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UNITED STATES PATENT OFFICE

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SYSTEM OF LUBRICATION

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This invention relates to improvements in methods of lubrication and an article adapted for such use.

It has been heretofore proposed to project a stream of lubricant under pressure upon the bearings or other articles to be lubricated, but usually a hydrostatic pressure was employed, obtained by means of a pump acting upon the liquid to be delivered, or compressed gas was delivered against the body of the liquid to be projected substantially at the moment of delivery.

In opposition to such systems, according to the present invention a lubricant liquid is saturated with and used as an absorbent for an inert gas, which under the conditions of pressure constantly prevailing during storage and at the moment of delivery, will cause a substantial portion of the gas to be retained within the liquid, so that it is released therefrom in substantial proportion as the container is evacuated. In other words, the gas pressure is self-regenerated within the container, so that a fairly constant pressure is maintained within the container, between maximum and minimum volumes of liquid therein. In this way, on the one hand, the liquid is delivered under a substantially steady pressure, and not under a rapidly decreasing pressure as would be the case with the simple expansion of an undissolved gas during the liquid delivery, and on the other hand, the liquid is expelled up to the last drop under the high pressure which delivers it forcibly against the elements to be lubricated.

This feature of the invention depends upon the discovery that certain hydrocarbon oils, in particular the oils employed for lubrication, are capable of absorbing or dissolving large quantities of gases, especially carbon dioxide gas, under pressure; that this gas is held within the liquid without substantially increasing the volume thereof; and that the mixture, upon reduction of the pressure, readily yields up the absorbed gas.

The use of the liquid under pressure of the dissolved gas permits of the application of the system and method by the placing upon the market of small, cheap individual containers, and holding a quantity of the gas-liquid mixture, and having a manually operated discharge valve, so that the operator may manipulate the valve and deliver as little or as much of the lubricant as he desires in a forcible stream which may be projected under the conditions set forth herein for a distance of fifteen or twenty feet with great accuracy. The power of the stream is sufficient to sweep out of its path at the ordinary working distances of projection, any particles of dirt which may be present to obstruct the free flow of lubricant.

A further feature of this invention is the fact that the lubricant is constantly giving off gas as the pressure upon it is released during the act of lubricating, so that the liquid forms a mass of whitish bubbles of much greater volume than that of the liquid itself. In this way, the point of impact of a stream of liquid is clearly indicated to the operator by the volume and color, so that he is enabled to direct the stream whithersoever he will.

According to the present invention, a lubricating oil is prepared from a light paraffin oil mixed with a small quantity of kerosene and an inert gas is dissolved therein to saturation and in a quantity greatly in excess of the volume of the lubricant. The mixed oils are agitated in a closed vessel in the presence of carbon dioxide gas which is admitted under increased pressures. The gas is admitted until the quantity of gas in the oil is such that the resulting product will exert a pressure of up to 50 to about 75 lbs. per square inch when the container is closed. In the winter the pressure is preferably around 50 lbs. per square inch and in the summer preferably around 75 lbs. per square inch. The material thus prepared may be stored for the year long and may be employed in hot or cold weather without substantial loss of projective power.

The mixture so prepared is then placed in cans or bottles for distribution. It is preferred to have cans for this purpose such as are described in my application Serial No. 112,584, filed May 29, 1926, which have a valve mounted on the top and a feeder duct extending downward into the can and in substantial contact with the bottom thereof at a

low internal pressure; when the internal pressure is increased, say from atmospheric to 50 or 75 lbs. per square inch, the pressure within the can causes the ends to be bulged until the tube is displaced from the bottom of the can, thus assuring a free flow of the lubricant mixture to the upper inner end of the pipe. As the lubricant mixture is discharged, the pressure will drop slightly, say to 20 or 25 lbs. per square inch within the can at near the point of exhaustion and the bulged ends will again collapse, permitting the tube to approach the bottom of the can more and more, so that the last few drops of oil may be blown out through the feeder duct.

This article is particularly adapted for use in lubricating automobile and similar parts, since it is unnecessary for the operator to crawl beneath the machine to reach the surfaces to be lubricated; the delivery of the oil is so forcible that the stream may be projected upon practically any element which may be seen from any direction; in particular, it may be pointed out that it has been found possible in practice to lubricate the springs of an automobile by projecting oil beneath the chassis from the opposite side of the vehicle. The same package with the same contents may also be used for lubricating other machine elements, such as sewing machines, typewriters, door hinges, clock parts and in general, for delivering a lubricant under considerable pressure at any point which which may be reached by the trajectory of the stream, or by drainage from a point which may be so reached.

The invention is not limited to the specific applications set forth; but may be employed in the preparation of other devices for dispensing liquids and delivering them by directed projection to a distance, and that such and other employments are within the scope thereof.

I claim:

1. A lubricating composition consisting of liquid hydrocarbon lubricating oils charged with an inert gas under pressure.

2. A lubricating composition consisting of liquid hydrocarbon lubricating oils charged with carbon dioxide gas under pressure.

3. A lubricating composition consisting of liquid hydrocarbon lubricating oils having dissolved therein an inert gas in such proportions that the resulting product will exert a pressure greater than atmospheric pressure when in a closed container.

4. A lubricating composition consisting of liquid hydrocarbon lubricating oils charged with an inert gas under a pressure of up to 50 to 75 lbs. per square inch.

5. A lubricating composition consisting of a mixture of light paraffin and kerosene oils having dissolved therein carbon dioxide gas in such proportions that the resulting product will exert a pressure of up to 50 to 75 lbs. per square inch when in a closed container.

6. A composition of matter comprising a light hydrocarbon oil, liquid at ordinary temperatures and pressures, saturated with carbon dioxide gas under more than atmospheric pressure.

7. A composition of matter comprising a light hydrocarbon oil, liquid at ordinary temperatures and pressures, and charged with an absorbed neutral gas under a pressure of several atmospheres.

In testimony whereof, I affix my signature

JOHN F. WERDER