Aug. 25, 1964 A. L. JOHNSON 3,145,468

SHEET MARKING METHOD

Filed Oct. 5, 1961

Fig. 1.

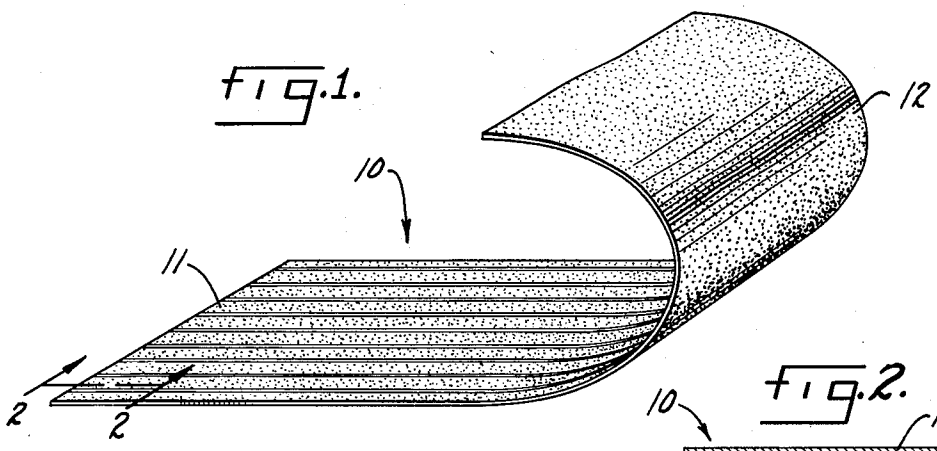


Fig. 2.

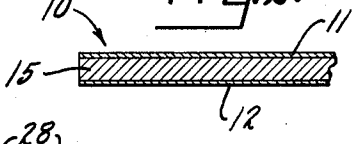


Fig. 3.

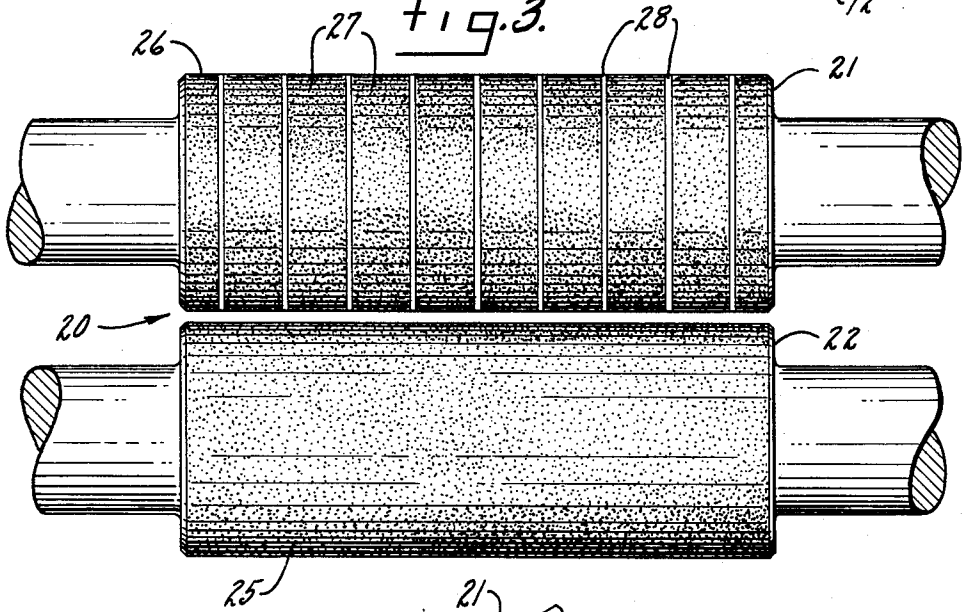
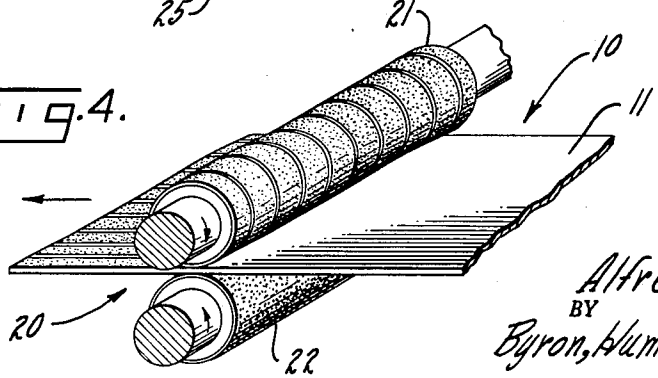


Fig. 4.



