

July 22, 1947.

B. MECHUR ET AL

2,424,482

SHOULDER PAD AND METHOD OF MAKING THE SAME

Filed Feb. 8, 1946

3 Sheets-Sheet 1.

FIG. 1.

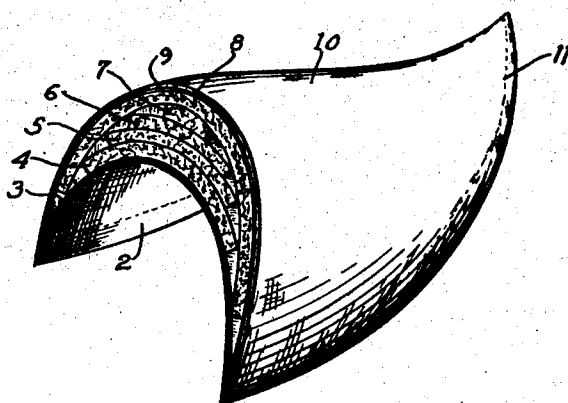


FIG. 3.

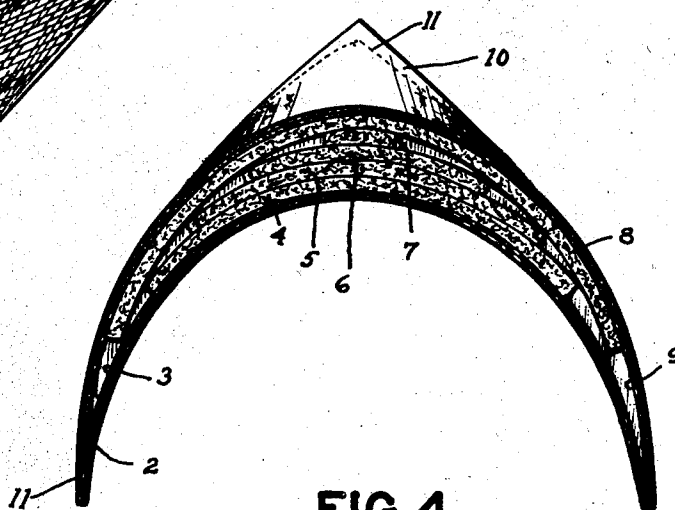
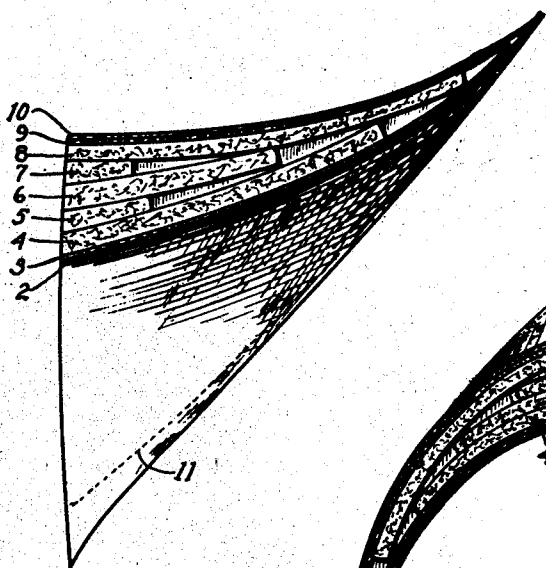


FIG. 4.

INVENTORS

BERT MECHUR & WALTER RIEDLER

BY

Duff MacIntyre
ATTORNEY

July 22, 1947.

B. MECHUR ET AL

2,424,482

SHOULDER PAD AND METHOD OF MAKING THE SAME

Filed Feb. 8, 1946

3 Sheets-Sheet 2

FIG. 2.

