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MOISTUREPROOF SHEET WRAPPING MATERIAL

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12 Claims. (Cl. 106—173)

This invention relates to moistureproof sheet wrapping material, especially transparent moistureproofed cellulosic web. More particularly it appertains to the plasticizing of moistureproofing coatings on films of regenerated cellulose and the like.

Recently there has appeared in commerce a transparent moistureproof sheet wrapping material comprising a base sheet of regenerated cellulose film having a thin moistureproofing coating. The moistureproofing coating ordinarily employed comprises essentially film forming material (binder, cementing agent), for example, nitrocellulose, and moistureproofing material, for example, a waxy substance such as paraffin wax. The coating may also contain transparentizing (blending, homogenizing) material and/or plasticizing material.

The manufacture of such a base sheet is described in U. S. A. Patent No. 1,548,864 (Brandenberger), and the coating thereof with typical moistureproofing coating compositions is described in U. S. A. Patent No. 1,737,187 (Charch and Prindle).

Because the better moistureproof sheet wrapping materials, now offered the trade, in addition to effectively resisting penetration or passage of water vapor therethrough to a substantial degree for an extended period of time, are also flexible, transparent, non-tacky and non-greasy, they have gone into very extensive use. It may be said, however, that, in spite of very extensive research directed toward improvement, this type of sheet wrapping material is still short of perfection.

One of the most important problems confronting the workers in this art at present is the development of a satisfactory plasticizing material. The presence of the waxy substance used as the moistureproofing agent and the exacting transparency requirements, make the selection of plasticizing material highly critical.

In describing moistureproofing coatings it has been customary in the art to utilize the term "moistureproofing agent" to designate a substance which serves as the basis for moistureproofness, and the term "film former" to characterize the material which serves as the binder for the moistureproofing agent and any other materials in the coating.

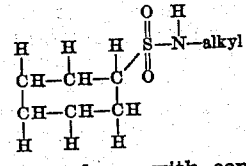
Although the flexibilizing materials, or plasticizers, as they are generally called, are incapable of serving as moistureproofing agents, it has been observed that some of them do promote, or contribute, to the moistureproofness. On this account it is common practice in the production of the more highly moistureproof coatings to employ more plasticizer than is necessary to bring about the requisite flexibilizing. Enhancing the moistureproofness in this way with the plasticizers heretofore known has its drawbacks, chief among which is an impairment of the surface characteristics of the coating. An increase in the amount of plasticizer is accompanied by an increase in the stickiness of the surface of the coating which prevents adjacent layers of the sheet wrapping material from slipping over each other satisfactorily. In addition, the coating becomes softer and more thermoplastic, with the result that the pressure involved in storage causes rolls or stacks of the sheet wrapping material to cake, because the individual layers stick together. Since a storage period between manufacture and use of the sheet wrapping material cannot be avoided, it is obvious that the surface must be smooth, non-tacky and not exhibit a tendency to cake or stick in the roll or cut-to-size sheet stock form in which it is supplied to users. It follows that the beneficial and detrimental effects of excess plasticizer, in the past, had to be very carefully weighed, and that the manufacturer of the sheet wrapping material had to exercise a nice control over, or regulation of, the plasticizer content. The search for plasticizers which augment the moistureproofing action and at the same time permit the moistureproofing coating to have good surface slip and storage properties, has been vigorously prosecuted.

This invention has for an object the provision of a moistureproofed sheet wrapping material, comprising a base sheet having a moistureproofing coating plasticized with a substance which can be used in high percentages without destroying the desirable properties of the sheet. A further object was to provide a composition which could be made into thin, coherent, self-sustaining sheets, or applied as a thin sheet or coating to thin self-sustaining sheets which were not moistureproof, for the purpose of providing a highly moistureproof sheet material comprising

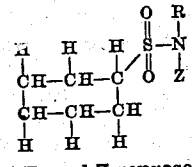
increased (as compared to the prior art) proportions of plasticizer. Still further objects were to plasticize moistureproofing coatings with alkyl cyclohexane sulfonamides, and to prepare alkyl cyclohexane sulfonamides. Other objects were to provide new cellulose derivative compositions containing as plasticizing material substances from the group comprising cyclohexane sulfonamide and the N-alkyl substituted derivatives of cyclohexane sulfonamide; to manufacture moistureproof film fulfilling present day commercial requirements of flexibility, transparency and surface characteristics (high degree of surface smoothness, slip, resistance to sticking under storage conditions, etc.), and to plasticize nitrocellulose (as the film former) moistureproofing coating compositions with N-butyl cyclohexane sulfonamide.

