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(54) **ADVANCED PORTING OF PROPELLANT GASES FOR SUPPRESSING FIREARMS**

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(57) **ABSTRACT**

A sound suppressor for a firearm comprised of a cylindrical housing having a rear end cap attached to the housing with means for mounting to the muzzle of a firearm. a front-end cap attached to the housing with having a centrally positioned aperture, and one or more baffle components positioned within the housing between the proximal and distal end. The baffle component is comprised of a cylindrical wall with two or more disc-like extrusion walls protruding external and perpendicular to cylinder wall with one or more apertures through the disc-like extrusions for redirecting propellant gases, an internal cone facing the proximal end with an aperture centered on the cone for the projectile to pass through. Redirecting of propellant gases is achieved with porting of the internal chamber of the proximal end through the alternate chambers formed between the cylindrical wall of the baffle and the suppressor tube and exiting through the dedicated apertures of the distal end.

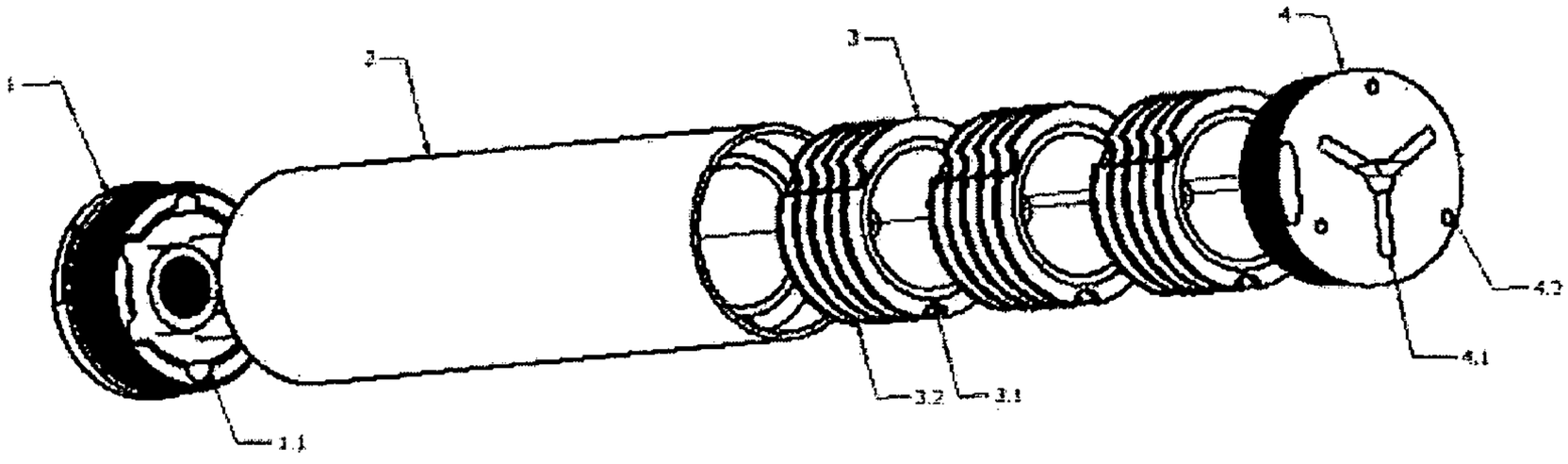


FIG 1

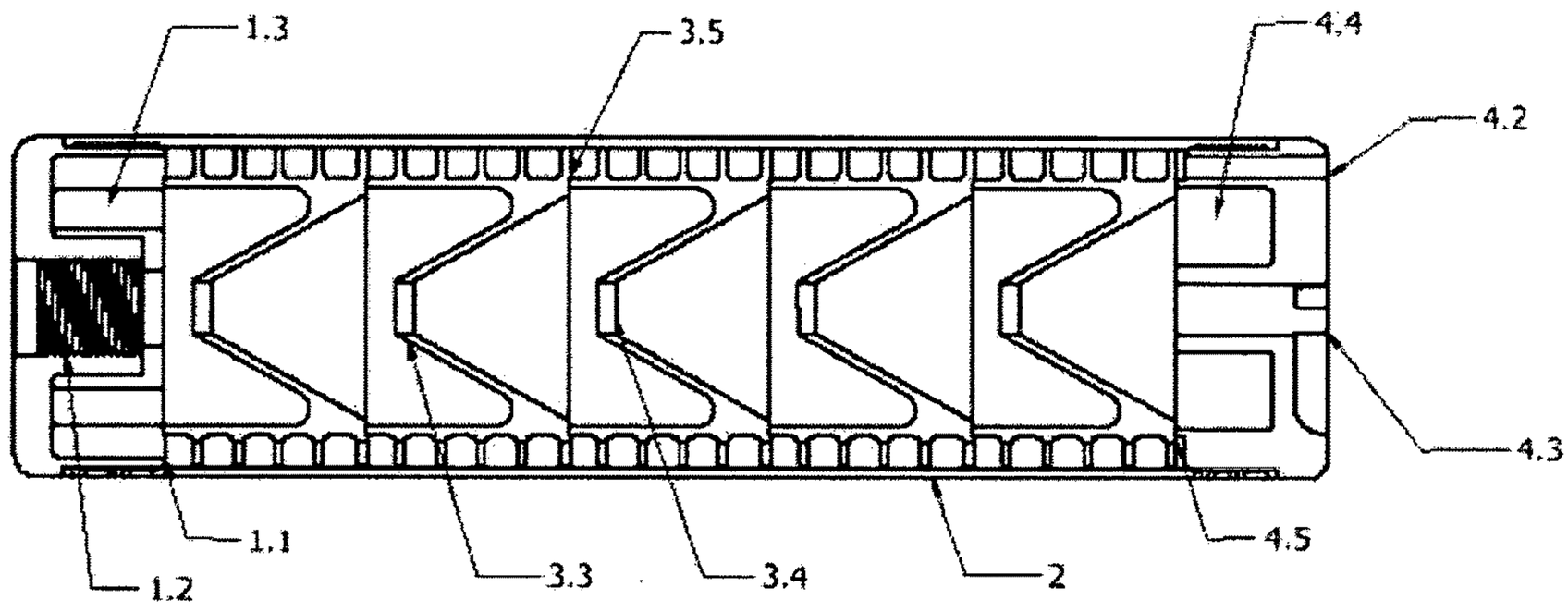
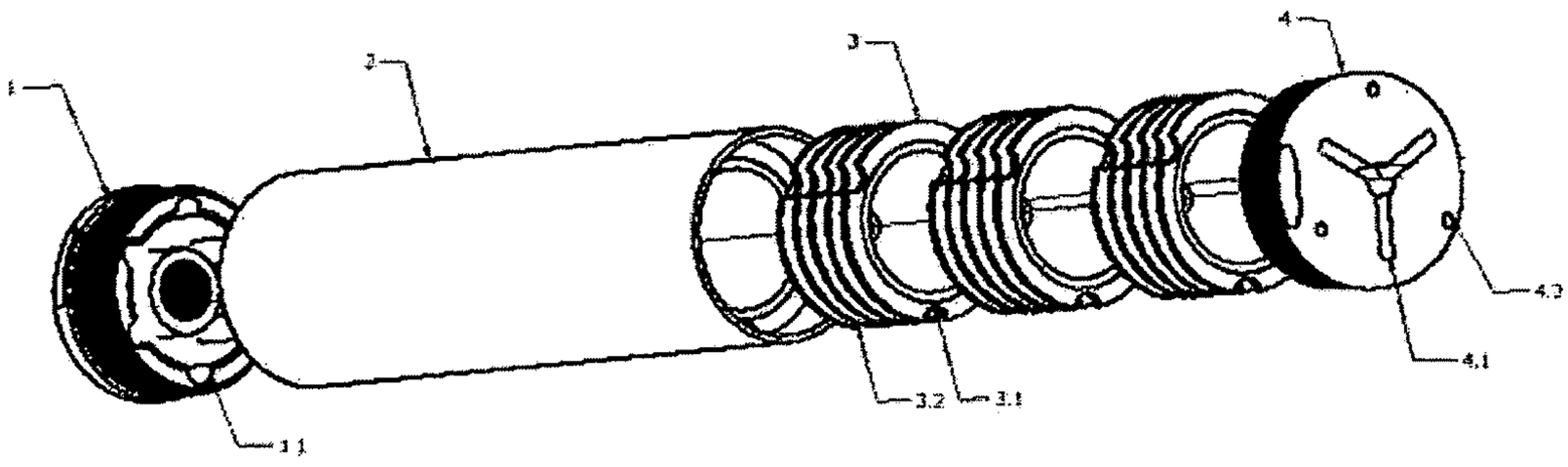


FIG 2



ADVANCED PORTING OF PROPELLANT GASES FOR SUPPRESSING FIREARMS

TECHNICAL

[0001] This invention relates to a controlled release of expanding gases experienced within a suppressor due to discharge of the firearm.

