Sept. 13, 1927. 1,641,978

H. B. LUNDQUIST

LIST REMOVING APPARATUS

Filed Nov. 25, 1925

FIG. 1

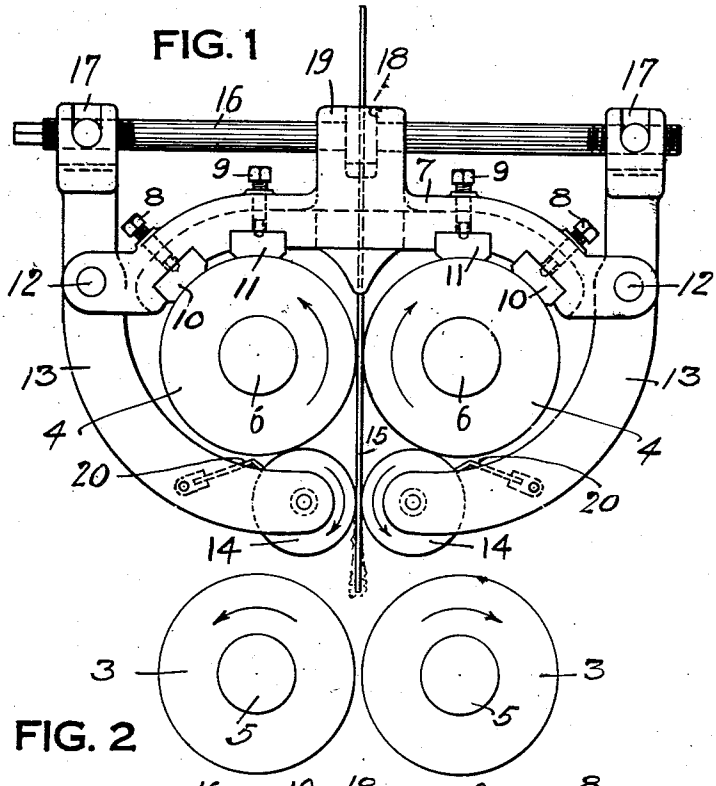
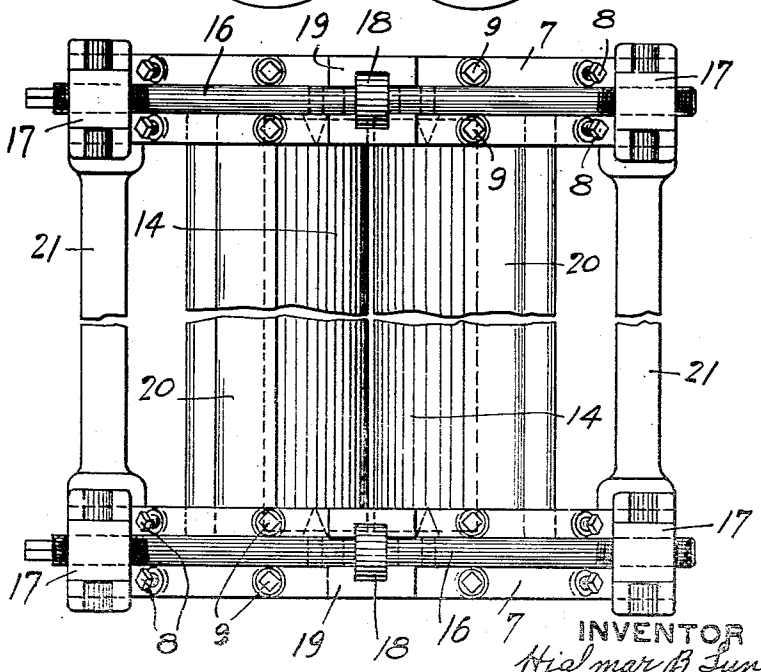


FIG. 2



INVENTOR

Hjalmar B. Lundquist

By Kay, Tittsworth & Martin,

Attorneys

Patented Sept. 13, 1927. 1,641,978

UNITED STATES PATENT OFFICE.

