

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DEAD AIR ARMAMENT, LLC d/b/a DEAD AIR SILENCERS,

Petitioner

v.

JARVIS ARMS LLC d/b/a MISSION SILENCERS,

Patent Owner

Case: IPR2026-00013
U.S. Patent No. 12,018,906

PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104

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LIST OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 12,018,906 B2 (“the ’906 patent”)
1002	Prosecution History of U.S. Patent No. 10,616,932 B2 (“’906 pros history”)
1003	U.S. Patent Pub. No. 2021/0207916 A1 (“Belykov”)
1004	U.S. Patent No. 11,268,776 (“Noonan”)
1005	U.S. Patent Pub. No. 2022/0276015 A1 (“Muceus”)
1006	U.S. Patent Pub. No. 2021/0381793 (“Slack”)
1007	U.S. Patent Pub. No 2015/0285575 (“Sclafani”)
1008	Declaration of Robert S. Silvers (“Silvers Declaration”)
1009	<i>Curriculum Vitae</i> of Robert S. Silvers
1010	National Firearms Act Handbook, ATF, April 2009, available at https://www.atf.gov/firearms/docs/guide/atf-national-firearms-act-handbook-atf-p-53208/download
1011	Letter dated June 9, 2025 from Brian D. Batt on behalf of Jarvis Arms LLC dba Mission Silencers
1012	Complaint for Declaratory Judgment of Non-Infringement, <i>Dead Air Armament, LLC d/b/a Dead Air Silencers v. Jarvis Arms LLC d/b/a Mission Silencers</i> , 4:25-CV-00497-BLW-DKG (DID Aug. 29, 2025).

Dead Air Armament, LLC *d/b/a* Dead Air Silencers (“Dead Air”), (“Petitioner”) petitions for IPR under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42 of claims 1-7 and 9-11 (“the Challenged Claims”) of U.S. Patent No. 12,018,906 (“the ’906 Patent”). Petitioner requests cancellation of the Challenged Claims.

As explained in detail herein, at the time of the earliest possible priority date of the Challenged Claims, firearm suppressors having multi-piece constructions were ubiquitous in the art. *See e.g.*, Ex. 1003 ¶¶28-29, Fig. 3; Ex. 1004 3:16-28, Figs. 3a-3c; Ex. 1005 ¶59, Fig. 13; Ex. 1008 ¶¶65, 72-73, 77-80. An annular channel was known to be formed between the core and outer housing of a subset of these suppressors to allow for expansion of propellant gases to cool and slow the gases while maintaining suppressor performance. *See e.g.*, Ex. 1003 ¶¶2, 5, 7, Fig. 7; Ex. 1004 4:23-37, 5:9-13, Figs. 3a-3c; Ex. 1005 ¶¶30, 33, 54, Figs. 11, 13; Ex. 1008 ¶¶66, 74-75, 81-82. Distinct from what was argued during prosecution, the Challenged Claims are broadly written to cover these basic building blocks of suppressor design, and indeed, the Patent Owner expressly represented in writing to Petitioner that the foregoing channel is “inherent in the design so as to allow [Petitioner’s] core to slide into the housing”. Ex. 1011 p. 32 *compare* Ex. 1002 pgs. 103, 109. As will be demonstrated below, such suppressors pre-date the Challenged Claims, and there is nothing that distinguishes the Challenged Claims from firearm suppressors described in the references cited herein.

I. STANDING UNDER 37 C.F.R. § 42.104(a)

Petitioner certifies the '906 Patent is available for IPR, and Petitioner is not barred or estopped from requesting IPR.

Petitioner filed a Complaint for Declaratory Judgment of Non-Infringement against Patent Owner seeking a declaration that it does not *infringe* the '906 Patent. Ex. 1012. Because the Complaint filed by Petitioner alleges a cause of action only for non-infringement and does not allege a cause of action for invalidity, Petitioner is not barred from filing its Petition under 35 U.S.C. § 315(a)(1). *Samsung Electronics Co. v. BiTMICRO, LLC*, IPR2018-01720, Paper 14 at 28-30 (PTAB Mar. 29, 2019) (quoting *LG Elecs., Inc. v. Straight Path IP Grp., Inc.*, IPR2015-00196, Paper 56 at 17 (PTAB May 9, 2016)); see also *Ariosa Diagnostics v. Isis Innovation Ltd.*, IPR2012-00022, Paper 166 at 14 (PTAB Sept. 2, 2014) (“A civil action for a declaratory judgment of non-infringement is not a civil action challenging the validity of a patent.”).

II. PAYMENT OF FEES

Petitioner authorizes Account No. 16-0605 to be charged.

III. OVERVIEW OF CHALLENGES AND RELIEF REQUESTED

Pursuant to 37 C.F.R. § 42.22(a)(1) and 42.104(b)(1)–(2), Petitioner requests cancellation of the Challenged Claims pursuant to the grounds below. Additional support is provided in the Declaration of Robert S. Silvers (Ex. 1008).

Ground 1: Claims 1-6 and 9-11 are rendered obvious by Belykov in view of Sclafani.

Ground 2: Claims 6 and 7 are rendered obvious by Belykov in view of Sclafani and Noonan.

Ground 3: Claims 1 and 3-7 are anticipated or rendered obvious by Noonan.

Ground 4: Claim 2 is rendered obvious by Noonan in view of Slack and Sclafani.

Ground 5: Claims 4 and 9-11 are rendered obvious by Noonan in view of Belykov.

Ground 6: Claims 1, 2, 4, 10, and 11 are rendered obvious by Muceus in view of Slack.

Ground 7: Claims 3 and 4 are rendered obvious by Muceus in view of Slack and Belykov.

Ground 8: Claims 6 and 7 are rendered obvious by Muceus in view of Slack and Noonan.

IV. BACKGROUND

The '906 patent relates to a firearm suppression system designed to solve perceived problems in the industry that include “reduc[ing] muzzle flash, noise and back gassing and increase[ing] accuracy” by “managing gas flows and baffle angles to statistically balance sound, recoil, and back gassing”. Ex. 1001 1:34-41,

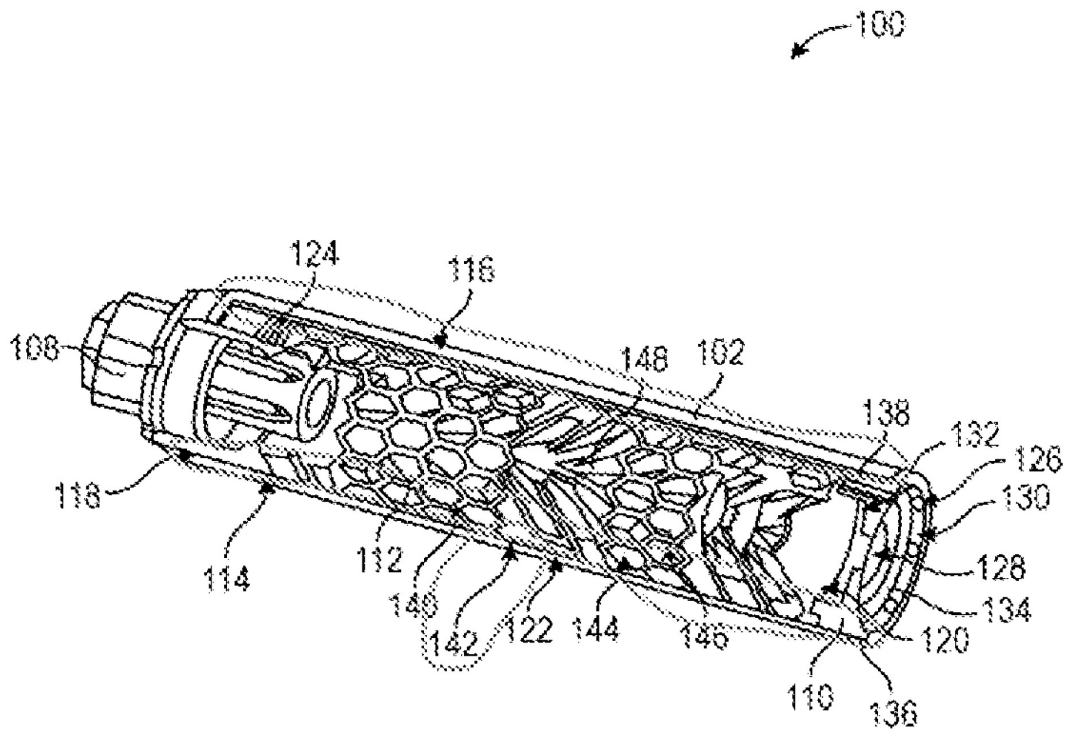
5:9-23; Ex. 1008 ¶¶42-52. The '906 Patent fails to add anything to the then-existing state of the art.

A. '906 Patent Prosecution History

U.S. Patent Application No. 18/382,845 (“the '845 application”) was filed on October 23, 2023, and resulted in U.S. Patent No. 12,018,906. The '845 application is a Non-Provisional Application of Provisional Application No. 63/419,776, filed on October 27, 2022.

In amending the claims to overcome a non-final Office action on February 16, 2024 (the “Response”), the Applicant amended claim 1 to recite the “wherein” clause of claim 1 through the end of the claim, including the plurality of core apertures and the channel, which amendment the Applicant asserted originated from claims 8 and 10. Ex. 1002 pgs. 103, 109; Ex. 1008 ¶¶53-57.

In the Applicant’s remarks in the Response, the Applicant cited to the passage at 6:62-67 noted above in §VI(A) for support and provided the following annotation of Fig. 2 of the '845 application along with the foregoing description. Ex. 1002 p. 104; Ex. 1008 ¶¶58-59.



A Notice of Allowance was mailed February 29, 2024. Ex. 1002 pgs. 123-129; Ex. 1008 ¶60.

B. Priority Date

The '906 Patent has an effective filing date of October 27, 2022. Ex. 1001 Cover. The '906 Patent claims priority to U.S. Provisional Application No. 63/419,776 filed on October 27, 2022. Petitioner assumes (without determining) that the priority claim is proper. If Patent Owner disputes the prior art status of any of Petitioner's cited references, Petitioner reserves the right to challenge the priority date.

C. Claim Construction (37 C.F.R. §42.104(b)(3))

The terms should receive their respective plain and ordinary meaning as understood by a person of ordinary skill in the art under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). Ex. 1008 ¶¶61-63.

V. PRIOR ART REFERENCES**A. Belykov (Ex. 1003)**

U.S. Publication No. 2021/0207916 (“Belykov”, Ex. 1003) is titled “Silencer for a firearm,” and Belykov was filed July 18, 2018, and published July 8, 2021. Ex. 1003, Cover; Ex. 1008 ¶¶64-70. Belykov qualifies as prior art under at least 35 U.S.C. §102(a)(1) and (a)(2). Belykov was never addressed or considered by the Examiner during prosecution, nor was it disclosed in any IDS filed by the Applicant.

B. Noonan (Ex. 1004)

U.S. Patent No. 11,268,776 B1 (“Noonan”, Ex. 1004) is titled “Expansion Chamber Assembly and a Method of Manufacturing the Same” and Noonan was filed May 23, 2018, and issued March 8, 2022. Ex. 1004 Cover; Ex. 1008 ¶¶71-75. Noonan qualifies as prior art under at least 35 U.S.C. §102(a)(1) and (a)(2). Noonan was never addressed or considered by the Examiner during prosecution, nor was it disclosed in any IDS filed by the Applicant.

C. Muceus (Ex. 1005)

U.S. Publication No. 2022/0276015 A1 (“Muceus”, Ex. 1005) is titled “Suppressor for a Firearm”, and Muceus was filed May 19, 2022 as a continuation of U.S. Appl. No. 16/855,387 filed April 22, 2020, and published September 1, 2022. Ex. 1005 Cover; Ex. 1008 ¶¶76-82. Muceus qualifies as prior art under at least 35 U.S.C. §102(a)(1) and (a)(2). Muceus was never addressed or considered by the Examiner during prosecution, nor was it disclosed in any IDS filed by the Applicant.

D. Slack (Ex. 1006)

U.S. Publication No. 2021/0381793 A1 (“Slack”, Ex. 1006) is titled “Firearm Suppressor”, and Slack was filed August 17, 2021, and published December 9, 2021. Ex. 1006 Cover; Ex. 1008 ¶¶83-88. Slack qualifies as prior art under at least 35 U.S.C. §102(a)(1) and (a)(2). Slack was never addressed or considered by the Examiner during prosecution, nor was it disclosed in any IDS filed by the Applicant.

E. Sclafani (Ex. 1007)

U.S. Publication No. 2015/0285575 A1 (“Sclafani”, Ex. 1007) is titled “Firearm Silencer with a Replacement Core”, and Sclafani was filed May 29, 2015, and published October 8, 2015. Ex. 1007 Cover; Ex. 1008 ¶¶89-90. Sclafani qualifies as prior art under at least 35 U.S.C. §102(a)(1) and (a)(2). Sclafani was

cited during prosecution of the '906 patent against several dependent claims, which dependent claims were ultimately allowed over Sclafani by virtue of their dependency on allowed independent claim 1 over a different primary reference.

VI. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (“POSITA”) at the time of the invention is an individual with a B.S. in Mechanical Engineering or equivalent with at least 2 years’ experience in the field of firearm suppressors; or an individual with at least 5 years of experience in firearm suppressors. Ex. 1008 ¶40-41. For example, a person with a different degree but with additional relevant experience could still qualify if the additional experience compensates for the different educational background. *Id.* A person with less than 2 years of experience working in a field involving firearm suppressors could still qualify if the person has additional education that compensates for their lesser experience. *Id.* For example, an individual with an advanced degree in a relevant field, such as a Masters or Ph.D. in Mechanical Engineering, Acoustics, Physics, or the like may qualify as one of ordinary skill in the art without having industry experience. *Id.*

VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

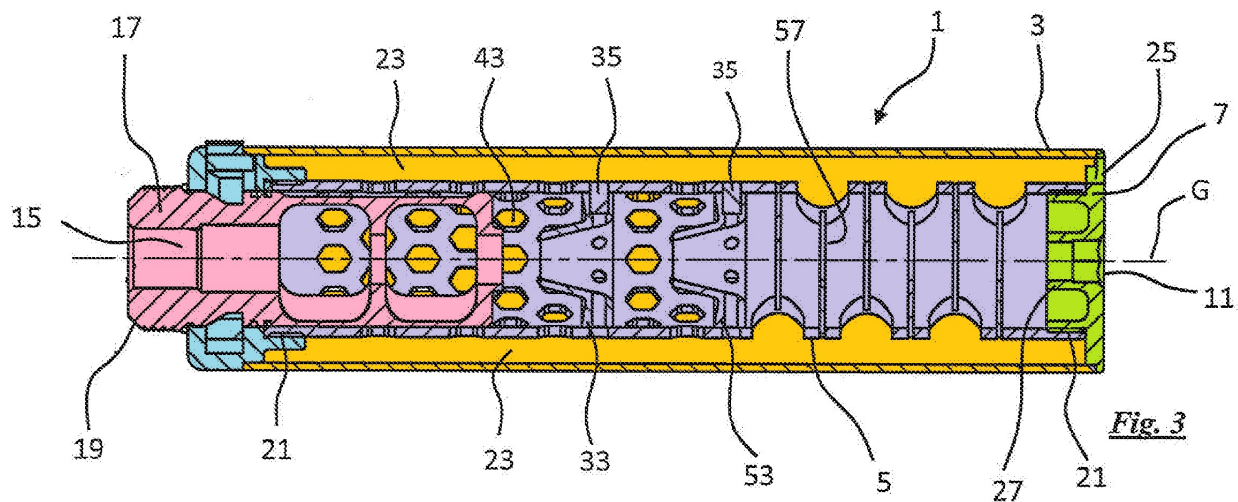
A. Ground 1: Claims 1-6 and 9-11 are rendered obvious by Belykov in view of Sclafani

1. Motivation to Combine Belykov and Sclafani

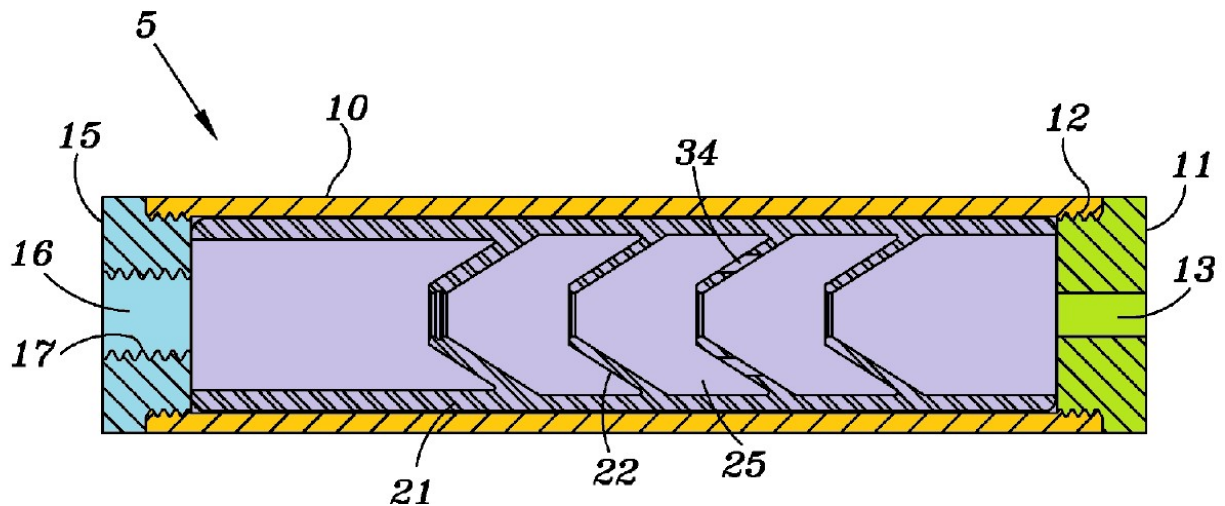
Belykov and Sclafani are each directed towards improvements in firearm suppressors related to improving suppressor durability. Ex. 1003 ¶4; Ex. 1007 ¶¶2-6; Ex. 1008 ¶¶92-94. For example, Belykov discloses a need for a silencer 1 (i.e., firearm suppression system) designed to “increase[e] the thermal and mechanical resistance” while, among other factors, “maintaining a sufficient sound absorption and spark extinguishing”. Ex. 1003 ¶ 4; Ex. 1008 ¶¶92-93. Sclafani discloses that “wear and corrosion caused by the explosive gasses entering the housing” causes the baffles in the interior of the silencer to deteriorate and that its core member (including baffles) is replaceable and printed with a three-dimensional printer to extend the life of the silencer by allowing reuse of the silencer. Ex. 1007 ¶4-5, 7-8; Ex. 1008, ¶¶93-95. A POSITA would have understood that terms such as “silencer” and “suppressor” are used interchangeably in the industry. Ex. 1008 FN3.

Comparing annotated Fig. 3 of Belykov and Fig. 3 of Sclafani below, Sclafani includes threading 12 between its caps 11, and 15 (i.e., end caps) (green and blue highlight) and its tubular housing 10 (i.e., housing) (orange highlight).

Belykov includes a screw connection 21 between its wall ends 7, and 13 (green and blue highlight) and its inner tube 5 (i.e., core) (purple highlight). Ex. 1003 ¶¶28-29, Figs. 3, 6, 7; Ex. 1007 ¶¶12-13, 15, Fig. 3; Ex. 1008 ¶¶95.



Belykov, Fig. 3 (annotated)



Sclafani, Fig. 3 (annotated)

A POSITA would have been motivated by the teachings of Sclafani to modify Belykov to (a) include the inner tube 5 (i.e., core) being removably attachable to the outer tube 3 (i.e., housing) and positioned therein (assuming *arguendo* that Belykov does not already include this limitation) and (b) printing the inner tube 5 (i.e., core) and the components associated with the inner tube (e.g., sound impact plates 33, 53, 57) of Belykov with a three-dimensional printer. Ex. 1008 ¶¶95-98, 100-113; Ex. 1003 ¶¶4-7, 28-31, Figs. 3-7; Ex. 1007 ¶¶14-16, Fig. 3.

The POSITA would have been motivated to make each of modifications (a) and (b) by using the three-dimensional printing of Sclafani with the existing inner tube 5 (i.e., core) structure of Belykov and/or by reversing the threading of Belykov as described with respect to §VII(B) below. Ex. 1008 ¶¶92, 95-96. In each case, such modifications would prolong the life of the silencer 1, to reduce the cost for replacement (e.g., of the core) or refurbishment (e.g., of the suppressor), to increase the longevity of the silencer, and to allow for faster prototyping and more variable structures and materials of the inner tube 5 (i.e. core) of Belykov. Ex. 1008 ¶¶93-96. These benefits are achieved by making a stronger and replaceable core to optimize performance, weight, and cost, including by three-dimensionally printing and/or making the various discrete components of Belykov's inner tube 5 (i.e., core) assembly monolithic. Ex. 1008 ¶¶93-96, 156; Ex. 1007 ¶¶2-6, 7, 14-16.

Moreover, the POSITA would have also had a reasonable expectation of success when manufacturing at least the inner tube 5 (i.e., core) of Belykov using a three-dimensional printer as taught by Sclafani and making the inner tube 5 (i.e., core) removably attachable to the outer tube 3 (i.e., housing) based on the similarity in structure and purpose between Belykov and Sclafani's silencers, and the POSITA would have had a reasonable expectation that making the aforementioned modifications (a) and (b) would result in the improvements suggested by Sclafani. Ex. 1008 ¶¶97-99.

In addition, Belykov includes all of the features of claims 1 and 2, as discussed below, except, solely for purposes of this combination argument, having the inner tube associated components such as the sound impact plates 33, 53, 57, that is (a) printed with a three-dimensional printer and (b) removably attachable to the outer tube 3 (i.e., housing), which a POSITA could have combined with Belykov using known methods as taught by Sclafani with predictable results, and each of the combined elements merely performs the same function as it does separately. Ex. 1008 ¶¶100-105.

For substantially the same reasons, modifying Belykov to include the features (a) and (b) as taught by Sclafani would represent applying a known technique (i.e., Sclafani's printing and removability) to a known device (i.e., Belykov's silencer) ready for improvement to yield predictable results and

substitution of one known element for another to obtain predictable results. Ex. 1008 ¶¶106-108. The POSITA would also have been motivated to make the silencer core components (i.e., inner tube 5 and sound impact plates 33, 53, 57) monolithic and/or to reverse the threading of Belykov to attach the outer tube to the end caps based on the teachings of Sclafani, and the POSITA would have had a reasonable expectation of success. Ex. 1008 ¶¶111-113.

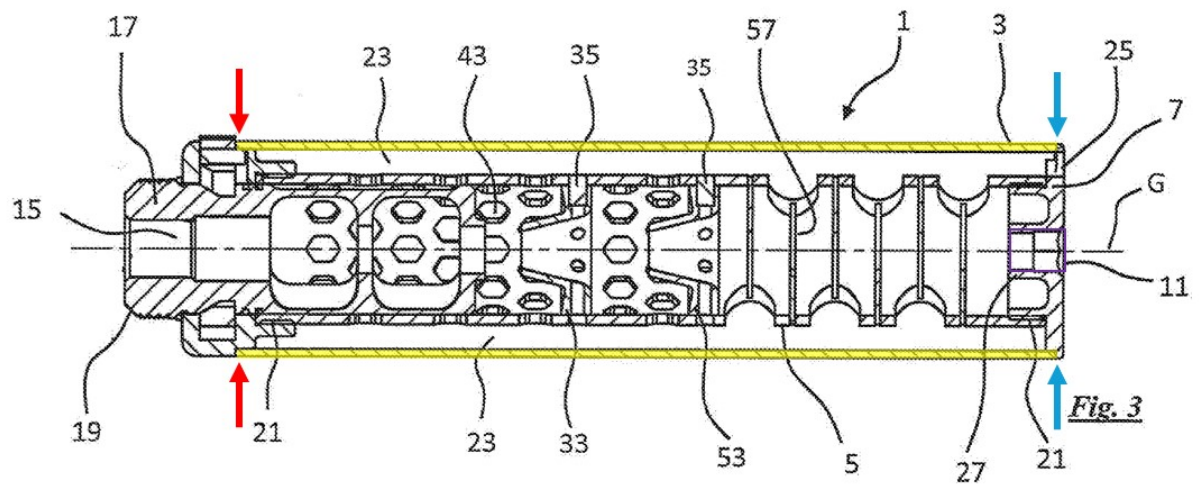
2. Claim 1

i. [1.PRE]

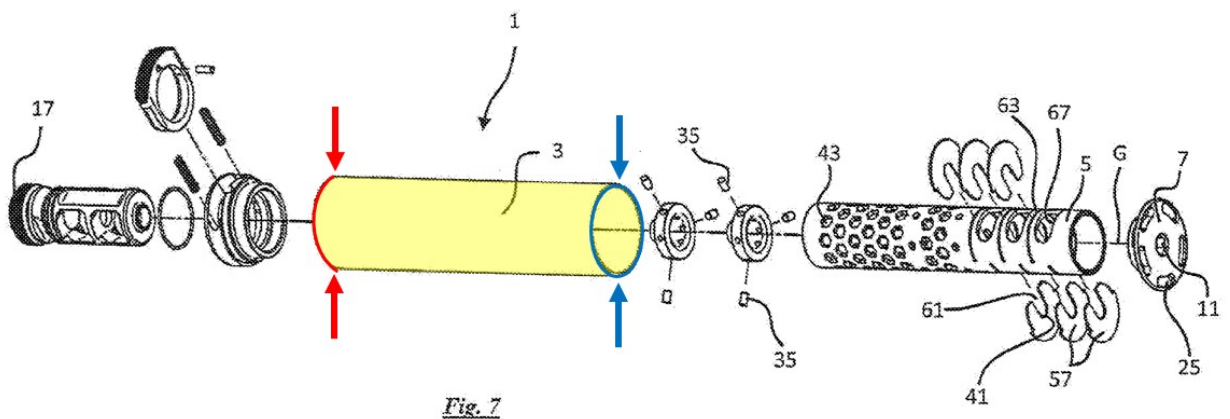
To the extent [1.PRE] is limiting, Belykov discloses that it “relates to a silencer for a firearm.” Ex. 1003 ¶1, 21-28, Figs. 1-7; Ex. 1008 ¶¶114. A POSITA would have understood that silencers and firearm suppression systems are simply two terms for the same device. Ex. 1008 ¶114.

ii. [1.1]

Referring to annotated Figs. 3 and 7 below, Belykov includes an outer tube 3 (i.e., housing) (yellow highlight) having a first end (red arrows) and a second end (blue arrows). Ex. 1003 ¶28, 31; Figs. 3, 7; Ex. 1008 ¶¶115-117.



