Patented Apr. 27, 1937

2,078,727

UNITED STATES PATENT OFFICE

2,078,727

COMPOSITIONS OF MATTER AND USE THEREOF

James J. Jackson, Woodbury, N. J., assignor to Paulsboro Manufacturing Company, Paulsboro, N. J., a corporation of New Jersey

No Drawing. Application August 20, 1935, Serial No. 37,100

2 Claims. (Cl. 134—23.7)

This invention relates to an adhesive composition and more particularly to adhesive compositions for securing fibrous sheet materials in laminated structures and to such structures, or for adhesively attaching fibrous materials to a supporting base.

Fibrous sheets of felted, matted, and woven or knitted types are used extensively in various fields including floor coverings and wall coverings and the like for decorative and other purposes. Fibrous sheets are frequently either brought together in two or more layers to form laminated articles or they are attached to a supporting base. In both cases, it has been difficult to prevent penetration of an adhesive to the outer surface of a fibrous sheet. In cases of decorative sheet goods having printed or other colored designs, certain tints are very apt to become obliterated by the penetration of an adhesive.

An object of the present invention is to provide an adhesive composition that has no undue tendency to penetrate into a fibrous sheet. A further object is to provide an adhesive composition that forms highly flexible adhesive films between sheets in laminated goods, which films are firm and non-tacky at room temperature.

The adhesive composition of the present invention comprises essentially an asphalt, a pitch, an asphaltite, and filler material. The asphalt used is preferably a pyrogenous asphalt obtained as a residue in petroleum cracking and distillation processes. The pitch is a pyrogenous residue and the most satisfactory pitch and one which is preferred is a vegetable oil pitch. Of the fatty acid pitches, cottonseed pitch is particularly preferred. Linseed pitch may be used in some cases. Pitches from animal fats and oils such as for instance stearine pitch or blends of such pitches with pitches from vegetable fats and oils, pine pitch, coal tar pitch, petroleum pitch, and oxidized asphalt may in some instances be substituted for vegetable oil pitch such as cottonseed pitch but for most purposes cottonseed pitch is found to be peculiarly satisfactory. For the asphaltite, gilsonites are preferred.

A cottonseed pitch that has a melting point of 112 to 115° F. and a penetration of 150, has greater ductility than asphalts and is less affected by heat and cold or temperature changes. In the formula given below the asphalt used may have a melting point of about 225° F. and a penetration of about 15. This asphalt may be designated as a relatively hard asphalt yielding a relatively hard final product. A gilsonite having a hardness of 2 (Moh's scale), and a softening point of about 340° F. (Ring and Ball) is found satisfactory for the purposes set forth.

Various fillers may be employed but the filler that is particularly preferred and which gives peculiarly highly satisfactory results in all cases, is powdered slate. Other fillers may be used such as asbestos fiber, whiting, barytes and clay but none of these have been found as satisfactory as slate in the particular composition of the present invention. One advantage in the use of slate is that better results are obtained by its use in compositions maintained at low temperatures than by the use of other fillers.

Omission of any one or more of the ingredients in the mix or omission of asphalt, or pitch, or the asphaltite, or particularly the filler such as slate, yields products that are not as satisfactory as a product having all of the ingredients present. To determine the desirability of the product particularly for purposes set forth above, several factors are to be kept in mind. The composition must be capable of being reduced to a thin film; it must have strong adhesive properties; it must not split readily or at all particularly when cold for instance at 36° F. or below; and it should be relatively inexpensive. These requirements are extremely well met in the application of the adhesive product of the present invention.

A composition having the following proportions and ingredients is preferred:

	Parts by weight
Asphalt	12
Cottonseed pitch	8
Gilsonite	4
Slate flour	24

If desired, the proportions may be varied within certain limits but any wide variation is likely to result in the formation of products that lack one or more of the necessary properties. For most purposes, compositions having proportions of ingredients that are within the ranges given below, are satisfactory:

	Parts by weight
Asphalt (15 to 40%)	6 to 24
Pitch (17–30%)	8 to 16
Gilsonite (4–12%)	2 to 6
Slate (45–55%)	18 to 30

Asbestos, having a lower specific gravity than slate, is used in much lower proportions as for instance four parts by weight replacing 24 parts by weight of the slate.

