

Feb. 29, 1944.

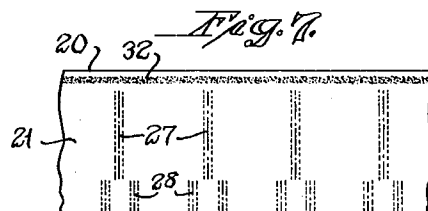
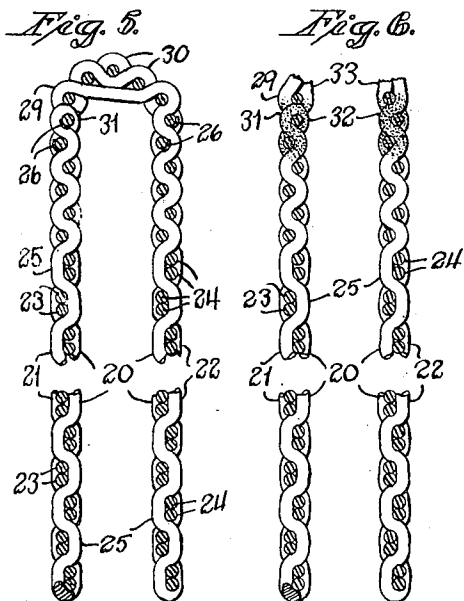
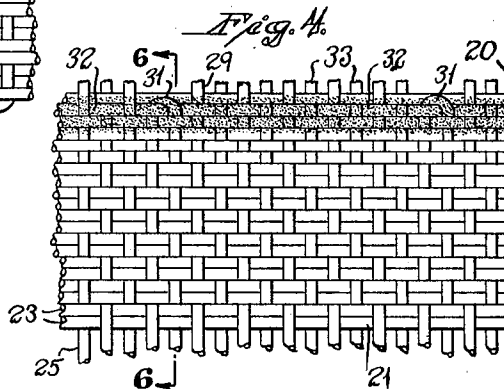
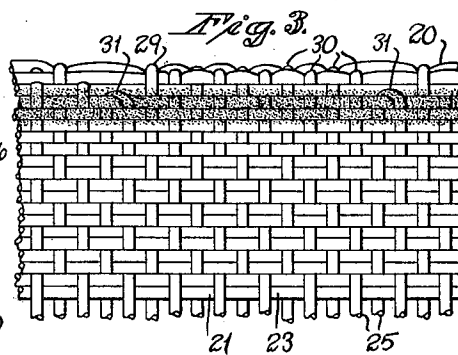
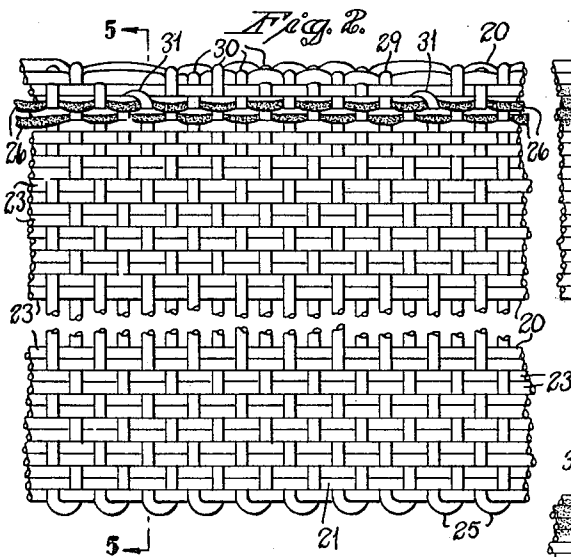
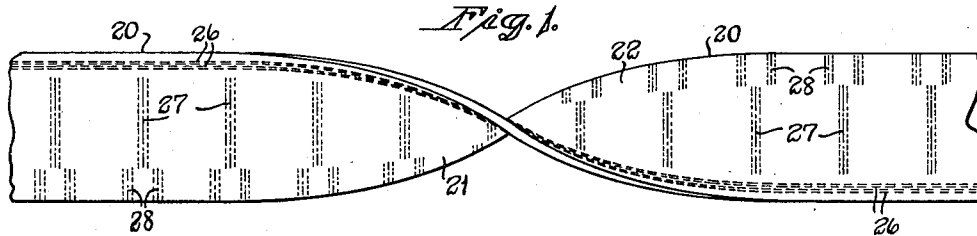
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2,342,802

