

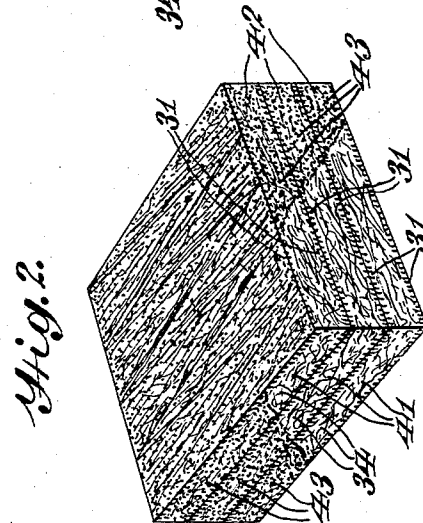
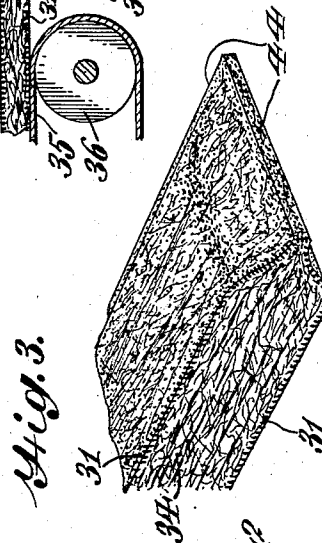
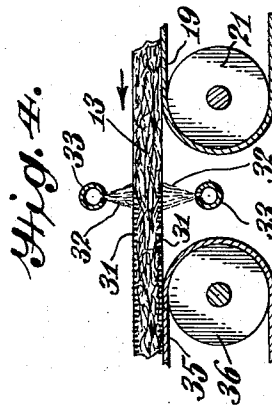
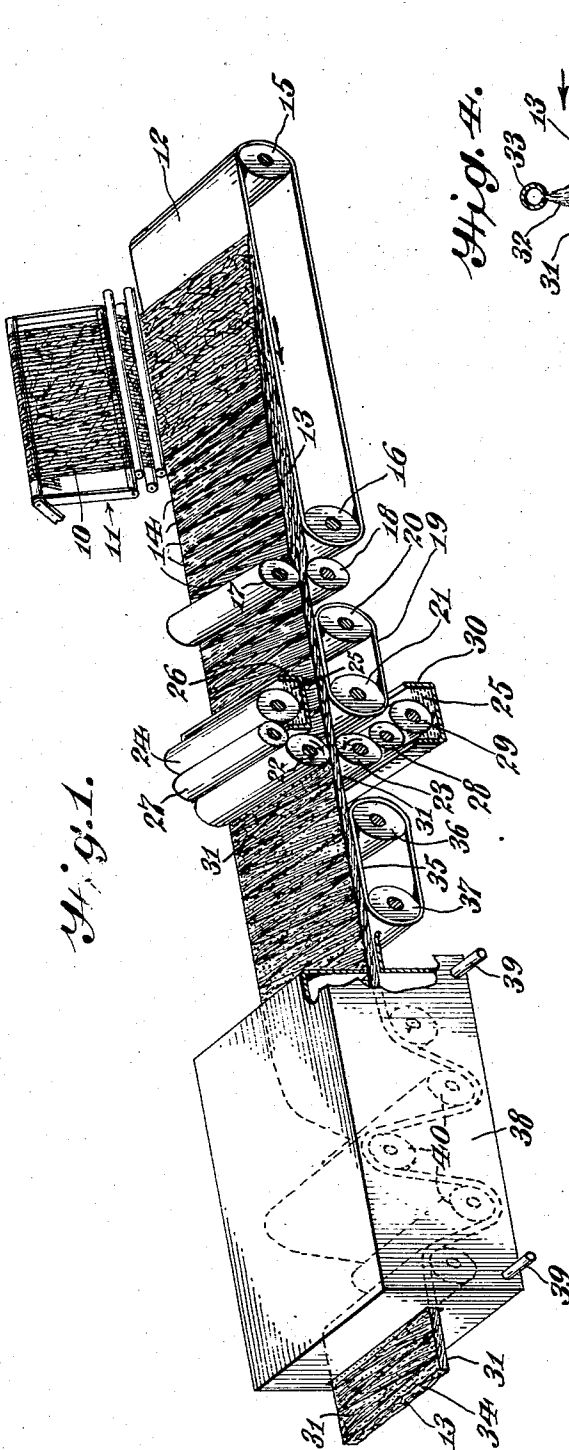
June 3, 1941.

