Jan. 19, 1971 A. L. WILLIS 3,555,580

PILLOW AND METHOD OF MAKING SAME

Filed Dec. 18, 1967 2 Sheets-Sheet 1

Fig. 2.

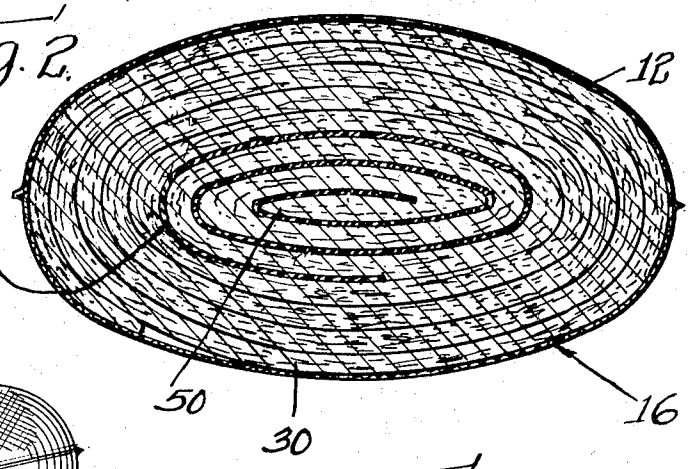


Fig. 1.

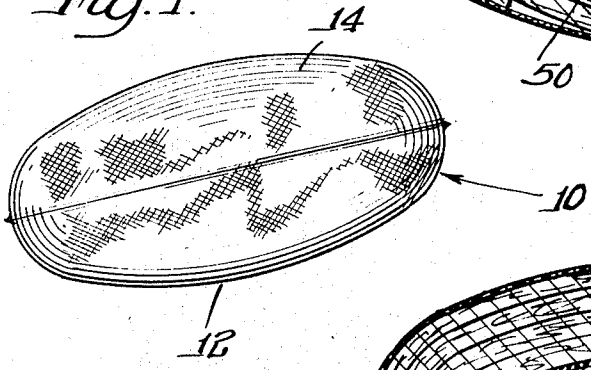


Fig. 3.

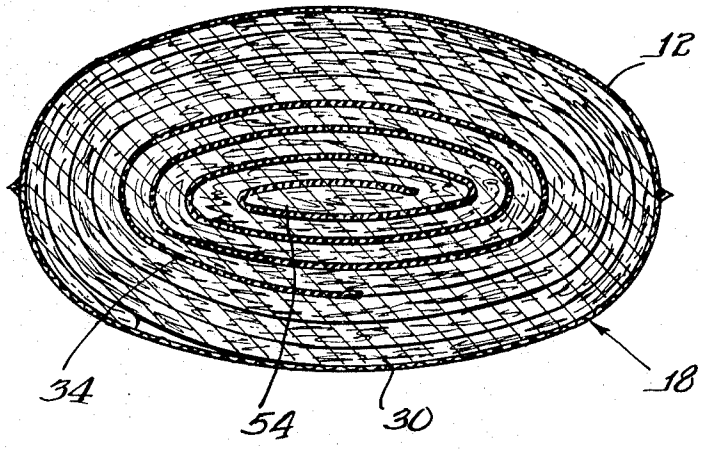
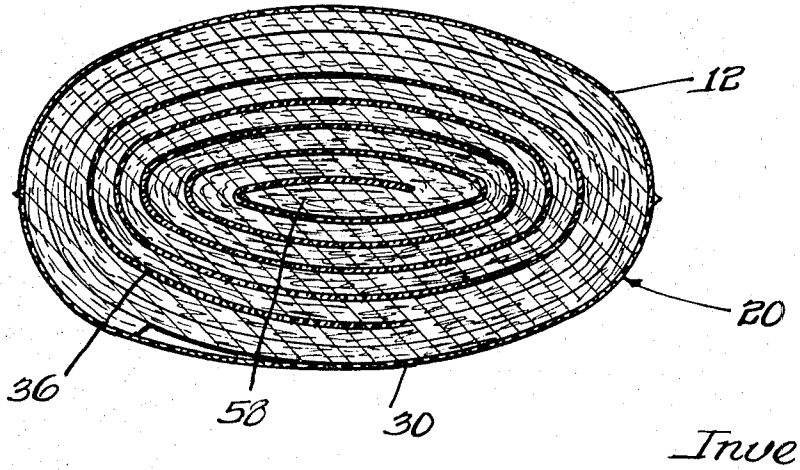


Fig. 4.



