

[54] POWDER PROPELLANT CARTRIDGE

[76] Inventors: Henry Andersson, Timmermansvagen 7 G, 632 23 Eskilstuna; Goran Dahl, Alfens Vag 2, 653 45 Karlstad; C. G. Arnell, Solrosgatan 12, 644 00 Torshälla, all of Sweden

[22] Filed: Oct. 12, 1971

[21] Appl. No.: 188,351

[52] U.S. Cl. ....102/100, 102/40

[51] Int. Cl. ....F42b 1/00

[58] Field of Search.....102/100, 101, 38, 102/40, 39

2,514,412 7/1950 Owens.....102/100  
653,208 7/1900 Brown.....102/38

Primary Examiner—Robert F. Stahl  
Attorney—Munson & Fiddler

[57] ABSTRACT

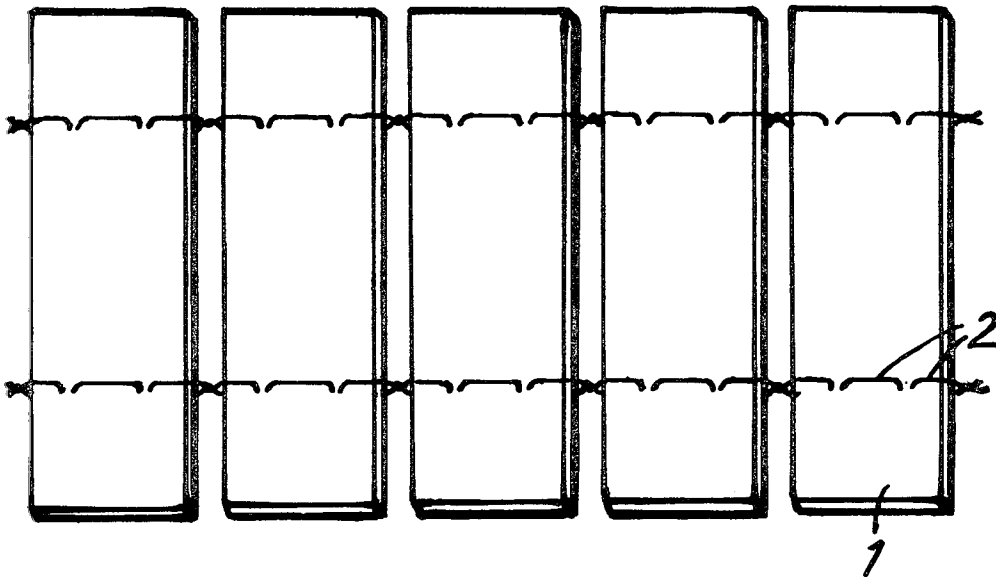
A powder propelling cartridge consisting of powder strips or rods uniformly arranged in a cartridge-casing. The strips or rods are connected to each other by threads or similar means which are applied perpendicularly to longitudinal axis the strips or rods so as to form a snow fence-like belt, which is coiled and inserted into the cartridge-casing.

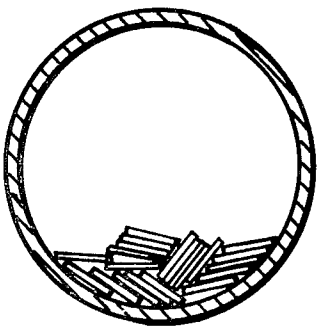
[56] References Cited

UNITED STATES PATENTS

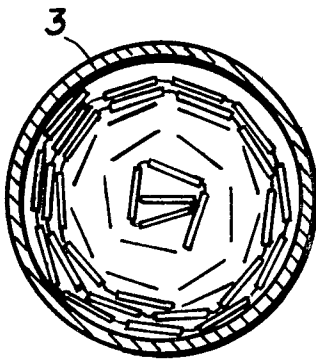
846,612 3/1907 DuPont .....102/38

2 Claims, 3 Drawing Figures

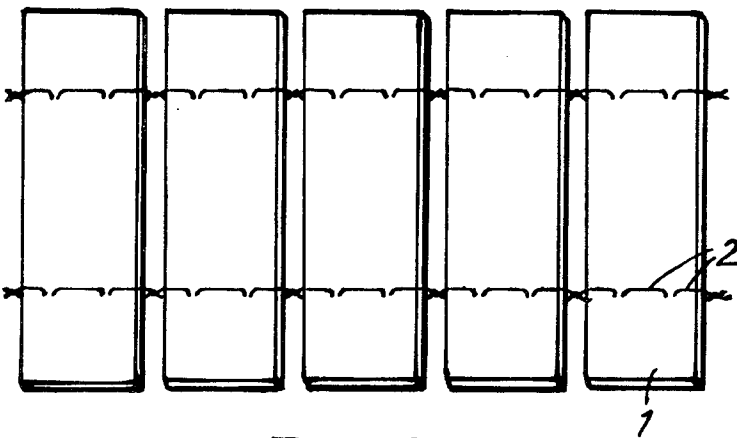




*Fig 1*



*Fig 2*



*Fig 3*

HENRY ANDERSSON;  
GORAN DAHL, and  
C. G. ARNELL,  
Inventors.