O. R. BURKART

2,244,097

FIBROUS PADDING AND METHOD OF MAKING THE SAME

Filed Sept. 14, 1936



INVENTOR.

Oliver R. Burkart,

BY

John D. Myers

ATTORNEY.

UNITED STATES PATENT OFFICE

2,244,097

FIBROUS PADDING AND METHOD OF
MAKING THE SAMEOliver R. Burkart, Webster Groves, Mo., assignor
to F. Burkart Manufacturing Company, a cor-
poration of Missouri

Application September 14, 1936, Serial No. 100,637

13 Claims. (Cl. 154—2)

The invention relates to fibrous padding and a method of making the same, and is disclosed herein as an improvement in pads of the type used as insulating or filling material over the springs in upholstery and mattress structures.

In the manufacture of padding for this purpose, the usual practice is to build up the pad material to the thickness desired and in such forms and shapes as are suitable for the use which is contemplated, and the individual pads made from this pad material may be reinforced by means of stitching or by covering or backing on one or both sides with a layer of fabric which is secured to the pads by stitching with thread or by a needling operation. Such reinforcement by means of stitching, a fabric cover, or both, is utilized not only for the purpose of preventing the fibrous material from which the pad is made from shedding, but also for the purpose of maintaining the body of the pad intact and preventing the fibrous material from pulling apart and being thereby damaged when the pad is handled and when it is in use in a mattress, cushion or other form of upholstery.

Inasmuch as some form of stitching, either with thread or by needling, has heretofore been regarded as essential in securing the fabric cover or backing to the fibrous structure, or in securing the fibrous structure together, and such stitching tends to limit the free movement of the fibers with respect to each other, padding made in this manner does not possess the flexibility or elasticity which it possesses when the stitching operation is omitted. Furthermore, a fabric cover or backing adds substantially to the cost of such a pad.

One of the objects of the present invention is the elimination of the fabric cover or backing which is now generally utilized for padding of this character.

Another object of the invention is the elimination of the stitching which is commonly employed in such padding, whether made by the use of thread or by a needling operation.

A further object of the invention is the provision of a pad for upholstery, mattresses and the like, which is substantially free from any tendency of the fibrous material from which the pad is made to shed from the surfaces of the pad material in the course of manufacture of the pads.

A further object of the invention is the provision of a pad structure in which the fibers composing the interior or main body portion thereof are free to move with respect to each other to thereby partake of the movements of the springs with which the pad structure is associated.

A still further object of the invention is the provision of padding material which possesses

filling properties as well as insulating properties when used over the springs of upholstery and mattresses.

It is a further object of the invention to eliminate friction between the fibers of such padding material and the springs over which the improved pad structure is used. This object is accomplished by so making the pad structure that the fibers composing the interior or main body of the pad have unrestricted movement with respect to each other, thereby permitting the fibers which are positioned immediately over the springs to follow freely the movements of the springs as they compress and expand.

Still another object of the invention is the provision of padding for upholstery, mattresses and the like, which is reversible in that either side thereof may be applied directly to the springs of the structure in which it is used.