BACKGROUND

[0002] Firearm suppressors conventionally include one or more baffles contained within a cylindrical housing that attaches to the muzzle end of the barrel. The baffles function to control the release of pressure and velocity of propellant gases so as to suppress the noise signature of the host weapon. A common baffle design is one that traps or holds pressure in each of the expansion chambers behind the projectile, preventing the expanding gases to release ahead of the projectile. These designs often create a significant amount of backpressure and stress on internal components as well as the host weapon. Other designs allow for porting or pressure relief by allowing expanding gases to pass between baffles, allowing gases to release ahead of the projectile which reduces backpressure but often leads to a louder noise signature due to a secondary combustion of the unburnt gases. PFC has developed a new method of porting that separates the propellant gases from the projectile path and allows it to flow with minimal restriction through a series of small chambers contained between the baffles cylindrical wall and the suppressor tube, and released to the atmosphere through isolated ports in the distal end. The isolated porting provides immediate relief of pressure from the muzzle blast without a secondary combustion of unburnt gases, stress on internal components, or additional stress to the host weapon.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The accompanying drawings illustrate the design features implemented along with a brief description that serve to explain the principles of the invention. Reference numbers below can be identified in one or more of the drawings. wherein:

[0004] FIG. **1** depicts the cross-sectional view for the length of the device, displaying the various chambers and ports available for redirecting gas pressure.

[0005] FIG. **2** depicts the assembly view and further illustrates the porting of the baffle system.

DETAILED DESCRIPTION

[0006] Referring to FIGS. **1** and **2**, feature **1** illustrates the overall design of the proximal cap that mounts on the muzzle of a threaded barrel using feature **1.2** with mating threads to match said barrel. Feature **1.1** and **1.3** illustrates the ports that were implemented on the inner expansion chamber of the proximal end cap to allow flow of propellant gases from the weapons muzzle, into the smaller chambers formed by the cylindrical tube housing the components, feature **2**, and the disc-like extrusions, feature **3.2**, formed perpendicular to the cylinder wall of the baffle, feature **3**. The propellant gases flow from the ports on the proximal end cap, feature **1.1**, to the initial outer chambers that are formed and separated by a series of disc-like extrusions, feature **3.2**. The propellant gases continue to flow through the baffle ports, feature **3.1**, filling each subsequent outer chamber until exiting through the isolated apertures, feature **4.2**, of the distal end cap, feature **4**. Features **3.5** and **4.5**, depict the mating of baffle to baffle, feature **3**, and baffle to distal end cap, feature **3** and **4**. The mating of these components ensures that the inner expansion chambers of the baffle system formed by the cone, feature **3.3**, of the baffle, feature **3**, will not facilitate exchange of propellant gases with the outer chambers formed by the suppressor tube, feature **2**, and the baffle features **3.2** and **3.1**.

[0007] In addition to the features described above, the inner features of the baffle system, feature **3**, allow the projectile to pass through an aperture, feature **3.4**, that is centered on the baffle cone, feature **3.3**, for each installed baffle, feature **3**. Prior to projectile passing through the distal end cap, remaining pressure exiting with the projectile will encounter one last expansion chamber, feature **4.4**, that aids in reducing the pressure further before exiting through the aperture, feature **4.3**, and finally disperse in a controlled release through machined pathways, feature **4.1**, located on the external face of the distal end cap, feature **4**.

[0008] While the present invention has been illustrated by the description of the embodiment thereof, and while the embodiment has been described in detail, it is not the intention of the applicant to restrict or in any way limit the scope of the appended claims to such detail. Those skilled in the art may become influenced by claimed features and implement similar design features in effort to achieve isolation of gas pressure from projectile path. Therefore, the invention in its broader aspects is not limited to the specific details representative apparatus and method, and illustrative examples shown and described. Accordingly, departures may be made from such details without departure from the scope of applicant's general inventive concept.

Related Applications

[0009] No related applications have been filed prior to this.

1. A firearm suppressor comprised of:

a flash hider with attachment method to host weapon,

a proximal end with attachment method to the flash hider or host weapon,

a distal end,

a cylindrical housing,

a central aperture through distal end cap, proximal end cap, and baffle system for the projectile to pass through,

a plurality of baffles wherein the assembled baffles in the cylindrical housing form an insulated path for propellant gases to flow through,

multiple outer expansion chambers with one or more apertures that facilitate the flow of propellant gas from the proximal end to the distal end, insulated from the inner expansion chamber(s) and main aperture the discharged projectile passes through, allowing propellant gas to exit the device through one or more of the insulated apertures on the distal end cap.

2. A proximal end comprised of:

a center aperture,

one or more apertures placed alternate to and insulated from the center aperture,

a method of porting propellant gases to atmosphere through the apertures that are insulated from the center aperture.

3. A baffle system comprised of:
a inner expansion chamber(s),
a center aperture,
a outer expansion chamber(s) insulated from the inner expansion chamber(s),
one or more apertures through the outer expansion chamber(s) providing a method to port propellant gases through the longitudinal length of the baffle system, wherein the ported propellant gases are not reintroduced to the inner expansion chamber(s) of the system.

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