ERIC Y. MUNSON  
and ROBERT W. FIDDLER,  
Attorneys.

**POWDER PROPELLANT CARTRIDGE****BACKGROUND OF THE INVENTION**

The present invention refers to a propelling charge, which consists of powder strips inserted into a cartridge-casing. Such cartridges involve a problem in that the burning of the strips or staves develops irregularly if they cluster within the cartridge casing, filling it irregularly as they often do in ordinary ammunition. This problem is similar to that of burning thick magazines or books. The degree of burning and the actual burning time of the propelling charge may vary to a great extent, which causes great variations of the muzzle velocity of the projectile and a wide scattering and fragmentation upon impact with the target.

Different suggestions for keeping the strips separate from each other in a cartridge have been presented already in the beginning of the 20th century but the problem to be solved then was principally connected with the production of a progressive burning effect, that is obtaining a pressure which slowly rises to a peak and which is of long duration in the weapon in question. Such prior art is exemplified by U.S. Pat. Nos. 751,386, 683,106 and 776,652). Nor do the suggested solutions appear to have brought about the purported uniform burning effect or to be sufficiently economical or practical from a manufacturing standpoint no such arrangement of the strips or rods are in practical use today.

**BRIEF SUMMARY OF THE INVENTION**

According to the invention the strips or rods are sewn together by a number of sewing threads, which are drawn principally perpendicularly to the strips, the strips being arranged at some distance from each other and the construction of threads and strips forming a band is folded and coiled to an approximately cylindrical body having a diameter smaller than the inside diameter of the cartridge-casing so as to enable the cartridge to be placed within the same. This way of fastening the strips or rods is quite suitable for mechanical handling.

**BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING**

In order to make the invention more readily understood, one embodiment illustrating the general principles of the invention will be described with reference made to the accompanying drawing.

FIG. 1 shows schematically a sectional view of a cartridge having strips arranged at random. (Only some of the strips are shown.)

FIG. 2 shows schematically a sectional view of a cartridge in which the strips are arranged according to the present invention.

FIG. 3 shows schematically a part of an uncoiled band of strips sewn together by threads.

**DETAILED DESCRIPTION OF THE INVENTION**

A number of strips 1 of a propelling powder are fastened to a number of threads 2 by sewing them together to a band so that the strips will be adjusted at some distance from each other. A kind of knots are shaped between the strips contributing to hold the strips apart.

The threads 2 joining the strips 1 in spaced relationship are then cut into such lengths that when coiled the band forms a cylindrical body having a diameter that will enable the body to be easily inserted into the cartridge-casing 3.

Practical tests have proved that the fastening of the strips or rods by means of adhesive tape or by glueing them to tapes also to some extent reduces the variations of the muzzle velocity of the projectile, but if the strips 1 are fastened in this way the surfaces which are covered by the tapes will burn poorly, thereby causing unsatisfactory explosive power. Good results have been obtained when the strips 1 have been sewn together on a machine by cotton threads or other equivalent threads.

By coiling the bands of strips and threads a powder propellant cartridge is obtained which has air filled venting channels extending through the cartridge. This is contrary to an ordinary charge, the strips of which, as shown by FIG. 1, are partly stuck to each other and form disordered clusters. Very good results have been obtained by using a propelling charge for an 8,4 cm recoilless antitank weapon, said charge consisting of strips of propelling powder having the dimension of  $0.40 \times 15 \times 167$  mm, each strip being fastened by a few stitches with a space of 3 mm between adjacent strips. The size of the thread was number 30 and the weight of the charge 350 g which corresponds to about 300 strips.

The firing data obtained from practical tests correspond to those of a more active propelling powder, that is, the powder gives off more of its supply of energy, so that a lower muzzle pressure, a more even pressure increase, smaller variations of muzzle velocity and recoil energy, as well as smaller deflection angles are obtained. and Furthermore a reduced ejection volume of propelling powder especially when firing at low temperatures, which is important as sometimes unburnt parts of the strips at low temperatures tend to lock the projectile when reloading the weapon.

The invention is not limited to the particular arrangements shown and described. The propelling charge may for instance consist of elements with a shape more like rods than strips and the nature and number of the stitches in each strip may vary.

We claim:

1. A powder propellant cartridge for insertion into a cartridge casing, comprising a plurality of spaced parallel rectangular powder strips interconnected by flexible tie means, said tie means extending across the strips and connecting same in a series to form a continuous train of articulately joined strips, the strips being fastened individually to said tie means, said train of strips being wound substantially into a spiral to form a coil, said tie means having portions extending across and projecting above the surfaces of the strips, spacing the strips from one another in adjacent convolutions to provide venting channels extending axially through the cartridge.

2. A powder propellant cartridge as claimed in claim 1, wherein the tie means are provided with knots between adjacent strips in said train of strips.

\* \* \* \* \*