Belykov, Fig. 3 (annotated)

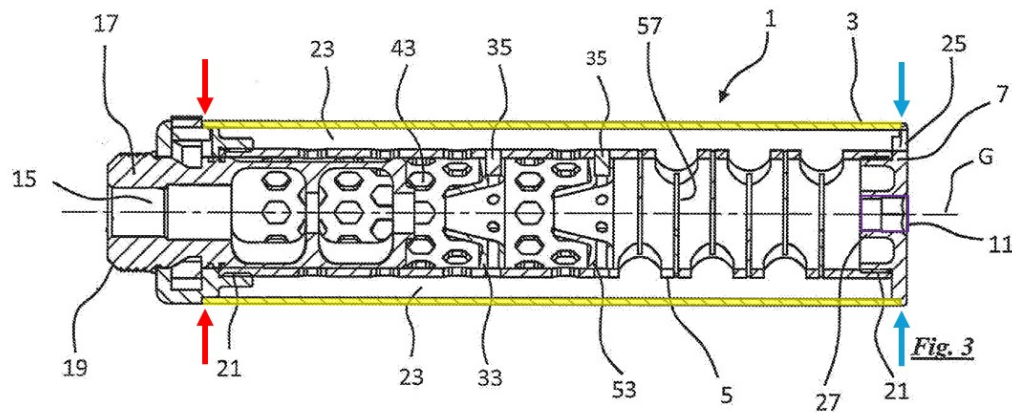


Belykov, Fig. 7 (annotated)

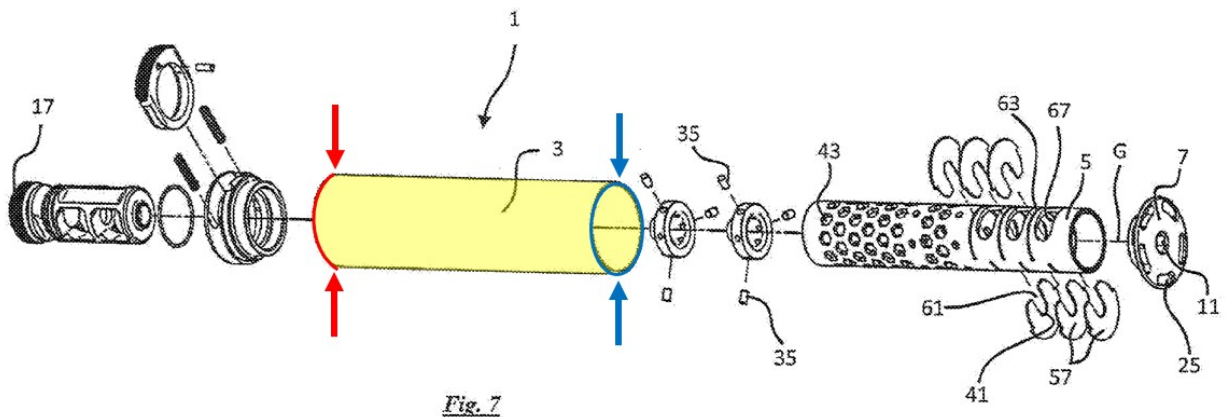
iii. [1.1a]

Referring to annotated Figs. 3 and 7 below, Belykov's outer tube 3 (i.e., housing) is described as possessing a "cylindrical cross-sectional shape" and includes a first aperture (red circle) at the first end (red arrows) and a second

aperture (blue circle) at the second end (blue arrows). Ex. 1003 ¶28, Figs. 3, 7; Ex. 1008¶ 118.



Belykov, Fig. 3 (annotated)



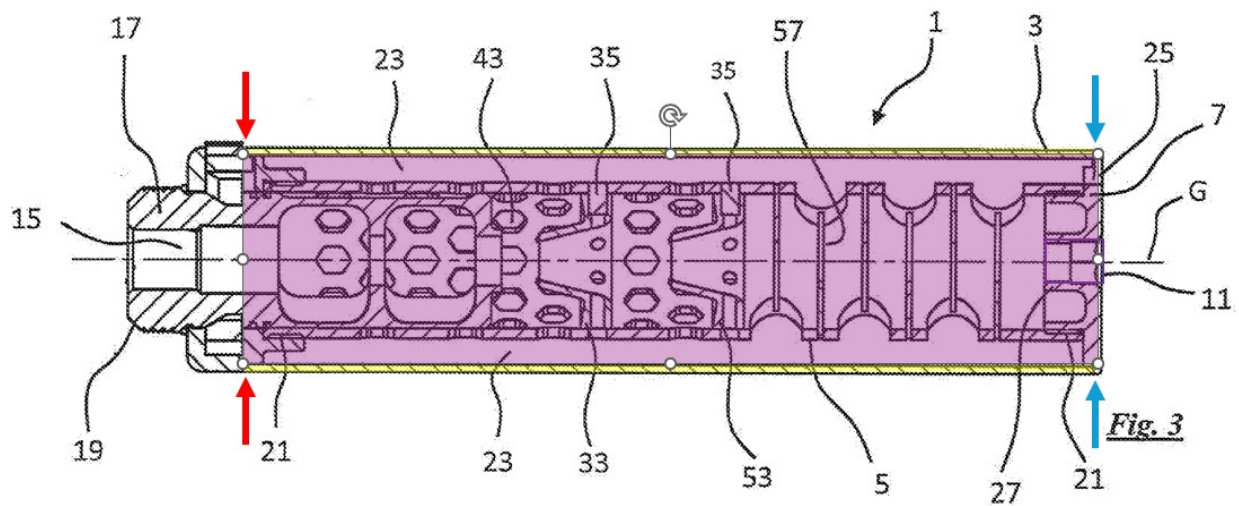
Belykov, Fig. 7 (annotated)

iv. [1.1b]

Referring to annotated Fig. 3 below, Belykov discloses an outer tube 3 (i.e., housing) (yellow highlight) that has an inner compartment (purple highlight) interposed between the first aperture (red arrow) and the second aperture (blue

arrow) with the tube having a “cylindrical cross-sectional shape[.]” Ex. 1003 ¶9, 28, Fig. 3; Ex. 1008 ¶¶119-122. Belykov discloses that “the annular space extends substantially over its entire length between the front walls, substantially gas permeable and/or barrier free” and that “[p]referably, *no radially protruding*, either arranged *on the inside of the outer tube* or on the outside of the inner tube, *radial annular space compartments* are provided.” Ex. 1003 ¶9, 28, Fig. 3 (emphasis added); Ex. 1008 ¶¶119-120, 122.

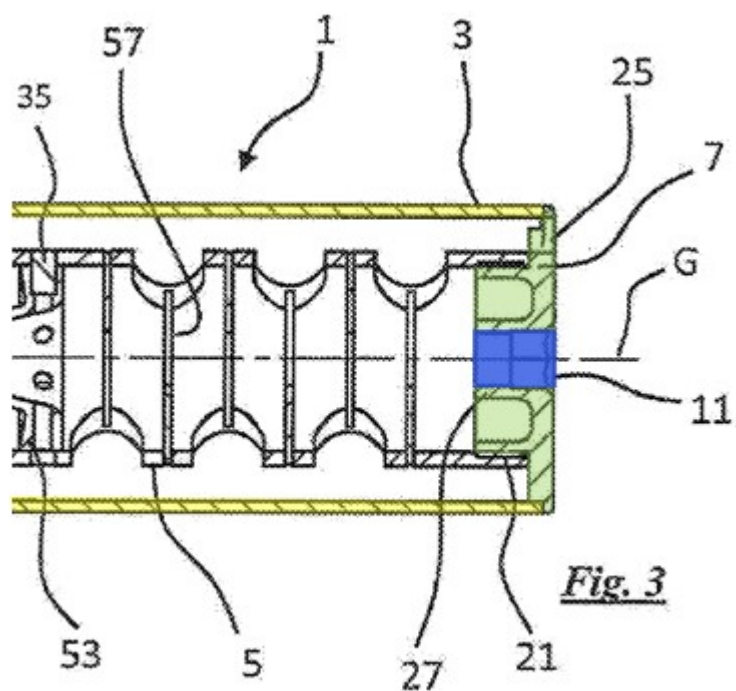
As additional confirmation, measuring the inner compartment (purple highlight) of Fig. 3 of Belykov confirms that the inner compartment has a rectangular cross-sectional shape, and, as depicted in Fig. 7, the outer tube 3 (i.e., housing) has a circular end. Ex. 1003 Figs. 3, 7; Ex. 1008 ¶¶121-122; *and see* MPEP 2125 (“Drawings and pictures can anticipate claims if they clearly show the structure which is claimed”) (*citing In re Mraz*, 455 F.2d 1069, 173 USPQ 25 (CCPA 1972)); *and Inergy Tech., Inc. v. Force Mos Tech. Co., Ltd.* IPR2024-00093, Paper 38 at 31 (PTAB May 16, 2025) (“a figure may be relied upon for what it clearly shows”).



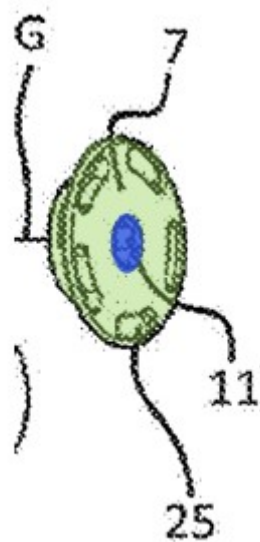
Belykov, Fig. 3 (annotated)

v. [1.2]

Referring to annotated Figs. 3 and 7 below, Belykov discloses a front end wall 7 (i.e., end cap, green highlight), which defines a projectile exit opening 11 (i.e., projectile aperture, blue highlight). Ex. 1003 ¶28, 30, Figs. 3, 7; Ex. 1008 ¶¶123-125.



Belykov, Fig. 3 (excerpt, annotated)

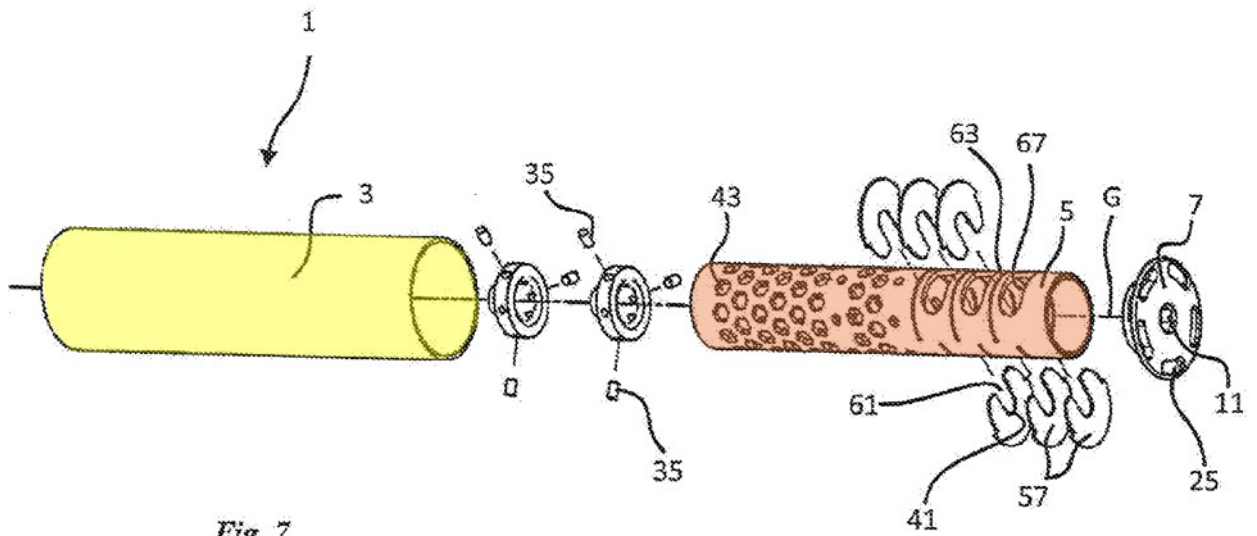


Belykov, Fig. 7 (excerpt, annotated)

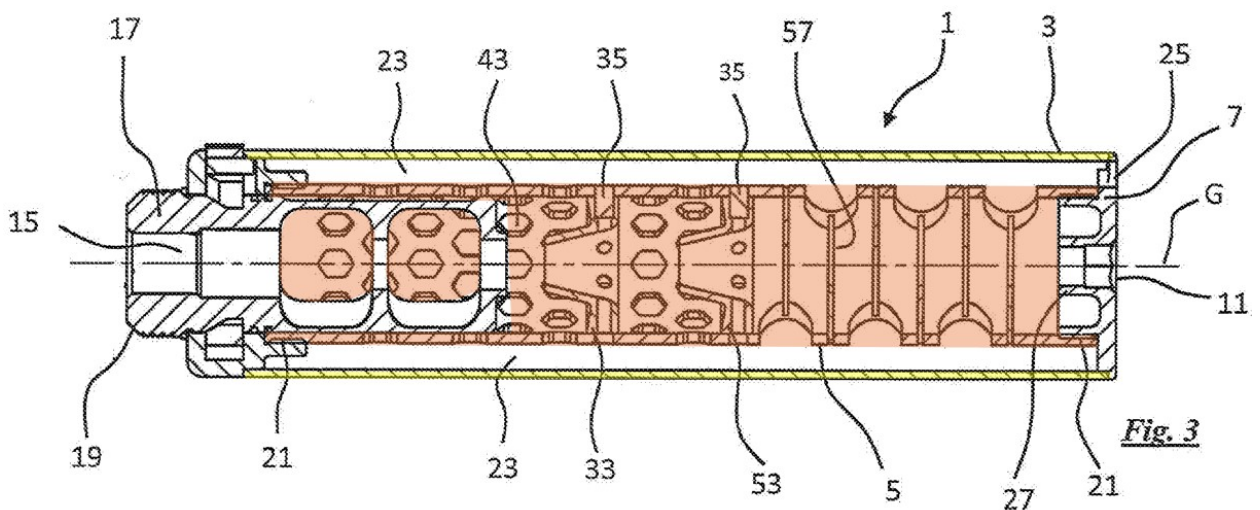
vi. [1.3]

Referring to annotated Figs. 3 and 7 below, Belykov discloses an inner tube 5 (i.e., core) (orange highlight) that is located on the “inside concentrically” to, and thus positioned within the outer tube 3 (i.e., housing) (yellow highlight). Ex. 1003 ¶30; Fig. 3; Ex. 1008 ¶¶126, 129. Belykov further discloses that the front end wall 13 and the end wall 7 (i.e., end cap) are each screwed to the inner tube 5 (i.e., core) via screw connections 21, and the outer tube 3 (i.e., housing) is “axially clamped” between the front end wall 13 and the end wall 7 (i.e., end cap). Ex. 1003 ¶28-29, Figs. 3, 7; Ex. 1008 ¶127. Belykov also discloses replaceable components (e.g., sound impact walls 57) that require separation of the inner tube 5 (i.e., core) and outer tube 3 (i.e., housing) to replace because they remove perpendicular to the axis of the inner tube. Ex. 1003 ¶16, 44-45, Figs. 3 and 7; Ex. 1008 ¶¶129-130.

The POSITA would have understood that these screw connections are removable attachments based on the disclosure of Belykov in view of common knowledge in the industry at the time. Ex. 1008 ¶128 (citing Ex. 1010 p. 17).



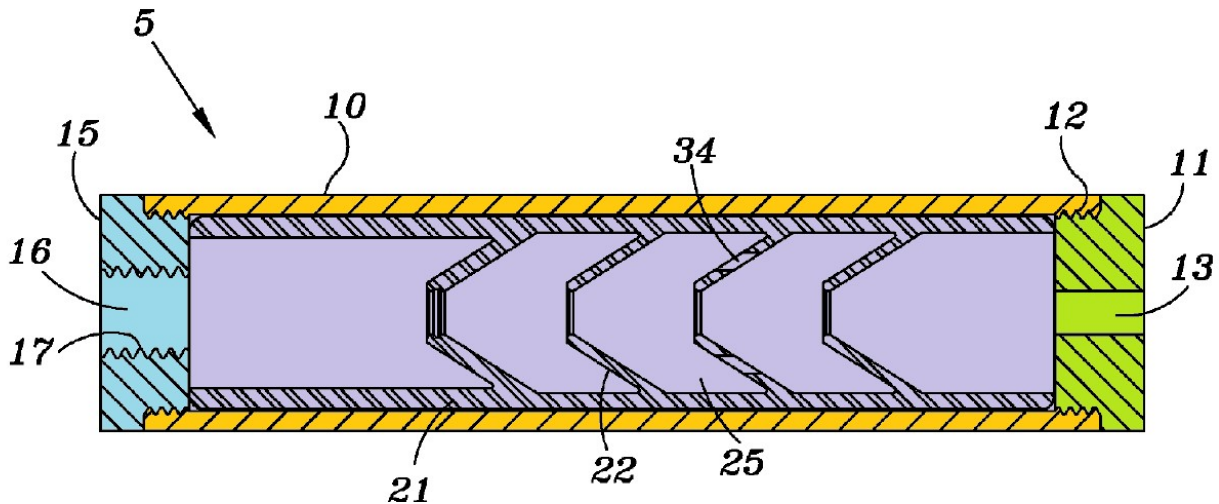
Belykov, Fig. 7 (excerpt, annotated)



Belykov, Fig. 3 (annotated)

To the extent it is argued that Belykov does not disclose Element [1.3], Sclafani discloses a removable core member 30 (i.e., core) positioned within a tubular housing 10 (i.e., housing) (Ex. 1007 ¶¶4-5, 7-8), and it would have been

obvious to modify Belykov to have an inner tube 5 (i.e., core) removably attachable to the outer tube 3 (i.e., housing) and positioned therein for the reasons discussed above. Ex. 1008 ¶¶131-133; Ex. 1007 ¶¶7-8, 14-15, Figs. 1-3; Ex. 1003 ¶¶28-29, Figs. 3, 6, 7; *see* Motivation to Combine.

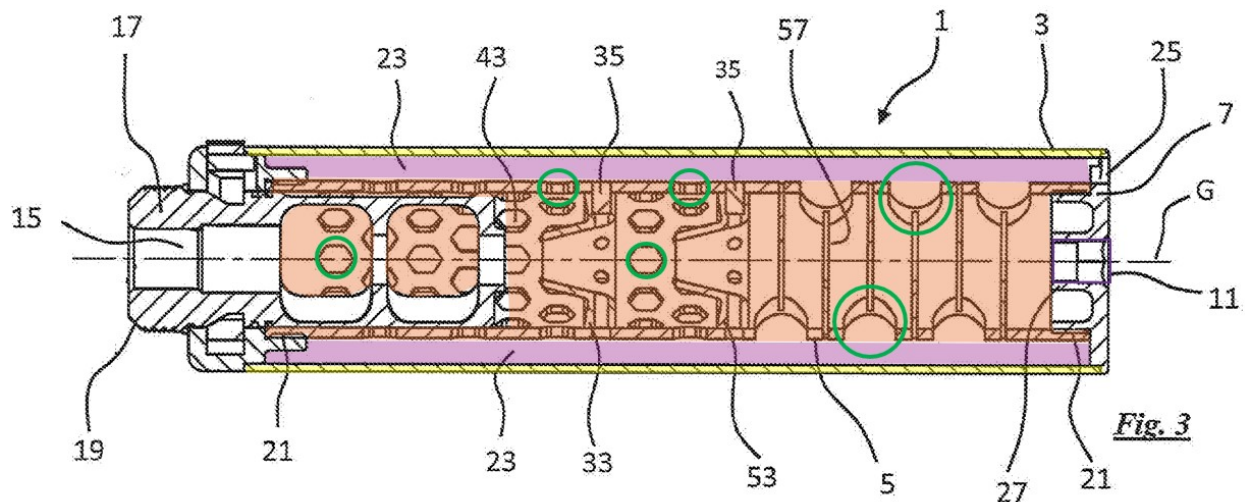


Sclafani, Fig. 3 (annotated)

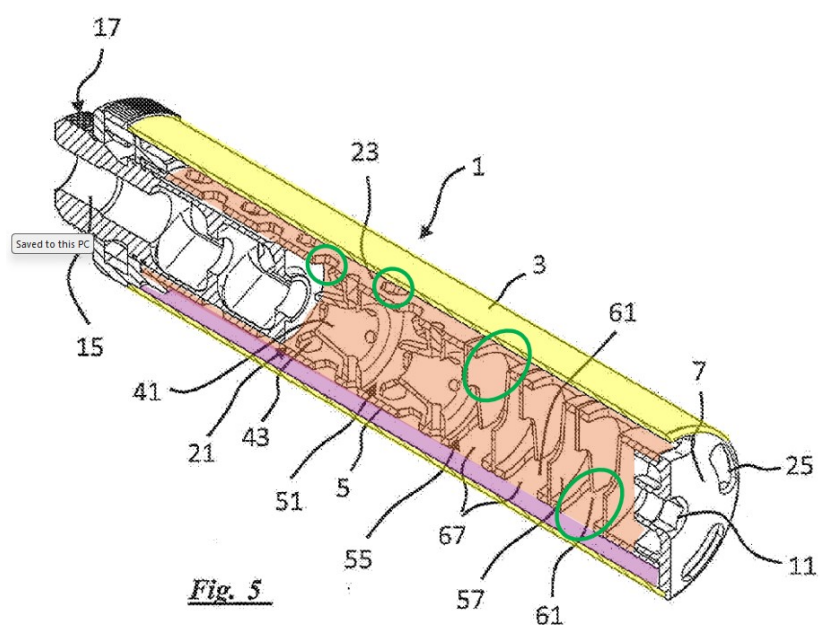
vii. [1.4]

Referring to annotated Figs. 3, 5, and 7 below, Belykov discloses that the inner tube 5 (i.e., core) (orange highlight) “is provided with a plurality of honeycomb cell-shaped exchange openings 43 [i.e., core apertures] which enable a gas transfer between the projectile channel 45 being margined by the inner tube 5, in particular of the channel expansion chamber 31, and the annular space 23.” Ex. 1003 ¶34; Ex. 1008 ¶¶134, 137-138. Belykov also discloses axial bypass openings 61 (i.e., core apertures) that radially end in the projectile passage opening 41 and

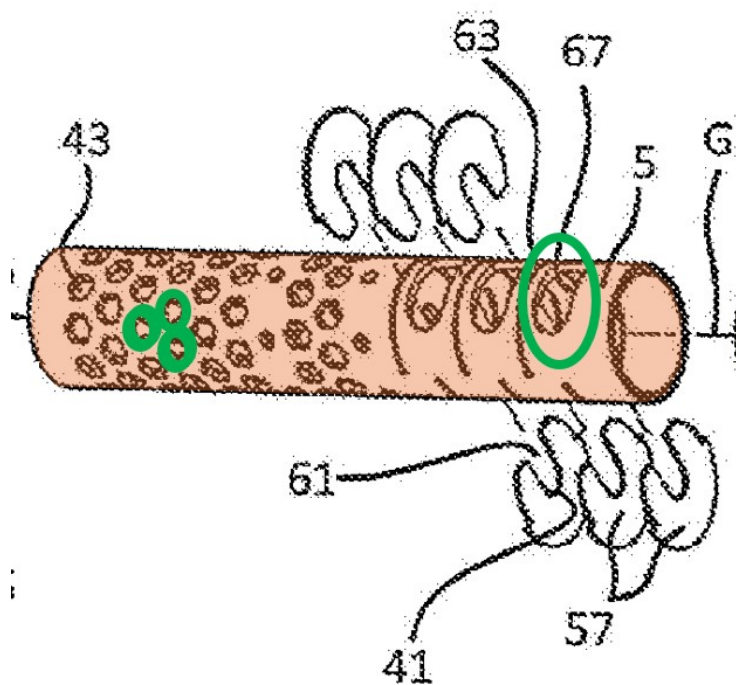
second exchange openings 67 (i.e., core apertures) that are formed in the inner tube 5 (i.e., core), each being radially opposite an axial bypass opening 61. Ex. 1003 ¶47; Ex. 1008 ¶¶134-135, 137-138. Each of these openings 43, 61, 67 (i.e., core apertures) (green circles on an exemplary subset of the openings shown below) is formed on an outer surface of the inner tube 5 (i.e., core) and allows communication to an annular space 23 (i.e., channel) (purple highlight) between the inner surface of the outer tube 3 (i.e., housing) (yellow highlight) and the outer surface of the inner tube 5 (i.e., core). Ex. 1003 ¶¶2, 48, Figs. 3, 5, 7; Ex. 1008 ¶¶134-138.



Belykov, Fig. 3 (annotated)



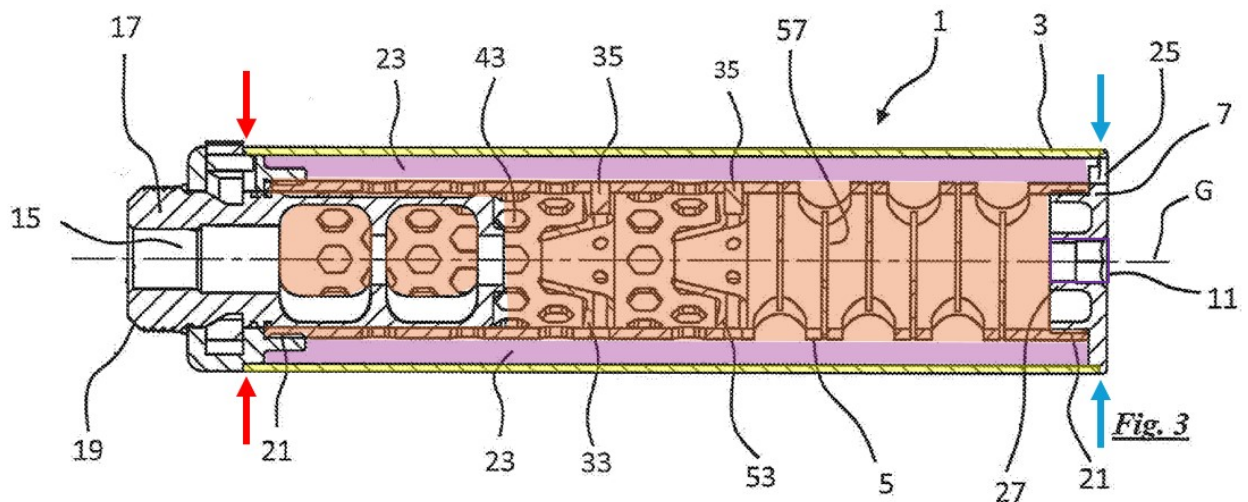
Belykov, Fig. 5 (annotated)



Belykov, Fig. 7 (excerpt, annotated)

viii. [1.5]

Referring to annotated Fig. 3 below, the annular space 23 (i.e., channel) (purple highlight) extends the full circumference around the inner tube 5 (i.e., core) (orange highlight) in addition to extending from at least the first end (red arrows) and to the second end (blue arrows) of the outer tube 3 (i.e., housing) (yellow highlight) without radial barriers or wall indentations. Ex. 1003 ¶31-32, Fig. 3; Ex. 1008 ¶139-141.

**Belykov, Fig. 3 (annotated)**

Belykov's annular space 23 (i.e., channel) equalizes pressure that begins at the first end of the housing and terminates at the second end of the housing, for example, based on the quantity and locations of the openings (e.g., openings 43, and bypass openings 61) and the disclosure of the annular space 23 between the inner tube 5 and the outer tube (i.e., housing) allowing gas to flow in the openings

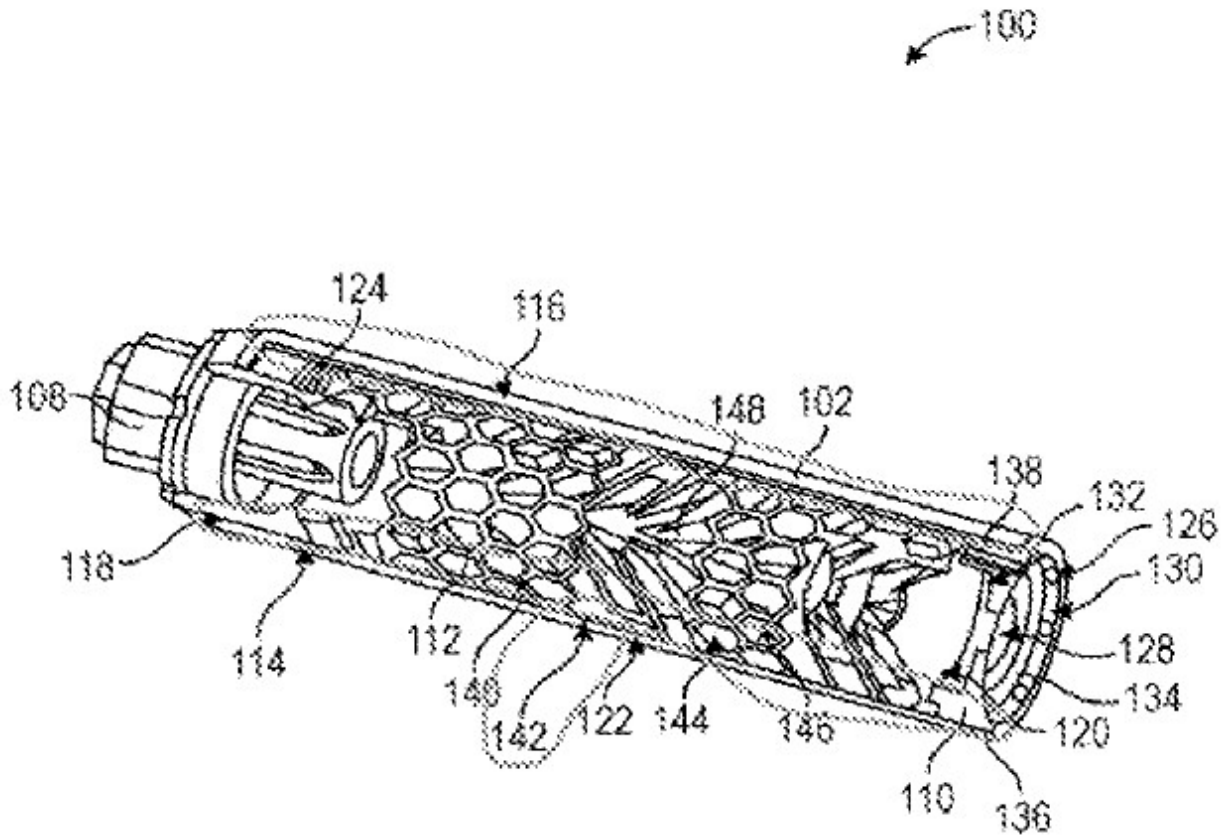
43, 61, 67 and out the “pressure release mechanism” of the vent openings 25 at the front end wall 7 (i.e., end cap) with the annular space 23 (i.e., channel) being unimpeded along its length. Ex. 1003 ¶¶5, 7, 34, 47, Fig. 3; Ex. 1008 ¶¶140-143.

