Dec. 10, 1929. L. WISBROD 1,739,112

ARMOR

Filed Feb. 1, 1928

Fig. 3

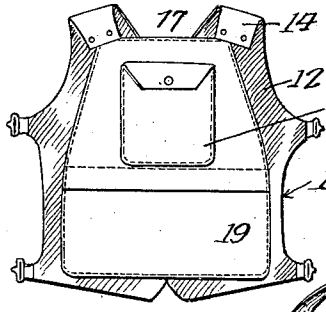


Fig. 1

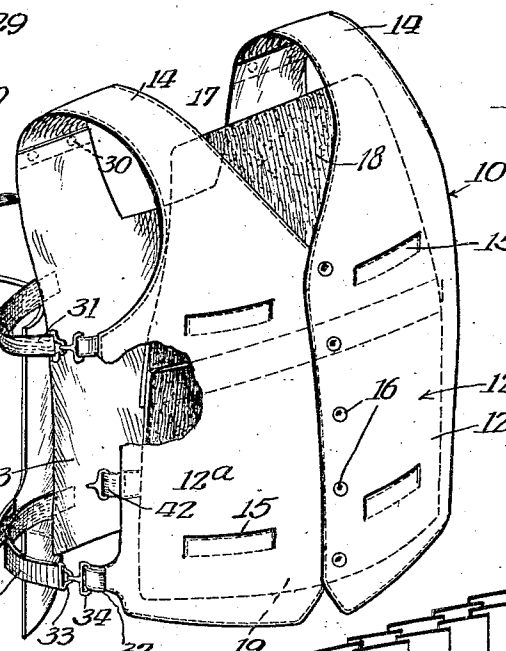


Fig. 2

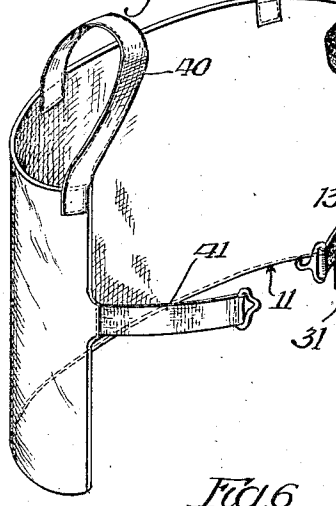


Fig. 4

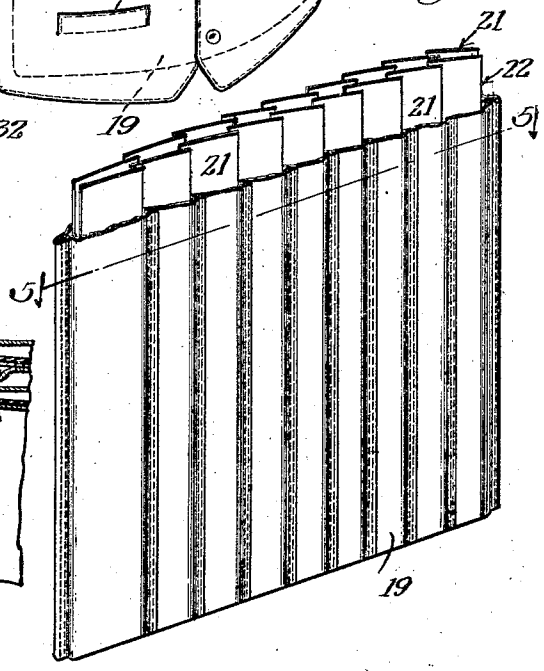


Fig. 6

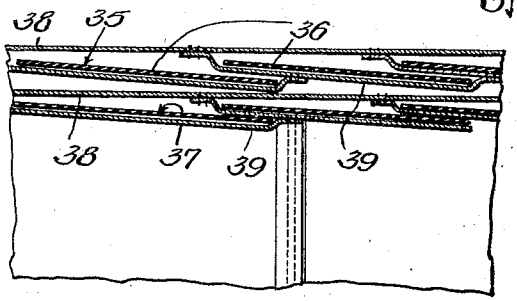
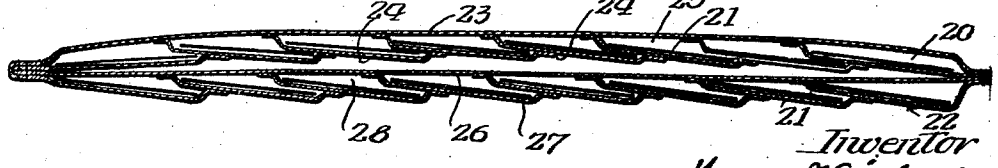