The structure of the improved pad, as well as the method of making the same, will be clear by reference to the accompanying drawing wherein:

Fig. 1 is a diagrammatic illustration, in perspective, of a suitable arrangement of apparatus for making the improved padding;

Fig. 2 is a perspective view of a stack of pads after being severed from the continuous length of pad material shown in Fig. 1, and showing the adhesive or binder partially applied to the edges thereof;

Fig. 3 is a sectional view, in perspective, of a slightly modified form of pad; and

Fig. 4 is a diagrammatic illustration of a modified form of apparatus for applying the adhesive to the opposite surfaces of the pad material.

Although the improved padding may be made from other kinds of fibers, it is preferably made from sisal as this has been found to have certain properties which adapt it for use in cushions, upholstery and mattresses, where the padding is utilized as a spring insulator and is therefore subjected to such use as tends to break the individual fibers and pull the mass of fibers apart when formed into a pad.

The sisal fibers are preferably passed through a suitable carding machine in order that they may be untangled, loosened, distributed and arranged in a generally parallel relation with respect to each other and formed into a web or veil 10 in a well-known manner. The web 10 is delivered from the carding machine to a conventional form of camel back lapping machine 11 which is so arranged that the delivery end thereof moves back and forth transversely of an apron or endless conveyer belt 12 supported for movement in the direction of the arrow shown in Fig. 1. The web of carded fibers is thereby laid back and forth across the moving conveyer 12

in a well-known manner so as to produce a continuous length of padding material 13 made up of overlapping webs 14, with the edges of each lap extending at an angle to the edges of each adjacent lap. The thickness of such a continuous length is controlled by the rapidity of movement of the camel back machine 11 as well as the speed of the conveyer belt 12, and ordinarily will be such as to produce a finished pad from one and one-half to two inches thick, depending upon the use to be made of it. The conveyer belt 12 preferably passes around a pair of rolls 15 and 16, one or both of which may be positively driven in order to give the conveyer such speed as may be desired.

The conveyer belt 12 delivers the continuous length of pad material 13 to a pair of squeeze rolls 17 and 18, arranged one above the other on opposite sides of the pad material, and preferably adjustable to and from each other so as to vary the compression exerted upon the pad material as it passes therebetween. The squeeze rolls 17 and 18 are preferably driven positively at the same peripheral speed as the conveyer belt 12. It is preferable, however, that the material not be subjected to a substantial pressure, as it is desirable that it remain in a fluffy condition for the application of adhesive to the surface as hereinafter described.

From the squeeze rolls 17, 18 the continuous length of pad material 13 is delivered to a short conveyer belt 19 which passes around a pair of rolls 20 and 21, one or both of which may be positively driven so that the belt 19 may have the same speed as the main conveyer belt 12 heretofore referred to. From the short conveyer belt 19 the length of pad material passes between upper and lower applicator rolls 22 and 23, the upper one being in contact with the upper surface of the material and the lower one being in contact with the lower surface of the material. The applicator rolls 22 and 23 serve to apply an adhesive or binder in liquid form to the opposite surfaces of the continuous length of pad material as it passes between these rolls. The applicator rolls are preferably positively driven so that the peripheral speed of each is the same as the speed of the endless conveyer belt 12.

The liquid adhesive or binder is supplied to the upper roll 22 by a roll 24 partially submerged in the liquid adhesive 25 in a trough 26 positioned transversely above the length of material 13, an intermediate roll 27 being utilized to transfer the adhesive from the roll 24 to the upper applicator roll 22 if desired. The lower applicator roll 23 is supplied with adhesive through an intermediate roll 28 and a roll 29 partially submerged in the adhesive 25 in a lower trough 30 extending transversely beneath the length of pad material 13.