CARTRIDGE FEED-BELT FOR MACHINE GUNS AND METHOD OF MAKING THE SAME

Filed July 22, 1942

2 Sheets-Sheet 1



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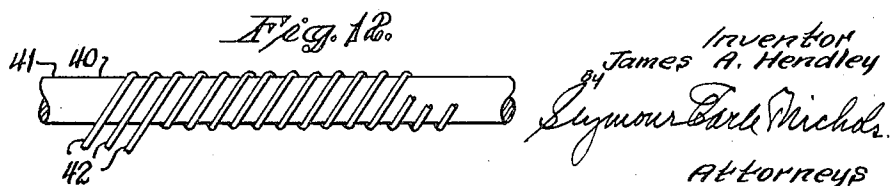
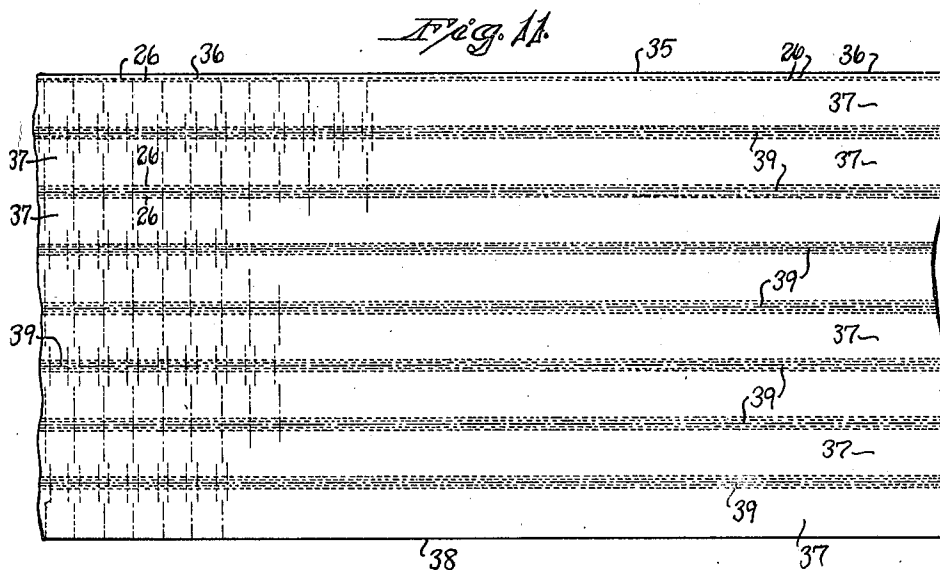
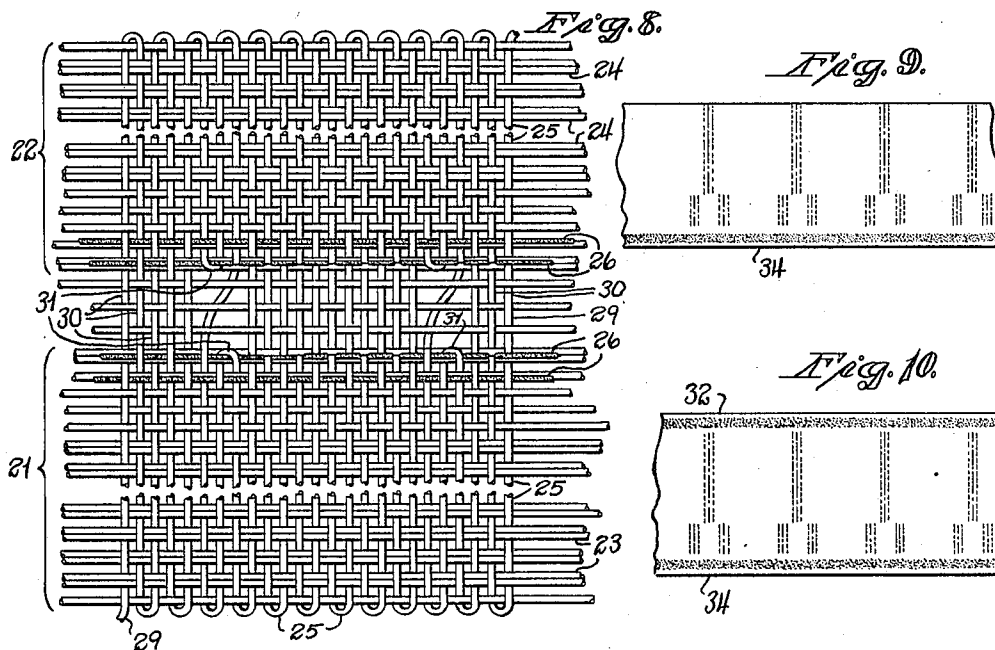
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,342,802