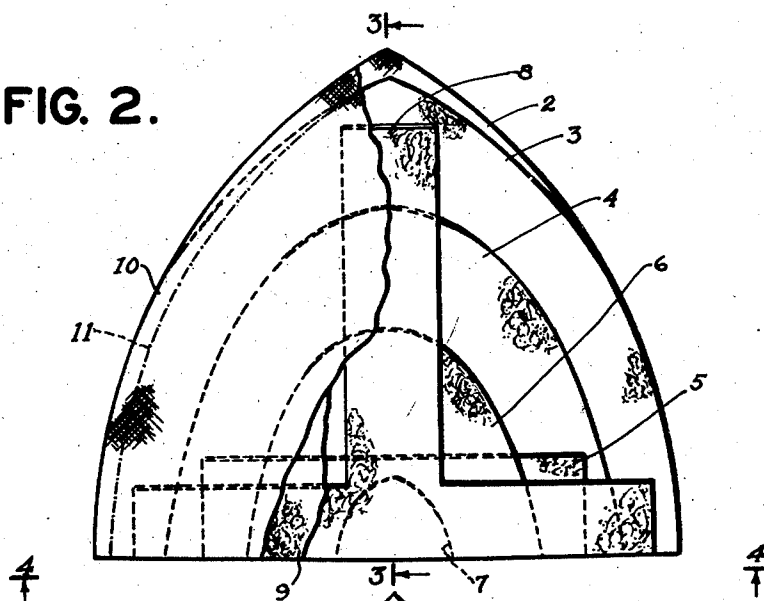


FIG. 5.

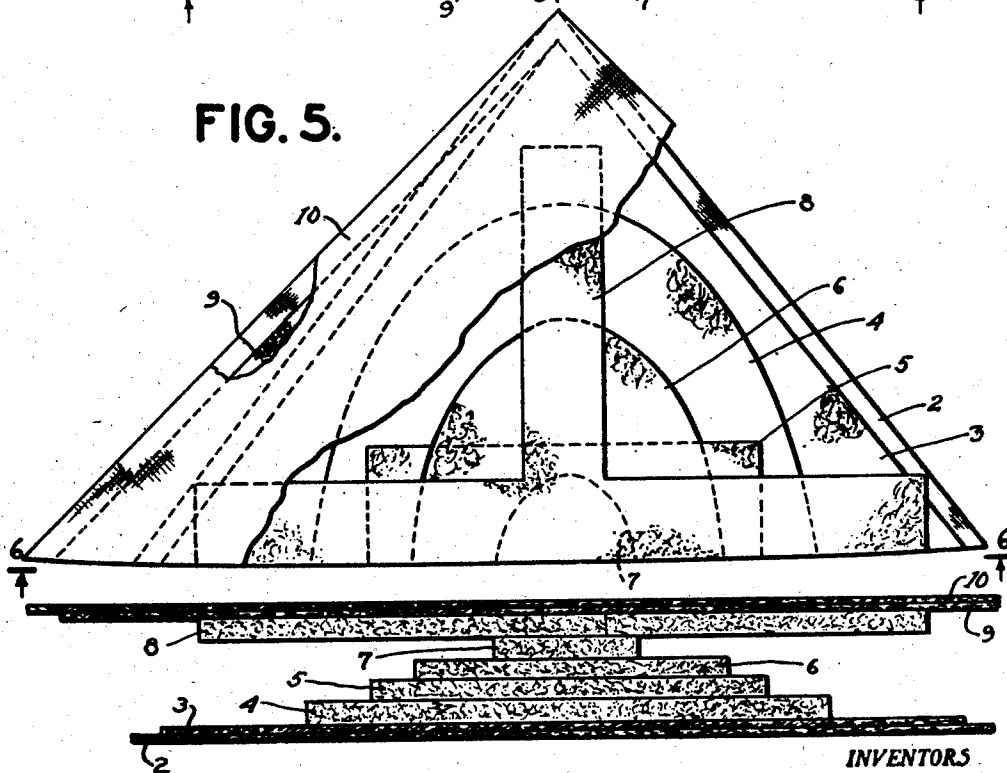


FIG. 6.

INVENTORS
BERT MECHUR & WALTER RIEDLER
BY *Dan M. Smith*
ATTORNEY

July 22, 1947.

B. MECHUR ET AL

2,424,482

SHOULDER PAD AND METHOD OF MAKING THE SAME

Filed Feb. 8, 1946

3 Sheets-Sheet 3

FIG. 8.

