EXAMPLE 55

A polyurethane foam is made by mixing 432 grams of "Hylene" TM (mixed toluene diisocyanate isomers—E. I. du Pont de Nemours and Company) for 10 seconds in a Hobart kitchen mixer operating at low speed, with a mixture consisting of:

Selectron 6201 resin (Pittsburgh Plate Glass Company) ---------- grams--	1,049
Emulsifier (polyoxyethylated vegetable oil) grams--	15
Water ---------- cc--	38
N-methyl morpholine ---------- cc--	15
Filter aid (Johns-Manville Super Floss) --grams--	30

As quickly as possible, the foams are poured in the mold, 13" x 15" x 19". Foaming takes place in about 15–30 seconds and is complete in 2 minutes. The foam is cured overnight at room temperature.

The polyurethane foam so made is cut into 1" cubes which are thoroughly deaerated by mechanical means for 1 minute in a 2.81% fibrous alumina monohydrate dispersion, squeezed dry and dried in an air-circulating oven at 110° C. for 1 hour. The 1" cubes are subsequently impregnated with a 2% solution of a polyvinyl methyl ether/maleic anhydride copolymer by a 1-minute mechanical working in the copolymer solution at room temperature and dried at 110° C. for 1½ hours. The polyvinyl methyl ether/maleic anhydride copolymer treatment is found not to be permanent without pretreatment with fibrous alumina monohydrate.

The rate of wicking in any direction is ⅛–1 inch per second. The rate of absorption for foam made in an identical manner except that it has not been treated as described, is less than 1/16 inch per second. This rate of wicking is measured after thorough washing with water and wringing in a washing machine wringer. The rate is observed by immersing the foam in a water solution at room temperature containing a small amount of nigrosine black water-soluble dye and watching the rise of water containing dye.

The improved rate of absorption is further demonstrated by the amount of water picked up in a short time, in accordance with the following test procedure. The foam sample is thoroughly wet out and put through a washing machine wringer. The sample is then weighed to the nearest 1.0 gram and the weight recorded is "wet weight." It is then placed carefully on the surface of water in a pan deep enough to allow the foam to float without touching the bottom. After exactly 5 seconds, the sample is lifted from the water. The sample is again weighed and the difference between the final weight and the "wet weight" represents the 5-second water absorption of the foam.

Six 1" x 3" x 3" size foams prepared as above described and treated with fibrous alumina monohydrate, followed by a treatment with polyvinyl methyl ether/maleic anhydride have an initial average absorption of 38.3 grams. After washing for 1 hour in 0.1% "Tide" detergent solution, the average absorption is 36.5 grams. After washing in plain water solution for 1 hour, the average absorption is 55.7 grams. A control sample given no treatment absorbs about 2 grams of water.

The foams treated as above described retain their hydrophilicity after 5 days of two 1-hour washings per day at which time the test is discontinued.

Any hydrophilic organic polymer (hydroxyl or carboxyl groups or precursors to such groups through hydrolysis such as ester, amide, ether or anhydride) may be employed as the final (topcoating) agent. In addition, the polymer may contain groups such as amino, amide, nitro, sulfonate or other groups capable of interacting with water. As specific examples of useful solid hydrophilic organic polymers there may be mentioned polyvinyl alcohol, acidic vinyl acetate copolymer, cyanoethyl cellulose, sodium carboxymethyl cellulose and a copolymer of polyvinyl methyl ether and maleic anhydride. The hydrophilic organic polymer is conveniently applied from an aqueous dispersion or solution thereof containing from 0.001% to 10%, and preferably from 1% to 3% by weight of polymer.

EXAMPLE 56

Polyurethane foam manufactured as in Example 55 and treated with the fibrous alumina monohydrate dispersion and dried as in Example 55 is post-treated in a similar manner as in Example 55, except that a 2% solution of polyvinyl alcohol is used. Results substantially the same as those of Example 55 are obtained.

EXAMPLE 57

A polyurethane foam mixture is produced as follows: 300 grams of "Pluronic" L–61 (polyether block copolymer containing 90% propylene oxide with 10% polyethylene oxide and having a molecular weight of approximately 2000) and 27.3 grams of toluene diisocyanate are heated together at 120° C. with stirring under a nitrogen blanket for 2 hours. An additional 64.2 grams of toluene diisocyanate are slowly added at 120° C. during 30 minutes. The reaction mixture is then quickly cooled to 30° C. This prepolymer is used to make a foam by the following procedure:

	Grams
Prepolymer ----------	50.0
Emulsifier (polyoxyethylated vegetable oil) --------	.05
N-methyl morpholine ----------	.05
Water ----------	.05

are thoroughly mixed quickly, then poured in a mold to foam. After the foam has risen to its maximum height, it is placed in an oven at 75° C. to cure for 4 hours. This foam is very soft and springy but does not wet well with water. It is post-treated as described in Example 55 with like result.

A salient feature of the present invention is that by reason of its practice a previously hydrophobic polyurethane is made permanently hydrophilic. This property, in addition to its unaltered properties of "feel," appearance, wear-resistance, heat-resistance, permanent softness and freedom from bacterial degradation, that give it customer appeal, makes polyurethane foam sponges desirable for household and industrial usage. The absorptive and wettable polyurethane foam sponge, as described in this invention, is characterized by the following improvements: Flushing the cleaning agents and dirt from the foam is improved; less physical effort is required to squeeze or wring the water from the foam; the foam picks up more water when squeezed under the surface of a fluid; and the hydrophilic foams absorb more water from the surface in a given time since the foam is more permeable.

Specific improved products, although not limited to these which can be made by application of the above invention, in addition to an all-purpose household and industrial scrubbing and wiping sponge mentioned before, include an all-purpose household and industrial scrubbing and wiping mop and a quick-drying sponge mop which is less susceptible to bacterial degradation.

Other sponge uses, such as disclosed in Banigan et al., U.S. Patents 2,280,022 and 2,295,823, and Saffert, U.S. Patent 2,138,712, may apply to the improved product and provide functional uses and wider utility than any sponge herebefore known. It will be understood that plastic foams treated so that they become hydrophilic by the treatment of the present invention may be used for any purpose for which their hydrophilic properties render them suitable.

What is claimed is:

1. A solid state, organic plastic in the form of a solid film coated with and bonded to fibrous boehmite, said