Dec. 23, 1952 M. J. HARRIS ET AL 2,622,308

CUSHIONING MATERIAL AND METHOD OF MAKING SAME

Filed July 19, 1951 2 SHEETS—SHEET I

Fig. 1.

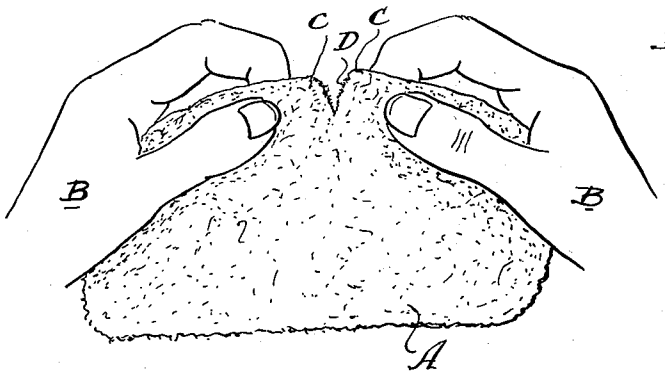
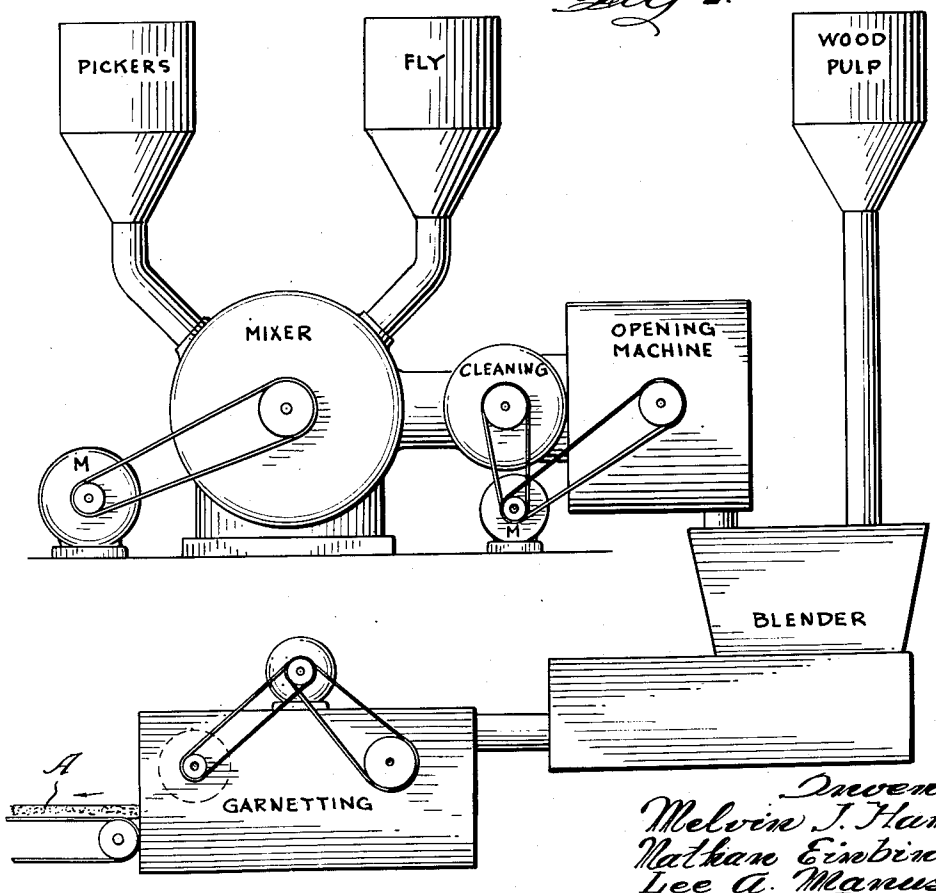


Fig. 2.



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Fig. 3.

