

March 30, 1943.

S. H. BOBROV

2,315,150

EXIT ROLL FOR GALVANIZING POTS

Filed Aug. 10, 1939

FIG. 1.

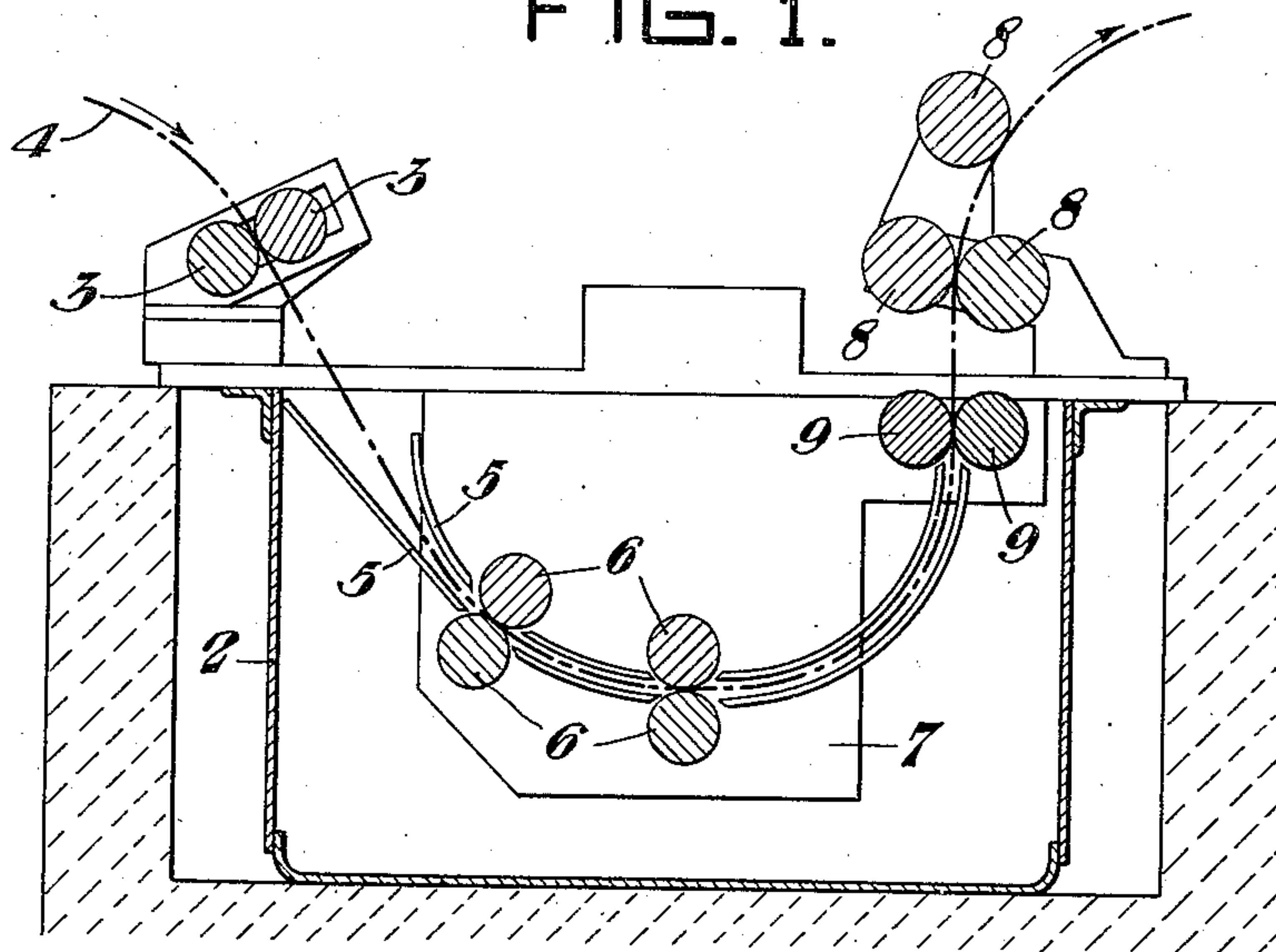


FIG. 2.