Inventor

Arnold L. Willis

By: Wallenstein, Spangenberg, Hattis & Strampel attys.

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Fig. 5

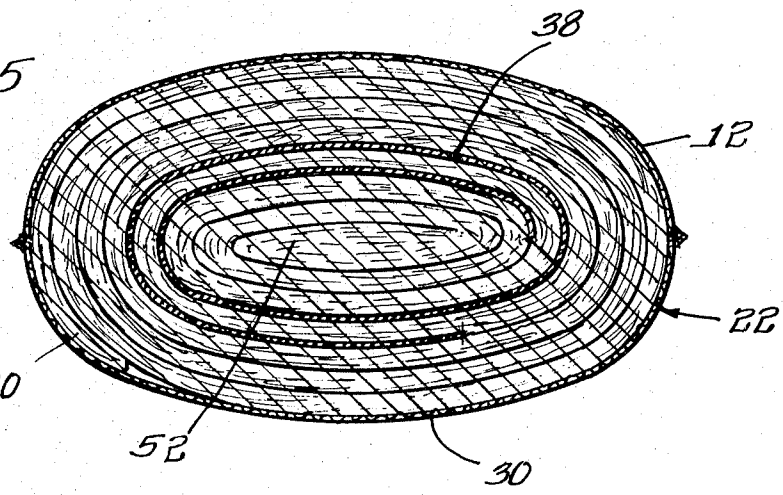


Fig. 6.

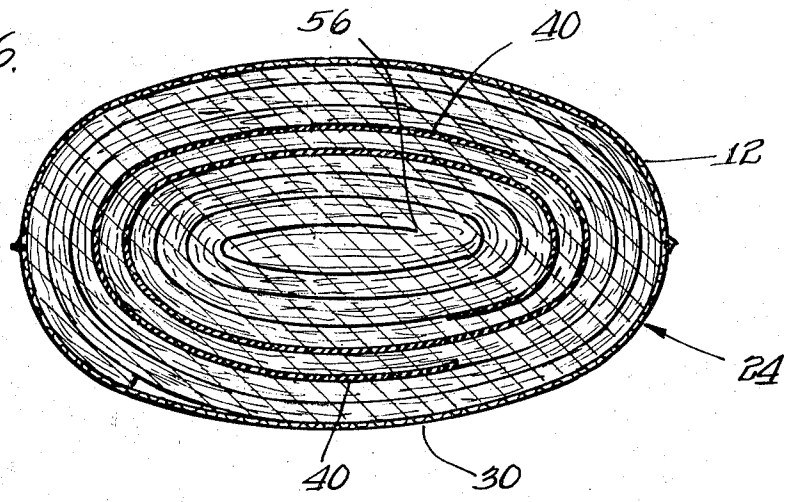
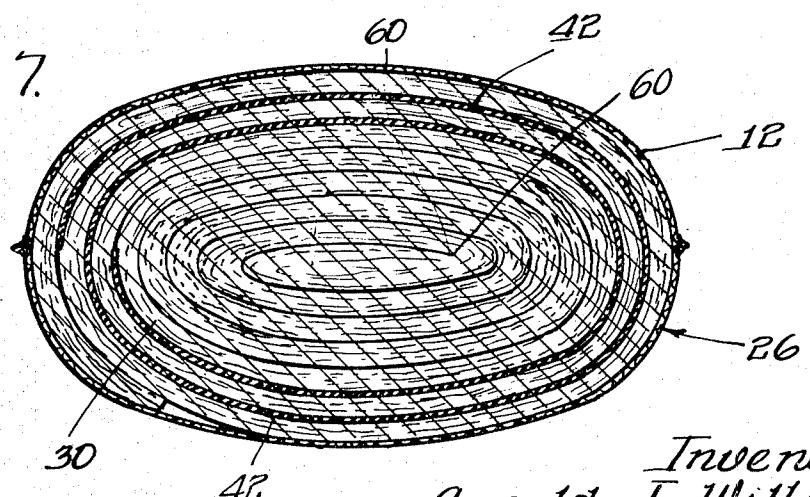


Fig. 7.