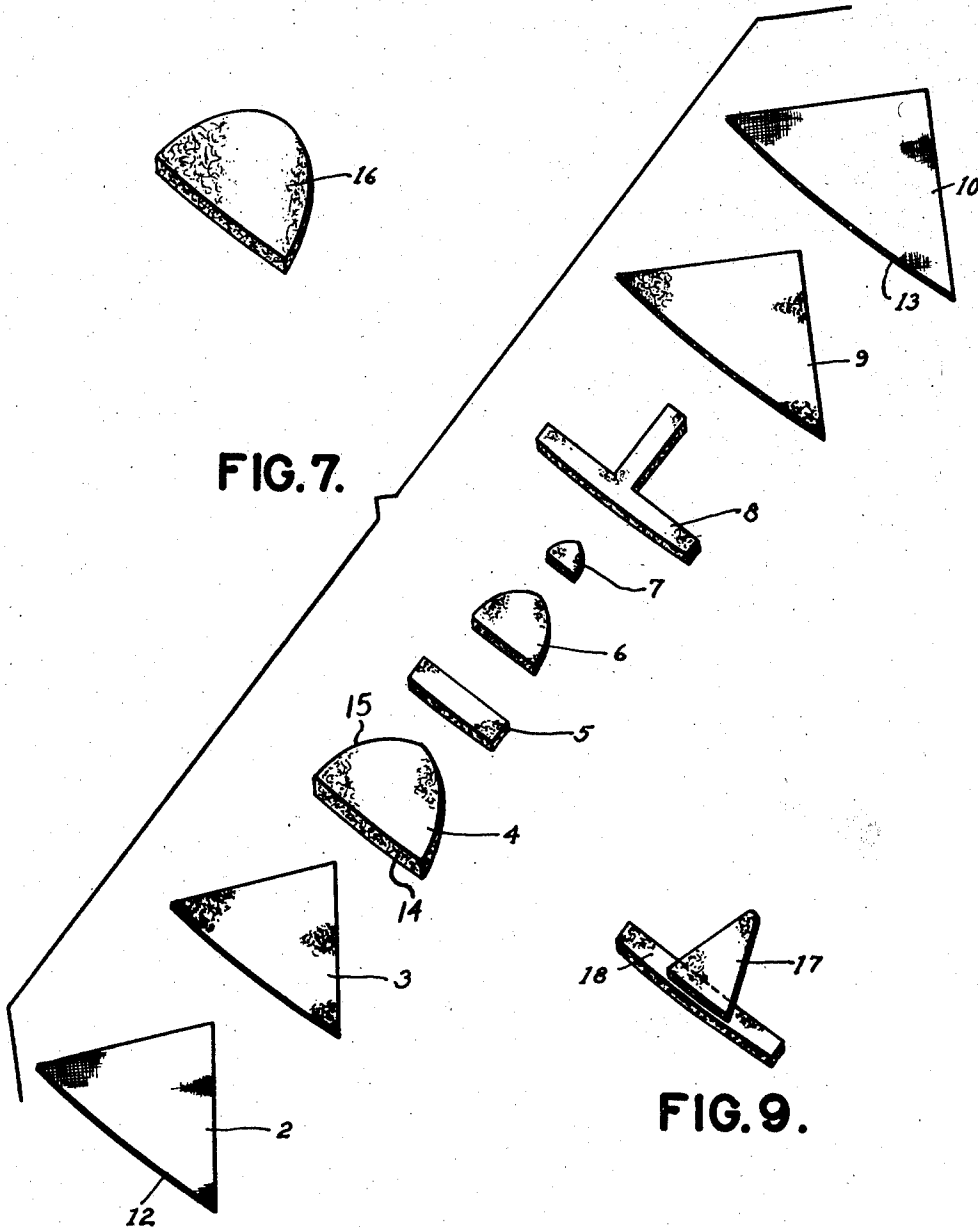


FIG. 9.

INVENTORS
BERT MECHUR & WALTER RIEDLER
BY *[Signature]*
ATTORNEY

UNITED STATES PATENT OFFICE

2,424,482

SHOULDER PAD AND METHOD OF
MAKING THE SAME

Bert Mechur and Walter Riedler, New York, N. Y.

Application February 8, 1946, Serial No. 646,250

17 Claims. (Cl. 2-268)

1

This invention relates to pads used in shaping and building up the shoulders of garments, and is more specifically directed to a novel construction of a shoulder pad, and to a method of making the same.

It is the primary requisite of a shoulder pad that it possess, and be capable of retaining, a smooth, evenly tapering outline which will confer on the finished shoulder of the garment a natural, attractive appearance. In order to stand up well under wear, the pad must be substantially resilient, so as to adapt itself to the various positions and motions of the wearer, returning always to its original shape, and its shape and resiliency must not be affected by any of the operations of servicing the garment. Finally the pad should be easy and economical to manufacture.

