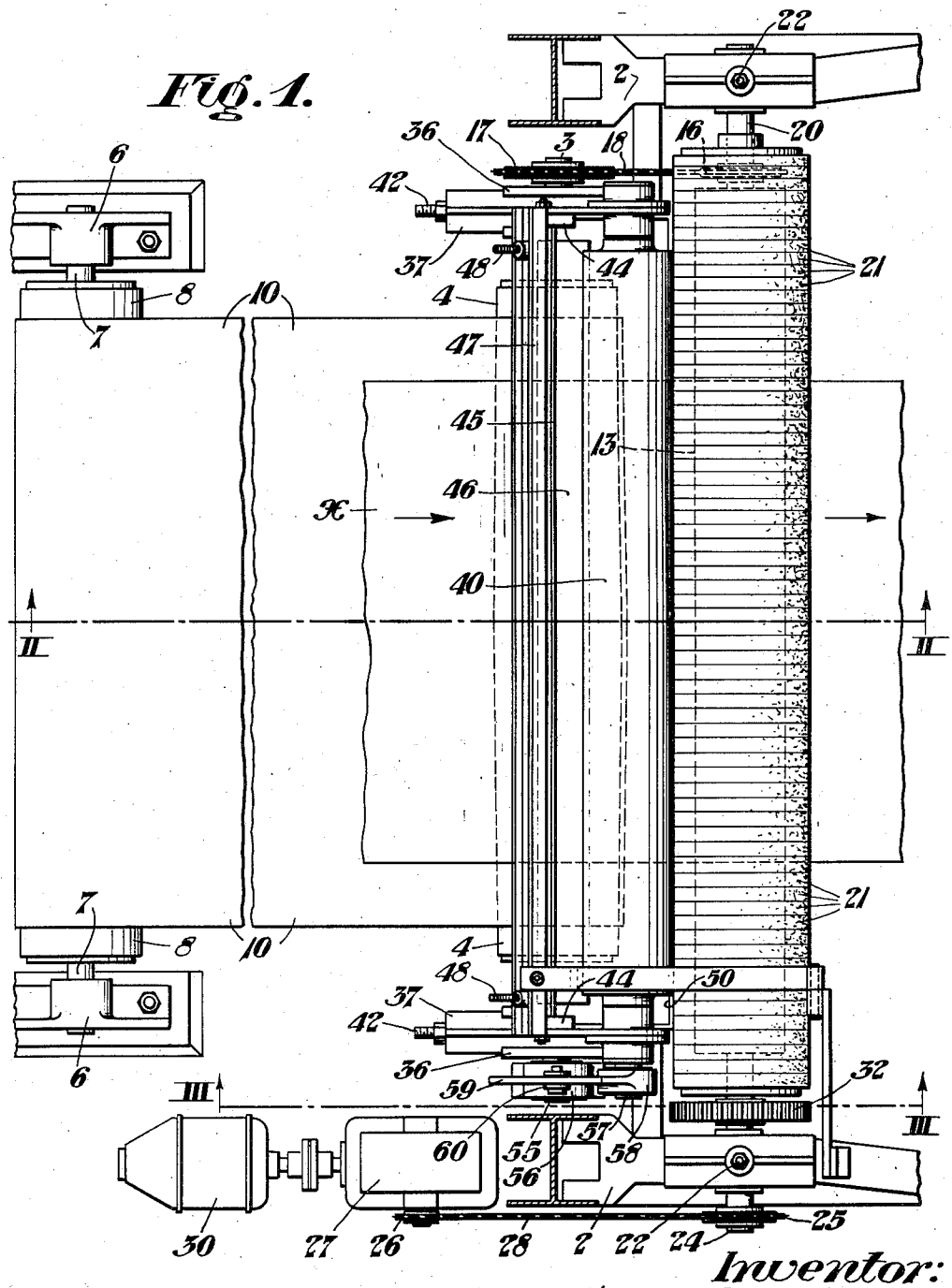
Feb. 15, 1938. I. J. PAUL 2,108,389

APPARATUS FOR COATING

Filed Dec. 13, 1935 3 Sheets-Sheet 1

Fig. 1.



