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COLD BRASS ROLLING

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The present invention relates to improvements in the art of cold rolling metals, particularly brass and other copper alloys, and will be fully understood from the following description thereof.

In the cold rolling of copper, brass, and copper alloys, the metal to be rolled, in ordinary practice, goes from the water washing bath to the rolls, which are of steel or is wetted while on the roll; and in order to prevent seizing of the brass to the surface rolls, with consequent roughening both of the rolling surface and the surface of the brass, a light lubricating oil is applied to the metal. This lubricating oil may suitably have a viscocity range of 60 to 225 sec. Saybolt at 100° F. The oil, although effective in preventing seizure, spreads unevenly over the wet surface of the metal, collects in pools on the rolled sheets and produces irregular discoloration of the latter during annealing, these discolorations showing up upon subsequent pickling and washing.

In accordance with the present invention, there is applied to the surface of the wet material as it enters the rolls a mixture of a suitable lubricating oil and an emulsifying or spreading agent, preferably one which is capable of emulsifying oils rapidly in cold water. Although the agent employed is of the character of an emulsifying agent, lowering the surface tension of the oil, it is preferably not employed in quantities sufficient to cause actual formation of an emulsion, but only sufficient to secure rapid spreading action on a cold wet surface or on cold water. I have found the alkali metal compounds of oil soluble petroleum sulfonic acids(derived by the action of strong sulfuric acid and particularly fuming acid on heavy petroleum oils), and of naphthenic acids, either alone, or in admixture with soaps, when added to a suitable lubricant oil, to be satisfactory in operation. The proportion of emulsifying agent may be varied within wide limits; thus from 2 to 20% has been found suitable.

The lubricant oil may be a mineral oil of the character hitherto used, or mixtures of mineral oil and fats or fatty oils, such as tallow, tallow oil, lard oil, and the like, fatty oils low in or free from free fatty acids being preferred. Thus, I have employed mixtures containing the following:

1. Mineral lubricating oil and about 10% sodium compound of preferentially oil soluble petroleum sulfonic acids.

2. A mixture of 10% tallow oil; 2.3% preferentially oil soluble sodium compound of petroleum sulfonic acids; 1% soda rosin soap and the remainder mineral lubricating oil with traces of alcohol and water.

I have also found that other emulsifying or spreading agents may be employed, such as the sodium, potassium or ammonium soaps from stearin, lard oil or the like, oil miscible naphthenates, sulfonated fish oils or sulfonated castor or other fatty oils and their alkali metal compounds, either alone or in combination with the compounds of the preferentially oil soluble petroleum sulfonic compounds. Other fatty oil may be used in place of tallow oil, such oils being selected for viscosity, freedom from acidity, etc., as is usual in the industry.

In carrying out the invention, the mixed lubricating compound is applied to the wet copper, brass, or other alloy before entering the rolls. The action of the rolls, in addition to mechanically reducing the alloy, tends to form an emulsion between the lubricant and the water on the sheet, causes the lubricating compound to spread evenly over the sheet and hence results in an improved lubrication during operation. The rolled sheet, being evenly wet by the lubricating compound, then passes to the annealing furnaces where annealing is effected without discoloration, and subsequent cleansing of the sheets is greatly facilitated. Furthermore, in the finished sheets, the uneven results hitherto obtained by reason of the irregular deposits of oil on the rolled sheets are avoided. It is obvious that the invention is also applicable when the sheets are wetted as they enter the rolls, by application of water either to the sheets or to the rolls.

I claim:

1. In the method of rolling soft metals by means of cold rolls to which the metal is

delivered with a wetted surface, applying to the metal before entering the cold rolls a lubricant oil containing an agent capable of lowering its surface tension, and causing it to spread rapidly on the wetted surface of the metal.

2. In the method of rolling soft metals by means of cold rolls to which the metal is delivered with a wetted surface, applying to the metal before entering the cold rolls a lubricant oil containing an emulsifying agent, thereby lubricating the surfaces of the latter and evenly distributing the lubricating oil over the surface of the metal.

3. In the method of rolling soft metals such as brass by means of cold rolls to which the metal is delivered with a wetted surface, applying to the metal before entering the cold rolls a lubricant oil containing an alkali metal compound of petroleum sulfonic acids and passing the metal through the rolls, thereby lubricating the surfaces of the latter and evenly distributing the lubricating oil over the surface of the metal.

4. In the method of rolling soft metals by means of cold rolls to which the metal is delivered wet, applying to the metal before entering the cold rolls a lubricant oil containing a mixture of an alkali metal compound of a petroleum sulfonic acid and a fatty acid soap, and passing the metal through the rolls, thereby lubricating the surfaces of the latter and evenly distributing the lubricating oil over the surface of the metal.

5. In the method of rolling soft metals by means of cold rolls to which the metal is delivered wet, applying to the metal before entering the cold rolls a lubricant oil comprising a mixture of mineral oil and fatty oil and containing an alkali metal compound of a petroleum sulfonic acid, and passing the metal through the rolls, thereby lubricating the surfaces of the latter and evenly distributing the lubricating oil over the surface of the metal.

6. In the method of rolling soft metals in which the metal is wetted on contact with the roll, applying to the metal and rolls a lubricant oil containing an alkali metal compound of a preferentially oil soluble petroleum sulfonic acid adapted to spread on the wet metal surfaces and prevent seizure.

Signed this 25 day of September, 1929, at Chicago, Cook County, Illinois.

JOHN C. SHARP.