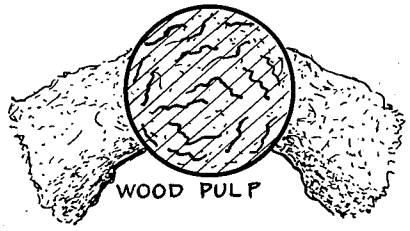


Fig. 4.

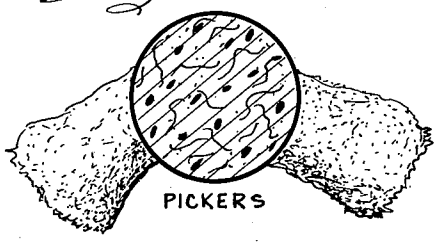
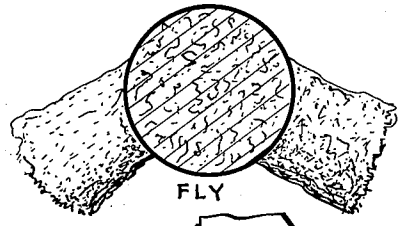


Fig. 5.



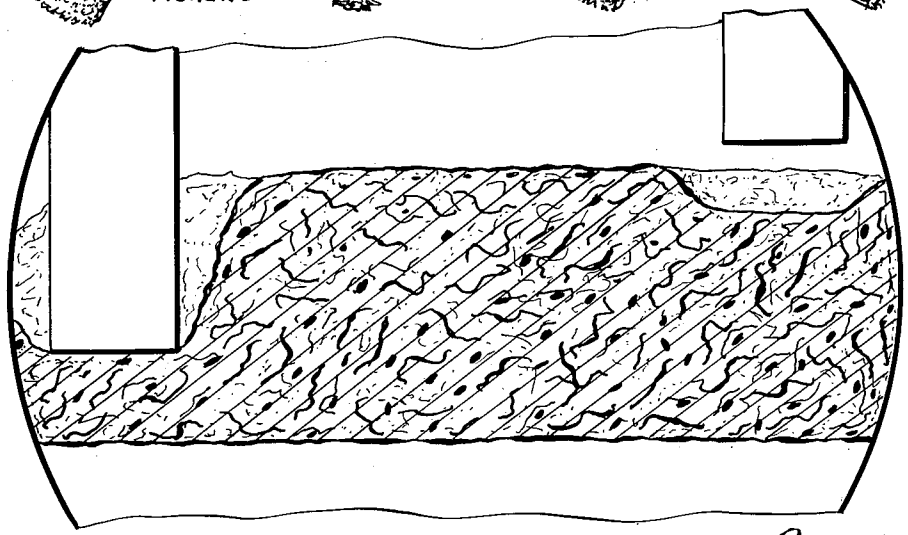


Fig. 6.

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Patented Dec. 23, 1952

2,622,308

UNITED STATES PATENT OFFICE

2,622,308

CUSHIONING MATERIAL AND METHOD OF MAKING SAME

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Application July 19, 1951, Serial No. 237,638

16 Claims. (Cl. 28—79)

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This invention relates to improvements in cushioning materials and more particularly relates to a compound felt consisting of a homogeneous blend of a wood pulp product and short cotton fibres which is particularly suitable for use as a filling medium in a great variety of situations and to a novel method of making same.

Raw cotton picked in the fields first is sent to the cotton gin mills where the cotton seeds are removed. The raw cotton then is packed in large bales, classified and sent to various mills where the end products consisting mainly of cotton yarn are produced. It is estimated that depending upon the efficiency of the mill in operation, age of the machinery used, etc., from about 5 to 20% of the raw cotton actually processed ends up as waste cotton. The uses of waste cotton in the main have been directed to filling or cushioning materials for upholstering, mattresses, pillows, blankets and the like.

There are a goodly number of cushioning materials available which have been prepared from the various cotton fibres obtained as waste from cotton mills. Some of these materials are manufactured as blends of only cotton waste fibres of different types. Others consist of blends of cotton waste with other products such as bark strips, various kinds of husks, and the like. The properties desired to be obtained in these cushioning materials are resiliency, strength, body, resistance against matting and durability.

