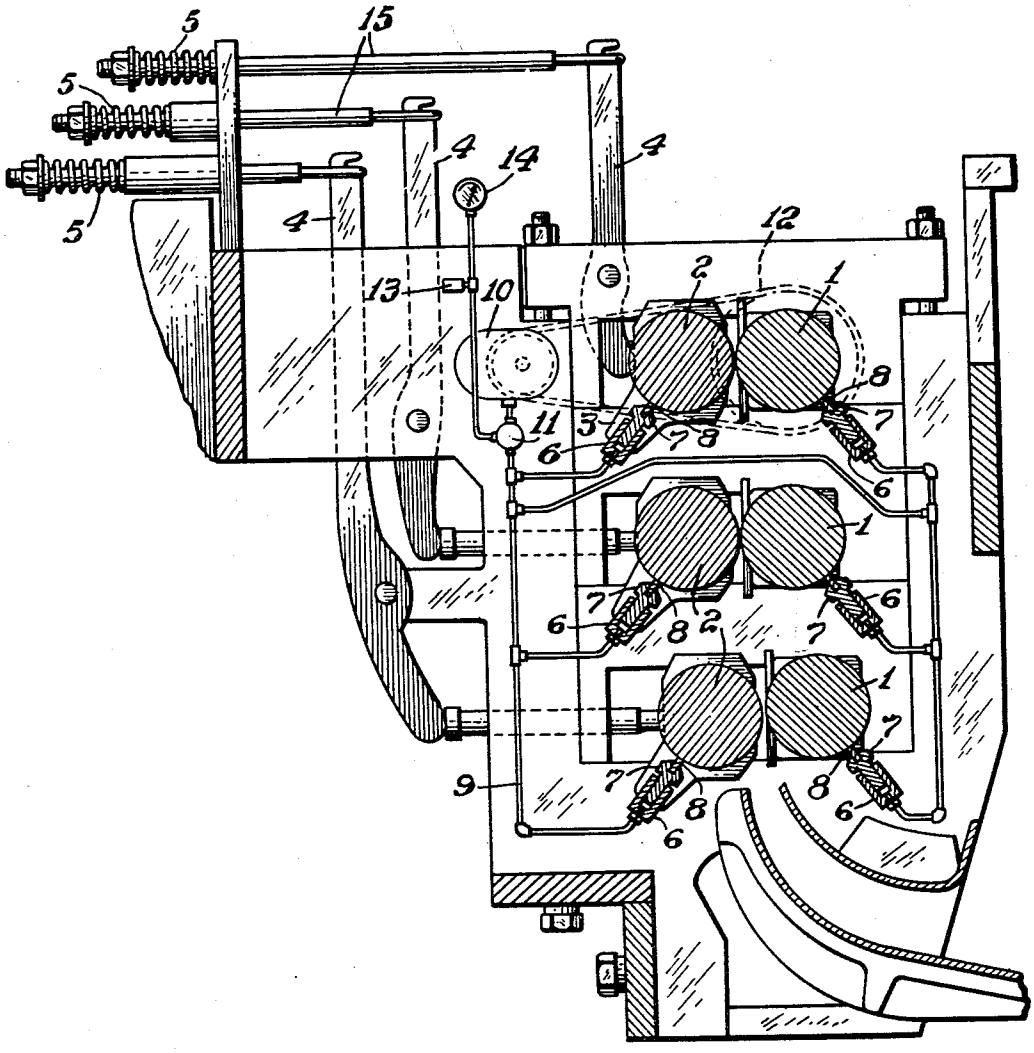
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DEVICE FOR WIPING OFF LIQUID METAL FROM ROLLERS

