

UNITED STATES PATENT OFFICE

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PROTECTIVE COMPOSITION AND USE
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cago, Ill., assignors to Pyroxylin Products, Inc.,
Chicago, Ill., a corporation of IllinoisNo Drawing. Application February 4, 1937,
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12 Claims. (Cl. 91-68)

The present invention relates to a new composition of matter having ordinary, special and new uses and advantages. It relates to the arts of protecting surfaces, of water-proofing, of moisture-vapor-proofing, and of packaging, by using the composition as a coating, film, wrapper, or the like. It has special use on packaged goods, as a coating on a package, or as a wrapper, or a coating on a wrapper. In such use it avoids "blocking" or sticking of packages together, especially when hot, as in packaging, shipping or storing.

Many articles such as foodstuffs, tobacco, etc. are now packed in metallic containers in order to preserve them in a fresh condition over a period of time. Fiber containers are also used for this purpose, but where moisture is a factor it has heretofore been common practice to coat or impregnate the container, or the paper wrapper with a wax, as for example with paraffin wax. Waxes, however, soften at relatively warm summer temperatures and in heated storerooms, and the surfaces frequently stick to each other, and may be damaged in separating them. Waxed articles in cold environments become brittle and break at the folds thus admitting moisture. In either case there may be formed an unsightly package. More recently, the use of nitrocellulose lacquers containing a wax, as for example products such as those described in U. S. Patent No. 1,826,696 to Charch and Prindle have found extensive use for coating a regenerated cellulose sheet to render it moisture-vapor-proof.

While the use of nitrocellulose lacquers containing a wax produces a coating having relatively good moisture-vapor-proofing qualities, there are certain difficulties in the use of such protecting coatings, and especially where such coatings are used on paper or paper products such as carton stock, as compared to dense smooth materials such as a sheet of regenerated cellulose. For example, there is substantially no penetration of organic solvents into regenerated cellulose, whereas there is not only penetration, but persistent retention of many solvents into fibrous cellulosic materials such as paper. Because of the nature of the solvents required to hold the cellulose nitrate in solution, it is often difficult to remove many of the solvents to such an extent as to leave no odor—an important factor in food packaging. Furthermore, solvents such as esters and alcohols are apt to affect colors or inks, where the coating is applied over printed or decorated surfaces, and cause many of the coloring materials of the inks, such as toners, dyes, etc. to

"bleed," and change the color and appearance of the printed design. Also it is difficult to secure an adhesive union to such a proofing nitrocellulose-wax coating, so that difficulty is encountered in applying stickers, or in gluing the "laps" of coated labels, or the folds of a carton that is so coated. The cost of moisture-proofing paper, carton stock, etc. with a nitrocellulose wax coating is relatively high, not only because of the expensive solvents required, but also because a relatively heavy coating is required, as compared to that required on a dense smooth material such as regenerated cellulose, or cellulose acetate films.

A very important and serious disadvantage of the use of nitrocellulose-wax compositions, is the tendency of the wax to "sweat out" at somewhat elevated temperatures. Waxes in general are not compatible to any great extent with nitrocellulose, and it is almost essential that such coating compositions be dried above the melting point of the wax. Even when so prepared, such coatings, when reheated "sweat out" considerable quantities of the wax, and the wax which appears on the surface is easily removed by wiping, and is readily so removed in handling. An example of this difficulty is encountered in the packaging of salt, cheese, soap, etc. which are packed hot. When the hot material, such as table salt (packaged at from 150° to 170° F. to secure free screening) is placed in a carton coated with a nitrocellulose-wax moisture-vapor-proof coating, the wax in the coating comes to the surface, and is removed in many areas by mechanical or manual handling, or by coming in contact with other cartons, or with the fiber box in which the cartons are packed, and in other ways, thus producing areas of low or void moisture-proofing quality, impairing the value of the coating, and defeating its purpose.

