Oct. 29, 1929. L. LÖWY 1,733,379

ROLLER CONVEYER

Filed May 4, 1928

Fig. 1.

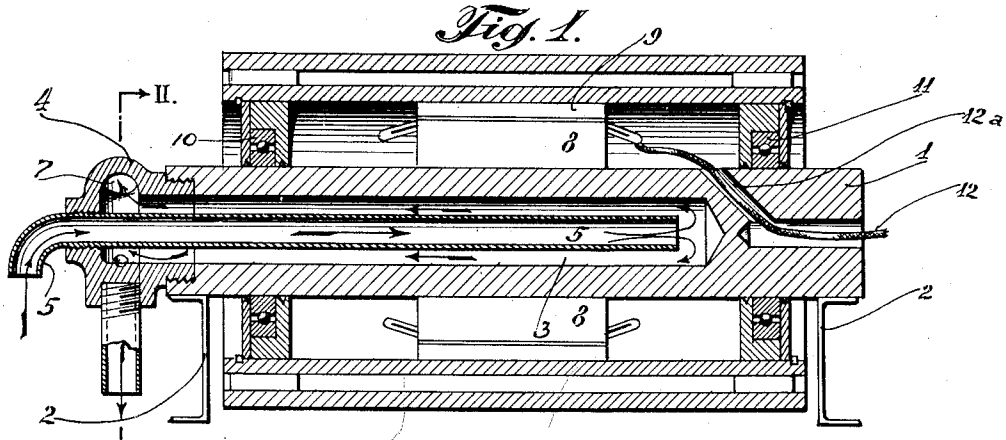


Fig. 5.

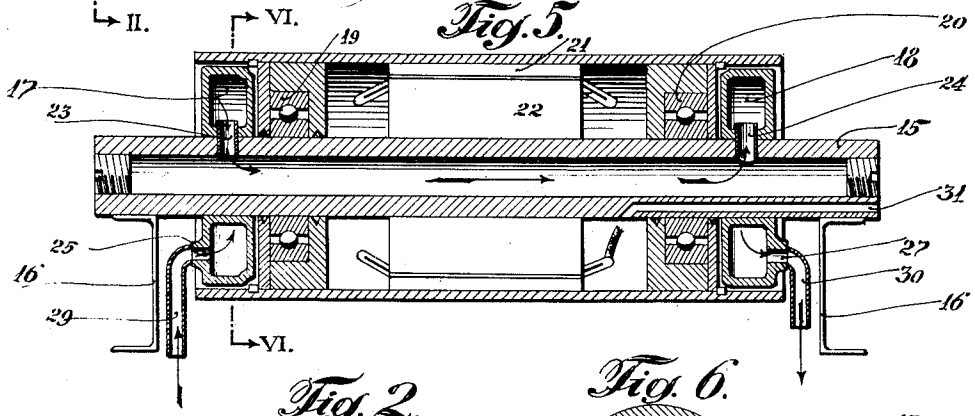


Fig. 2.

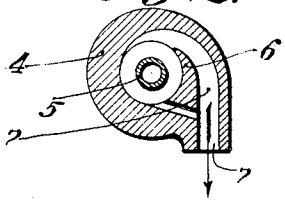
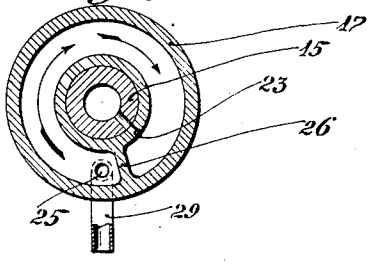


Fig. 6.



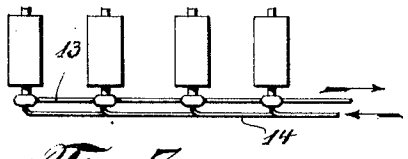


Fig. 3.

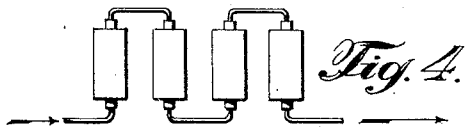


Fig. 4.

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UNITED STATES PATENT OFFICE

LUDWIG LÖWY, OF DUSSELDORF, GERMANY

ROLLER CONVEYER

Application filed May 4, 1928. Serial No. 275,234.

My invention has reference to conveyers, more particularly such as used in rolling mills. Such conveyers are now composed of a plurality of motor rollers each forming an independent unit, and lately motor rollers have come into use in which the motor is built inside the outer roller shell which acts as the support for the hot metal parts to be conveyed. The motor being completely enclosed must be cooled so as to control the temperature of the motor windings and to protect the insulation. Ordinarily, for cooling the motor, air is blown through the windings, or through the windings and the shaft, which for that purpose is made hollow. This manner of cooling, however, requires a large volume of air, which moreover, must be filtered. Pipe lines of large diameter are require to carry the air from the fan to all the rollers of the conveyer, and that means expensive installation.