Heretofore, it has been deemed essential in the manufacture of felt and batting for stuffing and upholstering purposes to use some form of long fibre material or medium fibre material for supplying the properties of resiliency and binding without coarseness. Long fibre cotton has been the most popular of these materials because of its light weight, light color, and its suitability for articles of human use. For example, common cotton batting usually is made from linters with a mixture of other cotton fibres. The waste lends body to the batting.

The art has developed along lines directed to the substitution of other substances for the long fibre cotton, and in every instant of which we are aware, such substitution has involved the use of other materials having long fibres—or using some adhesive binder to enable the felt to retain its shape and resilience. Various degrees of success have been achieved, even with the use of long fibre materials, but a usual result is a matting of the felt. This is caused principally by the lack of resilience in the material added to the cotton waste. This latter is, for example, fly and pickers.

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It is a principal object of the invention to produce a cushioning material consisting of a special blend of wood fibres and cotton fibres of short lengths, which material is inexpensive to manufacture, is light in weight and is characterized by its high degree of resiliency, strength and durability.

The cushioning material embodying the invention may be made into a great variety of lengths and widths and in dimensions suitable for a great variety of uses.

Another object accomplished of the invention is to provide a felt which is smooth and easy to handle and which has no annoying odors or colors.

It is another object of the invention to provide an excellent cushioning material which has superlative resiliency, body and strength and yet which does not include the use of long fibres or the addition of adhesive substances.

Still another object of the invention is to provide a novel and unique method of making the cushioning material herein described which method is economical and simple and which insures the proper blending and formation of said material.

In the drawings:

Fig. 1 is a side elevational view of the cushioning material embodying the invention and showing same separated at a portion thereof to indicate the consistency and body thereof.

Fig. 2 is a flow diagram illustrating the method of the invention by which the said material is made.

Figs. 3, 4 and 5 are side elevational views of the individual constituents used in making my cushioning material showing portions of each greatly magnified for purposes of clarity.

Fig. 6 is a side elevational view on a greatly enlarged scale of the cushioning material embodying the invention and showing the properties thereof.

One of the constituents of our novel blend consists of a wood pulp product with which we have been familiar and which is available commercially. This product consists of a felting made of fine wood pulp, such as used in the manufacture of paper, which is bound together by dextrin starch. After the wood pulp is prepared by suitable grinding apparatus, it is baled, dried and cooled. The cooled product then is blown into a forming chamber where it is agitated thoroughly and thereafter allowed to settle out on the floor of the chamber. During the settling of the pulp, a binder such as dextrin starch is blown into the chamber thoroughly to

cover each individual wood fibre. There is provided a conventional conveyor belt along the chamber floor upon which the wood fibres may settle. The fibres then are conveyed out of the chamber under a series of rollers which compress the wood fibres into continuous sheets of felted and bonded wood fibres, very smooth, porous and fibrous in character. The finished felt is shown in Fig. 3. It will be seen that the wood fibres are relatively short in length and fine and fluffy and believed to be held together in a rather tight manner by means of the dextrin starch binder.

Such felt, i. e., the wood pulp felt, is used by certain industries in large quantities and the scrap obtained from such use is useless. Such scrap may consist of punchings, strips and other irregularly shaped masses.

We have discovered that the scrap of this above described wood pulp product, when combined and blended with short fibre cotton waste, produces a felting which has substantially all of the good properties desired in a batting. It is resilient, light in weight per unit volume, of light color, odorless, has good body, strength, and will not readily pack or mat.

By producing the cushioning material embodying the invention, we have not only eliminated the need for expensive and difficult to procure long fibre cotton in the manufacture of felting, but we have also provided a hitherto unknown use for the scrap of the above described wood product.

