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DEICING COMPOSITION FOR AIRCRAFT PARTS AND SURFACES

Theodore Augustine Dissel, Hartford, and Isaac Laird Newell, Wethersfield, Conn., assignors to United Aircraft Corporation, East Hartford, Conn., a corporation of Delaware

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This invention relates to a composition and a process for preventing the formation or accretion of ice on solid surfaces. It is particularly useful in preventing the formation of ice on propeller domes, rods, guides, rails, or wires in such thickness or amounts as to become dangerous on ships or aircraft for example.

It is well known that it is difficult to remove ice that has formed on either metal or non-metal bodies or objects such as cables, rods, guides, and rails, for example, that are provided on such structures as ships, cables, rods, guides, and propeller domes such as are provided on airplanes. It is especially difficult to remove ice when the temperature is quite low, with the result that the hazard of losing control of the craft arises.

With the present invention the formation of dangerous thicknesses of ice on metallic or non-metallic articles is prevented by coating such articles or applying thereto a mixture of certain water-insoluble esters or partial esters and a water soluble salt or ester.

We have discovered that a composition containing certain substantially water-insoluble long chain fatty acid esters or partial esters and strongly ionizable water-soluble inorganic salts or a strongly ionizing, relatively non-volatile salt of an alkyl group with an inorganic acid radical can be applied to the surfaces of metal and non-metal structures or parts, thus lowering the adhesion of ice thereto so that the same can be safely used even at very low temperatures.

The proportions of the materials used in forming the de-icing composition can be varied widely but we prefer to have a larger amount of the insoluble ester in the composition than of the ionizing material. Mixtures containing proportions between 99 parts by weight of ester to one part by weight of ionizing material and 10 parts by weight of ester to 90 parts by weight of ionizing material have been found to be suitable.

These compositions may be dissolved in suitable solvents or lacquers and paints so that they may be applied by spraying or brushing.

The following specific examples are given to illustrate the invention but it is to be understood that the proportions of the ingredients can be varied widely and still produce satisfactory results.

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Example 1

Sorbitan monopalmitate and powdered anhydrous potassium acetate are thoroughly mixed in a mill or by other mechanical means in the proportion of about 10 to 1 by weight, thus forming a stiff paste that can be applied to and will adhere to the surfaces that are to be protected, thus facilitating removal of the ice that may form thereon.

Example 2

Sorbitan monostearate and powdered anhydrous potassium acetate are thoroughly mixed in a mill or by other mechanical means in the proportion of about 10 to 1 by weight, thus forming a stiff paste that can be applied to and will adhere to the surfaces that are to be protected, thus facilitating removal of the ice that may form thereon.

Example 3

Ten parts by weight of sorbitan monostearate polyoxyalkylene derivative and one part of finely divided anhydrous potassium ethyl phosphate are thoroughly mixed until a heavy or thick paste is formed which can be applied to surfaces exposed to ice accretion so that the ice can be easily removed from the objects for example by impact, vibration or shear.

Example 4

The following ingredients are mixed together, making a liquid medium which is suitable for application to surfaces to facilitate the removal of ice accretions:

	Parts by weight
Sorbitan monopalmitate	29.8
Potassium acetate (anhydrous)	3.0
Ethyl acetate	47.5
Ethyl alcohol	17.6
Nitrocellulose—5–6 seconds viscosity, spirit soluble	.6
Bodied castor oil	1.5

What is claimed is:

1. A de-icing composition, consisting essentially of a long chain fatty acid partial ester of sorbitan, selected from the group consisting of

sorbitan monopalmitate and sorbitan monostearate, and anhydrous potassium acetate, these materials being present in the ratio of the sorbitan compound to the potassium compound of about 10 to 1 by weight.

2. A de-icing composition consisting essentially of an intimate mixture of sorbitan monopalmitate and anhydrous potassium acetate in the proportion of about 10 to 1 by weight.

3. A de-icing composition consisting essentially of an intimate mixture of sorbitan monostearate and anhydrous potassium acetate in the proportion of about 10 to 1 by weight.

THEODORE AUGUSTINE DISSEL.
ISAAC LAIRD NEWELL.

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