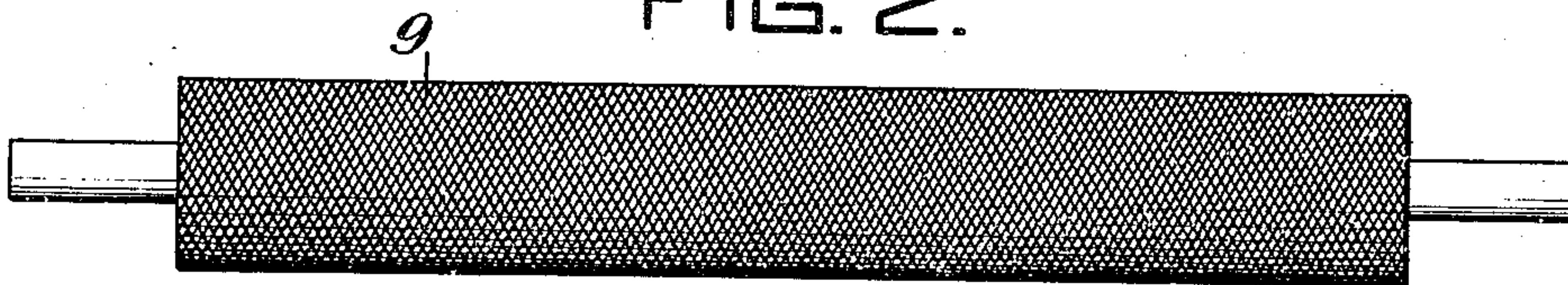


FIG. 3.

