Jan. 13, 1970 R. E. LAIGLE ET AL 3,488,988

PROCESSING OF LONGITUDINALLY RIDGED BRASS STRIP AND PRODUCT

Filed Aug. 18, 1967

FIG. 1

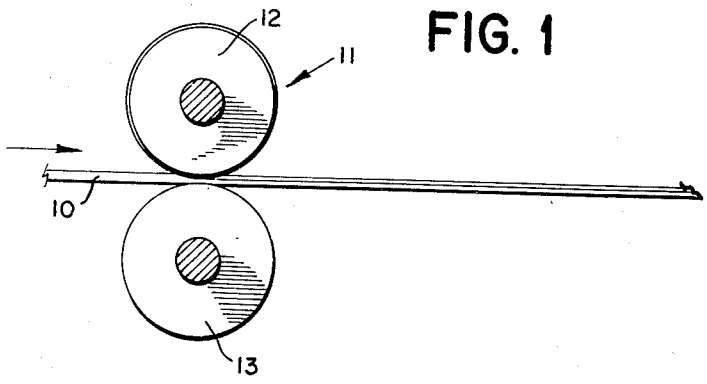


FIG. 2

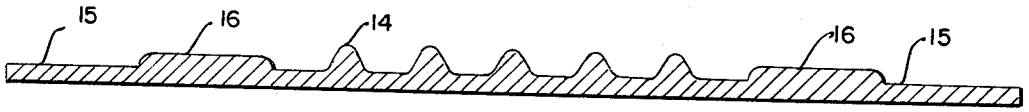
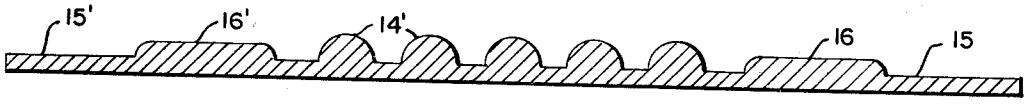


FIG. 3



INVENTORS
ROGER E. LAIGLE
ANTONE F. RAKICH
RICHARD J. CHRISTINE

BY Pennie, Edmonds, Morton, Taylor & Adams

ATTORNEYS

United States Patent Office

3,488,988
Patented Jan. 13, 1970

3,488,988

PROCESSING OF LONGITUDINALLY RIDGED BRASS STRIP AND PRODUCT

Roger E. Laigle, Torrington, Antone F. Rakich, Waterbury, and Richard J. Christine, Woodbury, Conn., assignors to Anaconda American Brass Company, Waterbury, Conn., a corporation of Connecticut

Filed Aug. 18, 1967, Ser. No. 661,679
Int. Cl. B21b *1/00, 1/08*
U.S. Cl. 72—366 6 Claims

ABSTRACT OF THE DISCLOSURE

Strip straightness is realized during rolling of longitudinal ridges in an intermediate portion of a metal strip by flattening the marginal edges of the strip while rolling of the intermediate longitudinal ridges and forming relatively broad longitudinal raised portions on both sides of the strip which are raised above the flattened marginal portion to guide the strip during rolling.

BACKGROUND OF THE INVENTION

This invention relates to the processing of metal strip to raise longitudinal ridges along an intermediate portion thereof and to the metal strip per se.

In the fabrication of metal strip wherein longitudinal ridges are raised along an intermediate portion of the strip by a rolling operation, movement of the metal by the rolling operation must be in a direction perpendicular to the plane of strip and at a right angle to the rolling direction. It has been found that where a plurality of ridges are being raised on a flat strip by rolling, the metal did not fill the grooves in the roll and the height of the ridges was not that desired. Attempts to increase the pressure on the roll to overcome this difficulty only resulted in roll breakages. Furthermore, the strip has never successfully been rolled straight primarily because of displacement of the metal laterally during rolling due perhaps to small variations in the ductility of the metal, its lubrication and surface conditions. It is a purpose of this invention to improve the manufacture of this type metal strip by rolling so that extreme straightness in the strip will be realized and a more precision ridged metal strip element will result.

SUMMARY OF THE INVENTION

The invention provides a method of raising longitudinal ridges in an intermediate portion of metal strip by a rolling operation in which a metal strip is passed through a grooved roll and metal is displaced perpendicular to the plane of the strip and perpendicular to the rolling direction along one surface of the strip to form ridges. According to the invention, by flattening the marginal edges of the strip during rolling of the intermediate ridges and forming relatively broad longitudinal raised portions which are raised above the flattened marginal portion between the flattened marginal edges and the intermediate raised portion on both sides of the strip, the strip is guided during the rolling operation to promote strip straightness; and metal flow along the intermediate portion into the grooves of the roll is assured. It is preferred that the width of the flattened marginal portion and the raised portion of the strip be substantially the same and that the difference in cross-sectional area between the flat marginal portion and the portion of the strip that includes the raised portion is equal to the area of the raised portion that extends above a flat plane which extends parallel to the strip and includes the surface of the flattened marginal portions.