A general advance in the art, and other objects which will appear hereinafter, are also contemplated.

It has now been found that a superior moistureproof sheet wrapping material can be prepared by coating the well known non-moistureproof base sheet material with moistureproofing coating compositions comprising one or more N-alkyl cyclohexane sulfonamides as the essential plasticizing material. These plasticizers (flexibilizing materials) are comprehended by the general structural formula:



in which (in accordance with conventional usage) the alkyl radical may be straight or branched chain. Desirable results are also obtained with structurally related compounds covered by the somewhat broader formula:



in which each of R and Z represent an alkyl residue. The aliphatic residues R and Z, whether open (straight) chain or closed ring, may have straight chain alkyl substituents. In this structural formula one or both of R and Z may also represent a hydrogen atom. The cyclohexyl radical (shown at the left of the SO_2 grouping) may have one or more alkyl substituents such as methyl.

From the following description, in which are disclosed certain embodiments of the invention as well as details of what is believed to be the best mode for carrying out the invention, it will be apparent how the foregoing objects and related ends are accomplished. The parts are given by weight throughout the specification unless otherwise specified.

Example I

	Parts
Nitrocellulose (11.6% N)	50
Paraffin wax (M. P. 60° C.)	3
Damar (dewaxed)	7
Cyclohexane sulfonamide	40
Ethyl acetate	175
Toluene	235
Ethyl alcohol	20

	Examples		
	II	III	IV
Nitrocellulose (11.6% N)	50	58	58
Paraffin wax (M. P. 60° C.)	5	3	3
Spermaceti	10	7	7
Damar (dewaxed)	35		
N-propyl-cyclohexane sulfonamide		32	
N-isopropyl cyclohexane sulfonamide			32
N-(2-ethyl-hexyl) cyclohexane sulfonamide	475	460	475
Ethyl acetate	235	240	235
Toluene	20	30	20
Ethyl alcohol			

	Examples	
	V	VI
Nitrocellulose (12.5% N)	46	50
Paraffin wax (M. P. 60° C.)	4	
Spermaceti		5
Damar (dewaxed)		15
Ester gum	14	
N:N-di-ethyl cyclohexane sulfonamide	36	
N-(2-ethyl-butyl) cyclohexane sulfonamide		30
Ethyl acetate		450
Butyl acetate	400	
Toluene	310	250
Ethyl alcohol		30
Butyl alcohol	20	

	Examples			
	VII	VIII	IX	X
Ethyl cellulose (48.0% ethoxyl)	66	55	66	65
Paraffin wax (M. P. 60° C.)	4	5	4	
Spermaceti				5
Ester gum	15	20	15	20
N:N-di-methyl cyclohexane sulfonamide	15			
N:N-di-butyl cyclohexane sulfonamide		20		
N-lauryl cyclohexane sulionamide			15	
N-cyclohexyl cyclohexane sulfonamide				10
Toluene	584	584	580	590
Ethyl alcohol	146	146	150	140

The preferred plasticizers are cyclohexane sulfonamide, N-methyl-cyclohexane sulfonamide, N-ethyl cyclohexane sulfonamide, N-propyl-cyclohexane sulfonamide, N-isopropyl cyclohexane sulfonamide, N-allyl cyclohexane sulfonamide, N-butyl-cyclohexane sulfonamide, N-isobutyl-cyclohexane sulfonamide, N-hexyl-cyclohexane sulfonamide, N-cyclohexyl cyclohexane sulfonamide, N-(2-ethyl-butyl)-cyclohexane sulfonamide, N-octyl-cyclohexane sulfonamide, N-(2-ethyl-hexyl)-cyclohexane sulfonamide, N-lauryl-cyclohexane sulfonamide, N-dodecyl-cyclohexane sulfonamide, N:N-di-cyclohexyl-cyclohexane sulfonamide, N-octadecyl-cyclohexane sulfonamide, N:N-di-methyl-cyclohexane sulfonamide, N:N-di-ethyl-cyclohexane sulfonamide, N:N-di-allyl-cyclohexane sulfonamide, and N:N-di-butyl-cyclohexane sulfonamide.

