

UNITED STATES PATENT OFFICE.

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LUBRICATING EMULSION.

1,035,868.

Specification of Letters Patent.

Patented Aug. 20, 1912.

No Drawing.

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To all whom it may concern:

Be it known that I, EDWIN A. EMERY, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented new and useful Improvements in Lubricating Emulsions, of which the following is a specification.

This invention relates to lubricants for apparatus operated by compressed air and more particularly instances where leather is employed as packing in machinery of this class, such as pistons of cylinders in air brake apparatus, and the like.

One of the objects of my invention is to provide an improved lubricant emulsion of a soft or semi-fluid consistency which may be readily applied to the cylinders or other parts of pneumatic apparatus and having the properties of affinity for and solubility in the moisture of the compressed air, and adapted to be distributed by the action of such air over the surfaces to be lubricated.

Another object of my improvement is to provide a lubricant emulsion adapted to have a cleansing effect upon the packing leathers and other parts to which it is applied, to permeate the leather or other packing material used under the action of the air pressure, to fill the pores therein, to prevent the hardening or drying of the same, and to form a coating upon the wearing surface thereof whereby the efficiency and life of the packing is greatly increased.

A preferred composition of lubricant may comprise an ingredient such as saponaceous matter soluble in the moisture of the air, a non-refrigerant and leather softening ingredient having an affinity for moisture, such as glycerin, a finely divided insoluble ingredient, such as amorphous graphite, or powdered soapstone, adapted to fill the pores of the leather and form a coating thereon to preserve same and increase wearing qualities, and a sufficient quantity of mineral lubricating oil to give a soft or semi-fluid consistency such as is desirable in this class of lubricants. It will of course be understood that any other equivalent ingredients having the desired properties may be employed in lieu of those specifically named herein.

It is desirable that the saponaceous matter employed should be soft and plastic and also retain a suitable degree of solubility, and for this purpose I prefer to use animal fats or vegetable oils, or a combination of

both, reduced to a saponaceous condition with a caustic potash solution.

A preferred method of making the lubricant is as follows:—Melt together about equal portions of tallow and cottonseed oil at about 180° F., making 12 or more parts; then mix about 14 parts of caustic potash solution (about 22° Baumé) with about 22 parts glycerin and add the mixture slowly to the melted tallow and cottonseed oil until saponification occurs, then heat about 50 parts of mineral lubricating oil, of suitable body to give the desired consistency, to the same temperature as the mass and mix together slowly; this amount of oil will give a fluid body to the mass and add to its lubricating qualities, but will not separate or render the mass insoluble; and lastly add about 7 or more parts of finely divided graphite, the amorphous or so-called air floated variety being preferred. It will be found that this produces a smooth emulsion in which the soap and glycerin act as a menstruum for supporting the mineral oil and the graphite. The mineral oil should have a specific gravity of about .85 or .90 and a viscosity approximating that of cylinder oil. A mixture of equal parts of Atlantic red engine oil, cylinder stock and paraffin oil serves admirably for this purpose. The lubricant then cools as a semi-fluid mass and is ready for use by being injected into the cylinders or other parts of the pneumatic machinery, or it may be placed directly in the groove formed in the piston for the expander ring, also by coating the cylinder walls, or applied in any other way as desired.

The glycerin present in my lubricant is in decided excess of the quantity of glycerin liberated as the chemical equivalent of the fatty acids in the soap produced by saponification and is present in such amount as to enable it to act as a non-refrigerant preventing the lubricant from becoming hard or stiff even at low temperatures. It also serves to attract the moisture of the air to the mass for dissolving the saponaceous matter, prevents drying out and keeps the leather soft and pliable. The graphite serves to fill the pores of the leather and ultimately forms a sort of coating on the wearing surface thereof, which protects the leather, takes the wear and greatly increases the efficiency and life of the packing.

The mineral lubricating oil should be prepared of the proper consistency before adding to the mass and a satisfactory oil for this purpose may be obtained by mixing
5 about equal parts of a heavy mineral oil such as cylinder stock with a lighter variety.

After the lubricant is applied in position for use it is subjected to the action of the compressed air employed in operating the
10 apparatus and the glycerin attracts moisture in the air to the lubricant and gradually dissolves the saponaceous ingredients thereby disintegrating the lubricant, setting free
15 a smooth emulsion with the oil which is forced upon and into the leather packing by means of the air pressure. In this manner it permeates the packing leathers, the graphite filling the pores and stopping all leaks, and
20 finally forming a permanent coating upon the leather, thereby preserving the same and increasing its durability and efficiency. In actual use my improved lubricant also has the following additional advantages; the
25 well known property of glycerin in attracting moisture prevents the compound from hardening or drying out in the atmosphere even in hot dry climates where sufficient moisture will be attracted to maintain the
30 lubricant in its soft or semi-fluid condition; this property also prevents any hardening or gumming of the lubricant upon the working

parts of the machinery. The glycerin also, on account of its non-refrigerant properties, prevents any freezing or stiffening of pack- 35
ing leathers due to the presence of the moisture in low temperatures or to the refrigerative effect of expansion of the air currents. The cleansing action of the saponaceous ingredients has the tendency to prevent the 40
accumulation of dirt in the cylinders and other parts where the lubricant is employed and thereby keeps the apparatus clean during long periods of service.

Having now described my invention, what 45
I claim as new and desire to secure by Letters Patent, is:

1. A lubricant consisting of an emulsion of mineral oil and plumbago (or graphite) in a menstruum of soap and glycerin. 50

2. A lubricant consisting of an emulsion of mineral oil and plumbago (or graphite) in a menstruum of a water-soluble soap and glycerin.

3. A lubricant consisting of an emulsion 55
of mineral oil and plumbago (or graphite) in a menstruum of potash soap and glycerin.

In testimony whereof I have hereunto set my hand.

EDWIN A. EMERY.

Witnesses:

WM. M. CODY,
A. M. CLEMENTS.