Dec. 7, 1965 R. H. P. DEVAUX 3,221,658

SHOT-GUN CARTRIDGE AND WAD THEREFOR

Filed Oct. 2, 1963

Fig. 1

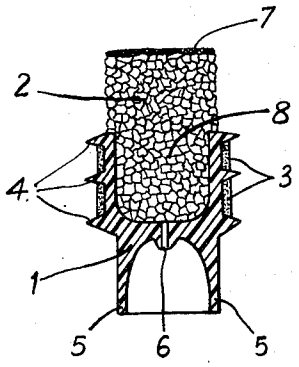
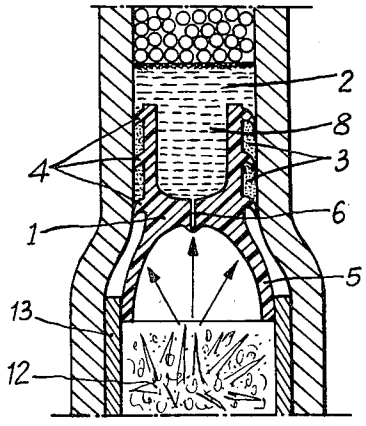


Fig. 2



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United States Patent Office 3,221,658 Patented Dec. 7, 1965

3,221,658

SHOT-GUN CARTRIDGE AND WAD THEREFOR

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Filed Oct. 2, 1963, Ser. No. 313,301
2 Claims. (Cl. 102—95)

The invention relates to shotgun cartridges and to wads for shotgun cartridges, said wads being adapted to be placed between the powder charges and pellets of the cartridges.

The conventional wads have the disadvantage that in order to obtain a sufficient and stable ballistic power, they require on the one hand a high degree of precision in their diameter in order to ensure strict tightness and on the other hand adequate and conventional charges of powder and pellets in conformity with those generally recommended, particularly as regards the powder, the cost of which is high. A reduction in this charge considerably reduces the firing power.

Various contrivances are already known with the object of obtaining apparently attractive ballistic results, either by the addition of expansible substances to the charge or by a reduction in the volume of the charge when the latter is sealed for instance by a thin cover or is compressed; however these arrangements have serious disadvantages and in particular that of causing high pressures which deform the pellets, and even dangerous excess pressures, particularly when the body of plastic material expands in the barrel of the choke-bored gun, while a certain recoil is generally produced.

Hitherto wads were formed by concave elements of plastic material which engage the rim of the internal reinforcement of the cartridge case without being capable of resisting the thrust to which they are subjected at the time of loading the cartridge, and the lateral expansion thereof becomes dangerous; the conditions are the same when the plastic element disposed on the same side as the wad is thin, the resultant of the combustion pressure of the powder and of the counterpressure opposed by the resistance against movement of the shot whereby the wad is caused to expand and this leads to excessive pressures, especially as it passes the choke part of the barrel of the weapon.

One object of the invention is to obviate all these drawbacks while reducing the powder at the same time obtaining considerable initial and continuing velocities, with very reduced pressures, as a result of providing the wad which forms the subject of the invention. It makes it possible to avoid the fouling of the barrels, while reducing the recoil and obtaining pellet groupings which exceed 90% at thirty meters with a maximum penetration.

My improved wad includes a conventional pneumatic joint which is no longer positioned on the shoulder of the reinforcement of the powder chamber inside the casing, but is formed by a skirt of yielding plastic material engaging the powder chamber and engages the walls of the latter. This skirt advantageously comprises in its upper portion a flange adapted to limit its penetration into the space reserved for the powder, the said skirt ensuring tightness on firing throughout the entire travel of the wad in the barrel.

Another feature of the invention consists in arranging an elastic packing formed by a cylinder of expanded or foamed plastic material on that part of the body of the hollow element which is opposed to the skirt and between this element and the charge of shot, said packing filling said upper element of the wad, the wall thickness of which is sufficient to oppose its expansion upon firing, its internal diameter being smaller than of the barrel, even in its "choked" portion, but comprising one or more thin flanges or ribs a diameter greater than that of the weapon barrel.

