

Aug. 5, 1947.

D. C. HOWARD

2,424,985

BODY ARMOR

Filed Sept. 5, 1944

2 Sheets-Sheet 1

Fig. 1.

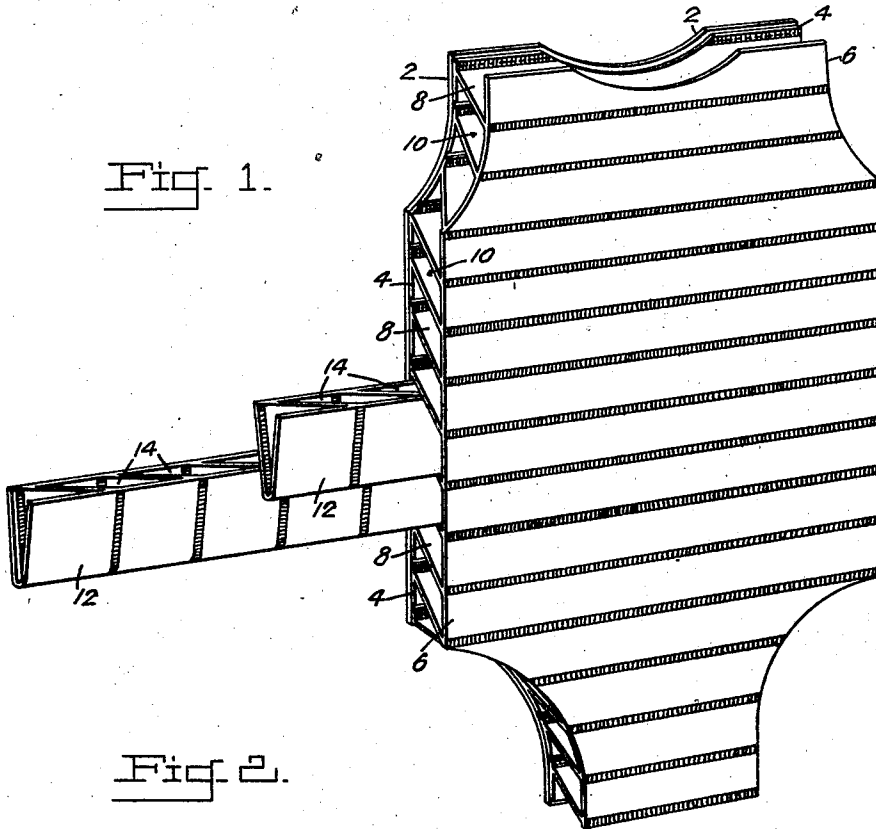


Fig. 2.

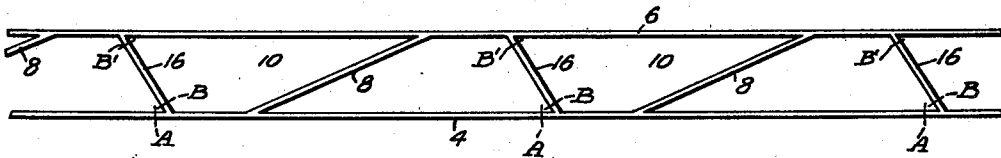
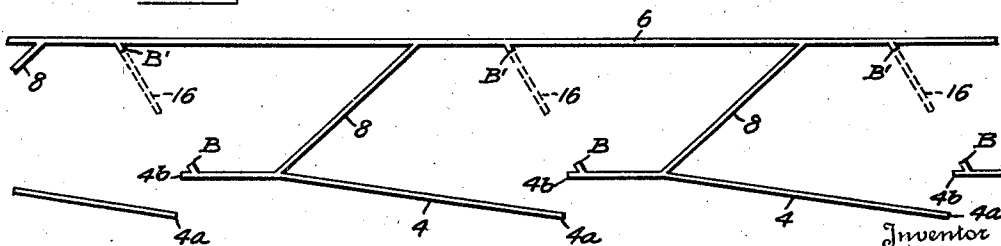


Fig. 3.



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Fig. 4.