Inventor
Arnold L. Willis
By: Wallenstein, Spangenberg, Hattis & Strampel Attys

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3,555,580

PILLOW AND METHOD OF MAKING SAME

Arnold L. Willis, Chicago, Ill., assignor to MSL Industries, Inc., a corporation of Minnesota

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Int. Cl. A47g 9/00
U.S. Cl. 5—337 4 Claims

ABSTRACT OF THE DISCLOSURE

A pillow, or a pillow-like article such as a cushion, which in its preferred form comprises a pillow tick, or other covering, with a batt enclosed therein, the batt being formed of a web of intermingled, resilient fibers which is rolled upon itself and has interposed between successive convolutions thereof for at least a portion of the length of the web a thin, flexible sheet of a cellular or foamed material such as polyurethane foam. By varying the length of the sheet of foamed material and its position in the batt, the degree of softness or firmness of the pillow or cushion can be selectively controlled. In making the batt for the pillow or cushion, the web of intermingled fibers, in sheet form, and the sheet of foamed material are placed in superimposed relation to one another and rolled up together in "jelly roll" like fashion. The thusly formed batt is then enclosed in a pillow tick or other covering in accordance with any of various known practices.

In the main, batt-filled pillows heretofore have been made by garnetting a suitable fiber into a web, putting the web through a cross-lapper, lapping the web to the desired length dimension of the pillow, rolling the lapped web upon itself, and stuffing the thusly formed rolled batt into an open-ended cloth bag or ticking. The open end of the bag or ticking is then sewn to provide a finished pillow. The softness, or firmness, of pillows made in this way is largely determined by the density of the web formed from the fibers and the length of the lapped web used to form the batt. So far as is known, no one, heretofore, has provided a solution to the problem of adequately selectively controlling the softness, or firmness, of such a pillow by means not substantially wholly dependent on the aforementioned determinative parameters. One approach to controlling the firmness of a fiber-filed pillow, wherein the fibers are distributed randomly in the pillow, rather than in the form of a rolled batt, is shown in U.S. Pat. No. 3,109,182. There, a slab, of appreciable thickness, of a synthetic resin foam is embedded in the center of the randomly packed fibers. While the slab acts, among other things, to impart firmness to a pillow of the type disclosed in the patent, the use thereof is too cumbersome and costly, and does not satisfactorily lend itself to presently employed practices, as outlined above, for fabricating batts for batt-filled pillows.

In accordance with the present invention, the softness, or firmness, of a batt-filled pillow, of any particular size, of the type hereunder consideration, can be selectively controlled without the need for varying the density of the web formed from the fibers, or the length of the lapped web used in forming the batt. This result, furthermore, can be achieved with substantial precision in a continuous, automated, pillow fabricating operation. Apart from having a desired preselected softness, or firmness, the pillows of this invention have substantially improved durability in that they very effectively resist compacting and deformation even after prolonged use.

Briefly, the pillows of the present invention, in their preferred form, comprise a pillow tick having a rolled batt therein formed of a web of intermingled, resilient

fibers of a synthetic material. Interposed between successive convolutions of the rolled batt, for at least a portion of the length of the web from which the batt is formed, is a thin, flexible sheet of a cellular or foamed material. The alternate convolutions of the web and the sheet of foamed material in the rolled batt are suggestive of a "jelly-roll." The softness, or firmness, of the pillow is determined, in the main, by the location of the sheet of foamed material in the rolled batt and the length of the sheet of said material. Thus, for example, by locating the sheet of foamed material in the center of the rolled batt, a relatively soft pillow results. By interposing the sheet of foamed material between successive convolutions of the web remote from the center of the batt, on the other hand, a firm pillow results. By varying the length of the sheets of foamed material and positioning them as described, a general firming up of the pillow will result in both instances. Pillows of medium softness, or firmness, will result by locating the sheet of foamed material at points between the convolutions of the web intermediate the innermost and outermost convolutions thereof. As before, a change in length of such intermediately situated sheets will effect a general firming up of the pillow.

