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WIRE DRAWING

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In cold drawing steel wire, it is common practice to coat the wire with a lubricating composition prior to its passing through the drawing dies, to facilitate passage through the dies. Various compositions customarily are employed for this purpose. Thus lime is used commonly as a coating compound, it being a conventional practice to coat the wire or rod with lime by hot dipping prior to drawing the wire with lime powder and soap which are placed in a die box immediately in advance of the die. This coating of the rod must be repeated for each drawing.

In addition to the disadvantages incident to the use of the lime through the necessity of applying recoatings, when lime is used for the coatings there inevitably result disadvantages of sloppy lime-covered floors in the cleaning house and in the baker room, where the lime coating is baked on the rod. Also, further disadvantages in the use of lime arise from the very air of the mills being filled continuously with lime dust and the floors and all of the equipment and apparatus becoming continually coated with a layer of fine lime dust.

The present invention avoids these and other objections by eliminating lime altogether and by providing a wire drawing lubricant which enables a very substantial increase in the number of drawings permitted, without applying additional lubricating coatings.

In accordance with the present invention, sulphur, preferably in the form of flowers of sulphur, is mixed in various proportions with wire drawing soap or any of the metallic stearates, it being found in practice that either insoluble or soluble stearates are equally applicable for the purpose of this invention, water-soluble stearates being more readily removable, however, from the wire after drawing; and the mixture is placed in a die box in front of the wire drawing die. The wire is drawn through this dry powder mixture in the die box, which adheres to the wire, the thus-coated wire being drawn through the die and the powder serving as a lubricant in the wire drawing operation.

In practice, it is found that the combination of sulphur and dry soap is so effective that it enables a coil of low-carbon rods, properly pickled and washed in hot water but without any lime whatsoever either in the lubricant or on the wire, to be drawn through nine successive drafts down to 20¼ size wire. Prior to the present invention, it has been impossible to draw wire in this manner nine successive drafts that did not have lime in the coating.

It is found in practice that it is needed to apply the dry powder to the rod being drawn into wire only on the first draft. While the improved powder lubricant can be used in the die box for each draft, in practice it is not found necessary to do so. When drawing a No. 5 rod down to 20¼ size wire, the powder forms a coating on the wire which remains on the wire all the way down to the last draft.

Prior to the present invention it has been impossible to draw nine drafts from an uncoated No. 5 rod by using lime with soap or a stearate in the die box, it being necessary first to coat the rod with lime by hot dipping, the coating being required to be repeated between the draws.

The preferred composition of the improved lubricant is as follows:

	Parts
Flowers of sulphur (by weight)	4
Wire drawing soap (calcium stearate)	3

However, these proportions may be varied in practice, as will be found to be required, depending on the type of soap that is used and condition of service. Thus, two parts of flowers of sulphur to one part of calcium stearate gives excellent results.

Instead of calcium stearate, other metallic stearates which are insoluble in water may be used with the flowers of sulphur, as will become apparent, the proportions being determined. Also, while flowers of sulphur are preferred, other forms of finely comminuted elemental sulphur may be employed. In any case, a uniform mixture of the sulphur and soap is produced for use.

I claim:

1. The process of drawing wire, which consists in applying to the wire a wire-drawing lubricant consisting essentially of a dry mixture of sulphur and wire-drawing soap in the proportions of from two to four parts by weight of sulphur and from one to three parts by weight of wire-drawing soap, and drawing the thus-lubricated wire through a wire-drawing die.

2. The process of drawing wire, which consists in applying to a stock to be drawn into wire, a wire-drawing lubricant composed essentially of a dry mixture of sulphur and a metal stearate in the proportion of from two to four parts by weight of sulphur and from one to three parts by weight of metal stearate, and drawing the thus-lubricated stock through a wire-drawing die.

3. The process of drawing wire, which consists in applying to a stock to be drawn into wire, a wire-drawing lubricant composed essentially of a dry mixture of sulphur and a metal stearate selected from the class of stearates consisting of water-insoluble stearates and water-soluble stearates, said dry mixture being in the proportion of from two to four parts by weight of sulphur and from one to three parts by weight of the stearate, and drawing the thus-lubricated stock through a wire-drawing die.

4. The process of drawing wire, which consists in applying to a stock to be drawn into wire, a wire-drawing lubricant composed essentially of a dry mixture of sulphur and a metal stearate in the proportion of from two to four parts by weight of sulphur and from one to three parts by weight of the stearate, and drawing the thus-lubricated stock into wire by a multiplicity of drafts, one application of the said lubricant effectively lubricating the stock through all of the drafts without requiring re-application of the lubricant to the stock between the drafts.

5. The process of drawing wire, which consists in applying to a stock to be drawn into wire, a wire-drawing lubricant composed essentially of a dry mixture of sulphur and calcium stearate in proportions of from two to four parts by weight of the sulphur and from one to three parts by weight of calcium stearate, and drawing the thus-lubricated stock through a wire-drawing die.

6. The process of drawing wire, which consists in applying to a stock to be drawn into wire, a wire-drawing lubricant composed essentially of a dry mixture of sulphur and a metal stearate selected from the class of stearates consisting of water-insoluble stearates and water-soluble stearates, the said dry mixture being in the proportion of from two to four parts by weight of sulphur and from one to three parts by weight of the stearate, and drawing the thus-lubricated stock into wire by a multiplicity of drafts through wire-drawing dies, one application of the said lubricant effectively lubricating the stock through all of the multiplicity of drafts without requiring re-application of the lubricant to the stock between the drafts.

7. The process of drawing wire, which consists in applying to a stock to be drawn into wire, a wire-drawing lubricant composed essentially of a dry mixture of sulphur and a metal stearate selected from the class of stearates consisting of water-soluble stearates and water-insoluble stearates, the said dry mixture being in the proportion of from two to four parts by weight of sulphur and from one to three parts by weight of stearates, the said stock consisting of uncoated No. 5 low-carbon rod, and drawing the thus-lubricated rod into wire by a multiplicity of drafts through wire-drawing dies, there being up to nine of the said drafts, one application of the said lubricant effectively lubricating the stock through all of the drafts without requiring re-application of the lubricant between the drafts.

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