June 14, 1949. W. A. SCHAICH 2,472,861

MACHINE GUN AMMUNITION FEED BELT

Filed Nov. 30, 1945 2 Sheets-Sheet 1

Fig. 1.

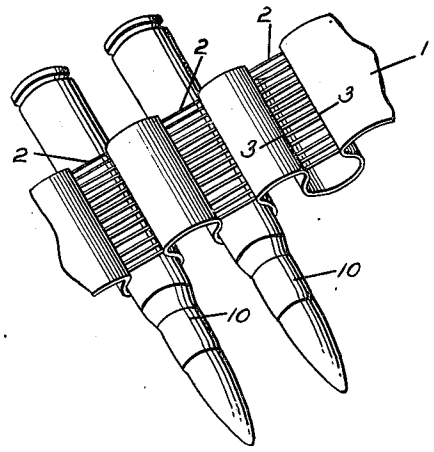


Fig. 2.

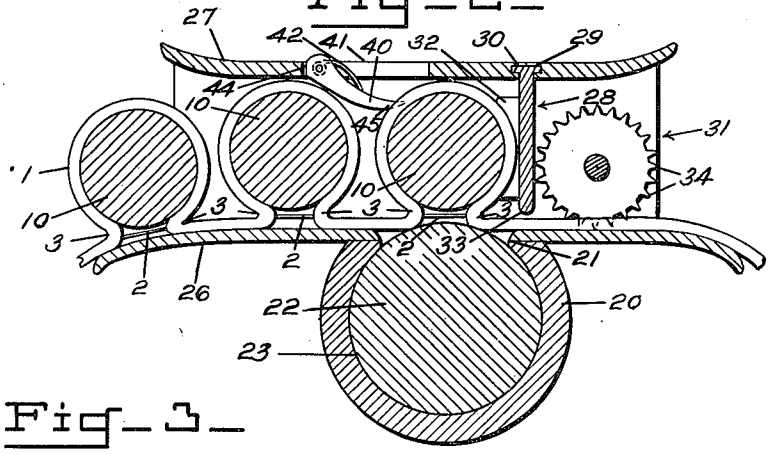
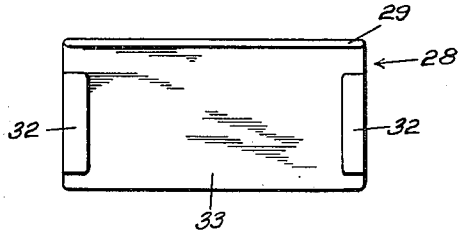


Fig. 3.



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Filed Nov. 30, 1945 2 Sheets-Sheet 2

Fig. 4

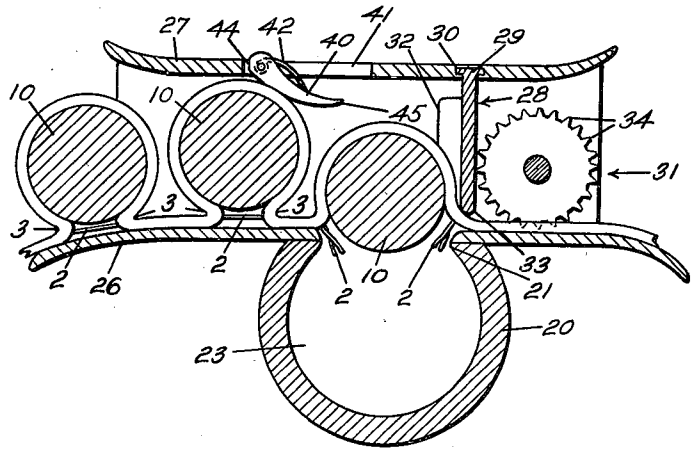
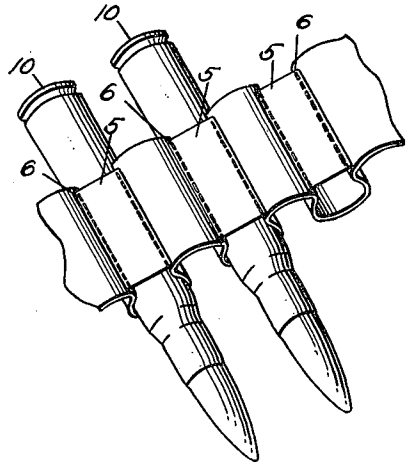


Fig. 5



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Patented June 14, 1949

2,472,861

UNITED STATES PATENT OFFICE

2,472,861

MACHINE GUN AMMUNITION FEED BELT

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Application November 30, 1945, Serial No. 632,099

2 Claims. (Cl. 89—35)

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

1

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

This invention relates to a cartridge belt for machine guns.

