

# UNITED STATES PATENT OFFICE

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## PAPER AND PROCESS THEREFOR

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This invention relates to paper, and more particularly to a grease-proof paper, either glazed like glassine or unglazed like imitation parchment, which is to be converted into individual receptacles for food products such as cakes and candies, drinking cups, containers to be used as finger bowls, and the like; and the object thereof is to improve the surface on such paper so that one sheet will slip easily upon another.

In the manufacture of paper containers for use as finger bowls and drinking cups and of paper receptacles for use in the candy and cake trade, it is the custom to die out shapes like circles, ovals, octagons, etc., in blocks, from which blocks "lifts" are taken and placed in the form and there subjected to heat and pressure so that when the pressure is released the sides of the cups are "fluted" or "crinkled" in clusters. These clusters of cups and/or receptacles must readily separate when handled in automatic dispensers, by waiters and waitresses in restaurants, and by "piece workers" in the candy and cake trade.

I have discovered that I can produce papers like glassine and imitation parchment having the "slip-easy" surface desired for the uses in question by applying hot wax to the wet paper web while it still retains a moisture content, usually not less than from 70 to 75 per cent., sufficient to allow the wax to satisfactorily penetrate the sheet. What is known as "wet waxed" paper, that is to say, a waxed paper where all the wax appears on the surface thereof, does not have the "slip-easy" characteristics, nor, for the cup cake industry for example, is it desirable to have a large quantity of wax on the surface of the sheet. The wax used must, therefore, so penetrate the sheet as to leave on the surface only the small amount sufficient to give the "slip-easy" effect.

The wax, preferably a paraffin wax—or an equivalent such, for example, as petrosene, Montan, carnauba, ceresine, japan, wool, and beeswax, all of which melt at a sufficiently low temperature, or a mixture of two or more of these waxes—can be applied in any suitable way, as by spreading it upon the paper sheet on the smoothing press or on one of the dryers in the usual battery of drying cylinders in a standard paper machine. A more convenient and the preferred way, however, is to pass the sheet through a size press which is inserted at a point in the battery of drying cylinders where the sheet is dry enough so that it can be carried through the press without crushing and the pan of which contains the melted wax preferably carried at a temperature

somewhat higher than the temperature of the sheet as it enters the size press, from 160° to 210° F. for example. The bottom roll of the press picks up the melted wax and spreads it upon the sheet, while the top roll by its pressure thereon partially excludes the wax. The degree to which the paper sheet is impregnated with the wax, and consequently the degree of "slip" on the surface of the finished paper, can readily be controlled by varying the temperature of the wax and/or by regulating the pressure exerted by the top roll of the press, the cooler the wax or the less the pressure of the top roll the greater the amount of the wax applied to the sheet and the greater the "slip" produced, and vice versa.

The paper sheet thus treated with wax is then further dried, until its moisture content is reduced to some 60 to 68 per cent., and then impregnated with a plasticizer, preferably a solution composed of glycerin, cerelose (a commercial corn sugar), sodium meta-silicate and water, in a second size press which is inserted at this point in the battery of drying cylinders, substantially as disclosed in my co-pending application filed on May 10, 1932, Serial No. 610,506, upon which Letters Patent No. 1,914,799 were issued under date of June 20, 1933. The plasticizer thus applied serves to cover the wax previously incorporated in the sheet and so to prevent the heat of the remaining drying cylinders from so bringing it to the surface of the sheet as to give it an undesirable glaze, foul the dryer felts, and, in the case of glassine, interfere with its passage through the supercalenders. The degree of "slip" produced on the surface of the finished paper can also be controlled at this point, since the weaker the plasticizer solution used the more wax will appear on the surface of the sheet and the greater the "slip" produced.

In the case of an unglazed imitation parchment paper, it is ready for shipment as soon as it has been completely dried, so as to leave the usual moisture content of approximately 6 per cent., and wound into rolls or cut into sheets. It requires no further treatment since the wax impregnation and the plasticizing and therefore the contact with the hot dryers gives a sufficient finish. If the paper is to be glazed, as in the case of glassine paper, it will next be dampened, preferably with the alkali treated water and in the manner set forth in my said co-pending application, and then finally run through the supercalenders where it is glazed and then it is that the full effects of the



wax are shown in the "slip-easy" surface produced on the highly glazed paper.

It will, of course, be understood that for paraffin or other wax specified any equivalent thereof may be substituted, and that the invention may be modified in its various details, within the scope of the appended claims, without departing from the spirit or sacrificing the substantial advantages thereof.

What I claim as new and desire to secure by Letters Patent, is—

1. Paper of the type described treated when partially dried but retaining some 70 to 75 per cent. of moisture with hot wax and when further dried but retaining some 60 to 68 per cent. of moisture with a plasticizer, said paper being characterized by a surface slipping readily on another similar surface.

2. Paper of the type described treated when partially dried but retaining some 70 to 75 per cent. of moisture with melted paraffin wax carried at a temperature of some 160° to 210° F. and then treated when further dried but retaining some 60 to 68 per cent. of moisture with a plasticizing solution composed of glycerin, cerelose, sodium meta-silicate and water.

3. A paper having incorporated therein during the drying of its web first a wax and then a plasticizer and characterized by a surface slipping readily on another similar surface.

4. A glazed paper having incorporated therein during the drying of its web first a wax and then a plasticizer, and finally dampened immediately before being passed through the supercalenders with an alkali treated water.

5. The process of making paper having a sur-

face slipping readily on a similar surface, which comprises as steps therein impregnating the wet paper web while it still retains a considerable part of its original moisture content first with a melted wax and then with a plasticizer.

6. The method of producing paper having a surface slipping readily on a similar surface, which comprises as steps therein impregnating the sheet when partially dried but containing some 70 to 75 per cent. of moisture with melted paraffin wax carried at a temperature of approximately 160° to 210° F. and when further dried but retaining some 60 to 68 per cent. of moisture with an aqueous solution containing glycerin, cerelose and sodium meta-silicate.

7. The process of making paper with a surface slipping readily on a similar surface, which comprises as steps therein applying to the sheet while in course of manufacture and while being dried first a film of hot wax adapted to impregnate the sheet and then a film containing a plasticizer adapted to so cover over the wax as to leave exposed on the surface of the finished paper only sufficient thereof to give it the desired slip.

8. The method of making a paper having a surface slipping readily on a similar surface, which comprises as steps therein impregnating the paper web while it still retains a major part of its moisture content with a melted wax and controlling the degree of surface slip of the sheet by subsequently treating it while still retaining a considerable part of its moisture content with a solution containing a plasticizer.

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