The POSITA would have understood that gas generally travels from regions of higher pressure to regions of lower pressure. Ex. 1008 ¶143. As such, to “equalize” pressure, Belykov’s regions of higher pressure are fluidically connected to the regions of lower pressure, and Belykov’s explicit disclosure of the annular space (providing communication between the exchange openings and venting openings) serving as a “pressure release mechanism” shows that Belykov’s annular space 23 (i.e., channel) that circumscribes the outer surface of the inner tube 5 (i.e., core) would equalize pressure that begins at the first end of the housing and terminates at the second end of the housing. Ex. 1008 ¶143; Ex. 1003 ¶¶5, 7, 34, 47, Fig. 3.

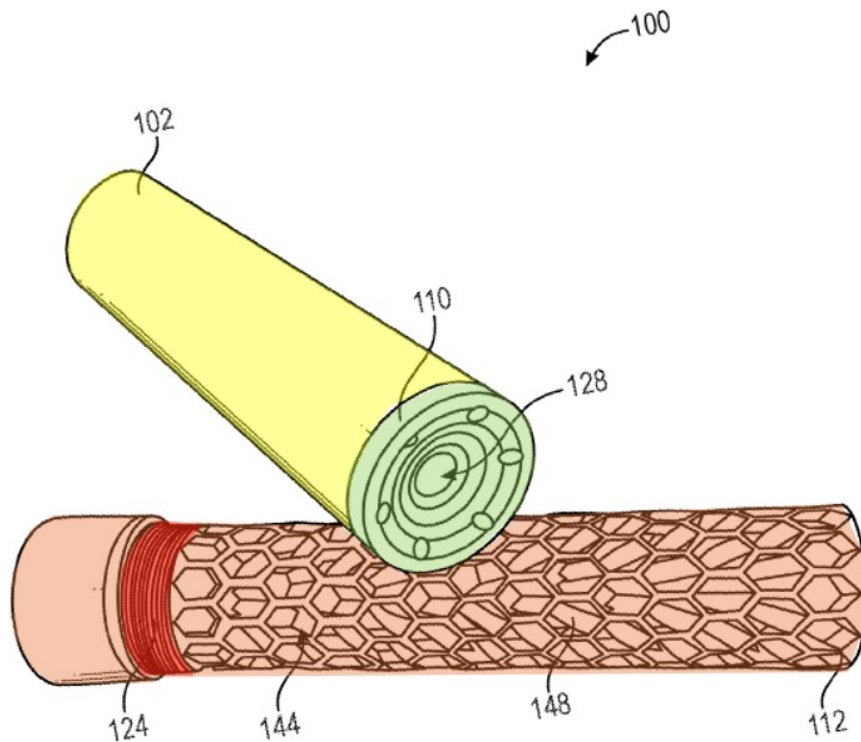
To the extent it is argued that Belykov does not include the features of Element [1.5], the structure and purpose of Belykov’s annular space 23 (i.e., channel) corresponds to the structure and purpose of the channel 142 of the ’906 patent, which the ’906 patent describes as performing the claimed equalization function, such that the annular space 23 of Belykov also equalizes pressure that begins at the first end of the housing and terminates at the second end of the housing. Ex. 1008 ¶¶144-151; Ex. 1001 6:62-34, 7:22-25, Fig. 2. For example, the

'906 patent's channel is between the core 112 and the housing 102, and the core apertures 144 of the '906 patent are dispersed along a substantial length of the core 112 "that allow gas passing from the projectile and operating system to pass to the channel 142." Ex. 1001 6:62-34, 7:22-25, Fig. 2; Ex. 1008 ¶¶144-148.

In the Response to the Office Action dated February 16, 2024, Patent Owner cited to the preceding passage from its specification for support for the amendment that included Element [1.5] and asserted that "[t]he following screenshot of Fig. 2 illustrates the channel 142 that is positioned between the housing and the core and that circumscribes the core, running the entire length of the core." Ex. 1002 p. 104; Ex. 1008 ¶¶145-146. This annotated Fig. 2 and annotated Fig. 3 below show that the device of the '906 patent includes a threaded fastener 124 (red highlight) connecting the core 112 (orange highlight) to the housing 102 (yellow highlight) at the first end 104 and includes a sidewall 138 that "may be threaded" to the inner surface 114 of the housing 102. Ex. 1001 6:39-42, Fig. 2; Ex. 1008 ¶¶145-146. Thus, even with a portion of the length of the housing 102 connected to the core 112 via threads and unable to receive gas pressure therein, the '906 patent specification and the Patent Owner have stated that this is sufficient for equalizing pressure that begins at a first end of the housing and terminates at the second end of the housing. *See* Ex. 1002 p. 104; Ex. 1008 ¶¶145-151.



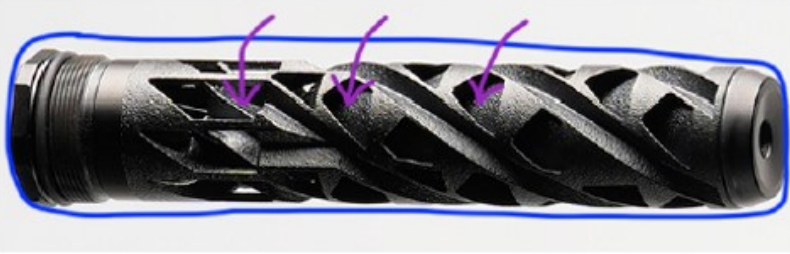
**Annotated Fig. 2 of the '906 patent (annotated by Patent Owner in the
Response to the Office Action dated February 16, 2024)**



'906 Patent, Annotated Fig. 3

Belykov, with reference to annotated Fig. 3 above, states that its annular space extends “over the entire axial length of the silencer” (Ex. 1003 ¶5), such that the annular space 23 (i.e., channel) (purple highlight) covers at least the same length of the outer tube 3 (i.e., housing) as the '906 patent's channel extends relative to its housing. Ex. 1008 ¶¶119, 147-151.

For further avoidance of doubt, Patent Owner believes and asserted in a claim chart (excerpt provided below) that a suppressor design that allows a “core to slide into the housing” would *inherently* include a channel meeting the requirements as recited in claim 1. Ex.1011 p. 32; Ex. 1008 ¶¶152-153.

<p>a core removably attachable to the housing and positioned therein, wherein the core comprises a plurality of core apertures on an outer surface that allow gas passing from a projectile and cartridge to pass to a channel between the inner surface of the housing and an outer surface of the core, the channel circumscribes the outer surface of the core and equalizes pressure that begins at the first end of the housing and terminates at the second end of the housing.</p>	 <p>Company's Suppressor includes a core (blue), a plurality of core apertures (purple arrows), and a channel. While the channel is not shown, it is inherent in the design so as to allow Company's core to slide into the housing. As such, a channel surrounds the core and is positioned between an outer surface of the core and an inner surface of the housing/shell.</p>
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core apertures (purple arrows), and a channel. While the channel is not shown, it is inherent in the design so as to allow Company's core to slide into the housing. As such, a channel

Patent Owner's Claim Chart (excerpt, annotated)

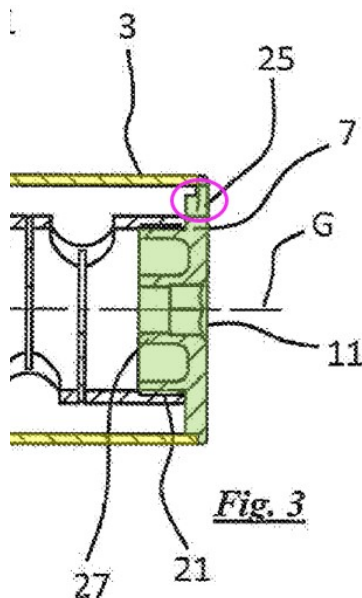
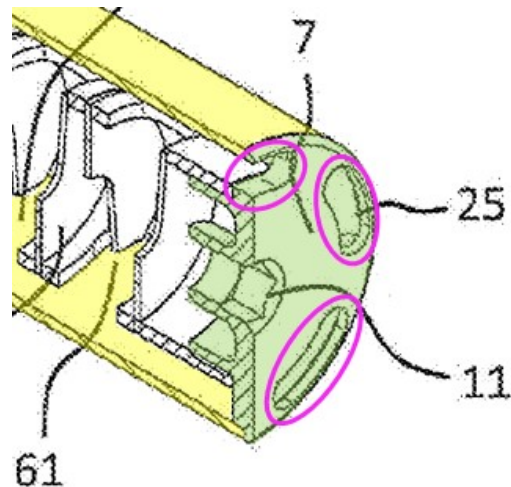
The Belykov silencer 1 features an inner tube 5 (i.e., core) that slides into an outer tube 3 (i.e., housing). Ex. 1003 Fig. 7; Ex. 1008 ¶¶152-153. As such, according to Patent Owner's definition, the Belykov device would have a channel 23 that surrounds (i.e., circumscribes) the core, is positioned between the outer surface of the core and the inner surface of the housing/shell, and equalizes pressure that begins at the first end of the housing and terminates at the second end of the housing. Ex. 1008 ¶¶152-153; Ex. 1003 Fig. 3; Ex. 1011 p. 32.

3. Claim 2

Sclafani discloses that the core member 30 (i.e., core) “may be formed by a three-dimensional printer such that the core member consist [sic] of a one piece, monolithic and homogeneous body.” Ex. 1007 ¶7, 14, Abstract; Ex. 1008 ¶154-156; *see* Motivation to Combine.

4. Claim 3

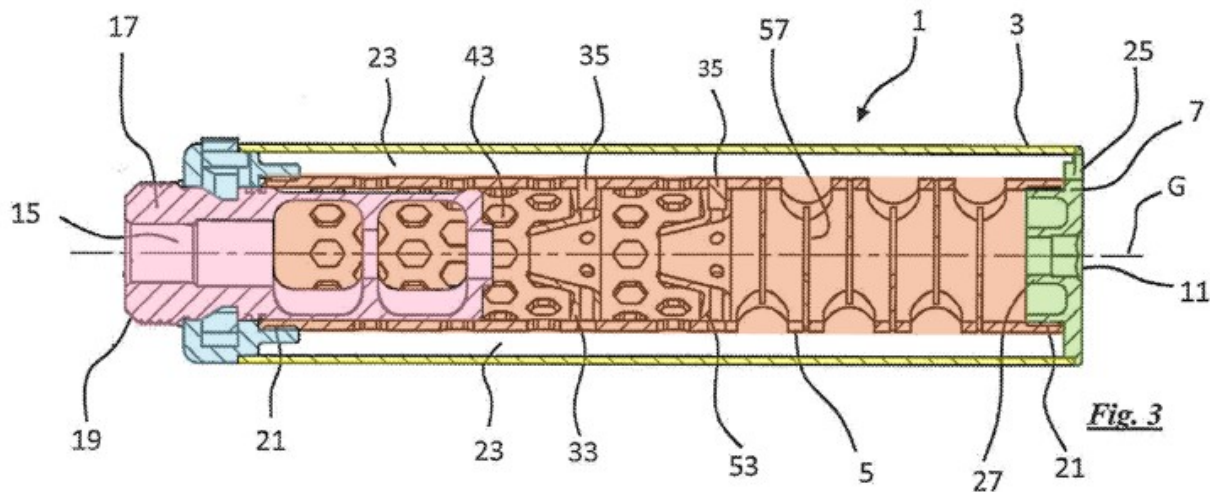
Belykov discloses an end wall 7 (i.e., end cap) (green highlight) having a plurality of venting openings 25 (i.e., vent apertures) (purple circles) as shown in annotated excerpts of Figs. 3 and 5 below. Ex. 1003 ¶32, Figs. 3, 5; Ex. 1008 ¶¶157-158.



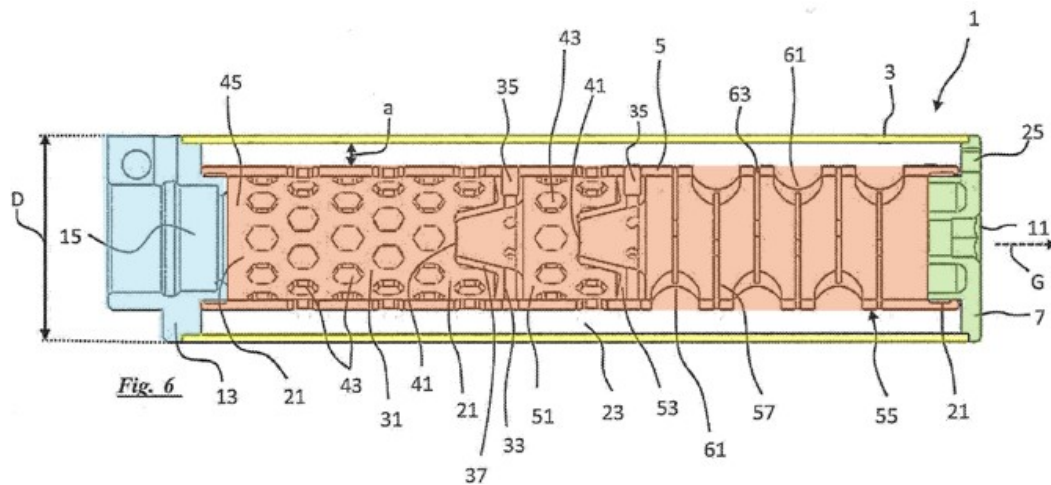
Belykov, Fig. 3 (excerpt, annotated) Belykov, Fig. 5 (excerpt, annotated)

5. Claim 4

Comparing annotated Figs. 3 and 6 below, Belykov discloses a “face wall 13” (blue highlight in Fig. 6) that couples to a firearm and alternatively discloses that the face wall 13 can be replaced with a detachable fastening device (unlabeled in the figures) (blue highlight in Fig. 3) that engages a muzzle brake 17 (pink highlight) (pink highlight). Ex. 1003 ¶28, Figs. 3, 6; Ex. 1008 ¶159-160.



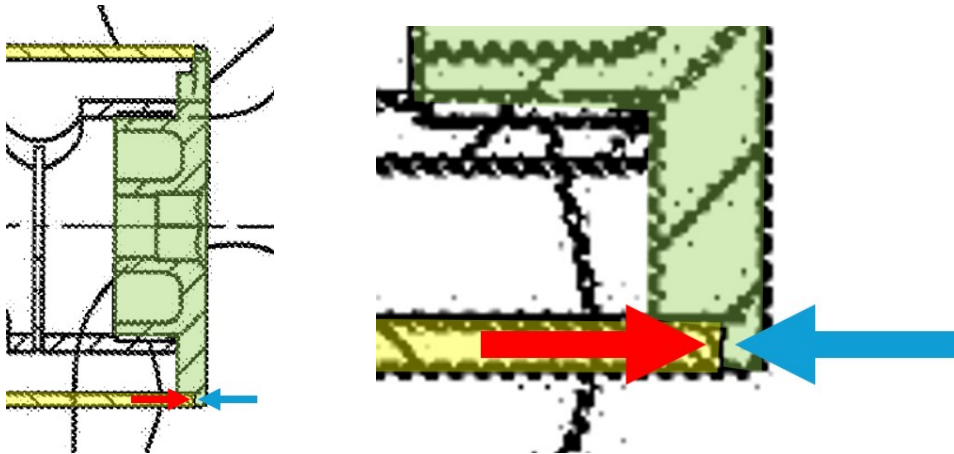
Belykov, Fig. 3 (annotated)



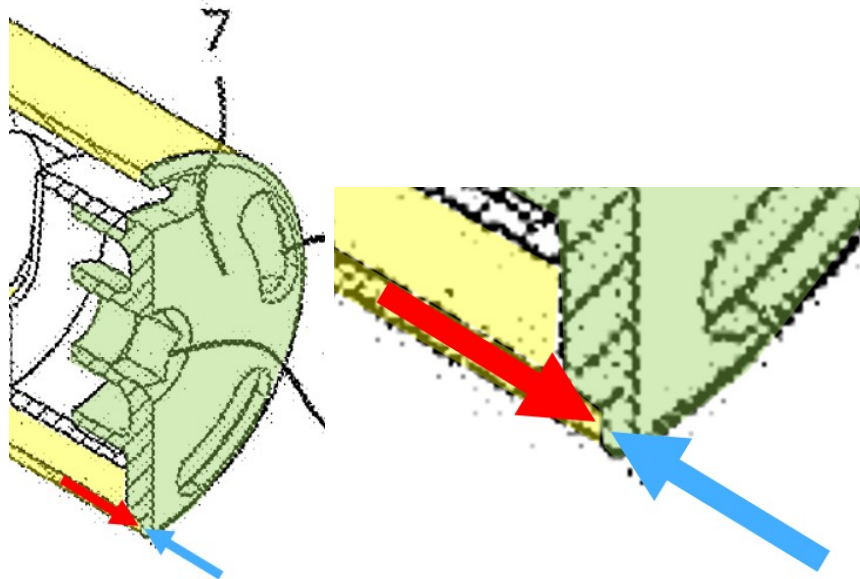
Belykov, Fig. 6 (annotated)

6. Claim 5

As shown in the annotated excerpts of Figs. 3 and 5, below, Belykov discloses a front end wall 7 (i.e., end cap) (green highlight) and an outer tube 3 (i.e., housing) (yellow highlight) that comprises a second end (red arrow), with the outer tube 3 (i.e., housing) being “axially clamped” by the front end wall 7 and a second end wall (i.e., end wall 13) at the opposing end. Ex. 1003 ¶29, Figs. 3, 5; Ex. 1008 ¶161-162.



Belykov, Fig. 3 (excerpts, annotated)

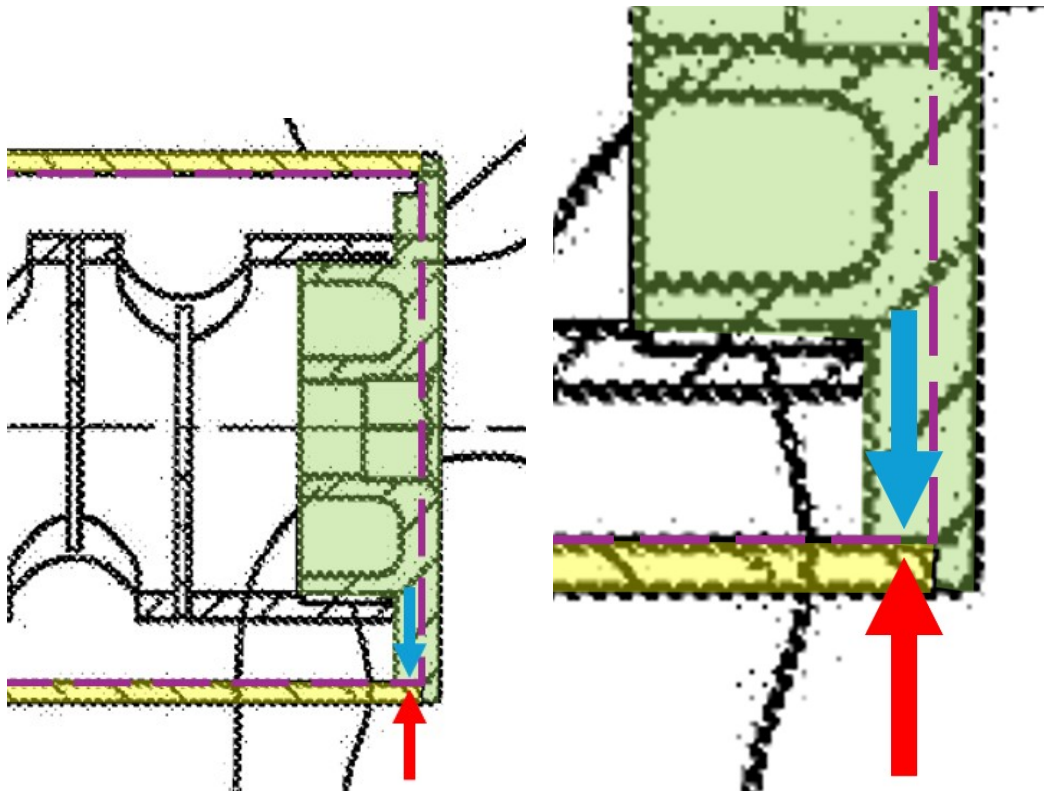


Belykov, Fig. 5 (excerpts, annotated)

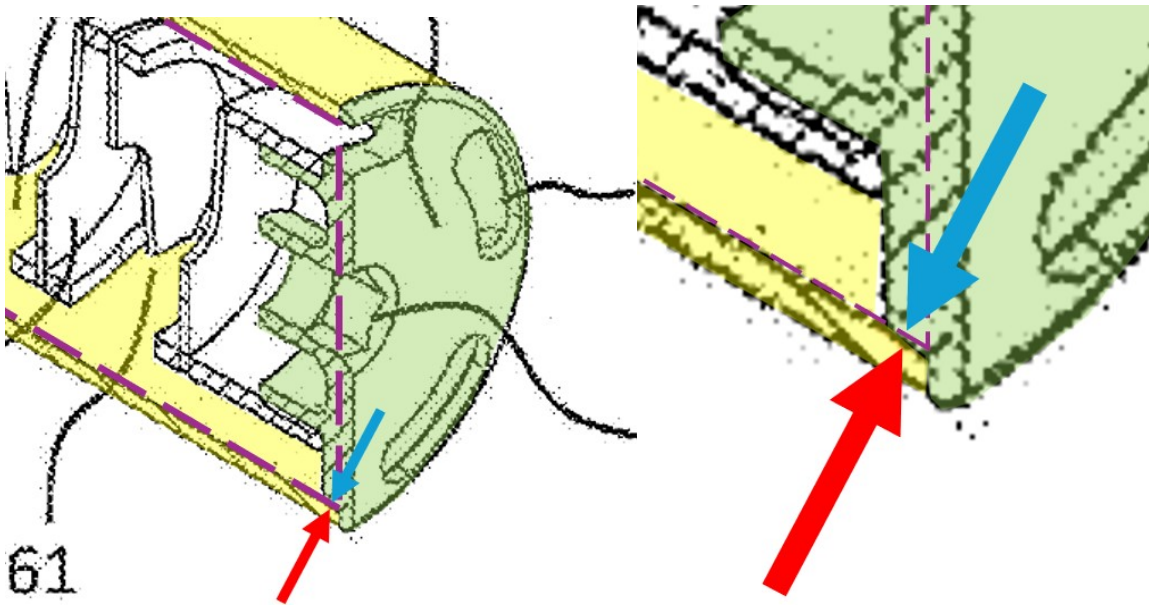
Referring to the annotated excerpts of Figs. 3 and 5, and as is used to perform the axially clamping described above, the front end wall 7 (i.e., end cap) includes a radially-extending flange (i.e., ledge) (indicated by the blue arrow). Ex. 1003 ¶29, Figs. 3, 5; Ex. 1008 ¶161-164.

7. *Claim 6*

Referring to the annotated excerpts of Figs. 3 and 5 below, the front end wall 7 (i.e., end cap) (green highlight) has a sidewall (blue arrow) resting against the inner surface (red arrow) of the outer tube 3 (i.e., housing) within the inner compartment (purple dashed lines). Ex. 1003 ¶¶29, Figs. 3, 5; Ex. 1008 ¶¶165-168.



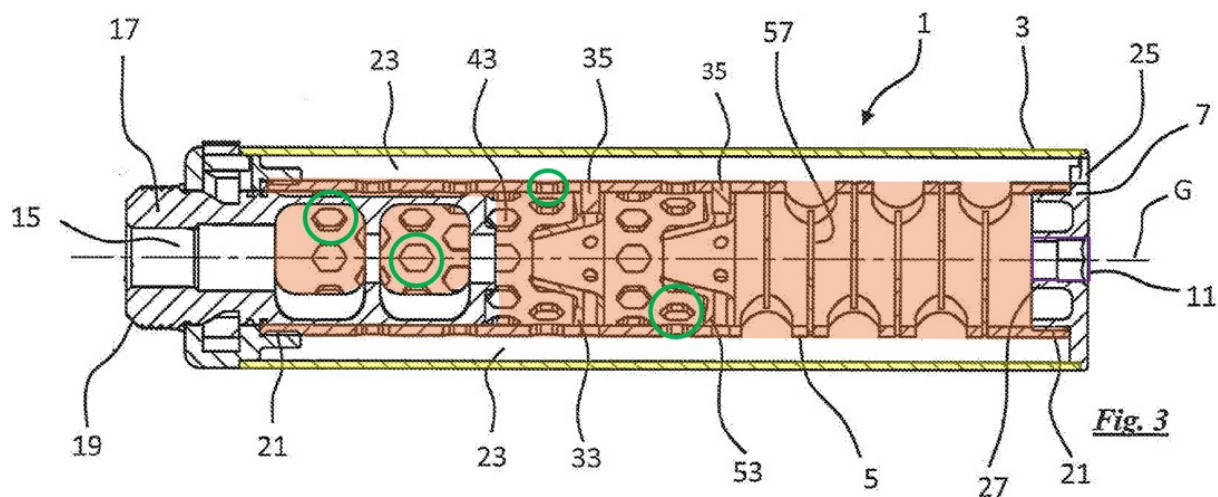
Belykov, Fig. 3 (excerpts, annotated)



Belykov, Fig. 5 (excerpts, annotated)

8. *Claim 9*

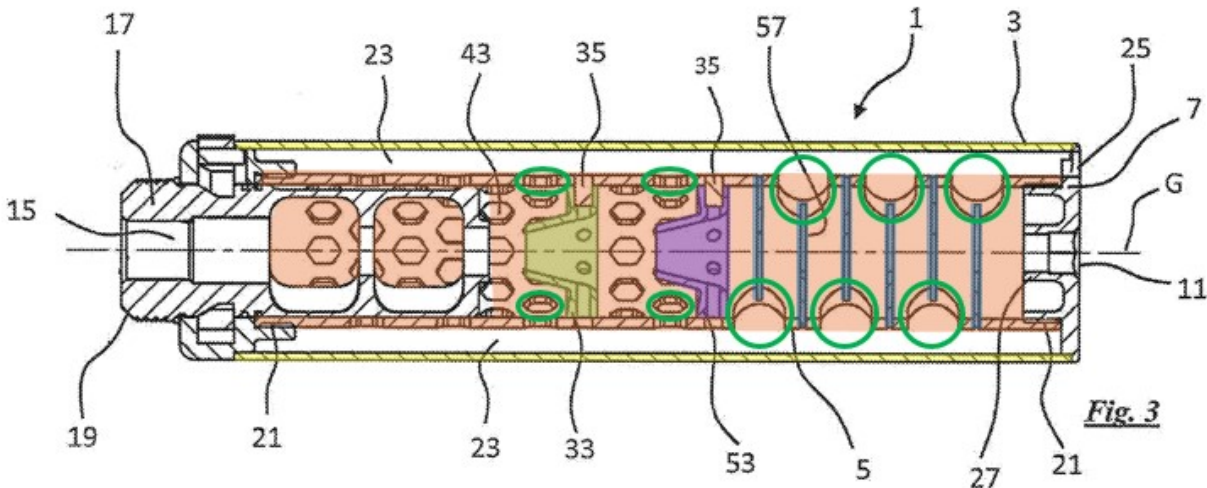
Belykov discloses that the exchange openings 43 (examples green highlight) have a “special honeycomb hexagonal shape”. Ex. 1003 ¶2, 39, 48; Ex. 1008 ¶¶169-170.



