UNITED STATES PATENT OFFICE

2,050,046
COLD-ROLLING STEEL STRIP

Walter O. Everling, South Euclid, Ohio, assignor to The American Steel and Wire Company of New Jersey, a corporation of New Jersey

Application January 21, 1935, Serial No. 2,811

2 Claims. (Cl. 80—60)

This invention relates to the art of cold-rolling steel strip, one of the objects being to produce strip covered with a minimum amount of oil by means of a cold-rolling mill having the conventional oil-lubricated working rolls.

An example of the invention is illustrated by the accompanying drawings, in which:

Figure 1 shows strip passing over the bottom roll of a mill to which any example of the invention is applied.

Figure 2 shows the edges of the strip and the ends of the rolls.

Figure 3 shows the strip leaving the rolls and illustrates the operation of the invention.

These drawings show the working rolls 1 of a cold mill. The oil is applied in several ways, but in all cases it is carried on the rolls so as to contact the strip, marked S in the drawings, as it enters the working pass.

Because of the seal formed by the heavy-pressure contact of the rolls 1 with the strip S, any excess oil is effectively prevented from flowing onto the latter except at its edges. Since the oil is not sealed at the dead portions of the pass, it forms rings through which the strip’s edges are dragged, some oil clinging to these edges and eventually creeping from them onto the surfaces of the strip to a sufficient extent to interfere with bright annealing operations.

The remedy heretofore used consisted of various methods and devices for wiping or otherwise removing this oil from the surfaces of the strip. Such procedure has drawbacks, but was resorted to for the lack of anything better.

Now the present invention covers a method of producing cold-rolled strip, which includes rolling the strip by means of a cold-rolling mill having oil-lubricated working rolls, while blowing the lubricating oil away from the pass of the rolls not occupied by the strip, in a direction such that it will not contact the latter as it leaves the rolls. It is apparent that this method is particularly characterized by striking directly at the root of the evil, rather than being merely a remedy.

The method goes further, in that the blowing away of the oil is accomplished by directing jets of air or any other fluid moving at high velocity into the passing pass of the rolls adjacent the edges of the strip in directions opposite the movement of the latter. The jets should be directed slightly towards the strip’s edges and into the part of the pass not being actively used and which, therefore, contains oil.

Certain apparatus is also covered by the invention, and this will now be disclosed with the aid of the drawings.

A bar 3 is fastened transversely across the mill at a level well below the pass line of the working rolls 1 and on the exit side of the latter. Two brackets 4 are fixed to this bar by fastenings 5, the latter being releasable to permit adjustment of the brackets along the bar. Incidentally, the latter may be mounted on the mill frame or otherwise positioned at the fancy of the installer.

The brackets 4 mount lengths of pipe 6 that are welded to the respective brackets and are of a shape such that their end portions 8 are positioned in a plane with the pass line of the rolls 1 and point toward the extremes of the live portion of the latter’s pass. These end portions may be considered as being nozzles. The best effect is obtained when the end portions 8 cant slightly towards the extremes of the live or active pass, and their tips extend between the rolls so as to terminate closely adjacent the pass of the latter in such mutually spaced relationship as is necessary. The use of tapered tips permits closer positioning.

When these nozzles are supplied with air or any other fluid under pressure, they eject high-velocity jets of fluid into the nip of the rolls toward the edges of the strip S, thus effectively blowing the oil to points remote from these edges so as to prevent flowing onto the latter. The figure showing the operation of the invention shows the rings of oil in its displaced position by solid lines, and in its old or normal position by dotted lines. The velocity of the jets should be varied until proper action is secured, the ease with which the oil can be removed depending largely on its physical characteristics.

I claim:

1. A method of producing cold-rolled metal strip, including rolling said strip by means of a cold-rolling mill having oil-lubricated working rolls, while blowing the oil away from the pass of said rolls not occupied by said strip in a direction opposite the travel of the latter as it leaves said rolls.

2. A method of producing cold-rolled metal strip, including rolling said strip by means of a cold-rolling mill having oil-lubricated working rolls, while blowing the oil away from the portions of the pass of said rolls adjacent said strip that is not occupied by the latter, in a direction opposite the travel of said strip so it leaves said rolls.

WALTER O. EVERLING.