Jan. 4, 1966 J. L. RAMER 3,227,085

SHOT SHELL

Filed Sept. 5, 1963

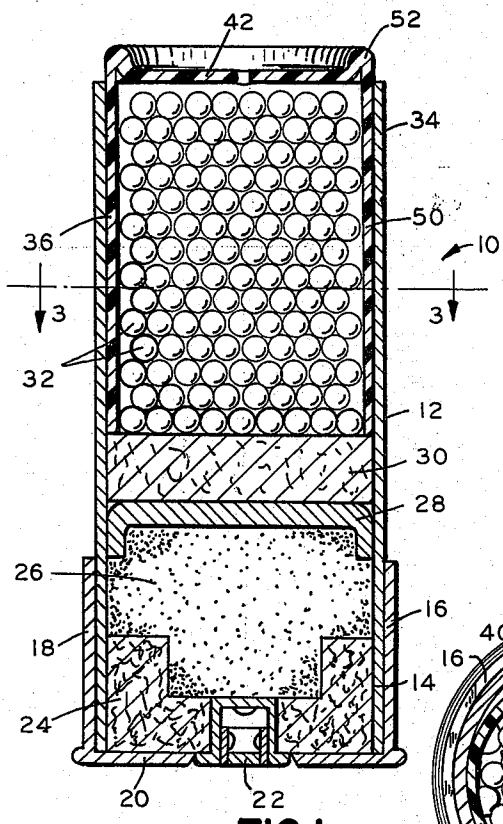


FIG. 1

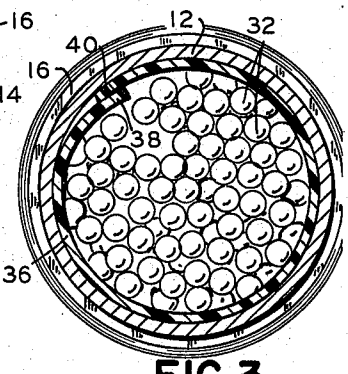


FIG. 3

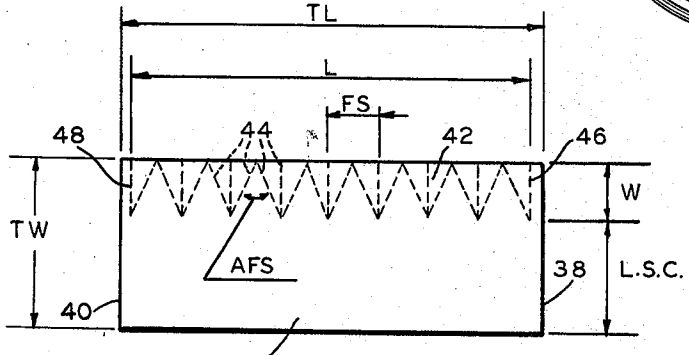


FIG. 2

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United States Patent Office 3,227,085 Patented Jan. 4, 1966

3,227,085

SHOT SHELL

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Filed Sept. 5, 1963, Ser. No. 306,828
6 Claims. (Cl. 102—42)

This invention relates to a method and apparatus for loading and reloading shot shells and the like. More specifically this invention relates to a shot wrapper and a method for using this shot wrapper in loading and reloading shot shells.

It is common in the making of shotgun shells to encase a propellant charge and a shot charge in a paper, metallic or plastic tube with the propellant charge and the shot charge being separated by one or more layers of gun wadding. The end of the tube containing the propellant charge is closed by attachment to a metallic base including a primer cap. The other end of the tube is closed by either placing a layer of wadding ("B" wad) in the end or by crimping the end of the tube inwardly in what is referred to as a "star crimp."

When the shell is fired the crimped end is blasted open by the rapid discharge of the shot charge and the gases from within the tube. The loosely arranged shot charge tends to scatter in the gun barrel resulting in a relatively nonuniform and widely separated shot pattern.

For the sake of economy it is the common practice to reload shotgun shells. In reloading, the same tube and base are reused with new shot charge, propellant charge, wadding and primer cap. However, after a relatively few reloadings of the same shotgun tube the open end (shot charge end) of the tube becomes highly flexible and tattered, making it impossible to crimp the end closed to efficiently retain the shot charge in the tube. When this occurs the shotgun shell tube and base must be thrown away as no longer usable.

It has long been recognized that there exists a need for extending the use of these shell tubes and base members. However, prior to this invention there has been no successful attempt made toward the realization of this need.