CARTRIDGE FEED BELT FOR MACHINE GUNS AND METHOD OF MAKING THE SAME

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Application July 22, 1942, Serial No. 451,970

11 Claims. (Cl. 28—74)

This invention relates to improvements in woven cartridge feed-belts for machine guns, and methods of making the same.

One object of this invention is to provide improved woven cartridge feed-belts for machine guns in which one or more of the side-edges of the belt has a selvage formed by means of cementitious material.

Another object of this invention is to provide an improved method of making woven cartridge feed-belts for machine guns in which one or more side-edges of the belt have a selvage formed by means of cementitious material.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings forming part of the present disclosure, in which certain ways of carrying out the invention are shown for illustrative purposes:

Fig. 1 is an elevational view in which both faces of a feed-belt made in accordance with the present invention are shown;

Fig. 2 is an enlarged elevational view of a fragment of Fig. 1;

Fig. 3 is an elevational view of the upper part of Fig. 2 after the same has been treated to form a cemented selvage portion;

Fig. 4 is a view similar to Fig. 3 after the plies have been slit apart along the upper edge;

Fig. 5 is a sectional view on line 5—5 of Fig. 2;

Fig. 6 is a sectional view on line 6—6 of Fig. 4;

Fig. 7 is an elevational view of the finished belt;

Fig. 8 is a schematic elevational view looking at the left of Fig. 5, and with the rearmost ply swung upward to form the top part of the view, in order to illustrate the weave construction;

Fig. 9 is an elevational view of a modified construction in which the cementitious selvage is formed along the rear edge of the belt;

Fig. 10 is an elevational view of another modified construction in which both selvage edges are formed by means of cementitious material;

Fig. 11 is an elevational view of another modified construction in which a plurality of belts are initially woven as a single fabric which are afterwards formed into separate belts; and

Fig. 12 is an elevational view of a modified form of cementitious warp strand for use in forming a cementitious selvage along one or more edges of a belt.

In the description and claims, the various parts and steps are identified by specific terms for convenience, but they are intended to be as generic in their application as the prior art will permit.

In carrying out the invention in the way illus-

trated in Figs. 1 to 8 of the drawings, the cartridge feed-belt 20 is formed of two plies of fabric 21 and 22, formed by weaving together two sets of warp strands 23 and 24 with weft picks 25. One or more special warp strands 26 of cementitious material such, for example, as cellulose acetate, are also woven in each ply with weft picks 25. At least certain of the strands of each of the sets of warp strands 23 and 24 cross back and forth from one ply to the other at locations 27 and 28 to form the cartridge-receiving pockets of the belt, in a manner fully set forth in Patent No. 2,061,072, granted November 17, 1936.