HJALMAR B. LUNDQUIST, OF YOUNGSTOWN, OHIO.

LIST-REMOVING APPARATUS.

Application filed November 25, 1925. Serial No. 71,399.

My invention relates to list removing devices for tinning rolls, and constitutes in part a continuation of my application, Serial No. 721,516, filed June 21, 1924.

Heretofore, difficulty has been encountered in removing list or surplus tin from the sheets as they emerge from the tin pot, and as many as three pairs of rolls have been provided to insure that the tin coating will be properly distributed upon the sheet. At present, brushes of asbestos and steel have been provided for keeping the set of rolls, through which the sheets pass, scraped clear of the surplus tin which adheres thereto. The rolls are usually made of high carbon steel and are very expensive. The brushes tend to wear them rapidly, requiring frequent regrinding of the rolls and replacing them. Supplemental squeezing devices and scrapers operating on the sheets and mounted between two pairs of rolls, have also been employed, but such devices have not proven altogether satisfactory.

One object of my invention is to provide an improved form of apparatus for removing surplus tin from the metal sheets as they emerge from the bath of molten tin, to effect an even distribution of the tin coating over the surfaces of said sheets, and to avoid the necessity of using asbestos brushes.

Another object of my invention is to provide an improved means for positioning the various rolls with which the sheets of tin are brought into contact, in order to place them in proper alignment, and to compensate for wear.

Still another object of my invention is to provide a unit comprising wiping rollers tinning roll positioning devices, and adjusting devices for the wiping rollers, so arranged that the whole unit or various parts thereof may be removed from the list removing apparatus, without disturbing any other parts of the tinning machine.

One form which my invention may take is shown in the accompanying drawing, wherein Fig. 1 is an end elevational view of list-removing apparatus embodying my invention, and Fig. 2 is a plan view thereof.

My invention is applicable to existing tanks and tinning rolls of various standard types, and is shown as employed in connection with a pair of tinning rolls 3 by means of which the coated sheets of tin are fed upwardly from a molten tin bath (not shown), and an upper pair of tinning rolls 4 to which coated sheets are fed by the rolls 3. The rolls 3 and 4 are provided with the usual necks or bearing portions as indicated at 5 and 6, respectively, by which the rolls are supported in bearings at the ends of the tinning tank (not shown). The tinning rolls may be of any usual type.

At each end of the rollers 4 I provide a yoke 7, each of which is provided with two pairs of screws 8 and 9 that have screw threaded engagement with said yokes, and have swivel connection at their outer ends also with shoes 10 and 11, respectively, that bear against the rolls 4 and are adjustable radially thereof by means of the screws 8 and 9, to take up wear and looseness in the end bearings of the rolls and to maintain the rolls in proper vertical and horizontal positions.

The shoes 10 and their screws 8 are disposed at an angle of approximately 45 degrees to the path of movement of the sheet and are adjustable independently of the shoes 11 and screws 9.

The yokes 7 are bifurcated at their ends and provided with pins 12 for pivotally supporting arms 13 that carry wiper rollers 14. The wiper rollers 14 are normally held in engagement with the tinning rolls 4 so that as the tinning rolls are driven in the direction indicated by the arrows thereon, the wiping rollers 14 will be rotated in the opposite direction, as indicated by the arrows, to wipe surplus metal from the upwardly advancing coated sheet 15.

Adjustment of the wiping rollers 14 is effected by means of screws 16 that have right and left hand threads at their respective ends. The threaded end portions engage nuts 17 that are pivotally supported in the upper ends of arms 13. The screws 16 are each provided with a shouldered portion 18 intermediate its ends, which shouldered portion is disposed within a recess in a boss 19 that extends upwardly from the yoke 7, so that the screw will not have endwise movement when it is rotated in its nuts. The rollers 14 will therefore be adjusted equal distances when the screws 16 are turned. Scrapers 20 are pivotally connected to the arms 13 and engage the rollers 14 to remove tin which adheres thereto.