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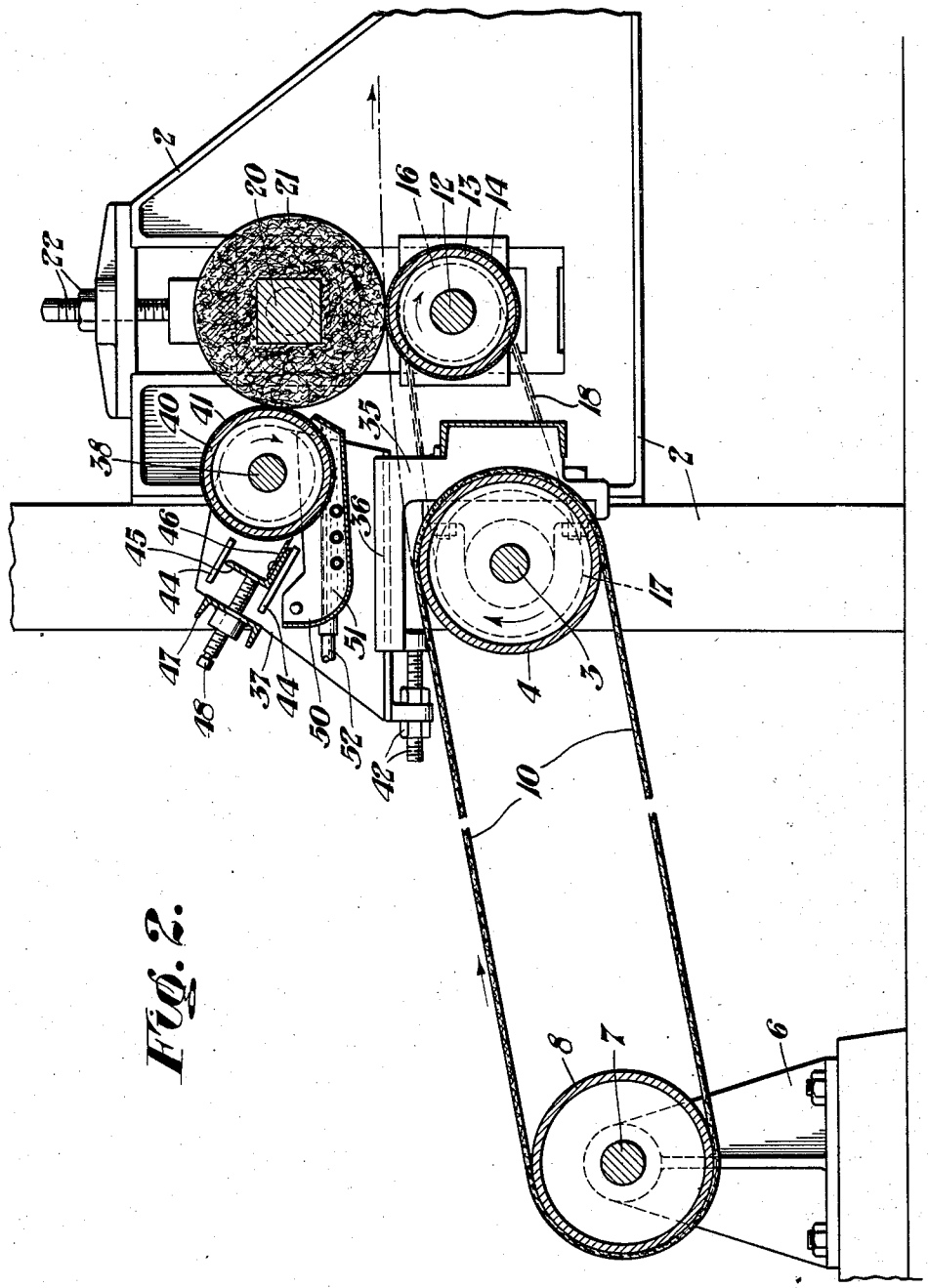


Fig. 2.