In the design of belt-fed machine guns, the problem of efficiently and reliably feeding a belt of cartridges into the gun and then extracting each cartridge successively from the belt is one of the most difficult encountered. This is particularly true when the machine gun design requires the feeding of the cartridges directly from the belt into the path of a reciprocating breech member.

Heretofore, cartridge belts known in the art have permitted such feeding only when a so-called "open-link" belt has been utilized. Such belt comprises a plurality of spaced resilient tines which surround slightly more than half of the cartridge, and due to their resilience, permit the cartridge to be pushed forwardly or downwardly out of the grip of the tines. Obviously such belt requires the use of relatively high grade metal as the belt material in order to provide the necessary resilience to the tines. Such belts had the following difficulties: First, lack of sufficient flexibility to permit necessary twisting of the belt under adverse feeding conditions, and secondly, the relatively high probability of feeding jams due to the frictional engagement between the cartridge and the resilient tines during most of the feeding operation.

The construction of a machine gun belt from a flexible fibrous or plastic material is well known to those skilled in the art. Heretofore, however, such belts comprised a plurality of spaced pockets into which the successive cartridges were inserted, and hence such belt could not be utilized in a machine gun in which the breech member strips the cartridge from the belt forwardly to feed directly into the chamber. The flexible fabric belts heretofore constructed therefore could only be utilized in machine guns wherein the cartridge is first pulled rearwardly out of the belt, and then moved transversely into the path of the reciprocating breech member.

It is an object of this invention to provide an improved flexible fabric or plastic belt for machine guns which not only secures the successive cartridges together in spaced relationship for feeding into the gun, but also permits such cartridges to be fed directly into the path of the reciprocating breech member by movement of the cartridges substantially transversely with respect

2

to the general plane of the belt of cartridges. Accordingly, a flexible fabric belt constructed in accordance with this invention may be utilized in machine gun actions designed to strip the cartridges out of so-called "open links."

A further object of this invention is to provide an improved cartridge belt for machine guns wherein, after the cartridge has been released from the belt, the belt assists in forcing the cartridge into the path of the reciprocating breech member.

The specific nature of this invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings in which:

Fig. 1 is an isometric view of a cartridge belt in accordance with this construction shown partially loaded with cartridges.

Fig. 2 is a schematic sectional view of a machine gun action illustrating the feeding action of the improved cartridge belt. The action is shown in battery position.

Fig. 3 is a side elevational view of the cartridge stop member utilized in Figs. 2 and 4.

Fig. 4 is a view similar to Fig. 2 but illustrating an instantaneous condition of the feeding cycle.

Fig. 5 is a view similar to Fig. 1 of a modification of this invention.

In Fig. 1 there is shown a preferred embodiment of this invention comprising a cartridge belt formed from a long integral strip 1 which at least partially surrounds each successive cartridge 10. The strip 1 is preferably formed of a flexible fibrous fabric but may equally well be formed from any flexible plastic or metallic material. While the dimensions of the strip 1 are relatively immaterial, it will be obvious to those skilled in the art that the strip 1 should preferably have a width equal to at least one-third the length of the cartridge in order to firmly support such cartridge.

As heretofore stated, the strip 1 is shaped to at least partially surround each cartridge. The extent of the periphery of each cartridge that is surrounded by strip 1 may be any selected value from greater than one-half of the periphery to substantially the entire periphery. Each cartridge is firmly secured within the wrapped-around portion of the strip 1 by means of frangible threads 2 which are sewed across adjacent ends of the shaped portions of the strip 1. In the preferred embodiment of this invention the threads 2 may be formed of very fine wire, preferably of a non-ferrous, corrosion resistant mate-

rial such as copper. However, it is equally possible to utilize threads formed from common fibrous material or plastics, such as nylon. Such threads are sewn or otherwise suitably secured across the two end portions 3 of that portion of the strip which surrounds each cartridge. The sewing is of course preferably done prior to insertion of the cartridges into the cartridge pockets defined by the strip 1.

