Sept. 6, 1932. G. F. FRENCH 1,876,216

MACHINE GUN CARTRIDGE BELT

Filed April 30, 1931 2 Sheets-Sheet 1

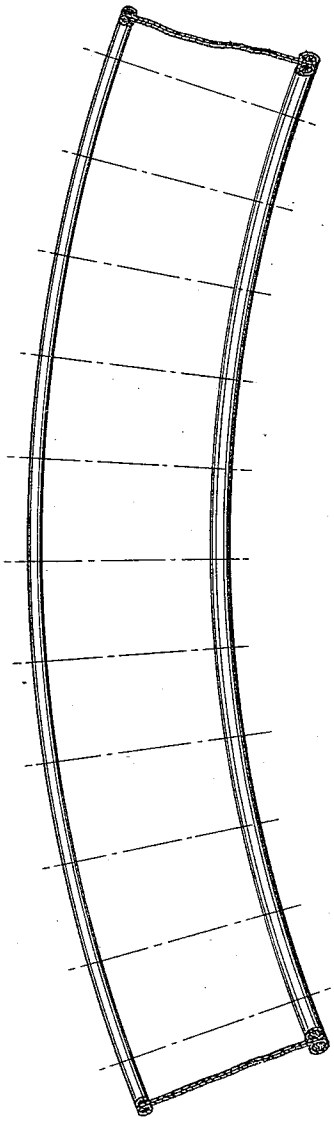

Fig. 1.

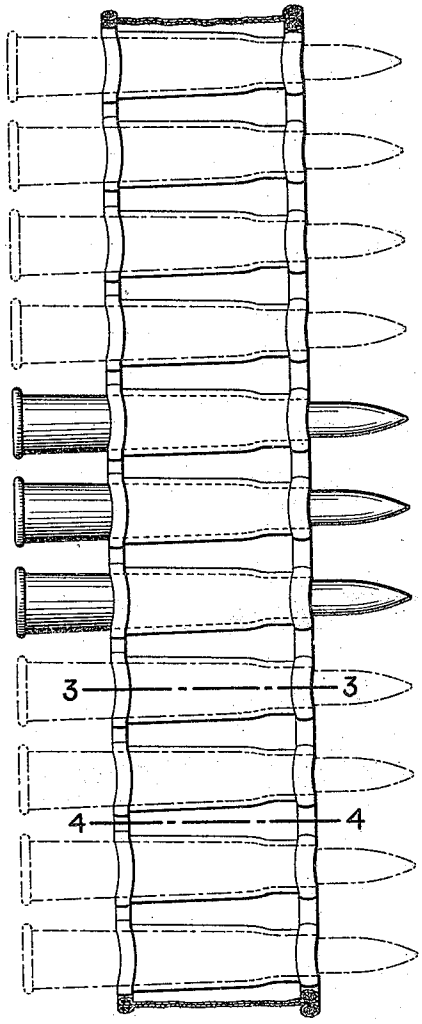


Fig. 2.

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MACHINE GUN CARTRIDGE BELT

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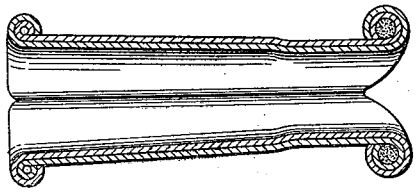

Fig. 3.

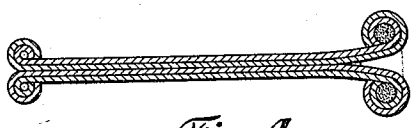

Fig. 4.

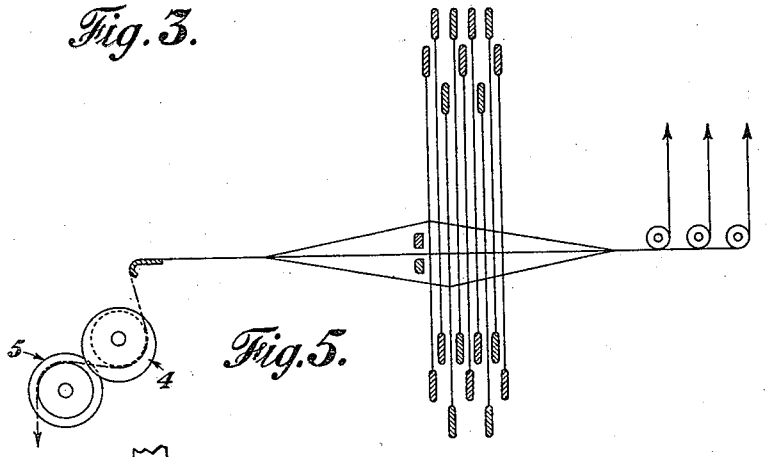


Fig. 5.