Cyclohexane sulfonamide, a white crystalline solid melting at 94.5° C., is prepared by the reaction of cyclohexane sulfonyl chloride and ammonia. The N-substituted cyclohexane sulfonamides can be prepared by analogous reactions with amines, for examples, N:N-di-methyl-cyclohexane sulfonamide which is a white crystalline solid melting at 58° C. and boiling at 115°–120° C. (at 0.3 millimeter) can be prepared by the reaction of cyclohexane sulfonyl chloride with aqueous dimethyl amine. Similarly, N-isobutyl-cyclohexane sulfonamide, a white crystalline solid melting at 72° C. and boiling at 150°–160° C.

(at 1 millimeter), can be prepared by the reaction of cyclohexane sulfonyl chloride with aqueous isobutyl amine, N-cyclohexyl cyclohexane sulfonamide, a white crystalline solid melting at 73° C. and boiling at 165°–175° C. (at 1 millimeter) can be prepared by the reaction of cyclohexane sulfonyl chloride and cyclohexyl amine in the presence of aqueous alkali, and N-(2-ethylhexyl)-cyclohexane sulfonamide, a colorless viscous liquid boiling at 180°–190° C. (at 1 millimeter), can be prepared by the reaction of cyclohexane sulfonyl chloride and 2-ethyl-hexyl amine in the presence of aqueous alkali.

These plasticizers may be used singly or in combination, and in either instance, if desired for the production of special effects, may be used in conjunction with previously known plasticizers. Heretofore known plasticizers particularly suitable for employment in this auxiliary capacity include dibutyl phthalate, dilauryl phthalate, cyclohexyl butyl phthalate, di-(methyl cyclohexyl) phthalate, di-(dimethyl cyclohexyl) phthalate, methyl-(dimethyl cyclohexyl) adipate, dicyclohexyl adipate, tricresyl phosphate, butyl benzoyl benzoate, amyl benzoyl benzoate, hexyl benzoyl benzoate, octyl benzoyl benzoate, lauryl benzoyl benzoate, ditolyl ketone, diethyl phenyl ketone, dixylyl ketone, phenyl tolyl ketone, monobutyl phthalate, monoamyl phthalate, mono-octyl phthalate, mono-lauryl phthalate, di-amyl acetamide, di-amyl lauramide, di-butyl stearamide, mono-amyl oleamide, di-ethyl linoleamide, and di-lauryl acetamide. In general the esters of ortho benzoyl benzoic acid, the derivatives of toluene sulfonamide, esters of keto acids such as tolyl benzoic acid, aromatic ketones, mono-alkyl phthalates, esters of tartaric, citric, aconitic, and tricarballylic acids with alkyl radicals such as ethyl, propyl, butyl, amyl and octyl, N-substituted alkyl amides of saturated and unsaturated aliphatic acids and the like, are suitable for this purpose. The specific esters of ortho-benzoyl benzoic acid, and other specific members of the groups listed immediately above, appear to be the most satisfactory representatives of these groups.

The present invention primarily concerns moistureproofing compositions for the production of films (either as a coating on a base or as a self-sustaining film) comprising film forming material, moistureproofing material, the plasticizing material described above, and preferably also a resin or other blending agent.

In the preferred embodiments of the invention the film forming material is a cellulose derivative such as cellulose nitrate, cellulose acetate and like substitution products of cellulose.

The preferred cellulose substitution derivative film forming materials are cellulose ethers such as glycol, ethyl and benzyl cellulose; cellulose esters such as cellulose nitrate (which is particularly useful), cellulose acetate (which is of limited compatibility); and cellulose mixed esters or ether esters such as cellulose acetate nitrate, cellulose acetate propionate and ethyl cellulose nitrate. These cellulosic products may be of varying degrees of substitution or conversion, as for example, cellulose nitrate varying from 10.5% to 12.5% nitrogen.

As the moistureproofing agent, any wax (used generically to include waxy substances like paraffin wax as well as true waxes which are monohydric alcohol esters of higher fatty acids) may be employed. In the specific examples, and ordinarily, paraffin wax melting above 50° C., or better, that melting at 60° C. (and above), is preferred. It is highly satisfactory not only because of the results obtained therewith, but also for economic reasons. It is to be understood that the paraffin wax may be replaced in whole or in part by one or more other wax-like materials. Specific wax-like materials particularly suitable in this connection are petrolatum, ceresin, Japan wax, spermaceti, palm wax, beeswax, chlorinated hydrocarbon waxes, synthetic waxes (or wax-like materials) and Chinese insect wax. If some of these waxes are too soft to be used alone for the purpose desired, they may be mixed with harder waxes from the foregoing group, or with carnauba wax, candelilla wax or other harder waxes. Paraffin wax hardened by admixture with carnauba wax or candelilla wax has been used satisfactorily in many instances.