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United States Patent Office 3,145,468 Patented Aug. 25, 1964

3,145,468

SHEET MARKING METHOD

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Filed Oct. 5, 1961, Ser. No. 143,176
7 Claims. (Cl. 29—552)

This invention relates in general to metal coatings and more particularly to galvanized coatings on strip or sheet stock or the like. It deals specifically with a method of identifying and enhancing the surfaces of galvanized stock

Galvanized iron and steel have been widely utilized for many years, as is well known. A zinc coating on steel sheet or strip, for example, provides a rust inhibitive surface of substantially low cost which also enhances the attractiveness of the product concerned. Galvanized stock of this type finds advantageous application in the construction field, for example. Similarly, it is used in hardware where it might be embodied in the well-known water pail. Numerous other applications are also to be found.

In recent years, the demand for galvanized steel in the automobile industry has increased substantially. This is due to the fact that many new and varied uses have and are being developed for galvanized steel in the construction of automobiles. In the future, it is contemplated that there will be an even greater demand for this product in the industry and in various other fabricating fields.

Referring, for example, to the automobile industry, it is common practice to use galvanized stock which is coated on only one side, or in the alternative, differentially coated. In the latter case, a relatively thin coating of zinc is provided on one side of the sheet or strip and a relatively thicker coating on the other side. In either case, the object is to lower the cost of the galvanized stock and provide the protection of galvanization only where it is required in its eventual utilization. Frequently, it is the case that only one side of a specific metal component of an automobile, for example, need be galvanized for oxidation protection or the like.

In the past it has been the practice to identify one or the other sides of galvanized sheet or strip which has been differentially coated, for example, by marking a predetermined side with an indelible ink or similar marking substance. This marking is necessary so the fabricator can quickly and easily determine how this sheet or strip must be orientated in fabricating a component part, for example. Unfortunately, this type of marking is frequently quite temporary, since there is a tendency for it to be rubbed off very easily. The fabricator is consequently faced with the time consuming task of identifying the differentially coated sides, for example, of the galvanized stock. This is usually an expensive operation, as can be well understood.

Accordingly, it is an object of this invention to provide a new and improved method of identifying the coated or more heavily coated side of galvanized sheet or strip stock or the like.

It is another object to provide a new and improved method of distinguishing between the differentially coated sides of galvanized sheets or strip stock or the like.

It is still another object to provide a method of the aforedescribed character which assures a permanent identification of the side in question, yet which does not affect the eventual use of the product.

It is yet another object to provide a method of identifying the more heavily coated side of galvanized sheet or strip stock or the like which is substantially less expensive than identification or marking methods heretofore utilized.

It is still a further object to provide a method for marking the more heavily coated side of galvanized stock

having coatings of differential thickness on opposite sides wherein a distinctive and attractive pattern is developed on the side in question.

The above and other objects are realized in accordance with the present invention by providing a new and improved method of distinguishably marking the differentially coated sides of galvanized sheet or strip stock or the like. Briefly, the invention contemplates characteristically treating the surface of one roll in the final stage of the temper rolls commonly utilized in rolling the stock after it has been galvanized. This treatment develops a distinctive surface pattern on the roll in question and, when the galvanized stock passes through the rolls, the distinctive pattern is transferred to one side of the stock, preferably the more heavily coated side..

The invention, both as to its organization and method of operation, taken with further objects and advantages thereof, will best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a perspective view of a sheet of galvanized steel after it has been treated and consequently marked by the method embodying the features of the present invention;

FIGURE 2 is a sectional view taken along line 2—2 of FIGURE 1;

FIGURE 3 is a front elevational view of a distinctively treated set of temper rolls utilized in the method embodying the features of this invention; and

FIGURE 4 is a perspective view of the temper rolls illustrated in FIGURE 3 in operative relationship with a passing sheet of differentially coated galvanized steel.