By the present invention, I aim to overcome these defects which I accomplish by using water or other liquid cooling agent, of which a comparatively small amount with no extra pressure is sufficient to effectively cool the rollers. This manner of cooling does not call for high power consumption and permits pipes of small diameter to be mounted along the conveyer.

In the annexed drawing in which I have shown, by way of illustration a few embodiments of my invention, Fig. 1 is a central longitudinal section through a motor roller; Fig. 2 is a section along line II—II in Fig. 1; Figs. 3 and 4 are diagrammatic views showing a plurality of motor rollers; Fig. 5 is a similar view as Fig. 1 showing a modification, and Fig. 6 is a section along line VI—VI in Fig. 5.

At 1 in Fig. 1 is shown the stationary shaft of a motor roller. 2 are the supports for the ends of the shaft. As shown, the shaft is provided with a bore 3 extending almost all the way through the shaft. 8 is the motor stator mounted on the shaft, and 9 is the rotor element, preferably made of two relatively spaced concentric cylindrical shells. At 10 and 11 are shown bearings for said rotor element. The electric current is supplied through a cable 12 which enters the shaft 1 at one end thereof, as shown in Fig. 1, a bore being provided for that purpose in the shaft at 12^a.

4 is a cap screwed onto the end of shaft 1 for supporting the inlet pipe 5 provided for the admission of the liquid cooling medium. Said pipe extends almost all the way into the bore 3. Within the cap 4 is formed an overflow shown at 6 in Fig. 2.

In the construction just described, the liquid cooling medium entering pipe 5 flows in the direction of the arrow pointing to the right in Fig. 1. The pipe being open at its end, the cooling medium returns through the bore 3 of the shaft and after having passed the overflow 6 in cap 4 escapes through the outlet 7, shown in Fig. 2. There being a continuous flow of the cooling medium, the heat developed in the motor windings as well as the heat being transmitted from the outside by the hot material passing over the roller is thus carried off by the cooling medium.

Where several motor-rollers are combined in parallel to constitute a conveyer, as shown in Fig. 3, all the outlets 7 are connected to a common discharge pipe extending along the conveyer, while the inlet ends of the various inlet-pipes 5 are all connected to a common supply-pipe shown at 14 in Fig. 3.

In the diagrammatic Fig. 4 the motor rollers are shown combined in series, in which case the bore 3 extends through the entire shaft of each roller so that the cooling medium can flow successively through the various shafts, passing through the same in alternate directions. The advantage of this arrangement is that instead of two pipes as in Fig. 3 only one pipe-line is required.

Fig. 5 shows a construction designed for a roller conveyer situated in hot surroundings, where heat will radiate also against the bearings of the roller element, which, therefore, must also be cooled. 15 is the hollow stationary shaft resting on supports 16 and carrying two stationary hollow gaskets 17 and 18, one at each end, which gaskets are located outside of the bearings 19 and 20 supporting the motor roller 21. 22 is the motor stator, which as in Fig. 1 is mounted on the stationary shaft 15 inside the motor rotor being completely

enclosed thereby. The hollow shaft 15 is closed at both ends.

The liquid cooling medium entering through the inlet pipe at 29 into gasket 17 passes through the opening 23 in the wall of the hollow shaft 15 into said shaft flowing therethrough in the direction of the arrow pointing to the right in Fig. 5. Through an opening 24 at the other end of shaft 15 the cooling medium enters the gasket 18 and finally escapes through the outlet pipe 30. As the two gaskets 17 and 18 are thus always filled with the cooling medium, the bearings 19 and 20 will thus be effectively cooled, while the heat transmitted to shaft 15 is carried off by the continuous flow of the cooling medium through said shaft.

According to the sectional view in Fig. 6 of gasket 17 a partition 26 is provided therein so that the cooling medium which enters the gasket through the opening shown at 25 is compelled to flow into the hollow shaft through opening 23. A similar partition is provided in gasket 18 between the opening 24 and outlet opening 27.

Since my invention is capable of other modifications than those shown and described, I do not, of course, limit myself to the constructions shown in the drawing.

I claim:

In a motor roller for roller conveyers comprising a hollow stationary shaft closed at both ends, an electric motor stator, an outer rotatable roller member, and rotor elements respectively carried by said stationary shaft and moved by said rotatable member, and bearings for said rotor element, the combination with said hollow stationary shaft and said bearings, of gaskets mounted on said stationary shaft adjacent said bearings and in communication with said shaft so as to form therewith a continuous passage and to permit of admitting to and discharging from said passage a liquid cooling medium.

In testimony whereof I affix my signature.

LUDWIG LÖWY.