An object of our invention is to produce a protective coating which is also a moisture-vapor-proofing composition, and which employs relatively inexpensive and unobjectionable solvents which may be selected so as not to leave odors, or seriously to affect printing inks. Another object is to produce a moisture-vapor-proof composition that has a high resistance to moisture-vapor-penetration, even when employed in thin films. One of the prime objects of our invention is to produce a moisture-vapor-proof composition that retains its moisture-vapor-proofing characteristics at relatively high temperatures and upon cooling after heating, and which when hot or after heating is not subject to loss of those characteristics by wiping or handling. Other objects

and advantages will be apparent from or described in the following descriptive matter and claims.

In carrying out our invention we employ a condensation derivative of rubber, a water-insoluble metal soap, and a mutual dispersing liquid which is volatile, and which we term a "solvent." We may also employ modifying agents, such as plasticizers to secure greater flexibility, coloring agents, mere diluents, resins, waxes, etc. These materials may be mixed in various proportions, depending on the qualities desired, but we prefer to use the rubber derivative in an amount substantially greater than the amount of metal soap.

As rubber derivatives we prefer to use a condensation rubber derivative having the characteristics of one such product known as "Pliolite" made by the Goodyear Tire & Rubber Company. This is sometimes referred to as a rubber resin, but such term is to be distinguished from the resin which is found in rubber.

The invention affords great improvements in the use of a condensation derivative of rubber. The latter is characterized particularly by softening with heat to a degree that it becomes tacky at a given temperature, herein referred to as the "tacky point." When heated to the tacky point, protective coatings consisting of this material alone frequently stick, or a mass of packages protected with it will "block." Where a moisture-proofing wax is added to it, the resulting composition will block at even lower temperatures than the same composition without the wax. While higher-melting modifications of these rubber derivatives may be made, we have found that an increase in the softening or tacky point is accompanied by an increase in brittleness. When plasticizer is used to overcome this increased brittleness the softening or tacky point is correspondingly lowered, so that little or no improvement, as regards blocking, is secured.

By means of the present invention a new and different agent is employed, namely the metal soap, which not only avoids the bad effect of wax in making the product tacky at a lower temperature, but which renders it less tacky than the rubber derivative alone at any given temperature. In other words, the temperature at which tackiness or blocking may occur is raised, rather than lowered, by using the metal soap in place of a wax. Thus the present invention affords a product which may be used in cases where the prior art product cannot be used.

Some of the rubber derivatives suitable for use in our invention are described in an article entitled "Plioform—A New Molding Resin," Journal of Industrial and Engineering Chemistry, vol. 26, page 123, February 1934, by H. R. Thies and A. M. Clifford of The Goodyear Tire & Rubber Company, Akron, Ohio. One product is also known as "Pliolite" and is referred to as "Pliolite" in an article by said H. R. Thies, on page 22 of Paint, Oil and Chemical Review, issue of April 18, 1935. Especially useful are the products obtained by the reaction of rubber with stannic chloride, ferric chloride, boron fluoride, chlorostannic acid, etc. The formation of such products is described in prior U. S. Patent No. 1,751,817, No. 1,797,188 and No. 1,846,247, wherein numerous halides of metals and chlorostannic acid are disclosed as reagents and are characterized generally as constituting a group consisting of chlorostannic acid and halides of amphoteric metals. Among such products may be mentioned the product sold under the trade name of "Pliolite," manufactured by the

Goodyear Tire and Rubber Company of Akron, Ohio, which is described in a public bulletin by the manufacturer as "an amber colored thermo-plastic solid, having a softening point of 55° to 65° C. and a specific gravity of 1.047. It contains more than 92% by weight of rubber hydrocarbon." One way in which such a product may be secured is to dissolve, for example, 10 parts of milled rubber with a plasticity of about 300, in 90 parts of benzol to which is added 1 part of chlorostannic acid. The mixture is refluxed until the desired condensation has taken place. The solution is filtered, and poured into water, or preferably water in which a reducing agent such as sodium sulfite has been dissolved to minimize oxidation. The benzol may be removed by steam distillation, and a fine powder of the rubber condensation product is precipitated.

