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UPHOLSTERY PAD

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This invention relates to cushioning structures such as upholstery pads, seat cushions, mattresses, rug liners and the like, and to a method for their manufacture.

Upholstery pads and similar structures used for cushioning purposes are of several general types. One type includes structures consisting essentially of intermingled fibers, such as animal hair or plant fibers, held in association by means of a binder, such as rubber latex applied thereto. Such cushioning structures are commonly made by packing the fibrous material in an open mesh wire mold of the desired size, shape, and thickness, and applying a liquid binder to it. After drying and curing the thusly treated structure, it is ready for use. Such cushion structures are characterized by good resilience, "cushioning effect," and particularly by the excellent ventilation they provide due to their open, fibrous structure. This latter characteristic is important in providing a cool and comfortable effect on one's body when it is in contact with upholstery cushions, seat cushions, mattresses and the like, particularly in warm weather. A disadvantage of this type of cushion structure is that it does not have the "spring-like" characteristics of other types of such structures.

Another type of cushion structure which has found extensive use in the manufacture of mattresses, seat cushions, upholstery pads, rug pads and the like, is one made of foamed rubber, such as sponge rubber. Cushion structures of this material have excellent structural strength and resiliency and the cushioning effect of such structures more nearly approaches that produced by coiled springs than do other types of cushion pads. However, due to the characteristic internal structure of foamed rubber, air does not move through the body of the structure very readily, with the result that foamed rubber seat cushions, mattresses and like products frequently produce a clammy and uncomfortable effect on the body of a person in contact therewith, particularly in warm weather.

To overcome the disadvantages inherent in present day cushion structures, and to provide a cushion structure having excellent resilience, cushioning effect and structural characteristics which are conducive to good ventilation, this invention contemplates a structure comprising a mixture of discrete pieces of foamed rubber uniformly intermingled with a fibrous material, and a resilient binder therefor.

In producing such a structure according to the present invention, fibrous material, such as ani-

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mal, vegetable or synthetic fiber, is thoroughly mixed with pieces of foamed rubber until a uniform mixture of the two is formed. This mixture is then formed to a desired size, shape and thickness either by placing the mixture in an open mesh wire mold, or between open mesh wire belts, or in any other manner. The thusly confined mixture may be steamed and dried in order to "set" the fibrous material before applying a binder to the said mixture, or the binder may be applied to the confined mixture without the aforesaid steaming step. The liquid binder may be applied to the confined mixture of sponge rubber pieces and fibrous material by spraying, dipping or in any other manner as is well known to those skilled in the art. After application of the binder, the confined mixture may be heated or otherwise treated to dry the mixture. After drying, curing and removal from the mold or from between the screens, the resulting structure is ready for use.

In preparing the mixture of the present invention, we prefer to use animal hair such as hog hair, cattle tail hair, horsetail hair and horse mane hair, though other types of fibers such as tula, Tampico, cocoanut fibers or synthetic fibers can be used with good results. The hair, or other type of fibrous material, may be artificially curled or left in the natural state, though we prefer to use curled hair because of the added "springiness" it imparts to the finished structure.

The size and shape of the pieces of sponge rubber used may vary, though we prefer to use irregularly shaped pieces, with an average diameter of about one-eighth of an inch to about one-half inch. We have found that irregularly shaped pieces of foamed rubber form a more stable structure when mixed with the fibrous material than do pieces having a regular shape. The proportion of fibrous material to foamed rubber we prefer to use is from about 10% to 75% by weight of the former to about 25% to 90% by weight of the latter, though somewhat more or less of one or the other of the elements of the mixture can be used without seriously impairing the cushion structure. We prefer to use a liquid binder such as natural or synthetic latex though, of course, other types of liquid binders can be used, such as resins, glues and the like, as is well known in the art. It is understood, of course, that the binder may be applied to the mixture of fibrous material and foamed rubber either before or after forming the mixture to a desired size, shape, and thickness. Preferably, we apply the binder to the said mixture after it has been given

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a definite structural form, as by molding or otherwise forming it. We have found that when a mixture of fibrous material and foamed rubber is sprayed with or dipped into a binder, the foamed rubber has a tendency to soak up the binder. This not only makes drying more difficult, but additionally, the foamed rubber loses some of its resiliency on drying, due to the accumulation of binder in the pores of the rubber. We have further found that we can retain the resiliency of the foamed rubber by applying the binder in such a manner that a lattice work of the said binder is formed on the surface and at least partially through the body of the pre-formed, loosely associated dry mixture of fibrous material and pieces of foamed rubber. This may be accomplished by passing the aforesaid preformed structure across the path of fall of one or more streams of liquid binder to form a crisscross pattern on the surface and at least partially through the body of the structure, or in any other way. After the applied binder has dried and cured, the structure is ready for use.