Therefore it is an object of this invention to provide a shot wrapper and a method for using this shot wrapper in loading and reloading shotgun shells that greatly extends the use of the reusable portions of the shotgun shells.

It is another object of this invention to provide a shot wrapper for use in loading and reloading shells that is economical to manufacture, is simple of construction and is easily usable.

It is still another object of this invention to provide a shot wrapper for use in loading and reloading shotgun shells wherein the shot wrapper serves a dual function of holding the shot together until after it emerges from the gun muzzle and closing the open shot charge end of the shell tube.

A further object of this invention is to provide a shot wrapper for use in loading and reloading shotgun shells that is received inside the open end of the shell tube, surrounding the shot charge therein, and is provided along one edge with a prefolded star crimp portion to close the open end of the shell tube.

Yet a further object of this invention is to provide a shot wrapper that surrounds the shot charge in the gun shell tube and is expelled from the tube and the gun barrel along with the shot charge upon firing of the shell.

Still a further object of this invention is to provide a shot wrapper that is received about the shot charge in a shotgun shell and surrounds the bulk of the shot charge after firing of the shell until the charge emerges from

the muzzle of the gun at which time the wrapper falls free of the charge.

Further objects and advantages of this invention will be apparent from the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts of the several views.

FIGURE 1 is a longitudinal cross-sectional view of a shotgun shell including the shot wrapper of this invention.

FIGURE 2 is a plan view of the shot wrapper of this invention in its unrolled, flat position.

FIGURE 3 is a cross-sectional view of the shotgun shell of FIGURE 1 taken along line 3—3.

GENERAL DESCRIPTION

In general the shot wrapper of this invention is intended for use in loading and reloading a shot gun shell consisting generally of a shell tube having a forward and a rearward end with a base member, including a primer cap, received about the rearward end of the shell tube to close that end; the tube containing a propellant charge and a shot charge, separated by one or more layers of gun wadding.

The shot wrapper consists of an elongated substantially flat ribbon of foldable material such as paper or relatively thin plastic. The ribon is preferably rectangular in shape and is provided along one longitudinal edge portion with a rectangular shaped area of pre-indented fold lines, preferably of the star crimp type. This ribbon is adapted to be rolled longitudinally into a cylinder having an outside diameter approximately equal to the inside diameter of the forward end portion of the shell tube. The cylindrically rolled ribbon is intended to be telescoped coaxially into the open forward end portion of the shell tube, surrounding the shot charge contained therein, with the area of fold lines extending forwardly of the forward end of the shell tube.

The area of fold lines preferably has a length approximately equal to the inside circumference of the forward end of shell tube and a width approximately equal to the inside radius of the open end of the shell tube so that when the area is folded along the lines of fold it will substantially close the forward end of the cylindrically rolled ribbon and the forward end of the shell tube.

SPECIFIC DESCRIPTION

For a more specific description of this invention reference is now made to the drawings in general and specifically to FIGURE 1 wherein is shown a shotgun shell **10** that is provided with the shot wrapper of this invention. Shotgun shell **10** consists of a shell tube **12** the rearward end **14** of which is received within the relatively short cylindrical metallic base member **16**. Base member **16** is substantially cup-shaped having cylindrical side wall **18** and a disc-shaped bottom wall **20**.

Bottom wall **20** is provided at its center with a conventional primer cap **22**. Since cap **22** is of a conventional design further description of this cap will be omitted.

An annular wooden or fabric support member **24** is positioned coaxially within the end **14** of tube **12**, surrounding cap **22**, to cushion detonation shock to prevent damage to the metallic base member **16** and tube **12** when the shell **10** is fired.

A propellant charge **26** is located within the tube **12**, adjacent support member **24** and in contact with the upper end of the primer cap **22**. One or more layers **28** and **30** of a conventional gun wadding material is positioned coaxially within tube **12** immediately adjacent to the propellant charge **26**. The shot charge **32** is packed

into the forward end 34 of tube 12, adjacent to the gun wadding 28 and 30.

To this point the description is typical of a conventional shotgun shell in use today. The novelty of this invention resides in the shot wrapper 36 positioned in the upper end 34 of the tube 12.