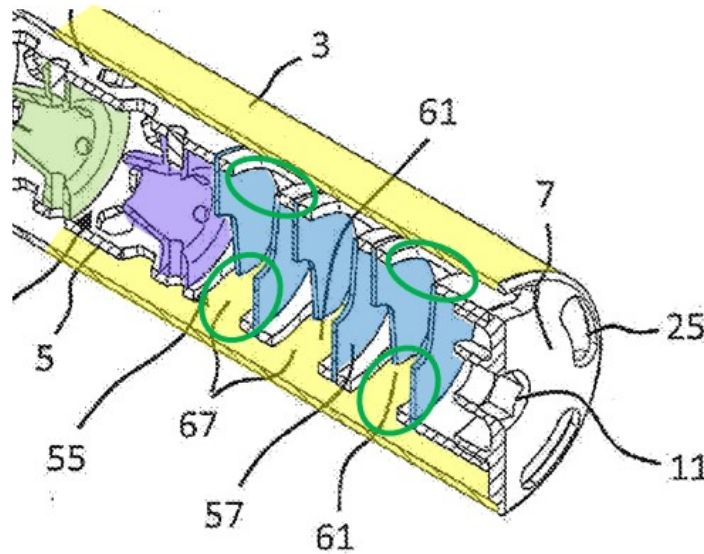
Belykov, Fig. 3 (annotated)

9. Claim 10

Belykov discloses a core that comprises openings 43, 61, 67 (i.e., a plurality of core apertures) (green circles on an exemplary subset of the openings shown below). Ex. 1003 ¶2, 39, 48, Figs. 3, 5; Ex. 1008 ¶¶171. Referring to annotated Figs. 3 and 5 below, Belykov further discloses sound impact walls 33, 53, 57 (i.e., baffles) (green highlight, purple, and blue respectively) interacting with these openings (i.e., core apertures). Ex. 1003 ¶¶41, 43, 44; Figs. 3, 5; Ex. 1008 ¶¶171-176.



Belykov, Fig. 3 (annotated)



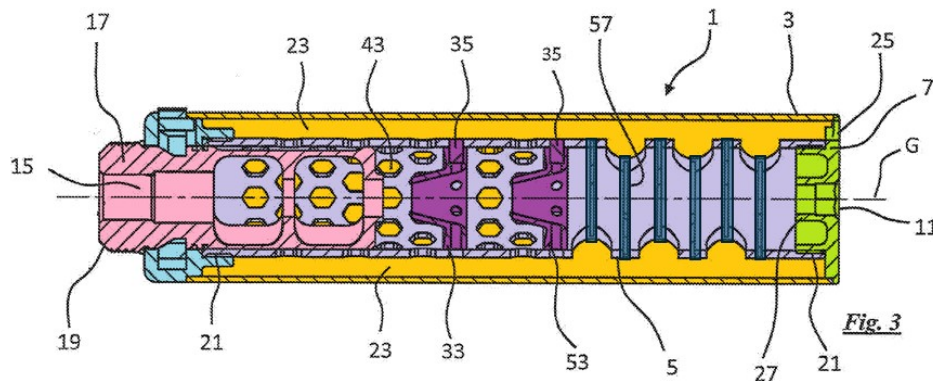
Belykov, Fig. 5 (excerpt, annotated)

Belykov's sound impact walls 33, 53 (i.e., baffles) are disposed adjacent the exchange openings 43 (i.e., a plurality of core apertures) and divert propellant gas through the openings, and Belykov discloses that the third sound impact walls 57 (i.e., baffles) (blue highlight) redirect propellant gas out of the openings 61, 67 (i.e., a plurality of core apertures). [Ex. 1003 ¶¶43, 47-48; Ex. 1008 ¶¶174-176.]

10. Claim 11

The POSITA would have understood that the plain and ordinary meaning, in light of the specification of the '906 patent, of the baffles being "extruded inwardly" refers to the direction toward the shooter (e.g., aft towards the firearm muzzle) and/or radially inward towards a center axis. Ex. 1008 ¶¶177-178; Ex. 1001 6:26-29; 10:51-53. Belykov's third sound impact walls 57 (i.e., baffles) (blue highlight) are extruded radially inward.

Referring to annotated Fig. 3 below, Belykov discloses that “[t]he first sound impact plate 33 [...] extends *from the inside of the inner tube 3* in a first arm section *radially to the inside* to which a central section 37 is connected which is designed *as a funnel*” and “extends in a tapering manner *contrary to the projectile flight direction G* to the front wall 13 and defines coaxially a first passage opening 41.” Ex. 1003 ¶¶34, 41 (emphasis added); Ex. 1008 ¶¶179. Said differently, the funnel shape of the first sound impact plates 33 (and the identical second sound impact plate 53) (i.e., baffles) (highlighted in dark purple) extends both radially towards the center axis of the silencer 1 (e.g., firearm suppression system) and rearward (i.e., inwardly) towards the muzzle end of the suppressor. Ex. 1008 ¶¶177-179; Ex. 1003 ¶¶34, 41, Fig. 3.



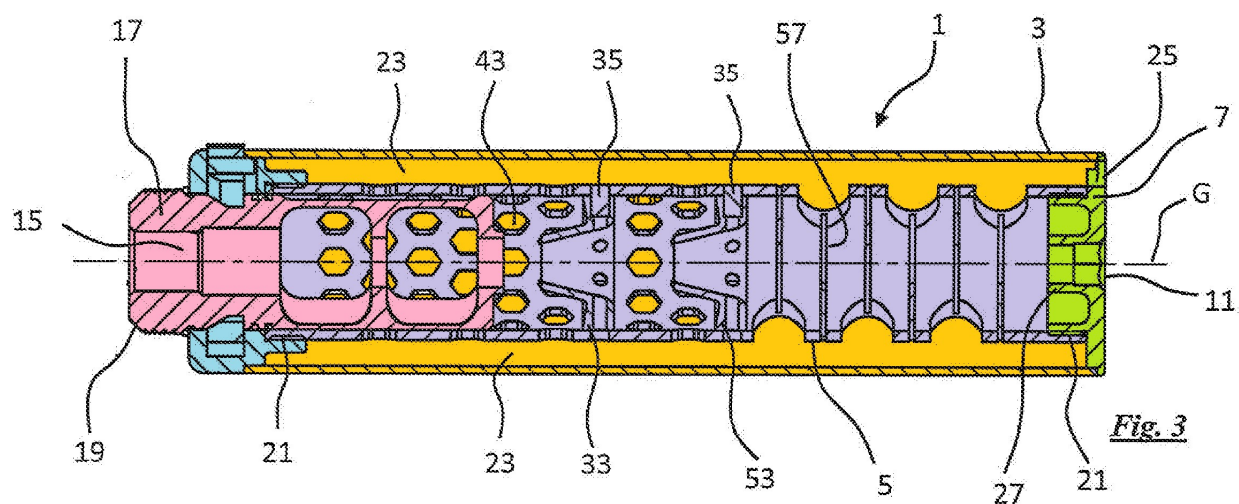
Belykov, Fig. 3 (annotated)

B. Ground 2: Claims 6 and 7 are rendered obvious by Belykov in view of Sclafani and Noonan

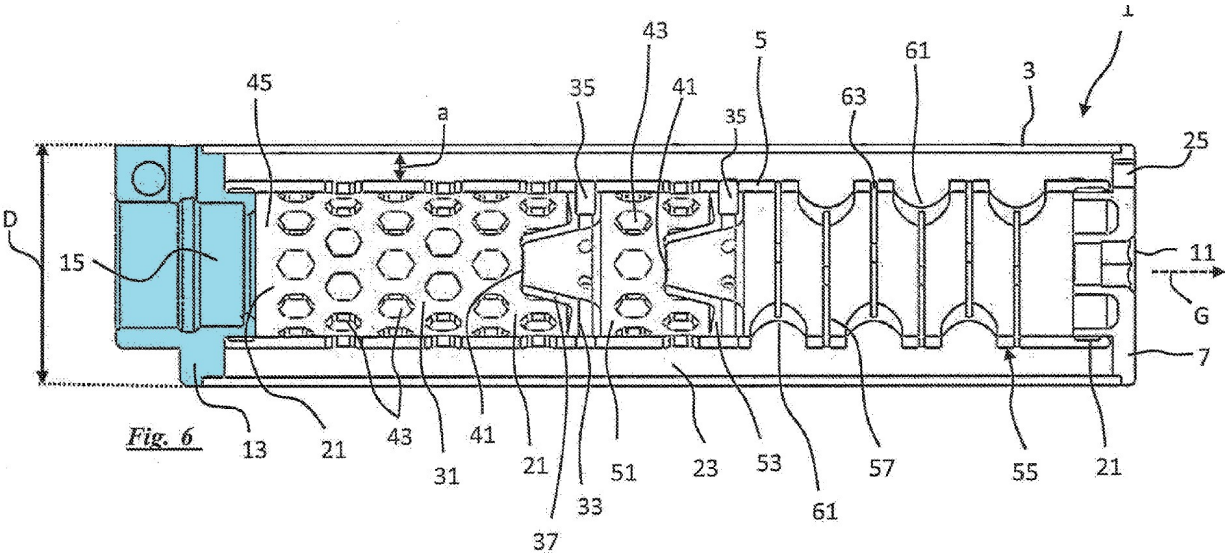
1. Motivation to Combine Belykov, Sclafani, and Noonan

The POSITA would have been motivated to combine Belykov and Sclafani for the reasons provided above in Ground 1. *See supra* §VII §VII(A)(1), *see also* Ex. 1008 ¶¶92-113. Moreover, the POSITA would have been motivated to combine Belykov, Sclafani, and Noonan, and the POSITA would have had a reasonable expectation of success in the combination. Ex. 1008 ¶¶181-197.

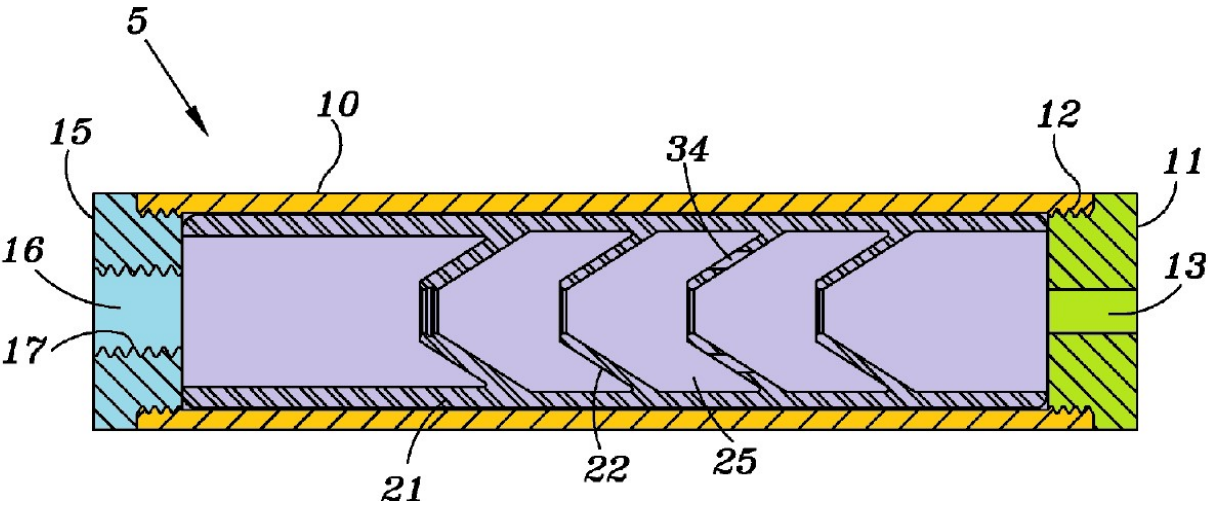
Noonan and Sclafani, on the one hand, and Belykov, on the other hand, are threaded inversely to each other, with the outer tube 15 (i.e., housing) of Noonan being threaded to the end caps 25, 30, and Belykov and Sclafani being threaded as discussed in Ground 1. *See supra* §VII §VII(A)(1), Ex. 1004 3:42-47, Fig. 3c; Ex. 1007 ¶¶12-15, Fig. 3; Ex. 1003 ¶28-29, Figs. 3-7, *see also* Ex. 1008 ¶¶182-184.



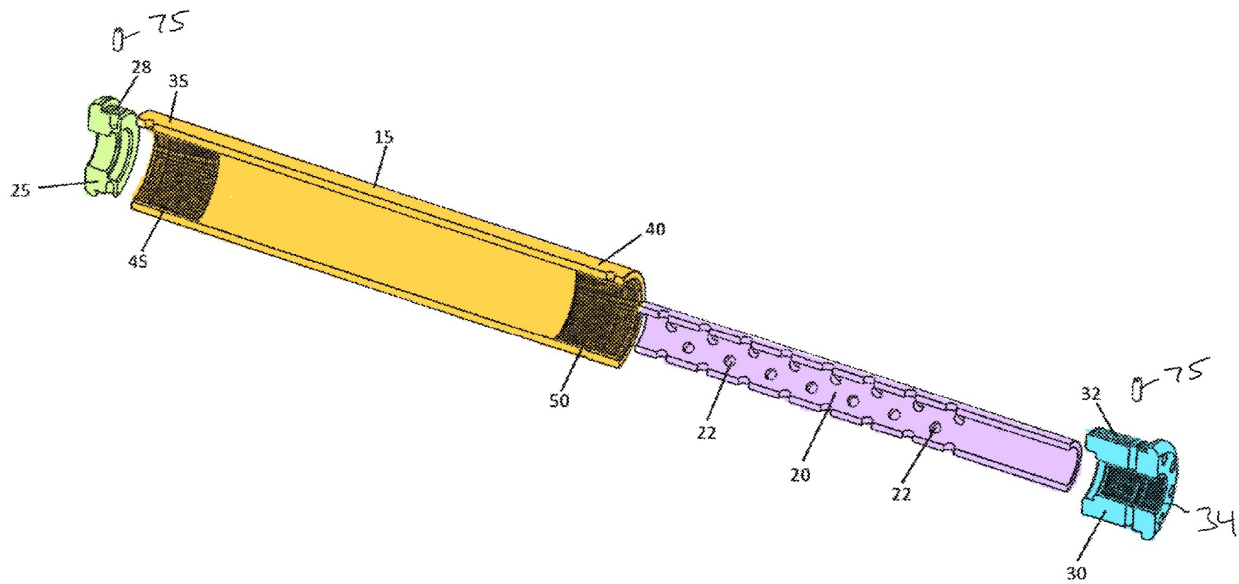
Belykov, Fig. 3 (annotated)



Belykov, Fig. 6 (annotated)



Sclafani, Fig. 3 (annotated)



Noonan, Fig. 3c (annotated)

The POSITA would have been motivated to replace the threading positioning of Belykov from between the inner tube 5 (i.e., core) and end walls 7, 13 (i.e., end caps) to instead be between the outer tube 3 (i.e., housing) and the respective end walls 7, 13 and to extend the sidewall as needed to accommodate the threads as taught by Noonan and Sclafani. Ex. 1008 ¶185. In particular, Noonan's attachment method (and Sclafani's) allows the threading to be on the exterior (e.g., and optionally omitting the original interior threading of Belykov) to provide an improved solid seal for the interior compartment of outer tube of the silencer of Belykov and simplifies the manufacture and replacement of inner tubes 5 (i.e., cores), which may fail faster than the outer tube 3 (i.e., housing) as

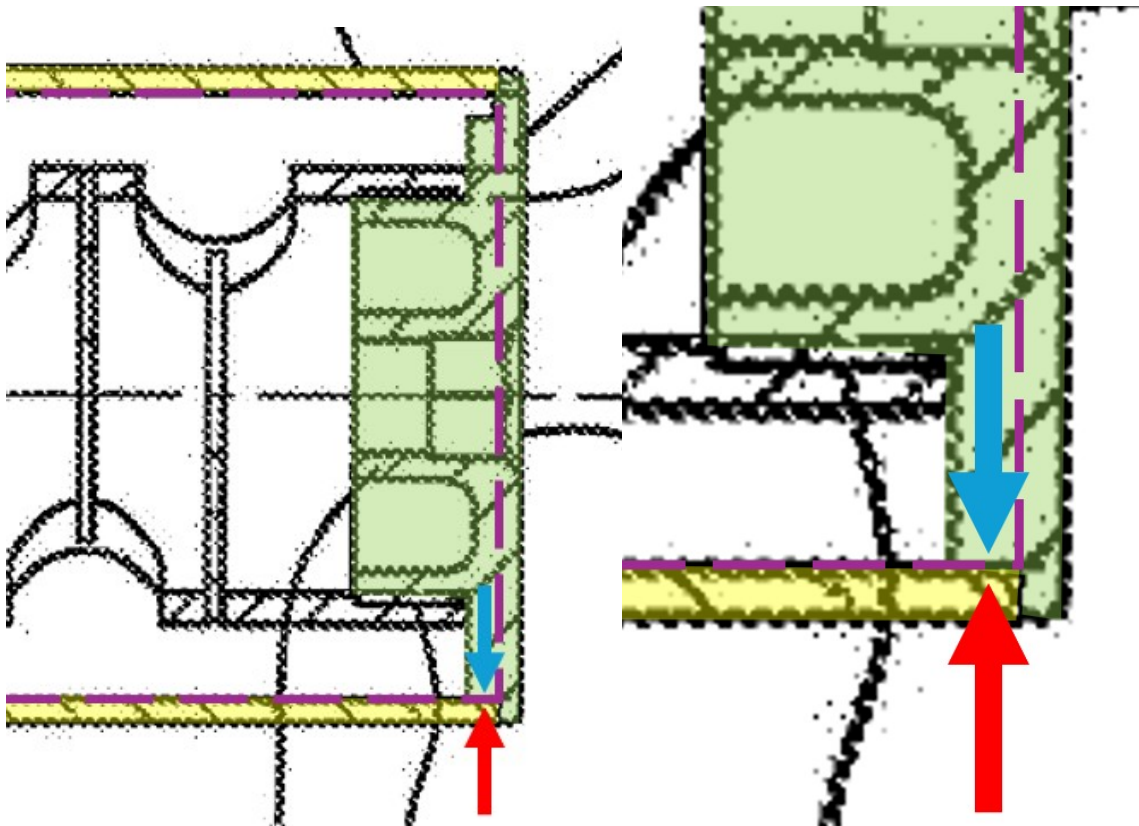
disclosed by Scalfani, leading to more cost effective replacement parts. Ex. 1008 ¶185.

Moreover, the POSITA would have also had a reasonable expectation of success and a reasonable expectation of improving the performance of Belykov in the combination of Belykov as modified by Scalfani and Noonan because each discloses a silencer usable for the same function and having the same relevant components (e.g., comparable core, housing, and opposing end cap structures). Ex. 1008 ¶186-197.

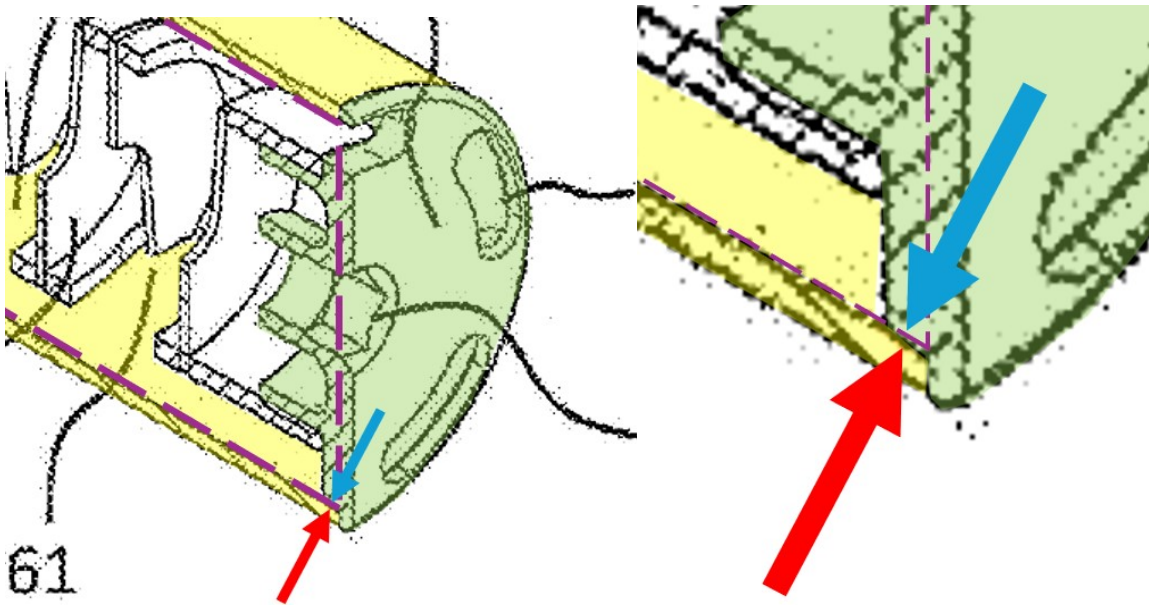
In addition, the POSITA would recognize that replacing the threading positioning of Belykov (e.g., threading Belykov's outer tube 3 (i.e., housing) to the respective end walls 7, 13) is obvious as a simple use of a known technique and substitution of one known element/technique (i.e., the threading arrangement of Belykov) to another (i.e., the threading arrangement of Scalfani and Noonan) to obtain predictable results (Ex. 1008 ¶¶187-196); and would also be obvious to try (e.g., in view of known sealing, cleaning, performance, assembly, and manufacturability needs) because it chooses from a finite number of identified, predictable solutions (i.e., the specific engagement between the respective components of Noonan and Scalfani), with a reasonable expectation of success. Ex. 1008 ¶197.

2. Claim 6

With reference to the annotated excerpts of Figs. 3 and 5, below, and as described *supra* at §VII(A)(7), Belykov discloses an axially-extending surface (i.e., sidewall) (blue arrow) that is positioned in the inner compartment (purple dashed lines) and rests against an inner surface (red arrow) of the outer tube 3 (i.e., housing) (yellow highlight). Ex. 1003 ¶¶Figs. 3, 5; Ex. 1008 ¶¶180, 198-199.

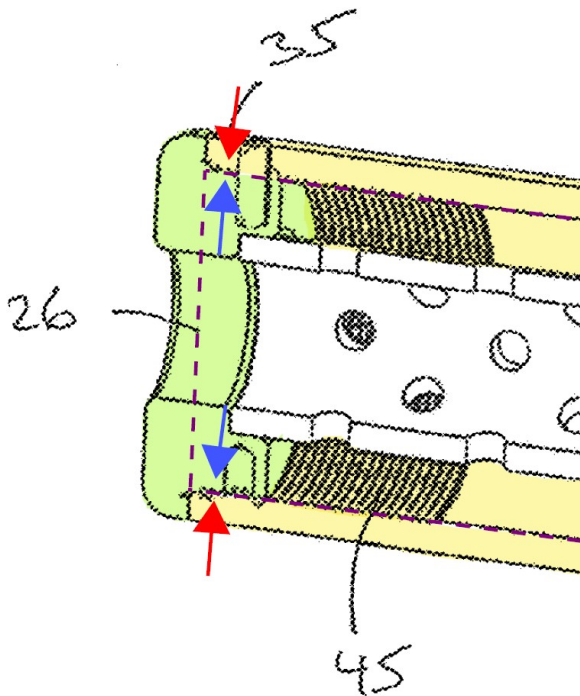


Belykov, Fig. 3 (excerpts, annotated)

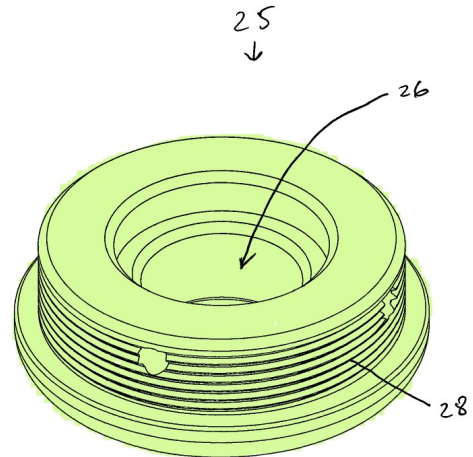


Belykov, Fig. 5 (excerpts, annotated)

To the extent it is argued that Belykov does not disclose a sidewall, referring to annotated Figs. 3a and 4a of Noonan below, Noonan discloses a front cap 25 (i.e., end cap) (green highlight) and an outer tube 15 (i.e., housing) (yellow highlight) that comprises an inner compartment (purple dashed lines). Ex. 1004 Figs. 3a, 4a, 3:16-22; Ex. 1008 ¶¶200-201. The outer tube 15 (i.e., housing) (yellow highlight) of Noonan further includes inner screw threads 45 that are configured to engage (i.e., rest against and couple to) corresponding threads 28 on a sidewall (blue arrows) of the front cap 25 (green highlight) with the threads 28 and associated sidewall being positioned within the internal compartment (purple dashed lines). Ex. 1004 Figs. 3a, 4a, 3:36-39; Ex. 1008 ¶¶200-201; *see* Motivation to Combine.

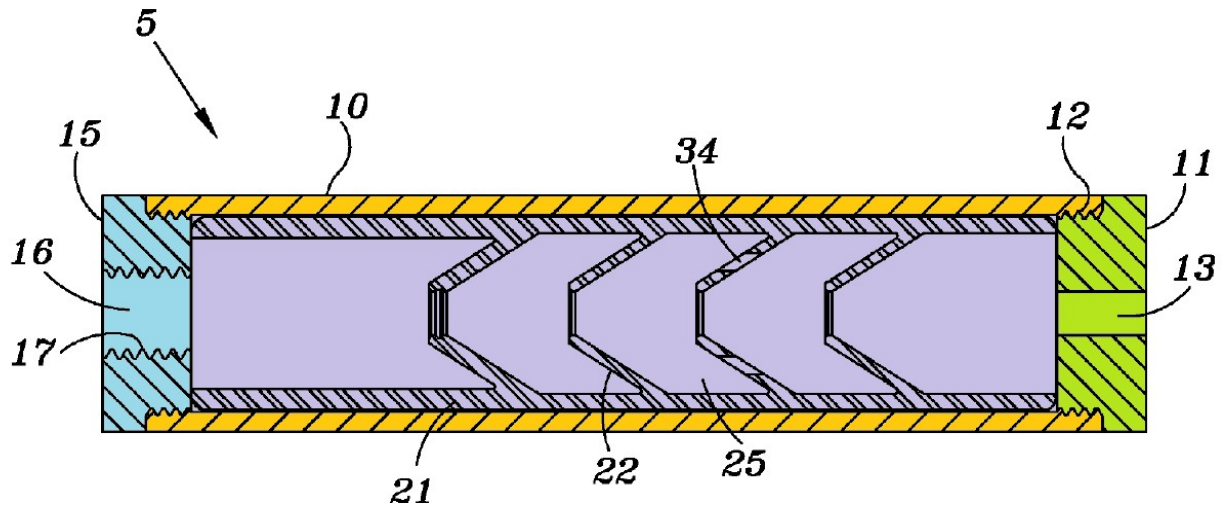


Noonan, Fig. 3a (excerpt, annotated)



Noonan, Fig. 4a (annotated)

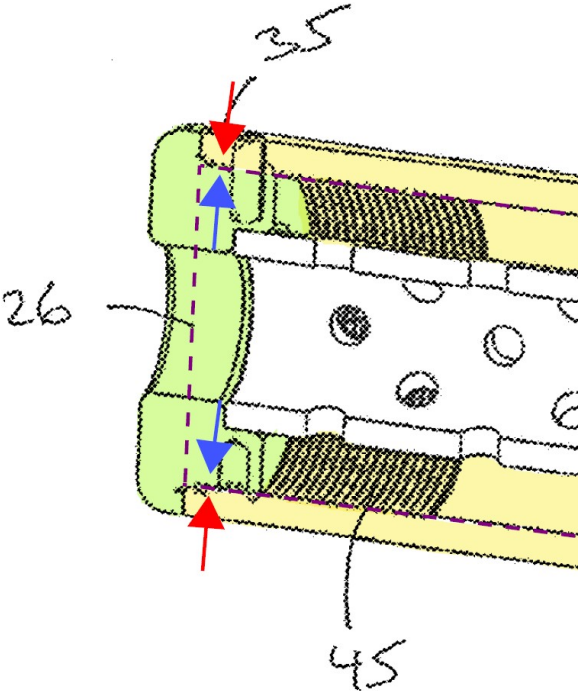
For further avoidance of doubt, with reference to annotated Fig. 3 of Sclafani below, Sclafani includes an cap 11 (green highlight) on which a sidewall includes threads 12 that are positioned within the inner compartment of the tubular housing 10 (orange highlight)) to rest against and couple to an inner surface of the housing. Ex. 1007 ¶¶12-13, Fig. 3; Ex. 1008 ¶202; *see* Motivation to Combine.