The short cotton fibres used in our novel blend preferentially are selected from two types of waste cotton, to wit, fly and pickers. Referring to Fig. 4, there is shown a magnified portion of the pickers used in our blend. After the cottonseeds have been removed from the raw cotton, the bales are sent to various mills for further processing. At the mill the bale is opened and the cotton fed into apparatus which is designed to beat up and agitate the cotton in order to remove therefrom sand, dirt, leaves and other foreign matter. The foreign matter is permitted to sift through a screen during the agitating procedure, during which time it is inevitable that a certain amount of cotton also pass through the screen along with portions of the hulls having cotton fibres attached thereto. The cotton and hulls sifted through the screen is called picker motes. The picker motes are separated and cleaned further, this cotton waste thereafter being called willowed pickers. Willowed pickers are characterized by their strength and body and consist of short cotton fibres. These pickers are matted and do not have the resilience desirable in a cushioning material of the character herewith concerned.

The other type of short cotton fibre used in our blend is known as fly, same being shown in Fig. 5. Fly is waste cotton obtained from carding machines. After the first beating and agitating, the cotton is passed through a carding machine which cleans the raw cotton, opens up the matted fibres, arranges them in roughly parallel directions and covers the cotton fibres into a ropelike form called roving. The waste cotton found under the carding machine and on the card is known as fly and consists of neps and short fibres. They have little resilience and are likely to mat.

Our novel method for preparing the cushioning material is illustrated in Fig. 2 by means of the flow diagram showing the various steps labelled. The first step in the process consists of mixing the fly and pickers in the necessary proportions in a mixing machine and thereafter passing the batch through a cleaning machine to remove any sand or dirt therein. From the cleaning machine the batch is passed through an opening machine and thereafter into a blending machine. At this time the required amount of the wood-pulp product also is added to the blending machine and all the constituents are mixed and agitated thoroughly so as to form a homogeneous batting. Upon removal from the blending machine, the mixture is passed through a garnetting machine which aligns the fibres substantially in one direction and combs them so to speak. The mixture coming out of the garnetting machine is compressed and rolled into one continuous sheet known as a felt, same being shown at A in Fig. 2. The felt may then be cut to suitable size batts for use in a particular manner.

Although we have found that the particular blend of wood-pulp product, fly and pickers gives the best results, an excellent blend also may be obtained by substituting short waste cotton fibres known as sweeps for pickers. Sweeps are the droppings swept up from the floor under the spinning machines in the cotton spinning mills.

Referring to Fig. 1, it is intended to show by way of illustration the properties of the cushioning material embodying the invention, same being designated A. The color thereof is different than the color of any of individual constituents thereof. It is fluffy and smooth to the touch. When spread between the hands B, the material A does not come apart too readily and the spread ends C have very fluffy and shoft fibres D extending therefrom. The material A has good body, resiliency and strength and has no obnoxious smell. It is virtually impossible to distinguish the individual constituents of the material A by visual examination. The completed material A is a product which is completely unexpected considering the individual constituents thereof.

Various proportions of wood pulp and cotton waste fibres may be blended together to form our cushioning material. We have found that excellent results are obtained where the proportions of ingredients mixed range from 30 to 60 percent of the wood pulp and from 70 to 40 percent of the waste cotton fibre, the percentages being in terms of total weight per given amount of batch.

We have prepared a preferred blend in which 35% by weight of wood pulp, 45% by weight of fly and 20% by weight of pickers were mixed and prepared in the manner heretofore described. No adhesive binder is used nor are long cotton fibres for binding the felt produced.

It is again desired to reiterate that the blend prepared in the manner above described had all the properties desirable in such type material. The relative cost of manufacturing same was low. The cushioning material had a high degree of resiliency, body and strength. The color thereof was excellent from a commercial standpoint and no offensive odors were present in the material. The blend was light in weight, particularly in weight per unit volume of material and extremely durable. Of particular importance was the fact that no long fibre cotton or adhesive binder was used in preparing the cushioning material embodying the invention.

It will be apparent that we have provided a novel and unique cushioning material which has eliminated the use of long staple cotton for use

as a binder or to give the material the qualities of resiliency, body and strength necessary for the same and also the use of adhesive binders. It is believed that the invention has been fully set forth and described such that one skilled in the art will be enabled to make the same. Many variations are possible within the scope of my invention, but it is not intended to be limited except by the appended claims.

