Jan. 14, 1930. A. C. FISCHER 1,743,764

BUILDING MATERIAL

Filed Jan. 15, 1921

Fig. 1.

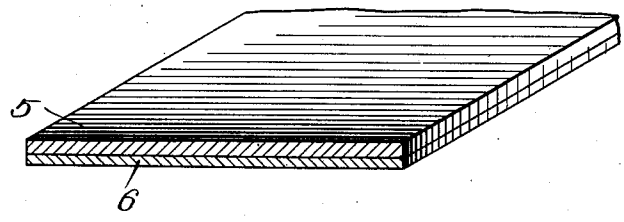
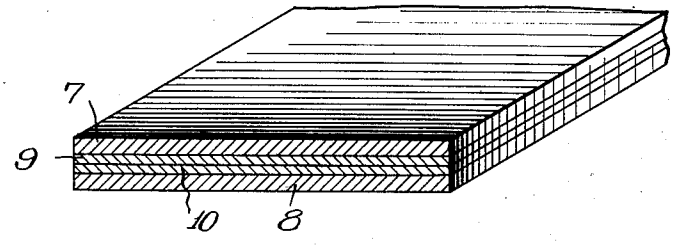


Fig. 2.



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UNITED STATES PATENT OFFICE

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BUILDING MATERIAL

Application filed January 15, 1921. Serial No. 437,622.

The object of my invention is to facilitate the joining of roofing sheets, and the laying of roofing materials in general; also to prepare a convenient water-proofing material, which readily takes to itself other fabrics or construction materials of like or unlike manufacture at normal or even zero or sub-zero temperatures, and one which, upon contacting with a saturated uncoated felt, or other surface which is oil-absorbing, gives up some of its oily content and eventually causes permanent adhesion; also to provide such a material which while functioning as stated, will be suitable for use in the manufacture of mastic tapes which are rolled upon themselves and used to proof seams of surfacing material such as shingle roofs, against the weather.

In the accompanying drawing I have selected two embodiments of the invention for illustrating the salient features of the invention. In said drawing Figure 1 is a detailed perspective view of a vehicle coated with a layer of adhesive; and Figure 2 is a detailed perspective view of two juxta-posed vehicles separated by layers of adhesive.

Referring now to the drawing in detail. In Figure 1, 5 represents a vehicle and 6 a layer of adhesive which may be developed by saturating the vehicle with the surplus of the saturant presented in the form of the layer 6 at the surface of the vehicle, or where the vehicle 5 is coated with a layer of intense adhesive 6, but not saturated thereby, or where the vehicle per se represents adhesive material formed into a sheet and coated with a layer of intense adhesive 6.

In Figure 2 the juxta-posed sheets 7 and 8 may be formed in any of the ways described with reference to the vehicle 5 and separated by superimposed layers 9 and 10 of different intensity of tackiness. These layers 9 and 10 may be developed in the same way as explained with reference to the layer 6. The materials adaptable for this purpose are already known and on the market, and exist mostly as flux, road oils, either blown asphalts, semi-solid bitumens, asphaltites and asphalt, also vegetable and animal oils in a blown or raw state, and gums. The adhesiveness in materials applied to sheets, heretofore, has always been killed to avoid sticking together of the sheets. This elimination of adhesiveness has been done by dusting or surfacing with mineral matter or interposing paper or tissue, which remains permanently in place thereon, and maintains a non-adhesive surface.

This invention relates to a composition of matter which when put into use, for instance, applied to a sheet of surfacing material, will remain in an adhesive state, if left free from the dusting usually employed for finishing such a surface, but which will be without the intense stickiness that would prevent such sheets if placed face to face, from being pulled apart, at varying temperatures down to 0° F. and even lower when the substance used does not congeal. This product results from the use of various groups of bituminous, vegetable or animal substances or a combination of two or more of them, and the manner of compounding them. For instance, a sheet may be saturated with a substance of one group, and after setting may be coated with another group, both groups being adhesive in their nature, but the adhesiveness being in different intensities so that the intense adhesiveness of the sheet saturated or coated with one group will not be destroyed but will be protected by a coating of one of the other groups, which will be less intense, and, therefore, permit the separation of the sheets. Likewise, substances of these groups may be used individually, provided various packaging arrangements are made. In some cases this is done by the intervention of non-adhesive materials. In other cases, the composition will separate by the cleaving of the fibrous matter of which it is constructed, and in still other cases because of a breaking apart of the composition of matter with which the vehicle is saturated or coated. In these cases the adhesiveness is less intense and permits of easy separation.