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Fig. 4.

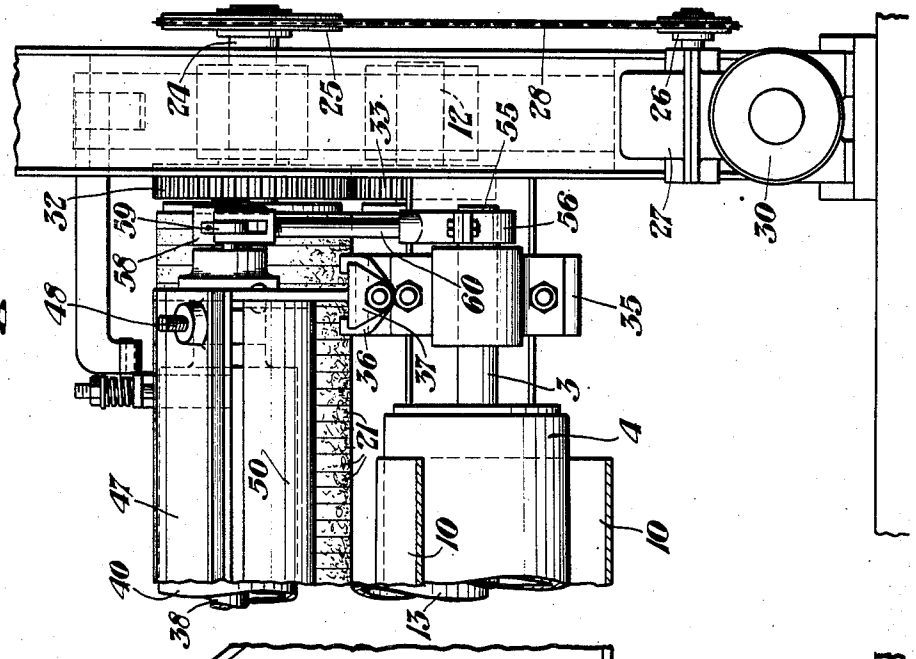
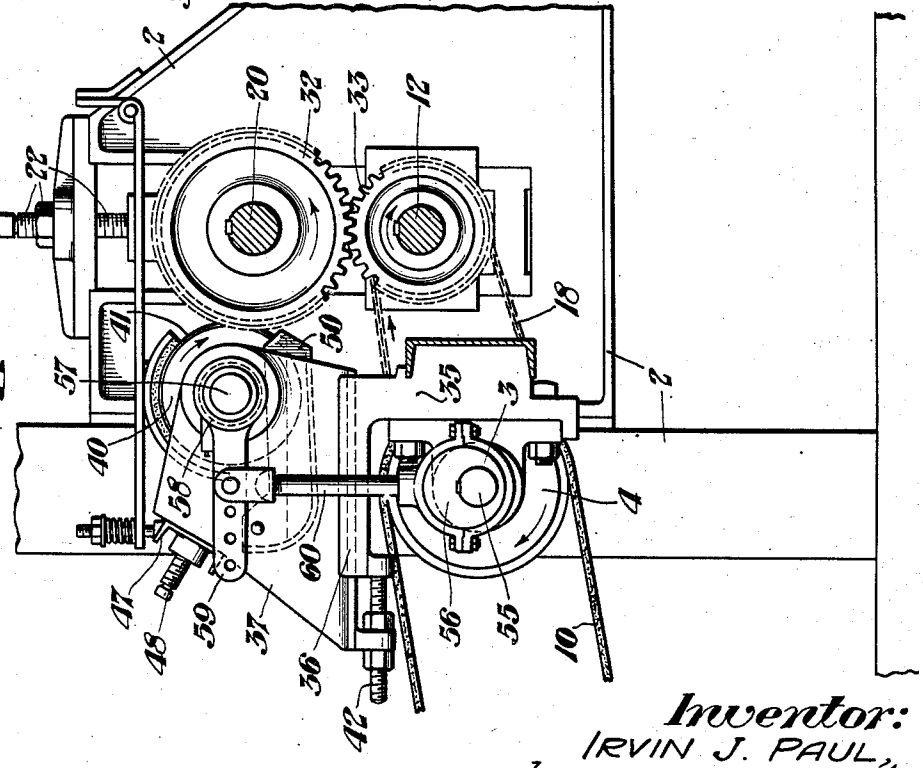


Fig. 3.