What we claim is:

1. A product of manufacture comprising a mixture of felted and bonded wood fibres and cotton fibres of short lengths, said wood and cotton fibres having been blended and formed into a homogeneous, continuous sheet of cushioning material suitable for general stuffing purposes.

2. A product of manufacture comprising a mixture of felted and bonded wood fibres and cotton fibres of short lengths, said wood and cotton fibres having been blended and formed into a homogeneous, continuous sheet of cushioning material suitable for general stuffing purposes, said cotton fibres comprising fly.

3. A product of manufacture comprising a mixture of felted and bonded wood fibres and cotton fibres of short lengths, said wood and cotton fibres having been blended and formed into a homogeneous, continuous sheet of cushioning material suitable for general stuffing purposes, said cotton fibres comprising fly and pickers.

4. A product of manufacture comprising a mixture of felted and bonded wood fibres and cotton fibres of short lengths, said wood and cotton fibres having been blended and formed into a homogeneous, continuous sheet of cushioning material suitable for general stuffing purposes, said wood fibres each having a coating of dextrin starch thereon.

5. A product of manufacture comprising a mixture of felted and bonded wood fibres and cotton fibres of short lengths, said wood and cotton fibres having been blended and formed into a homogeneous, continuous sheet of cushioning material suitable for general stuffing purposes, said cotton fibres being present in a percentage by weight greater than said wood fibres.

6. A blended cushioning material suitable as a filling medium comprising a mixture of felted and bonded wood fibres each coated with dextrin starch and cotton fibres of short lengths, said wood and cotton fibres having been blended in proportions suitable for forming same into a homogeneous felt.

7. A blended cushioning material suitable as a filling medium comprising a mixture of felted and bonded wood fibres each coated with dextrin starch and cotton fibres of short lengths, said wood and cotton fibres having been blended in proportions suitable for forming same into a homogeneous felt, said cotton fibres comprising waste cotton including fly.

8. A blended cushioning material suitable as a filling medium comprising a mixture of felted and bonded wood fibres each coated with dextrin starch and cotton fibres of short lengths, said wood and cotton fibres having been blended in proportions suitable for forming same into a homogeneous felt, said cotton fibres comprising waste cotton including fly and pickers.

9. A blended cushioning material suitable for general stuffing purposes comprising a mixture of wood fibre and cotton waste fibers, said wood fibre being felted and bonded and said cotton fibre having short lengths, said wood fibre constituting from 30 to 60 percent by weight of the said mixture and said cotton fibres constituting from about 70 to 40 percent by weight of the mixture.

10. A blended cushioning material such as described in claim 9 in which the wood fibre constitutes 35% by weight of the said mixture and the cotton fibres constitute the remainder.

11. A blended cushioning material such as described in claim 9 in which the cotton fibres comprise fly and pickers.

12. A blended cushioning material such as described in claim 9 in which the cotton fibres comprise fly and pickers, said wood fibres each being coated with dextrin starch.

13. A blended cushioning material suitable for general stuffing purposes comprising a mixture of wood fibres each coated with dextrin starch and cotton waste fibres, said wood fibres being felted and bonded and said cotton fibres being of short lengths, said mixture containing approximately 35% by weight of the mixture wood fibres, approximately 45% by weight of the mixture fly, and approximately 20% by weight of the mixture pickers.

14. As a new product of manufacture, a felting which consists of a substantially homogeneous blend of a wood fibre product and short fibre cotton waste, said wood fibre product comprising a felt formed of short fibres and a starch binder.

15. As a new product of manufacture, a felting characterized by resilience and resistance to separation, which consists of a homogeneous blend of members of a pre-formed wood fibre product of relatively fine fibres treated with a starch binder, and short fibre cotton waste.

16. As a new product of manufacture, a felting characterized by resilience and resistance to separation, which consists of a homogeneous blend of members of a pre-formed wood fibre product of relatively fine fibres treated with a starch binder, and short fibre cotton waste, consisting of fly and pickers.

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