

Oct. 12, 1937.

W. H. WATERS ET AL
SHAPE RETAINING FIBER MATTRESS

2,095,375

Filed May 7, 1935

2 Sheets-Sheet 1

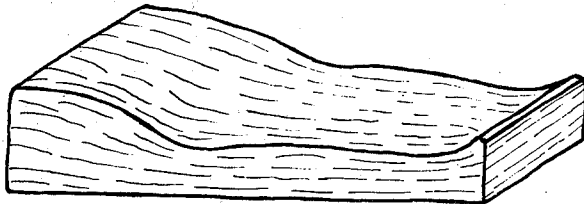


Fig. 1

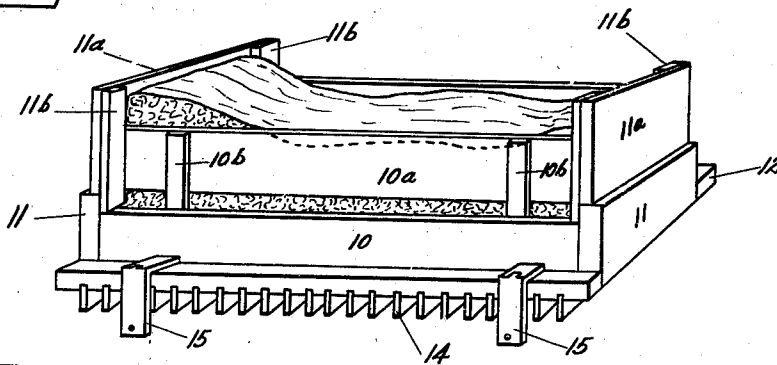


Fig. 2

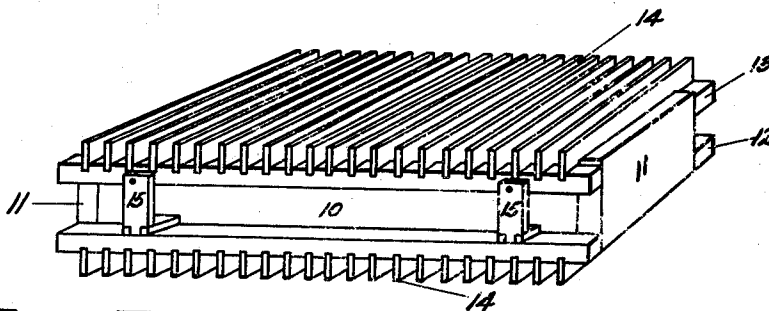


Fig. 3

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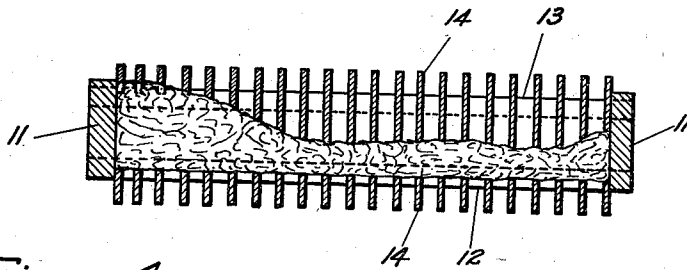


Fig. 4

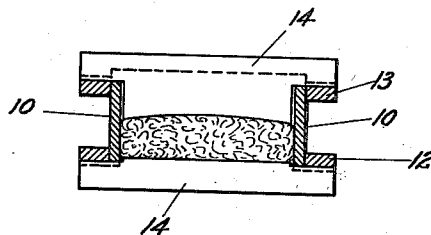


Fig. 5

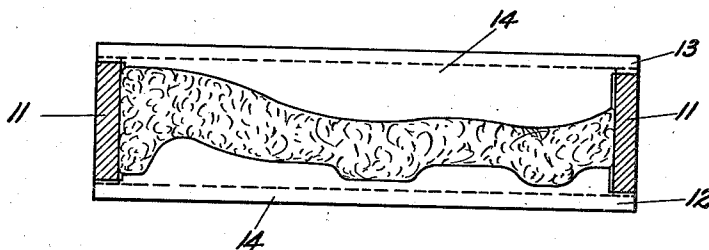


Fig. 6

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UNITED STATES PATENT OFFICE

2,095,375

SHAPE RETAINING FIBER MATTRESS

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Application May 7, 1935, Serial No. 20,182

4 Claims. (Cl. 28—4)

This invention is in part a division of our co-pending application Ser. No. 610,636, filed May 11, 1932, and in part a continuation of the same, and relates to an improved mattress, cushion, or the like, of needled fibers of curled hair, or other animal or vegetable fibers, and to the fabrication of the same into a cohesive shape-retaining fashioned unit capable of being handled without disintegrating, and preserving its configuration without the usually required enclosing casing and tufting ties.