The wad of expanded material ensures the elasticity and the cleaning of the barrel, the flanges ensuring the guiding and tightness at the initiation of a firing. Thus, the expanding plastic material ensures safety and stability upon firing. The sections of the wad extending between the flanges can be lubricated in any conventional manner. An essential feature of the invention consists in that the transverse section of the wad extending over the powder charge is perforated at its centre to permit the discharge of air at the moment of positioning the wad on the powder on loading the cartridge in order to avoid the elastic return reaction which would be caused by the air thus compressed; according to the invention, this perforation is situated at the centre of a thin-walled projection or protuberance facing the powder which protuberance is heated, softened and bent over on igniting the powder, thus automatically sealing off the central perforation, this eliminating any loss of gas.

By way of example and in order to illustrate the possibilities of the invention, without having any limiting character as regards the scope of the latter, one embodiment of the invention as illustrated in the accompanying diagrammatic drawing will now be described. In the drawing:

FIGURE 1 is an axial section of the thrust element designed according to the invention, on which is disposed the wad of expanded plastic material; and

FIGURE 2 is an axial section corresponding to FIGURE 1 showing the wad and associated packing, disposed in a weapon and in a cartridge which has just been fired. This figure shows the expansion of the airtight skirt and the crushing of the packing.

The main or body element **1** is shown in FIGURE 1, this element preferably being injection-moulded from plastic material and having fixed thereon the packing **2** of expanded or foamed plastic material; the cellular structure of this material is indicated in the drawing, a part **8** thereof being disposed in the upper cavity of the element **1**. There is also shown the treated and hardened part **7**, the flanges **4** and the skirt **5**, which extend into the powder chamber of the cartridge case.

The perforation **6** enables the air to be evacuated so as to facilitate the introduction of the wad into the cartridge case on loading. The projection adapted to seal off this perforation is also illustrated.

In FIGURE 2, there is to be observed the expansion of the skirt **5** under the pressures which are indicated by the arrows and resulting from the combustion of the powder **12**, this skirt sealing off the end of the cartridge case **13**, thus preventing any passage of the gases. It is also possible to see the heated projection which is bent over to ensure the sealing off of the perforation. Also to be noted are the inclination of the flanges **4** and the lubrication **3**, as well as the crushing of the cells in the zones **2** and **8** of the expanded material, which has a resilient reaction on the projectile charge without deforming the latter.

The body element and the packing may be of any suitable material, preferably synthetic plastic material, for example, polyvinyl chlorides, polystyrenes, polyethylenes, polyurethane, urea, formaldehyde, these materials being foamed or expanded when used as packings.

It obviously comes within the scope of persons skilled in the art to apply modifications as regards details of the embodiment which has been described, and particularly as regards the shape and the length of the skirt penetrating into the powder chamber, lubrication of the element or elements, the material employed in the manufacture, either by moulding or injection, all this within the scope of the accompanying claims.

I claim:

1. A cartridge case wad comprising two coaxial aligned generally cylindrical sections rigid with each other and

open at their ends facing away from each other, a transverse partition lying across the adjacent ends of the two sections and closing the inner ends of the two sections, said partition having a central port connecting the inside of the two sections, and a small annular projection surrounding the opening of said port into one of said sections, said projection tapering in thickness from a greater thickness adjacent its base to a lesser thickness adjacent its free end, said projection being adapted to collapse and close said opening of the port upon firing of the associated cartridge.

2. A cartridge having a case containing a wad, a packing on one side of the wad and a powder charge on the other side of the wad, the wad comprising two coaxial aligned generally cylindrical sections rigid with each other and open at their ends facing away from each other, one said open end confronting the packing and the other said open end confronting the powder charge, a transverse partition lying across the adjacent ends of the two sections of the wad and closing the inner ends of the two sections,

said partition having a central port connecting the inside of the two sections, and a small annular projection surrounding the opening of said port on the same side as the powder charge, said projection tapering in thickness from a greater thickness adjacent its base to a lesser thickness adjacent its free end whereby said projection collapses and closes said opening of the port upon firing of the powder charge.

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