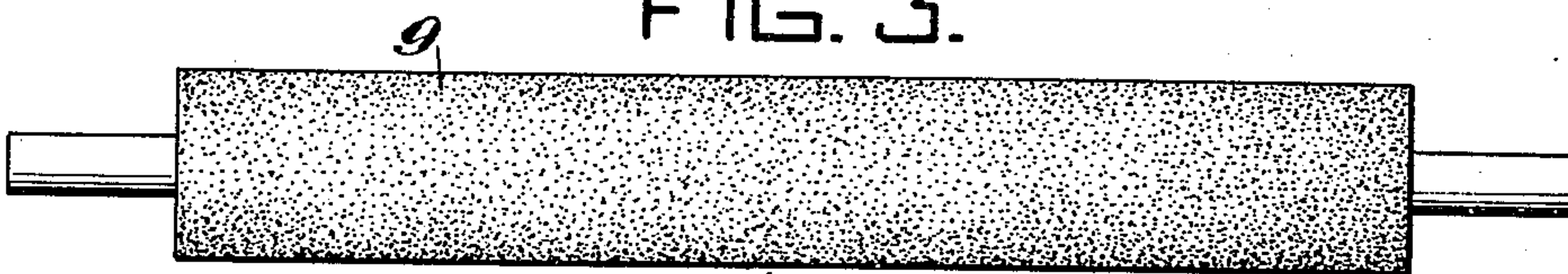
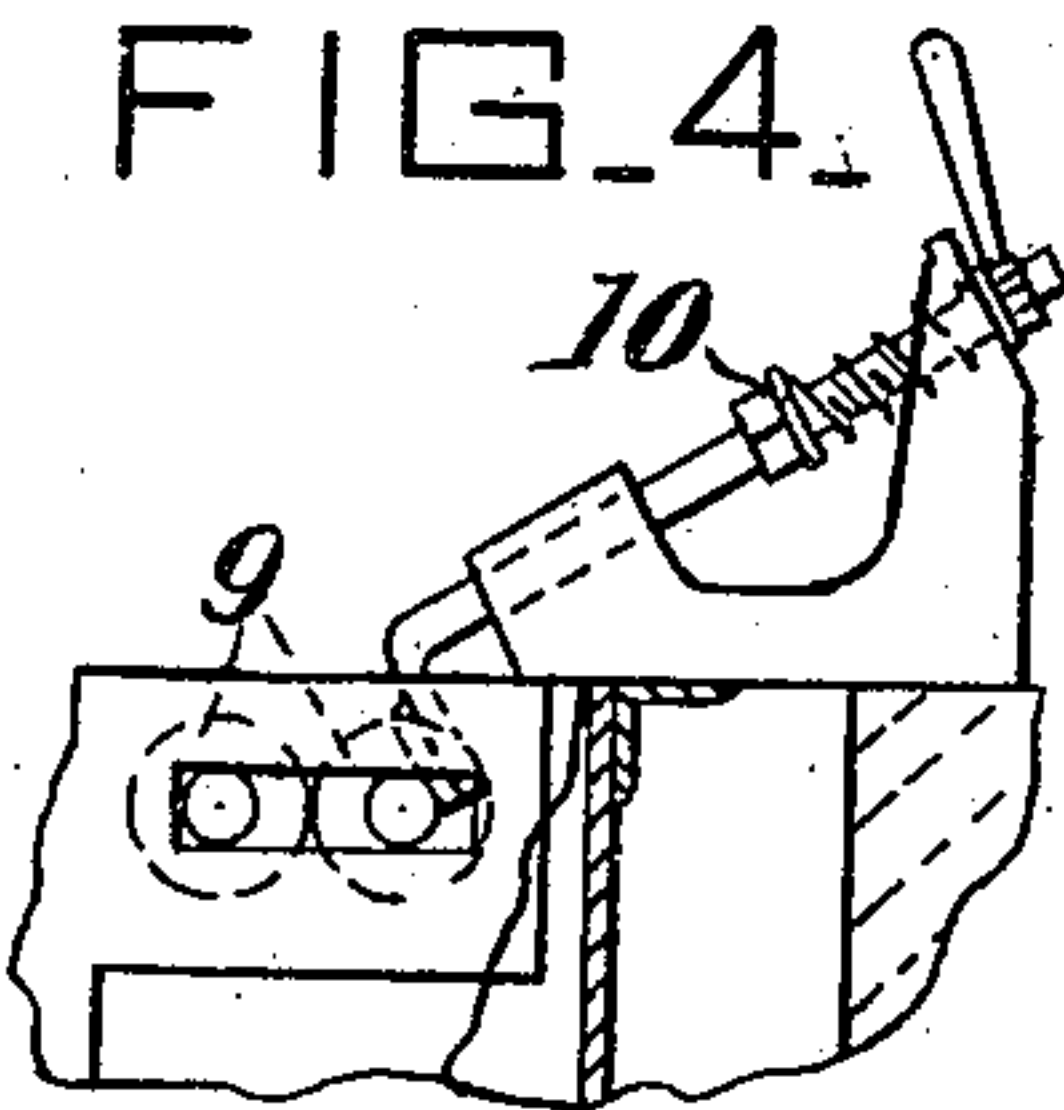


FIG. 4.



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## UNITED STATES PATENT OFFICE

2,315,150

## EXIT ROLL FOR GALVANIZING POTS

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Application August 10, 1939, Serial No. 289,475

## 1 Claim. (Cl. 91—59.2)

The present invention relates to exit rolls for galvanizing pots and the like and more particularly to rolls having a roughened surface.

An object of the present invention is the provision of exit rolls having a shot blasted or knurled surface to eliminate dirt accumulation on the surface of the rolls and thereby produce cleaner sheets.

Another object of the present invention is the provision of roughened exit rolls in a galvanizing pot or the like so as to produce sheets free from the usual foreign particles and surface imperfections which have, in the past, been the cause of the high percentage of rejections in finished galvanized sheets.

Other objects and advantages will become apparent as the description proceeds and reference is had to the accompanying drawing in which:

Figure 1 is a longitudinal section of a galvanizing pot embodying the present invention;

Figure 2 is an elevation of an exit roll having a knurled surface;

Figure 3 is an elevation of an exit roll having a shot blasted surface; and

Figure 4 is a fragmentary view illustrating a means for pressure adjustment of the exit rolls.

Under old practice, exit rolls were grooved and, in so being, they tended to gather in and became coated with foreign particles during production by the lead and zinc method. Grooved rolls contain continuous uninterrupted depressions protected by two unbroken walls which, should undesirable foreign matter become lodged therein, would prevent ready removal of the foreign matter and restrict flow of the molten metal, and prevent efficient rinsing.