Heretofore, it has been necessary to heat either the composition, or the roofing containing various cementitious substances containing highly volatile oils, which oils would

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evaporate and the residue thereupon cement the sheets together. These processes were and are all conducted on the job, but it is the intention to prepare the composition of the present invention in combination with fabrics, fibrous material, or by rolling into thin sheets of the material itself at the factory so that it will only be necessary to unroll or separate the sheets at point of delivery; unless it is desired to use a solvent, such as, toluol, benzol, kerosene, etc. to intensify the inherent adhesiveness of the material, the inherent adhesiveness at normal temperatures, if utilized properly, binding the sheets together when laid in the usual methods, or used in such novel improved methods as have been disclosed in my various applications for Letters Patent. Inherent adhesiveness of surfacing and other materials at normal temperatures has heretofore been disclosed by me and is not broadly claimed herein.

In carrying out this invention vegetable products are preferably used rather than bituminous products, although bituminous products having the same properties or characteristics as to adhesiveness may be utilized in some instances singly or in combination with the vegetable products enumerated.

Group No. 1.—Consists of cotton seed Foot's pitch or any of the Foot's pitches or stearine pitches having the same properties. These products are on the market and I do not wish to be limited in their use or chemical properties, but prefer the pitches which have better weather-proofing properties.

Group No. 2.—Consists of various gums, such as, rosins, gum thus, and the like, which are selected for their color and better adhesive qualities. Various combinations of the different colored rosins may be used to accomplish the results desired, when compounded with one or more of the materials of the other groups.

Group No. 3.—Consists of a drying oil or oils, such as, linseed oil, soya, China wood etc., either in the raw or blown state, which is utilized for its stiffness and mucilaginous properties either upon being boiled down or naturally inherent.

Group No. 4.—Consists of such oils as rape seed, cottonseed, corn, fish, etc., in either the raw or blown state, which are viscous in nature and have very slow drying qualities, which set or oxidize to a gummy rubbery substance when exposed to air and light more quickly than non-drying oils.

Group No. 5.—Consists of such oils as raw or blown castor oil, olive, peanut, refined cottonseed oil and such non-drying animal oils as Neat's Foot oil, which may be either raw or blown and which have unusually slow drying qualities and are slow to oxidize in the air.

Group No. 6.—Consists of such products as glue, gelatine and the like, which may be waterproofed and may be utilized for the purpose herein described in combination or singly.

Group No. 7.—Consists of such products as whiting, lime, asbestos floats, fuller's earth, etc., which impart a flow retarding quality to the groups herein mentioned.

Group No. 8.—Consists of bituminous substances, such as, road oils, asphalt pitches, waterproof cements, etc., which have inherent tackiness and adhesiveness at normal temperatures, depending upon the flux condition of the bituminous product.

Group No. 9.—Consists of bituminous products which require temperatures above normal to produce inherent tackiness or stickiness and includes such products as high melting point paraffins, asphalts, bituminous tars, pitches, etc. Among these are blown bituminous oils, Gilsonite-Texas, and others becoming tacky at various temperatures over 125° in a natural or fluxed state.

Group No. 10.—Consists of oils known as cutting oils such as kerosene, naphtha, benzine, and oils of like nature, as well as non-blown raw vegetable or flower oils, many of which have solvent action on bituminous substances, I prefer oils having a flash point above 175° F.

Group No. 11.—Consists of highly volatile oils such as, benzine, etc., which are used for cutting purposes and by evaporation form cementitious substances.

