

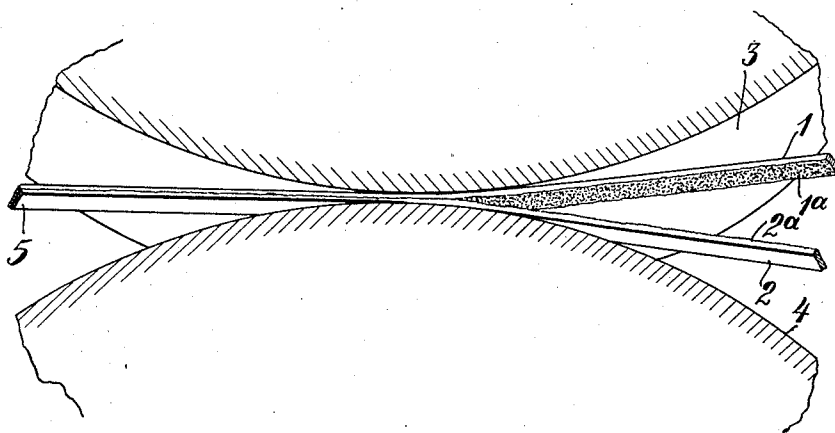
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METHOD OF APPLYING A PLATING OF ALUMINUM TO IRON AND STEEL SHEETS AND BANDS

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METHOD OF APPLYING A PLATING OF ALUMINUM TO IRON AND STEEL SHEETS AND BANDS.

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Various methods have been adopted and suggested for combining iron or steel sheets or bands with aluminum for the purpose of producing a plating of aluminum. Thus for instance both metals or at least one of them was heated before the two were rolled together to at least 300° C., but usually still higher, viz. to the welding temperature of aluminum (550-600° C.). In another method of binding agent in fluid form (solder) was used or the sheets of iron were rubber over for this purpose before being united to the aluminum sheet with aluminum powder. For multiple plating the suggestion has been made to apply the metal to be placed between the two other metals in a fluid state.

All these methods have considerable drawbacks. The heating which is now usually taken to 300° C. or even higher always entails the danger of the formation of a certain amount of scale and it is known that the plating cannot be perfect if there should be any non-metallic foreign bodies between the metal sheets. It is also necessary to place the bands to be plated in a crucible in the furnace and to observe their temperature, which both entails expense and loss of time and necessitates the provision of skilled labour.

According to the present invention iron or steel sheets or bands are plated with aluminum by the sheets or bands of these metals being united after being specially prepared without heating by being passed through cold rolls.

The accompanying drawing is a diagrammatic and perspective view to a considerably enlarged scale, showing the method of uniting the metals.

A metal sheet, preferably an iron or steel band 1 of considerable length, for instance the usual length of 400 m., is artificially roughened on one side 1^a, for instance by a sand blast, the surface to be united to the other metal being at the same time made metallically clean. The other metal band, an aluminum band 2, is preferably treated in the same manner, that is it is also artificially roughened on the side 2^a. Any adhering sand is removed from the two bands, which are thereupon passed through the rolls 3, 4 of a cold rolling mill with the two roughened sides lying one on the other. Ow-

ing to having been roughened the sides of the metal bands facing one another have an infinite number of minute depressions and projections, which under the pressure of the rolls enter one into the other and become interlocked. During the rolling operation a temperature of 100° C., such as is caused by the rolling pressure, is not exceeded so that the plated band can always be held and manipulated with leather gloves. In this manner an exceedingly intimate connection between the two metal strips is effected so as to form a bi-metallic strip 5, without any of the disadvantages of the methods used hitherto, which entailed a heating of the metal strips. A considerable advantage of the present method consists in this, that, for instance when a very flexible steel band is to be united with an aluminum band, the former will not lose a part of its resilience, as was the case with the heat treatment, but will fully retain its resilience.

An iron band plated in this way with aluminum is thereupon converted by repeated rolling and without the application of heat into a thin multiple metal strip. It has been found that the iron band plated with aluminum can be passed a greater number of times through the rolls without any intermediate annealing and be rolled down thinner than the same iron band without the aluminum plating.

The present method is of course not limited to the uniting of only two metal bands to form a bi-metallic band, but may be applied to the manufacture of plated metal strips composed of a plurality of metal layers.

Should one of the bands have a naturally somewhat rough surface, it may be possible in such a case to omit the artificial roughening of this band.

The invention is of course not limited to a method, in which the sheet or band used for plating consists of pure aluminum, but it should be understood that sheets or bands may be used for the aluminum plating consisting of an aluminum alloy, for instance an aluminum-magnesium-copper alloy, an aluminum-magnesium-manganese alloy or an aluminum-magnesium-nickel alloy.

What we claim is:

1. A method of applying a plating of alu-

minum to iron bands, consisting in making
an iron band and a metal band comprising
aluminum metallicity clean and roughening
the same, passing the said bands together
5 first through the rolls of a cold rolling mill,
causing the same to combine only through
the pressure of the cold rolling mill and con-
verting them into a thin multiple metal strip
by repeated rolling without the application
10 of heat, as set forth.

2. A method of applying a plating of alu-
minum to iron bands, consisting in making
an iron band and a band of an aluminum al-

loy metallicity clean and roughening the
same, passing the said bands together first 15
through the rolls of a cold rolling mill, caus-
ing the same to combine only through the
pressure of the cold rolling mill and con-
verting them into a thin multiple metal strip
by repeated rolling without the application 20
of heat, as set forth.

In testimony whereof we have signed
our names to this specification.

OLIVER JAEGER.
ERNST LUETH.