While other kinds of adhesive or binder may be employed, it is preferred to use latex or a rubber solution inasmuch as the properties of an adhesive of this type are such as to flexibly unite the fibers of a superficial outer layer 31 of the material to each other, and it serves to strengthen the individual fibers, when so coated, without impairing their flexibility. Instead of applying the latex or other adhesive to the surfaces of the length of pad material 13 by means of applicator rolls as shown in Fig. 1, it may be applied by means of a spray 32 from perforated tubes 33 extending transversely of the length of material 13 as illustrated in Fig. 4. It will be understood that the adhesive is applied only in

such a quantity as may be necessary to coat the fibers in a superficial layer 31 on one or both sides of the length of material 13, and care should be taken to impregnate the superficial layer 31 so that the fibers of this layer only will adhere to each other and the fibers 34 on the interior of the padding will have no adhesive applied to them and will therefore remain free to move with respect to each other.

From the applicator rolls 22 and 23 the continuous length of material 13 is delivered to a short conveyer belt 35 passing around a pair of rolls 36 and 37, this conveyer being driven at the same speed as the conveyers 12 and 19 heretofore referred to. The conveyer 35 delivers the padding material to drying apparatus of any desired construction. As shown herein, the dryer comprises an oven 38 which may be heated by means of steam admitted thereto through the pipes 39, and the continuous length of padding material may pass over suitable drying drums or rolls 40 arranged within the oven. The particular form of dryer which is utilized is unimportant, although it is desirable that some form of drying apparatus be used in order that the entire process of making the pads may be carried out in one continuous operation.

Upon emerging from the drying apparatus, the pad material 13 is then severed into suitable lengths or pads 41. These pads may then be stacked as shown in Fig. 2, whereupon the edges 42 are sprayed with the liquid adhesive as indicated at 43 in Fig. 2. The pads 41 may then be subjected to a further drying operation where this is necessary by reason of the character of the adhesive which is utilized.

In some cases it may be desirable to place the stack of pads 41 shown in Fig. 2 under pressure before spraying the edges of the pads with adhesive. Again, it may be advantageous under certain conditions to apply pressure to the marginal edges of the stack of pads before spraying the edges of the pads with the adhesive. When the stack of pads or the marginal edges are compressed before the adhesive is applied to the edges of the pads, the edges of the finished pads will have an appearance substantially like that shown at 44 in Fig. 3.

When formed in the manner herein described, the finished pads consist of a fluffy filler or body portion 34 made up of loose fibrous material wherein the individual fibers are free to move with respect to each other, and this filler is enveloped in a layer of fibers bound together at their points of intersection by means of a flexible adhesive, thereby forming a flexible reticulated covering for the filler. This particular structure of the filler and covering forms a pad which possesses important advantages when used as an insulation for springs in cushions, upholstery and mattresses.

When such a pad is in use the covering readily partakes of the movements of the springs, and it is of such a character as to restore itself to its normal condition when the pressure to which the pad is subjected when in use is relieved. By reason of the structure of the filler, the individual fibers of the filler are free to move with respect to each other as well as with respect to the reticulated covering, and thus partake of the movements of the springs when they compress under a load and when they expand upon the removal of the load. The individual fibers of the filler are thus restored to their normal positions when the springs are relieved of the load, so that

the filler is not permanently distorted by continued use of the pad.

While certain forms and arrangements of apparatus are disclosed diagrammatically herein for carrying out the method of making the pads, it will be understood that other forms and arrangements may be utilized, and that the disclosure herein is intended to be illustrative only. It will also be understood that it may be desirable, for certain purposes, to utilize the particular structure of reticulated covering upon one face only of the pads, the opposite face being covered in any suitable manner, such as by a fabric as heretofore commonly used. The invention is therefore not limited to a pad which is completely enveloped by the reticulated covering herein disclosed, but is intended to include a pad in which one side only is provided with the new protective covering.

The invention having thus been described what is desired to secure by Letters Patent is:

1. A pad for upholstery and the like, comprising a plurality of superposed veils of loosely arranged carded fibers and having a superficial layer only of said fibers forming the outer surface of the pad impregnated with a binder to tie the fibers of said superficial layer together into a reticulated, flexible envelope, the fibers within said envelope being freely movable with respect to each other.