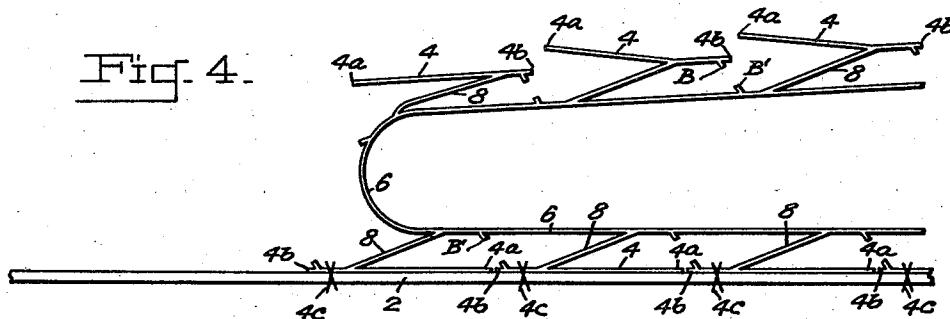


Fig. 5.

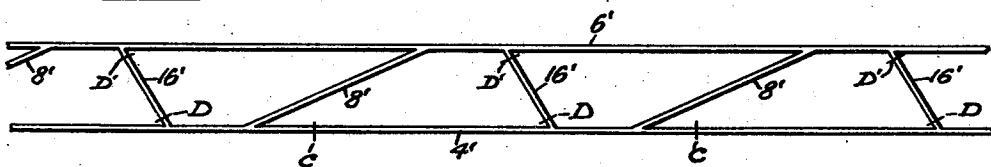


Fig. 6.

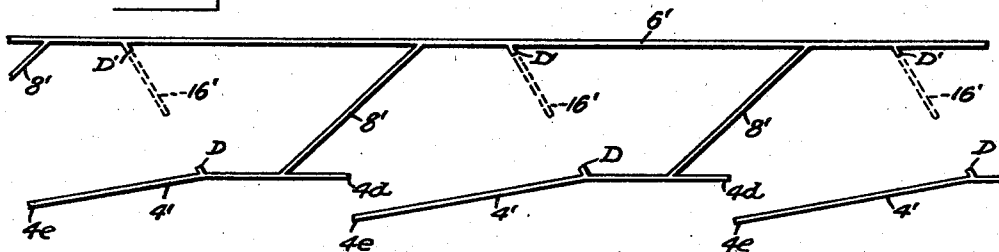
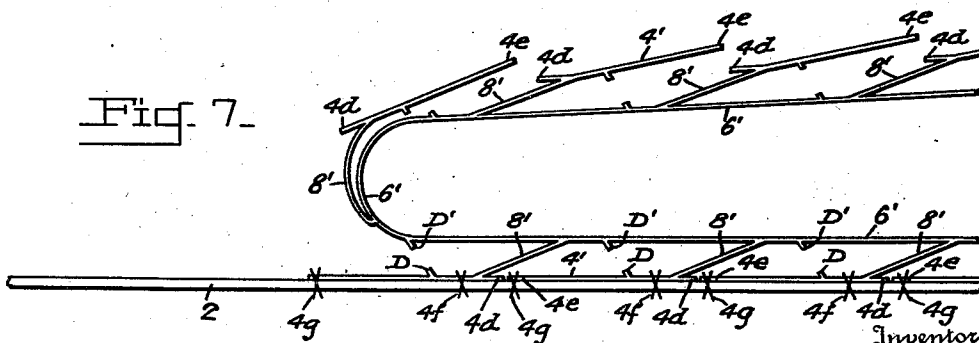


Fig. 7.



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UNITED STATES PATENT OFFICE

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BODY ARMOR

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8 Claims. (Cl. 2—2.5)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me for any royalty thereon.

My invention relates to improvements in body armor and more particularly to that type of armor known as bullet proof vest, and its general object is to provide an armor of this character with a heavy backing of canvas or other suitable material or fabric, and in which the front portion comprises a series of rows of horizontal, diagonal, overlapping pockets, adapted to receive strips of material in which individual pockets containing metallic inserts are arranged in horizontal, overlapping relation.

A further object of my invention is to provide a method of attaching one side of a pocket or a series of pockets to a heavy backing, in overlapping relation.