The pads known in the art are not possessed of the above requisites to any satisfactory degree, and any attempt to overcome some of their drawbacks has invariably resulted in intensifying others. For instance, a pad can be given any desired outline provided that it is made of a substantially rigid material or with a substantially rigid frame, but such a pad obviously has little utility. Or a pad can be made by stitching together scraps of suitable stuffing materials and making allowance for sag in wear and for the compacting effect of pressing operations, thereby producing an imperfect article by means of a laborious and uneconomical procedure.

A more complex approach to the problem is the following: If the desired finished pad is visualized, it will be apparent that it is a solid having at least two curved surfaces. Such a solid can be conceived as divided into component elements by a number of parallel and/or intersecting planes, in such a way that each component element is small enough to maintain its shape reasonably well, and that if all said elements are actually made and assembled together, they will build up a finished pad of the required shape. However, built-up pads have been found defective for many reasons. First, the component elements still have some curved surfaces, and are expensive and difficult to shape. If they are made smaller in an effort to overcome this difficulty, the structure of the pad becomes far too intricate, and the cost of making it prohibitive, and the task of holding the elements together in a reasonably permanent relative position, at best always difficult, becomes an impossible one. Then the component elements themselves soon become displaced with respect to one another, and the pad as a whole loses its shape. In short, experience

2

has shown that no type of built-up pad known in the art can be made satisfactorily, and at a reasonable price.

It has also been proposed to manufacture pads from materials which can be introduced in a loose condition into a mold, and therein molded to the desired shape. But this method involves difficult, costly operations, requiring the use of a separate set of molds for each size of pad, as molding does not allow of any adjustments, no matter how slight. Serious difficulties are encountered in applying the fabric covering the molded pieces, further complicating the manufacture of the pad. It will be apparent therefore that the aforementioned method is impractical and unsuited to the needs of the trade.

We have now invented a new and useful shoulder pad and a method of making the same, which are free from the drawbacks specifically pointed out and from all other shortcomings of the pads and methods of making the same heretofore known. Our pad comprises a number of elements, several of them resilient, and the remaining flexible, the resilient elements being made of a material, pieces of which have the property of developing a surface bond between one another when heated and pressed together. The several elements of our pad originally are substantially flat, being cut out of sheets of material. The pad cannot be made by simply assembling the component elements in superimposed or adjacent relationship, because the sum total of the configurations of said elements is not the configuration of the pad, but only by permanently associating said elements in a predetermined deformed relationship to achieve a shoulder pad outline with the proper curvature of the various portions thereof by means of a novel structural arrangement and a novel method of attaining the same, as hereafter described and claimed.

The general object attained by our invention is to provide a shoulder pad with a predetermined natural appearing outline, which pad is substantially resilient, stable under wear and servicing, and easy and cheap to make, said desirable features being concurrently attained to the highest degree.

A more specific object of our invention is to provide a shoulder pad consisting of a plurality of deformed elements, joined and bonded together in such a way that the resulting assembly can be made with any desired configuration and is resiliently stable under all conditions of wear.

Another object is to provide a shoulder pad having any desired configuration, consisting of

component elements which originally are flat pieces of suitable materials.

A further object is to provide a method of making a shoulder pad having any desired configuration by cutting a number of component elements out of sheets of suitable materials, and assembling and bonding said elements together in predetermined deformed relationship.

A still further object is to provide a method whereby shoulder pads of somewhat different dimensions can be made as desired from the same basic elements and with the same equipment.

Other related and ancillary objects of our invention will become apparent as the description proceeds.

Our invention will be understood with reference to the preferred embodiment illustrated in the drawings, wherein:

Fig. 1 is a perspective view of a finished shoulder pad according to our invention.

Fig. 2 is a top plan view of the same pad, with the two top elements partially removed to show the arrangement of the underlying elements.

Fig. 3 is a longitudinal section on the line 3—3 of Fig. 2.

Fig. 4 is an end elevation, looking in the direction of the arrows 4—4 of Fig. 2.

Fig. 5 is a top plan view of the component elements of the pad, loosely assembled prior to the deforming and bonding thereof to form the finished pad, with the top two elements partially removed.

