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FIG. 1

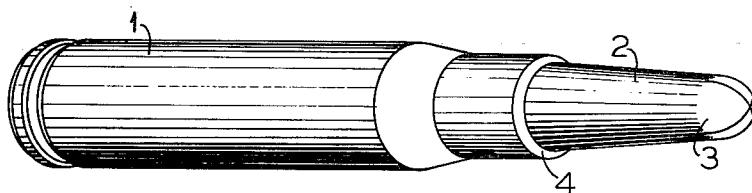


FIG. 2

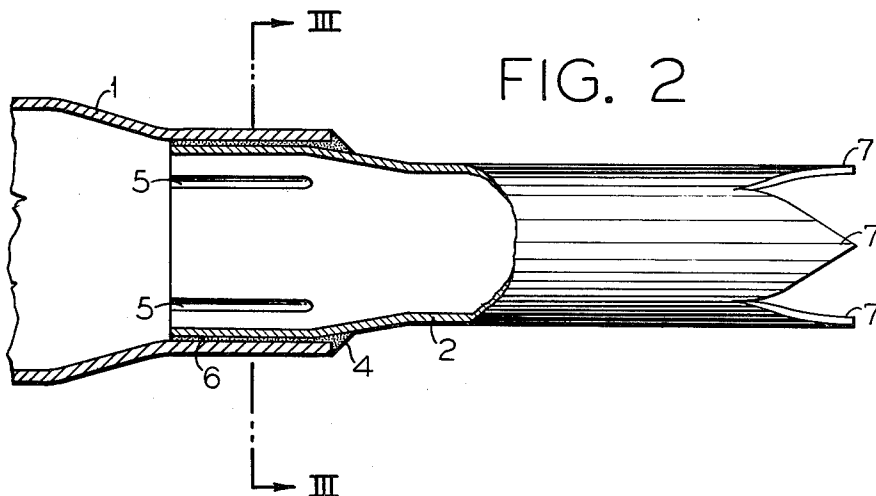
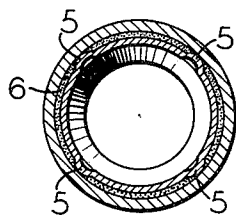


FIG. 3



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This invention relates to ammunition and particularly to a blank cartridge and its method of manufacture.

In the interest of economy and safety, rounds of blank fire ammunition are extensively used in training military personnel. To be effective, the blank cartridge must simulate warfare conditions in all respects. Thus, a satisfactory round of blank ammunition will simulate the report of combat ammunition and will function in automatic small arms such as machine guns and repeating rifles specially adapted with muzzle attachments for blank ammunition. Ideally, blank ammunition is completely safe at point blank range. Also, such ammunition must be adaptable to conventional manufacturing operations. All previously developed blank ammunition has been seriously deficient in at least one of these characteristics. A small measure of success has been realized by preparing a one-piece round of blank ammunition of the same size and configuration as a cartridge and projectile. However, such a unit is exceedingly difficult to make and is not amenable to conventional manufacturing methods.

It is, therefore, an object of the present invention to provide a round of blank ammunition overcoming the disadvantages of the prior art. A further object of this invention is to provide a novel and improved round of blank ammunition. A more specific object of this invention is to provide a satisfactory round of blank ammunition that can be prepared by using standard shell cases.

In accordance with this invention generally stated these and other objects are provided by sealing a hollow bullet jacket to a conventional primed cartridge, charging the cartridge with propellant powder, and closing the end of the bullet jacket to form a round of blank ammunition having the same size and general configuration as a standard round of ammunition. More specifically, this invention contemplates soldering a substantially hollow tubular bullet jacket into the mouth of a standard cartridge, inserting a propellant charge through the open end of the jacket, and subsequently closing the jacket to form a substantially hemispherical bullet nose. The cartridge can be primed before or after it is soldered to the jacket. However, it is preferred to prime the cartridge after it is joined to the jacket. That end of the jacket which is sealed within the neck or mouth of the cartridge is provided with a plurality of protuberances or axial extensions which form a light press or frictional fit within the neck of the cartridge case. Thus, the base diameter of the bullet jacket is somewhat smaller than the inside diameter of the cartridge mouth while the outside diameter formed by the extensions on the bullet jacket form a frictional fit with the mouth of the cartridge case. The opposite end of the bullet jacket is scalloped or fluted and adapted to be converged to form a substantially hemispherical extremity.

