United States Patent Office 2,783,161 Patented Feb. 26, 1957

2,783,161

WAX COMPOSITIONS

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No Drawing. Application February 1, 1952, Serial No. 269,585

12 Claims. (Cl. 106—270)

This invention relates to improvements in wax compositions, and methods of coating paper therewith, and in the coated paper so produced.

The improved wax composition of the present invention is a petroleum wax composition suitable for coating paper and containing a small amount, less than about 1%, of a solid oil-soluble polyglycol ester such as nonaethylene glycol distearate.

This composition is particularly advantageous for the coating of paper, enabling the packaging or wrapping machine to be operated at an increased rate and with improved slip without reduction in gloss or blocking resistance.

The present invention is concerned particularly with a composition for decreasing the friction between surfaces of waxed articles, such as waxed paper and paper board, when the surfaces in contact are moving past one another.

Often waxed paper and paper board are transported to the user in the form of sheets stacked horizontally in cartons. When the sheets are being utilized from the stacks they are taken away by hand or by machine action and it is important not only that the sheets do not block or stick seriously, but that there be a minimum of friction of the waxed surfaces as they are moving in contact.

I have found that certain polyglycol esters which are solid and wax soluble, such as commercial nonaethylene glycol distearate, decrease friction of waxed surfaces to a marked degree when present in very small percentages in petroleum waxes used for coating paper.

A compound which I have found particularly advantageous is the commercial product sold under the trade name "Paraspread," which is a polyethylene glycol ester of a higher saturated fatty acid such as stearic acid. This product has a melting point of around 29 to 32° C., a saponification value of around 120 to 130, an acid value of around 10 to 14 or less and contains about 58% fatty acids of low iodine value, around 5.2, and can be considered a commercial nonaethylene glycol distearate.

The amount of this wax soluble ester which is combined with the paraffin or other petroleum wax is a small amount, less than about 1%, and advantageously used in smaller amount, e. g., around 0.3%.

This ester is soluble in the wax and readily blended therewith, for example, in amount corresponding to 0.3% of the "Paraspread" dissolved in a paraffin wax having an original Tinius-Olsen tensile strength of 95 pounds per quarter square inch and a melting point of 140.8° F. AMP (ASTM—D87–42).

Such a wax composition can be used in wax coating machines to particular advantage, giving increased feed or speed of the machine.

The wax with which the ester is used may be ordinary paraffin wax but is advantageously a fractionated paraffin wax, fractionally distilled to remove both heavy and low ends and non-normal paraffin type constituents and

with control of the oil content so that the tensile is in a suitably low range and the wax is not too flaky.

The waxes with which the ester is used may also be microcrystalline waxes which are suitable for coating paper, for example, a petroleum ceresin having an ASTM petrolatum melting point (D127–49) of from approximately 170° F. to 210° F. and a needle penetration at 77° F. (ASTM D5–25, 5 seconds, 100 grams) of approximately from 3 to 15 tenths of a millimeter.

The waxes with which the ester is used may also be mixtures of microcrystalline and paraffin waxes such as are used for coating paper. Mixtures in all proportions of microcrystalline wax suitable for coating paper and paraffin wax can thus be used, for example, a mixture containing 90% of paraffin wax and 10% of a petroleum ceresin having an ASTM petrolatum melting point (D127-49) of approximately 170° F. to 210° F. and a needle penetration of 77° F. (ASTM D5-25, 5 seconds, 100 grams) of approximately from 3 to 15 tenths of a millimeter; or a mixture containing 90% of paraffin wax and 10% of a so-called amorphous type of microcrystalline wax having an ASTM petrolatum melting point (D127–49) of approximately 140° F. to 170° F. and having a needle penetration (ASTM D5-25, 5 seconds, 100 grams) of approximately 15 to 35 tenths of a millimeter.

Paper can be coated with the new wax composition in ordinary waxing machines by passing the paper or carton through the wax bath in the usual way.

The coated paper is characterized by low friction and improved slip, such that sheets of paper or paper board coated with the composition not only do not block or stick seriously but have an improved slip and low friction when the surfaces move in contact with each other.

I claim:

1. A wax composition consisting essentially of paper-coating petroleum wax containing a small amount but less than 1% of nonaethylene glycol distearate.

2. A wax composition consisting essentially of paper-coating paraffin wax containing a small amount but less than 1% of nonaethylene glycol distearate.

3. A wax composition consisting essentially of paper-coating microcrystalline wax containing a small amount but less than 1% of nonaethylene glycol distearate.

4. A wax composition consisting essentially of a mixture of paper-coating paraffin and microcrystalline waxes containing a small amount but less than 1% of nonaethylene glycol distearate.

5. The method of coating paper which comprises applying thereto a molten wax composition consisting essentially of paper-coating petroleum wax having incorporated therein a small amount but less than about 1% of nonaethylene glycol distearate.

6. The method of coating paper which comprises applying thereto a molten wax composition consisting essentially of paper-coating paraffin wax having incorporated therein a small amount but less than about 1% of nonaethylene glycol distearate.

7. The method of coating paper which comprises applying thereto a molten wax composition consisting essentially of paper-coating microcrystalline wax having incorporated therein a small amount but less than about 1% of nonaethylene glycol distearate.

8. The method of coating paper which comprises applying thereto a molten wax composition consisting essentially of a mixture of paper-coating paraffin and microcrystalline waxes having incorporated therein a small amount but less than about 1% of nonaethylene glycol distearate.

9. Waxed paper coated with a wax composition consisting essentially of paper-coating petroleum wax con-

taining a small amount but less than about 1% of nonaethylene glycol distearate.

10. Waxed paper coated with a wax composition consisting essentially of paper-coating paraffin wax containing a small amount but less than about 1% of nonaethylene glycol distearate.

11. Waxed paper coated with a wax composition consisting essentially of paper-coating microcrystalline wax containing a small amount but less than about 1% of nonaethylene glycol distearate.

12. Waxed paper coated with a wax composition consisting essentially of a mixture of paper-coating paraffin and microcrystalline waxes containing a small amount but less than about 1% of nonaethlyene glycol distearate.

References Cited in the file of this patent

UNITED STATES PATENTS

2,374,931	Griffin	May 1, 1945
2,456,283	Jefferson	Dec. 14, 1948
2,595,158	McCue et al.	Apr. 29, 1952
2,625,491	Young et al.	Jan. 13, 1953
2,637,665	Dodge	May 5, 1953
2,642,366	Rumberger	June 16, 1953
2,684,948	Cross	July 27, 1954

OTHER REFERENCES

"Chemicals by Glyco," Glyco Products Co., Brooklyn, New York, copyright, 1944, page 6.