Fig. 5



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UNITED STATES PATENT OFFICE

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ARMOR

Application filed February 1, 1928. Serial No. 250,971.

The present invention relates generally to body armor. More particularly the invention relates to armor or bullet-proof vests which are adapted primarily for use by policemen, bank messengers, paying tellers, watchmen and other such individuals.

Heretofore, vests of this character have been made with plates of comparatively thick steel which are suitably arranged so as to protect the vital organs of the wearer. While these vests have proved to be efficient in effectively withstanding bullets, they are impractical because they are extremely heavy, and the body is usually bruised when the vest is hit due to the fact that the steel plates are not resilient and transmit the shock of the bullet directly to the body. In other instances the vests have been formed of sections consisting each of a plurality of steel strips which are suitably held together in abutting relation. Although the sections are somewhat resilient they are not sufficiently so to avoid shocking the body. Furthermore they are heavy which results in the vest being a burden to the wearer and the joints between them either prevent the vest from being easily flexed when arranged in its operative position about the wearer or do not prevent the bullets from penetrating.

The primary object of this invention is to provide a vest which is efficient and is an improvement upon vests of former constructions in that it is comparatively light and does not shock or bruise the body when hit by bullets. In general, the armor sections of the vest consist of series of vertically extending spring steel strips which overlap each other at the side margins thereof. These strips are made of substantially the same resiliency as the human body and are adapted to cooperate with the latter to dissipate the shock of and cushion the bullets. Because the plates are held in overlapped relation the sections may be flexed with ease and since usually two series of strips are used one in front of the other, a double overlap is provided which effectively prevents the entry of bullets striking the vest at an angle.

Another object of the invention is to provide a bullet-proof vest of the aforementioned type in which the sections at the front part thereof are arranged one above the other and are overlapped and slidable vertically relatively to each other so that forward bending movement of the wearer is not impaired.

Still another object of the invention is to provide a vest of armor in which the section forming the back and sides is detachably connected to the remainder of the vest and supported independently thereof so that it may be dispensed with if so desired or used alone.

A further object of the invention is to provide a vest in which the armored sections are held in close contact with the body of the wearer by means of resilient or elastic connections.

A still further object of the invention is to provide body armor which is of new and improved construction, is light and comfortable when worn, and may be manufactured at a comparatively low and reasonable cost.

Other objects will be manifest from a consideration of the following detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly defined by the claims at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification and in which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a perspective of the vest proper, that is, the main and front part of a vest embodying the invention;

Figure 2 is a perspective of the detachable and independent back and side part;

Figure 3 is a rear view of the front part, made on a comparatively small scale;

Figure 4 is a fragmentary perspective of one of the armored sections used in the front part;

Figure 5 is a section taken on line 5—5 of Figure 4; and

Figure 6 is a detail sectional view of the armor of the side and back part, made on a comparatively large scale.

The invention is exemplified in an armored or bullet-proof vest comprising a vest part 10 and a back member 11 which is supported

independently of the vest part and is detachably connected thereto as hereinafter described so that it may be used together with the vest part or dispensed with when so desired. The vest part consists of a front member 12 and a back 13 which are connected together by a pair of shoulder straps 14. The front member 12, as well as the back 13 and shoulder straps, is preferably formed of cloth and is cut or tailored in the manner usually employed in connection with vests. Pockets 15 are formed in the side pieces 12^a of the front member 12 and these pieces are connected together by a vertical series of buttons 16 and have their upper ends shaped to form a V-shaped opening 17 for accommodating the neck of the wearer, as well understood in the art.