The number of the threads 2 utilized is selected in accordance with the relative tensile strength of the threads with respect to the tensile strength of the strip 1. The essential requirement is that such threads will be sufficiently strong to support the weight of the entire belt of cartridges during feeding of the belt into the machine gun. At the same time the tensile strength of the total threads is selected to be frangible at a tensile force substantially less than the ultimate tensile strength of the strip 1. It is particularly desirable, though not essential to the practice of this invention, that the elasticity of the threads 2 be substantially less than that of the strip 1.

Alternatively, as illustrated in Fig. 5 a band 5 of frangible material may be utilized in place of the threads 2. This construction has an advantage over the thread construction in that it is certain that the entire band will sever while occasionally not all of the threads snap simultaneously and thus interfere with the movement of the cartridges. The band 5 is preferably formed from heavy paper, textile or plastic material having proper frangibility properties. The band 5 may be sewed to strip 1 in any desired manner as by threads 6, however the threads 6 should be stronger than the tensile strength of band 5.

Thus assuming the first cartridge is held against movement, upon application of a tensile load to the strip 1 greater than the tensile strength of the threads 2 or band 5, such threads or band will sever and thus free the first cartridge from the belt for movement in a direction substantially transverse to the general plane of the belt. The strip 1, however, will not sever at such load and will be unimpaired so far as feeding the remainder of the cartridge belt into the machine gun.

The novel and desirable features of the cartridge belt constructed in accordance with this invention will become more apparent when described in connection with a machine gun constructed to utilize such belt. The essential portions of the feeding portions of such machine guns are shown schematically in assembled relation in Fig. 2.

Referring to Fig. 2 there is shown a hollow cylindrical receiver 20 having a feeding opening 21 provided in its top portion of sufficient width to permit a cartridge to be laterally inserted therethrough. Within the cylindrical channel formed by the receiver 20, a substantially cylindrical breech member 22 reciprocates and is arranged to push any cartridge projecting into the receiver 20 through the opening 21 forwardly into the chamber of a barrel (not shown) which is secured to the forward end of receiver 20. A cartridge belt feedway is defined in overlying relationship to the receiver 20 by spaced sheet metal feedway members 26 and 27. A cartridge stop 28 is secured in depending relation to the upper feedway member 27 at a position overlying one edge of the cartridge opening 21 of the receiver 20. With the cartridge stop 28 in the position shown, the machine gun will feed a belt of cartridges containing the spaced cartridges 10 into the machine gun from left to right, as viewed in Figs. 2 and 4. This stop member 28 may be removably secured to the upper feedway member 27 by means of a dovetailed portion 29 cooperating with a similarly shaped slot 30 in the feedway member 27. On the cartridge entering side of stop 28, two spaced transverse projections 32 are provided to engage the areas of the cartridge on each side of the cartridge surrounding strip. The bottom edge 33 of stop 28 holds the belt strip 1 close to the bottom feedway member 26.

A belt retaining pawl 40 is pivotally mounted in a slot 41 in upper feedway member 27. A torsion spring 42 pivotally biases pawl 40 into the feedway. The mounted end of pawl 40 is provided with a flat 44 which limits pivotal movement of pawl 40 into the feedway by cooperation with the end of slot 41. The free end of pawl 40 is formed into a plurality of prongs 45 and shaped so as to bite into that portion of the strip 1 surrounding the foremost cartridge in the belt when such strip portion tends to rotate in a counterclockwise direction, as will be explained.

