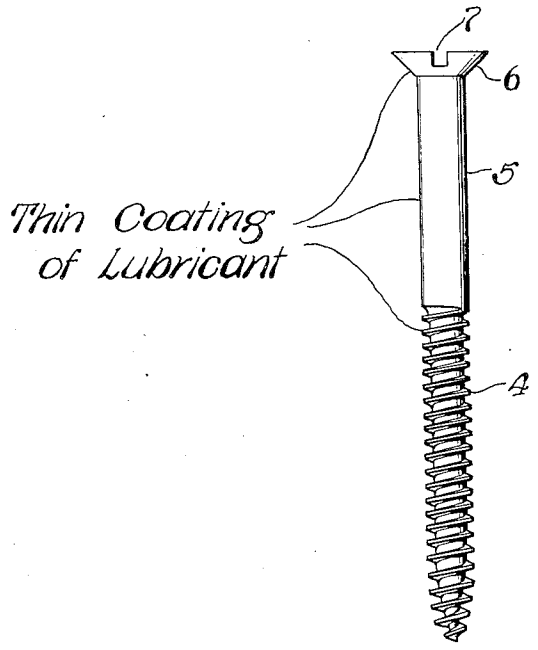
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LUBRICATED SCREW

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LUBRICATED SCREW

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The invention pertains to screws, adapted for entry into wood or similar substance, and has more particular reference to metallic wood screws of this type, having a coating of a lubricating material applied thereto for the purpose of facilitating the operation of driving the screws into wood or other hard substance.

It is of course, well known that by applying a lubricant such as beeswax to the threaded portion of a screw, a substantial reduction in the driving force required may be effected. In fact, some large users of screws such as automobile body manufacturers have adopted the practice of dipping the screws in molten beeswax for this purpose. This practice, however, is expensive, and further, it results in the application of a heavy coating of the wax with an attendant gummy and sticky surface to which dirt and grit will adhere, so that it is capable of employment only by the users of the screws.

The primary object of our invention is to provide as a new article of manufacture, a wood screw or the like having an applied coating of a lubricating material in the form of a thin film firmly adhering to the metallic surface of the screw and of such character as to facilitate substantially the driving operation, but at the same time avoiding a sticky and gummy surface, thereby rendering the production of such screws for general distribution entirely practicable.

A further object is to provide a screw having a relatively hard and smooth surface coating which is substantially incapable of detection by the ordinary senses of touch and sight, but nevertheless effective to a high degree in facilitating the passage of the screw into the work and this without reducing its holding power.

Still another object is to provide as a new article of commerce a practical lubricated screw capable of being produced at a cost not materially greater than the cost of ordinary screws.

In the accompanying drawing we have shown a side elevational view of a screw embodying our invention.

While the invention is not limited to screws of any particular kind or character, we have shown in the drawing a conventional wood screw having a body with a threaded lower end portion 4 and an unthreaded upper end portion 5. The latter carries a head 6 with the usual driving kerf 7 cut in its upper surface. To the outer surface of the screw is applied a coating of a liquid lubricating material providing an extremely thin film firmly adhering to the metallic surface of the screw and presenting a hard dry finish at normal temperatures. For best results this material is applied to the screw in a quantity so small as to be substantially imperceptible. In the drawing it is designated by the legend "Thin Coating of Lubricant".

Preferably, the coating is applied to the entire metallic surface not only because this is more convenient from the manufacturing standpoint, but because it is found that the coating material serves to protect the metal of the screw against rust or corrosion. While the coating material is thus applied to the head with its driving kerf 7, this is not objectionable when the coating is very thin in that the quantity of material lodging in the kerf is not sufficient to cause slippage between the driving bit and the walls of the kerf.