In accordance with the preferred method aspects of the present invention, formation of the web, and lapping thereof can conveniently be carried out in any manner known in the art, utilizing standard equipment. A sheet of foamed material is then positioned in any desired location on the lapped web and the web, together with the sheet of foamed material, is rolled upon itself to form a "jelly-roll" like batt. The batt thereafter is encased in a pillow tick to provide a finished pillow having the desired softness, or firmness. While any of various methods may be used to encase the batt in the pillow tick, it is preferred to employ either the method disclosed in U.S. Pat. No. 3,290,704, or, especially desirably, the method disclosed in copending U.S. application Ser. No. 647,487, filed June 20, 1967, now abandoned. Briefly, in the method of the aforementioned patent, the formed batt is placed on a sheet of suitable ticking material which has been cut to desired dimensions. A second sheet of the ticking material is then superimposed on the exposed side of the batt, and the opposed free margins of the sheets are secured together, as by stitching, to encase the batt in the tick formed from the two sheets. In the aforementioned copending application, the formed pillow batt is compressed by applying pressure to it, preferably from above and below, and introducing the batt, in its compressed state, into an open-ended pillow tick. The compressed batt instantaneously returns to its normal, non-compressed state, and the open end of the pillow tick is then closed, as by stitching, to provide a finished pillow.

The materials utilized in forming the web for the batt employed in making the pillows are numerous and variable. They may be natural or synthetic in origin, and desirably are non-woven and fibrous or filamentary in character. The individual fibers or filaments of the material of the web advantageously should possess an inherent resiliency due to a curvature impressed upon them either during their natural development or during processing so that a random distribution of the fibers or filaments will produce a web of desired dimensions which is compressible, flexible and resilient. An especially desirable web can be produced from a synthetic fiber sold under the trademark "Dacron" (E. I. du Pont de Nemours & Company) made by the condensation of dimethyl terephthalate and ethylene glycol, and which is sold as "Dacron" fiberfill for pillows. This material is obtainable in bale form and formed into a batt to attain the objectives of the present invention.

The cellular or foamed materials having utility in the practice of the preset invention also can be selected from a wide group. They may be of the open-cell or closed-cell type, and include natural and synthetic foamed rubbers, in addition to synthetic resin foams based on materials such as polyethylene, polyurethane, polypropylene, polystyrene, polymethplmethacrylate, polyvinyl chloride, polyvinyl acetate, cellulose acetate, cellulose acetate butyrate, polycaprolactam, and the like. Of this group, polyurethane is especially preferred. This material is available in thin, flexible sheets which can withstand rough handling and which retain their resilience even after prolonged use.

Referring now to the drawing, in which illustrative embodiments of the invention are shown:

FIG. 1 is a view in perspective of an embodiment of a pillow made in accordance with the teachings of this invention; and

FIGS. 2–7 are transverse vertical sectional views of embodiments of pillows showing various forms of pillow batts made in accordance with the teachings of this invention to provide pillows of preselected softness, or firmness.

The embodiment of the pillow, designated generally by reference numeral **10**, shown in FIG. 1 of the drawings, comprises a pillow tick **12** in which is encased a pillow batt **14**. The pillow tick **12**, as illustrated, is formed of two sheets or panels of a suitable ticking fabric such as cotton, cotton percale, or the like, which desirably are stitched together along their opposed margins. A liner, not shown, formed of a loosely woven fabric such as cheesecloth can be used, if desired, to cover the batt **14** prior to encasing it in the tick **12**.