Group No. 12.—Consists of viscous castor oils, either separately or in combination with resinous material, turpentines, mastics and other of the oils already mentioned which give a viscous, jelly-like or stringy body, used as coatings and as retarders of escaping volatile oils, usually prevalent in paints and lap cements, usually used for roofing purpose.

Group No. 13.—Consists of dryers, and stiffeners, such as, sulphur, oxides or manganese, nitrates, zinc oxides, their clorides and acids.

For a more detailed disclosure of oils which constitute the foregoing groups and their characteristics, I herewith give various oils which come under the different classifications:—

Drying oils	Perilla Linseed Tung Soya Poppy seed, etc.
Semi-drying oils	Maize or corn Cotton seed Sesame Ravison Rape, etc.

Vegetable non-drying oils	Almond, Peanut, Rice, Teaseed, Olive, Castor, etc.
Terrestrial animal non-drying oils	Neat's foot and silkworm oils, etc.
Fish oils for slow drying properties	Menhaden, Sardine, Japanese sardine, Salmon, Herring, etc.

Group No. 14.—This group consists of powdered glue, hard asphalt, tar, etc., which can be dusted over the tacky surface rendering the same temporarily non-adhesive, and which enable the sheets laid upon it to be separated in the plane of the powdered surface. These may or may not be soluble in the material of the tacky surface, but they are soluble in a solvent applied preparatory to laying or applying.

Group No. 15.—Consists of such chemicals as tannin, borax, alum, potassium bichromate, etc., slight proportions of which render an oil or glue base, proof against molding and rancidity, and also act as waterproofing.

Group No. 16.—Consists of such acids as sulphuric and nitric acids, etc. in weak solution, sulphur chloride, zinc chloride and the like, which affect the consistency of mastic bodies such as described.

Group No. 17.—Consists of waxes, fats, etc., such as, Japan beeswax, carnauba, ceresin, spermaceti, etc. which also affect the flow of mastic bodies when combined therewith.

It is understood in view of the number of groups which can be used either individually, in combination, or collectively as saturating media or coatings, that the scope of this invention is very broad and the field of products to draw from in bringing about the desired result is large.

All of these groups, having oily content may be used individually with a dryer group or in special treatment with gums, glues, etc.

Saturating media

"*A.*"—These materials may be taken from Group 4, such as ordinary cotton seed oil, rape or other slow dryers, which upon heating will readily be taken up by porous fibrous matter.

"*B.*"—Saturating media may be taken from Group 8 (or from an oil group), and may consist of bituminous substances having a tacky or adhesive nature at normal temperatures, and which upon heating will readily be taken up by a body of felt or fabric and will set to their normal tackiness.

"*C.*"—Saturating media consist of high melting point bituminous or vegetable substances (Group 9) which, upon heating will be taken up by a body of felt or fabric and will set in normal temperatures without developing adhesiveness or tackiness as is herein recognized.

"*D.*"—Saturating media (Group 6) consisting of such products as glue, gelatine and the like, which upon heating and properly treating to render them liquid and incorporating such materials as glycerine, oil, etc. will be taken up in either a simple or complex form by a satisfactory body.

"*E.*"—Consist of saturating media in which gum and oil (Groups 2 and 5) and rosin compounds are used, which in their liquid state will be taken up by satisfactory body and develop the said tackiness or stickiness.

"*F.*"—Saturating media may consist of any of the nondrying slow-oxidizing oils in Group 5. A satisfactory body will readily take up these oils and they will remain in a non-drying, tacky state for a considerable period of time.

"*G.*"—Saturating media consist of Group 10, and include such oils as kerosene, etc., which are readily absorbed by a porous body or act upon bituminous or vegetable substances as a solvent.

"*H.*"—Saturating media consist of highly volatile oils and must be coated with oils or compounds which retard volatilization.

"*I.*"—Saturating media consist of materials in Groups 1 or 9 which upon being heated will readily be taken up by an absorbent body or may be pressed into sheets immersed in warm water, heated and pressed with rolls or flooded in water or oil or a solution of water and sodium silicate.

