Patented July 14, 1953 2,645,614

UNITED STATES PATENT OFFICE

2,645,614

METAL-WORKING LUBRICANT

Wilbur C. Holmes, Hollydale, Calif., assignor to Tap and Drill Ez Corp., Inglewood, Calif., a corporation of California

No Drawing. Continuation of application Serial No. 48,149, September 7, 1948. This application October 29, 1951, Serial No. 253,755

8 Claims. (Cl. 252—56)

1

My invention relates to the field of lubricants; particularly to a lubricant adapted for use on drills, taps, cutting tools, grinding wheels, and the like, and is a continuation of my patent application Serial No. 48,149, filed September 7, 1948, entitled "Lubricant," and now abandoned.

In the high-speed drilling of metals and plastic materials, as well as in the tapping of the resulting holes, it is desirable to have a lubricant on the drill or tap which will not be displaced therefrom by centrifugal force, nor flow therefrom as a fluid due to the heat generated during this mechanical operation. A number of lubricants have been developed in the past for use with drills and taps, but the majority of them are in liquid form. As is well known, any liquid lubricant is easily "thrown" from a high-speed drill, and as a result liquid lubricants fail to serve the purpose for which they are intended and also spatter the operator as well as everything in the immediate vicinity thereof.

Due to the fact that prior lubricants tend to be displaced from a drill or tap when in operation, the tools are subject to the risk of lack of proper lubrication at a critical time, resulting in imperfect drillings and tappings, and a loss of time and materials. Many times when an imperfectly drilled or tapped hole is obtained, the operator mistakenly assumes that the drill or tap is the cause and discards the tool, which adds to production cost. It is to eliminate the disadvantages of the previous lubricants that I have devised my present invention, which may be applied in a paste form to drills, taps, cutting tools, and grinding wheels.

A major object of my invention is to provide a paste lubricant that may be applied in that form to a drill, tap, cutting tool or grinding wheel to prevent heating of such tool when in operation to cause damage thereto, with the paste having a sufficiently high consistency to permit it to remain on the tool even during high-speed rotation.

Another object of my invention is to provide a lubricant that is non-inflammable, is convenient to use, will have a sufficiently high melting point so as not to assume a liquid state due to the heating of the tool on which it is applied as the tool performs its particular mechanical operation, and one that can be compounded from commercially available materials which are relatively low in cost whereby the sale thereof is at such a price as to encourage its widespread use.

A further object of my invention is to provide a lubricant which will lower production cost in that ordinary inexpensive carbon drills may be operated at the same speeds and drill substantially all materials for which high speed drills

2

are required, when lubricated with my new and novel lubricant compound.

Yet another object of my invention is to provide a lubricant which when applied thereto will permit grinding wheels to be used in grinding soft materials such as brass and aluminum without the ground material adhering to the wheel.

A still further object of my invention is to provide a lubricant that will maintain a drill or tap in a sufficiently cool condition to permit drilling or tapping of plastic materials without melting or fusing of the plastic surface.

These and other objects and advantages of my invention will become apparent from the following description of a preferred form thereof.

The composition of my lubricant preferably includes and consists essentially of carbon tetrachloride, paraffin wax, beeswax, and lubricating oil such as is commonly used in internal combustion engines.

For best lubricating results, it has been found desirable that these materials be intermixed in proportions by weight falling within the following ranges:

2 to 6 parts paraffin wax
3 to 5 parts beeswax
1 to 3½ parts machine lubricating oil
1 to 2 parts carbon tetrachloride

Two typical formulas which have proven satisfactory are the following:

Composition A

	Parts
Paraffin wax	2
Beeswax	3
Machine lubricating oil	1
Carbon tetrachloride	1

Composition B

	Parts
Paraffin wax	6
Beeswax	5
Machine lubricating oil	3½
Carbon tetrachloride	2

Of these two formulas, the first listed is in some respects better for most metal working operations.

In preparing my lubricant I have found that it may be compounded by mixing and agitating the components thereof together until the mixture assumes the characteristics of a paste. The purpose of the carbon tetrachloride is that of a fire preventative. Although the lubricant of my invention minimizes heat generated by a cutting or drilling tool while in operation, the carbon

tetrachloride component thereof prevents ignition of the other components in the case of excessive heat. In addition, the carbon tetrachloride serves as a cooling agent and lubricant for a rotating tool. The paraffin wax and oil cooperate to provide the primary lubricant of the compound. I have found that the paraffin wax may have a melting point of between 143° to 170° Fahrenheit, but I prefer a wax which has a melting point of approximately 165° Fahrenheit. Although waxes such as carnauba wax, ceresin, candelilla, and the like, have been used successfully, the best results are obtained with paraffin wax.