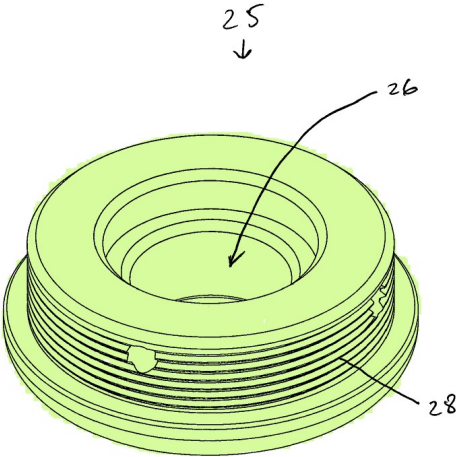
Sclafani, Fig. 3 (annotated)

3. Claim 7

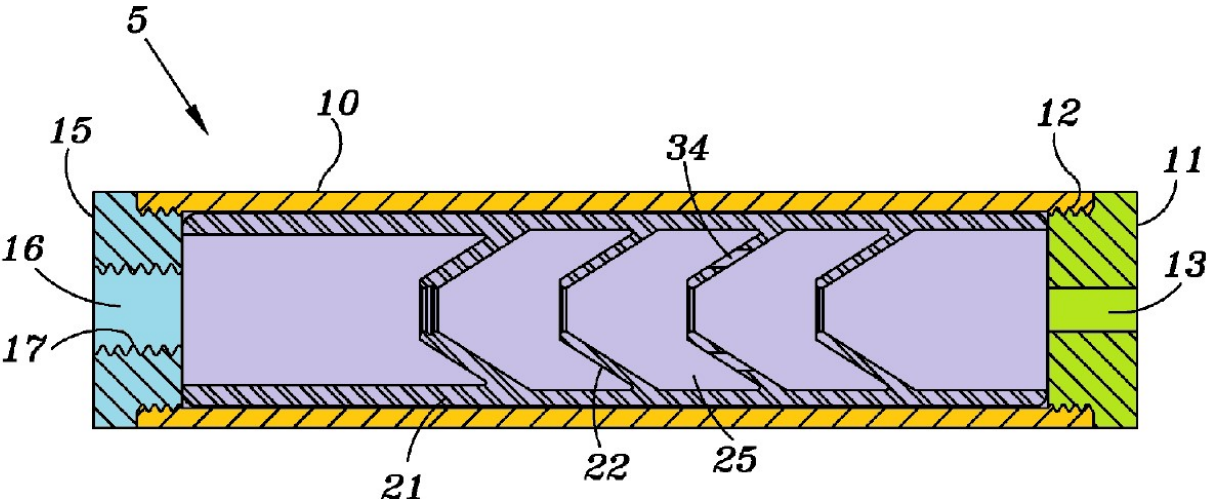
For the reasons set forth above with respect to Claim 6 and referring to annotated Figs. 3a and 4a of Noonan and annotated Fig. 3 of Sclafani reproduced below, Noonan discloses a sidewall with threads 28 and Sclafani discloses a sidewall with threads 12 each coupled to the housing. *See supra* §VII(B)(2); Ex. 1004 Figs. 3a, 4a, 3:36-39; Ex. 1007 ¶¶12-14, Fig. 3; Ex. 1008 ¶¶180, 203-205; *see* Motivation to Combine.



Noonan, Fig. 3a (excerpt, annotated)



Noonan, Fig. 4a (annotated)



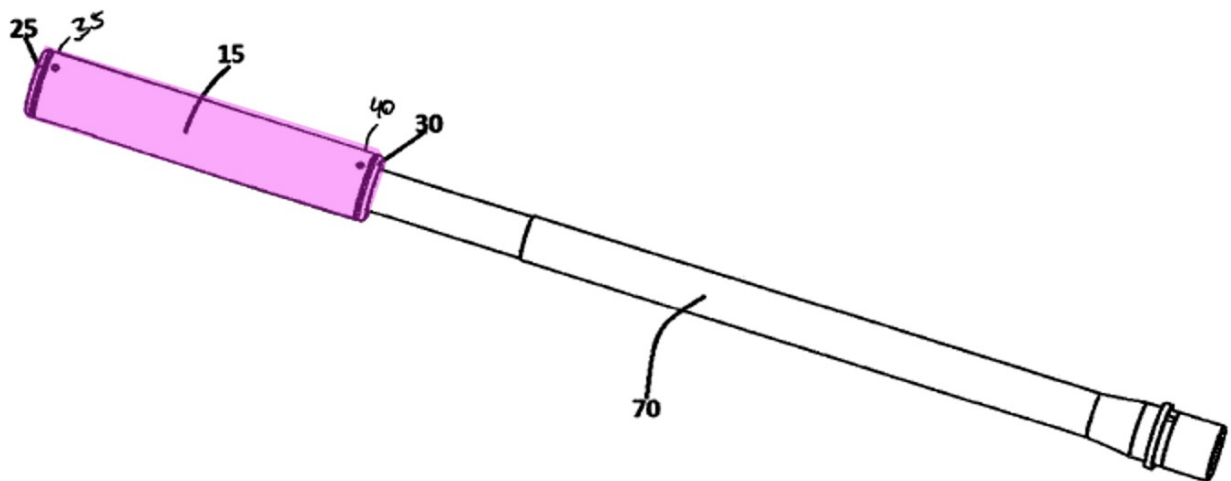
Sclafani, Fig. 3 (annotated)

C. Ground 3: Claims 1 and 3-7 are anticipated or rendered obvious by Noonan

1. Claim 1

i. [1. PRE]

Referring to annotated Fig. 2 below, Noonan discloses that it “relates to an expansion chamber assembly 10 (i.e., firearm suppression system) (highlighted in pink) for a firearm” (i.e., firearm suppression system)”. Ex. 1004 1:13-15, 19-30; Ex. 1008 ¶¶206-207.

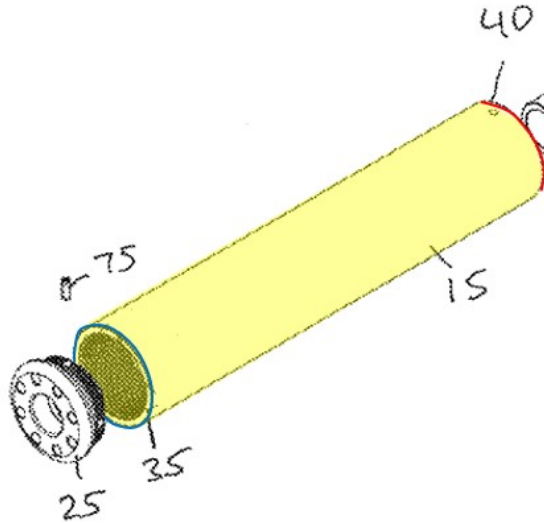


Noonan, Fig. 2 (annotated)

ii. [1.1]

Referring to the annotated excerpt of Fig. 1b below, Noonan discloses that “the expansion chamber assembly 10 comprises an outer tube 15” (i.e., housing) (yellow highlight) that comprises a front end 35 (i.e., first end) (red arc) and a rear

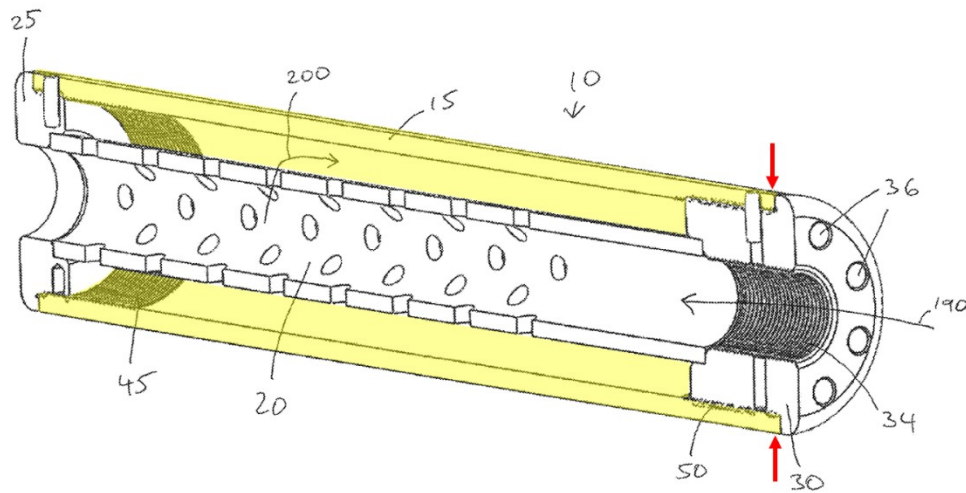
end 40 (i.e., second end) (blue arc). Ex. 1004 2:58-60, 3:12-15, 35-36, Fig. 1b; Ex. 1008 ¶208-210.



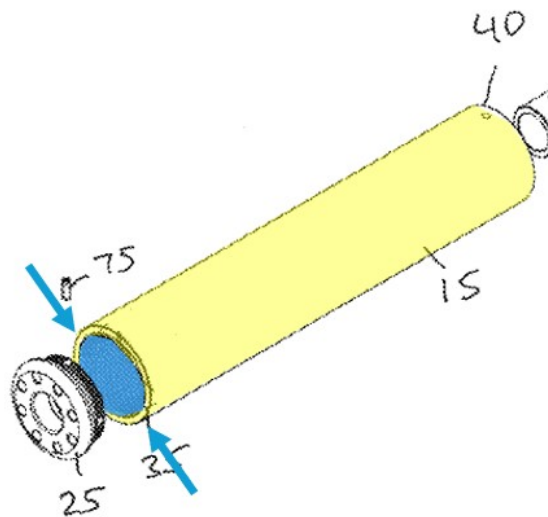
Noonan, Fig. 1b (excerpt, annotated)

iii. [1.1a]

Noonan's annotated Figs. 1b and 3b show a first aperture at the rear end 40 (i.e., first end) (red arrows) and a second aperture (blue highlight) at the front end 35 (i.e., second end) (blue arrows). Ex. 1004 3:14, Fig. 1b, Fig. 3b; Ex. 1008 ¶¶211-213; Ex. 1004 3:34-42.



Noonan, Fig. 3b (annotated)

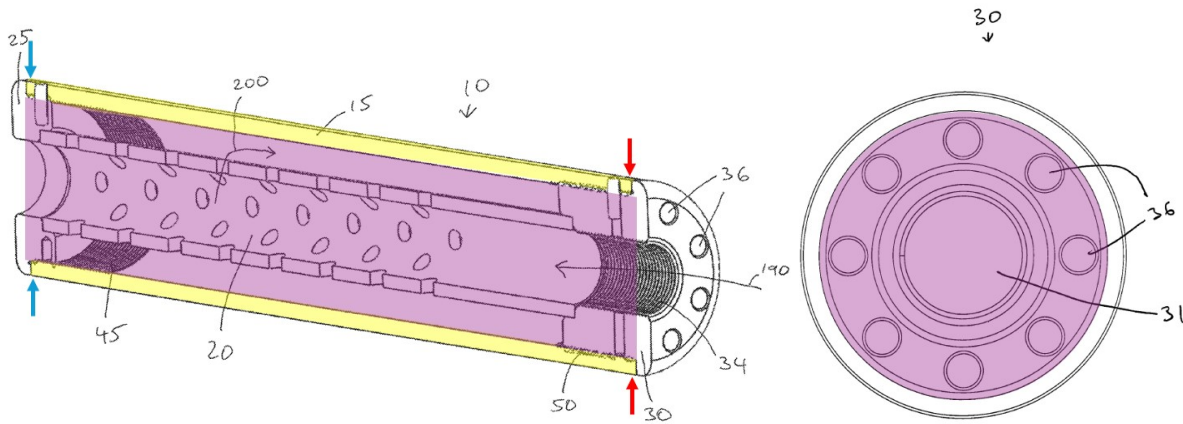


Noonan, Fig. 1b (excerpt, annotated)

iv. [1.1b]

Noonan discloses that the outer tube is a “hollow cylinder”. Ex. 1004 3:12-15; Ex. 1008 ¶214. Noonan’s annotated Fig. 3b, provided below, shows an inner compartment (purple highlight) interposed between the first aperture (red arrows)

and the second aperture (blue arrows), the inner compartment being substantially the same circumference from the rear end 40 (i.e., first end) to the front end 35 (i.e., second end). Ex. 1004 Fig. 3b; Ex. 1008 ¶214-215.

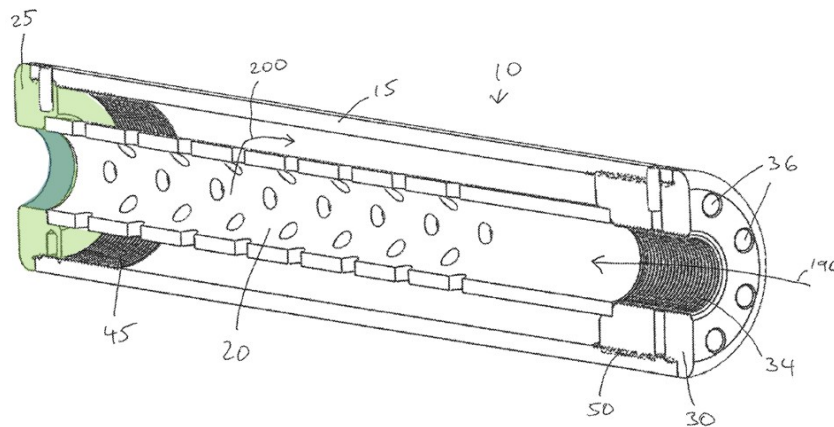


Noonan, Fig. 3b (annotated)

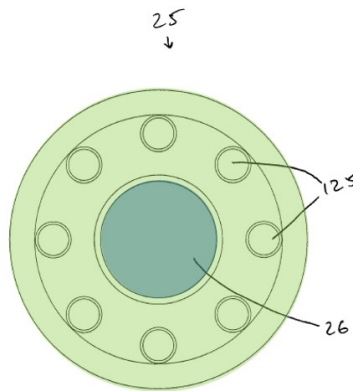
Noonan, Fig. 5b (annotated)

v. [1.2]

Referring to annotated Figs. 3b and 4b below, Noonan discloses a “front cap 25 [green highlight] comprises a through aperture 26” (blue highlight) and “a bullet, fired from a firearm, travels [...] through the aperture 26 of the expansion chamber assembly 10.” Ex. 1004 3:29-31, Figs. 3b, 4b; 4:6-13; Ex. 1008 ¶216-218.



Noonan, Fig. 3b (annotated)



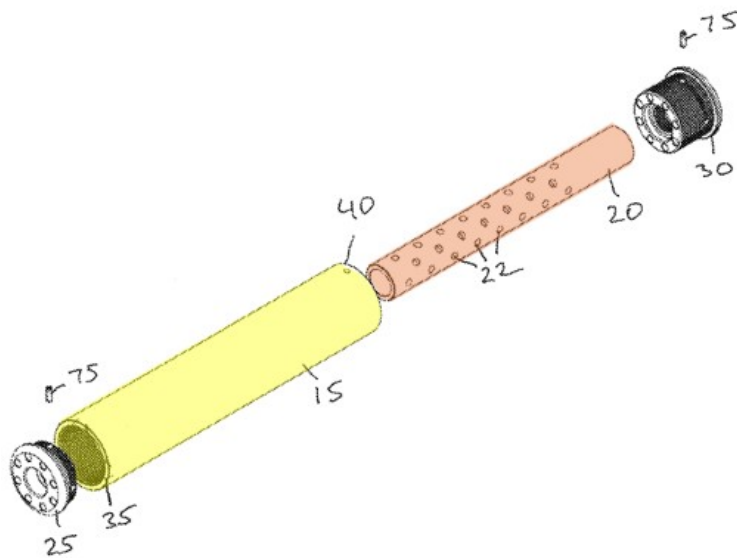
Noonan, Fig. 4b (annotated)

vi. [1.3]

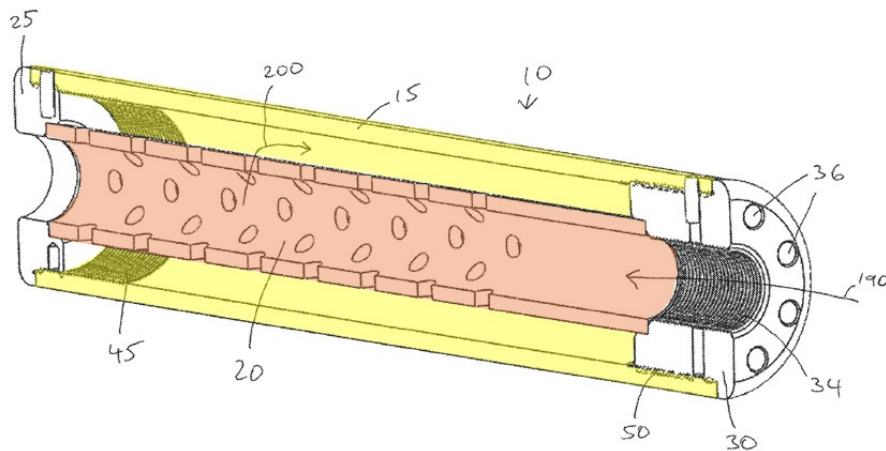
Noonan discloses an inner tube 20 (i.e., core) positioned within the outer tube 15 (i.e., housing). Ex. 1004 3:16-17; 4:8; Ex. 1008 ¶219. Noonan discloses that the inner tube 20 (i.e., core) is retained inside the outer tube 15 (i.e., housing) by screwing the front cap 25 (i.e., end cap) in the front end 35 (i.e., second end) and screwing the rear cap 30 in the rear end 40 (i.e., first end), such that the core is removably attachable to the housing and positioned therein. Ex. 1004 3:39-45; Ex.

1008 ¶220-221. Noonan then confirms that “[a]ccording to some embodiments, the front cap 25 and/or the rear cap 30 are removably coupled with the outer tube 15.”

Ex. 1004 3:20-22; Ex. 1008 ¶220. A POSITA would have understood that the term “coupled” encompasses both direct coupling and indirect coupling through one or more intermediate components. Ex. 1008 ¶222-226.



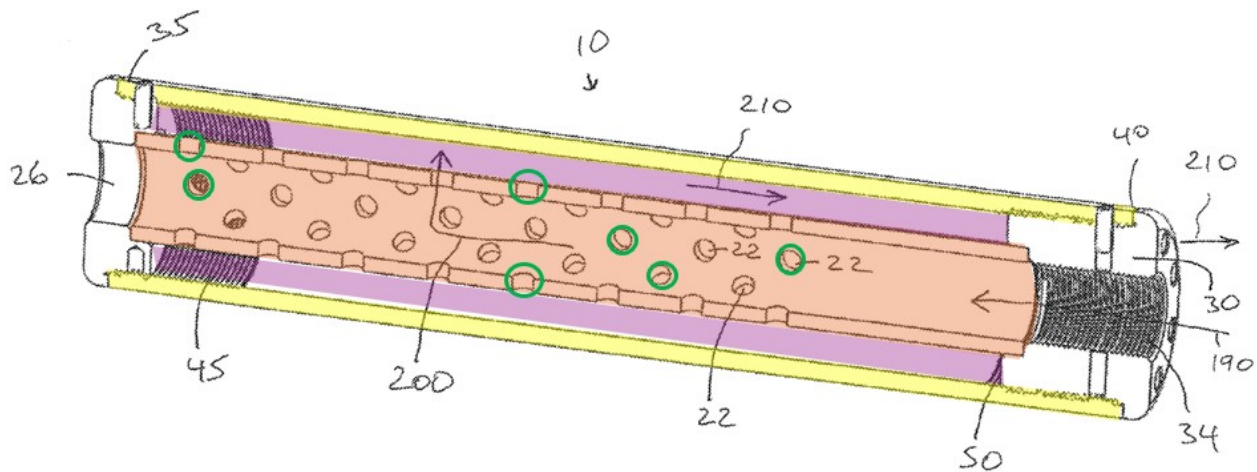
Noonan, Fig. 1b (annotated)



Noonan, Fig. 3b (annotated)

vii. [1.4]

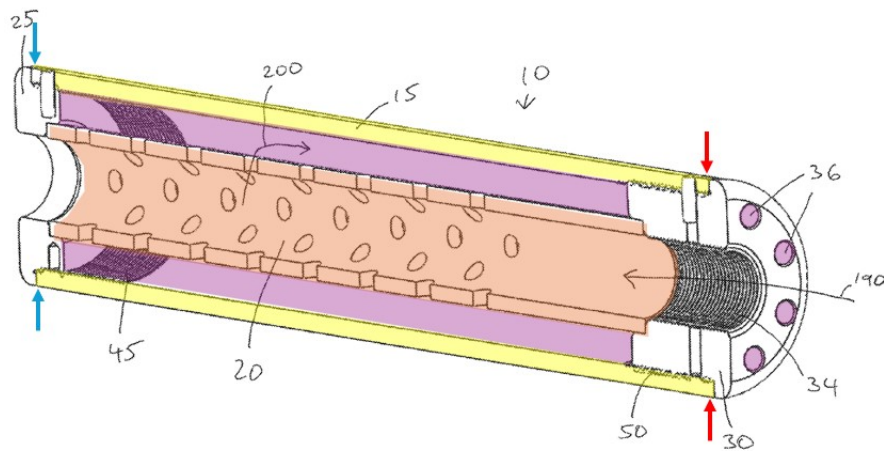
Referring to annotated Fig. 3a below, Noonan discloses that the inner tube 20 (i.e., core) (orange highlight) comprises through apertures 22 (i.e., plurality of core apertures) (examples circled in green) on an outer surface of the inner tube to allow expanding gases passing from a projectile and cartridge to pass to a space (i.e., channel) (purple highlight) between the inner surface of the outer tube 15 (i.e., housing) (yellow highlight) and an outer surface of the inner tube 20 (i.e., core), as shown by the arrow 200 in Fig. 3a. Ex. 1004 4:17-20, 23-37; Fig. 3a; Ex. 1008 ¶227-231. The expanding gases located between the outer tube 15 (i.e., housing) and the inner tube 20 (i.e., core) exit the expansion chamber assembly 10 through one or more exit through apertures 36 in the rear cap 30 as shown by arrow 210 in Fig. 3a or through one or more exit apertures (not shown in the figures) in the front cap 25 (i.e., end cap). Ex. 1004 4:27-35, Fig. 3a; Ex. 1008 ¶227.



Noonan, Fig. 3a (annotated)

viii. [1.5]

Noonan shows that the channel (purple highlight) circumscribes the outer surface of the inner tube 20 (i.e., core). Ex. 1004 Fig. 3b; Ex. 1008 ¶232.



Noonan, Fig. 3b (annotated)

Noonan discloses that expanding gases (i.e., gas passing from a projectile and cartridge) entering the channel (e.g., from the direction of arrow 190 at the

front end) may escape through the front cap 25 (i.e., end cap) at exit apertures of the front cap 25 (i.e., end cap) (not shown), which is past the second end of the outer tube 15 (i.e., housing). Ex. 1004 4:31-35; Ex. 1008 ¶233.

The quantity and locations of the apertures 22 (i.e., a plurality of core apertures) described above and the flow paths from those apertures 22 through the channel between the outer tube 15 (i.e., housing) and the inner tube 20 (i.e., core) of Noonan evidence that Noonan would equalize pressure that begins at the first end of the outer tube and terminate at the second end of the outer tube. Ex. 1008 ¶234.

For example, to “equalize” pressure would require the gas would flow from the region proximate the firearm’s barrel, which has higher pressure, towards the exit through apertures in the front cap 25, which has lower pressure at firing, which would equalize pressure between the two locations. Ex. 1008 ¶235-236.

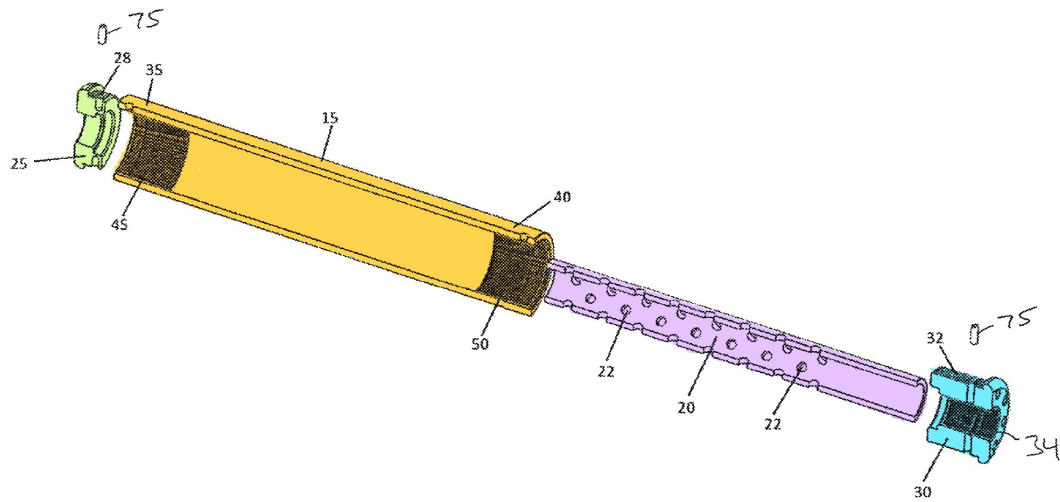
For the avoidance of doubt, and to the extent it is argued that the space between the outer tube 15 (i.e., housing) and inner tube 20 (i.e., core) of Noonan does not equalize pressure that begins at the first end of the housing and terminates at the second end of the housing, the structure and purpose of the channel of Noonan corresponds to the structure and purpose of the channel 142 of the ’906 patent, which the ’906 patent describes as performing the claimed equalization function, such that the channel of Noonan also equalizes pressure that begins at the

first end of the housing and terminates at the second end of the housing. Ex. 1008 ¶237-242. Moreover, the pressure (e.g., at the ends of the housing) need not be in the channel from the first end to the second end as explained in Ground 1. *See supra*, §§VII(A)(2)(viii.); Ex. 1002 p. 104; Ex. 1008 ¶243.

For further avoidance of doubt, the Noonan expansion chamber assembly 10 features an inner tube 20 (i.e., core) that slides into an outer tube 20 (i.e., housing), such that Noonan also inherently includes a channel meeting the requirements of claim 1 as admitted by Patent Owner and described in Ground 1. *See supra* §VII(A)(2)(viii); Ex. 1011 p. 32; Ex. 1004 Fig. 1b; Ex. 1008 ¶244-247.