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Fig. 1



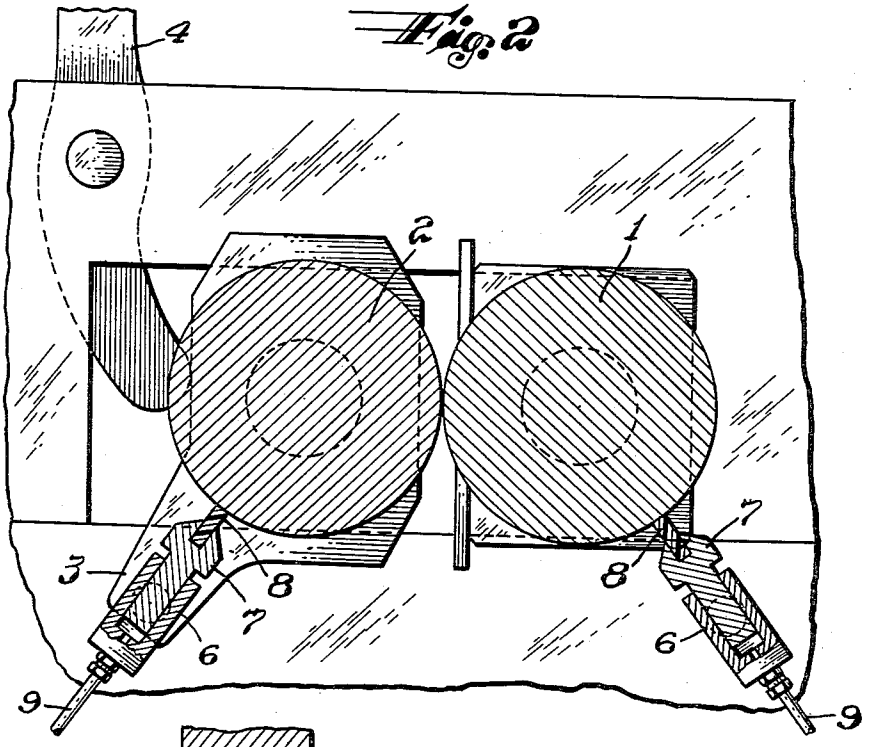
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Fig. 2



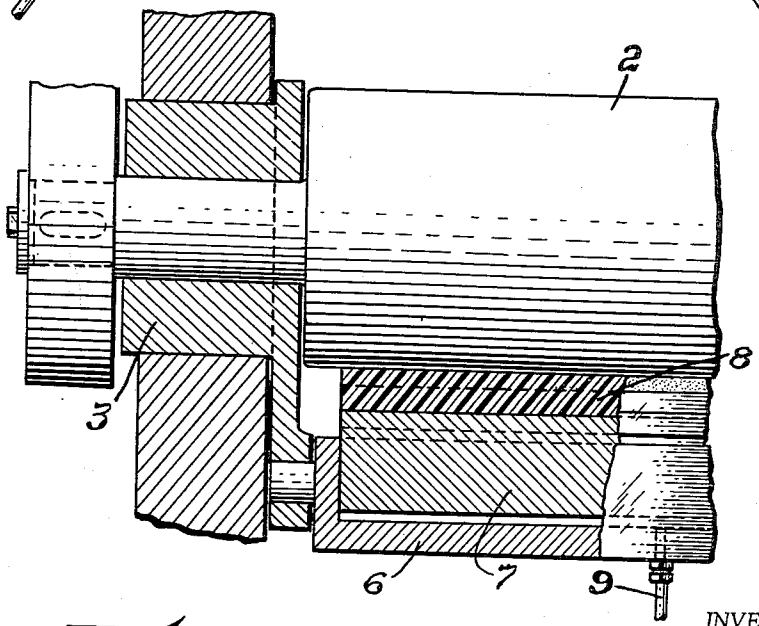


Fig. 3

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DEVICE FOR WIPING OFF LIQUID METAL FROM ROLLERS

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The hitherto known devices for pressing the wiper bars, placed in the oil container of machines for metal-coating of steel sheets and bands, against the working rollers include for each roller a pair of steel springs the pressure of which can be regulated only by hand. Such regulation is difficult, especially during the operation of the machine when the temperature of the oil bath reaches 240° C. and the radiant heat at the place where the regulation is done is very high. Another disadvantage of the known devices is due to the fact that one of the sets of rollers is movable and the rollers are moved depending on the thickness of the sheets or bands to be handled, the thickness varying between 0.2 and 0.6 mm. Since the wiper remains in the same position with regard to the rollers, the aforeindicated movements of the rollers frequently cause the edge of the respective wiper bar to be damaged or cause, at best, the wiper to be subject to undesirable irregular impacts of high pressure. As the length of the wiper bars amounts to 2 meters, the pressure of the above mentioned steel springs cannot maintain a constant value along the whole length thereof, which presents the following disadvantages: the controlling of the pressure during the operation of the machine is rendered still more difficult; it is impossible to maintain a predetermined thickness of the metal coating so that the metal layer on the steel sheet or band becomes uneven and unequally distributed; and the consumption of coating metal is too high.

The said disadvantages are eliminated by the device according to the present invention, by means of which an equally distributed pressure is achieved along the whole length of the wiper bars. The wiper bars are then uniformly pressed against the working rollers.