Secured to the inner face of the front member 12 are a pair of armored sections 18 and 19 which are arranged one above the other and are of such areas that the uppermost one covers and protects the chest region of the wearer while the lowermost section covers the lower or abdominal region. Each section comprises a horizontal row or series of vertically extending spring steel strips 21 and a similar row 22 which is positioned directly behind the row 20 and is coextensive therewith. The strips of each row are of substantially the same dimensions and lap each other at one side thereof, as shown in Figures 4, 5 and 6, so that they form a continuous armored surface. The lapped area of each strip is approximately equal to one half its entire area and since two rows of strips are used in each section a double overlap arrangement occurs which effectively prevents the entry of bullets striking the vest at an angle. The strips 21 are specially tempered so that their resiliency is substantially equal to the softness of the human body with the result that they cooperate with the latter to cushion and take up the shock of the bullets striking the vest. Because of the lapped arrangement, a plurality of strips are brought into operation each time the vest is hit. This distributes the impact or shock of the bullet over a comparatively large resilient or cushioning area with the result that the body is not bruised. Should the strips 21 rust or corrode from moisture or perspiration, they would lose their temper and correct resiliency and consequently would not be effective in avoiding penetration. To avoid this, the strips are plated with copper or any other suitable material.

The front row 20 of each section is held in place against a front piece 23 by means of a horizontal series of strips 24. Each of these strips has one of the side margins thereof sewed or otherwise secured to the front piece 23 and the other side margin sewed to the central portion of the back side of the adjoining or contiguous strip 24 to form an elongated pocket 25 in which one of the spring steel strips 21 is tightly held. The strips 24 and the front piece 23 are preferably formed of cloth and together exemplify means for individually holding the armored strips of the front row 20 in their overlapped and operative position. The armored strips of the back row are held in place in a similar manner by means of a front piece 26 and strips 27 which are sewed together and to said front piece in a manner similar to that employed in connection with the front row to form individual overlapped pockets 28. The side margins of the pieces 23 and 26 and the outermost strips 24 and 27 are sewed together, as shown in Figure 5, so that the sections are unitary in character. The uppermost section 18 is sewed or stitched to the upper part of the front member 12 in such a manner that the bottom part is free. The lowermost section 19 is sewed or stitched to the lower part of said front member and is arranged so that the upper margin thereof laps the lower margin of the section 18 and extends between it and the side pieces 12^a. Since the bottom part of the uppermost section 18 is free, the sections may slide vertically relatively to each other in response to forward bending movement of the wearer. In addition to affording comfort, the sliding or overlapped connection prevents bullets from passing between the sections. The top part of the section 18 is adapted to cover the chest of the wearer, and although it extends between the V-shaped margins of the side members 12^a, it is not conspicuous or unsightly because the front piece 23 is made of cloth and is preferably of the same material as the side pieces 12^a. A pocket 29 is sewed to the back side of uppermost section 18, for retaining articles of value.

The back 13 of the vest part 10 is formed separately from the front member 12 and the top portion thereof is removably secured to the shoulder straps 14 by buttons 30. The side margins of the back are provided with elastic straps 31, the distal ends of which are connected to elastic straps 32 by means of quickly detachable fasteners comprising socket members 33 and hook members 34. The straps 32 have their front ends fixed to the side margins of the side pieces 12^a. The straps 31, together with the straps 32 exemplify spring or resilient connections between the separately formed back and the front member 12 which operate to hold the armored sections 18 and 19 in close contact with the body of the wearer. This is of great importance as far as the efficiency of the vest is concerned because of the fact that the strips 21 cooperate with the body of the wearer in resisting penetration and it is essential that a contacting relation exist. The vest part 10 is applied to the wearer by separating the elastic straps 31 and 32 and then slipping the

head through the V-shaped neck opening 17. The straps are then connected together again to hold the vest part in its operative position.