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Patented Feb. 15, 1938 2,108,389

UNITED STATES PATENT OFFICE

2,108,389

APPARATUS FOR COATING

Irvin J. Paul, Gary, Ind., assignor to American Sheet and Tin Plate Company, a corporation of New Jersey

Application December 13, 1935, Serial No. 54,305

1 Claim. (Cl. 91—50)

This invention relates to an apparatus for coating and more particularly one which is adapted to the coating of highly finished metallic sheets or strips, although not limited thereto.

According to the teachings of the prior art, most coating apparatus adapted to the treatment of highly-finished metallic sheets, or strip, is concerned with the deposition thereon of oil and the like, in order to prevent corrosion of the finished product. These apparatus therefore are adapted to apply coating medium to material which is characterized by having "open" surfaces which readily retain the medium. That is to say, the surface of the material, although extremely smooth, is somewhat porous.

Accordingly, for material of this type the use of conventional rubber, cloth, or felt rolls and/or associated wiper plates has been very satisfactory, despite the fact that the various indentations and depressions of the rolls and wiper plates caused the work-piece to become streaky with excess coating medium. This streaky condition was not very objectionable.

In recent years there has been a great demand for highly-finished metallic sheets or strip obtained by severe hot and/or cold reduction to gage by rolling. The surface of this material is extremely smooth and has what might be termed "closed" pores. The surface condition of material of this type is such as to cause the coating medium to congeal and segregate thereon. If the material is merely to be coated in order to prevent corrosion this condition is not important, but modern processing methods require it to be closely compacted and annealed in furnaces at relatively high temperatures. Under these conditions a coating which is not uniform causes the highly-finished surfaces to adhere. That is to say, in the case of sheets they are superimposed and thus caused to adhere; while on the other hand the various convolutions of a coil will stick in the same manner.

It is one of the objects of the present invention to provide a novel apparatus for coating which distributes the coating medium over the work-piece in an extremely uniform manner, and one which has in the past been impossible to attain. The coating thus obtained enables highly-finished metallic sheets, or strip material, to be either stacked, or coiled, and subjected to extremely high temperatures for annealing or other heat treatment, without adherence.

Another object is the provision of a novel apparatus of the class described which enables a constant and uniform coating of sheet material in a rapid manner, and one which is at the same time relatively cheap and easy to install and operate.

These and further objects will be apparent after referring to the drawings, in which:

Figure 1 is a plan of the apparatus of the invention.

Figure 2 is a sectional view on the line II—II of Figure 1.

Figure 3 is a sectional view on the line III—III of Figure 1.

Figure 4 is a fragmentary enlarged detail.

Referring more particularly to the drawings, the numeral 2 generally designates the frame of the apparatus of the invention. A shaft 3 is suitably journaled in the frame 2 and carries a relatively large roll 4. A pair of supports 6 is disposed adjacent the frame 2 and carries a shaft 7 which is suitably journaled therein. This shaft 7 has a relatively large roll 8 mounted thereon. These rolls 4 and 8 support an endless conveyer belt 10.

A shaft 12 is journaled in the frame 2 adjacent the shaft 3 and carries a roll 13 which is coated with a non-corrodible metal 14, such as chromium, chromium-nickel, etc. The shaft 12 carries a sprocket 16 which is connected to a larger sprocket 17 on the shaft 3 by means of a chain 18. Thus, it will be seen that while the roll 4 is larger than the roll 13 their sprockets (16 and 17) are correspondingly different, which provides not only for their rotation in unison but also at substantially the same peripheral speed.