Fig. 6 is an end elevation of the pad assembly of Fig. 5, looking in the direction of the arrows 6—6.

Fig. 7 is an exploded perspective view of the elements of Figs. 5 and 6.

Fig. 8 is a perspective view of an alternative embodiment of a certain component element of the pad, referred to in the description as the "bonding element."

Fig. 9 is a perspective view of still another embodiment of the bonding element.

Referring now in detail to the drawings, the finished pad generally indicated at 1 comprises two outer elements, the bottom element 2 and the top element 10, and intermediate elements 3, 4, 5, 6, 7, 8 and 9. The outer elements are made of a flexible material, such as a felt, or a fabric, or the like, such material being non-adhesive to the hot plates of a press, and being preferably suited to be stitched to interconnect the two outer elements along a portion of their periphery, as indicated at 11. It is important to note that the two outer elements preferably are not sized or otherwise prepared so as severally to acquire a permanent shape of their own, but on the contrary are allowed to maintain their full flexibility.

The intermediate elements 3, 4, 5, 6, 7, 8 and 9 are made of a resilient thermo-adhesive material, by which latter term is meant that under the influence of heat and pressure two superimposed layers of the material in question will become bonded together, and that the heat necessary to establish a bond strong enough for the purposes of this invention is not in general sufficient seriously to impair the required elastic properties of the material. An example of such a material is that made of fibres of wool or the like, coated and cemented with one of the synthetic rubbers.

Referring now particularly to Figs. 5, 6 and 7, it is seen that all the component elements of the pad are originally, that is prior to assembling, flat pieces, cut out of sheets of suitable material into the desired shapes and sizes. Resilient

thermo-adhesive materials in sheet form are available on the market at a cost low enough to permit of an economical manufacture of our pad—an important feature of our invention. As to the original shape of the several elements, the outer elements 2 and 10 are substantially triangular, but their bases 12 and 13 respectively are preferably slightly convex. Top and bottom element have the same height, but the top element 10, which in the finished pad assumes a greater curvature than the bottom element 2, has the longer base. Overlying the bottom element 2 is a substantially triangular element 3, slightly smaller than 2 and in a like manner a substantially triangular element 9, slightly smaller than the top element 10, underlies said top element. Superimposed to the element 3, and to one another, are one or more elements (in this example the three elements 4, 5 and 7) of stepwise decreasing sizes, and of substantially the same shape, said shape being defined by two curved edges, one of said edges, such as 14 of the element 4, having generally the same curvature, if any, as the bases 12 and 13 of the outer elements, and the other of said edges, such as 15 of the element 4, being sharply convex in somewhat the general way of an arc of parabola. These latter elements will be designated as the "shaping elements" for reasons which will become apparent later. It is to be understood that the precise contour of the shaping elements may vary somewhat, and is a matter of judicial design.

Other pieces may be interposed between the shaping elements to build up the pad, and will be designated as the "thickness elements." This example shows only one thickness element at 5, but there may be more, or there may be none. The thickness elements need not have the same contour as the shaping elements. They may be substantially rectangular, as is the case in this example, or triangular, or may follow any other figure which the experienced designer of the pad will consider suitable in the light of the function they perform, as hereafter more fully set forth.

Finally, there is one more intermediate element, which will be designated as the "bonding element," and is shown in the drawings at 8. In this example the bonding element 8 is located between the element 9 immediately underlying the top element, and the topmost shaping element 7 is substantially T-shaped, the head of the T being flush with the bases 12 and 13, and the stem extending axially with respect to the pad, and has such dimensions that it may bend over the underlying elements 4, 5, 6 and 7 and yet protrude beyond any of them both axially and transversely, as shown in Figs. 2, 3 and 4. It is to be understood that, without departing from our invention, the position of the bonding element within the pad assembly may be varied somewhat, and that its shape likewise may be changed, and that two or even more elements may be employed to perform collectively the function of the bonding element, which function will be fully specified hereafter, though in general an excessive multiplication of the bonding elements will not improve the properties of our pad. Two alternative embodiments of the bonding element, one of which consists of two separate pieces, are shown in the drawings.