In the preparation of the moistureproofing films comprising a cellulosic cementing agent and a moistureproofing material, it is frequently advantageous to include some other material which will improve the compatibility of the two first mentioned ingredients. This material, commonly referred to as the blending agent or material, is usually of a resinous nature, although this is not absolutely necessary. When the blending agent is resinous, advantage may be taken of its film-forming characteristics, if any, and a sufficient quantity may be added to the moistureproofing composition to contribute toward the body and build of that composition (in addition to the blending action). Depending upon the nature of the blending agent, more or less plasticizing action of the cellulose derivative may be obtained.

As specific materials suitable for blending or transparentizing, the commonly available natural or synthetic resins are most frequently used. Materials like ester gums, rosinates, hydrogenated rosin, hydrogenated rosin esters, damar, copal, kauri, alkyd resins, vinyl derivatives, chlorinated diphenyl resins, and soluble resins of the phenol formaldehyde type, have characteristics which make them compatible with, and enable them to form homogeneous mixtures of the other components of the moistureproofing composition.

Among the non-resinous blending agents which yield homogeneous mixtures are hydrogenated castor oil, castor oil phthalate, lanolin (wool grease), ethyl abietate, methyl abietate, diethylene glycol rosinate, diethylene glycol hydro-rosinates, and the like.

The wide variety of materials, film formers, moistureproofing agents, blending agents, etc., for use in the moistureproof coating compositions, and the characteristics which render them suitable for such a composition, are well known in the art.

The application of the moistureproofing coating may be accomplished in any suitable manner, such as by passing the base film through a bath of the coating composition, by spraying the composition on the base, etc. After application, any excess coating may be removed in any desired manner, such as by doctor knives, doctor rolls, etc. Various coating procedures are known to the art, and in the interest of brevity are not here reviewed in detail. Typical procedures are disclosed in U. S. A. Patents Nos. 1,826,696–7–8–9. It is most convenient to apply the compositions of the foregoing examples to the base sheets by means of suitable solvents. The ingredients, conveniently considered as solids, may be dissolved to give a coating com-

position of appropriate viscosity and solids content, and the resulting solution applied to the desired base. In a preferred procedure, the solvents are removed from the coated base, after which it is subjected to an elevated temperature at least equal to the melting point of the wax, and then chilled rapidly to give, after cooling, a clear, transparent, flexible, moistureproof coated base having good surface characteristics.

The common solvent mixtures used in preparing the moistureproofing lacquer are disclosed in the specific examples. These solvent mixtures may be modified by the addition or substitution of other well known lacquer solvents, in order to obtain special drying effects without in any way affecting the properties of the plasticizers described elsewhere.

In the examples given above, and in the discussion of the proportions of ingredients in the moistureproofing compositions following, the range or percentage composition (or ratio) has been given to facilitate the formulation of highly satisfactory and preferred compositions, and to aid one skilled in the art in easily and quickly arriving at operable compositions not set out in the specific examples. It is to be understood that these limited ranges are largely illustrative.

The cellulose derivative film former ordinarily comprises 30% to 70% of the total solids. Approximately 60% is a convenient and generally useful proportion, and in most instances the range of 50% to 70% will be found satisfactory. The ratio of the cellulose derivative to blending material may vary over a wide range, say for example, 2:1 to 10:1 (or even greater), but for most purposes a ratio of 3:1 to 9:1 is satisfactory. A ratio of 4:1 is convenient, and generally yields good results.

The cellulose derivative is usually in excess of the total plasticizer content, and the ratio of cellulose derivative to plasticizer may vary from 1:1 to 6:1, but a ratio of 1.5:1 to 4:1 has generally been found to give the best results.

The blending agent may vary according to the cellulose derivative, plasticizer and moistureproofing agent employed, and may constitute 1% to 20% or more of the total solids. The ratio of blending agent to moistureproofing agent may vary from 1:5 or less to 5:1 or more. Usually a ratio of approximately 3:1 or 4:1 will be found satisfactory. Larger amounts of blending agent are usually used when the blending agent exerts some plasticizing action, and can therefore replace a portion of the plasticizer.