Referring now to the drawings and particularly to FIGURE 1, a differentially coated galvanized sheet is illustrated generally at **10**. The upper side of the sheet **10** (as seen in FIGURE 1) carries a relatively thick coating **11** of zinc which is applied by conventional galvanizing methods. On the other hand, the lower or opposite side of the sheet **10** has a relatively thin coat **12** of zinc which is also applied by any conventional galvanizing means. In the latter case, alternatively, the lower side of the sheet **10** might be left entirely free of zinc coating such that only one side of the sheet is galvanized. As will readily be understood, in that case the coat **12** of zinc would be eliminated. In this light, although the succeeding description and illustration of the method embodying the features of this invention is directed toward steel stock having differentially coated sides, it should be understood that the method applies equally as well to stock having only one coated side.

Referring now to FIGURE 2, the galvanized stock **10** includes a sheet of steel **15** between the relatively thick layer **11** of zinc on the upper side of the sheet stock and the relatively thin layer **12** of zinc on the lower side of the sheet stock. It should be readily understood, of course, that though the side having the relatively thicker coating of zinc thereon is easily identified when viewed in cross section, as in FIGURE 2, an identification is exceedingly difficult when the exterior of such galvanized sheet is examined by a fabricator in preparation for fabricating a component part of an automobile, for example.

Steel manufacturers have for years marked the more heavily coated surface of a galvanized sheet with an ink stripe to aid the fabricator in identifying that particular surface. A conventional way of accomplishing this striping is to provide equipment capable of making such markings on the "slitter," for example, which sizes and cuts the sheet or strip as it comes out of the final stages of the temper rolling mill, for example. Since additional and specifically designed equipment must be utilized in such a marking method, however, it has been found that relative-

ly high costs are encountered in applying the ink stripe to the galvanized sheet, for example. More specifically, costs in the neighborhood of five to six dollars per ton of galvanized sheeting are common.

In contrast to the ink striping method of marking differentially coated galvanized stock, the method embodying the features of the present invention is performed and the stock distinctively marked during the final stages of the temper rolling of the galvanized stock. This is accomplished by characteristically treating a roll or rolls in the temper roll mill complex in such a manner that a distinctive and permanent marking is applied to a predetermined surface of the galvanized stock. In contrast to the aforedescribed ink striping method, the cost is less than four dollars per ton of galvanized stock with this method. This is a saving of in the neighborhood of about 30–40 percent over the costs formerly encountered.

Referring now to FIGURE 3, a set of rolls, which might be the last stage of temper rolls in a temper mill, is illustrated generally at **20**. This last stage of rolls **20** includes an upper roll **21** and a lower roll **22** of generally conventional construction. The rolls are mounted in a temper mill (not shown) of any well-known type and rotated, of course, by conventional means.

The lower roll **22** has a surface **25** to which an overall grainy or slightly roughened effect has been imparted by blasting or etching the entire surface. This roughened surface gives a conventional cold rolled surface to the galvanized strip. The surface **26** of the upper roll, however, is treated in a different manner to impart a characteristic marking to a predetermined side of the differentially coated galvanized sheet **10**.

The distinctive surface **26** of the upper roll **21** includes alternating circumferentially extending roughened stripes **27** separated by alternating circumferentially extending glossy stripes **28**. As will readily be seen, the glossy stripes **28** are substantially narrower than the roughened stripes **27**. This is significant only insofar as the aesthetic results of the method are concerned and the stripes might be of varying widths without departing from the theme of the invention. Under certain circumstances they might even take the form of other designs depicting, for example, the trademark of the galvanized sheet producer or the fabricator.

The surface **26** of the roll **21** might be distinctively treated in a number of ways to produce the striped effect. It is preferable, however, to utilize strips of masking tape spaced in encircling relationship around the roll to define the thinner stripes **28**. The roll is then grit or sand blasted, or the like, to provide a grainy surface between the stripes **28** similar to the entire surface **25** of the lower roll **22**. This grainy surface is embodied in the wider stripes **27**. The effect, after the masking tape has been removed, is that of a series of thin glossy stripes **28** separated by a series of relatively wide, roughened stripes **27**.