The powder obtained as above is suited for our use. The metal soap may be dispersed into the powder or other form of the material of such powder, for example by milling, as on rubber-rolling mills or by mechanical working, as in a Banbury mixer, or with a heavy dough mixer. A small amount of solvent may be advantageous, as when a dough mixer is used. The precipitated rubber derivative described above may be milled prior to dispersing the soap therein, and the metal soap may be added as a solution or dispersion in a solvent, as for example toluene or a suitable petroleum fraction.

Other condensation products of rubber are known, such as those made by use of paratoluene sulphonic acid. This type for example is not soluble in the gasoline-type of solvents. Those prepared in solution are preferred, such as first above described, since they may be made colorless and transparent, and are more universally soluble in organic solvents.

As water-insoluble metal soaps, we have found that a wide variety may be employed and the selection depends in part upon the nature of the product desired. For example we have found that magnesium oleate, zinc palmitate, magnesium stearate, calcium stearate, and aluminum stearate, may be used with suitable rubber derivatives to produce compositions that are highly resistant to the transfer of moisture vapor. In certain solvents the aluminum soaps, when used in appreciable amounts, tend to form solutions having plastic properties, so that on rotary types of coating machines there is apt to be "laid lines" when such coatings are applied to a surface. However, such coatings may be applied to give smooth films by coating machines that shear the wet liquid or plastic film, as for example the machine described by Fawkes and McKenzie in U. S. Patent No. 2,016,085, or by various other coating machines.

Where our composition is to be flexed, as when it is used as a coating on a flexible surface, we prefer to add a plasticizer to increase the flexibility of the film. Various plasticizers may be added, such as drying or nondrying vegetable oils, as for example raw or bodied tung oil, linseed oil, etc. We may also use a plasticizer which is also a moisture-vapor-proofing agent, as for example a wax. Since these rubber derivatives are compatible with a large number of natural and artificial waxes, as for example paraffin wax, montan wax, ceresin, spermaceti wax, beeswax, halowax, etc., the waxes do not "sweat out" when the composition is exposed to relatively high temperatures. We may, therefore, use waxes in combination with the metal

soap and rubber derivative. The wax may act as a plasticizing agent, and the wax may also act as a part of the total moisture-proofing substance. The moisture-vapor-proofing quality of waxes is effective in rubber derivatives as well as in nitrocellulose base compositions, but the wax is retained in the rubber-derivative compositions under conditions where it sweats out in nitrocellulose compositions. We do not claim moisture-vapor-proofing waxes alone as our invention, but do claim them in combination with metal soap. We know that in general waxes alone used as moisture-vapor-proofing agents will cause the composition to become more sticky or tacky at less elevated temperatures than the same composition without the wax. We have found that a combination of wax and metal soap may be used which does not so early become tacky or sticky with increasing heat, which does not become subject to injury while hot, by scuffing or rubbing, and which is capable of being heated and cooled without loss of moisture-vapor-transmission resistance. In such combination, the metal soap and the wax contribute such moisture and other resistant properties, but the metal soap is the essential agent of our invention for that purpose. The wax may be an auxiliary agent for contributing such resistance, but it also may be a plasticizer. In our invention the wax may be one which is a plasticizer, or one which has some other function, or one which is poor or lacking in the property of imparting moisture-vapor-resistance in a combination with a rubber derivative. Therefore, our invention contemplates use of a wider range of waxes than used heretofore in moisture-proofing compositions.

