

# UNITED STATES PATENT OFFICE.

CHARLES HENRY RIDSDALE, OF GUISBOROUGH, AND ALFRED JONES, OF  
MIDDLESBOROUGH, ENGLAND.

## LUBRICANT.

SPECIFICATION forming part of Letters Patent No. 486,196, dated November 15, 1892.

Application filed November 17, 1891. Serial No. 412,137. (No specimens.)

*To all whom it may concern:*

Be it known that we, CHARLES HENRY RIDSDALE, analytical chemist, of The Grange, Hutton, Guisborough, and ALFRED JONES, rolling-mill manager, of Cleveland View, Newport Hill, Middlesborough, both in the county of York, in the Kingdom of England, respectively, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Lubricants, of which the following is a specification.

The object of this invention is a lubricant especially suitable for heavy machinery, such as the necks of rolls in iron and steel rolling mills, heavy engine-shafts, axles, &c. Hitherto it has been usual to apply the lubricant by some such method as smearing it on (which entails great waste) or inclosing it in bags or some outer covering permeable by the lubricant, (which necessitates the use of lubricants of low melting-points and viscosity,) in consequence of which great waste ensues, and also the bearings are less perfectly protected from wear than by a more solid lubricant.

We make the lubricant in solid form, as blocks, bars, slabs, &c., suitable to the requirements of the machinery, or as a more or less solid grease, according to consistency required, where preferable, and in order to obtain a lubricant which will resist the effects of high temperature and water, singly or combined, without undue wear we use a hard insoluble alkaline-earth soap, and combine therewith oils, ordinary soap as met with in the market, and a solid mineral lubricating material, as mica, plumbago, or sulphur, or a mixture of these.

For the harder form of lubricant we prefer a mixture substantially as follows: lime hydrate, three per cent.; tallow, twenty-one per cent.; total, twenty-four per cent.; ordinary soap, six per cent.; suet, tallow, or other saponifiable oil or grease, fifty-four per cent.; fine plumbago, sixteen per cent.

For a softer kind of lubricant, the following is a suitable formula: lime hydrate, two per cent.; tallow, fourteen per cent.; lime-soap, sixteen per cent.; rendered suet or tallow, thirty-one per cent.; sulphur, nine per

cent.; plumbago, fourteen per cent.; heavy petroleum-oil, thirty per cent.

For some kinds of work we prefer simply a mixture of hard insoluble alkaline-earth soap and sulphur in various proportions.

We would have it understood that the above proportions are not to be taken as binding, as considerable variation may be made therein.

On preparing the lubricants it is preferable to mix the oil or grease or equivalent fatty matter to be saponified with a greater or less quantity of the ordinary soap, as this induces the saponification to commence. The alkaline earth, &c., is then added either dry or made up into a sirup with a small quantity of water, and heat is then applied and all the uncombined water driven off. In this way the lime-soap is formed in the mass and intimately mixed much more quickly than if formed separately and added, the ordinary soap greatly aiding the saponification. The remainder of the ingredients is then added and the mass preferably cast into blocks or bars and allowed to cool.

In conclusion, we are well aware that a mixture of insoluble soap and plumbago has been proposed for this purpose; but such mixture is of a pulverulent or soft nature, and the insoluble soap has been added to the plumbago to assist in causing it to adhere to the surface and is in the proportion of about thirty-three per cent. of the mass. In our case we add, as a rule, only from two to five per cent. of insoluble soap, and this is mixed with ordinary potash or soda soap, as sold for washing purposes, preferably soda-soap, to harden it. We are further aware that lime in dry powder has been added to grease and other material to correct acidity; but in this case it is only a simple mixture, and an alkaline-earth carbonate, which under no circumstances will make a soap, is generally mentioned as an equivalent, and, indeed, for this purpose mechanical admixture to cure acidity will do just as well; but

We declare that what we claim is—

1. A lubricant consisting of the combination of hard alkaline-earth soap, ordinary soap, fatty matters containing a large amount

of stearine, and a solid lubricating material, the whole forming a somewhat-greasy body capable of just being scraped by the nail and not fusing under the boiling-point of water.

- 5 2. A lubricant consisting of the combination of an alkaline earth and fatty matters consisting largely of stearine, ordinary soap, and sulphur, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of 10 two subscribing witnesses.

CHARLES HENRY RIDSDALE.  
ALFRED JONES.

Witnesses:

DAVID DAVIES,  
PERCY A. G. BROADBRIDGE.