2. Claim 3

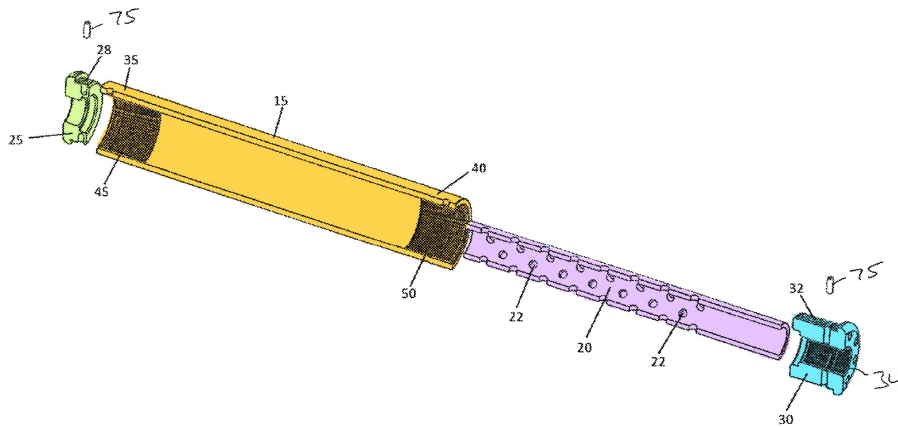
With reference to annotated Fig. 3c below, Noonan includes a front cap 25 (i.e., end cap) (green highlight) defining the through aperture 26 (i.e., projectile aperture) and a rear cap 30, with the outer tube 15 (i.e., housing) (orange highlight) and inner tube 20 (i.e., core) (purple highlight) held therebetween. Ex. 1004 Fig. 3c; Ex. 1008 ¶248-249. Noonan additionally describes that “the expanding gasses located between the outer tube 15 and the inner tube 20 may exit the expansion chamber assembly 10 through one or more exit apertures [i.e., plurality of vent apertures] (not shown) in the front cap 25 [i.e., end cap].” Ex. 1004 4:31-35; Ex. 1008 ¶248-249.



Noonan, Fig. 3c (annotated)

3. Claim 4

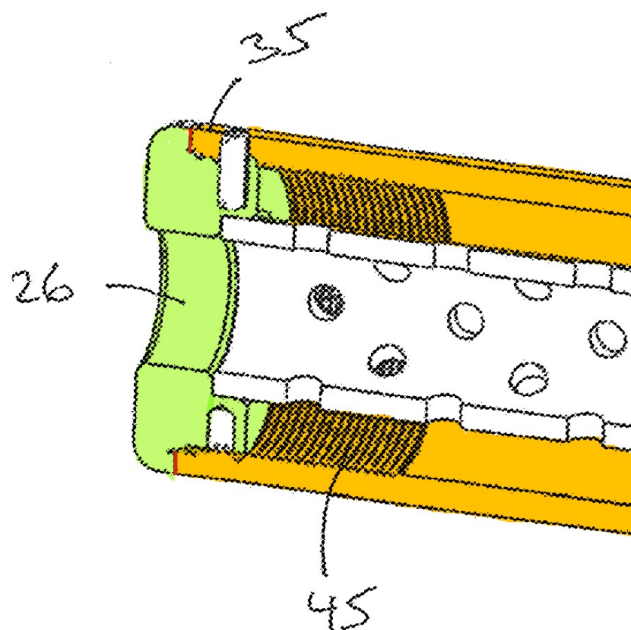
Referring to annotated Fig. 3c below, the expansion chamber assembly 10 (i.e., firearm suppression system) includes a rear cap 30 (i.e., muzzle adapter). Ex. 1004 Fig. 3c; Ex. 1008 ¶250. Thus, the rear cap 30 (i.e., muzzle adapter) is configured to threadably connect (e.g., adapt) the expansion chamber assembly with the muzzle end of the firearm barrel (e.g., muzzle) and thus is a muzzle adapter. Ex. 1004 4:1-5; Ex. 1008 ¶250.



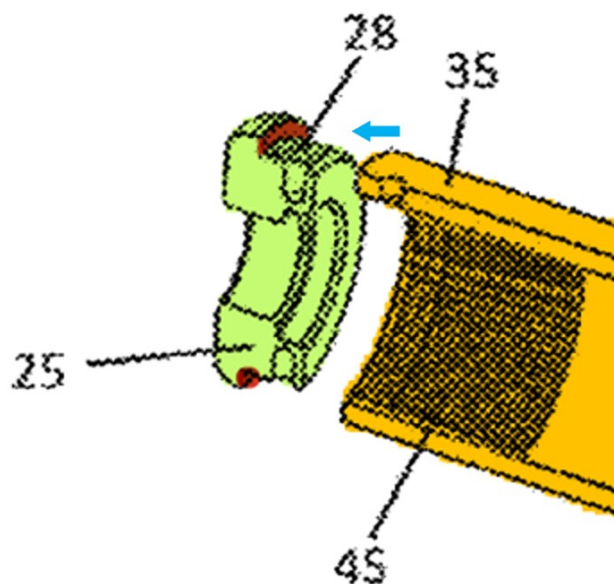
Noonan, Fig. 3c (annotated)

4. Claim 5

Referring to the annotated excerpts of Figs. 3a and 3c below, the front cap 25 (i.e., end cap) (green highlight) at the front end 35 (i.e., second end) of the assembly 10 (i.e., housing) of Noonan includes a side (i.e., second side, blue arrow in Fig. 3c) opposite its front face (the left side in Figs. 3a, 3c) that includes a ledge (red highlight and red lines) that rests upon and is flush with the front end 35 (i.e., second end) of the outer tube 15 (i.e., housing) (orange highlight). Ex. 1004 Figs. 3a, 3c; Ex. 1008 ¶¶251-252.



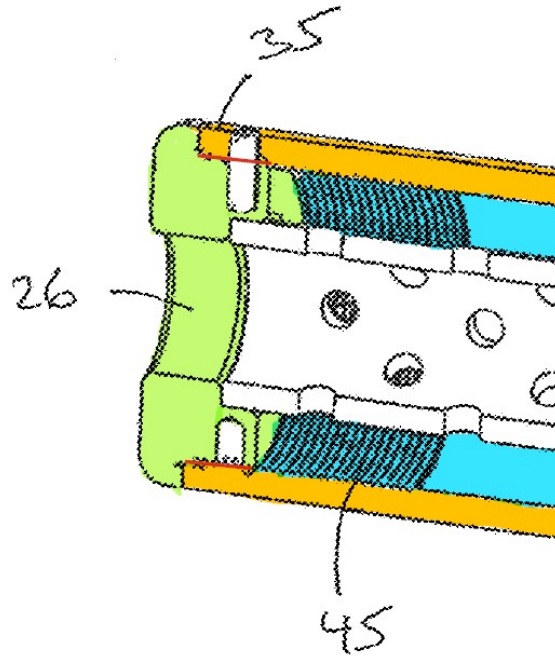
Noonan, Fig. 3a (excerpt, annotated)



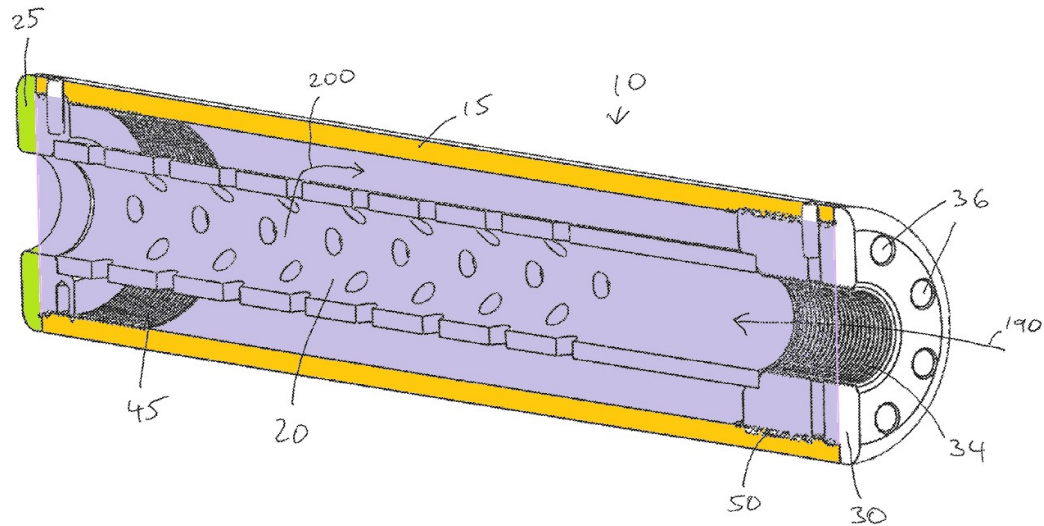
Noonan, Fig. 3c (excerpt, annotated)

5. Claim 6

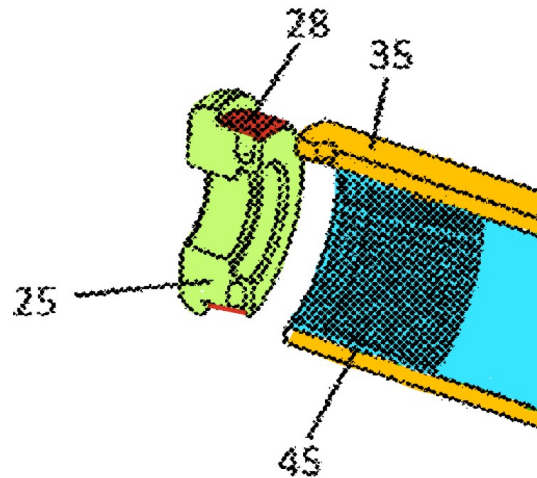
Referring to the annotated excerpts of Figs. 3a and 3c below, the front cap 25 (i.e., end cap) (green highlight) at the front end 35 (i.e., second end) of the assembly 10 of Noonan includes an outer thread 28 (i.e., the sidewall being the wall defining the thread) (red highlight and red lines in annotated excerpts of Figs. 3a, 3c) that is positioned in the inner compartment (purple highlight in Fig. 3b) and rests against the inner surface (blue highlight in annotated excerpts of Figs. 3a, 3c) of the outer tube 15 (i.e., housing) (orange highlight). Ex. 1004 Figs. 3a, 3c; Ex. 1008 ¶253-254.



Noonan, Fig. 3a (excerpt, annotated)



Noonan, Fig. 3b (annotated)

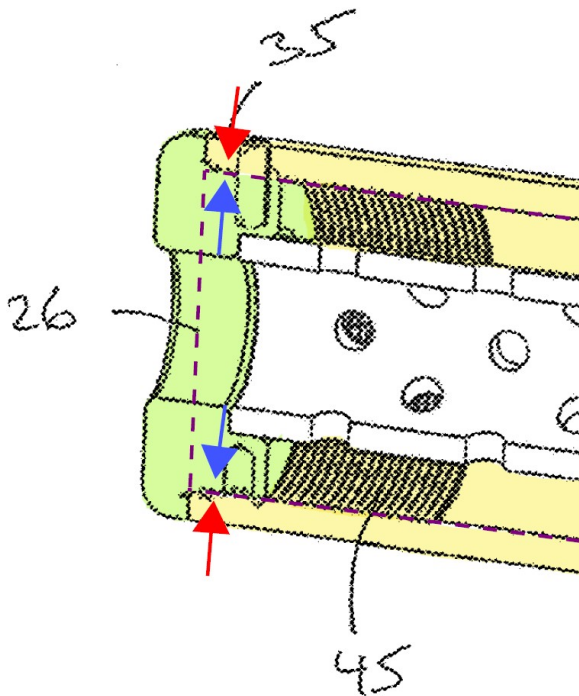


Noonan, Fig. 3c (excerpt, annotated)

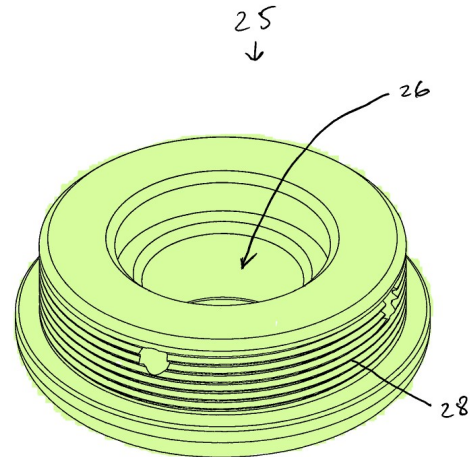
6. Claim 7

As depicted in annotated Figs. 3a and 4a, the resulting sidewall (blue arrows) may further include threading 28 for engaging (i.e., coupling to) the corresponding threading 45 on the inner surface of the outer tube 15 (i.e., housing).

See Ex. 1004 Figs. 3a, 4a, 3:36-39; Ex. 1008 ¶255.



Noonan, Fig. 3a (excerpt, annotated)



Noonan, Fig. 4a (annotated)

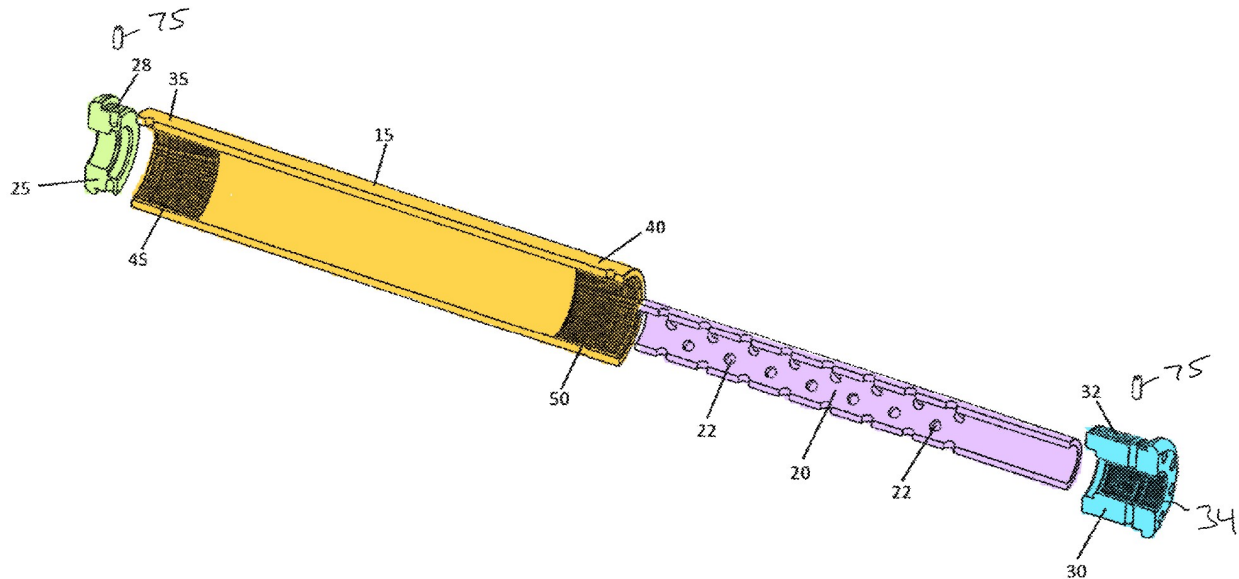
D. Ground 4: Claim 2 is rendered obvious by Noonan in view of Slack and Sclafani.

1. Motivation to Combine Noonan, Slack, and Sclafani

A POSITA would have been motivated to combine Noonan with the three-dimensional printing disclosed by Slack and Sclafani, and would have had a reasonable expectation of success based on the similarities of the structure and operation of the three references (e.g., each being improved firearm suppressors).
Ex. 1008 ¶¶257-285; Ex. 1004 1:29-30; Ex. 1006 ¶4; Ex. 1007 ¶¶2-6.

Slack discloses an interchangeable list of manufacturing techniques for forming the “suppressor 20 and/or 120, or the components thereof”, which list includes “*3D printing*.” Ex. 1006 ¶67 (emphasis added); Ex. 1008 ¶259.

Moreover, referring to annotated Fig. 3c of Noonan and annotated Fig. 9 of Slack below, the structure of the expansion chamber assembly 10 (i.e., firearm suppression system) of Noonan is the same as Slack in all material respects related to the choice of *3D printing* as a manufacturing process for the inner tube 20 (i.e., core) (purple highlight). See Ex. 1004 3:16-28, 4:1-5; Fig. 3c; Ex. 1006 ¶¶42-44, 63, 64, 67, Fig. 9; Ex. 1008 ¶¶260-261.



Noonan, Fig. 3c (annotated)

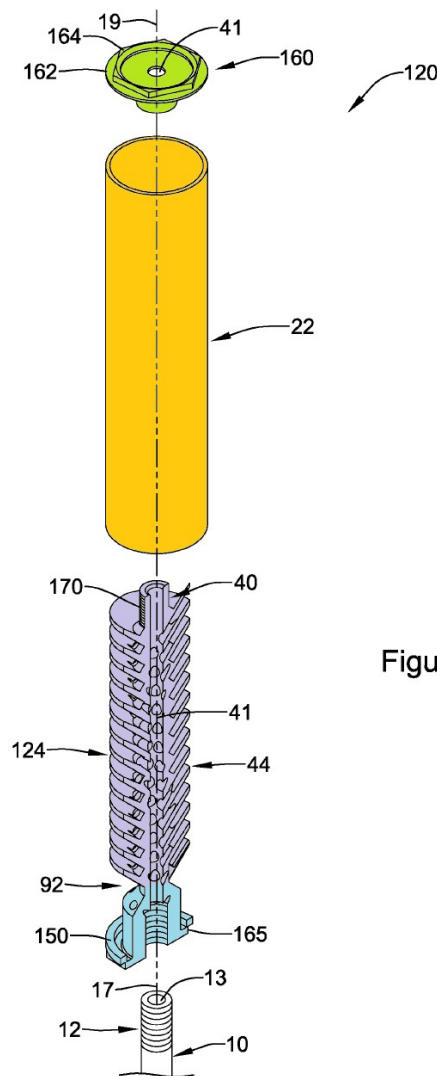


Figure 9

Slack, Fig. 9 (annotated)

A POSITA would have been motivated to use 3D printing as taught by Slack to print at least the inner tube 20 (i.e., core) of Noonan, which would result in faster and more cost effective prototyping, lighter and simpler manufacturing, a more adjustable and repairable expansion chamber assembly, easier parameter optimization, reduced waste and improved suppression performance. Ex. 1008

¶¶259-262, 265; Ex. 1004 1:29-30; Ex. 1006 ¶4; Ex. 1007 ¶¶2-6. Suppressor cores are known to fail more quickly than the surrounding suppressor (discussed herein with respect to Sclafani), such that 3D printing (e.g., metal additive manufacturing) would allow optimization of cost, performance, weight, and longevity/durability of the inner tube 20 (i.e., core) of Noonan via material selection, and would allow rapid replacement of the inner tube 20 (i.e., core) of Noonan in the event of a failure. Ex. 1008 ¶¶185, 262.

Moreover, the POSITA would have had a reasonable expectation of success in combining Noonan with 3D printing as taught by Slack because both devices are similarly structured and operate similarly, such that the POSITA would have had a reasonable expectation that using a technique taught by Slack to print a comparable part (i.e., the inner tube 20 of Noonan) would have been successful and would benefit Noonan with simplified manufacture, reduced cost, and improved part interchangeability. Ex. 1008 ¶263.

Moreover, Sclafani also discloses printing a core with a three-dimensional printer as disclosed in Ground 1. *See supra* §VII(A)(1); *see also* Ex. 1008 ¶¶271-273. The POSITA would further have been motivated to combine Noonan with Sclafani with a reasonable expectation of success for substantially the same reasons. Ex. 1008 ¶¶271-285.

In addition, a POSITA would have understood that manufacturing at least the inner tube 20 (i.e., core) of Noonan using 3D printing as disclosed by Slack and Sclafani would have been a simple use or substitution of known technique (i.e., Slack's and Sclafani's printing) to improve a similar device (i.e., Noonan's expansion chamber assembly) in the same way to yield predictable results (Ex. 1008 ¶¶264-267, 271-284); and obvious to try (e.g., based on the needs of core durability, manufacturability, and performance) as choosing from a finite number of identified, predictable solutions (i.e., the processes of Slack), with a reasonable expectation of success (Ex. 1008 ¶¶268-270).

2. Claim 2

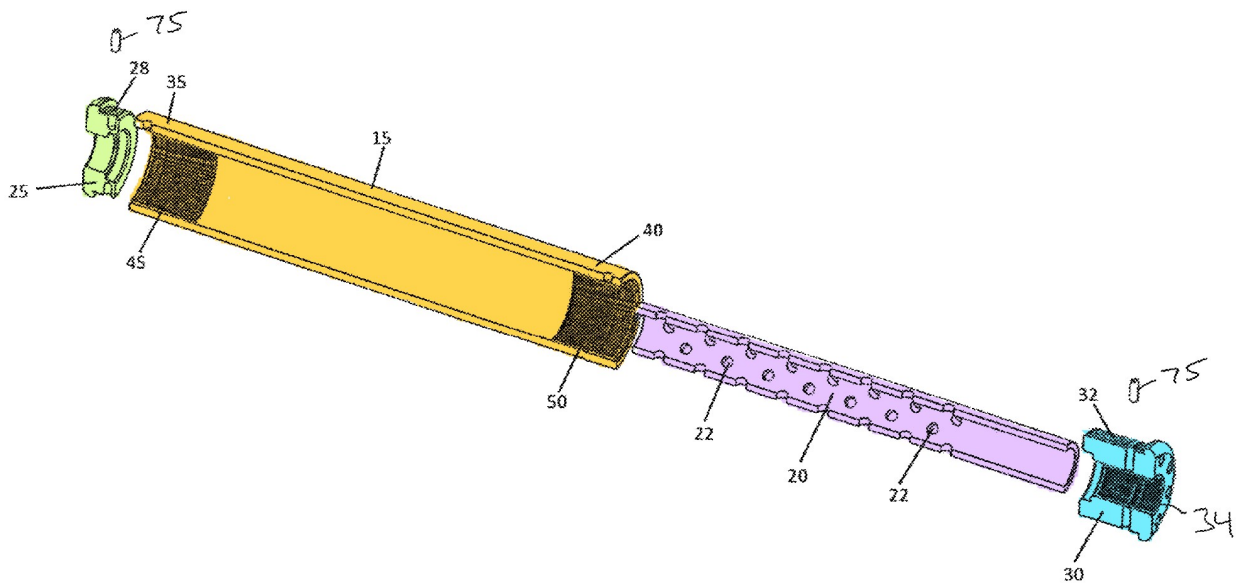
As described above in Ground 3 (*supra* §VII(C)(1)), Noonan discloses all of the limitations of independent claim 1. Ex. 1008 ¶286. It would further be obvious to make at least the inner tube 20 (i.e., core) of Noonan using a three-dimensional printer based on the teachings of Slack (i.e., "3D printing") and Sclafani. Ex. 1008 ¶286-288; Ex. 1006 ¶67 ("the suppressor or components thereof may be made by . . . 3D printing"); Ex. 1007 ¶14 ("[c]ore member may be formed by a three dimensional printer"); *see* Motivation to Combine.

E. Ground 5: Claims 4 and 9-11 are rendered obvious by Noonan in view of Belykov

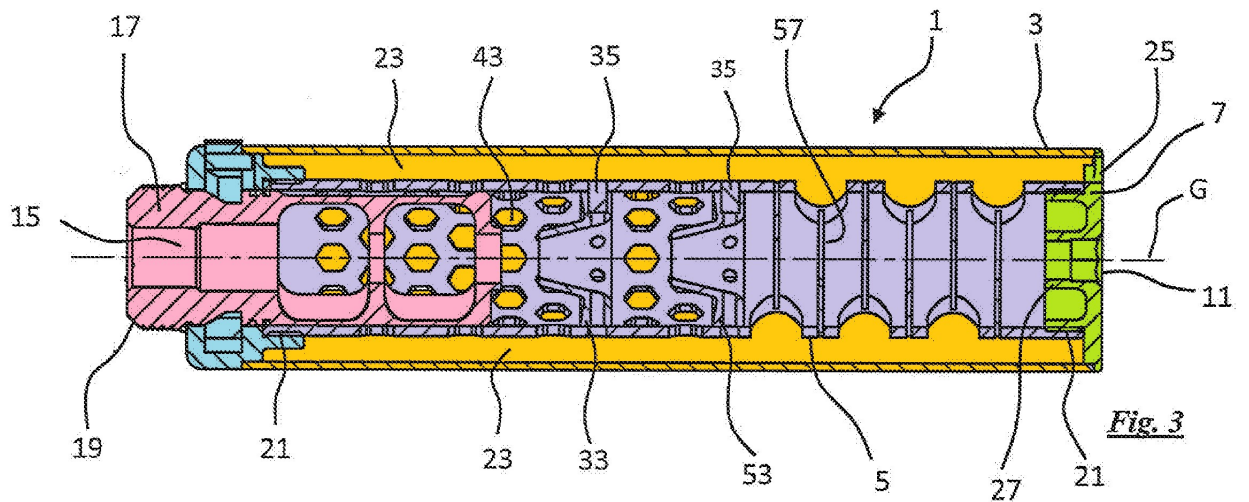
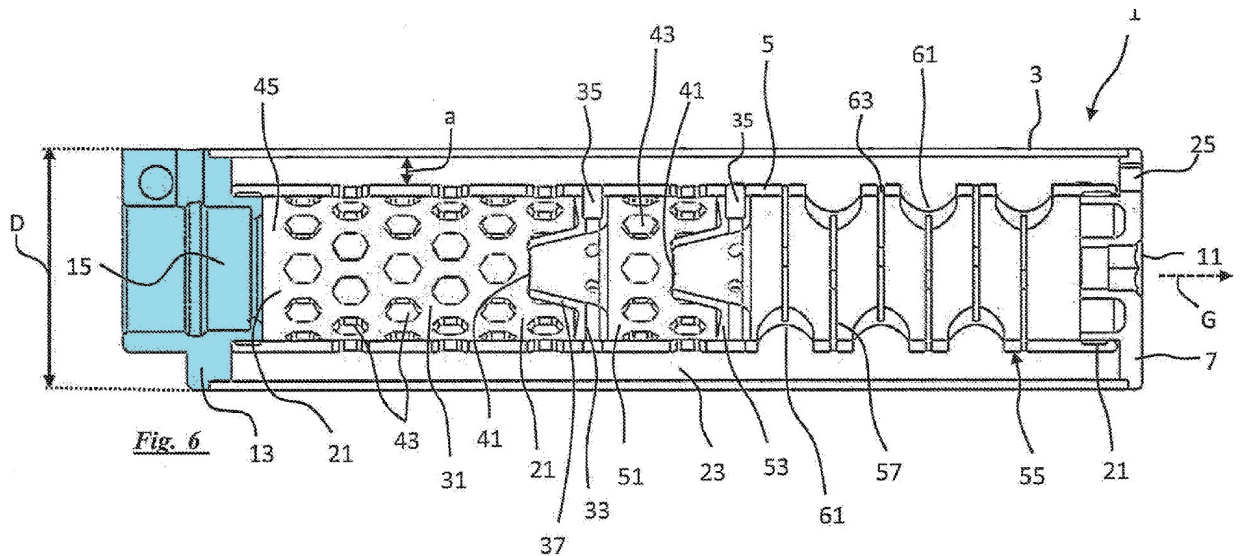
1. Motivation to Combine Noonan and Belykov

A POSITA would have been motivated to combine Noonan and Belykov, and would have had a reasonable expectation of success. The POSITA would have been motivated to combine Noonan and Belykov for the same reasons as explained in Grounds 2. Ex. 1008 ¶¶181-186, 290-291; Ex. 1003 ¶6; *see supra*, §§VII(B)(1).

In addition, Belykov discloses a muzzle adapter (i.e., face wall 13 or the unlabeled holding component), as explained in Ground 1 and Noonan discloses a muzzle adapter (i.e., rear cap 30). *See supra*, §§VII(A)(5), (C)(3); Ex. 1008 ¶¶310-311.



