May 2, 1950 W. C. FORREST 2,506,203

CARTRIDGE FOR SMOKE SIMULATING POWDER

Filed April 5, 1949

FIG. 1.

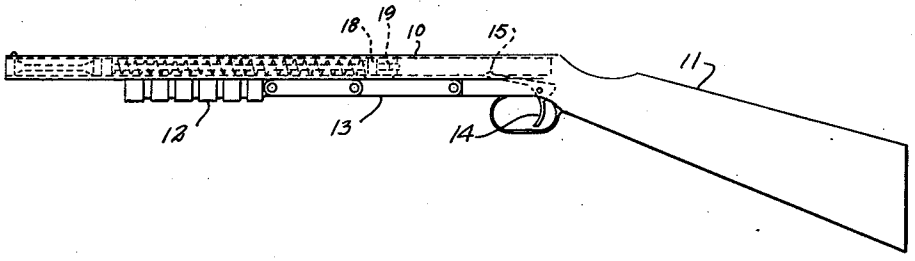


FIG. 2.

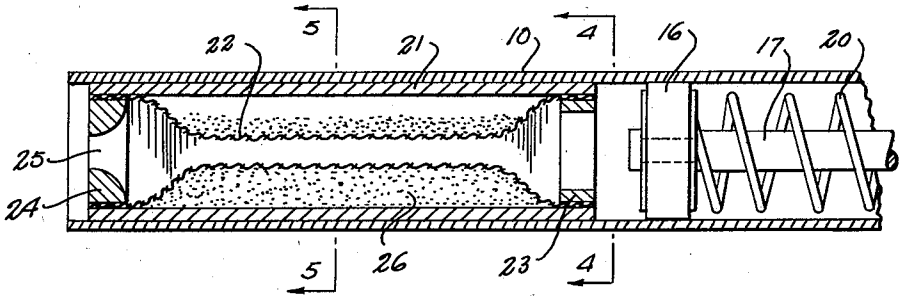


FIG. 3.

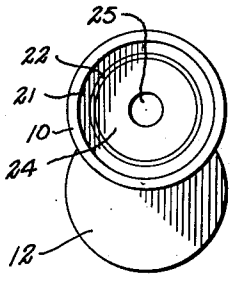


FIG. 4.

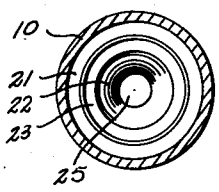


FIG. 5.

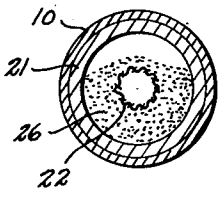
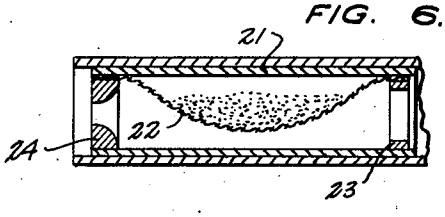


FIG. 6.



INVENTOR.
WILLIAM C. FORREST,
BY
McMorrow, Berman + Davidson
ATTORNEYS.

Patented May 2, 1950 2,506,203

UNITED STATES PATENT OFFICE

2,506,203

CARTRIDGE FOR SMOKE SIMULATING POWDER

William C. Forrest, Merchantville, N. J.

Application April 5, 1949, Serial No. 85,577

3 Claims. (Cl. 222—193)

1

This invention relates to toy guns, and more particularly to a compressed air type of toy gun having smoke-simulating means.

It is among the objects of the invention to provide a toy gun of the spring plunger or compressed air type having therein means for containing a harmless powder, such as talcum powder, for ejection by the compressed air blast created by the gun whenever the gun is operated, which powder-ejecting means is of simple and economical construction, may be applied to an existing gun or incorporated in a gun during manufacture thereof, holds a large supply of powder and dispenses such powder in small quantities to simulate smoke from gunpowder each time the gun is operated, and is easily replenished or replaced.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawing, wherein:

Figure 1 is a side elevation of a toy gun showing, in broken lines, the position therein of a powder dispenser illustrative of the invention;

Figure 2 is a longitudinal, medial cross-section on an enlarged scale of the muzzle-end portion of the barrel of the gun illustrated in Figure 1, showing a powder dispenser illustrative of the invention operatively disposed in the gun barrel;

Figure 3 is an end elevation of the muzzle end of the gun barrel illustrated in Figures 1 and 2;

Figure 4 is a transverse cross-section on the line 4—4 of Figure 2;

Figure 5 is a transverse cross-section on the line 5—5 of Figure 2; and

Figure 6 is a view on a reduced scale, similar to Figure 2 and showing a somewhat modified form of powder dispenser.

With continued reference to the drawing, the gun, illustrated in Figure 1, has a tubular barrel 10 attached at its breech end to a stock 11 and carrying on its under side a slidable forearm 12 connected by pivoted links 13 to the front end of the stock 11. A trigger 14 is pivotally mounted in the stock at the breech end of the barrel and is provided with a sear 15. A piston 16 is slidably mounted in the gun barrel and a rod 17 is connected at its forward end to the piston and extends rearwardly from the piston through a spring abutment 18 secured in the barrel. A disc 19 is secured on the piston rod rearwardly of the abutment 18, and a coiled compression spring 20 surrounds the rod between the abutment 18 and the piston 16 to drive the piston forwardly in the barrel. The slidable forearm 12 is connected to the piston rod and when moved in a direction toward the stock 11, moves the rod 17 with the piston 16 and abutment washer 19 toward the stock, compressing the spring 20, until the abutment washer 19 is engaged by the trigger sear 15. When the trigger is then pulled, the spring drives the piston 16 forwardly in the barrel and ejects a blast of compressed air from the muzzle end of the barrel. Forward travel of the piston is limited by engagement of the abutment washer 19 with the fixed abutment 18 or with a resilient stop bearing against the fixed abutment.