In practice, the coating material is applied by submerging the screws into a liquid bath of the desired characteristics. For this purpose, a convenient quantity of screws is placed in a suitable carrier or hanger, which may be made of wire or the like, and upon the removal of the screws from the bath they are subjected to centrifugal action while still in the carrier. Preferably, heat is applied to the solution in a sufficient quantity to maintain a high degree of fluidity, so that when the screws are subjected to the aforesaid centrifugal action, the amount of material adhering to the metallic surface is so small as to be practically imperceptible.

It will be observed that by applying the coating to the screws in the manner above set forth, the entire surface thereof becomes coated. This is advantageous because it permits of the rapid treatment of a large number of screws simultaneously. Moreover, when the screws are submerged in a heated solution, the heat of the material is imparted to the screws so that when the latter are withdrawn from the bath the cooling of the material is sufficiently retarded to insure removal of all but a very thing coating.

It will of course be understood that the particular ingredients employed in the solution may be varied within the spirit and scope of our invention. A satisfactory coating bath may be obtained by using one part of the following concentrated solution with four parts by volume of water:

	Per cent by weight
Hard soap (preferably in flake form)	2.5
Beeswax	12.5
Stearic acid	25.0
Potash	5.0
Water	55.0

When the above solution is cold, it takes the form of a relatively thick emulsion, but by the application of heat its viscosity may be reduced to the desired degree to permit of the application of a thin coating. The stearic acid and potash combine to form a soft soap which, like beeswax, is an excellent lubricant for facilitating the driving of screws into wood and like material. This

soft soap and beeswax will mix or combine in any proportion. However, if the amount of beeswax employed is materially increased, a sticky surface results. Through the use of a small amount of hard soap, a harder finish is obtained in the composition.

It is of the essence of our invention that the lubricating material be applied in the form of a liquid so as to form a thin film, and that it be of a character such as to insure that this film shall adhere firmly to the metallic surface of the screw. Also it is important that the coating material shall present a dry hard finish at normal temperatures, which does not become sticky in warm weather, does not detract from the appearance of the screw and offers no objection on account of a tendency for dust and grit to adhere thereto. Moreover, due to the character of the material and the method of applying the same, the cost of manufacture is not increased materially over ordinary screws.

In the use of the improved screw, it has been found that notwithstanding the application of an extremely thin substantially imperceptible coating, the operation of driving the screws into wood or other substance is substantially facilitated. Consequently, substantially less force is required for the driving operation. In this connection, tests have shown a reduction of from one-half to two-thirds of the driving force required as compared to ordinary screws. Moreover, where the screws are driven by power actuated screw driving tools into hard wood, as in the case of automobile body manufacture, a large saving is effected due to the substantial elimination of breakage of the screws. Finally, in the driving operation, the heat of friction developed between the screw and the work apparently produces a melting of the coating material which subsequently hardens, thus serving to set or bind the screw in position.

We claim as our invention:

1. As a new article of manufacture, a metallic screw having a coating of a lubricating material in the form of a thin film firmly adhering to the entire metallic surface of the screw and applied uniformly to such surface in a quantity so small as to be substantially imperceptible, said coating presenting at normal temperatures a hard dry finish to avoid the adherence of grit.

2. As a new article of manufacture, a metallic screw having a coating of a lubricating material in the form of a thin film firmly adhering to the surface of the screw body substantially throughout the length thereof and applied uniformly to such surface in a quantity so small as to be substantially imperciptible, said coating material presenting a hard dry surface at normal temperatures to avoid the adherence of grit.

3. As a new article of manufacture, a metallic screw having an extremely thin coating of a lubricating material applied to the screw body over a substantial portion of its length, said coating material being in the form of a film firmly adhering to the metallic surface and presenting a hard dry surface at normal temperatures to avoid the adherence of grit.

4. As a new article of manufacture, a metallic screw having a coating of a lubricating material in the form of a thin film firmly adhering to the surface of the screw body substantially throughout the length thereof but applied in a quantity so small as to be substantially imperceptible, said coating material presenting a hard dry surface at normal temperatures and comprising a small amount of beeswax combined with a relatively larger amount of soap.

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