The characteristic surface marking of the roll **21** might be developed in other ways than by blasting, as could well be understood. In the alternative, for example, roughened surface stripes or other designs might be etched on the surface with a liquid etchent or the like after the roll has been masked in a predetermined manner. In any event, the object is to simply and inexpensively establish a characteristic surface on one of the rolls, in this case the roll **21**, which is adapted to contact that side of the galvanized strip **10** having the thicker coating **11** thereon.

As has been pointed out, of course, designs other than stripes of this nature might also be utilized, although it has been found that such striping is the simplest of designs and consequently the least expensive. In the alternative, firm markings or trademarks or other decorative designs might be utilized, for example.

Referring now to FIGURE 4, the last stage **20** of tempering rolls **21** and **22** is shown in operative relationship

with a sheet **10** of galvanized steel passing therebetween. The thicker coating **11** of zinc is disposed upwardly such that it is contacted by the characteristically treated surface **26** of the roll **21**.

As a result, the relatively thickly coated side of the galvanized sheet **10** receives a permanently striped design. The design in this case is one of a series of spaced, relatively wide, dull stripes separated by a series of relatively thin glossy stripes. In contrast, the opposite side of the sheet **10** has a completely dull surface as is conventional. The identification is permanent and does not interfere with the final use of the product in any way.

As has previously been pointed out, by utilizing the method embodying the features of this invention, it has been found that the cost of marking galvanized stock is substantially lower than that previously found possible. In addition, the identifying marking will not rub off or fade.

While the method described herein is at present considered to be preferred, it should be understood that various modifications and improvements might be made therein without departing from the theme of the invention and it is intended to cover in the appended claims all such modifications and improvements as fall within the true spirit and scope of the invention.

What is desired to be claimed and secured by Letters Patent of the United States is:

1. A method of characteristically marking a differentially coated piece of galvanized strip or sheet stock to facilitate ready identification of a relatively more heavily coated side of the stock, comprising the steps of; treating the surface of at least one roll in a set of finishing rolls to define an area of said surface having a distinctive texture, passing the stock through the set of rolls with a predetermined side of the stock facing said one roll to impress a pattern in the galvanized coating of the predetermined side of the stock engaged by the surface having a distinctively textured area, whereby the relatively more heavily coated side of the stock is readily identifiable.

2. A method of characteristically marking a differentially coated piece of galvanized strip or sheet stock to facilitate ready identification of a relatively more heavily coated side of the stock, comprising the steps of; roughening a portion of the surface of at least one roll in a set of finishing rolls to define an area of said surface having a relatively smooth texture and another area of said surface having a relatively grainy texture, passing the stock through the set of rolls with a predetermined side of the stock facing said one roll to impress a distinctive pattern in the galvanized coating on the predetermined side of said stock engaged by the differentially textured surface whereby the relatively more heavily coated side of the stock is readily identifiable.

3. A method of characteristically marking a differentially coated piece of galvanized strip or sheet stock to facilitate ready identification of the relatively more heavily coated side of the stock, comprising the steps of; roughening the surface of one roll in a set of finishing rolls to define a surface having a relatively grainy texture substantially throughout, roughening a portion of the surface of the opposing roll in said set of finishing rolls to define an area having a relatively smooth texture and another area having a relatively grainy texture, passing the stock through the set of rolls with a predetermined side of the stock facing said one roll to impress a distinctive pattern in the galvanized coating on the predetermined side of said stock engaged by the differentially textured surface, whereby the relatively more heavily coated side of the stock is readily identifiable.

4. The method of claim 3 further characterized in that said piece of stock is passed through the roll with its relatively more heavily coated side coming into engagement with said differentially textured surface.

5. The method of claim 3 further characterized in that

the portion of the surface of said opposing roll is roughened to define a series of circumferential stripes having a relatively smooth texture and an interspersed series of circumferential stripes having a relatively grainy texture.

6. The method of claim 5 further characterized in that the portion of the surface of said opposing roll is roughened by etching.

7. The method of claim 5 further characterized in that the portion of the surface of said opposing roll is roughened by particulate blasting.

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