2

As the gun may be entirely conventional in construction and operation, a more detailed description is not considered necessary for the purposes of the present invention.

The powder dispenser of the invention comprises a tubular, cylindrical cartridge 21 which may be inserted into the muzzle end of the gun barrel 10, as illustrated in Figure 2, ahead of the forward position of the piston 16, or secured to the muzzle end of the barrel by a suitable socket or other convenient means. In the arrangement illustrated, the tubular cartridge 21 has an outside diameter substantially equal to the inside diameter of the gun barrel at the muzzle end of the latter, and a length substantially equal to the distance from the forward position of the piston 16 to the muzzle end of the gun barrel.

A piece of flexible, porous material 22 is disposed in the tubular cartridge 21 and extends from one end to the other of the latter. This piece of material 22 may conveniently be a piece of coarse woven cloth through which powder, such as talcum powder will filter, and in the form of the invention shown in Figures 2 to 5 inclusive, it takes the form of an elongated tube arranged substantially concentric with the tubular cartridge 21. It may, however, be a piece of material of single thickness secured along its edges to the inner surface of the tubular cartridge, as illustrated in Figure 6.

The end of the tube 22, at the inner end of the tubular cartridge, that is, the end next to the piston 16, is secured to the cartridge by suitable adhesive and is reinforced by means of a ring 23 disposed within the end of the cartridge and compressing the corresponding end portion of the tube 22 between itself and the adjacent inner surface of the cartridge. The cartridge 21 and ring 23 may both be formed of a heavy paper or cardboard material for economy in manufacture.

The end of the tube 22 at the opposite or outer end of the cartridge is secured to the cartridge

by suitable adhesive, and reinforced by an annular nozzle 24 which may conveniently be formed of wood and is provided with a convergent, restricted orifice 25 which is preferably concentric with the corresponding end of the cartridge 21.

The space between the tube 22 of porous, flexible material and the tubular cartridge 21 provides a storage space for powder 26 which powder filters at a slow rate through the tube 22.

When the gun is operated, the piston 16 rapidly advances under force of spring 20 from its retracted position to its extended or forward position, as illustrated in Figure 2, and in doing so, forces a blast of compressed air through the interior of the tubular body 22 which air picks up powder from the inner surface of the tube and forces the powder outwardly through the aperture 25 of the nozzle 24, projecting a small cloud of powder at the muzzle end of the gun barrel to simulate the smoke of gunpowder.

In the modified arrangement shown in Figure 6, the ring 23 and nozzle 24 are preferably retained and reinforce the connections between the ends of the bag of flexible, porous material and the end portions of the tubular, cylindrical cartridge 21. The piece of material 22 may comprise a complete tubular structure, as shown in Figure 2, the ends of which are brought together and secured in closed condition to the cartridge 21, or may be a piece of material of single thickness, as explained above.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. Smoke-simulating means associable with the barrel of a toy gun comprising a tubular, cylindrical cartridge, a piece of flexible, porous material in said cartridge extending substantially from one end to the other end of the cartridge and attached to the inner surface of the latter to provide a powder reservoir between said piece of flexible, porous material and the inner surface of said cartridge, and means within the opposite ends of said tubular cartridge reinforcing the attachment of said piece of flexible, porous material to said tubular cartridge, the reinforcing means in one end of said cartridge comprising an annular nozzle having therethrough a restricted, convergent orifice substantially concentric with said tubular cartridge.

2. Smoke-simulating means associable with the barrel of a toy gun comprising a tubular, cylindrical cartridge, a piece of flexible, porous material in said cartridge extending substantially from one end to the other end of the cartridge and attached to the inner surface of the latter to provide a powder reservoir between said piece of flexible, porous material and the inner surface of said cartridge, and means within the opposite ends of said tubular cartridge reinforcing the attachment of said piece of flexible, porous material to said tubular cartridge, the reinforcing means in one end of said cartridge comprising an annular nozzle having therethrough a restricted, convergent orifice substantially concentric with said tubular cartridge and the reinforcing means in the opposite end of said cartridge comprising a flat ring.

3. Smoke-simulating means associable with the barrel of a toy gun comprising a tubular, cylindrical cartridge, a piece of flexible, porous material in said cartridge extending substantially from one end to the other end of the cartridge and attached to the inner surface of the latter to provide a powder reservoir between said piece of flexible, porous material and the inner surface of said cartridge, and means within the opposite ends of said tubular cartridge reinforcing the attachment of said piece of flexible, porous material to said tubular cartridge, the reinforcing means in one end of said cartridge comprising an annular nozzle having therethrough a restricted, convergent orifice substantially concentric with said tubular cartridge and the reinforcing means in the opposite end of said cartridge comprising a flat ring, and said piece of flexible, porous material comprising a tubular piece of such material extending from one to the other end of said cartridge.

WILLIAM C. FORREST.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
552,123	Guild	Dec. 31, 1895
1,121,845	Kallusch	Dec. 22, 1914
2,324,359	Callan	July 13, 1943