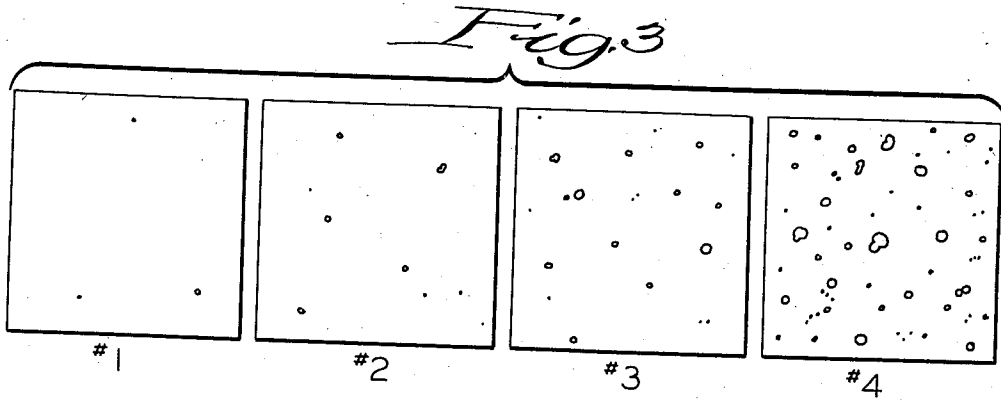
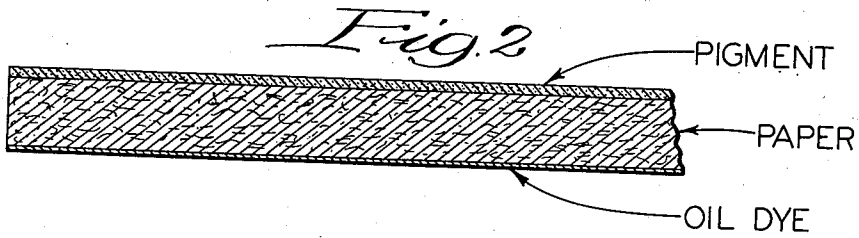
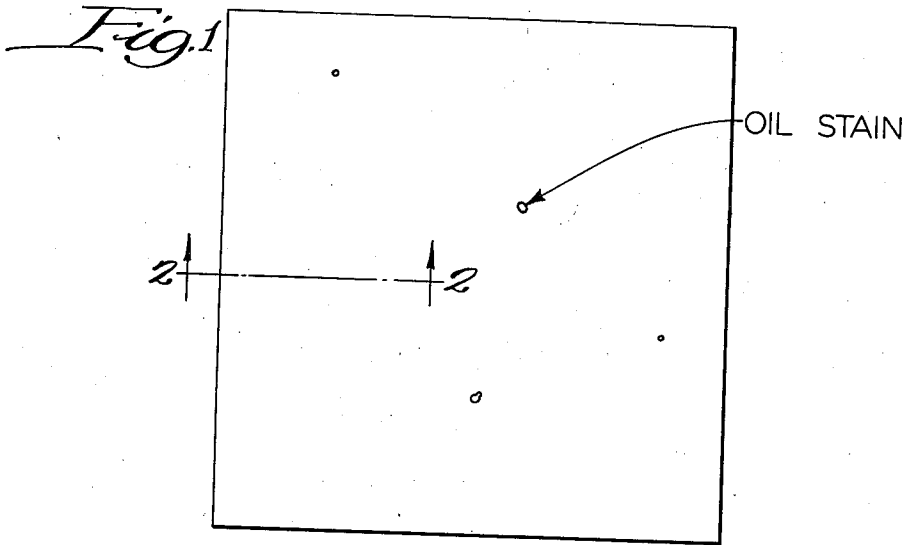


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TESTING GREASEPROOF PAPER

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Inventors:
Milton G. Schmitt
and Martin L. Downs,

By *Loane, Pond, & Anderson,*
Attorneys.

