

## UNITED STATES PATENT OFFICE

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COMBINATION COOLANT AND LUBRICANT  
FOR COLD ROLLING MILLS

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2 Claims. (Cl. 252—56)

This invention relates to the cold rolling of metals such as strip steel and, more particularly, to liquid mixtures used therein for the dual purpose of cooling the rolls of the mill and lubricating the workpiece therebetween. In the art of rolling thin wide strips of steel in a 4-high mill, it is of extreme importance that a satisfactory medium be employed.

According to the prior art, numerous media have been employed, including mixtures of water and oils of various types. While some of these media serve quite well as coolants, they tend toward breaking down during the rolling operation because of the high heat encountered and thus have little or no lubricating value.

So far as I am aware, all prior art mixtures have necessitated the employment of various mechanical means to keep the component parts in a fusible state.

It is among the objects of the present invention to provide a mixture comprising an emulsifying agent which keeps the various and component parts in a fusible state at all times, thus dispensing with the use of the mechanical means referred to hereinbefore.

Another object is to provide a mixture which, so long as the proper ratio of the various ingredients is maintained, will last indefinitely and thereby conserve considerable expense and trouble.

The foregoing and other objects will become more apparent after referring to the following description.

The mixture embodies palm oil, water and lactic acid so combined as to act as a satisfactory coolant with lubricating properties effective without breaking down from room temperature to the boiling point of water.

The various proportions of ingredients are as follows:

|                   | Per cent  |
|-------------------|-----------|
| Palm oil -----    | 1 to 50   |
| Water -----       | 50 to 99  |
| Lactic acid ----- | .3 to 33½ |

As a preferred embodiment, I have found the following mixture to be very satisfactory:

|                   | Per cent |
|-------------------|----------|
| Palm oil -----    | 15       |
| Water -----       | 83.3     |
| Lactic acid ----- | 1.7      |

In practice, the solution or liquid mixture is sprayed through nozzles against the surface of the working rolls and on the surface of the strip being rolled, pressure being applied by any suitable means. The solution, as it drips from the rolls and the work, is collected in a sump wherein the temperature is controlled as desired by a suitable heat exchanger, the solution or mixture being pumped from the sump into the circulating system, sprayed on the rolls and surface of the strip being reduced, and the excess mixture being returned again to the sump.

While I have described one specific embodiment of the invention, it will be seen that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope thereof, as defined in the appended claims.

I claim:

1. A combined coolant and lubricant for cold reduction apparatus comprising a solution of approximately 1% to 50% palm oil, 50% to 99% water and .3% to 33½% lactic acid.

2. A combined coolant and lubricant for cold reduction apparatus comprising a solution of approximately 15% palm oil, approximately 83.3% water and approximately 1.7% lactic acid.

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