Coating media

It may readily be understood that any type of adhesive surface or coating which does not flow may be provided as coatings for the purposes defined, provided such surfaces are treated in such a manner as will allow of their separation after having been joined in an adhering manner, as shown in my co-pending and previous applications for Letters Patent. In order to emphasize the exact action of such coatings in their different utilization I shall group the coatings likewise into their respective classes.

Class AA.—Relates to a vegetable pitch coating such as Foot's pitch, which is tough when at normal temperature but upon considerable pressure develops tackiness. Over such coating a substance such as castor oil and pitch, or castor oil and Gilsonite in the presence of a fluxing oil such as lard, neat's foot or other vegetable oils can be utilized, which creates a very thin film yet does not dry, as castor oil will not mix with a mineral oil or mineral oil asphalts except perhaps under extreme temperatures under pressure.

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A third oil or mixing oil must be present. For this purpose 80% castor oil—10% Gilsonite and 10% Neat's foot oil heated until thoroughly united would prove a good formula, or 80% castor oil and 20% vegetable oil or Foot's pitch would prove satisfactory. When the sticky condition is not all that is desired, a blown oil may be used or rosin added until the consistency proper for the purpose is reached. This overcoating on a Class AA coating keeps the Class AA coating soft and pliable and prevents permanent adhesion in the roll or sheet so it can be readily parted along the line of the less intense adhesive.

Class AB.—Coating consists of a viscous sticky, non-drying coating placed over a saturated felt on one or both sides, so that the sheet can be unrolled at a later date or when packed superposed they can be separated at the point of adhesion. The same formula may be used as is used in AA for an overcoating or eight parts rosin, one and one half parts Venice turpentine, two and one half to four parts cottonseed oil, castor oil or rape seed oil used separately or mixed in equal parts with a fluid non-drying road oil.

Class AC.—Coating consists of a tacky slow drying bitumen approximating the following formula:

1. Consistency at 77° F. should be below 7.0.

2. Susceptibility factor low as possible, preferably under 25.

3. Ductility at 77° F. high as possible, preferably over 25.

4. Fusing point by K. & S. between 80 and 100.

5. Should appear tacky and adhesive at room temperature; when coated on strip and hung indoors in medium light should not diminish in tackiness at end of two months. Other consistencies may be used but this class of coatings is intended to be of a heavy tacky nature placed over the saturated felt or felts, this coating representing one of intense adhesiveness. In order that the rolls or sheets may be separated at normal temperature a coating of less intensity is placed thereover so the sheets can be separated along the line of the less intense adhesive. Any of the formulas mentioned for the purpose may be used for the less intense adhesive, even to a coating in which the oil does not congeal at 0° F., such as blown castor oil 95% and 5% cotton seed Foot's pitch.

Class AD.—Coating is one consisting of high melting point bitumen or vegetable pitches which ordinarily are dusted to prevent adhesion. These coatings as herein described are not dusted but are given a coat of viscous non-drying or slow-drying adhesive placed on after the first coat has chilled, unless the coat is of a paraffinous nature. The less intense adhesive may be any of the formulas heretofore described.

Class AE.—Coatings are waterproof cements for the weathering side, which are dusted and given a surface treatment of grit or mineral matter.

Class AF.—Coatings relate to coatings consisting of paints or cements containing volatile oils etc., treated with a retarder in order to secure a tacky semi-dry surface. Among the many volatile cements are asphalt paint and lap cements, fibre coatings etc. To retard volatilization mix any of the former with 8 parts rosin, 1½ parts venice turpentine, and 2½ to 4 parts cottonseed oil or castor oil, until a pasty non-flowing consistency is secured when spread thin. This surface will remain tacky for nine or ten months, but must be protected where it comes in contact with other surfaces by a less intense adhesive of a viscous nature as previously described. A good pasty material with which this can be mixed is a commercial product known as tree tanglefoot, or an equivalent thereof, a wax or fat may be added to aid setting.

Class AG—Coating.—Relates to sheets pressed from vegetable pitch or bituminous substances, the latter preferably of a blown variety—or spongey asphalt. These sheets are formed between pressure rolls, preferably under warm water to prevent adhesion and ready shaping of sheets. Such sheets when pressed are passed over rolls containing viscous or non-drying adhesive and coated therewith to prevent adhesion of the surfaces where not dusted. They may also be formed as previously described.