The weft picks 25 may be formed by weaving in both plies 21, 22 a continuous weft strand 29 which periodically crosses back and forth from one ply to the other. By referring to Fig. 8, it will be seen that the weft strand 29 at the left of Fig. 8 forms one pick in ply 21, then crosses over at 30 to form two picks in ply 22 and then crosses back again at 30 to form two picks in the first-mentioned ply 21, and so on for the formation of picks alternately in one ply and then the other until the weft strand 29, instead of crossing from one ply to the other, reverses back on itself within the same ply to form a selvage-loop 31, and then after forming the next two picks thereafter, crosses at 30 to the other ply where it also forms a selvage-loop 31 in such other ply, after which the weft strand again alternates back and forth from one ply to the other after the formation of each two picks in a ply with the result that a partly-completed feed-belt is formed, as illustrated. Thereupon, the cementitious strands of each ply is treated to cement the weft picks of each ply to at least one warp strand of each ply along the region of one edge of the belt. In the case of cementitious warp strands of cellulose acetate, the cementing operation is preferably accomplished by quickly passing the woven belt through a bath of solvent such, for example, as acetone, which brings about a more or less dissolving action upon the cellulose acetate strands with the result of cementing the weft picks of each ply to at least one of the warp strands of each ply after the acetone has evaporated, as is illustrated in Fig. 3. Thereupon, the looped cross-overs 30 of the weft picks are slitted, whereby the two plies are separated from one another along the edge of the belt where the slitting operation is performed. But inasmuch as the weft picks and warp strands along this edge have been cemented together, ordinarily by the removal of one or a few warp strands between the cemented region and the extreme edge of the belt, a definite selvage 32 is produced, the selvage along the opposite edges of the plies 21 and 22 of the opposite edge of the feed-belt being formed by the loops formed by the reversals of the weft strand 29, as clearly shown in Fig. 8. If so desired, instead

of merely slitting the crossovers 30, which results in free projecting ends 33, a knife or other cutting device can be passed through both plies along the edge 32 of the belt in the region of the cementitious material, whereby it is possible, if so desired, to form a clean-cut selvage edge, although this is not necessary. The selvage-loops 31 merely serve as a precautionary means to maintain a selvage in case of failure to form a proper cemented selvage at all locations, and ordinarily may be omitted as unnecessary. In omitting them, the weft strand would be crossed alternately back and forth from ply to ply at all locations, the same as illustrated at 30, without forming any loops 31.

Instead of forming the cemented selvage edges in the plies along the front or cartridge-entrance edge 32 of the belt, as in Fig. 7, the selvage could be formed along the rear edge of the belt 34, as in Fig. 9, or along both edges as two selvage edges 32 and 34 as in Fig. 10. The Fig. 10 form of construction could be made by weaving in any of the ways described concerning the construction illustrated in Fig. 11. If desired, cementitious material could be used along both edges of any of the forms of the feed-belts, in order to give a balanced effect of the cementitious material on both edges of a belt, especially where the cementitious material is somewhat stiff, like cellulose acetate.

Instead of weaving a single cartridge belt, a wide two-ply fabric 35 could be woven as illustrated in Fig. 11, with at least one cementitious warp strand 26 woven in each ply along one edge 36 to later form a selvage for each ply, and with at least two cementitious warp strands 26 woven in each ply along the juncture of each two adjacent feed-belt blanks 37. The other edge 38 of the wide fabric 35 may have its selvages in each ply formed by weft-strand reversal loops in each ply by weaving the fabric with a single weft strand which is crossed back and forth from ply to ply along the edge 36 in a manner similar to that illustrated in the form of the invention illustrated in Figs. 2 and 8. Or the fabric 35 could be made in a manner similar to weaving a tube by using a continuous weft strand which, after forming one pick in one ply, then crosses over at one edge of the fabric 35 to the other ply, where it forms one pick and then crosses over at the opposite edge of the fabric 35 to the first ply again, where it forms another pick, and so on, in which case cementitious selvages would be formed along the opposite edges of the plies of the fabric 35 before slitting the plies apart at these edges. Or the fabric 35 could be woven by two weft strands, one for each ply, which never cross from ply to ply, each weft strand remaining in a single ply, in which case the reverse looping of each weft strand in its own ply would form selvages along both edges 36 and 38 and make it unnecessary to have any cementitious warp strands along either of the opposite edges 36, 38 of the fabric 35.