The component elements all having been pre-cut, the process of making the pad comprises the following steps. First, the outer elements 2 and 10 are associated with their respective adjacent intermediate elements 3 and 9. Since the

primary function of said adjacent elements is to establish a bond between the outer elements, which are not thermo-adhesive, and the remaining elements of the pad, it is generally desirable that said outer elements and said adjacent elements be connected as intimately as possible. Therefore we preferably cut the adjacent elements into a shape similar to that of the outer elements out of a thin layer of thermo-adhesive material, and furthermore we interpose between them and the outer elements a layer of an adhesive substance, such as rubber cement.

The second step consists in superimposing all of the elements of the pad in the general manner shown in Figs. 5 and 6. We find it generally advantageous to coat each intermediate element on at least one face with an adhesive material such as a solution of rubber cement, because, though such a coating is by no means necessary, it helps maintain the correct positioned relationship of the various elements during the intermediate stages of the manufacture of the pad prior to the pressing operation described hereafter, and also said coating speeds said pressing operation.

The third step consists in applying pressure to the pad assembly of Figs. 5 and 6 to cause it to assume a predetermined configuration, which is the desired configuration of the finished pad, and in heating the pad assembly in the resulting deformed condition until the elements of thermo-adhesive material become firmly bonded together, so that they thereafter prevent each other from returning to the original flat configuration, toward which their inherent elasticity tends to impel them. This step may preferably be accomplished by placing the pad assembly in a press, the two plates whereof are shaped like the desired final top and bottom of the pad and are provided with heating means, and holding it there for a long enough time at a high enough temperature.

The final operation consists in stitching together the outer elements 2 and 10 along the two sides of their periphery at which they contact each other.

In the finished pad, the various component elements permanently but resiliently maintain the predetermined curved deformed relationship which they have caused to assume in step three. How this result is brought about, can be best understood by analyzing the functions of the individual component elements. The outer elements are mainly covering, which adapt themselves to, and do not determine, the shape of the pad. The function of the elements adjacent to the outer elements has already been explained. The shaping elements have such a configuration and relative position that, after deformation, the sharply convex, nearly parabolic portions of their peripheries together define a curved surface substantially like the desired final outline of the shoulder pad. To be sure, there are other elements superimposed to be shaping elements, but said other elements, as is apparent from an inspection of Figs. 2, 3 and 4, are in contact with the peripheries of the shaping elements and have adapted themselves thereto, so that it may be said that the shaping elements form the foundation of the surface of the pad. Hence the term by which they have been designated. It is now clear how the skilled craftsman may design said shaping elements, by visualizing them in their final deformed relationship.

The thickness elements have the function of increasing the thickness of the pad, when that

is desirable, by being interposed between some of the shaping elements. As each of them is generally smaller than the shaping element it underlies directly, at least axially, as seen in Fig. 3, this latter bends over the thickness element, which therefore only indirectly affects the profile of the pad, and may have a variety of shapes without detriment to the smoothness of the said profile.

Finally, the bonding element, by protruding beyond both the shaping elements and the thickness elements in at least two directions, provides a bracing bond in the aforementioned two directions, and causes the pad to maintain its shape, or resiliently to return thereto when temporarily forced out of it. Obviously other shapes of the bonding element can be devised to give the necessary minimum bond in any two directions, although the T shape illustrated is quite simple and satisfactory. A continuous peripheral bond can also be provided. Thus Fig. 8 shows an alternative bonding element 16, similar in contour to the shaping elements, but larger than any of them, and Fig. 9 shows two separate bonding elements to be used cooperatively, the axial element 17 substantially triangular, and the transverse element 18 substantially rectangular.

It is to be particularly noted that the described pad structure is eminently adjustable, that is an experienced craftsman will be able to produce a line of shoulder pads of various sizes and thicknesses by suitably combining the same basic component elements described, exercising his judgment within certain limits in choosing the number, thickness, and even the outline of said component elements, and using the same machinery for all. The plates of the press referred to in the description need not be changed to produce said different sizes and thicknesses, as long as the desired general outline of the pad remains substantially the same. That this feature of our invention is an extremely useful one, will be apparent at once to anyone familiar with this art.

It will be understood that the foregoing description has been given merely by way of example, and that many changes may be made in the pad and in the method of making the same without departing from the spirit of the invention or exceeding the scope of the appended claims.

We claim:

1. A shoulder pad, comprising a number of deformed resilient elements assembled in resiliently fixed positioned relationship to define a predetermined outline of the pad, one at least of said elements contacting several of the remaining ones and being directly bonded thereto, substantially both along the plane of symmetry of the pad and in a direction perpendicular to said plane of symmetry, to maintain all of the elements in said resiliently fixed positioned relationship, said elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat.