It is also contemplated that the metal strip can be used as electrical contact members for splicing small coated wires in which case the metal would be brass and the longitudinal ridges in the intermediate portion would extend to a height greater than the height of the raised portions.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevation of a metal strip being passed through a roll assembly;

FIG. 2 is an enlarged cross-section of one form of metal strip of the invention, and

FIG. 3 is an enlarged cross-section of a second form of metal strip.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring initially to FIG. 1, a flat strip **10** is fed through a grooved roll assembly **11** which is comprised of an upper grooved roll **12** and a lower roll **13** not grooved. In this example the strip is a flat brass strip of nominally .026" thickness by 7/16" wide and is being rolled to place longitudinal intermediate sharp ridges along one surface for the purpose of providing electrical contacts which take the form of serrations and can penetrate the insulation on magnet wire when crimped so as to splice together several magnet wires.

The upper grooved roll **12** is configured to give the configurations shown in FIGS. 2 and 3. In such a rolling operation, in order to raise intermediate longitudinal ridges **14**, **14'** the metal will flow perpendicular to the plane of the strip and thus perpendicular to the rolling direction upwardly into the grooved roll and substantially fill the grooves. By simultaneously forming a flattened marginal edge **15**, **15'** on both sides of the longitudinal strip and forming relatively broad longitudinal raised portions **16**, **16'** between the flattened marginal edges and spaced from the adjacent intermediate raised ridges on both sides of the strip it has been found that the broad longitudinally raised portions promote strip straightness by serving as guides during the rolling operation. It is preferred that the flattened marginal portions **15**, **15'** and the raised portions **16**, **16'** are of substantially the same width so that the difference in cross-sectional area between the flattened marginal portion **15**, **15'** and the portion of the strip which includes the raised portion **16** will be equal to the area of the raised portion which extends above a flat plane which extends parallel to the strip and includes the surface of the flattened marginal portion **15** and in the embodiments shown would include the surface of flats between the longitudinal ridges.

The intermediate raised ridges **14**, **14'** also preferably extend above the raised portion **16**, **16'** where the longitudinal ridges are to serve as contacts. In FIG. 2 the raised ridges **14** are relatively sharp and are suitable for penetration of thin insulating coatings, whereas the ridges **14'** of FIG. 3 are rounded and to be suitable for penetration of insulation they should be skived or otherwise sharpened.

By adding the flattened marginal portion **15** and the broad raised portion **16** extreme strip straightness has been realized and the invention of this configuration has made the difference between success and failure in the manufacture of thin metal strip with raised longitudinal ridges along one surface.

We claim:

1. A method of raising longitudinal ridges in an intermediate portion of metal strip by a rolling operation in which a metal strip is passed through a grooved roll and metal is displaced perpendicular to the plane of the strip and perpendicular to the rolling direction along one surface thereof to form the ridges comprising flattening the

marginal edges of the strip during rolling of the ridges and forming relatively broad longitudinal raised portions which are raised above the flattened marginal portion between the flattened marginal edges and the adjacent intermediate raised ridges on both sides of the strip which guide the strip during rolling to promote strip straightness and metal flow along the intermediate portion into the grooves of the roll is effected.

2. A method according to claim 1 wherein the width of the flattened marginal portion and the raised portion of the strip are substantially the same and the difference in cross-sectional area between the flat marginal portion and the portion of the strip including the raised portion is equal to the area of the raised portion which extends above a flat plane drawn parallel to the strip and including the surface of flattened marginal portion.

3. A method according to claim 2 wherein the longitudinal ridges in the intermediate portion extend to a height greater than the height of the raised portions.

4. A flat metal strip comprising sharpened longitudinal ridges in an intermediate portion of a strip, flattened marginal edges along both side edges of the strip, and two broad longitudinal raised portions which are raised above the flattened marginal portions between the flattened marginal edges and the adjacent intermediate ridges on both sides of the strip.

5. A strip according to claim 4 wherein the width of the flattened marginal portion and the raised portion of the strip are substantially the same and the difference in cross-sectional area between the flat marginal portion and the portion of the strip including the raised portion is equal to the area of the raised portion which extends above a flat plane drawn parallel to the strip and including the surface of flattened marginal portion.

6. A strip according to claim 4 wherein the longitudinal ridges in the intermediate portion extend to a height greater than the height of the raised portions.

References Cited

UNITED STATES PATENTS

938,109	10/1909	Bell	72—197
2,193,231	3/1940	Gibbons	72—199

CHARLES W. LANHAM, Primary Examiner

LOWELL A. LARSON, Assistant Examiner

U.S. Cl. X.R.

29—183.5, 193