After the wide fabric 35 has been woven, it can be passed through a bath of acetone or other suitable solvent to cement the various weft and warp portions in the region of the cementitious material. After drying, the wide fabric 35 can be slit into separate machine-gun feed-belts by severing the fabric along the lines indicated at 39 between two cemented warp strands along the juncture of each two adjacent feed-belt blanks 37.

Instead of having the cementitious warp strands composed wholly of cementable or ce-

mentitious material, such a warp strand 40 can be formed of a non-cementitious central textile core strand 41 with a spiral wrapping of one or more cementitious strands 42 to provide the cementing action.

Instead of using cellulose acetate as the cementitious material, any other suitable cementitious material could be used, whether the cementing action is accomplished by the use of solvent, or thermoplastically by heat. And where so desired, the cementitious material employed may possess flexibility or elasticity similar, for example, to soft rubber or plasticized methyl-polyacrylate. And instead of weaving in strands of cementitious material, the cementing action can be accomplished by directly applying cementitious material along the areas to be cemented as, for example, in the form of a cementitious solution or molten liquid, or in the form of a tape to be melted or rendered adhesive by application of heat as, for example, by a heated roller.

At the cross-over locations, either all of the warp strands or only part thereof could be crossed back and forth from ply to ply to form the pockets. Thus, for example, each alternate warp strand of each set of warp strands in the cross-over region could be crossed over. Where sets of warp strands are referred to, it does not mean that the same strands always form the same set, since, due to the crossing-over from ply to ply of warp strands, the identity of the warp strands forming the set in a ply will be different at different locations along the belt.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A strip-like woven cartridge feed-belt for machine guns comprising: two sets of warp strands woven with weft picks to form a two-ply cartridge feed-belt having a plurality of cartridge-receiving pockets extending transversely of the belt; and at least one warp strand of each ply along one edge of the belt being cemented to weft picks of such ply to form a selvage edge on each ply, and the cementitious material extending back from said edge for only a minor portion of the width of the feed-belt, and the said two plies not being cemented together by the cementitious material.

2. A strip-like woven cartridge feed-belt for machine guns comprising: two sets of warp strands woven with weft picks to form a two-ply cartridge feed-belt having a plurality of cartridge-receiving pockets extending transversely of the belt; and at least one warp strand of each ply along one edge of the belt, having cementitious material along it as woven, said cementitious material having been activated to cement at least one warp strand of each ply along said edge of the belt to weft picks of such ply to form a selvage edge on each ply, and the cementitious material extending back from said edge for only a minor portion of the width of the feed-belt, and the said two plies not being cemented together by the cementitious material.

3. A strip-like woven cartridge feed-belt for machine guns comprising: two sets of warp

strands woven with weft picks to form a two-ply cartridge feed-belt having a plurality of cartridge-receiving pockets extending transversely of the belt; and at least one warp strand along each of the opposite front and rear edges of each ply of the belt being cemented to weft picks of such ply, and the cementitious material extending back from each of said edges for only a minor portion of the width of the feed-belt, and the said two plies not being cemented together by the cementitious material.

4. A strip-like woven cartridge feed-belt for machine guns comprising: two sets of warp strands woven with weft picks to form a two-ply cartridge feed-belt having a plurality of cartridge-receiving pockets extending transversely of the belt; at least certain of the strands of each of said sets of warp strands crossing back and forth from one ply to the other to form said pockets; and at least one warp strand of each ply along one edge of the belt being cemented to weft picks of such ply and said weft picks having been woven as a weft strand periodically crossing back and forth from one ply to the other along said edge of the belt nearer to said edge than said cemented warp strand; and said weft-strand crossings having been severed to free the plies from one another along the pocket openings at said edge of the belt.

