chain a half turn and guide the twisted or reversed chain in tight engagement with a portion of said second web so that the metallic members tend to embed themselves slightly in the web, a metal band having portions thereof extending collaterally of the aforesaid portions of said webs and tightly contacting the side of said chain opposite the web, means for moving said webs and chain of members and metal band in unison, and means for applying a difference in electric potential between said metal band and said electrolyte-saturated webs such that the band acts as a cathode contact for electroplating the chain or slide fastener members.

5. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, a metal cylinder, an endless web of relatively soft porous material having a part thereof immersed in the electrolyte and mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said web so that the members tend to embed themselves slightly in the web, means for moving said web and chain of members in unison, a metal band having a portion thereof extending collaterally of the aforesaid portion of the web and tightly contacting the side of said chain opposite the web, and means for applying an electric potential to the metal cylinder, as one pole, and the metal band, as the other, whereby said cylinder and band act as electrodes of a rectifying circuit for the electrolytic treatment of the chain of members.

6. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, a metal cylinder rotatably mounted above the tank, an endless web of relatively soft porous material having a part thereof immersed in the electrolyte and mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said web around the upper half of the cylinder so that the members tend to embed themselves slightly in the web, a metal band having a portion thereof extending collaterally of the aforesaid portion of the web around the upper half of the cylinder, means for keeping said band in tight contact with the chain around the upper half of the cylinder, means for moving said web and chain of members and metal band in unison, and means for applying an electric potential to the metal cylinder as one pole and the metal band as the other.

7. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, a metal cylinder rotatably mounted above the tank, a floatingly mounted roller within the tank beneath the cylinder, an endless web of relatively soft porous material arranged to run about the cylinder and the roller with a part thereof immersed in the electrolyte, said web being mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said web around the upper half of the cylinder so that the members tend to embed themselves slightly in the web, a metal band having a portion thereof extending collaterally of the aforesaid portion of the web around the upper half of the cylinder, means for keeping said band in tight contact with the chain around the upper half of the cylinder, power-driven means for moving said band and the chain whereby said web and chain of members and metal band move in unison, and means for applying an electric potential to the metal
cylinder as one pole and the metal band as the other.

8. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, a rotatable metal cylinder the lower part of which is immersed in the electrolyte, an endless web of relatively soft porous material arranged about the cylinder with a part thereof immersed in the electrolyte, said web being mounted for movement in a fixed path through said electrolyte, means for guiding the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said web around the lower half of the cylinder so that the members tend to embed themselves slightly in the web, a metal band having a portion thereof extending collaterally of the portion of the web around the lower half of the cylinder and tightly contacting the side of said chain opposite the aforesaid web portion, means for moving said web and chain of members and metal band in unison, and means for applying an electric potential to the metal cylinder as one pole and to the metal band as the other.

9. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, a rotatable metal cylinder the lower part of which is immersed in the electrolyte, a roller disposed above the cylinder, an endless web of relatively soft porous material arranged about the cylinder with a part thereof immersed in the electrolyte, said web being mounted for movement in a fixed path through said electrolyte, means for guiding the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said web around the lower half of the cylinder so that the members tend to embed themselves slightly in the web, a metal band having a portion thereof extending collaterally of the portion of the web around the lower half of the cylinder, power driven means to feed the chain of members whereby said web and chain of members and metal band move in unison, and means for applying an electric potential to the metal cylinder as one pole and to the metal band as the other.

10. Apparatus for electroplating an elongated chain of metallic slide fastener members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a main tank for an electrolyte, a rotatable metal cylinder the lower part of which is immersed in the electrolyte, a roller disposed above the cylinder, an endless web of relatively soft porous material arranged about the cylinder and the roller with a part thereof immersed in the electrolyte, said web being mounted for movement in a fixed path through said electrolyte, means for guiding the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said web around the lower half of the cylinder so that the members tend to embed themselves slightly in the web, a metal band having a portion thereof extending collaterally of the portion of the web around the lower half of the cylinder and tightly contacting the side of said chain opposite the aforesaid web portion, means for feeding the band, power driven means to feed said chain of slide fastener members whereby said web and chain of slide fastener members and metal band move in unison, means for immersing a part of said band outside the tank in an auxiliary tank for stripping the band of any metal deposited thereon in the main tank, and means for applying an electric potential to the metal cylinder as one pole and the metal band as the other, whereby said cylinder and band act as electrodes of opposite polarity for electroplating the chain of slide fastener members.

11. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, first and second metal cylinders the lower parts of which are immersed in the electrolyte, first and second endless webs of relatively soft porous material arranged about the cylinders with a part of each of the webs immersed in the electrolyte, said webs each being mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said first web around the lower half of the first cylinder so that the members tend to embed themselves slightly in the web, means to twist the chain a half turn and guide the twisted or reversed chain into relatively tight engagement with a portion of said second web around the lower half of the second cylinder so that the metallic members tend to embed themselves slightly in the web, a metal band having portions thereof extending collaterally of the aforesaid portions of said webs around the lower halves of said cylinders and tightly contacting the side of said chain opposite the webs, means for moving said web and chain of members and band in unison, and means for applying an electric potential to both metal cylinders as one pole and to the metal band as the other.

12. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a main tank for an electrolyte, first and second metal cylinders the lower parts of which are immersed in the electrolyte, first and second endless webs of relatively soft porous material arranged about the cylinders and rollers with a part of each of the webs immersed in the electrolyte, said webs each being mounted for movement in a fixed path through said electrolyte, means to guide the aforesaid chain of members longitudinally of and in relatively tight engagement with a portion of said first web around the lower half of the first cylinder so that the members tend to embed themselves slightly in the web, means to twist the chain a half turn and guide the twisted or reversed chain into relatively tight engagement with a portion of said second web around the lower half of the second cylinder so that the metallic members tend to embed themselves slightly in the web, a metal band having portions thereof extending collaterally of the aforesaid portions of said webs around the lower halves of said cylinders and tightly contacting the side of said chain opposite the webs, means for keeping said band in tight engagement with the chain around the lower half of each of the cylinders, power driven means to feed the chain whereby the webs, chain of members and band move in unison, and means for applying an electric potential to both metal members.
11. Apparatus for electrolytically treating an elongated chain of discrete metallic members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a tank for an electrolyte, a rotatable cylinder the lower part of which is immersed in the electrolyte, an endless web of relatively soft porous material having a part thereof immersed in the electrolyte beneath the cylinder and mounted for movement in a fixed path through said electrolyte, a metal band passing around said cylinder between said cylinder and said web, means to guide the aforesaid chain of members between the band and the web, the web being in relatively tight engagement with said chain so that the members tend to embed themselves slightly in the web, means for moving said web, chain of members and band in unison, an electrode in the tank, and means for applying a difference in electric potential between said metal band and said electrode in the tank to thereby subject the metallic members of the chain to electrolytic treatment.

12. Apparatus for electroplating an elongated chain of metallic slide fastener members secured in insulatedly spaced relation on a non-metallic carrier, said apparatus comprising a main tank for an electrolyte, a rotatable non-metallic cylinder the lower part of which is immersed in the electrolyte, an endless web of relatively soft porous material having a part thereof immersed in the electrolyte beneath the cylinder and mounted for movement in a fixed path through said electrolyte, a metal band passing around said cylinder between said cylinder and said web, means to guide the aforesaid chain of members between the band and the web, the web being in relatively tight engagement with said chain so that the members tend to embed themselves slightly in the web, means for immersing a part of said band outside the tank in an auxiliary tank for stripping from the band metal deposited thereon in the main tank, an anode in the main tank, a cathode in the auxiliary tank, means for moving said web, chain of members and band in unison, and means for applying an electric potential to the anode and cathode to thereby subject the metallic slide fastener members of the chain to electroplating in the main tank.

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