2. A shoulder pad, comprising a number of elements assembled in resiliently fixed positioned relationship to define a predetermined outline of the pad, two at least of said elements together defining with several of the remaining ones an area of contact extending substantially both along the plane of symmetry of the pad and along a direction perpendicular to said plane of symmetry, and being directly bonded to said several remaining elements along said area of contact to

maintain all of the elements in said resiliently fixed positioned relationship, said elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat.

3. A shoulder pad, comprising a number of deformed resilient elements assembled in resiliently fixed positioned relationship to define a predetermined outline of the pad, one at least of said elements being in peripheral contact with several of the remaining ones, and being directly bonded thereto to maintain all of the elements in said resiliently fixed positioned relationship, said elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat.

4. A shoulder pad, comprising a number of deformed resilient elements assembled in resiliently fixed positioned relationship, certain of said elements being so shaped as to define together a predetermined outline of the pad, and one at least of said elements contacting several of the remaining ones and being directly bonded thereto to maintain all of the elements in said resiliently fixed positioned relationship, said elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat.

5. A shoulder pad, comprising a number of elements assembled in resiliently fixed positioned relationship, certain of said elements being so shaped as to define together a predetermined outline of the pad, and others of said elements being interposed therebetween to modify the positioned relationship thereof to build up the pad to the required thickness, one at least of said elements contacting several of the remaining ones, and being directly bonded thereto to maintain all of the elements in said resiliently fixed positioned relationship, said elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat.

6. A shoulder pad, comprising a number of elements assembled in resiliently fixed positioned relationship, certain of said elements being similar in shape and of progressively decreasing sizes with respect to one another, corresponding convex portions of the peripheries of said certain elements being formed to define together the shape of the upper surface of the pad, one other at least of said elements contacting several of the remaining ones and being directly bonded thereto to maintain all of the elements in said resiliently fixed positioned relationship to define a predetermined outline of the pad, said elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat.

7. A shoulder pad, comprising shaping elements similar in shape and of progressively decreasing sizes with respect to one another, corresponding convex portions of the peripheries of said shaping elements being formed to define together a predetermined outline of the upper surface of the pad; additional elements interposed between said shaping elements to build up the pad to the required thickness; and at least one other element contacting several of the

aforementioned shaping and additional elements and being directly bonded thereto to maintain the same in a resiliently fixed positioned relationship to define a predetermined shape of the pad; all of the elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat.

8. A shoulder pad, comprising a number of resilient elements assembled in resiliently fixed positioned relationship, certain of said resilient elements being similar in shape and of progressively decreasing sizes with respect to one another, corresponding convex portions of the peripheries of said certain elements being formed to define together the shape of the upper surface of the pad, one other at least of said resilient elements contacting several of the remaining ones and being directly bonded thereto to maintain all of the resilient elements in said resiliently fixed positioned relationship whereby a predetermined outline of the pad is defined, said resilient elements being made of a material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat; outer flexible elements juxtaposed to said resilient elements; and means for interconnecting said outer flexible elements to form a covering for the pad.

9. A shoulder pad, comprising resilient shaping elements similar in shape and of progressively decreasing sizes with respect to one another, corresponding convex portions of the peripheries of said shaping elements being formed to define together a predetermined outline of the upper surface of the pad; additional resilient elements interposed between said shaping elements to build up the pad to the required thickness; at least one other resilient element contacting several of the aforementioned shaping and additional elements and being bonded thereto to maintain the same in a resiliently fixed positioned relationship whereby the desired shape of the pad is defined; all of the resilient element being made of a material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat; outer flexible elements juxtaposed to said resilient elements; further resilient elements associated with said outer flexible elements, adjacent to the inner surfaces thereof, and adhesively connected thereto; and means for interconnecting said outer flexible elements to form a covering for the pad.

10. A method for making a shoulder pad, comprising the steps of cutting sheets of a resilient material which has the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat, to form a number of elements, superimposing said elements in a predetermined positioned relationship, deforming the same to a predetermined shape, and subjecting the same to the action of heat while in said deformed condition, to cause the elements to become permanently bonded together.