5. A blank from which can be cut a plurality of strip-like woven cartridge feed-belts for machine guns comprising: a plurality of pairs of sets of warp strands woven with weft picks to form a two-ply fabric in which the pairs of sets of warp strands with the weft picks form parallel feed-belt blanks each having a plurality of transversely-extending cartridge-receiving pockets; and at least two warp strands of each ply along the juncture of each two adjacent feed-belt blanks being cemented to weft picks of such ply, and the cementitious material extending in opposite directions back from the said juncture of each two adjacent feed-belt blanks for only a minor portion of the width of each said feed-belt blank, and the said two plies not being cemented together by the cementitious material.

6. A blank from which can be cut a plurality of strip-like woven cartridge feed-belts for machine guns comprising: a plurality of pairs of sets of warp strands woven with weft picks to form a two-ply fabric in which the pairs of sets of warp strands with the weft picks form parallel feed-belt blanks each having a plurality of transversely-extending cartridge-receiving pockets; at least certain of the strands of each set of warp strands crossing back and forth from one ply to the other to form said pockets; and at least two warp strands of each ply along the juncture of each two adjacent feed-belt blanks being cemented to weft picks of such ply, and the cementitious material extending in opposite directions back from the said juncture of each two adjacent feed-belt blanks for only a minor portion of the width of each said feed-belt blank, and the said two plies not being cemented together by the cementitious material.

7. The method of making a strip-like woven cartridge feed-belt for machine guns comprising: weaving together two sets of warp strands with weft picks to form a two-ply cartridge feed-belt having a plurality of cartridge-receiving pockets extending transversely of the belt; and cementing at least one warp strand of each ply to weft picks of such ply along one edge of the

belt, and the cementitious material extending back from said edge for only a minor portion of the width of the feed-belt, and the said two plies not being cemented together by the cementitious material.

8. The method of making a strip-like woven cartridge feed-belt for machine guns comprising: weaving together two sets of warp strands with weft picks to form a two-ply cartridge feed-belt having a plurality of cartridge-receiving pockets extending transversely of the belt, at least on warp strand of each ply along one edge of the belt, having cementitious material along it as woven; and activating said cementitious material to cement at least one warp strand of each ply along said edge of the belt to weft picks of such ply, and the cementitious material extending back from said edge for only a minor portion of the width of the feed-belt, and the said two plies not being cemented together by the cementitious material.

9. The method of making a strip-like woven cartridge feed-belt for machine guns comprising: weaving together two sets of warp strands with weft picks to form a two-ply cartridge feed-belt having a plurality of cartridge-receiving pockets extending transversely of the belt; and cementing at least one warp strand of each ply to weft picks of such ply along each of the opposite front and rear edges of the belt, and the cementitious material extending back from each of said edges for only a minor portion of the width of the feed-belt, and the said two plies not being cemented together by the cementitious material.

10. The method of making a strip-like woven cartridge feed-belt for machine guns comprising: weaving together two sets of warp strands with weft picks to form a two-ply cartridge feed-belt having a plurality of cartridge-receiving pockets extending transversely of the belt; crossing at least certain of the strands of each of said sets of warp strands back and forth from one ply to the other to form said pockets; and cementing at least one warp strand of each ply to weft picks of such ply along one edge of the belt and said weft picks having been woven as a weft strand periodically crossing back and forth from one ply to the other along said edge of the belt nearer to said edge than said cemented warp strand; and severing said weft-strand crossings to free the plies from one another along the pocket openings at said edge of the belt.

11. The method of making a plurality of strip-like woven cartridge feed-belts for machine guns comprising: weaving together a plurality of pairs of sets of warp strands with weft picks to form a two-ply fabric in which the pairs of sets of warp strands with the weft picks form parallel feed-belt blanks each having a plurality of transversely-extending cartridge-receiving pockets; cementing at least two warp strands of each ply to weft picks of such ply along the juncture of each two adjacent feed-belt blanks; and severing the fabric between said cemented warp strands to produce separate feed-belts, and the cementitious material extending in opposite directions back from the said juncture of each two adjacent feed-belt blanks for only a minor portion of the width of each said feed-belt blank, and the said two plies not being cemented together by the cementitious material.

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