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TESTING GREASEPROOF PAPER

Milton G. Schmitt, Kaukauna, and Martin L. Downs, Appleton, Wis., assignors to Thilmany Pulp & Paper Company, a corporation of Wisconsin

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3 Claims. (Cl. 73—51)

Our invention relates to the testing of the ability of paper to resist penetration by grease or oil, and particularly relates to the testing or evaluation of papers of the character which are sold under the general designation of greaseproof papers, for example certain types of glassine or other papers which are employed in the wrapping or packaging of various food and other products which contain oleaginous ingredients.

The primary object of the invention is to provide a method of evaluating the greaseproof characteristics of paper in such a manner as to be able to express such values in understandable and usable form according to certain known and predetermined standards, to obtain by such a method a permanent record of the result of the test, to provide a method of the class described which may be performed in a relatively simple and economical manner without the use of intricate or expensive equipment or technique, and in general to provide an efficient method of the character referred to.

General method

In order to evaluate the greaseproof properties of various kinds and weights of paper, we have found it to be inaccurate, unreliable and impractical to express the greaseproof property of the paper in terms of the percentage of the particular factors which are supposed to impart to the paper the necessary greaseproof properties. Therefore, we find it necessary to compare the actual performance of the paper with the actual performance of other known standard papers the greaseproof properties of which in actual practice have been determined. Hence, according to our preferred practice, as a preliminary step to the practicing of our improved method, we select samples from various types of paper which have different but known greaseproof properties when used commercially for packing food stuffs or for other purposes. A sufficient selection is made in order to provide samples of paper having the very highest greaseproof properties and those papers which have lower and still lower greaseproof properties until finally, at the bottom of the scale, we have a paper which is so low in greaseproof property that it is not entitled to be marketed as a greaseproof paper.

Having arranged these various samples in the order of their greaseproof properties, each sample is then subjected to a standard procedure by way of test, and the record of such test in the form of the tested sample is preserved as a standard

by which to compare or evaluate the greaseproof properties of a sample of paper to be tested. A sample of such paper to be tested is then subjected to a similar procedure, and the visual appearance of said sample, after having been subjected to said procedure, is compared with the visual appearance of the set of standard samples which have previously been prepared.

In order to make these standards permanent and readily available for anyone to use in testing the greaseproof properties of any paper at any time, and in order to establish commercial or trade standards, we prefer to take photographs or in some cases make colored pictures of the entire set of standard samples. These printed and published pictures of the samples thus may be made to constitute standards of comparison to the same extent that the octane rating of motor fuel is employed as an arbitrary standard for the anti-knock properties of gasoline.

Heretofore, so far as we have been aware, there has been no available procedure by which the general scheme above outlined could be practiced. Therefore, the principal problem has been to evolve a practical method or treatment to which the standard samples and the test samples could be subjected so as to give uniformly reliable results. All reasonable requirements are satisfied by the method of treatment which we will now describe.

A section of paper of suitable size, for example four inches by four inches, is coated on one side only with a pigment, preferably in such a manner that the only addition to the paper consists in the pigment coating which has been applied. Preferably the pigment is of such character that the coating, when dry, will be in the form of a coherent continuous film of such thickness as to be quite opaque to light. Materials such as clay, lithopones or titanium pigments in finely divided form are quite suitable for the purpose. The pigment is preferably applied by first dispersing it in a volatile medium and then coating the sample on one side by means of any known method such as by brushing, spraying, doctoring, printing or otherwise. Also, it is desirable to use such precautions as to insure that the particles of pigment are of a certain standard size, and that the finished dry coating contains a definite amount of pigment per unit of area. It is also desirable that the liquid vehicle should be of such character as not to penetrate into the body of the sheet too far and also must be capable of being substantially completely evaporated so that its presence will not affect the test.