Referring in greater detail to FIGS. 2–7 of the drawings, the batts, designated generally by reference numerals **16**, **18**, **20**, **22**, **24** and **26**, illustrated, while each comprising a web **30** of substantially the same length and width, are capable, when encased in a pillow tick, of providing finished pillows no two of which will have the same softness, or firmness. Thus, the batts **16** and **22**, when enclosed in pillow ticks, will provide pillows which, by trade standards, would be considered soft, but the degree of softness of the two pillows will be different. Similarly, the batts **18** and **24**, when encased in a pillow tick, will provide pillows of medium firmness, but the pillows themselves will differ in degree of firmness. Also, the batts **20** and **26** will provide firm pillows, but the firmness of each of the pillows will be different. These unique results are attainable in accordance with the practice of the present invention by incorporating into the batts **16**, **18**, **20**, **22**, **24** and **26** a thin sheet of a foamed material **32**, **34**, **36**, **38**, **40** and **42**, respectively. Utilizing a web of given dimensions, the relative softness, or firmness, of pillows formed from the batts is determined, in the main, by the length of sheets **32**, **34**, **36**, **38**, **40** and **42**, and their position within their respective batts. Thus, by way of specific illustration, in the case of batts **16** and **22**, as shown in FIGS. 2 and 5, wherein, for example, the web used in making the batt has a length of from about 22 to about 24 feet and a predetermined width, a soft pillow can be produced from such batts by locating the sheet **32** of foamed material, having a length of about 4 feet, either at the center of the batt **16**, in proximity to the inner end **50** of the web, or by locating a sheet **38** of the same length centrally of the butt **22**, about 8 feet from the inner end **52** of the web thereof. In the case of batts **18** and **24**, illustrated in FIGS. 3 and 6, which, as indicated, will provide pillows of medium firmness when incorporated into a pillow tick, the desired effect can be attained with a web of the same length, that is, from about 22 to about 24 feet, and of the same uniform width, by positioning the sheet **34** of foamed material, having a length of about 8 feet, either at the center of the batt **18** in proximity to the inner end **54** of the web thereof, or by locating the sheet **40**, of essentially the same length as the sheet **34**, centrally of the batt **24**, but about **4** feet from the inner end **56** of the web. Similarly, in the case of batts **20** and **26**, as shown in FIGS. 4 and 7, a firm pillow can be produced using a web of the same length, that is, about 22 to about 24 feet, and of the same uniform width, by locating a sheet **36** of foamed material about 12 feet long centrally of the batt in proximity to the inner end **58** of the web, or, as illustrated in FIG. 4, by positioning a sheet **42** of foamed material, of essentially the same length as the sheet **36**, between the outer convolutions of the web at a distance of about 8 feet from the inner end **60** thereof. It should be understood that the foregoing description has been given by way of illustration, and that no unnecessary limitations are to be read into the present invention based thereon. As pointed out hereinabove, a pillow of any desired preselected softness, or firmness, can be produced in accordance with the teachings of this invention depending, in the main, upon the dimensions of the sheet of foamed material employed and its location in the batt.

The sheets of foamed material having utility for the purposes of the present invention advantageously should have a thickness of from about 1/16 to about 1/4 inch, with thicknesses of from about 1/8 inch to 3/16 inch being preferred. The width of the sheets of foamed material desirably is less than that of the web used in forming the batt, and, generally speaking, will range from about 2/3 to about 4/5 the width of the web. More specifically in this connection, the width of the sheets advantageously should be such that the lateral margins thereof terminate from about 3 to 6 inches, usually about 4 inches, inwardly of the corresponding margins of the web used to form the batt. Thus, by way of illustration, in a batt having a width of approximately 24 inches, the sheet of foamed material desirably will have a width of approximately 16 inches and will be positioned in the web to provide an approximate 4 inch border of the web along each side thereof. Similarly, in the case of a batt having a width of approximately 30 inches, the width of the sheet of foamed material desirably should be approximately 22 inches and should be centrally disposed with relation to the web to provide a border of the web approximately 4 inches wide along each side of the sheet. As is clear from what has preceded, the length of the sheet of foamed material employed is variable and will depend, in large measure, on the degree of softness, or firmness, desired in the finished pillow. Generally speaking, the length of the sheet of foamed material used will range from about 1/8 to about 3/4, usually about 1/6 to 1/2, the length of the web. The density of the foamed material comprising the sheets can vary within a relatively wide range. As stated, the sheets are formed of a flexible foamed material. To this end it is preferred to use foamed materials commonly referred to in the art as being of the "soft" density type. Generally speaking, the foamed materials will have a density of the order of about 1 to about 10 pounds per cubic foot, especially desirably from about 2 to about 4 pounds per cubic foot.

In fabricating batts for making pillows in accordance with the teachings of the present invention, the sequence of steps outlined above, that is, garnetting of the fibers into a web, putting the web through a cross-lapper and lapping the web to the length dimension of the pillow, can be followed. Thereafter, the desired sized sheet of foamed material may be selectively positioned on the lapped web whereby, when the web, together with the sheet of foamed material, is rolled up to form the batt, the sheet of foamed material will be interposed between layers of the web in "jelly roll" like fashion to provide a pillow of the desired softness, or firmness, as described hereinabove. The batt can then be placed into a pillow tick in any manner known in the art to form a finished pillow. In accordance with the preferren practice of this invention, this is most advantageously achieved by fol-

lowing the teachings of the aforementioned patent or copending application.