As solvents we prefer to use hydrocarbons because of their low cost, because of the ease with which hydrocarbons may be eliminated by evaporation, and because of their freedom from residual odors. Furthermore, hydrocarbons have less tendency to soften the ink, or to "bleed" the pigments of the inks, than do more powerful solvents such as alcohols, esters, ketones, etc., such as are used in nitrocellulose lacquers. For the preferred condensation derivative of rubber we may use either aliphatic (petroleum) hydrocarbons such as varnish makers and painters naphtha, or their derivatives such as chloroform, or aromatic (coal tar) hydrocarbons such as toluene, or their derivatives such as chlorbenzol. We do not, however, preclude the use of other solvents when such solvents are useful or desirable but in general we prefer to use hydrocarbons, because of their low cost and the ease with which they may be eliminated. Simple or mixed solvents may be used.

The metal soap may be incorporated with the rubber derivative in a variety of ways. One method is to dissolve or disperse the soap in a portion of a solvent, using heat if necessary, and add the soap solution to a solution of the rubber derivative. Another method is to grind or masticate the metal soap with the rubber derivative, as for example on roller mills, or in a heavy duty dough type mixer, or in a Banbury mixer, using some solvent if necessary. In general we have found it preferable to masticate the rubber derivative and metal soap to secure a high dispersion of the soap, and a better gloss.

A resin or resins may be added to secure better adherence where the composition is to be applied so as to be carried by a surface. Resin also may increase the gloss. It may be added as a

diluent merely to decrease the cost, or for other purposes. The resin used should be compatible with the rubber derivative, and should of course be soluble in the solvent employed. Examples of suitable resins are the cumar and indene resins, hydrogenated rosin-glycerol esters, etc. These resins may be added in any convenient manner as for example as solutions, or they may be milled into the rubber derivative, as for example on a Banbury mixer, or on differential rolls. This may be done when the soap is added or at another time.

In order to illustrate our invention the following examples are given merely as illustrations of several phases of our invention. It is, of course, to be understood that these are illustrative formulas only, and that wide departures from these examples may be made within the scope of our invention as will be understood by those skilled in the art.

Example 1

	Parts by weight
Condensation derivative of rubber, such as "Pliolite".....	135
Magnesium stearate.....	15
Toluol, or other solvent.....	850

The magnesium stearate may be incorporated in any convenient manner. For example the magnesium stearate may be dissolved in the toluol before the rubber derivative is added; or a heavy solution of the rubber derivative may be dissolved in a part of the solvent to produce a very viscous solution, and the magnesium stearate dispersed in the heavy solution in a dough mixer, or by grinding on three-roller mills; or the magnesium stearate may be milled into the rubber resin (before it is dissolved) on a rubber-rolling mill of the type used for making rubber compositions, or in a Banbury mixer. In general the product produces a glossier finish as the solvent is decreased in combining the rubber derivative and the metal soap. The composition of Example 1 is suitable for coating paper and other materials to produce waterproof coatings that have a high degree of moisture-vapor-proofness. Furthermore, since the tacky point of the rubber derivative is lower than that of the composition there is less tendency for the composition to "block" when used as a coating than is the case where the same rubber derivative is used by itself, or with a wax.

Example 2

Zinc palmitate is substituted for the magnesium stearate of Example 1.

Example 3

	Parts by weight
Condensation derivative of rubber, such as "Pliolite".....	225
Paraffin.....	12.5
Zinc palmitate.....	12.5
Toluol or other solvent.....	585

This composition results in a coating somewhat more flexible than Examples 1 and 2 because of the plasticizing function of paraffin, and is especially useful for coating thin caliper paper and other materials that require a considerable degree of pliability. The paraffin does not sweat out on heating. Such a coating has much less tendency to soften and to become sufficiently sticky to "heat block" than do coatings consisting only of the same rubber derivative and paraffin or other wax.

Example 4

Parts by weight

Condensation derivative of rubber, such as "Pliolite"-----	81
Cumar resin-----	9
Zinc palmitate-----	6
Paraffin wax-----	4
Toluol or other solvent-----	234

The above example illustrates a coating composition which contains a suitable resin in combination with the rubber derivative. It has the further advantage of having a lower water-vapor-transfer rate. The residue of the above composition without the metal soap will soften and "block" at somewhat elevated temperatures, which are nevertheless lower than the tacky-point when the metal soap is present.