Although the adhesive may be employed for other purposes, it has been found to be particularly adapted to combining fibrous sheets together in laminated form. Penetration by the mix is controlled by the use of pitch such as particularly fatty acid pitches which have the property of forming a skin and of freezing when coming in contact with a cold surface. The slate flour also helps to prevent penetration of saturated or unsaturated sheets. The slate flour also gives the mix body by raising the viscosity so that the pressure of laminating rolls cannot squeeze the mix ahead and thereby leave no mix between the sheets to act as an adhesive.

An important property of the adhesive of the present invention is that it will not stick to cold laminating rolls, but will peel off very easily. If a sheet breaks or has a hole in it, the mix on coming in contact with the rolls will not stick to the rolls and therefore will not render it necessary to stop a machine in order to clean the rolls. Any of the mix that runs over the edges of sheets on the rolls can be peeled off and no trouble is caused by building up of layers of the mix on the rolls.

Numerous bituminous mixes disclosed in prior publications have been employed in manufacturing laminated sheets, but they have generally been found to stick to the rolls, which means that the latter must be frequently scraped and then cleaned with solvent. Generally such mixes are soft and sticky at normal temperatures and it is possible to pull the sheets apart and to find the mix still sticky after long use. With such mixes, sheets are apt to skid over each other when passing through the rolls because the mixes are not hard enough. Likewise, when a laminated sheet material is rolled up, if the adhesive mix employed for combining the sheets is too soft, the outer lamination is apt to slip so that the laminations are not kept in the same relative positions when the sheet material is laid out flat. Also one lamination may be affected by moisture or atmospheric conditions more than another lamination as the result of which there is greater expansion or contraction in one lamination than another. The adhesive employed between such laminations must be hard enough to prevent undue skidding of one lamination on another under all conditions.

The mix of the present invention can be used to coat one side of a sheet of goods. The mix can be poured on a sheet as it passes through squeeze rolls and it will not stick to the roll with which it comes into direct contact. A sheet coated on one side with a film of the mix, can be rolled up within a few feet of the coating machine without sticking to the uncoated side of a sheet. The mix is not sticky or tacky at room temperature, but is flexible and when in film form will not readily break.

Decorated fibrous sheets, previously saturated, or unsaturated, are readily laminated with sheets saturated or unsaturated with for instance bituminous or other plastic saturants. The decorated sheet may be of the open porous type such as Krafelt, for instance, which is made up principally of curly or kinked vegetable fibers, and yet the adhesive will not penetrate to obliterate decorations. The adhesive of the present composition permits of printing on paper even as thin as newspaper with oil paints without discoloring the print paint.

The composition of the present invention may have a melting point within a wide range, particularly from about 185° to 225° F. The melting point of the composition is not as important, however, as the proportion of ingredients. The mix may be applied in a liquid state at about 420° F. When the mix reaches room temperature, it is necessary for the successful manufacture of the laminated sheets that the mix be hard, non-tacky, and yet flexible.

Although fatty acid pitch has been mentioned as one of the ingredients, it has been found that in some cases a non-drying oil can be substituted for the pitch with some degree of success. One formula that may be used is as follows:

	Parts by weight
Asphalt	19
Non-drying oil	1
Gilsonite	4
Slate flour	24

Non-drying oils such as olive oil, cottonseed oil, and castor oil may be employed in the above formula.

The above formula is not to be preferred and is not as serviceable as a composition in which the pitch is used.

I claim:

1. A plastic adhesive composition that will not stick to cold laminating rolls, comprising asphalt substantially 15 to 40%, pitch substantially 17 to 30%, gilsonite substantially 4 to 10%, and slate substantially 45 to 55% by weight.

2. A plastic adhesive composition that will not stick to cold laminating rolls, consisting of substantially 12 parts by weight of asphalt, 8 parts by weight of cotton seed pitch, 4 parts by weight of gilsonite, and 24 parts by weight of slate flour.

JAMES J. JACKSON.