Beeswax is employed in my lubricant compound its tough, pliable body as well as its polishing action on any surface with which it comes into rubbing contact. The melting point of beeswax is from 140° to 149° Fahrenheit, and it acts as a lubricant as soon as a cutting tool begins to generate heat due to friction, with the paraffin remains in a semi-solid state until a considerably higher temperature is reached.

Lubricating oil is employed in my compound to act as a carrying vehicle for the paraffin wax and beeswax, and serves to give a smooth finish to the walls of the hole being drilled or tapped, as well as to permit the paste lubricant to be spread thinly and evenly on a grinding wheel. The lubricating oil may be any one of the commercially available oils for the lubrication of machinery, and while not essential, should preferably be of a viscosity 40 Saybolt. I have successfully used lubricating oils with a viscosity as low as 20 Saybolt, and in the opposite extreme, oils of such consistency that they border on grease. In the commercial production of my lubricant I normally use oil drainings from automobiles which have been thoroughly processed to remove any metallic content. Thus it will be apparent that the type and viscosity of the lubricating oil used in my lubricant compound is not important so long as the amount added thereto does not prevent it from remaining in the paste form. I have found that various commercially available cutting oils may be used as a substitute for a machine lubricating oil, but I have not found this to be completely satisfactory as some cutting oils stain various metals normally unaffected by a machine lubricating oil.

The preparation of my invention is extremely simple. After the components of my lubricant have been thoroughly mixed together and agitated they form a paste having droplets of carbon tetrachloride dispersed therethrough. The resulting paste is then packaged in cylindrical tubes or containers for use. I have found that narrow cylindrical containers of approximately one inch in diameter and from five to six inches in length to be a most convenient size for the average machine operator. However, a larger container may be used which is adapted for placement on a bench and the cutting tools and parts may be dipped prior to use.

My lubricant is adapted for use on either inexpensive carbon drills or high speed drills. From experience I have found that a carbon drill can be used for drilling substantially all materials on which high speed drills are normally used. Such materials include chrome-molybdenum steel, stainless steel, plow steel, boiler plate, cyanide hardened steel, casting having chill hardened spots, ketos steel, brass, copper, herculoy, and the various synthetic plastics.

The result achieved by carbon drills with my lubricant have been found sufficiently accurate for precision work, and are equal to the results attained by high speed drills. It has been found that the life of both high speed and carbon drills have been prolonged when my lubricant has been used in conjunction therewith, which results in considerable savings. My lubricant permits a carbon drill to be successfully used in forming a smooth bore in hard materials such as files, and the bore so formed has a sufficiently smooth surface to allow easy tapping thereof. Thus by the use of the compound of my invention a carbon drill may be used in the same manner and for the same purposes as a high speed drill.

While the above described lubricant is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred form of my invention, and that I do not mean to limit myself to the details herein shown and described other than as defined in the appended claims.

I claim:

1. A tool lubricant composition in a paste form consisting essentially of substantially two parts paraffin wax, three parts beeswax, one part machine lubricating oil, and one part carbon tetrachloride on a weight basis, with a portion of the carbon tetrachloride disposed through the paste in the form of droplets.

2. A tool lubricant composition in a paste form consisting essentially of substantially two parts paraffin wax, three parts beeswax, one part machine lubricating oil, and one part carbon tetrachloride on a weight basis.

3. A tool lubricant composition in a paste form consisting essentially on a weight basis of two to six parts paraffin wax, three to five parts beeswax, one to three and one-half parts machine lubricating oil and one to two parts carbon tetrachloride.

4. A tool lubricant composition in a paste form consisting essentially of two to six parts paraffin wax and three to five parts beeswax, to which machine lubricating oil and carbon tetrachloride is added during agitation of the mixture until said mixture assumes the form of a paste.

5. A tool lubricant composition comprising 2 to 6 parts by weight of paraffin wax, 3 to 5 parts by weight of beeswax, and lubricating oil, and having the consistency of a paste.

6. A tool lubricant composition as recited in claim 5, including carbon tetrachloride.

7. A tool lubricant composition as recited in claim 5, including one to three and one-half parts of said lubricating oil.

8. A tool lubricant composition as recited in claim 5, including one to three and one-half parts of said lubricating oil, and including carbon tetrachloride.

WILBUR C. HOLMES.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,948,194	Williams	Feb. 20, 1934
1,953,904	Bowyer et al.	Apr. 3, 1934
2,298,844	Schilling et al.	Oct. 13, 1942
2,444,357	Maguire	June 29, 1948
2,466,927	Burton	Apr. 12, 1949

OTHER REFERENCES

"Chip Formation, Friction and Finish," Ernst & Merchant, Cincinnati Milling Machine Co., Cincinnati, Ohio, 1940, page 27.