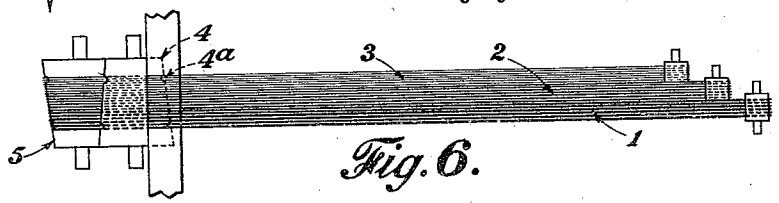


Fig. 6.

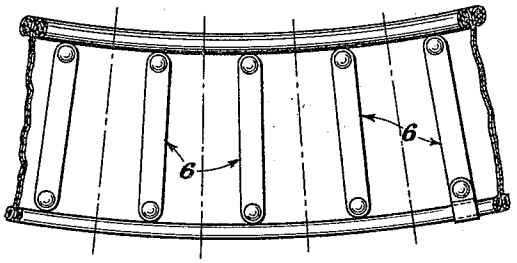


Fig. 7.

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# UNITED STATES PATENT OFFICE

GEORGE FREDERICK FRENCH, OF MANCHESTER, ENGLAND

## MACHINE GUN CARTRIDGE BELT

Application filed April 30, 1931, Serial No. 534,082, and in Great Britain May 6, 1930.

This invention refers to cartridge belts, either of the all-woven, or built-up fabric and strip type, for small or large calibre quick-firing guns.

The all-woven cartridge belts are usually composed of two thicknesses of material interwoven with each other at intervals, the intermediate free parts forming the necessary pockets and the walls of the pockets consisting of a single thickness and projecting equally on both sides of the belt when the pockets are filled with cartridges. Further, the pockets are tapered in the process of weaving in order that they shall closely fit and grip the cartridges.

Built-up belts are composed of two separate lengths of woven material held together at intervals by metal strips, the free portions of the material forming the pockets. The material is woven in single straight lengths, with one edge turned over a cord and stitched down to form a beaded selvedge. In this type of belt one end of each pocket is smaller than the other owing to the corded or beaded selvedge.

With either construction of belt the insertion of a cartridge by known mechanical means is difficult and slow, further, the all-woven belt if made straight becomes curved when fully loaded with cartridges. Again, the built-up belt, while sometimes slightly curved by reason of the beaded selvedge, is liable to be curved in an opposite direction when fully loaded. In each case the curvature is objectionable, for several reasons, but mainly because (1) it interferes with a straight-line feed of the belt through the filling machine and through the feed block of the machine gun, and (2) it interferes with the compact nesting of the belts in the usual ammunition boxes. Moreover, any forcing of a filled curved belt into the straight to permit of packing, stretches the pockets at their wider ends with consequent slackening of the grip on the cartridges.

The main objects of the invention are (1) to provide belts of the kind referred to, which permit of easy and rapid filling, (2) which will be straight from end to end when fully loaded, (3) which will be stronger and less liable to stretch when in use than the known makes of belts, and (4) will allow of being packed in the usual ammunition boxes without distorting the pockets.

According to the invention, the belt (all-woven or built-up) is formed on the edge in which the narrow (bullet) ends of the pockets lie, with an open-ended channel or gutter, the two thicknesses of the belt along such edge being left free, and collectively producing a selvedge of Y or V section.

The said free parts of the selvedge may be formed with corded or beaded edges, and the other edge of the belt may be similarly corder or beaded, the corded or beaded edges at the narrower ends of the pockets being larger than the corded or beaded edge at the wider ends. The said corded or beaded edges help to guide the belt as it passes through the filling machine, or machine gun feed block, and the larger beads form shoulders by which the belt is held against lateral movement during the initial opening of the pockets.

To cause the belt to be straight after being fully loaded with cartridges, the belt (or its webs) is (or are) made to a curved formation, the larger ends of the cartridge pockets being on the convex edge of the belt and the degree of curvature being such that contraction of the convex edge of the belt caused by the wider ends of the cartridges will equal the amount necessary for effecting the straightening of the belt when fully loaded. The walls of the belt pockets may each be woven to a single thickness, or to a double (tubular) thickness, in the latter case the two thicknesses being united by binding warp threads, or by their own warp threads.

In the accompanying drawings:—

Fig. 1 is a plan view of a portion of an all-woven cartridge belt made according to the invention and as it appears prior to being filled with cartridges.

Fig. 2 is a plan view of the same belt as it appears after being filled with cartridges.