2. A pad for upholstery and the like, comprising a plurality of superposed veils of carded fibers and having a superficial layer only of said fibers throughout the outer surface of the pad impregnated with a flexible binder to tie the fibers of said superficial layer together into a reticulated envelope, the fibers within said envelope being freely movable with respect to each other.

3. A pad for upholstery and the like, comprising a body of superposed veils of loosely arranged sisal fibers freely movable with respect to each other, said body having disposed on a face thereof a superficial layer of carded sisal fibers coated with a binder to tie the fibers of said superficial layer only together and form a reticulated protective covering.

4. A pad for upholstery and the like, comprising a body of loosely arranged carded sisal fibers freely movable with respect to each other, said body having disposed on a face thereof a superficial layer of carded sisal fibers coated with a flexible binder to tie the fibers of said superficial layer only together into a reticulated protective covering.

5. In a pad for upholstery and the like, a filler of superposed veils of carded sisal fibers loosely arranged and freely movable with respect to each other, and an envelope for said filler consisting of a superficial layer of carded sisal fibers, impregnated with a binder to tie the fibers of said layer together.

6. In a pad for upholstery and the like, a filler made up of carded fiber veils overlapping and laid at an angle to each other and having the fibers loosely arranged and freely movable with respect to each other, and a layer of carded fibers tied together with a binder of latex and closely enveloping said filler.

7. A pad for upholstery and the like, comprising a plurality of superposed carded sisal veils laid with the fibers of each veil at an angle to the

fibers of the adjacent veil, a superficial layer only of said fibers forming the outer surface of the pad being tied together with a flexible binder, the other fibers being freely movable with respect to each other and said layer.

8. A pad for upholstery and the like, comprising a plurality of carded sisal veils superposed with the edges of adjacent veils overlapping each other on the opposite faces of the pad, a superficial layer only of the sisal fibers forming each of the opposite surfaces of the pad being impregnated with a flexible adhesive to bind the fibers of said layer together and the exposed overlapping edges of the veils to the adjacent veils, the fibers between said superficial layers being freely movable with respect to each other and said layers.

9. The method of making pads for upholstery and the like, which comprises superposing a plurality of veils of carded fibers freely movable with respect to each other, compressing the superposed veils, and applying a flexible binder to a superficial layer only of the fibers forming the outer surface of the pad to tie the fibers of said layer together into a reticulated covering.

10. The method of making pads for upholstery and the like, which comprises superposing a plurality of veils of carded fibers loosely arranged with respect to each other, passing the superposed veils through a set of compressing rolls, and applying a flexible binder to the superficial layers of the fibers forming the opposite faces of the pad to tie the fibers of each layer only together and form a reticulated covering.

11. The method of making pads for upholstery and the like, which comprises progressively forming a continuous length of fibrous pad material, applying a flexible binder to the opposite faces of said pad material to tie together the fibers of a superficial outer layer on each face and form a reticulated covering, severing the continuous length into pads, superposing a plurality of said pads to form a stack, compressing the edges of said stack in the direction of the thickness of said pads, and applying a flexible binder to the edges of said pads while under compression.

12. The method of making pads for upholstery and the like, which comprises progressively superposing veils of carded fibers to form a continuous length of fluffy pad material, progressively applying a flexible binder to the superficial layers forming the opposite faces of said material to tie the fibers of each layer only together, severing the continuous length of material into pads, and applying a flexible binder to the edges of the severed pads.

13. The method of making pads for upholstery and the like, which comprises progressively superposing veils of carded fibers with the edges of the veils in overlapping relation to form a continuous length of fluffy pad material, passing said pad material through a set of compressing rolls, progressively applying a flexible binder to the superficial layers forming the opposite faces of said material to tie the fibers of each layer only together, drying the flexible binder, severing the continuous length of material into pads, and applying a flexible binder to the edges of the severed pads.

OLIVER R. BURKART.