11. A method for making a shoulder pad, comprising the steps of cutting sheets of a resilient material which has the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat, to form a number of resilient elements, providing outer flexible elements suited to form a cover for the pad, adhesively connecting one resilient element to the inner surface of each outer flexible

element to form an upper and lower cover assembly, assembling the remaining resilient elements with said cover assemblies in predetermined superimposed relationship to form a pad assembly, applying pressure to force said pad assembly to assume the predetermined final shape of the pad, and subjecting said pad assembly to the action of heat while in said deformed condition permanently to confer upon the pad assembly the desired final shape.

12. A method for the manufacture of a shoulder pad, comprising the steps of cutting sheets of a resilient material which has the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat, to form a number of resilient elements, providing outer flexible elements suited to form a cover for the pad, assembling said resilient and flexible elements in predetermined superimposed relationship and concurrently interposing at each contact surface of different elements a coating of a suitable adhesive substance to form a pad assembly, applying pressure to force said pad assembly to assume the predetermined final shape of the pad, and subjecting the pad assembly to the action of heat while in said deformed condition permanently to confer thereupon the desired final shape.

13. A method for making a shoulder pad, comprising the steps of cutting sheets of a resilient material which has the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat, to form a number of resilient elements, providing outer flexible elements, assembling said resilient and flexible elements in predetermined superimposed relationship, applying pressure to the resulting assembly to deform the same to a predetermined shape, subjecting the same to the action of heat while in said deformed condition to cause it to permanently retain said predetermined shape, and interconnecting said outer flexible elements to form a covering for the pad.

14. A method for making a shoulder pad, comprising the steps of cutting sheets of a resilient material which has the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat to form a number of shaping resilient elements similar in shape and of progressively decreasing sizes having corresponding convex portions of the peripheries thereof formed to define together a predetermined outline of the upper surface of the pad, a number of additional resilient elements shaped so as to build up the pad to the required thickness when interposed between said shaping resilient elements, and two further resilient elements; cutting sheets of a flexible material to form outer flexible elements suited to provide a cover for the pad; adhesively connecting one of said further resilient elements to the inner surface of each outer flexible element to form upper and lower cover assembly; assembling said shaping and additional resilient elements with

said cover assemblies in predetermined superimposed relationship to form a pad assembly; applying pressure to force said pad assembly to assume the predetermined final shape of the pad; and subjecting said pad assembly to the action of heat while in such deformed condition permanently to confer upon the pad assembly the desired final shape.

15. A shoulder pad, comprising a number of resilient elements deformed and assembled to define together a predetermined configuration of the pad, one at least of said elements contacting several of the remaining ones and being directly bonded thereto, said elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof subjected to pressure and heat, whereby the elements are maintained in their deformed and assembled relationship and resiliently return thereto when displaced therefrom.

16. A shoulder pad, comprising a number of elements deformed and assembled together to define a predetermined configuration of the pad being limited by an uppermost convex surface and a lowermost concave surface, one at least of said elements contacting several of the remaining ones and being directly bonded thereto, said elements being made of a resilient material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat, whereby the elements are maintained in their deformed and assembled relationship and resiliently return thereto when displaced therefrom.

17. A shoulder pad, comprising a number of deformed resilient elements assembled in resiliently fixed positioned relationship to define a predetermined outline of the pad, one at least of said resilient elements contacting several of the remaining ones and being directly bonded thereto to maintain all the resilient elements in said resiliently fixed positioned relationship, said resilient elements being made of a material having the property of developing a permanent bond between contacting surfaces thereof when subjected to pressure and heat, and another resilient element similar in contour to the aforesaid one of said resilient elements, said two resilient elements being bonded substantially at least for the greater portion of their peripheries thereby to define an enclosure for the remaining resilient elements.

BERT MECHUR.
WALTER RIEDLER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,698,144	Sladdin	Jan. 8, 1929
622,765	Goldman	Apr. 11, 1899
873,999	Goldman	Dec. 17, 1907

Disclaimer

2,424,482.—*Bert Mechur and Walter Riedler*, New York, N. Y. SHOULDER PAD AND METHOD OF MAKING THE SAME. Patent dated July 22, 1947. Disclaimer filed Apr. 26, 1949, by the inventors.

Hereby enter this disclaimer to claims 1, 3, 6, 10, 15, 16, and 17 of said Letters Patent.

[*Official Gazette June 7, 1949.*]