Fig. 3 is an enlarged cross section of the belt shown in Fig. 2, on line 3—3, and

Fig. 4 is an enlarged cross section of the same belt on line 4—4.

Fig. 5 is a diagrammatic side view, and

Fig. 6 a plan view of one arrangement of conical take-over roller and warp layout used in weaving the improved belt.

Fig. 7 is a plan view of a portion of a built-up belt made according to the invention, and as it appears prior to being filled with cartridges.

Along the concave edge of the belt in which the bullet ends of the cartridges lie, the two thicknesses of the belt are left free, thereby producing an open-ended channel or gutter, the said free parts collectively producing a Y or V shaped selvedge, see Figs. 3 and 4. The edges of such free parts are preferably corded or beaded by weaving therein a cord or extra warp threads, the effect of such formations being to allow (*a*) for the effective initial opening of the pockets when being filled with cartridges, (*b*) to prevent lateral displacement of the belt when a cartridge is being withdrawn, and (*c*) to help in levelling the belts when stored in the usual ammunition boxes. The convex edge of the belt, in which the case ends of the cartridges lie, may also be corded or beaded to help in preventing lateral displacement while being filled with cartridges, and while a cartridge is being extracted.

The curving of the belt, or its thickness, is effected in the process of weaving by employing one or more sets of warp threads, and means whereby certain warp threads are taken up (or supplied) at a different rate than the other warp threads.

In one example, see Figs. 5 and 6, three sets of warp threads are used, 1, 2, 3, also a conical take-up roller 4, (the warp threads being independently tensioned) so that the warp threads 1 engaging the wider end of the roller 4, shall move forward at a slightly quicker rate than the warp threads 2, and similarly, the warp threads 2 shall move at a slightly quicker rate than the warp threads 3. A second and reversed conical roller 5 may be used, the belt passing between and being gripped by the rollers. In each of the rollers 4 and 5, may be grooves (as also in the breast piece) to accommodate the corded edges of the belt.

In another example, a single set of warp threads are drawn from a conical drum, whereby the warp threads are delivered to the loom at slightly varying rates, thus causing the belt or belt webs to be curved on leaving the loom. In this case a conical take-up roller will also be used, the larger end of the roller being opposite the larger end of the drum.

In the case of a built-up belt, using metal strips 6 to connect the two webs together at intervals, the said strips will only extend near to the shoulders formed by the larger beaded edges of the belt, the other ends of the strips extending on to the smaller beaded edges as shown in Fig. 7. In place of pairs of strips (one strip on each side of the belt), a single long U-shaped strip may be used, the bend of the strip passing around the convex edge of the belt, see right hand end strip in Fig. 7. By reason of the strips 6 extending only near to the shoulders of the larger beaded edges, they do not close in the opening of the Y or V shaped selvedge.

The walls of the pockets of the all-woven belt are preferably tubular and additional warp threads are used to bind the two thicknesses of each wall together, the said threads also serving to bind the main webs together where required, although they may not be so used, the webs then being interwoven with each other at such points. The shaping of the pockets will be effected in the usual way during the process of weaving.

The webs of the built-up belt may also be made tubular and united by binding warp threads. The pockets may be shaped by the metal strips 6, or (and) by extra or thicker threads along one edge of the belt.

Two shuttles will generally be used for the all-woven belt, one for each wall, as shown in Fig. 5.

The formation of the edge of the belt in which the narrow ends of the pockets are formed to a Y or V section is important, in that it greatly facilitates the initial opening of the pockets when being filled with cartridges.

The curving of the belt in the process of weaving is also important, in that it ensures of the belt when fully loaded being straight from end to end, and thus better adapted to pass through the belt filling machine, and the feed block of the machine gun. And, by forming the walls of the belt pockets of double thickness and binding same, a much stronger and less stretchable and less distortable belt is provided.

What I claim is:—

1. A cartridge belt having two free thicknesses at intervals producing open-ended pockets for cartridges, the pockets being narrower at one end than the other, and said belt being of curved formation longitudinally and along the edge in which the narrower ends of the pockets lie having free selvedges producing a continuous channel or gutter, as set forth.

2. A cartridge belt as claimed in claim 1, wherein the edges of the belt are corded, as set forth.

3. A cartridge belt composed of two thicknesses of woven material, each having a longitudinal curvature, and metal strips and rivets fastening the two thicknesses of woven material together at intervals, the intervening parts of the thicknesses being left free and forming tapered pockets, and said metal strips at one end passing around that edge of

the belt in which the wider ends of the pockets lie, and extending to a point near the other edge of the belt, which is provided with continuous loose, beaded selvedges, as set forth.

In testimony whereof I have signed my name to this specification.

GEORGE FREDERICK FRENCH.