The moistureproofing agent is usually present in a quantity sufficient to impart a suitable degree of moistureproofness while still maintaining homogeneity of composition so that the ultimate moistureproofing coating on the moistureproof article will be clear, transparent, non-greasy, non-smeary and non-tacky under normal conditions of handling and storage.

Generally speaking, if the moistureproofing agent constitutes less than 10% of the total solids, these conditions will be fulfilled. While 2% to 6% of the moistureproofing agent has been found to yield excellent results, more or less may be used, depending upon the nature of the moistureproofing agent or the degree of moistureproofness desired.

The total plasticizer concentration may vary from 10% to 60% of the total solids. Low percentages of plasticizer, however, are usually used only when the blending agent is capable of exhibiting a plasticizing action and therefore substitutes for a portion of the plasticizer which might otherwise be added.

The moistureproofing compositions described herein may be applied to various base sheets to produce flexible moistureproof sheet wrapping material (tissue). Cellulose regenerated from viscose (solutions of cellulose xanthate) is the preferred base material, but other cellulosic film regenerated or precipitated from aqueous alkaline cellulosic dispersions or solutions, for example, cuprammonium cellulose and cellulose ethers, which ethers have not been substituted to an extent or degree sufficient to cause them to lose their water sensitivity, such as glycol cellulose, cellulose glycolic acid, alkyl cellulose (especially methyl and ethyl cellulose), and similar cellulosic products, may advantageously be employed. The majority of these specific cellulose substitution derivatives just described can be grouped under the generic term low (or lowly) substituted (not more than one mol of substitution per glucose unit) cellulose ethers (see U. S. A. Patent No. 2,123,883 to Ellsworth).

Since the moistureproofing coating compositions give improved results with any non-porous, non-fibrous, dense, smooth surface transparent material, cellulose ethers and esters substituted to an extent sufficient to make them organic solvent soluble may also be employed. Specific examples of the cellulose esters of this class are cellulose nitrate and cellulose acetate. Cellulose ethers of this class include ethyl cellulose and benzyl cellulose.

Other base materials of a non-fibrous character such as albuminous materials (gelatin, agar-agar, casein), rubber derivatives (rubber hydrochloride, chlorinated rubber, Pliolite, Plioform), and even paper (a fibrous substance) can be used. Pliolite and Plioform are rubber derivatives of substantially the same chemical composition, usually containing a fraction of a per cent of chlorine, produced by reacting rubber and stannous chloride (see Paper Trade Journal, page 96, February 23, 1939; J. I. E. C. XXVI 125, and U. S. A. Patents No. 1,797,188, 1,846,247, 1,853,334 and 2,052,391). The preferred rubber hydrochloride contains 26% to 34% chlorine, and the preferred chlorinated rubber contains 65% to 68% chlorine.

If for any reason it is desired to modify the characteristics of the moistureproofing coating, minor proportions of other materials may be incorporated therein. Among such other materials may be mentioned opaquing agents such as sizes and pigments, oils of the drying and non-drying variety, and resin of natural or synthetic varieties.

In this connection such specific compositions as cellulose acetate 100 parts, N-(2-ethyl-butyl) cyclohexane sulfonamide 40 parts; cellulose nitrate 100 parts, N-(2-ethyl-hexyl) cyclohexane sulfonamide 60 parts, pigment 200 parts; ethyl cellulose 100 parts, N-lauryl cyclohexane sulfonamide 20 parts; cellulose nitrate 12.0 parts, gum damar 3.0 parts, N:N-dimethyl cyclohexane sulfonamide 5.0 parts, castor oil 2.6 parts, solvent 166.0 parts; ethyl cellulose 12.0 parts, N-isobutyl cyclohexane sulfonamide 4.0 parts, solvent 180.0 parts, are also useful.

The moistureproofing compositions may be coated onto the base sheet to give a wide range of coating thicknesses. Where heat sealing is

desired, an increase in coating thickness will generally be employed because it increases the heat sealing properties of a given composition. For the purpose of this invention, and particularly where the ultimate coated sheet material is to be used as a wrapping sheet, the coating thickness is 0.00002 inch to 0.0005 inch, and preferably 0.00005 inch on each side of the base sheet.

Moistureproofness, moistureproofing and moistureproof materials and expressions are defined in U. S. A. Patent No. 2,147,180 (Ubben). In the interest of brevity the definitions are not repeated here. The terms and expressions related thereto and employed herein are used in accordance with such definitions.