This invention relates to a device for wiping off excess liquid metal from working rollers of a machine for metal-coating, especially tinning. The term "sheet" or "sheets" is to be understood to comprise strips and webs of any suitable width and length. The excess metal passes on, in adherence to surfaces, from metal-coated sheets to the working rollers. The device according to the invention comprises at least a single pair of rollers, a movable and an immovable roller, which are mounted to form a nip through which the sheet being worked on passes, bearing means for the movable roller, means for automatically and constantly urging the movable roller into yielding engagement with the immovable roller, separate wiper means for each roller, means for automatically and constantly urging a wiper insert of each wiper means into yielding engagement with the respective roller, and means for mounting the wiper means of the movable roller on said bearing means. The movable roller is to move toward and away from the immovable roller, and the bearing means of the movable roller are provided to be taken along by the movable roller. The movements of the movable roller take place in accordance with the varying characteristics of the sheet.

An embodiment of the device according to the present invention is shown by way of example in the accompanying drawings wherein:

FIG. 1 shows a section of a part of a metal-coating machine with oil bath; and

FIGS. 2 and 3 are fragmentary views, drawn to enlarged scale, of a device for wiping off excess liquid metal from a single pair of working rollers.

In an oil bath there are placed, in superposed condition, three pairs of working or oiling rollers, each pair consisting of a rotatable and otherwise immovable roller and a rotatable and radially movable roller. The radially movable rollers 2 are supported in bearings 3 each of which forms a guide for a cross-bar 6. The movability of the rollers 2 makes it possible to give sheets a metal coating of various thicknesses, for instance, of 0.2 to 0.6 mm. The rollers 2 are pressed against the rotatable but relatively immovable rollers 1 by means of levers 4, rods 15, and springs 5. In each cross-bar 6 there is a ledge-like member or rib 7 inserted which moves in the cross-bar 6 perpendicularly to the axis of the roller 2 and is provided with a longitudinal rectangular or otherwise shaped slot in which is fixedly received a wiper insert 8 made of polytetrafluoroethylene or polytetrafluoroethylene in combination with inorganic matter. The insert 8 and rib 7 form a rigid whole.

The rib 7 with insert 8 is brought into working position by a pressure medium supplied into the space between the cross-bar 6 and the lower part of the rib 7.

In the case of the rollers 1 the installation is analogous, except that the cross-bar 6 may be fixed directly in the machine frame.

The pressure medium is supplied through a system of conduits 9. As pressure medium, palm oil, cotton oil, or a suitable gas may be used. The necessary pressure of the medium is obtained by means of a centrifugal pump or a gear pump 10 located above a distributor 11 for the pressure medium through the system of conduits 9 to the various wipers. In the embodiment selected for illustration, six wiper devices are shown. The pump 10 is submerged in the conventional oil bath of the machine and is driven by a drive 12 which is schematically shown. It propels oil of the oil bath to the distributor 11 from where it moves on, as has already been stated, to the six wipers. The pressure to be exerted by the wiper bars or cross-bars 6 on the working rollers can be controlled by means of an overflow valve 13 or a number of such valves located in the system of conduits 9 so as to be safely accessible. The registration of the pressure is obtained by means of a manometer 14 which may be adapted so as to indicate directly the approximate thickness of the metal layer in g./m.^{2}.

It will be apparent that while we have shown and described our invention in a preferred form only, many changes and modifications may be made without departing from the spirit of the invention defined in the following claims.

What we claim is:

1. A device for wiping off excess liquid metal from rollers, said excess metal being passed on, in adherence to surfaces, from metal-coated sheets to said rollers, said device comprising

(1) at least a single pair of rollers mounted to form a nip through which the sheet being worked on passes,

(2) movable bearing means for one of said rollers connected to said one roller for motion therewith toward and away from the other of said rollers,

(3) means for automatically and constantly urging said movable roller into yielding engagement with said other or relatively immovable roller, said movable roller being thus mounted to move automatically, in accordance with varying characteristics of said sheet, toward and away from said immovable roller,

(4) separate wiper means for each of said rollers,

(5) the wiper means of each of said rollers including a wiper insert and means for automatically and con-

stantly urging the respective wiper insert into yielding engagement with the respective roller, and

(6) means for mounting the wiper means of said movable roller on said bearing means, permitting the wiper means of said movable roller to move with said movable roller and bearing means toward or away from said immovable roller.

2. In the device according to claim 1, the wiper means of each of said rollers comprising a bar, a support for said bar, said bar extending over the roller length and being provided with a longitudinally extending slot, a ledgelike member slidingly received in said slot, said member defining together with said bar an interior space, said wiping insert being secured to said member, and means to conduct a pressure medium from outside said bar to said interior space.

3. In the device according to claim 2, said wiping insert being of a material selected from a group consisting of polytetrafluoroethylene and a combination thereof with inorganic matter.

4. In the device according to claim 1, said automatic and constantly effective urging means including a member, a support for said member, permitting said member to constantly engage said movable roller, and resilient means provided to automatically and constantly ensure a yielding engagement between said member and movable roller and said yielding engagement between said rollers.

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