For more specific description of shot wrapper 36 reference is now made to FIGURE 2. Shot wrapper 36 is a substantially rectangular shaped flat piece of pliable material such as heavy paper, thin plastic, or similar material. The total length TL of wrapper 36 is sufficiently great that the wrapper can be rolled longitudinally to form a cyclindrical sheath the outside diameter of which is approximately equal to the inside diameter of the shell tube 12. It is preferred that the wrapper 36 be long enough to allow for a slight overlapping of the ends 38 and 40 when the wrapper is rolled into the cylindrical sheath. Wrapper 36 is provided along one longitudinal peripheral area 42 with a series of preindented star crimp-type fold lines 44. These fold lines 44 facilitate the folding of area 42 inwardly to close the upper end 34 of shell tube 12 after the wrapper 36 and shot charge 32 have been placed in the tube. The length L of fold area 42 is preferably equal to the inside circumference of shell tube 12. The width W of fold area 42 is preferably equal to or slightly less than one half the inside diameter of the shell tube 12 since area 42 is to be folded radially inwardly at right angles to the axis of the tube to close the forward ends of the cylindrically rolled wrapper 36 and tube 12.

The number of fold sections FS is strictly a matter of preference of the manufacturer with either 6 or 8 being most commonly preferred. When the wrapper 36 is rolled into a cylindrical sheath one edge 46 of the area of fold 42 will lie adjacent to the other edge 48 of that area. Therefore the angle of the fold section AFS will be equal to 360° divided by the number of fold sections in the wrapper 36.

It is preferred that the wrapper 36 completely surround the substantially cylindrical outer surface of the shot charge 32 when in place within the shell tube 12. Therefore, the total width TW of the wrapper 36 is preferably equal to the length of the shot column LSC plus the width W of the fold area 42.

By way of summary, the following are the preferred dimensions of wrapper 36 as above described;

$W = \frac{1}{2} \times$ inside diameter of shell tube 12

$L = 3.1416 \times$ inside diameter of shell tube 12

$$AFS = \frac{360°}{\text{Number of fold sections}}$$

$TL = W +$ overlap (preferably 0.10 inches)

$TW = W + LSC$

In assembling the shot wrapper 36 of this invention the wrapper is rolled lengthwise into a cylinder with the ends 38 and 40 overlapping by a preferred amount of approximately 0.10 inch. The wrapper thus formed into a cylinder is telescoped coaxially into the open end 34 of shell tube 12 with the peripheral fold area 42 extending upward from the forward open end 34. The shot charge 32 is then packed into the shell within the cylindrically shaped wrapper 36. The peripheral fold area 42 of the wrapper 36 is then folded radially inwardly and downwardly until it extends substantially at right angles to the axis of the shell 10 as shown in FIGURE 1.

As above described the preindented fold lines 44 greatly simplify this folding operation which is especially important when shell 10 is being reloaded by one other than the manufacturer. Also, lines 44 assist the loader in producing a very uniform star crimp which will be strong and will not unfold to allow loss of the shot charge 32 prior to firing of shell 10. Because of the nature of the star crimp fold an annular lip 52 is formed between the

folded area 42 and the cylindrical side portion 50 of the wrapper 36. This lip 52 assists in maintaining the star crimp in its folded position.

As is seen in FIGURE 1 when the dimensions of the shot wrapper 36 are those listed above as preferred, the shot charge 32 will be substantially surrounded over its entire axial length by the wrapper 36 and the forward open end 34 of the shell tube 12 will be substantially closed by the star crimped area 42 of the shot wrapper.

When the shell 10 is discharged the gases resulting from the rapid burning of the propellant charge 26 force the gun wadding 28 and 30, the shot charge 32 and the shot wrapper 36 out the open forward end 34 of the shell tube 12, out the barrel of the gun. Since it is preferred that shot wrapper 36 be expelled from the shell and the muzzle of the gun it is necessary that there be little or no bonding material between the outside surface of wrapper 36 and the interior surface of the forward end 34 of the shell tube 12. It should be understood however, that the wrapper 36 will be retained within the forward end 34 of the shell tube 12 by the friction resulting from the contact of the outside surface of the wrapper 36 with the inside surface of shell tube 12.

As the shot charge 32 travels down the barrel of the gun, substantially the entire length of the charge will be surrounded by the wrapper 36. Therefore, the shot charge 32 will be maintained in its closely packed position to greatly increase the uniformity of the shot pattern after the shot leaves the muzzle of the gun. A short distance after the shot charge 32 leaves the muzzle of the gun the shot wrapper 36 will fall away from the shot charge to allow the shot to disperse to form a relatively tight, uniform shot pattern.

In addition to facilitating the loading and reloading of shot gun shells and improving the shot pattern, wrapper 36 functions as a sheath surrounding the major portion of the shot charge 32 as the charge is expelled from the gun barrel (not shown) to prevent lead build up in the barrel.