The plasticizers used in this invention are particularly well suited to compounding with cellulose derivative compositions containing moistureproofing agents. They produce coatings of high flexibility and toughness, without in any way impairing the transparency of the coating. Furthermore, the plasticizers may be added in comparatively large proportions to the cellulose derivative compositions without imparting tackiness, and in the higher concentrations they contribute materially to the moistureproofness. The softness and stickiness accompanying the use of many plasticizers is not present in the compositions of this invention. This last characteristic, combined with the high degree of moistureproofness, good appearance, flexibility, transparency, excellent surface slip, resistance to caking, and the ability to withstand storage without sticking or marring, makes the present invention outstanding.

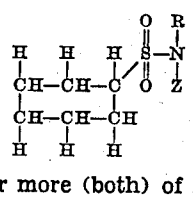
As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that this invention is not limited to the specific embodiments thereof except as defined in the appended claims.

I claim:

1. A thin, flexible, moistureproof sheet material comprising a film of a moistureproofing composition, said moistureproofing composition comprising essentially a wax, a binding agent and N-alkyl cyclohexane sulfonamide as the essential plasticizer.

2. A sheet wrapping material comprising a regenerated cellulose base sheet and moistureproofing coating thereon, said coating comprising an organic solvent soluble cellulosic film former 30% to 70%, a wax 2% to 6%, and N-alkyl cyclohexane sulfonamide 10% to 60%, the film former-plasticizer ratio being in the range 1:1 to 6:1.

3. A thin, flexible, moistureproof sheet material comprising a regenerated cellulose base sheet and moistureproofing coating thereon, said coating comprising an organic solvent soluble cellulosic film former 30% to 70%, a wax 2% to 6%, and material of the formula:



in which one or more (both) of R and Z represent members of the group consisting of alkyl residues and hydrogen, 10% to 60%, the film former-plasticizer ratio being in the range 1:1 to 6:1.

4. A transparent, moistureproof, sheet wrapping material consisting of transparent regenerated cellulose base sheet having a moistureproofing surface coating, said moistureproofing coating consisting of:

	Parts
Cementing agent	50
Wax	5
Damar (dewaxed)	10
N-propyl-cyclohexane sulfonamide	35

5. A transparent, moistureproof, sheet wrapping material consisting of transparent regenerated cellulose base sheet having a moistureproofing surface coating, said moistureproofing coating consisting of:

	Parts
Nitrocellulose (11.6% N)	50
Spermaceti	5
Damar (dewaxed)	10
N-propyl-cyclohexane sulfonamide	35

6. A composition for producing moistureproof articles, comprising:

	Parts
Cementing agent	46
Wax	4
Ester gum	14
N:N-diethyl-cyclohexane sulfonamide	36

the proportions being by weight.

7. A composition for producing moistureproof articles, comprising:

	Parts
Nitrocellulose (12.5% N)	46
Paraffin wax (M. P. 60° C.)	4
Ester gum	14
N:N-diethyl-cyclohexane sulfonamide	36

the proportions being by weight.

8. A moistureproofing composition comprising essentially cementing material, wax, transparentizing material and N:N-dibutyl-cyclohexane sulfonamide.

9. A moistureproofing composition comprising essentially organic solvent soluble ethyl cellulose, paraffin wax, ester gum and N:N-dibutyl cyclohexane sulfonamide.

10. Moistureproofing lacquer comprising essentially:

	Parts
Ethyl cellulose (48% ethoxyl content)	55
Paraffin wax (M. P. 60° C.)	5
Ester gum	20
N:N-dibutyl cyclohexane sulfonamide	20
Toluene	584
Ethyl alcohol	146

11. A sheet wrapping material comprising a regenerated cellulose base sheet and moistureproofing coating thereon, said coating comprising essentially:

	Parts
Ethyl cellulose (48% ethoxyl content)	55
Paraffin wax (M. P. 60° C.)	5
Ester gum	20
N:N-dibutyl-cyclohexane sulfonamide	20

12. A thin, flexible sheet material comprising a film of a moistureproofing composition, said moistureproofing composition comprising essentially an organic solvent soluble cellulosic cementing material 30% to 70%, wax 2% to 6%, blending agent 1% to 20% and N-alkyl-cyclohexane sulfonamide 10% to 60%, the cementing material-plasticizer ratio being in the range 1:1 to 6:1, and the blending agent-wax ratio being in the range 1:5 to 5:1.

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