According to the preferred embodiment of our invention, which is illustrative only and not to be construed as limiting, one-half pound of curled hog hair and one-half pound of irregularly shaped pieces of sponge rubber having an average diameter of three-eighths of an inch were thoroughly mixed so that the pieces of rubber and the hair were uniformly intermingled. This mixture was then placed in an open mesh wire mold eighteen inches square and two inches deep, and the material packed down slightly in order to densify the mixture. The mold was then passed through falling streams of rubber latex, the streams being about one-quarter inch thick and spaced about one and one-half inches apart. The excess binder was allowed to drain from the underside of the pad. A wire screen was then placed across the top of the mold, the mold turned upside down, and removed. The thusly treated structure of hair, sponge rubber, and rubber latex was then dried in a current of air at 120° F. for one hour. Then the structure was placed in a curing oven at 220° F. for one hour. On removal from the oven, the pad was ready for use.

Such a cushion structure is highly resilient, has excellent comeback after compression, and possesses good structural strength. It is superior to ordinary fiber or hair cushion structures in its "cushioning" effect and possesses "spring-like" characteristics. It is superior to the ordinary foamed rubber cushion structures, in that its open, fibrous structure is conducive to good ventilation and to the dissipation of perspiration and body heat.

It is evident that the present invention is applicable to the manufacture of all types of cushion structures. It is clear, also, that the lattice work of binder can be applied to the mixture of fibrous material and pieces of foamed rubber in a con-

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tinuous manner, as by passing the said mixture on a moving belt through a series of falling streams of latex, or in other ways evident to those skilled in the art. It can be seen also that a loose dry mixture of fibers and pieces of foamed rubber can be used advantageously as an upholstery stuffing material where a pre-formed structure of such materials is not needed.

These and other embodiments we consider within the purview of our invention, and we do not intend that it be limited in scope except as necessitated by the appended claims.

We claim:

1. A cushioning structure comprising a mixture of substantially uniformly intermingled fibers and discrete pieces of foamed rubber bonded into a unitary mass by an elastic binder applied as a lattice work over the surface of the said mixture, the proportion of fiber in the mixture of fiber and pieces of foamed rubber being from about 10% to 75% by weight of said mixture.

2. A cushioning structure comprising a mixture of substantially uniformly intermingled fibers and discrete pieces of foamed rubber bonded into a unitary mass by a rubber latex binder applied as a lattice work over the surface of the said mixture, the proportion of fiber in the mixture of fiber and pieces of foamed rubber being from about 10% to 75% by weight of said mixture.

3. A cushioning structure comprising a mixture of substantially uniformly intermingled fibers and discrete pieces of foamed rubber bonded into a unitary mass by an elastic binder applied in spaced intervals between the fibers and pieces of foamed rubber of said mixture, the proportion of fiber in the mixture of fiber and pieces of foamed rubber being from about 10% to 75% by weight of said mixture.

4. A cushioning structure comprising a mixture of substantially uniformly intermingled animal fibers and discrete pieces of foamed rubber bonded into a unitary mass by a rubber latex binder applied as a lattice work over the surface of the said mixture, the proportion of animal fiber in the mixture of animal fiber and pieces of foamed rubber being from about 10% to 75% by weight of said mixture.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,023,273	Leguillon	Dec. 3, 1935
2,131,073	Roberts et al.	Sept. 27, 1938
2,140,063	Talalay	Dec. 13, 1938
2,147,362	Bloomberg	Feb. 14, 1939
2,159,213	Howard	May 23, 1939
2,290,613	Greenup et al.	July 21, 1942