Example 5

Zinc laurate is substituted as the metal soap in Examples 1, 3 and 4.

The composition of Example 4 has a "heat-block" temperature of about 170° F. under certain test conditions. By the same test, a composition like the above wherein the metal soap is changed to the same amount of paraffin wax (in addition to that already present), the "heat-block" temperature is about 115° F. Compositions generally like those of Examples 1 to 5 may readily be made with a "heat-block" temperature to withstand live steam by selecting specific materials and proportions.

To show that the combination using the condensation derivative of rubber is of a different character than a similar combination using a rubber hydrochloride, or a chlorinated rubber, the following examples are given, serving as a basis for the comparisons in the table below.

Rubber condensation derivatives are extremely stable and are substantially neutral. In general, for paper coating work, we have found that rubber derivatives containing relatively large amounts of halogens tend to lower the strength of the paper and cause it to become more brittle and fragile, especially upon aging.

In order to determine the relative merits of coatings intended for moisture-vapor-proofing, we have used a modification of the method described by Abrams and Chilson in the "Paper Mill" page 24, September 20, 1930, and also Abrams and Brabender "Paper Trade Journal," April 9, 1936, page 32. In this method a coating of known weight per 1000 sq. ft. is placed on a backing to be moisture-vapor-proofed, such for example as paper, (Glassine, printed stock, carton stock, etc.) or cloth, or any other sheet-like material that can be placed over the cup. If only one side is coated, the coated side should preferably be placed next to the zone of high humidity. In the tests described below, the coated side was thus placed outward. Calcium chloride was placed in the cup, and the cup placed in a cabinet maintained at 90° F., and having air therein at a relative humidity of 98%. The air within the cabinet was kept in motion by means of rotating paddles. By weighing the test cups at regular intervals, and determining the increase in weight, due to moisture absorption of the calcium chloride through the coating, the moisture transfer per 100 sq. in. per 24 hours is calculated.

Tests carried out in the above manner gave the following results on samples of the various

coatings applied to one side of Glassine paper described herein:

Table

	Grams per 100 sq. in. per 24 hrs.	
Glassine paper no coating-----	57.533	5
Rubber resin only-----	1.438	
Rubber resin—magnesium stearate as in Example 1-----	0.729	10
Rubber resin—zinc palmitate as in Example 2-----	0.655	
Rubber resin—zinc palmitate, and paraffin wax as in Example 3-----	1.050	
Rubber resin, zinc palmitate, paraffin, and cumar resin as in Example 4-----	0.779	15

It is to be understood that other metal soaps which are water-insoluble may be used besides those illustrated in the foregoing examples. Among these may be mentioned the stearate, palmitate, oleate, laurate, etc., of calcium, magnesium, lead, zinc and other metals yielding water-insoluble metal soaps which are well known to the art. We may employ single or mixed simple or complex metal soaps of this character. By a complex metal soap we refer to one in which more than one soap-forming acid is combined with one metal.

It is also to be understood that other solvents may be used, or mixtures of solvents such as various petroleum solvents, and coal tar hydrocarbons such as benzol, xylol, etc., as well as chlorinated solvents such as carbon tetrachloride, chloroform, ethylene dichloride, etc. The choice of the proper solvents may be readily exercised by anyone skilled in the art, and may be varied to secure different drying rates, to secure increased solvent power, to vary the viscosity at a given concentration, etc.

Furthermore, we may introduce other plasticizing agents such as various oils, either vegetable or mineral oils, as for example tung oil, linseed oil, either treated or raw, etc.