A shaft 20 is journaled in the frame 2 above the shaft 12 and carries a plurality of closely assembled cloth disks 21. Referring to Figure 2, it will be noted that the shaft 20 is provided with an adjustment 22 for enabling the holding of its cloth disks 21 against the roll 13 under suitable pressure. The shaft 20 is provided with an outboard extension 24 which carries a sprocket 25 on its outer extremity. This sprocket 25 is connected to a similar sprocket 26 of a speed reduction unit 27 by means of a chain 28. The speed reduction unit 27 is driven by an adjacently disposed electric motor 30.

The shaft 20 carries a gear 32 which engages a smaller gear 33 on the shaft 12, whereby the smaller roll 13 and the closely assembled cloth disks 21 will not only rotate in unison but at substantially the same peripheral speed.

Immediately above the shaft 3 the frame 2 carries a bed-plate 35 which is provided on each of its ends with horizontal ways 36. A reciprocable frame 37 is adapted for movement in the hori-

zontal ways 36 and carries a rotatable shaft 38 on which there is mounted an applicator roll 40 which is coated with a non-corrodible metal 41, such as chromium, etc. The disposition of the reciprocable frame 37 on the bed-plate 35 is adjusted and locked by means of a conventional adjusting-screw mechanism 42.

A pair of transversely extending and relatively spaced guides 44 are mounted on the reciprocable frame 37 for supporting a reciprocable bar 45 which carries a stripper-blade 46. This stripper-blade 46 is made of wear-resistant metal (such as phosphor bronze) and is adapted to bear against the applicator roll 40 on the rotatable shaft, which is in turn adapted to bear against the closely assembled cloth disks 21 on the shaft 20. A transverse channel 47 is carried on the reciprocable frame 37 adjacent the reciprocable bar 45 and carries an adjusting device 48 for adjusting the disposition of the latter, and the stripper-blade 46 which is carried thereby, with respect to the applicator roll 40.

A tray 50 is mounted on the reciprocable frame 45 immediately below the applicator roll 40 and is supplied with oil 51, or other coating medium, through a pipe 52. The level of the coating medium 51 in the tray 50 is maintained sufficiently high to enable its contact with the lower side of the applicator roll 40 which applies the same to the closely compacted cloth disks 21 on the shaft 20.

The rotation of the shaft 38 is effected in the following manner: The shaft 3 on which the roll 4 is mounted carries an outboard extension 55 to which there is secured an eccentric 56. The shaft 38 also carries an outboard extension 57 on which there is mounted a conventional ratchet device 58 having an operating arm 59. This operating arm 59 is connected to the eccentric 56 on the extension 55 on the shaft 3 by a connecting-rod 60. Thus, as the shaft 3 is rotated, the ratchet device 58 will cause the intermittent partial rotation of the applicator roll 40 which in turn applies the coating medium 51 to the closely compacted cloth disks 21 on the shaft 20.

The material to be coated (X in Figure 1) will be evenly coated on its upper surface as it passes between the cloth disks 21 and the roll 13 with which it is in contact.

The coating medium 51 will be transferred from the cloth disks 21 to the roll 13 after one work-piece being treated passes through the apparatus. If the work-pieces are in the form of relatively small sheets the application of the coating medium 51 to the roll 13 is an important factor, as it enables the even coating of the work-piece on both sides. In the case of continuous strip material, the medium will not be supplied to the roll 13 sufficiently often to be effective. However, this consideration is unimportant for the reason that it is only necessary to evenly coat one side of each work-piece, whether it is to be stored, heat-treated or otherwise processed.

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

I claim:

In an apparatus for coating flat metals a hard and non-corrodible roll, a resilient and absorptive roll, said first and second named rolls being constructed and arranged to receive the work-piece therebetween and make contact with the same, and a hard and non-corrodible roll for making contact with said resilient and adsorptive roll and applying a coating material thereto, said resilient and absorptive roll comprising a plurality of axially aligned fibrous disks.

IRVIN J. PAUL.