Since the shell tube 12 is surrounded by the bore of the gun barrel it will undergo very little if any damage resulting from the firing of the shell. Furthermore, since the forward open end 34 of the shell tube 12 is not folded or otherwise crimped inwardly into the path of the charge, it will not be damaged by the discharge of the shell. Therefore, it should be evident that the shell tube 12 and the metallic base member 16 can be reused a great number of times.

It must be understood that the description of the conventional elements of this shotgun shell 10 is for the purpose of illustration only and the scope of this invention is not intended to be limited by this description. It is contemplated that the shot wrapper 36 of this invention can be used with any shotgun shell having an open ended tubular body portion closed at one end by a base section including a prime cap.

It should be obvious from the foregoing description that the shot wrapper of this invention greatly increases the number of times that a conventional shotgun shell can be reloaded and fired. Furthermore the shot wrapper of this invention greatly improves the shot pattern of the shell and reduces damage to the bore of the gun usually resulting from continued contact of the bore with the shot charge of the shells.

Furthermore, this shot wrapper is relatively simply constructed, economical, and easily installed in a conventional shell tube both at the original loading of the shell and at subsequent reloadings of the shell. The preindented star crimp peripheral edge portion of the shot wrapper makes it possible for the reloader to easily close the open end of the shell tube 12 to prevent escape therefrom of the shot charge before detonation of the shell.

The invention has been described by reference to specific and preferred embodiments. It will be apparent,

however, that many modifications can be made without departing from the spirit and scope of the invention. Accordingly, this invention should be construed not to be limited to the embodiment herein described but should be limited only by the scope of the appended claims.

What is claimed is:

1. A shot gun shell consisting of a shell tube having a forward and a rearward end;

a base member received about said rearward end of said tube to close said rearward end, said base member including a primer cap;

a propellant charge located in the rearward end portion of said tube;

at least one layer of gun wadding in said tube, adjacent said propellant charge;

a shot charge in the open forward end portion of said tube, adjacent said gun wadding;

a wrapper comprising an initially elongated substantially rectangular flat ribbon of plyable and foldable material, said ribbon provided along one longitudinal edge portion with an area of preindented fold lines, said ribbon rolled longitudinally into a cylinder and telescoped coaxially within said open forward end portion of said shell tube, completely surrounding said shot charge, and with a second edge of said rectangular ribbon, opposite to said first edge, abutting said wadding, said preindented area being folded radially inwardly along said fold lines to form a star shaped closure for said cylinder formed of said wrapper, said closure adjacent said forward end of said tube.

2. A shot gun shell according to claim 1 wherein said ribbon is substantially rectangular in shape with length at least as great as the inside circumference of said forward end of said shell tube and width approximately equal to the sum of the axial length of said shot charge and the inside radius of said forward end of said shell tube.

3. A shot gun shell according to claim 1 wherein said area of preindented fold lines is substantially rectangular in shape with length at least as great as the inside circumference of said forward end of said shell tube and width approximately equal to the inside radius of said forward end of said shell tube.

4. A shot gun shell comprising, in combination:

a shell tube having an open forward end and a closed rearward end;

a primer cap in said rearward end of said tube;

a propellant charge located in the rearward end portion of said tube;

at least one layer of gun wadding in said tube, adjacent said propellant charge;

a shot charge in the open forward end portion of said tubes adjacent said gun wadding;

a shot wrapper comprising an initially elongated substantially flat rectangular flat ribbon of pliable and foldable material rolled longitudinally to form a cylinder having an outside diameter substantially equal to the inside diameter of said forward end of said tube, said cylinder being coaxially received within said open forward end portion of said tube, surrounding said shot charge, said ribbon provided along one longitudinal edge portion thereof with a substantially rectangular area of preindented fold lines, said area initially extending forwardly of said forward end of said tube, said area being foldable radially inwardly along said fold lines to close said cylinder formed of said ribbon and said closure extending forwardly of said forward end of said shell tube.

5. A shot gun shell according to claim 4 wherein said area of preindented fold lines has a length substantially equal to the inside circumference of said forward end of said shell tube and a width substantially equal to the inside radius of said forward end of said shell tube.

6. A shot gun shell according to claim 4 wherein said ribbon has a length at least as great as the inside circumference of said forward end of said tube and a width substantially equal to the sum of the axial length of said shot charge and the inside radius of said forward end of said tube.

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