We may also introduce various coloring agents, such as dyes, pigments, etc., in order to produce colored coatings either transparent or opaque, it being understood that the examples given above produce substantially colorless transparent coatings. Various resins, either natural or synthetic, which are compatible with the rubber derivatives may also be used. Furthermore, we may use mixtures of various rubber derivatives where they are compatible, as for example we may use both chlorinated rubber and a condensation derivative of rubber in the same composition, all without departing from our invention.

Our compositions are especially useful for rendering printed cartons waterproof and also moisture-vapor-proof, and may be present on the cartons initially where such cartons are to be used for packing hot materials, such as salt, cheese, soap, etc., or where the composition is liable to be exposed to a wide range of temperatures. Our coatings may be made so as not to soften and "block" at the temperatures used for packing these materials. Furthermore the moisture-proofing agent does not "sweat out" and move to the surface. The packages may be handled hot without danger of rubbing off anything which has been exuded from the composition by heating, and they may be handled without scarring the surface. A particular advantage of the product of this invention is the property of resisting transmission of sodium chloride.

Our coating compositions may be applied as thin or thick liquids, or as pastes to form a continuous film. The solvent is removed from such films by evaporation with or without heating, and the residue leaves a coherent continuous film having the desired properties. On most materials it will form an adherent coat with varying force of adhesion, depending upon the composition and the form or material of the surface coated. Some surfaces may be chosen to permit stripping to leave a tenuous film of the composition itself. For example, certain amalgams, or mercury, or low-temperature fusible metals may be coated to make such films. Films may be formed almost completely dry of the solvent, as in a rubber calender-machine. Such coatings may then be permitted to lose solvent to set the solute in coherence, thus to complete the film in situ for example on a sheet of cloth passing through calender rolls.

All kinds of materials may be thus protected in several ways, such as regenerated cellulose, cellulose acetate or other cellulose derivative films or forms, paper, woven fabric, vinyl compounds, sheets or other forms of casein, gelatin, prolamine, such as zein, wood, metal, etc.

Any container coated inside or out or impregnated and coated with the composition of this invention is considered as a new and improved container with properties distinctive over like containers heretofore made. For example in the salt-packaging industry where salt is packed at 150° to 170° F. in machines wherein the containers are in close contact with each other or with mechanical parts, or human hands, the composition is heat-resistant, not subject to injury by ordinary contact or wiping, moisture-vapor-proof and non-tacky when hot, and it remains moisture-vapor-proof when cold. Upon these characteristics depends the success of the hot-packing operations to provide a permanently moisture-vapor-proof container in the retail trade. At the present time containers with fiber or metal ends and paper carton-stock walls, are replacing all-metal containers. This replacement can be extended readily where the fiber sides can be made water-proof, moisture-vapor-proof, and heat-resistant for certain uses. The present invention therefore provides a fiber container, for example, for the hot-packing of salt, which is new, because it is capable of successful use where others fail.

In commerce temperatures as high as 120° to 125° F. are commonly encountered, as in box cars, holds of ships, warehouses, etc. Under this invention, compositions may readily be made which do not block or stick at these temperatures, either to themselves or to other surfaces, and under the influence of considerable pressure.

A mechanical mixture of the essential ingredients is considered to fall within the scope of the invention, because such a mixture may become an article of commerce which requires merely dissolution or dispersion in a volatile vehicle to form a simple coating composition. To constitute a composition of matter under this invention, the ingredients need not initially be in the required or preferred proportion to form the type of coating above described. It is possible for example to incorporate an excessive amount of the soap into a rubber derivative, as by mastication, to form a "compound" or "master batch" which may be used thereafter with more of the same or different rubber derivative, by dissolving, milling or other suitable method.

In the claims the term "film" is intended to comprehend an independent unattached film as well as an attached coating. It is also intended that the composition be used whether or not moisture-vapor-proofing is desired. The mere fact that the addition of the soap renders a condensation derivative of rubber non-tacky at a temperature when it would otherwise be tacky and induce blocking, is a sufficient advantage to claim such a simple mixture as a new and useful composition of matter. For this reason the metal soap need not always be selected for its high moisture-proofing qualities.

