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MILL ROLL COOLING DEVICE

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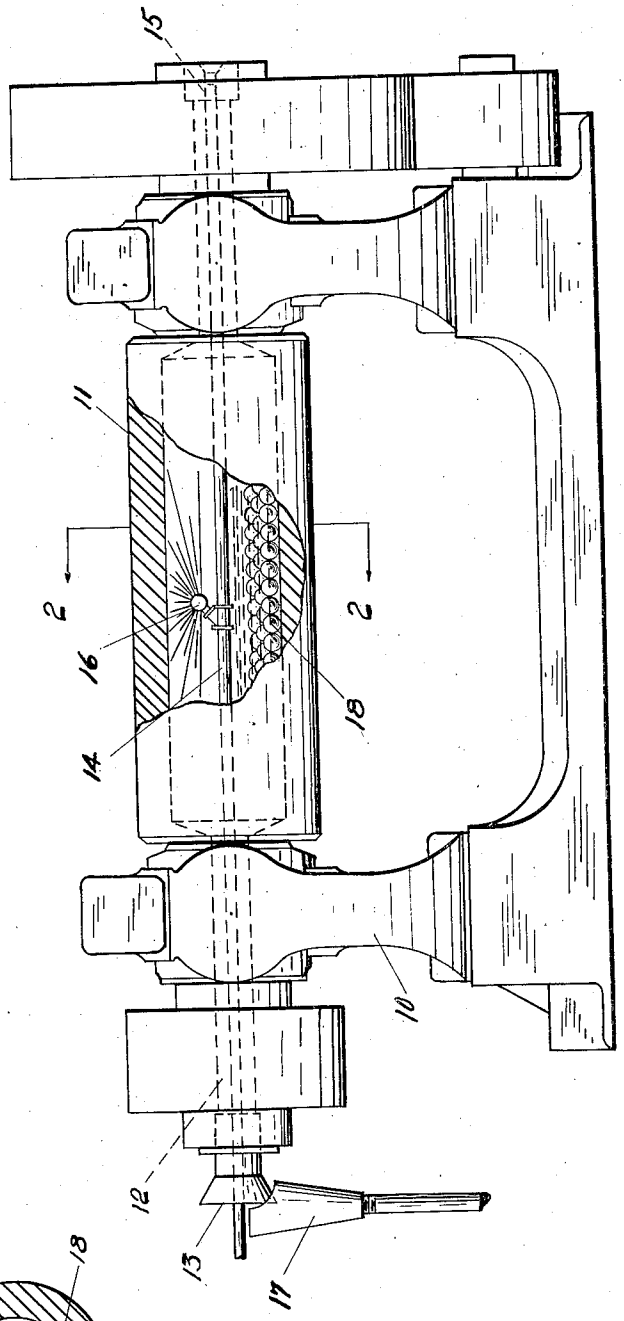



FIG. 1.

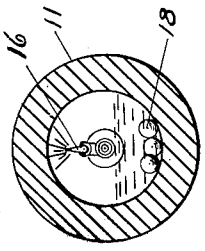



FIG. 2.

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# UNITED STATES PATENT OFFICE

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## MILL ROLL COOLING DEVICE

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This invention relates to cooling devices and has particular reference to water cooling means for mill rolls and the like.

Mill rolls have heretofore been cooled by directing a stream of cold water therethrough, but this system is ineffective due to the tendency of a layer of hot water to adhere to the inner surface of the rolls so that the cold water flows straight through the rolls without mixing with or disturbing the heated layer and consequently providing little, if any, cooling effect on the roll. Furthermore this stationary layer of hot water permits the deposition of sediment and scale upon the surface of the rolls which will decrease the cooling effect of the water and eventually clog the water passage completely.

It is the object, therefore, of this invention to provide a device for effectively cooling mill rolls by breaking up the layer of hot water tending to adhere to the inner surface thereof. A further object is to provide means for preventing the deposition of sediment on the interior of mill rolls.

The foregoing and other objects are obtained by the device illustrated in the accompanying drawings and described below. It is to be understood that the invention is not limited to the specific form thereof disclosed herein.

Of the accompanying drawings:

Figure 1 is a front elevation partly broken away, of a device embodying the principles of the invention; and

Figure 2 is a transverse section of the mill roll on the line 2—2 of Figure 1.

Referring more particularly to the drawings, 10 represents the supporting frame of a pair of similar mill rolls, only the front roll 11 showing in the view illustrated. The rolls are hollow and are provided at one end with an opening 12 having an annular skirt 13 attached thereto. A water pipe 14 passes through the opening and is journaled in the other end of the roll at 15, there being one or more spray nozzles 16 connected to the water pipe to direct a spray of cold water to the interior surface of the roll. The excess water flows from the opening in the end of the roll, through skirt 13 and into a suitable drain 17.

In order to agitate the water in the rolls for mixing the cold water with the water that has been heated by the rolls, a number of heavy balls 18 are provided inside the rolls. These balls positively break up the layer of hot water which clings to the interior of the rolls and furthermore prevent the deposition of sediment or scale thereon. While spherical iron balls as illustrated are preferably employed, any small heavy objects may be used, such as old iron nuts and bolts or other scraps of metal, stone, earthenware, etc.

Modifications of the invention may be resorted to, as will be understood, without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

1. A device for cooling a hollow mill roll having an opening in one end thereof, comprising a cold water supply pipe passing within said roll through said opening and journaled in the opposite end of said roll, a spray nozzle connected to said pipe for directing a spray of water to the interior of said roll, and a plurality of metal balls housed in said hollow roll and having free movement therein, whereby, as the roll is rotated, the layer of hot water adhering to the interior thereof will be broken up and the sediment deposited thereon removed.

2. A device for cooling a hollow roll having a central opening therein, comprising a water pipe passing within said roll through said central opening, a nozzle connected to said pipe for directing a stream of water within the interior of said roll, and a plurality of heavy objects movable within said roll for positively agitating the water therein, said central opening around the pipe serving as an overflow for water passing from said roll.

3. A device for cooling a hollow roll having a central opening therein, comprising a water pipe passing within said roll through said central opening, a nozzle connected to said pipe for directing a spray of water within the interior of the roll, and means positioned within the roll for positively agitating

the water therein, said central opening serving as an overflow for water passing from said roll and permitting the circulation of air within said roll from the exterior thereof.

4. A device for cooling a hollow roll having a central opening therein, comprising a water pipe passing through said opening within said roll, and a nozzle connected to said pipe for directing a spray of water within the interior of the roll, said central opening serving as an overflow for water passing from said roll and permitting the circulation of air within said roll from the exterior thereof through the opening around said pipe and above the surface of the water.

5. In combination a hollow roll having a central opening in the end thereof, means for introducing water within said roll, and means for positively agitating the water therein, said central opening serving as an overflow for water passing from said roll and also permitting circulation of air within said roll from the exterior thereof above the surface of the overflow water.

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