UNITED STATES PATENT OFFICE.

JOHN A. KYLE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO GRANT McCARGO, OF SAME PLACE.

MATERIAL FOR PROTECTING SHEETS, &c., IN TINNING.

SPECIFICATION forming part of Letters Patent No. 679,972, dated August 6, 1901.

Application filed May 27, 1901. Serial No. 62,073. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN A. KYLE, a citizen of Great Britain, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Material for Protecting Sheets, &c., in Tinning, of which improvements the following is a specification.

In the manufacture of tin and terne sheets it is necessary to cover the tin or lead bath with a suitable material which shall protect the sheets, the tinning-rolls, and also the bath from oxidation. The material heretofore used and found most suitable for that purpose is palm-oil. This material is not only expensive, but is objectionable on account of its decomposition, which effects a thickening of the oil and produces a black ash or residue which will choke the bath.

The object of the present invention is to provide a material for the purpose specified of such a character as will perform the protective functions of palm-oil and is also cheaper and practically free from oxidation.

The invention is hereinafter more fully described and claimed.

In the practice of my invention I employ as a principal ingredient of the mixture fatty acids which are insoluble in water and are derived from natural fats, either vegetable or animal, and which solidify at or above 68° Fahrenheit and are practically non-oxidizable at the melting-point of tin. These fatty acids require the addition of some material to protect them as against injury by high heat and to maintain them in a sufficiently fluid condition for the purpose at the temperature at which the coating is effected. I have found that a petroleum product having a fire test between 400° and 725° Fahrenheit forms a most efficient solvent for the purpose. In manufacturing tin plates the solvent is of a grade having a fire test of about 500° Fahrenheit, more or less, while in manufacturing terne plates, where the temperature of the bath is higher, the solvent should have a fire test of about 700° Fahrenheit, more or less.

Under the general term of "fatty acids" I include especially palmitic acid and stearic acid. These acids are obtained by saponifying and decomposing the natural fats, either vegetable or animal. In treating palm-oil palmitic acid and stearic acid are produced mingled together. These acids so formed or produced may be used in their mixed state or separately, the solvent being added thereto. The stearic acid can be best produced by subjecting the animal fats, preferably tallow, to saponification and decomposition, as is well known in the art, and then subjecting the resulting acid to pressure to eliminate the oleic acid or red oil.

While I include under the term "petroleum" any product thereof of the character specified—*i. e.*, with a fire test between 400° and 725° Fahrenheit however obtained—I have found it advantageous to produce this solvent by boiling down and filtering crude oil until I obtained a product having a specific gravity of about 27.8 Baumé and a fire test of 625° Fahrenheit. This boiled-down oil could be used in most cases alone with the fatty acids when manufacturing terne sheets, but in manufacturing tin sheets, where the temperature of the bath is about 600° Fahrenheit, more or less, it is found desirable to thin the mixture of petroleum product and fatty acid by adding a distillate of petroleum having a specific gravity of 23.5 Baumé and a fire test of 500° Fahrenheit. The boiled oil and the distillate are mixed in about the proportions of seventy-five per cent. of the boiled and twenty-five per cent. of the distillate, although these proportions may be changed as required by circumstances and the temperature at which the coating occurs. When using the boiled oil alone as a solvent for the fatty acid, it is found that a gradual distillation and consequent thickening of the mixture occurs, so that it is necessary to add a little of the distillate to bring the mixture to the required fluidity. The fatty acid or acids are mixed with the solvent in about the proportions of thirty-three per cent. of the fatty acid and sixty-seven per cent. of the solvent; but these proportions may be changed without departing from the spirit of my invention.

While I believe that the fatty acids mentioned are those best adapted to the purpose, I do not limit myself thereto, but under the

terms of the broad claims I include as chemical equivalents of those specifically mentioned any fatty acids which may have the characteristics stated—*i. e.*, solidifying at or above 68° Fahrenheit and practically non-oxidizable by atmospheric air at the melting-point of tin.

I claim herein as my invention—

1. A material for use in coating sheets with metal consisting of a fatty acid solidifying at or above 68° Fahrenheit and practically non-oxidizable by atmospheric air at the melting-point of tin and a solvent of the fatty acid, substantially as set forth.

2. A material for use in coating sheets with metal, consisting of a fatty acid solidifying at or above 68° Fahrenheit and practically non-oxidizable by atmospheric air at the temperature of molten tin, and a petroleum product, substantially as set forth.

3. A material for use in coating sheets with metal, consisting of a mixture of two or more fatty acids which solidify at or above 68° Fahrenheit and are practically non-oxidizable at the melting-point of tin, and a solvent of fatty acids, substantially as set forth.

4. A material for use in coating sheets with metal, consisting of palmitic acid, and a petroleum product, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN A. KYLE.

Witnesses:
DARWIN S. WOLCOTT,
F. E. GAITHER.