We claim:

1. A chemically stable solid composition of matter comprising in homogeneous admixture a major portion of the reaction product of rubber with a reagent from the group consisting of chlorostannic acid and halide of amphoteric metal, and a minor quantity of water-insoluble metal soap of a fatty acid, said soap imparting increased resistance to water-vapor transmission and elevating the temperature at which the composition becomes tacky compared to the same composition without said soap.

2. An article having a moisture-vapor-transmission resistant coat, said coat being the composition of claim 1.

3. A moisture-vapor-transmission resistant film consisting of the composition of claim 1.

4. A flowable composition comprising the composition of claim 1 and solvent therefor.

5. A liquid dispersion comprising the composition of claim 1 and a volatile liquid dispersing agent therefor.

6. A compound for providing dispersed water-insoluble metal soap in form for incorporation into rubber compounds, consisting of the reaction product of rubber with a reagent from the group consisting of chlorostannic acid and halide of amphoteric metal, and water insoluble metal soap of fatty acid, the compound being capable of dilution with an additional amount of said reaction product to impart to said additional amount increased moisture-vapor transmission resistance and an elevated tack-providing temperature.

7. The method of raising the heat-block temperature of a composition consisting in major portion and essentially of the reaction product of rubber with a reagent from the group consisting of chlorostannic acid and halide of amphoteric metal, which comprises dispersing water-insoluble metal soap of fatty acid in said reaction product in quantity less than said reaction product.

8. The method of providing a moisture-vapor-transmission-resistant barrier, which comprises forming a continuous chemically stable film comprising in major proportion and essentially the reaction product of rubber with a reagent from the group consisting of chlorostannic acid and halide of amphoteric metal, and dispersed therein a minor quantity of water-insoluble metal soap of fatty acid.

9. The method of providing a moisture-vapor-transmission-resistant barrier, which comprises applying to a surface a liquid dispersion containing solid ingredients in a volatile liquid, evaporating the volatile liquid to provide a continuous chemically stable film containing said solid ingredients, said film containing a major portion of the reaction product of rubber with a reagent from the group consisting of chlorostannic acid and halide of amphoteric metal,

and a minor quantity of water-insoluble metal soap of fatty acid, said dispersion being capable of drying to form a coat which is non-tacky at normal atmospheric temperatures.

- 5 10. The method of raising the heat-block temperature of a composition consisting in major portion and essentially of wax and the reaction product of rubber with a reagent from the group consisting of chlorostannic acid and halide
10 of amphoteric metal, which comprises dispersing water-insoluble metal soap of fatty acid in said reaction product in quantity less than the quantity of said reaction product.

- 15 11. A chemically stable solid composition of matter comprising in homogeneous admixture a major portion of the reaction product of rubber with a reagent from the group consisting of chlorostannic acid and halide of amphoteric metal, wax, and a water-insoluble metal soap of a

fatty acid in quantity less than the quantity of said reaction product, said soap imparting increased resistance to water-vapor transmission and elevating the temperature at which the composition becomes tacky compared to the same 5 composition without said soap.

12. The method of providing a moisture-vapor-transmission-resistant barrier, which comprises forming a continuous chemically stable film comprising in major proportion and essentially the reaction product of rubber with a reagent from the group consisting of chlorostannic acid and halide of amphoteric metal, wax, and dispersed therein a quantity of water-insoluble metal soap of fatty acid, which is less 10 than the quantity of said reaction product. 15

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CERTIFICATE OF CORRECTION.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 61, for "os" read --as--; page 3, first column, line 53, before the words "We do not" insert the following sentence -

--The solvent selected must be capable of producing
a satisfactory dispersion or solution of the ingredients.--;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of October, A. D. 1940.

(Seal)

Henry Van-Arsdale,
Acting Commissioner of Patents.