The actual testing of the sample consists in applying to the uncoated side of the sample a standard liquid or other material which either contains an oily constituent or is capable of mixing freely with grease or oil. Preferably a uniform standard amount of such material or liquid is applied per unit area of the sheet, and preferably the material is colored or is of a color which will contrast with the color of the pigment coating on the opposite side of the sheet. It is manifest that if any of this oily material penetrates through the sheet, it will be absorbed into the pigment coating which will thus exhibit a stain at the point of penetration. According to known standards, the number and size of the stains per unit of area of the sample provide an accurate measure of the greaseproof properties of the test sample.

In the drawing which illustrates a preferred embodiment of the invention;

Fig. 1 is a plan view of a sample of paper to be tested, which has been subjected to the prescribed treatment;

Fig. 2 is a section taken on the line 2—2 of Fig. 1; and

Fig. 3 is a plan view of a series of four standard samples with which the test sample is to be compared.

Specific example

According to the procedure which we have found most practical in our use of this method, the samples selected are about four and one-half inches square, and, by means of a suitable brush, we coat a sample with a liquid which consists of titanium dioxide dispersed in methanol, ethanol or other quick drying medium of a non-aqueous type. No binder of any kind should be used with the pigment. It is an advantage to grind the pigment in the vehicle, so that the particles of pigment may be properly suspended in the vehicle and of uniformly small size.

After coating the back of the sheet in a uniform manner, the sample is allowed to dry completely before it is subjected to the oil test.

The consistency of the liquid should be adjusted so that the dried coating will contain 15 to 25 grams of dry pigment per square metre, with an optimum of 20 grams of dry pigment per square metre.

The oil test is accomplished by completely covering the uncoated surface of the sample with a fairly penetrating oil or oil solvent, preferably turpentine, with which there has been incorporated sufficient dye, preferably red, so as to contrast well with the white color of the titanium dioxide pigment coating. Said dyed turpentine is applied to the sheet in an amount more than sufficient to cover the sheet. If the sheet is of the highest greaseproof value, none of the tur-

pentine will penetrate through the sheet, and therefore there will be no red markings visible in the pigment coating. However, if the greaseproof properties of the sample are quite low, the turpentine will rapidly penetrate the sheet at various points, and such penetration will be manifested by the presence of red spots of various sizes and numbers in the titanium coating, visible, of course, upon the exterior of the pigment coating. The number and size of these spots constitute an extremely accurate index of the greaseproof character of the paper which has been subjected to the test treatment.

The details of the procedure above described can, of course, be varied to suit any desired conditions which are encountered or are to be established. The scope of the invention should be determined by reference to the claims.

We claim:

1. The method of evaluating the resistance of a sheet of paper to penetration by grease or oil, which consists in coating one side of a test sample of the sheet with a pigment, applying to the other side of the sheet a liquid which is miscible with oil and is of such character that when the coating is impregnated with said liquid the appearance of said impregnated coating will contrast with the appearance of the coating which has not been so impregnated, and then comparing the appearance of the test sample with the appearance of a standard which has been subjected to a similar treatment.

2. The method of evaluating the resistance of a sheet of paper to penetration by grease or oil, which consists in coating one side of a test sample of the sheet with a pigment, applying to the other side of the sheet a liquid which is miscible with oil and is of a color which will contrast with the color of the pigment, and then comparing the appearance of the test sample with the appearance of a standard sample which has been subjected to a similar treatment.

3. The method of evaluating the resistance of a sheet of paper to penetration by grease or oil, which consists in coating one side of a test sample of the sheet with a pigment suspended in a liquid vehicle which, when applied to the sheet, will be retained substantially on the surface of the sheet, evaporating the vehicle so as to leave the pigment coating in dry condition on the said side of the sample, applying to the other side of the sheet a liquid which is miscible with oil and is of a color which will contrast with the color of the pigment, and then, after a predetermined interval of time, comparing the appearance of the test sample with the appearance of a standard sample which has been subjected to a similar treatment.

MILTON G. SCHMITT.
MARTIN L. DOWNS.