Class AH—Coatings.—Relate to vegetable pitch or bituminous substances, preferably blown asphalt mixed with fibrous matter pressed in sheets, preferably under warm water, the surface of said sheets being coated with a viscous non-drying adhesive to prevent the surfaces adhering prematurely when placed in rolls or superposed in sheets.

Class AI.—Coatings are those consisting of powdered bituminous, vegetable or animal substances, readily soluble in appropriate solvents, such as, benzol, toluol, formaldehyde, etc., and act as a non-adhesive insulation between surfaces so that other sheets placed upon the powdered adhesive will not adhere, but when separated and a solvent is used the tacky condition develops.

In my co-pending application Serial No. 437,621 for Letters Patent on the action and separation of adhesive surfaces, filed as of this date, it will be found that these various groups used in combination or separately bring about the results desired and described in such application for Letters Patent. The composition that is desired may constitute a mixture of one or more of the products from all or any number of the groups named, which products are classified under said groups, or an individual product of one group may function. A suitable formula for a composition

for use in producing a tacky surface would be a bulk of cottonseed together with one part of Foot's pitch, three parts of linseed oil, five parts of Neat's foot oil, two parts rosin, and one part of cottonseed oil.

One of the products can readily be made by taking a bituminous substance of comparatively high melting point, say over 180° for an asphalt product, ductile in nature, 125° for tar pitches and paraffines or vegetable pitch substances, ductile in nature, these substances to be slightly warm, so as to make a homogeneous mass and readily pressed between rollers and rolled in thin sheets. This would not require either a fibrous content or an absorbent sheet. Said sheets may be run in tandem or triplicate or single, as the case may be, and in order that they may be properly packaged, rolled upon themselves or placed face to face, an adhesive viscous coating is placed thereon, a good coating for the purpose consisting of rosin 8 parts, Venice turpentine 1½ parts, cotton seed oil 2½ to 4 parts, or a viscous blown or raw vegetable oil having great viscosity, such as, castor oil, rape seed oil and blown oils. These may be used as a coating for said sheets in a natural state. I have also found that ordinary sodium silicate, spread over raw bituminous and vegetable oil surfaces prevents adhesion of the two surfaces when brought together and permits of the separation of said sheets.

The above formulas and methods or processes are used in combination and utilize bituminous or vegetable substances under such conditions that at normal temperatures they will shape themselves into flexible bodies without danger of breaking, said sheets being separate or in combination and separable along the line of the least resisting adhesive, breaking apart, separating in a stringy condition or as a viscous oily substance in temperatures ranging down to 0° F.

Adhesives, fabrics or the like as related to roofing and construction purposes heretofore have not been provided for the use of the public so that they would be in an adhesive state during normal temperatures without the use of special contrivances to bring about the adhesive state, either thru heating means at the job, solvents over paper or dusted surfaces or the application of hot materials in building up a roof structure.

The invention of these adhesives lies principally in the fact that they must be provided in a non-flowing state, and where surfaces are packed together must remain in a viscous state over a considerable period of time in a very thin film or films, so as to avoid oozing out between surfaces.

What I wish to claim is:—

1. In combination, superposed sheets, and adhesive materials existing as film coatings upon opposed surfaces of the respective sheets, said adhesive materials being of different intensity of tackiness so that the sheets will separate along the lines of the adhesives of less tackiness.

2. Building material comprising base layers of intense adhesive covered by layers of adhesive of less intensity, said base layers being outwardly exposed and separable along the lines of the adhesives of less intensity.

3. Building material surfaced with normally adhesive materials in superimposed thicknesses of different intensity of tackiness, said thicknesses being separable along the lines of the adhesives of less tackiness.

4. Building material comprising juxtaposed sheets separated by superimposed thicknesses of adhesives of different intensity of tackiness, said sheets being separable along the lines of the adhesives of less tackiness.

In testimony whereof I have signed my name to this specification on this twelfth day of January, A. D. 1921.

ALBERT C. FISCHER.

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