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GREASE-PROOFING PAPER

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This invention relates to an improved grease-proofed paper and to a method of producing the same.

It is an object of this invention to produce a coated paper having a high resistance to grease, fatty materials and the like.

It is a further object of the invention to make a coated grease-proofed paper which retains its grease-proofing qualities on creasing.

Another object is the preparation of a tasteless, odorless paper suitable for the wrapping of fatty foodstuffs.

A further object is the preparation of a grease-proofed paper adaptable for wrapping frozen foodstuffs.

Other objects are disclosed in the following complete description of our invention.

We attain these objects by coating a wrapping paper with a substantially continuous thin layer comprising a water-soluble cellulose ether. This layer may be applied to the wrapping paper from an aqueous solution of the cellulose ether composition by means of a doctor blade, roller, or extrusion hopper in the ways well known to the paper coating art. Alternatively, we may bond a moistened preformed film comprising a water-soluble cellulose ether to a paper sheet.

We may use a solution of any water-soluble cellulose ether, but prefer to use a type of ether whose 5 per cent aqueous solution has a viscosity above 70 centipoises because it can form a thinner unbroken, co-extensive film than does a lower viscosity type. Examples of suitable water-soluble ethers are methyl cellulose, sodium cellulose glycolate, and hydroxy ethyl cellulose. With them may be incorporated water-soluble plasticizers, such as sorbitol, ethyl sorbitol, glycerine, and the like, also pigments or other adjuvants, or they may be used in a completely unmodified form.

The solution may be applied to any kind of wrapping paper, but we prefer to coat smooth surfaced papers as a continuous film is formed on such papers in lower thicknesses, and consequently with expenditure of less coating solution, than on uneven or rough surfaced papers. We have found glassine paper, parchment paper, market paper, and like smooth surfaced papers suitable for use in the practice of our invention. Some of these, in the uncoated form, possess a moderate degree of grease-proofness and are commonly used for packaging greasy foodstuffs, but the grease-proofing properties of each of them

are greatly enhanced by the treatment of the present invention.

Under favorable circumstances, that is, when using a high viscosity type, water-soluble cellulose ether and when applying it to smooth surfaced paper, such as glassine, a continuous film of the ether may be of the order of only 0.0001 inch thick. On the other hand, when using a low viscosity type ether, or a rough surfaced paper, it may be necessary to apply a coating of thickness averaging about 0.002 inch or more in order that it be continuous.

All these coatings, including the thicker ones, are tough and flexible, remain unbroken after creasing and handling and consequently retain their grease impermeability after such treatment. Further, the coatings remain flexible on subjection to low temperatures, for example, those in the neighborhood of -40° C. The coated papers of this invention may therefore be used both for wrapping foodstuffs that are to be frozen, and for those which are handled at ordinary temperatures.

The new coated papers, for use in packaging foods or other articles which are both greasy and water wet, may be moisture-proofed with wax, or with any of the usual moisture-proofing compositions including wax-resin mixtures, and wax-resin cellulose derivative mixture. Again, the new coated papers may be bonded to transparent foil or they may be coated with a lacquer to give a wrapping material having a moderate degree of moisture impermeability combined with attractive appearance and grease-proofness.

The following examples illustrate the practice of this invention:

Example 1

A sample of a paper known as "Market paper" of basis weight of 40 pounds per ream of 3000 square feet was coated with a 12 per cent aqueous solution of 80 centipoise type methyl cellulose using a doctor blade. The coating, after drying, had an average thickness of 0.0005 inch. The coated paper was tested in comparison with an uncoated sample of the market paper by a rapid test for grease-proofness as follows:

The sample to be tested was cut into four pieces $2\frac{1}{2}$ inches square and each was folded to form a box with $\frac{1}{2}$ inch high sides and $1\frac{1}{2}$ inch square base. The boxes were held in shape by placing them in suitable supports. A piece of white writing paper was placed beneath each box and one cubic centimeter of peanut oil, coconut oil, corn oil and molten hydrogenated stearoleine

was added respectively to the four boxes which were then placed in an oven at 70° C. The white paper underneath each box was inspected periodically for occurrence of a grease spot. When this appeared the sample under test was considered to have failed and the time taken for this failure was recorded. Grease resistance of a sample was reported as the average time of penetration for peanut oil, coconut oil, corn oil, and hydrogenated stearoleine.

The samples had grease resistance as follows:

Sample	Grease resistance
Uncoated market paper.....	Hours 1
Market paper coated with 0.0005 inch methyl cellulose.....	44

Example 2

A sample of low glycerine type glassine paper was coated with a 0.002 inch layer of 130 centipoise type methyl cellulose in the manner described in the foregoing example. The resulting coated paper was tested in comparison with a sample of uncoated low glycerine type glassine paper, using the above described rapid test for grease resistance, with the following results:

Sample	Grease resistance
Methyl cellulose coated glassine paper.....	Hours 100
Uncoated glassine paper.....	12

As stated, the invention has a particular application in the wrapping of greasy foodstuffs. Examples of such materials are butter, nut meats, potato chips, cheese, baked goods, meat and ice cream. Our product is also useful in the packaging of other classes of goods which tend to exude oily bodies on storage and which stain common wrapping papers. Among these are soaps, candles, and a number of pharmaceutical products.

We claim:

1. The method of preventing greasy and oily exudations from paper packages of products tending to give such exudates through paper, which comprises enclosing such products in paper bearing on at least one face thereof a substantially continuous superficial coating of a water-soluble cellulose ether of a type whose 5 per cent solution in water has a viscosity above 70 centipoises, the said coating being tough and flexible, even at sub-zero temperatures.

2. The method of preventing greasy and oily exudations from paper packages of products tending to give such exudates through paper, which comprises enclosing such products in paper bearing on at least one face thereof a substantially continuous superficial coating of a water-soluble methyl cellulose of a type whose 5 per cent solution in water has a viscosity above 70 centipoises, the said coating being tough and flexible, even at sub-zero temperatures.

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