The yokes 7 are connected together by cross bars 21 and these bars may be em-

ployed to support additional arms 13 and wiping rollers 14 where it is not desired to have wiping rollers 14 of as great length as the finishing rolls 4. For instance, the rolls 4 may be of such length that a plurality of sheets may be fed therethrough simultaneously, and a pair of wiping rollers provided for each sheet.

The yokes 7 and the wiping rollers may be readily removed without disturbing the finishing rolls 4, by simply removing the screw 16 and drawing the upper ends of the arms 13 inward a distance which will permit the rollers 14 to clear the rolls 4, and then lifting the yokes vertically.

In the operation of the apparatus, sheets are fed upwardly from a bath of molten metal, by the rolls 3. As they pass between the wiping rollers 14, surplus tin is removed therefrom and flows downwardly. This surplus tin may collect upon the rolls 3 but will be carried around as such rolls rotate in the direction indicated by the arrows, and will be thereby returned to the molten bath in the tank.

Likewise, the tin which adheres to the rollers 14 is removed by the scrapers and also flows to the rolls 3 and is carried back to the tank.

Various changes in detail and general arrangement may be readily made without departing from the spirit and scope of the invention as defined in the accompanying claims. For instance, means other than the arm 13 may be provided for supporting the wiping rollers 14, and such rollers may be driven in some other manner than by contact with the finishing rolls 4, as by an independent driving mechanism.

While I have shown and described my invention as applied to tinning rolls, it is apparent that it may be used in various other arts where a smoothing, scraping or brushing operation is desired upon moving sheets of material.

I claim as my invention:

1. The combination with a pair of discharge rolls of a sheet coating machine, of a pair of auxiliary rolls having driving engagement therewith at the intake side, and scrapers mounted for engagement with the auxiliary rolls to remove adhering material therefrom.

2. The combination with the discharge rolls of a sheet coating machine, of means for adjusting said rolls in vertical and horizontal directions, to compensate for wear, the said means comprising friction shoes disposed above and adjacent to one side of each of said rolls and adjustable radially thereof.

3. The combination with the discharge rolls of a sheet coating machine, of means for adjusting said rolls in vertical and horizontal directions, to compensate for wear, the said means comprising shoes disposed against the said rolls and adjustable radially thereof in a direction substantially 45° with respect to the line of movement of the sheet material passing between the rolls.

4. List removing apparatus comprising a pair of discharge rolls, a frame disposed transversely thereof, radially adjustable shoes carried by said frame and supported upon said rolls, downwardly extending arms carried by the ends of said frame, and wiping rollers carried by said arms in position to engage opposite sides of sheets passing between said rolls.

5. List removing apparatus comprising a pair of discharge rolls, a frame disposed transversely thereof, radially adjustable shoes carried by said frame and supported upon said rolls, downwardly extending arms carried by the ends of said frame, and wiping rollers carried by said arms in position to engage opposite sides of sheets passing between said rolls, the said rollers having frictional engagement with, and being rotated by, the said rolls.

6. List removing apparatus comprising a pair of discharge rolls, a frame disposed transversely thereof, radially adjustable shoes carried by said frame and supported upon said rolls, downwardly extending arms carried by the ends of said frame, and wiping rollers carried by said arms in position to engage opposite sides of sheets passing between said rolls, the said arms being provided with upward extensions that are movable transversely of the rolls to adjust the position of the wiping rollers.

7. List removing apparatus comprising a pair of tinning rolls, a framework disposed above said rolls and extending transversely thereof, vertically disposed arms pivotally connected to the ends of said framework, wiping rollers carried by the lower ends of said arms in position to engage the sides of the sheets passing through the tinning rolls, and means for adjusting said arms about said pivots to move said wiping rollers in directions transversely of the tinning rolls.

In testimony whereof I, the said HJALMAR B. LUNDQUIST, have hereunto set my hand.

HJALMAR B. LUNDQUIST.