On the right hand side of the stop member 28, a feeding sprocket 31 is rotatably mounted. Feeding sprocket 31 is provided with a plurality of teeth 35 which bite into the stripped portion 1 of the cartridge belt supported on the lower feedway member 26 to impart a feeding movement to the entire belt. Feeding sprocket 31 is uni-directionally rotated by a conventional mechanism (not shown) to impart a left to right transverse movement to the belt of cartridges each time that the gun is fired. It will be understood that, in accordance with conventional machine gun construction, the reciprocating breech member 22 moves rearwardly beyond the extreme rear end of the cartridge 10 and then forwardly into abutting relationship with the end of the barrel (not shown) after each shot is fired, extracting and ejecting the fired case on the rearward movement and loading the next cartridge on the forward movement. The rotation imparted to the feed sprocket 31 is preferably selected so that, assuming a cartridge to be loaded in the chamber 23, the next cartridge 10 is in abutting relationship with respect to the stop 28 at the instant the cartridge is freed as illustrated in Fig. 4. During the rearward movement of the breech member 22 following the discharge of the first cartridge, the feeding sprocket 31 rotates and takes up whatever slack may exist in the belt strip 1 and thus applies a gradually increasing tension to the strip 1. As the reciprocating breech member 22 reaches the end of its recoil stroke, the tension applied to the strip 1 by the feeding sprocket 31 is then sufficient to break the threads 2 (or band 5) which hold the first cartridge 10 in the belt. It will be noted that the projecting portions 32 of stop member 28 engage areas of the cartridge 10 on each side of the cartridge surrounding strip 1 and thus very little clamping action is applied to the belt strip 1 by the cartridge.

As that portion of the strip surrounding the foremost cartridge is stressed by feeding sprocket 31, it tends to rotate in a counterclockwise direction and is thereupon engaged by pawl 40 and further rotation prevented. This action of the pawl 40 is particularly desirable when feeding the last round of the belt of cartridges. Accordingly, substantially all of the tension imparted by the

feeding sprocket 31 is concentrated in the threads 2 (or band 5) adjoining the first cartridge and is not transmitted to the remainder of the belt. It will be apparent that when the threads 2 (or band 5) break, the cartridge will be substantially freed of the belt and can move transversely into position to be engaged by the forward end of the reciprocating breech member 22 and thus be pushed forwardly into the chamber 23. As the strip 1 moves downwardly and forwardly it readily slips off the prongs 45 of pawl 40.

With a cartridge belt constructed in accordance with this invention, it is not necessary to rely entirely upon gravity to accomplish the feeding of the cartridge into the receiver 20. A positive feed is provided by the portion of the strip which originally surrounded the cartridge 10. The driving mechanism for the sprocket 31 is selected to continue the rotation of the sprocket 31 as the breech member 22 starts forwardly. Thus the cartridge 10 will be urged transversely out of the feedway and into the receiver 20 and the path of the reciprocating breech member 22 by the pressure exerted by the strip 1 in response to the continued rotation of the feeding sprocket 31. Feeding sprocket 31 preferably continues to rotate during the entire forward movement of the reciprocating breech member 22 and thus takes up any slack in the strip 1 and pulls the next cartridge 10 into abutting relationship with the stop 28, completing the feeding cycle.

It is therefore apparent that a cartridge belt constructed in accordance with this invention may be applied to machine gun actions wherein the reciprocating breech member is designed to pick up a cartridge from the belt and feed it directly into the chamber. As has already been stated, such feed has heretofore been possible only by the use of metallic "open link" belt construction. Furthermore a belt constructed in accordance with this invention utilizes the ordinary feeding movement of such belt to impart a positive force on the cartridge in a direction transverse to the general plane and path of movement of the belt to assist the moving of such cartridge into the path of a reciprocating breech member. Obviously the cartridge belt of this invention may be used interchangeably with a firearm feeding construction as herein described, namely, where the reciprocating breech member forces the cartridge directly from the belt into the breech or in a firearm wherein the bolt extracts the cartridge from the belt.

I claim:

1. A cartridge belt comprising a single strip of flexible material shaped to provide a plurality of open cartridge receiving pockets, and frangible means bridging said open pockets to yieldingly secure a cartridge in each of said pockets, said means being frangible at a substantially lower tensile force than said flexible strip.

2. A cartridge belt comprising a single strip of flexible material shaped to provide a plurality of open cartridge receiving pockets, and a band-like member bridging each of said open pockets to yieldingly retain a cartridge in each of said pockets, each of said band-like members being secured to said flexible material and being of readily frangible material.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,140,715	Purcell	May 25, 1915

FOREIGN PATENTS

Number	Country	Date
108,481	Great Britain	May 2, 1918
542,122	Great Britain	Dec. 29, 1941