Noonan, Fig. 3c (annotated)

**Belykov, Fig. 3 (annotated)****Belykov, Fig. 6 (annotated)**

In addition, the POSITA would have been motivated to adapt Noonan's device by incorporating Belykov's muzzle adapter (i.e., face wall 13 or the detachable fastening device, both highlighted in blue), thereby enabling the

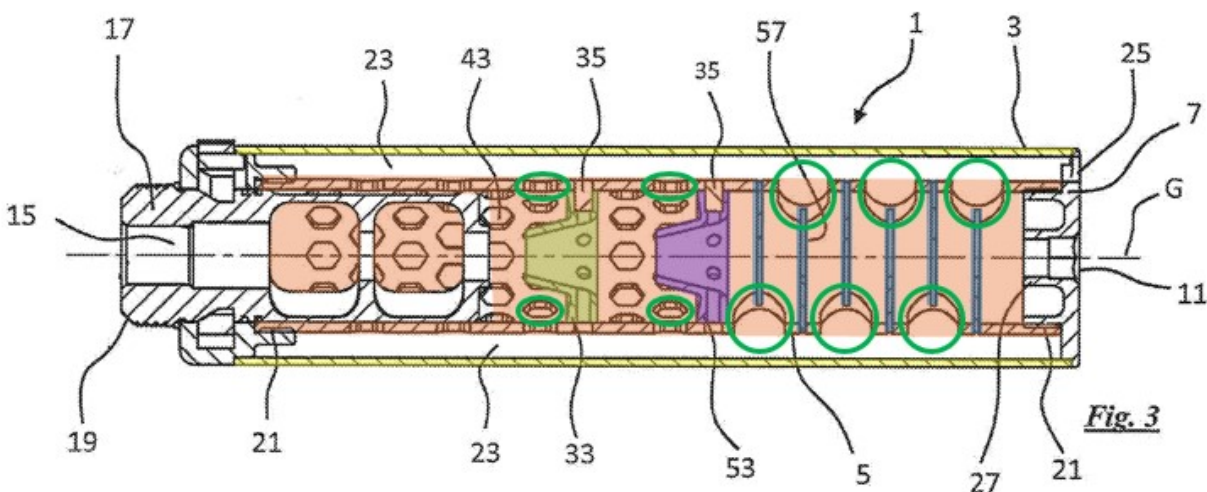
Noonan device to directly receive a firearm barrel or “silencer-unrelated components”—including, but not limited to, a muzzle brake 17 (highlighted in pink). Ex. 1008 ¶¶289-293, 305. The POSITA would know that muzzle brakes reduce the recoil of firing a firearm and, in addition, having multiple options for attaching the suppressor to the firearm and having options for additional silencer-unrelated components would make the suppressor more versatile and would improve the performance of the firearm and the ability of the user to choose accessories to add at their discretion. *See* Ex. 1003 ¶¶28, Figs. 3, 6. Ex. 1008 ¶294.

The POSITA would have had a reasonable expectation of success with the combination because the muzzle adapter would have been integrated into the device of Noonan according to the known structure shown by Belykov to fulfil its known and conventional design purpose and improve the device of Noonan in the same way as the device of Belykov to resolve a need expressed by Noonan. Ex. 1008 ¶295, 305-306.

A POSITA would have been motivated to combine Noonan and Belykov to use Belykov’s hexagonal openings for Noonan’s apertures 22 (e.g., shaping Noonan’s apertures as hexagonal openings and/or replacing the apertures of Noonan with the hexagonal openings of Belykov) both because Noonan states that “any other geometric shape” can be used and because Belykov discloses a specific structural benefit to the honeycomb shape, including allowing a high number of

relatively large opening cross-sections while maintaining stability, which also has synergies with 3D printing. *See* Ex. 1003 ¶13, 39; Ex. 1008 ¶296-299, 307-308.

In addition, the POSITA would have been motivated to add baffles, as taught by Belykov (i.e., sound impact walls 33, 53, 57 (also referred to as sound reflection elements)) (green, purple, and blue highlighting respectively in annotated Fig. 3, below), to the expansion chamber assembly of Noonan, which would operate as described above in Ground 1. Ex. 1008 ¶300-301, 309; *see supra*, §§VII(A)(9).



Belykov, Fig. 3 (annotated)

Noonan discloses that known silencers “have various baffles and intermediate spacers that attempt to decrease the noise level” and notes that these types of silencers are “heavy, use lots of different types of parts and/or are difficult to assemble”; however, in contrast, Noonan notes that “many prior art silencers do

not significantly reduce muzzle flash and/or recoil generated by the firearm when firing the bullet.” Ex. 1004 1:20-30. Thus, Noonan acknowledges that there is a trade-off with suppressor performance and continues to seek a way “to reduce noise levels, flash and/or recoil when firing a firearm”. Ex. 1004 1:29-30. The POSITA would have added baffles into the assembly of Noonan to reduce noise levels, flash, or recoil, with the acceptable tradeoff of increasing weight and complexity. Ex. 1008 ¶302-303.

The POSITA would have had a reasonable expectation of success because the improvements (e.g., the sound reflection elements and honeycomb shaped openings) would have been integrated into the device of Noonan because both describe suppressors with matching design goals—reducing recoil, noise, and flash—using comparable internal flow and venting structures, and the combination would have predictably enhanced gas flow area while maintaining structural strength and sound absorption. Ex. 1008 ¶304, 309.

In addition, modifying Noonan to comprise a muzzle adapter, as taught by Belykov, would be “obvious to try” in light of the known need to accept accessories and muzzles of different shapes because it chooses from a finite number of identified, predictable solutions (i.e., Belykov’s muzzle adapter), with a reasonable expectation of success (Ex. 1008 ¶305); combines prior art elements (i.e., Noonan’s expansion chamber assembly and Belykov’s muzzle adapter and

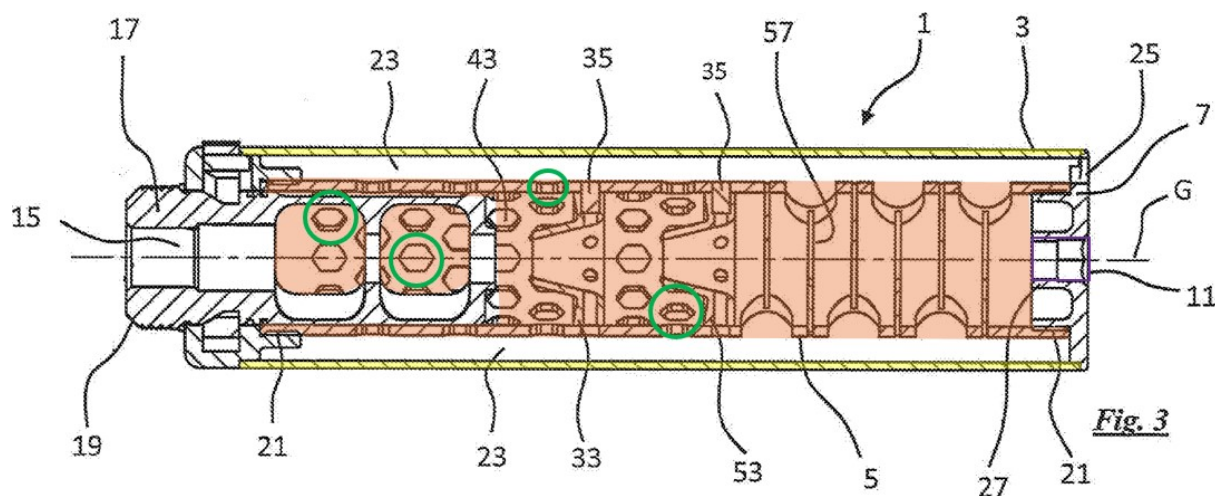
hexagonal apertures) according to known methods to yield predictable results (Ex. 1008 ¶306); and applies a known technique to a known device ready for improvement to yield predictable results (Ex. 1008 ¶308).

2. Claim 4

Noonan and Belykov each disclose a muzzle adapter for the same reasons as explained in Grounds 1 and 3. *See supra*, §§VII(A)(5), (C)(3); Ex. 1008 ¶¶310-311.

3. Claim 9

Belykov discloses that the exchange openings 43 (examples green highlight) have a “special honeycomb hexagonal shape”. Ex. 1003 ¶2, 39, 48; Ex. 1008 ¶¶312-314; *see* Motivation to Combine.



Belykov, Fig. 3 (annotated)

4. Claim 10

Belykov discloses that the core comprises an inner surface that includes baffles that interact with the plurality of core apertures for the same reasons as explained in Ground 1. *See supra*, §§VII(A)(9); Ex. 1008 ¶¶315-321; *see* Motivation to Combine.

5. Claim 11

Belykov discloses that the baffles are extruded inward for the same reasons as explained in Ground 1. *See supra*, §§VII(A)(10); Ex. 1008 ¶¶322-324; *see* Motivation to Combine.

F. Ground 6: Claims 1, 2, 4, 10, and 11 are rendered obvious by Muceus in view of Slack

1. Motivation to Combine Muceus and Slack

While Muceus discloses every element of Claims 1, 2, 4, 10, and 11 for the reasons discussed herein, Slack includes additional teachings that the POSITA would have been motivated to combine with Muceus based on the similarities of the structures surrounding the cores of the respective suppressors to the extent it is argued that Muceus lacks certain features. *See* Ex. 1005 ¶2; Ex. 1006 ¶2, 4; Ex. 1008 ¶¶326-339.

For example, Slack discloses an endcap 160 (i.e., endcap) with a bore 41 (i.e., projectile aperture), and the endcap 160 may include a threaded bore 172 to engage with a threaded portion 170 disposed on a distal end of the body portion 40

of the internal component 124 (i.e., core). Ex. 1006 ¶¶63; Ex. 1008 ¶¶328. The POSITA would have been motivated to further include a bore (i.e., projectile aperture) in the end cap 1360 of Muceus (assuming *arguendo* that one is not present) or to replace the end cap of Muceus with the endcap 160 of Slack because providing a projectile aperture (e.g., prior to firing the projectile) would have the added benefit of increased accuracy; reducing damage to the suppressor; and reduce the muzzle flash that is visible outside the suppressor because of the narrow opening through which the projectile exits. Ex. 1008 ¶¶329-330.

A POSITA would have had a reasonable expectation of success in making this combination because both references provide descriptions of suppressor components performing equivalent functions (e.g., the end cap 1360 and endcap 16), and the addition of a projectile aperture to the endcap would not require undue experimentation, in addition to being inherently present in Muceus as discussed herein. Ex. 1008 ¶¶330-331; Ex. 1005 ¶¶25, 59, Fig. 13; *and see* Ex. 1006 ¶¶42, 63, 64, Figs. 9-10.

In addition, the external component 22 (i.e., housing) of Slack is cylindrical with apertures on either end and can be captured between a flange 162 of the end cap 160 and a flange 150 of the internal component 124 (i.e., core). Ex. 1006 ¶¶42-43, 63, Figs. 9-10; Ex. 1008 ¶¶327. The POSITA would have been motivated to modify Muceus to include a threaded bore as taught by Slack that threadingly

engages with the end of the core to retain the main body (i.e., housing) of Muceus in the same manner as Slack's external component. *See* Ex. 1008 ¶332. This combination would have reasonable expectation of success for the same reasons as modifying or replacing the end cap. *See* Ex. 1008 ¶329-332.

Moreover, given that both Muceus and Slack use cylindrical outer structures (i.e., the main body and external component, respectively) and internal components for suppressing the high pressure gas from a firearm, the combination would have had a reasonable expectation of success including predictable results of improved performance, structure, manufacturability, and functional integration without undue experimentation. Ex. 1008 ¶¶334-335.

In regard to the motivation to modify the housing of Muceus to have an inner compartment being substantially the same circumference from the first end to the second end as taught by Slack (which Muceus also already includes as discussed below), the main body (i.e., housing) of Muceus and the external component (i.e., housing) of Slack are both cylindrical (i.e., with the same circumference from first end to second end). Ex. 1008 ¶336; *see* Ex. 1005 Figs. 11, 13. The POSITA would further have been motivated because cylindrical shapes are easier to produce when using standard lathe and milling equipment, are also rotationally symmetric, handle internal pressures well, allow gases to expand evenly, and improve sound suppression. Ex. 1008 ¶336.

Moreover, because both Muceus and Slack show substantially the same cylindrical housing shape and employ internal convoluted flow paths for gas suppression, including core structures with convoluted flow paths to suppress the propellant gases exiting the firearm, the combination would have had an inner compartment with the same circumference from the first end to the second end and a reasonable expectation of success including predictable results without undue experimentation. Ex. 1008 ¶337.

In regard to the motivation to modify Muceus to have a core removably attachable to the housing and positioned therein (which Muceus also discloses as discussed below), as taught by Slack, the POSITA would have been motivated to modify Muceus based on Slack because cores are high-precision elements subject to wear, fouling, and damage, with non-removable cores being difficult or impossible to service. Ex. 1008 ¶338. A POSITA would be motivated to use a removable core to allow the components to be cleaned, replaced, or optimized independently. Ex. 1008 ¶338.

Moreover, given that both Muceus and Slack depict separate cylindrical outer structures and removable internal components (*See e.g.*, Ex. 1005 Fig. 13, Ex. 1006 Fig. 9) and both share the same functional objectives of suppressing propellant gases, the combination would have had a reasonable expectation of

success including predictable results without undue experimentation. Ex. 1008 ¶339.

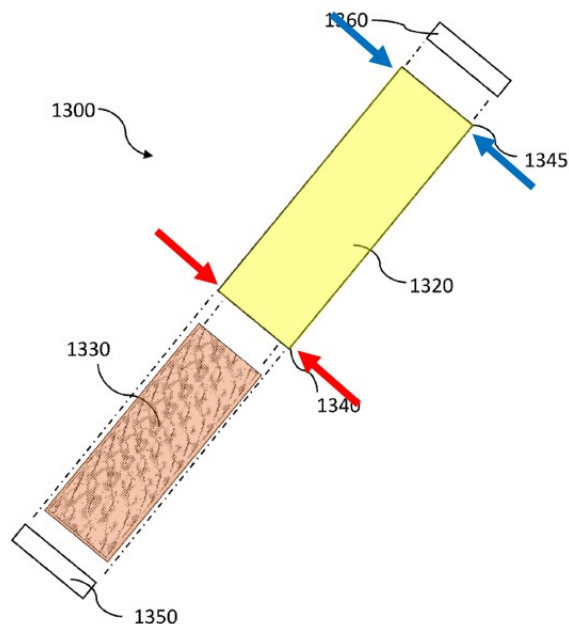
2. Claim 1

i. [1.PRE]

Muceus discloses “[s]uppressors for firearms”. Ex. 1005 abstract; Ex. 1008 ¶340; *see also* [1.1]-[1.5].

ii. [1.1]

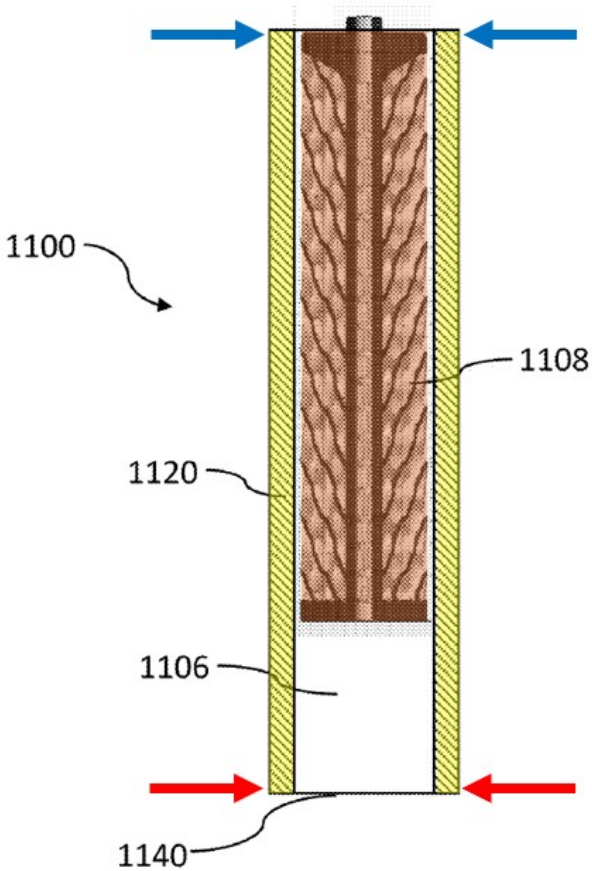
Referring to annotated Fig. 13 below, Muceus discloses that the suppressors (i.e., firearm suppression system) comprise a main body 1320 (i.e., housing), which has an entry end 1340 (i.e., first end, red arrows) and an exit end 1345 (i.e., second end, blue arrows). Ex. 1005 ¶51, 59, Fig. 13; Ex. 1008 ¶341-342).



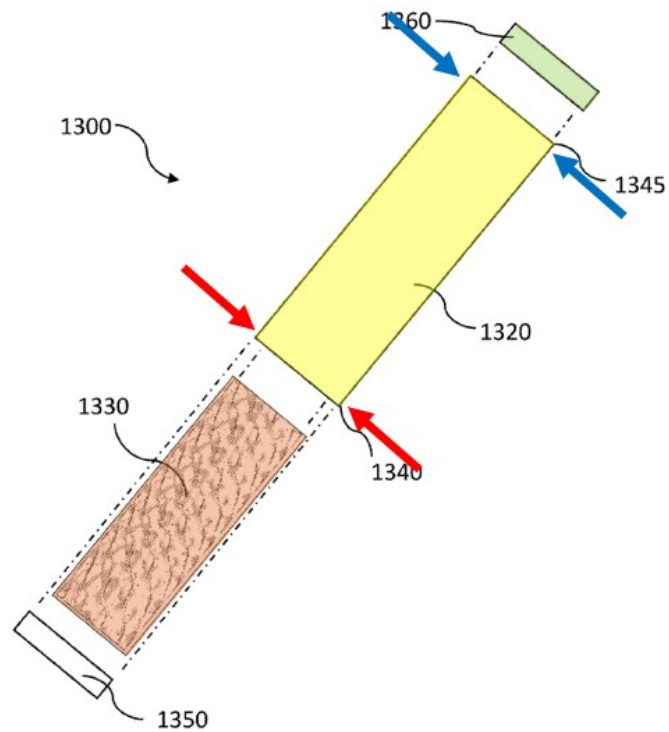
Muceus, Fig. 13 (annotated)

iii. [1.1a]

Muceus discloses that the main bodies (i.e., housing) of the suppressors (i.e., firearm suppression system) are *cylindrical bodies* and an “*outer tube*”. Ex. 1005 ¶¶51, 59 (emphasis added). Ex. 1005 ¶59, Fig. 13; Ex. 1008 ¶343. Referring to annotated Figs. 11 and 13 below, the main bodies of Muceus have apertures at the entry end (i.e., first end) (red arrows) and the exit end (i.e., second end) (blue arrows), which is confirmed by the cross-sectional view of Fig. 11, and the respective embodiments are interchangeable. Ex. 1005 Figs. 11, 13; Ex. 1008 ¶¶344-345.

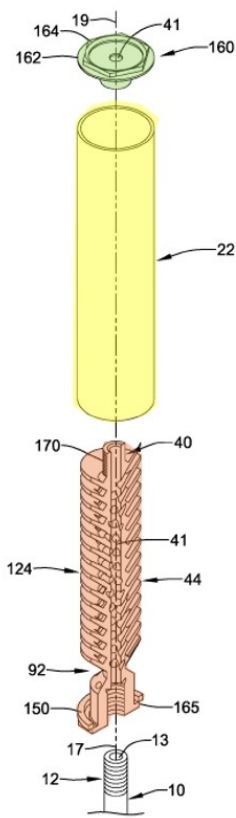


Muceus, Fig. 11 (annotated)

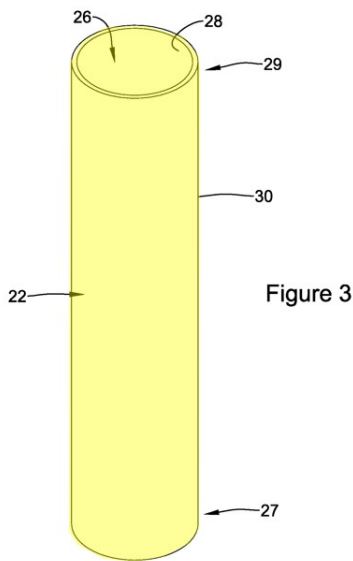


Muceus, Fig. 13 (annotated)

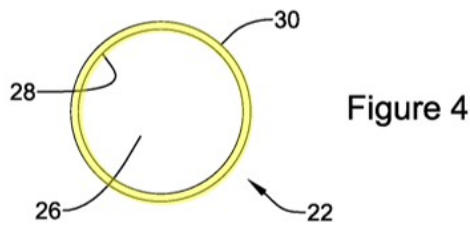
To the extent it is argued that Muceus lacks Element [1.1a], Slack discloses a first aperture at the first end and a second aperture at a second end of the external component 22 (i.e., housing) as shown in annotated Figs. 3-4 and 9 below. Ex. 1006 ¶42; Fig. 3, 4, 9; Ex. 1008 ¶¶346-347.



Slack, Fig. 9 (excerpt, annotated)



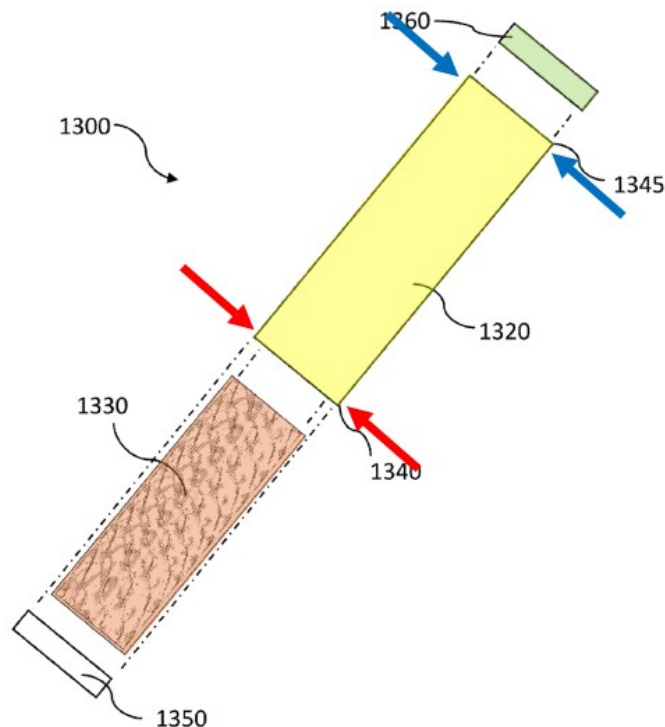
Slack, Fig. 3 (annotated)



Slack, Fig. 4 (annotated)

iv. [1.1b]

Muceus discloses that “[in] some embodiments, a noise suppressor for a firearm includes a *cylindrical body extending along a longitudinal direction*” between an entry end 1340 (i.e., first end, red arrows) and an exit end 1345 (i.e., second end, blue arrows). Ex. 1005 ¶¶4-6, 31-32, 40, 51-53, 59; Ex. 1008 ¶348 (emphasis added).

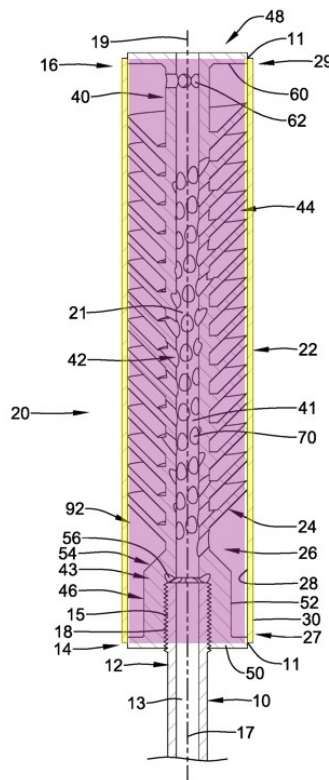


Muceus, Fig. 13 (annotated)

Moreover, the inner compartment is substantially the same circumference from the entry end (i.e., first end) to the exit end (i.e., second end) as evidenced by

both the cylindrical shape and Fig. 11. *See* Ex. 1005 Fig. 11, 13; Ex. 1008 ¶¶348-352.

To the extent it is argued that Muceus lacks Element [1.1b], Slack discloses a cylindrical external component 22 having a smooth inner compartment (purple highlight) having a rectangular cross section (i.e., substantially the same circumference from the entry end). Ex. 1008 ¶¶353-355; Ex. 1006 ¶42; Figs. 2-4, 9.

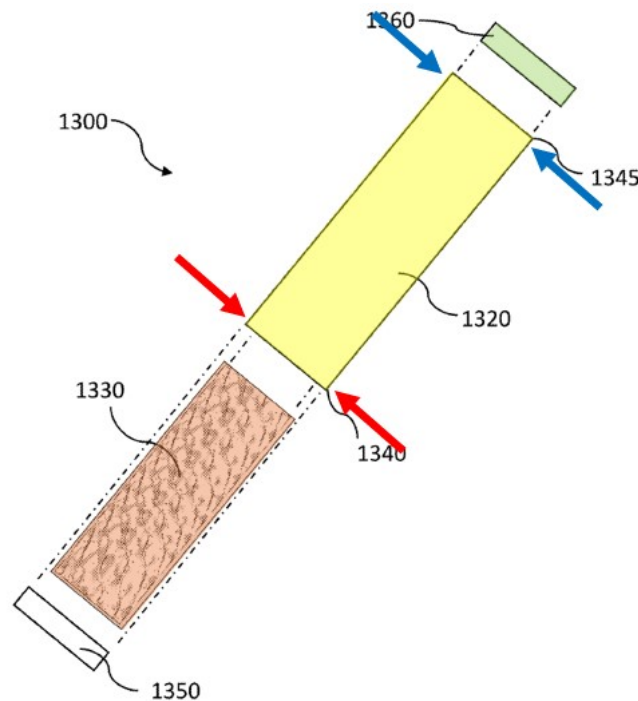


Slack, Fig. 2 (annotated)

v. [1.2]

Referring to annotated Fig. 13 below, Muceus discloses that an endcap 1360 (i.e., end cap) (green highlight) and necessarily and inherently includes a projectile

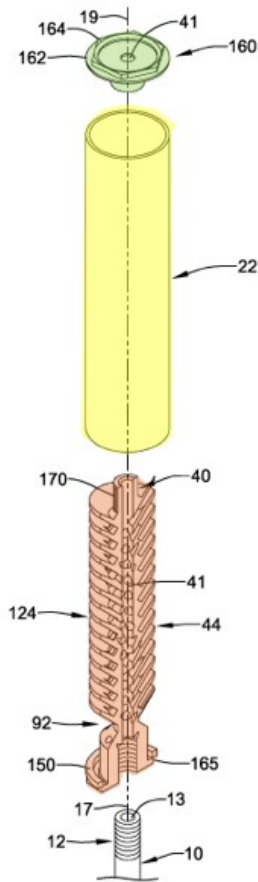
aperture. Ex. 1005 ¶25, 59, Figs. 1, 13. The conclusion that a projectile aperture is inherently present in the end cap 1360 of Muceus necessarily flows from Muceus' description of the suppressor operation, the projectile path through the suppressors, and the location of the end cap 1360, which require a projectile aperture for the projectiles to exit the suppressor. Ex. 1008 ¶356-357.



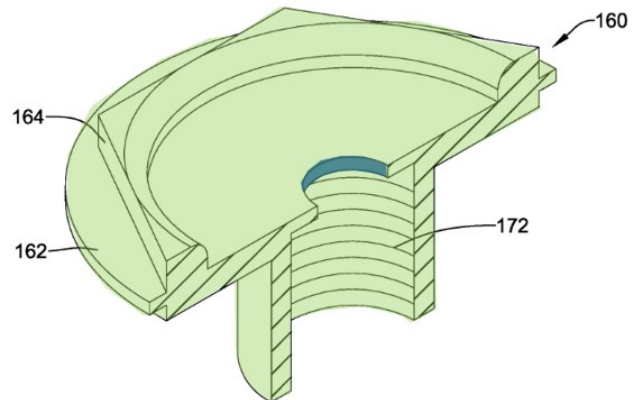
Muceus, Fig. 13 (annotated)

To the extent it is argued that Muceus does not disclose that the endcap 1360 (i.e., end cap) has a projectile aperture, referring to the annotated excerpt of Fig. 9 and the annotated Fig. 10 below, Slack discloses an end cap 160 (green highlight) with a bore 41 (i.e., projectile aperture) (blue highlight), and it would have been

obvious to add a projectile aperture to Muceus based on the teachings of Slack. Ex. 1008 ¶¶358-362; Ex. 1006 ¶42, 55, Figs. 9, 10; *see* Motivation to Combine.