The back member 11 of the vest is formed similarly to the sections 18 and 19 in that it consists of a horizontal outer row or series 35 of spring steel strips 36 and a similar inner row 37. The strips 36 overlap each other and are the same in character as the strips 21, being of a resiliency substantially equal to the softness of the human body and copper plated to prevent corrosion and rusting. The strips 36 are held in individual pockets 37 by means of cloth pieces 38 and lapped strips 39 which are similar in character to the strips 24 and 27. The back member 11 is shaped to fit around and conform to the back and sides of the user and is supported from the shoulders by a pair of straps 40. The side margins are provided with elastic straps 41 which are adapted to be attached to fasteners 42 fixed to the side margins of the side pieces 12^a. The back member 11 may be worn either inside or outside of the back 13 and is held in close contact with the body by the elastic straps 40. If desired, the back member may be worn separately or independently of the vest part. When it is done, the straps 40 are connected together across the chest of the wearer by any suitable means.

In the use of the vest, a bullet striking any of the armored sections will be repelled because the force thereof is dissipated and cushioned by the steel strips which are brought into play and cooperate with the body of the wearer. The vest is exceedingly simple to manufacture and has proved to be efficient in operation. It is light and comfortable to the user. Should, for any reason, one of the spring steel strips become broken or injured it may be replaced simply by ripping the margin of the section and withdrawing it from its individual pocket.

The invention is not to be understood as restricted to the details set forth, since these may be modified by the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. Body armor consisting of sections, each section embodying two series of overlapped spring steel strips, arranged one in front of the other, said strips being of substantially the same resiliency as the body of the person on whom the armor is to be worn.

2. Body armor consisting of sections, each section comprising a row of pairs of spring steel strips, the strips of each pair being coextensive and arranged face to face, and lapping respectively the front faces of the contiguous pair, and means for holding the pairs in place.

3. A section for body armor, comprising a row of pairs of metallic strips, the strips of each pair being coextensive and arranged face to face and having portions lapping respectively the front faces of the contiguous pair, and means forming individual retaining pockets for the strips.

4. A section for body armor, comprising a row of overlapped metallic plates, a piece adjacent and substantially co-extensive with one side of the row, and a series of strips adjacent the other side, said strips extending between the metallic plates respectively and being secured to said piece and to each other to form individual retaining pockets for the plates.

5. An armored vest comprising a front member and a back connected together by shoulder straps and tailored to fit the wearer, bullet-proof sections secured to the inner face of the front member and consisting of series of spring steel strips, said strips being tempered so that their resiliency is substantially equal to that of the human body, and elastic straps extending between and connecting the side margins of said front member and back and operative to hold yieldingly and firmly the strips against the body of the wearer.

6. An armored vest comprising a front member and a back connected together by shoulder straps and tailored to fit the wearer, bullet-proof sections secured to the inner face of the front member and consisting of series of spring steel strips, said strips being tempered so that their resiliency is substantially equal to that of the human body, and elastic straps extending between and connecting the side margins of the front member and back and operative to hold yieldingly and firmly the strips against the body of the wearer, said straps including quickly detachable fastening devices.

7. An armored vest comprising a front member and a back connected together and tailored to fit the wearer, bullet-proof sections connected to the inner face of the front member, and a bullet proof substantially rectangular back member formed as a unit and separately from the front member and back and shaped to extend around the back and sides of the wearer, and means for supporting and securing in place said back member.

8. An armored vest comprising a front member an a back connected together and tailored to fit the wearer, a plurality of bullet-proof sections connected to the inner face of the front member, a bullet-proof back member formed separately from the front member and back and shaped to extend around the back and sides of the wearer, said back member embodying a series of spring steel strips, said strips being of substantially the same resiliency as the human body, and elastic strips for holding the back member in place under spring pressure.

9. An armored vest comprising a front member and a back connected together and tailored to fit the wearer, a plurality of bullet-proof sections connected to the inner face of the front member, a bullet-proof back member formed separately from the front member and back and shaped to extend around the back and sides of the wearer, said back member embodying a series of spring steel strips, and readily disconnectible elastic means between and connected to the front member and said back member for holding the latter in place.

Signed at Chicago, Illinois, this 16th day of July, 1927.

LOUIS WISBROD.