Mattresses and the like of such curled fibers have heretofore been made by "stuffing" an amount of the fibres into a prepared casing, closing the latter by seaming, and then patting and fluffing the same into desired uniform shape and "tufting" with tie cords to more or less secure the enclosed fibers from shifting into uneven and lumpy contour.

Another known method has been to fill a casing with one or more layers of needled fiber batting cut from a roll of the latter, and then seaming the casing and tufting as before; such batten rolls have but a loose cohesion and cutting them into lengths starts their disintegration.

In both the above heretofore known methods the avoidance of fiber shifting has been only partially successful, and the renovating of the mattress has necessitated a complete remaking operation, as the cleaning and washing of the removed fiber contents destroys any unitary and shape-retaining semblance they may have had when secured in the enclosing casing.

Various other efforts to make the fiber contents a cohesive unit have heretofore been attempted, including needling the fiber batting to sheets of woven fabric, or combination with other material; but up to the time of the present improvements no means have been found for producing a commercially satisfactory fiber pad or mattress of compact cohesive resilience capable of being handled and renovated as a unit without disturbing its formation of retained structure shape independent of an enclosing casing or tufting ties.

In addition to the shape-retaining cohesion imparted to the fiber by the present improvements, varying resilient compactness may be secured in selected areas subject to more severe use, and further these improvements provide for any desired variation in shape both longitudinally and transversely adapted for needs in pillows, cushions, upholstery pads and the like where a desired surface contour is sought.

The present improvements and the manner of employing the same in the production of shaped fiber mattresses and the like, will now be more fully described in the following specification in connection with the drawings accompanying the same and forming part thereof, and the novel

features will be particularly set forth in the subjoined claims.

Fig. 1 indicates, in perspective view, a pad of curled fibers made in accordance with the present invention into a cohesive shape-retaining resilient unit of a determined size and contour.

Fig. 2 indicates a preliminary step in the making of the pad shown in Fig. 1, and indicates in a perspective view a suitable slatted-bottom form, with its cover removed, and with temporary side and end walls to facilitate loosely laying in the form a suitably distributed amount of curled fibers.

Fig. 3 indicates a further step in the making of the pad shown in Fig. 1, and indicates in a perspective view the form of Fig. 2 with the temporary side and end wall extensions removed, and the curled fibers confined and compressed to a desired resilient compactness beneath a slatted form cover shown in seated and locked position.

Fig. 4 is a longitudinal sectional elevation of the closed form shown in Fig. 3, indicating the shape-imparting contour of the inner edges of the slatted cover section.

Fig. 5 is a transverse sectional view of the form shown in Fig. 3.

Fig. 6 is a longitudinal sectional elevation similar to Fig. 4, but indicating the slats as extending lengthwise and having interior contour edges to give the desired shape to the compressed fibers.

As an essential step in producing a mattress, cushion, pillow, upholstery pad, or the like, in accordance with the present invention, a form of predetermined size is employed in which the curled fibers are loosely laid and piled up to a height sufficient to produce a desired resilient compactness when a form cover is pressed downward thereon and locked in closed position, the interior contour of the form determining the finished contour of the mattress, which is transformed into a cohesive shape-retaining unit by a through-and-through needling of the confined fibers.

A form for the above purpose is indicated in the drawings, and is shown as a rectangular frame, the sides 10 and ends 11 having a height sufficient to enclose the desired thickness of the mattress, and the bottom 12 and cover 13 being formed of slats 14, 14, preferably set edgewise and extending transversely from side to side. The bottom 12 is shown as united to the sides 10 and ends 11 to form an integral rigid frame, and the removable cover 13 is indicated as secured to said frame by hasps 15. And to facilitate the laying of the loose curled hair in the frame to a sufficient depth to produce the resilient compactness desired in the finished mattress, temporary sides 10a and ends 11a may be employed, held in position by any convenient means, as strips 10b and 11b shown, and removed to permit the placing of

the cover 13 and pressing the latter upon the piled up fibers until the hasps 15 are engaged to lock it in such seated position. Removal of the temporary sides and ends, due to the nature of the curled fibers, does not cause any spreading, and any bulging may be readily pushed back during compression of the cover, or the sides slotted to permit the cover compression before removal of the sides.