The sheet of foamed material tends to remain in a fixed position in the batt and, therefore, it is not necessary, generally speaking, to apply adhesives, or the like, to either the web or the sheet of foamed material in forming the batt. While the pillows of this invention demonstrate a marked resistance to bulk loss over batt-filled pillows of conventional construction, this characteristic, among other favorable properties of the pillows of this invention, can be enhanced by treating the web **30**, for example, to provide it with a small quantity of a flexible, non-tacky resinous substance, substantially uniformly distributed on one or both sides thereof. The resinous substances having utility for this purpose desirably are in the form of a liquid resin or elastomer dispersion. The character of the dispersion advantageously is such that, when dried or cured, it will be non-tacky and flexible. Contact of the fibers or filaments of the web with the dispersion can be attained in accordance with conventional techniques and with standard equipment. From the standpoint of ease and efficiency, spray application of the dispersion is preferred. The dispersion advantageously is applied to the web before the sheet of foamed material is superimposed thereon. Various types of liquid resin or elastomer dispersions, and mixtures thereof, can be used. Exemplary of resin dispersions having utility for this purpose are those containing polyvinyl chloride, acrylic esters, cellulose esters, alkyds, and the like. Excellent results can be attained with a water-soluble acrylic resin available commercially under the trademark "HA–16" (Rohm & Haas). The quantity of resinous substances employed may range from about 3% to about 15% of the total weight of the batt.

While the present invention has been described and illustrated with reference to the utilization of a unitary web of intermingled fibers and a single sheet of a foamed material, it is to be understood that a pillow can be fabricated in accordance with the teachings of this invention with a batt formed of a plurality of smaller, separate webs and sheets of foamed material precut to a desired length and width, and alternately superimposed one upon the other to provide a tiered batt. It should also be understood that the present invention contemplates the formation of pillows having shapes different from that illustrated. Thus, for instance, a substantially square- or rectangular-shaped pillow incorporating the advantages and features of the present invention can be made by forming batts of the corresponding shape, having alternate layers of the webb and foamed material.

What is claimed is:

1. A pillow comprising a pillow ticking and a pillow batt enclosed therein, the pillow batt being formed of a web of intermingled fibers of a soft, resilient material, said web being rolled upon itself and having interposed between successive convolutions except at least one convolution a thin, flexible sheet of foamed cellular material.

2. A method of making a batt for a pillow comprising forming a sheet of a web of intermingled fibers, placing a thin, flexible sheet of a foamed cellular material on at least one side of the first mentioned sheet, rolling said first mentioned sheet together with the sheet of foamed cellular material upon itself to form a pillow batt, and varying the length of the sheet of the foamed cellular material and the positioning thereof with relation to the inner and outer convolutions of the first mentioned sheet, whereby the softness or firmness of the pillow batt may be altered.

3. A pillow comprising a pillow tick and a pillow batt enclosed therein, the pillow batt being formed of a web of intermingled fibers of a soft, resilient material, said web being rolled upon itself and having interposed between the innermost convolutions of the web a thin, flexible sheet of a foamed cellular material to provide a soft pillow.

4. A pillow comprising a pillow tick and a pillow batt enclosed therein, the pillow batt being formed of a web of intermingled fibers of a soft, resilient material, said web being rolled upon itself and having interposed between the outermost convolutions of the web, a thin, flexible sheet of a foamed cellular material to provide a firm pillow.

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BOBBY R. GAY, Primary Examiner

A. M. CALVERT, Assistant Examiner

U.S. Cl. X.R.

5—355, 161—152

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,555,580 Dated January 19, 1971

Inventor(s) Arnold L. Willis

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 47, "fiber-filed" should read -- fiber-filled --. Column 2, line 2 from the bottom should read -- bal form and can be garnetted, in any manner known in the art, int a web and formed into a batt to attain the objectives --. Column 3, line 7, "polymethplmethacrylate" should read -- polymethylmethacrylate --. Column 4, line 74, "preferren" should read -- preferred --.

Signed and sealed this 27th day of April 1971.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

WILLIAM E. SCHUYLER, JR
Commissioner of Patents