In assembling the blank round of ammunition of the present invention, the cartridge case is placed in a substantially vertical position with the open mouth thereof facing upward. The end of a bullet jacket of the type described above is inserted into the mouth of the cartridge case. The radial extensions which may be in the form of grooves, stakes, beads, or any other divergences from the face of the jacket are spaced about the periphery of the jacket so as to provide an annular space between the jacket and the mouth of the cartridge when these two elements are telescopically engaged. After

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the end of the bullet jacket has been pressed into the mouth of the cartridge, a ring of solder which forms a sliding fit with the tubular bullet jacket is slipped over the jacket and in abutment with the end of the cartridge case. The solder ring can be of substantially any cross-sectional configuration and it is only necessary that the amount of solder is sufficient to fill the spaces and fillet the step between the case and jacket. It will be understood that the members to be soldered can be cleaned and fluxed in accordance with conventional practices.

With the ring of solder thus positioned, the cartridge provided with the open ended tubular jacket is subjected to a conventional mouth anneal during which the end of the cartridge, the solder ring, and the adjacent portions of the bullet jacket are elevated to a temperature that will cause the solder to flow into the spaces allowed for it. During the anneal, the solder is liquified and at least a portion thereof flows into and substantially fills the axial spaces between the bullet jacket and the mouth of the cartridge. The remainder of the solder remains external to the cartridge case and forms a readily discernible sealing ring between these two components. The presence of the external ring of solder permits visual examination of the assembly from which the condition of the joint between the cartridge case and the bullet jacket can be readily ascertained. The soldered assembly is then cooled to room temperature by artificial means or by natural cooling. After the assembly has cooled to substantially ambient temperatures, the shell is primed and a charge of a suitable propellant powder is inserted through the open end of the bullet jacket. The operation is then completed by forming the scalloped edges of the bullet jacket into a substantially hemispherical shape. The resultant closure at the end of the bullet jacket is sufficient to prevent egress of the powder charge therefrom. However, the closure can be augmented by a lacquer seal or the like to provide a substantially waterproof seal. Also, convention over-powder wadding can be positioned, if so desired, in the mouth of the cartridge after it has been charged with the propellant. When the cartridge is fired, the end of the bullet jacket is opened by the gas generated upon combustion of the propellant charge.

Any type of solder capable of forming a strong bond between the cartridge case and the bullet jacket can be employed. However, it is essential for the purposes of the present invention that the pull strength of the bond be greater than the force required to deform and open the nose of the bullet jacket. The strength of a solder bond normally increases with the melting point of the solder. Thus, for the purposes of the present invention, a hard solder is generally preferred, but weaker solders can be readily employed when the thickness of the solder band is reduced to a minimal value. The cartridge case used in accordance with the present invention is normally the standard copper base alloy case, but the invention can be applied with equal facility to cartridge cases of other metals. Similar metals can likewise be used in the manufacture of the bullet jacket.

The invention will be more readily understood by reference to the following description of a preferred embodiment thereof taken with the drawing in which:

FIGURE 1 illustrates a perspective view of a round of blank ammunition made in accordance with the present invention;

FIGURE 2 is a fragmentary cross-sectional view illustrating the salient features of the present invention; and FIGURE 3 is a cross-sectional view taken along the line III—III of FIGURE 2.

The round of blank ammunition illustrated in FIGURE 1 is specifically designed for use in automatic guns adapted to fire blanks, and cartridge 1 is a standard 7.62

mm. cartridge case. The cartridge is provided with tubular jacket 2 having a closed hemispherical nose portion 3. The cartridge and jacket are joined together by a ring of solder 4 positioned about and between them.