A still further object of my invention is to provide a method of cutting oppositely disposed fabric sections which are integrally woven and connected by cross sections, whereby the cut fabric section may be sewed or stitched, by the use of a conventional sewing machine, to a heavy backing material or fabric to form a series of overlapping pockets.

With these and other objects in view, as will hereinafter more fully appear, and which will be more particularly pointed out in the appended claims, reference is now made to the accompanying drawings forming a part of this application in which:

Figure 1 is a perspective view illustrating a section of body armor constructed in accordance with my invention, showing the manner in which the individual strip pockets are inserted and positioned therein;

Figure 2 is a diagrammatic elevational view of the ladder type fabric weave used to form the pockets of my invention and indicating the points where the fabric is to be cut;

Figure 3 is a diagrammatic view of the fabric of Fig. 1 illustrating same after the cuts have been made;

Figure 4 is a diagrammatic view, illustrating the manner in which the fabric cut according to Fig. 3, may be sewed or stitched to a heavy fabric backing;

Figure 5 is a view similar to Fig. 2, illustrating a modified form of the invention, indicating the points to be cut;

Figure 6 is a diagrammatic view of the fabric of Fig. 5, illustrating same after the cuts have been made; and

Figure 7 is a diagrammatic view, illustrating the manner in which the fabric cut according to Fig. 6 may be sewed or stitched to a heavy fabric backing.

It has long been recognized in the art that an effective armor or bullet proof vest can be provided by overlapping relatively thin, flat disks of suitable metal or alloy. The chief difficulty has been to find a satisfactory manner of retaining such disks in the proper overlapping relation and in maintaining the disks with the proper degree of elasticity adjacent a relatively heavy backing, such as canvas or the like. This feature is not only desirable but essential if optimum results are to be obtained, and this elasticity must impart a substantially uniform cushioning effect surrounding the point of impact.

Various adhesives, etc., have heretofore been proposed to attach one side of a pocket, or a series of overlapping pockets, such as illustrated in Fig. 1 of my invention, to a heavy backing of canvas or the like, in order to obtain the proper cushioning effect, and special arms to be attached to commercial sewing machines have been considered, but all have been deemed unsatisfactory for one reason or another, such as unsatisfactory results, prohibitive costs, etc.

By the use of the method disclosed by the present invention a satisfactory armor has been produced economically, and the method of producing this armor as well as the resulting product, is believed to be novel. Ladder type weave, in which opposing sections of fabrics are integrally woven with connecting diagonal cross sections, of the type shown in Figs. 2 and 5 of the accompanying drawings, is well known in the art, and by employing the method of the present invention, one of the transverse sections shown is eliminated and one side of the fabric cut in such a manner that the cut side may be folded back as illustrated in Figs. 4 and 7 and the cut sections sewed to the heavy backing by the use of a conventional commercial sewing machine.

Referring now to the drawings in which similar reference characters represent similar parts, in Fig. 1 I have illustrated a section of body armor constructed in accordance with my invention, comprising a backing section 2 of heavy canvas or the like to which is attached by sewing or stitching an intermediate section 4 of relatively light weight fabric, and a front section 6 connected to the intermediate section by integrally woven diagonal transverse sections 8, forming a series of horizontal, diagonal, overlapping pockets 10, adapted to receive strips of

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material 12, having integrally woven pockets 14, adapted to receive thin metallic plates, not shown, of a type well known in the art of bullet proof vests. It will be noted that the pockets 14 are overlapped, horizontally, whereby the individual scale-like metallic plates, when inserted in the pockets 14 of strips 12, and strips 12 inserted in pockets 10, are maintained in both vertical and horizontal overlapped relation.

Referring now to Figs. 2, 3 and 4 in which I have shown the preferred embodiment of the method of making the product illustrated in Fig. 1, the numeral 4 represents one side of a ladder type weave of relatively light fabric well known in the art, integrally woven with opposing side 6 by transverse sections 8 and 16. In Fig. 2, section 4 is cut at the points A, while transverse-section 16 is cut at B and B' and the material between these cuts B and B' discarded. This cutting results in the form of product diagrammatically shown in Figs. 3 and 4, in which the cut ends of the sections 4 are designated as 4^a and 4^b. Fig. 4 illustrates the manner in which the uncut section may be folded to permit the sewing or stitching by a conventional sewing machine to the heavy backing 2 at 4^c to form the product shown by Fig. 1.