Furthermore, grooved exit rolls generally leave characteristic imprints of the grooves upon the sheets which detract from the surface appearance of the finished product.

However, under the present invention, these difficulties are overcome.

In the drawing, the numeral 2 represents a conventional type galvanizing pot having entry rolls 3 of conventional design. The material 4 passes through the entry rolls and downwardly into the galvanizing pot between conventional guide construction 5 and guide rolls 6, which are supported, in any conventional manner, by the rigging housing 7, which likewise is of conventional design.

At the exit end of the galvanizing pot, the conventional peg rolls 8 are provided for guiding the material out of the pot.

Adjacent the exit end of the pot 2 and sup-

ported, in any conventional manner therein, are provided exit rolls 9. These exit rolls are provided with a roughened surface, which roughness is of sufficient magnitude to permit the liquid metal within the pot 2 to flow to any point on the roll surface so as to present ideal conditions for removal of attached foreign particles therefrom by free and unhampered rinsing with the molten metal through which the roll is rotating. One form of roughened surface is clearly illustrated in Figure 2, which surface is shown as being a knurled surface. This knurled surface is provided by a knurling tool of conventional design, so as to produce a uniform surface roughness, and while a particular design has been shown in the drawing, it is to be understood that other types of knurled surfaces may serve the same purpose and produce the same result desired.

In Figure 3, there is shown another form of roughened surface which, in this particular instance, is produced by shot blasting. The degree of blasting is determined by the desired uniform roughness of the roll surface.

It has been developed that, by the use of roughened exit rolls in the galvanizing pot, certain changes have been necessary in the operation of the galvanizing step. The exit rolls 9 must be operated as loosely as possible and are mounted in bearings of conventional design, as diagrammatically shown in Figure 4, so that only sufficient pressure is exerted upon the exit rolls to move the sheet forward into the peg rolls 8, an adjustable pressure device for such purpose being shown at 10.

In carrying out the present galvanizing operation, with the roughened exit rolls, a lower level of the molten metal within the pot is desirable, and it has been found that the use of sal ammoniac and sulphur at the exit rolls is desirable when larger sheets are coated so as to avoid irregular metal pick-up. The sal ammoniac should not be used too freely, and should be directed to the top side of the sheet in order to avoid staining. In certain types of galvanizing, a dull surface is developed by subjecting the freshly coated strip or sheet to open flames or higher temperatures in conjunction with the use of a muffle after the sheet or strip emerges from the exit rolls in order to destroy the spangling and develop a dull, satiny, spangle free finish. In such cases only a small amount of sulphur should be ignited to supply a minimum amount of fumes in order to avoid unnecessary brightening of the coating on the strip or sheet.

In conjunction with the aforementioned dull



surface type of galvanized products where the previously mentioned muffle is employed as an aid in developing the dull, spangle free surface in connection with the use of sulphur and sal ammoniac at the roughened exit roll, it becomes advisable to employ a higher flame or operate the muffle at somewhat higher than ordinary temperature in order to counteract the brightening effect of the sal ammoniac and sulphur treatment.

It will become apparent that, under the present invention of providing roughened exit rolls in the galvanizing pot, there are produced sheets free from the usual inclusions of foreign particles and surface imperfections which have, since the origin of the galvanizing processes, been the cause of high rejections, excessive costs and delayed deliveries. Also, by providing the knurled or shot blasted exit rolls, the surfaces of said rolls remain cleaner during operation and produce cleaner zinc coated products and eliminate the imprints usually made upon the sheet by grooved exit rolls.

While I have shown and described specific embodiments of the present invention, it will be seen that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of the invention, as defined by the following claim.

I claim:

In a galvanizing pot containing molten galvanizing metal, the combination with means for conveying sheets through said metal, of a pair of exit rolls rotatably mounted in the pot and being disposed at least partially in the molten metal, the surfaces of said rolls being composed of closely spaced indentations distributed thereover with substantial uniformity, the indentations being of sufficient magnitude and forming channels for flow of the molten metal axially as well as circumferentially of the roll surface to provide a self-rinsing action in contact with the sheet in the molten metal, said rolls being loosely mounted so as to only exert sufficient pressure upon the sheets to move the latter therebetween.

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