The manner in which the cartridge case and bullet jacket are joined together will be readily apparent by reference to FIGURE 2 of the drawing. The base of the bullet jacket is provided with four longitudinal beads 5. As the jacket is inserted into the mouth of the cartridge, these beads form an interrupted annular space 6 between the mouth of the cartridge and the base of the jacket. After the base of the jacket is pressed into the mouth of the cartridge case, a ring of solder is slipped over the end of the bullet jacket and the assembly is subjected to a conventional mouth anneal. When the ring of hard solder 4 positioned about the jacket is thus heated above its melting point, a portion of the solder flows downwardly, filling the interstices 6 between the two components. As shown in FIGURE 2, a portion of the solder remains external to the cartridge case, and fillets the step between the case and the jacket. This permits visual examination from which the condition of the juncture can be readily ascertained. The opposite end of the bullet jacket is provided with four scallops or flutes 7. While in this preferred embodiment, four scallops are shown, it will be readily understood that a different number can be readily employed. In any event, they are so designed as to form a substantially hemispheric nose portion when they are centrally converged.

After the annealing, the assembly is permitted to cool to ambient temperature. The shell is then primed, a charge of propellant powder is inserted through the scalloped end of the bullet jacket, and the scallops are closed to form a substantially hemispherical nose portion as shown in FIGURE 1. The resultant round of blank ammunition is of almost the same shape and configuration as a conventional 7.62 mm. round of ammunition and functions satisfactorily in guns adapted to accommodate this size cartridge. This type of cartridge can be used in all types of gas actuated automatic small arms adapted for blanks, and upon discharge simulates the report of standard ammunition. In addition, it is perfectly safe at point blank range.

While the invention has been illustrated with reference to a particular round of ammunition, it will be apparent to those skilled in the art that the invention is not limited to the details of the illustrative example hereinbefore described. For example, the space between the bullet jacket and the cartridge case can be formed by indentations in the mouth of the cartridge case or by other convenient means. Also, if necessary, the mouth of the cartridge can be trimmed slightly to accommodate the external solder ring. Various other modifications will also become apparent to those skilled in the art.

What is claimed is:

1. A round of blank ammunition comprising a primed cartridge case, a propellant charge within the case, a substantially tubular bullet jacket, a plurality of spaced protuberances in the wall of the jacket adjacent one end thereof, that end of the jacket being positioned within

the mouth of the case with the protuberances and the case forming a frictional fit, an interrupted annular space between the mouth of the case and the jacket in the area of the protuberances, the space being occupied by a layer of solder adhering both to the case and to the jacket, and a ring of solder about the jacket external to the case, the opposite end of the jacket being scalloped and formed into a substantially hemispherical nose portion.

2. The round of ammunition of claim 1 in which the pull strength of the solder ring is greater than the force required to open the nose portion of the jacket.

3. A process for the manufacture of a round of blank ammunition comprising positioning a center-fire cartridge case in a vertical position with its mouth upward, providing a substantially tubular bullet jacket with protuberances adjacent one end thereof and scallops on the other, pressing that end of the jacket having the protuberances into the mouth of the case, the protuberances forming a frictional fit therewith and also defining an interrupted annular space between the mouth of the case and the end of the jacket, placing a ring of solder having an internal diameter substantially equal to the outer diameter of the jacket about the jacket in contact with the mouth of the case, heating the case and the jacket in the area of the solder ring to at least the melting point of the solder whereby a portion of the solder flows into the interrupted annular space, cooling to substantially ambient temperature, charging the case with propellant powder through the scalloped end of the jacket and closing the scalloped end of the jacket.

4. A process for the manufacture of a round of blank ammunition comprising positioning a center-fire cartridge case in a vertical position with the mouth thereof facing upward, providing a substantially tubular bullet jacket, deforming one end of the jacket to provide a plurality of spaced axial extensions, scalloping the other end of the jacket, inserting that end of the jacket having the extensions into the mouth of the case, the extensions forming a frictional fit therewith and defining an interrupted annular space between the mouth of the case and the end of the jacket, positioning a ring of solder having an internal diameter substantially equal to the outer diameter of the jacket, subjecting the resultant assembly to a mouth anneal at a temperature not less than the melting point of the solder whereby a portion of the solder flows into the interrupted annular space, cooling to substantially ambient temperature, priming the cartridge case, inserting a charge of propellant powder into the cartridge through the scalloped end of the jacket, and then closing the scalloped end of the jacket.

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