The curled hair thus confined in the form is needled as by a machine of the nature set forth in our co-pending application Ser. No. 610,636 above referred to, such needling being effected between the spacings of the slats 14, 14 and preferably extended through the thickness of the confined fibers and effected in opposing directions as therein set forth.

The needling of the aforesaid machine, acting upon the confined and compressed fibers, and reversely directed through the top and bottom slats 14, and carried close to the sides and end walls, entwines and interengages the fibers to weave them into a secure engagement to form a shape-retaining integral unit of the shape and size determined by the form used.

The inner shape and contour of the form is determined by the shape of the slats 14, 14, and in Figs. 4 and 5, the bottom slats are shown as having a uniform width determining a flat under surface of the finished mattress, while the slats of the cover are shown as having a varying width, imparting a shaped contour to the top surface of the finished mattress, as that indicated in Fig. 1. As indicating that the invention provides for any shaping desired, Fig. 6 indicates another mattress or pad produced in a form of the nature described, with its interior contour changed by shaping of the slatted top and bottom inwardly directed edges.

By varying the shape of the inner edges of the slats, and by suitably shaping the form, any desired size and shape of mattress may be made, for use on a bed, as a pillow, fashioned cushion, or shaped upholstery pad employed to produce overstuffed furniture of any desired shape upon springs of uniform height.

Also, where wear is likely to cause sunken places in long continued use, extra fibers may be piled up at such places, which when compressed by the cover will form areas of greater density to withstand the forming of such sunken areas.

The fibers employed may be laid or blown into the form in the amount required, piled up in certain areas as stated, and all are confined and compressed in the form and needled into a shape-retaining mass that will withstand rough handling and laundering when required without loss of shape or resilience. The mattress is finished by the aforesaid needling operation and there is no necessity of cutting or trimming to size so as to break the long fibers into short ones not securable by needling. If desired the sides and ends may be subjected to needling to make a more perfect edge, but this is not required to maintain its unitary shape. A protective casing may also be employed, but is not required to hold the fibers in position, nor are any tufting ties required, but may be employed if desired.

The mattress or pad thus fully described, and the steps in its production, may of course be modified without departing from the invention. The form while essentially as shown and described, may be changed, and while preferable

need not be of rectangular outer shape as shown. And it may at times be desirable to produce two separate pads, as for a sectional mattress, or for increased production, confined, compressed and needled while held in one form having suitable separating panels dividing its inner contour. It is intended to include the above and other modifications and changes within the spirit of the invention defined in the following claims.

What we claim is:

1. A compressing form for confining and shaping loosely piled curled fibers to be entwiningly interengaged by piercing needles into a shape-retaining cohesive structure, comprising solid side and end members, a bottom, and a removable cover adapted to lockingly engage in seated position by compression of the piled-up fibers, said bottom and cover being formed with spaced slats set in vertical alinement to permit through-and-through passage of the fiber-entwining needles, and said slats having inwardly directed edges of varying depth adapted to impart a correspondingly shaped compression to the confined fibers.

2. A compressing form for confining and shaping loosely piled curled fibers to be entwiningly interengaged by piercing needles into a shape-retaining cohesive structure, comprising solid side and end members, a bottom, and a removable cover adapted to lockingly engage in seated position by compression of the piled-up fibers, said bottom and cover being formed with spaced slats set in vertical alinement to permit through-and-through passage of the fiber-entwining needles, and said slats having their outer edges in a common plane and their inner edges varyingly projecting to form a surface of irregular contour adapted to impart a corresponding shape to the confined fibers.

3. The process of making a shape-retaining mattress or similar resilient cushion-like article from curled hair-like fibers, which consists in piling-up a determined quantity of the loose curled fibers, materially reducing the mass of said piled hair by compression into an enclosing form having an irregular size and shape desired for the finished article, then needling the compressed and confined fibers by oppositely directed through-and-through piercing passes of hooked needles into a tenaciously cohering interlaced structure which will maintain the irregular size and shape of the form when removed therefrom.

4. The process of making a shape-retaining mattress or similar resilient cushion-like article from curled hair-like fibers and having selected areas thereof of increased wear-resisting density, which consists in unequally distributing a piled-up quantity of the loose curled-fibers with increased thickness in the desired wear-resisting areas, materially reducing the mass thereof by compressing said distributed fibers into an enclosing form having the size and shape desired for the finished article with the thickened areas more closely compressed than the remaining portions, then equally needling all the fibers thus confined and unequally compressed by oppositely directed piercing passes of hooked needles into a tenaciously cohering interlaced unitary structure which will maintain the desired varied density and shape of the form when removed therefrom.

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