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ADHESIVE AND METHOD OF MAKING THE SAME

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1 Claim. (Cl. 260—746)

This invention relates to an adhesive and a method of making the same and more particularly to an adhesive which is adapted to be used in the application of paper labels and the like to a smooth hard surface.

In the application of paper labels and the like to smooth hard surfaces such as metal or glass an adhesive should be used which will cause the label to adhere to the surface when applied and to continue to adhere for an indefinite period of time thereafter. At the same time, the label should be readily removable. Preferably the label should be removable without tearing or destroying the fiber of the paper. The adhesive itself should also be readily removable from the surface when the label is removed. The problem is particularly serious with respect to metal surfaces such as steel, tin plated cans or containers, glass bottles, varnished, lacquered or enameled surfaces.

With the ordinary adhesive the application of a paper base to such a surface results in an adhesive bond which either fails to provide the necessary adhesiveness for the label to remain in place for substantial periods of time or, on the other hand, the label is not readily removable or when removed leaves a residue of the adhesive bond which is itself difficult to remove and tends to stain the surface.

The present invention provides an adhesive which is adapted to secure paper on other materials to hard smooth surfaces and to maintain the material in position for long periods of time. The material may, however, be readily separated from the surface to which it is applied and the adhesive itself readily removed from the surface. In the removal of the material and the adhesive from the surface the material is not destroyed or affected by the removal. The adhesive composition of this invention also provides for a highly water-resistant bond.

In general the invention relates to an adhesive composition wherein a water-absorbent clay such as bentonite is mixed with hygroscopic material such as magnesium chloride with or without the addition of a suitable soap. The water-absorbent clay may be of any suitable type. Bentonite is the most highly water-absorbent of the clays now known and is used widely commercially. Other clays, however, may be used but in most cases with somewhat less satisfactory results. Such materials as kaolin, Georgia clay and china clay have been used in connection with the invention. Clays of this type are colloidal or semi-colloidal in character and tend to absorb water.

The hygroscopic material which is used should be capable of absorbing moisture from the air to prevent the complete drying out of the adhesive composition even after long periods of time. Although any hygroscopic material may be used for this purpose, I prefer to use such materials as magnesium chloride, calcium chloride and sodium chlorate. Organic hygroscopic materials such as glycerine, the glycols and their derivatives may also be used. The use of a small quantity of soap in the mixture provides further adhesive and moisture retaining qualities and adds detergent properties to the composition. I prefer to use a laundry soap for this purpose although any type of soap may be used. By the use of the term soap I mean to include the water-soluble salts of the long chain fatty acids.

In preparing the composition a small amount of the hygroscopic salt is dissolved in water. To the solution is added the bentonite or other clay. The balance of the hygroscopic salt is then added together with the soap.

As a specific example of the preparation of the adhesive composition 10 pounds of magnesium chloride may be added to 410 pounds of water and dissolved therein. To the mixture is added 165 pounds of bentonite which is thoroughly mixed in the solution until the bentonite is dispersed. An additional 10 pounds of magnesium chloride is then added to the solution. 4½ pounds of soap are separately dissolved in water and the solution added to the bentonite suspension. If desired, 1 pound of a suitable preservative such as the phenol derivative sold by the Monsanto Chemical Co. under the trade-name "Santobrite" may be added to the mixture.

Approximately 600 pounds of the adhesive composition are thus produced. The ingredients of the composition of this particular example are as follows:

	Pounds
Bentonite	165
Magnesium chloride	20
Preservative	1
Soap	4½
Water	410

By dissolving the hygroscopic salt in water before adding the bentonite it is possible to obtain a better dispersion of the bentonite. The mixture is thinner and more readily handled than would otherwise be the case. By using a salt such as magnesium chloride as the hygroscopic material an additional advantage is obtained in that

such salts aid in providing a better adhesive for metal surfaces.

The bentonite or other clay acts as the primary adhesive in the composition. As is well known, bentonite when moist possesses valuable adhesive properties. When the bentonite dries out and loses its moisture, its adhesive properties tend to be at least partially lost. By using a hygroscopic material in the composition, sufficient moisture is maintained therein to utilize the maximum adhesive properties of the bentonite. The hygroscopic material therefore actually augments the adhesiveness of the composition.

The soap in the composition adds some adhesive properties of its own and aids in retaining moisture in the mixture. Most important, however, is the fact that the soap provides a detergent which aids in removing the adhesive from the surface to which it is applied.

The adhesive composition when used in applying paper labels to metal surfaces for example, will cause the label to adhere to the surface. The label will be completely self-sustaining and resistant to ordinary friction which it is likely to encounter. When it is desired to remove the label it may be stripped from the metal surface by merely lifting one end of the label and drawing it from the surface. The adhesive composition will be partially removed with the label. Any adhesive which remains on the surface may be readily removed by washing the surface or by wiping it with a damp cloth.

The adhesive composition may, if desired, contain additional adhesive materials. If a strong adhesive bond is desired, a suitable quantity of rubber latex, starch, glue or other adhesive base material may be added to the mixture. Such adhesives may be added in any suitable amounts but ordinarily will not exceed 25% by weight of the composition. In the preparation of an adhesive for use on masking tape for example, it has been found desirable to incorporate 20% or 25% of rubber latex in the composition.

Although the composition has been described in connection with its use for the application of paper labels and the like to metal, glass, varnish or other hard smooth surfaces, it will be understood that there are many other uses for the composition and it is not intended to be limited to any particular purpose or function.

While in the foregoing specification certain steps, conditions and ingredients are set forth as illustrating the invention, it will be understood that those skilled in the art may modify such steps, conditions and ingredients without departing from the spirit and scope of the invention.

I claim:

An adhesive composition of the character described comprising, approximately 60% bentonite, 25% rubber latex, 10% magnesium chloride, 4% water-soluble soap and 1% preservative.

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