In the modified form of the invention shown in Figs. 5, 6 and 7, one side the ladder type weave 4' is integrally woven with opposing side 6' by transverse sections 8' and 16'. In Fig. 5, section 4' is cut at the points C, while transverse section 16' is cut at D and D' and the material between these cuts D and D' discarded. This cutting results in the form of product diagrammatically shown in Figs. 6 and 7, in which the ends of the sections 4' are designated 4^d and 4^e. Fig. 7 illustrates the manner in which the uncut section may be folded to permit the sewing or stitching by a conventional sewing machine to the heavy backing 2, at 4^f and 4^g, or at any other desired points therebetween.

While I have illustrated and described the invention in some detail, it is to be understood that the invention is not to be limited to such details, but only by the spirit of the invention and the scope of the appended claims.

I claim:

1. A method of forming a series of overlapping, diagonal pockets for body armor secured to a relatively heavier backing fabric, in which oppositely disposed, relatively lighter, fabric sections integrally connected by diagonal transverse sections are employed, comprising cutting alternate transverse sections, cutting one of said fabric sections at predetermined points on each side of the uncut transverse sections, folding back the uncut fabric section, and successively sewing the cut ends of the fabric section to said heavy backing.

2. A method of forming a series of overlapping, diagonal pockets for body armor secured to a relatively heavier backing fabric, in which oppositely disposed, relatively lighter, fabric sections integrally connected by diagonal transverse sections are employed, comprising cutting alternate transverse sections, cutting one of said fabric sections adjacent each of said cut transverse sections, folding back the uncut fabric section and successively sewing one cut end of the cut portions of the fabric section to said heavy backing.

3. A method of forming a series of overlapping, diagonal pockets for body armor secured to a relatively heavier backing fabric, in which op-

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positely disposed, relatively lighter, fabric sections integrally connected by diagonal transverse sections are employed, comprising cutting alternate transverse sections, cutting one of said fabric sections adjacent each uncut transverse section, folding back the uncut fabric section and successively sewing the cut portions of the fabric section to said heavy backing.

4. A section of body armor comprising a relatively heavy fabric backing, and a relatively light integrally woven ladder web construction fabric comprising fabric sections integrally connected by spaced transverse diagonally positioned sections whereby a series of horizontal rows of overlapping integrally woven diagonal pockets are formed, said fabric being attached to said backing.

5. A section of body armor comprising a relatively heavy fabric backing and a relatively light ladder web construction fabric comprising fabric sections integrally connected by spaced transverse diagonally positioned sections whereby a series of horizontal rows of overlapping diagonal pockets are formed, said fabric being attached to said backing and adapted to receive overlapping scale-like metallic plates in said pockets, and means for maintaining said plates in overlapping position both vertically and horizontally.

6. A section of body armor comprising a backing and a ladder web construction fabric forming a series of horizontal rows of overlapping diagonal pockets attached to said backing, a strip of fabric in each diagonal pocket, said strip being formed with a series of integrally woven overlapping pockets and adapted to receive a scale-like metal plate in each overlapping pocket in said strip, the strips being so positioned relative to each other and to the diagonal pockets whereby the plates adapted to be received by said strip pockets will be arranged in a vertically and horizontally overlapping relationship.

7. A section of body armor comprising a fabric formed with a series of adjoining horizontal overlapping pockets, a strip of fabric in each pocket, said strips being formed with pockets overlapping in the direction of the length of the strip and adapted to receive a scale-like metal plate in each of said strip pockets, the arrangement being such that the individual plates will overlap both horizontally and vertically.

8. The method of forming a series of overlapping pockets on a fabric backing from fabric sections integrally connected by diagonal transverse members comprising cutting alternate diagonal transverse members connecting said fabric sections, cutting one of said fabric sections at points between the remaining diagonal transverse members into portions attached to said remaining diagonal transverse members and successively and positively securing some of said cut portions to the fabric backing.

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REFERENCES CITED

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

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