Slack, Fig. 9 (excerpt, annotated)

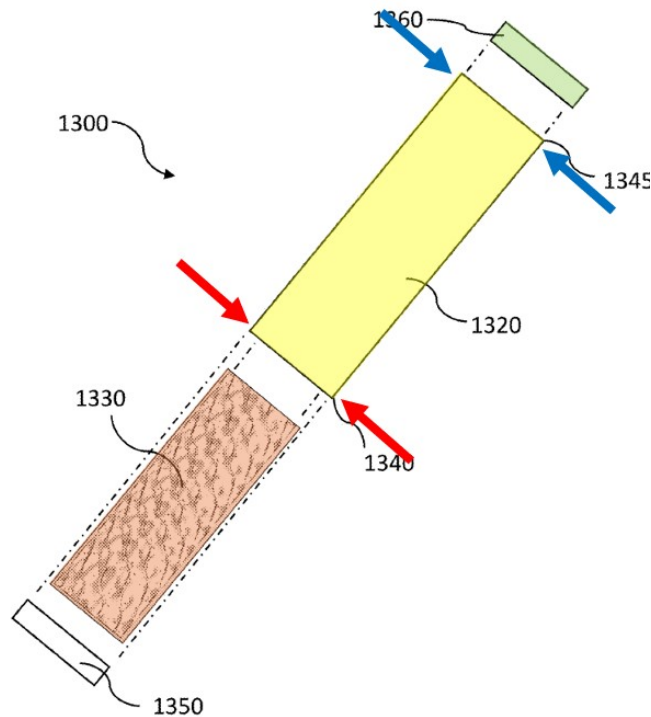


Slack, Fig. 10 (annotated)

vi. [1.3]

Muceus discloses that “[t]he suppressor core 1330 is inserted into the body 1320”. Ex. 1005 ¶59; Ex. 1008 ¶363. Muceus further discloses that the “suppressor core may be made separate from or integral with other components of the suppressor” and then “screwed” together with the other components (e.g., the main

body (i.e., housing), baseplate, and/or endcap (i.e., end cap)). Ex. 1005 ¶¶59, 63, Fig. 13; Ex. 1008 ¶¶364-365.



Muceus, Fig. 13 (annotated)

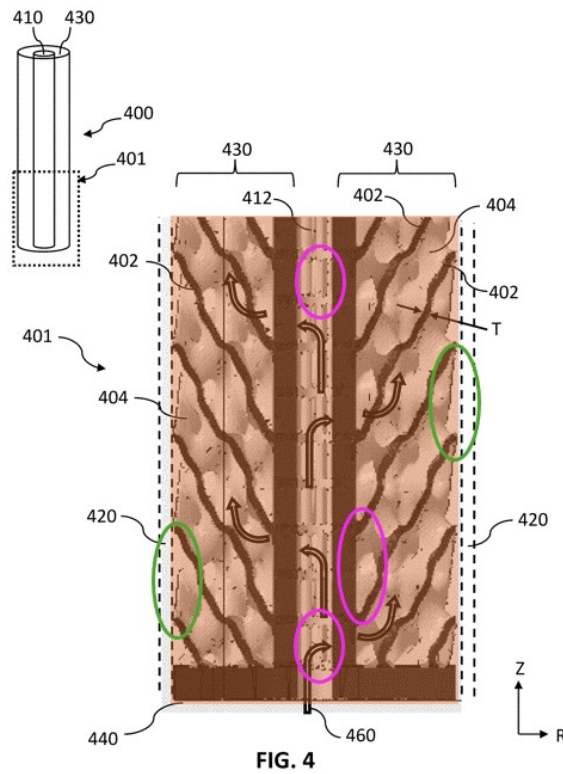
Slack also discloses an inner component 124 (i.e., core) removably attachable to the housing and positioned therein, such as by threading the end cap 160 onto the threaded portion 170. Ex. 1008 ¶¶366-368; Ex. 1006 ¶63, Fig. 9; *see* Motivation to Combine.

vii. [1.4]

Regarding the core apertures, Muceus discloses a core that is made of a TPMS structure which comprises a plurality of channels extending to the outer surface of the cores (i.e., the openings being a plurality of core apertures) that

allow gas passing from a projectile and cartridge to exit out of the core. EX 1005 ¶32; Figs. 3-14; Ex. 1008 ¶369. It is disclosed that the suppressor assemblies of Figs. 5, 11, and 13 can comprise any of the disclosed TPMS structures throughout the disclosure. *See* Ex. 1005 ¶¶14, 18, 19, 26 31, 32, 37, 38, 40, 42, 46, 54, 57, 59, 62; Figs. 3-14; Ex. 1008 ¶370.

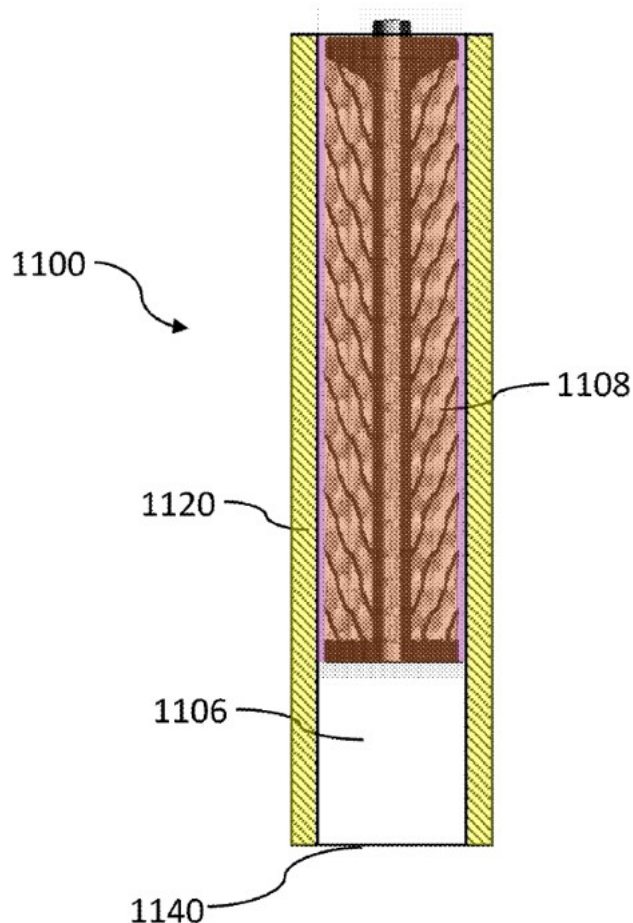
Referring to the annotated Fig. 4 below, Muceus explains that “[g]ases in the center bore 410, from firing a projectile, can enter the suppressor core 400 through a plurality of openings 412 [pink circles] at the inner diameter of the suppressor core 400, where the openings 412 are also connected to the channels 404” that exit at outlet openings of the channels 404 (examples shown with green circles) Ex. 1005 ¶32-33, Fig. 4; Ex. 1008 ¶¶371-373. Muceus also discloses that “[t]he channels 404 provide flow pathways for gases to travel from the entry end 440 of the suppressor core 400, along the center bore 410, radially outward and along the length of the suppressor core 400 as shown by the arrows 460.” Ex. 1005 ¶32; Ex. 1008 ¶371.



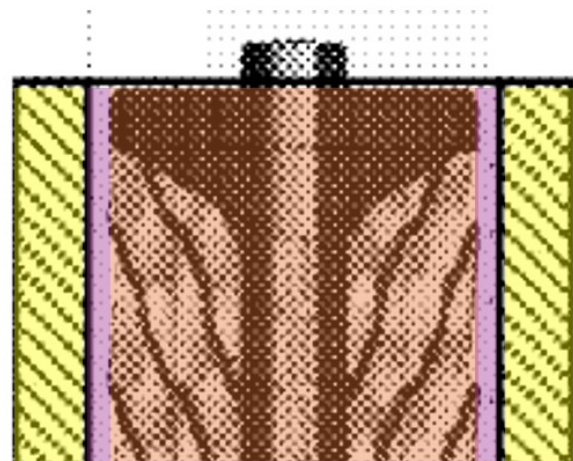
Muceus, Fig. 4 (annotated)

Regarding the “channel” of independent claim 1, Muceus discloses several different types of voids downstream of the channels (i.e., core apertures) of Muceus, within the main body of the suppressor, each of which corresponds to the “channel” claimed in claim 1 of the ’906 patent. Ex. 1008 ¶¶374-376; Ex. 1005 ¶54, Fig. 11. For example, Muceus further discloses that the outlet openings of the channels 404 (i.e., plurality of core apertures, green circles above) allow gas passing from a projectile and cartridge to pass to an empty region between the inner surface of the housing and an outer surface of the core. Ex. 1008 ¶376; Ex. 1005 ¶54, Fig. 11. Specifically, Muceus describes that the suppressor core can

extend partially along the length of the suppressor assembly and/or *partially in the radial volume of the chamber*, thereby indicating, and shown in at least annotated Fig. 11, that the suppression core does not occupy the entire internal radial volume of the main body (i.e., housing) in some embodiments, but instead may leave a circumferential gap (purple highlight) between the outer surface of the suppression core (i.e., core) (orange highlight) and the inner surface of the main body (i.e., housing) (yellow highlight). Ex. 1005 Fig. 11, ¶54; Ex. 1008 ¶¶376-378.

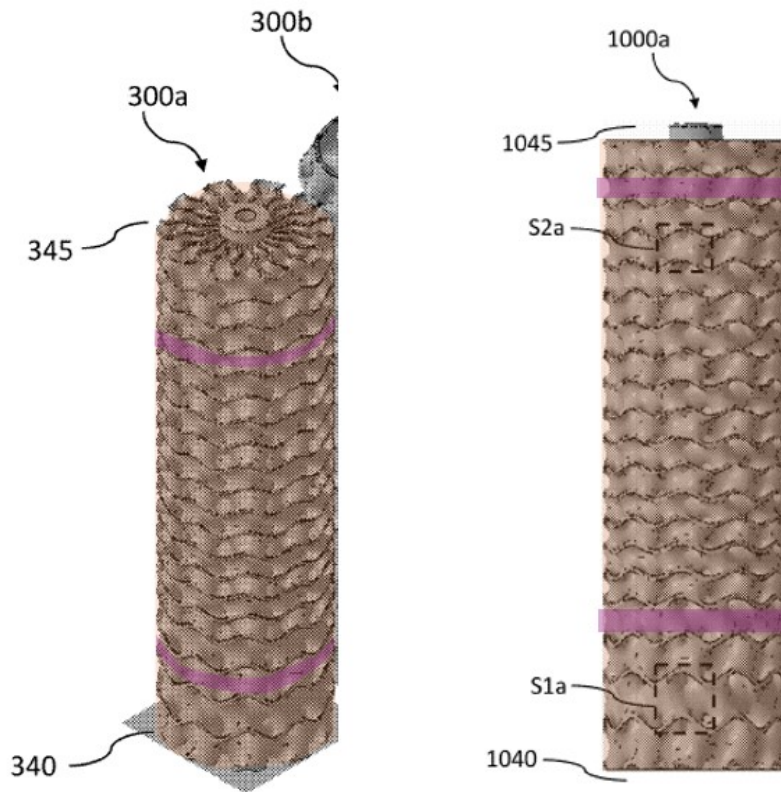


Muceus, Fig. 11 (annotated)

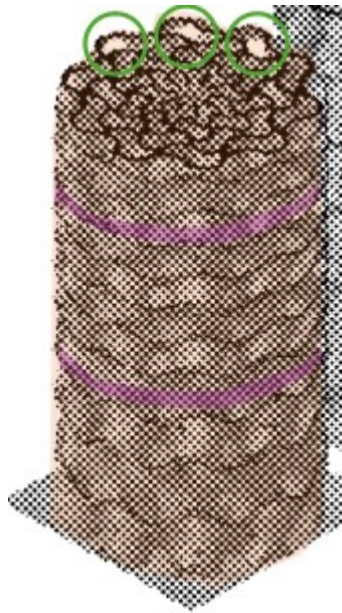


Muceus, Fig. 11 (excerpt, annotated)

In addition to the radial volume discussed above, Muceus also discloses cores that comprise a plurality of channels formed along the exterior of the core. For example, as shown in the annotated Figs. 3, 10A, and 12, below, at least suppressor core 300a of Fig. 3, suppressor core 1000a of Fig. 10A, and suppressor core 1200a of Fig. 12 depict channels (examples purple highlight) that extend circumferentially around the core. Ex. 1008 ¶379; Ex. 1005 Figs. 3, 10A, and 12.



Muceus, Fig. 3 (annotated, excerpt) **Muceus, Fig. 10A (annotated)**



Muceus, Fig. 12 (excerpt, annotated)

With reference to annotated Fig. 10B below, Muceus discloses spiral shaped channels (examples purple highlight) that extend circumferentially around the core. Ex. 1008 ¶380; Ex. 1005 Fig. 10B. Each of the foregoing also equate to the claimed channel at least because they provide “connected pathways” (i.e., a plurality of core apertures) on an outer surface of the core that allow gas passing from a projectile and cartridge to pass to the channels (areas purple highlight) between the inner surface of the housing and an outer surface of the core 300a, 1000a and on to the radial void between the core and the main body. Ex. 1008 ¶¶381-384; Ex. 1005 ¶¶32, 54, Figs. 3, 10A-10B, 11-13.

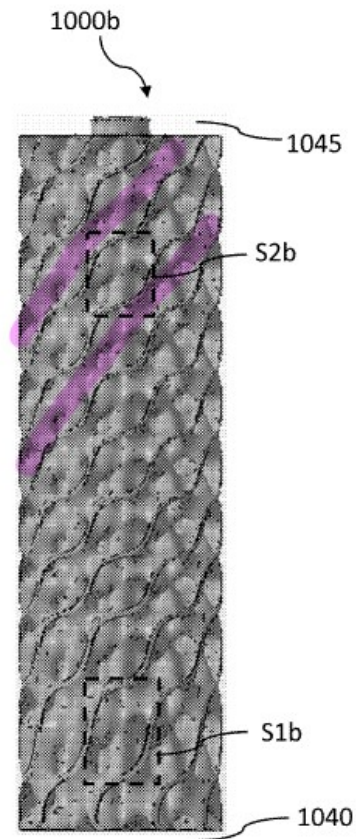


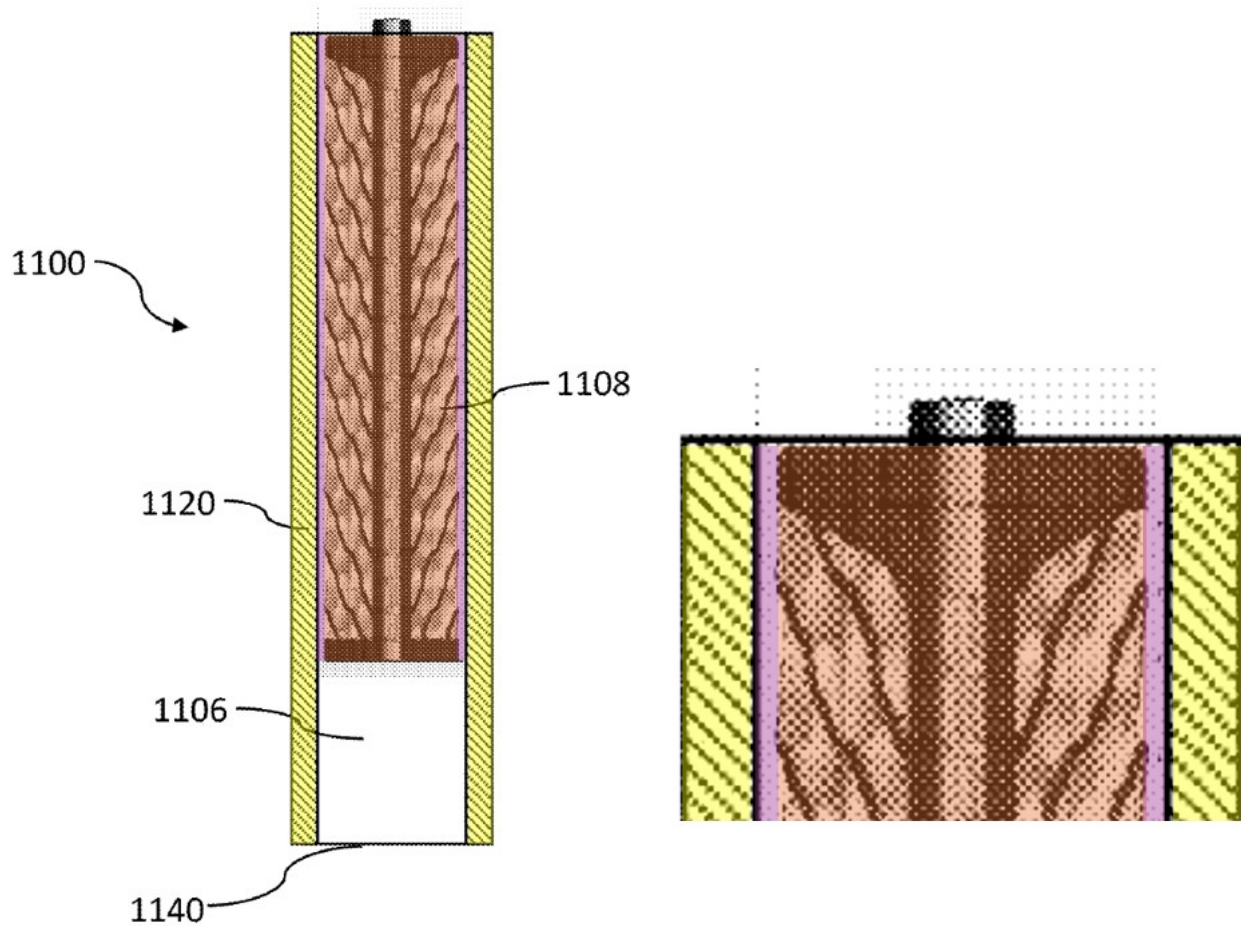
FIG. 10B

Muceus, Fig. 10B (annotated)

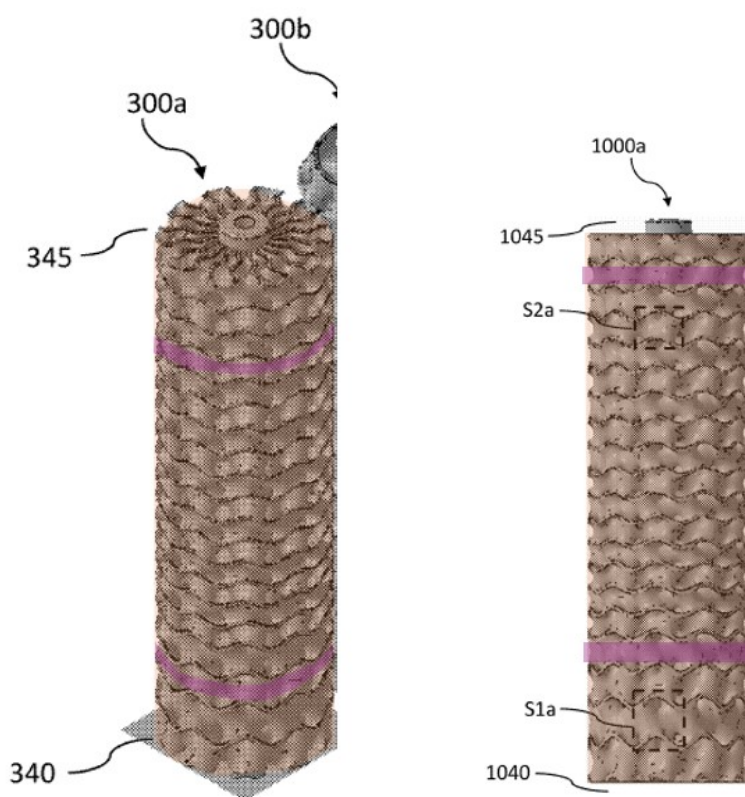
Additionally, the annotated excerpt of Fig. 12 above shows a view of suppressor core 1200 at an intermediate stage of being built by additive manufacturing. Ex. 1005 ¶57; Ex. 1008 ¶383. As depicted in the annotated Fig. 12, below, portions of the connected pathways (examples circled in green) extend through a wall of the TPMS structure (e.g., openings to the outside of the core), which would allow the expanding gases to flow to and between the channels (examples purple highlight). Ex. 1008 ¶¶381- 384.

viii. [1.5]

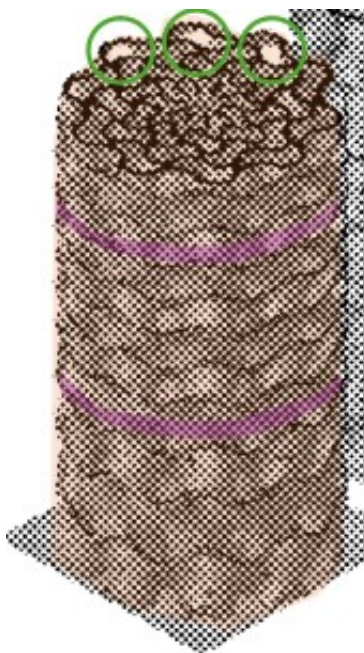
As discussed with respect to Element [1.4] immediately above, and with reference to annotated Figs. 3, 10A-10B, 11-13 below, Muceus discloses both (a) a circumferential gap (purple highlight in Fig. 11) between the outer surface of the suppression core (i.e., core) (orange highlight) and the inner surface of the main body (i.e., housing) (yellow highlight) and (b) circumferentially-extending channels (purple highlight in 3, 10A, 10B, 12) that gas may flow through from the entry end (i.e., first end) to the exit end (i.e., second end), each of which equalize pressure that begins at an entry end (i.e., first end of the housing) and terminates at an exit end (i.e., second end of the housing). *See supra* §VII(F)(2)(vii); Ex. 1005 ¶54 Fig. 11; ¶54; Ex. 1008 ¶¶385-392.

**Muceus, Fig. 11 (annotated)****Muceus, Fig. 11 (excerpt, annotated)**

Muceus Fig. 11 also discloses a clear path from the entry end 1140 of the suppressor to the gap between the core 1108 (i.e., core) and the main body 1120 (i.e., housing) confirming that the pressure is equalized from the first end of the main body (i.e., housing) to the second end of the main body (i.e., housing). Ex. 1005 Fig. 11; Ex. 1008 ¶387.



Muceus, Fig. 3 (annotated, excerpt) Muceus, Fig. 10A (annotated)



Muceus, Fig. 12 (excerpt, annotated)

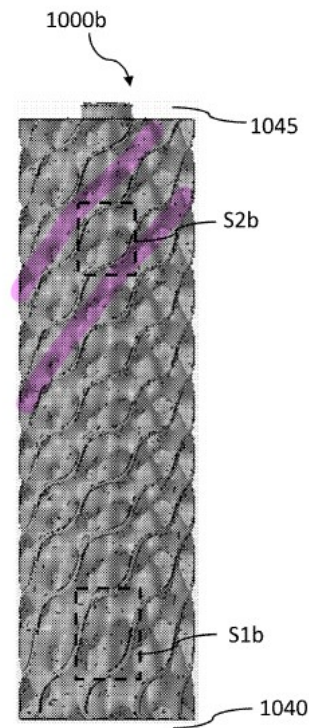


FIG. 10B

Muceus, Fig. 10B (annotated)

Also, Muceus discloses that channels connecting the openings in the bore and the second openings (i.e., plurality of core apertures) “provide flow pathways for gases to travel from the entry end 440 of the suppressor core 400, along the center bore 410, *radially outward and along the length of the suppressor core 400*”. Ex. 1005 ¶32; Fig. 4 (emphasis added); Ex. 1008 ¶¶389-391. The channels of Muceus, which are connected to the openings at the inner diameter of the suppressor core, “create turbulent flow which increases friction on the surfaces to slow the gases and then finally release the gases *at the lowest possible pressure*

relative to the ambient pressure at the exit of the suppressor end” thus confirming the equalization of pressure Ex. 1005 ¶¶32-34 (emphasis added); Ex. 1008 ¶391.

Muceus also discloses that the channels, which are the open spaces within the TPMS structure, are all fluidically connected and connected to the circumferentially-extending channels (i.e., channels) (and the radial and axial gaps around the suppressor as well). Ex. 1005 ¶¶32-33. Therefore, the circumferentially-extending channels (i.e., channels) described with respect to Figs. 3, 10A-10B, and 12 would perform the claimed equalization. Ex. 1008 ¶¶393-394.

Assuming, for purposes of argument, that the channel 142 of the '906 patent performs the claimed function of equalizing pressure that begins at the first end of the housing and terminates at the second end of the housing (e.g., the equalization as described at 6:62-67 of the '906 patent), the gap (i.e., channel) of Muceus would also perform the claimed function of equalizing pressure due to the corresponding structures and purposes of the gap (i.e., channel) of Muceus and the channel 142 of the '906 patent. Ex. 1001 6:39-42, Fig. 2; Ex. 1002 p. 104; Ex. 1008 ¶¶395-399. Moreover, the pressure (e.g., at the ends of the housing) need not be in the channel from the first end to the second end as explained in Ground 1. See *supra*, §§VII(A)(2)(viii.); Ex. 1002 p. 104; Ex. 1008 ¶¶400-402.

For further avoidance of doubt, the Muceus suppressor features a main body (i.e., core) that slides into a body (i.e., housing), such that Muceus also inherently

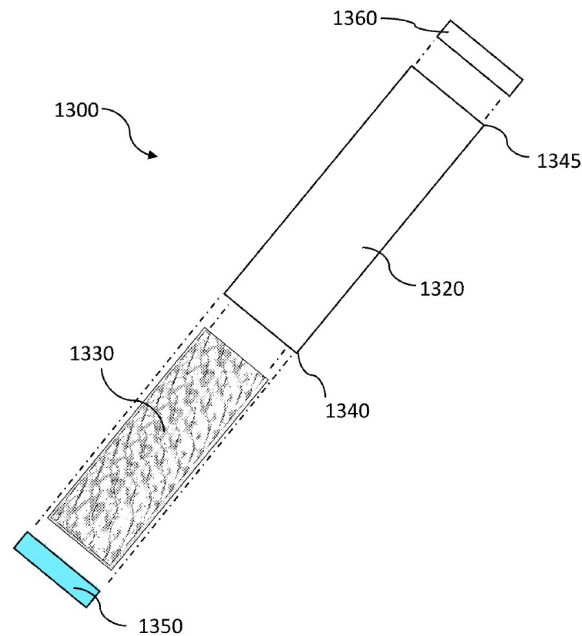
includes a channel meeting the requirements of claim 1 as established by Patent Owner and described in Ground 1. *See supra* §VII(A)(2)(viii); Ex. 1011 p. 32; Ex. 1005 Figs. 11, 13; Ex. 1008 ¶¶403-404.

3. Claim 2

Muceus discloses that “suppressors having TPMS structures in accordance with the present disclosure are fabricated using additive manufacturing, which is also known as three-dimensional (3D) printing.” Ex. 1005 ¶56; Ex. 1005 ¶¶31-32, 37-40, 42, 46, 48, 54, 57, 59, Figs. 3-13; Ex. 1008 ¶¶405-406.

4. Claim 4

Referring to annotated Fig. 13 of Muceus below, the suppressor assembly 1300 (i.e., firearm suppression system) includes a baseplate 1350 (i.e., muzzle adapter) that is attached at the firearm (i.e., entry) end of the suppressor assembly. Ex. 1005 Fig. 13, ¶59; Ex. 1008 ¶407.

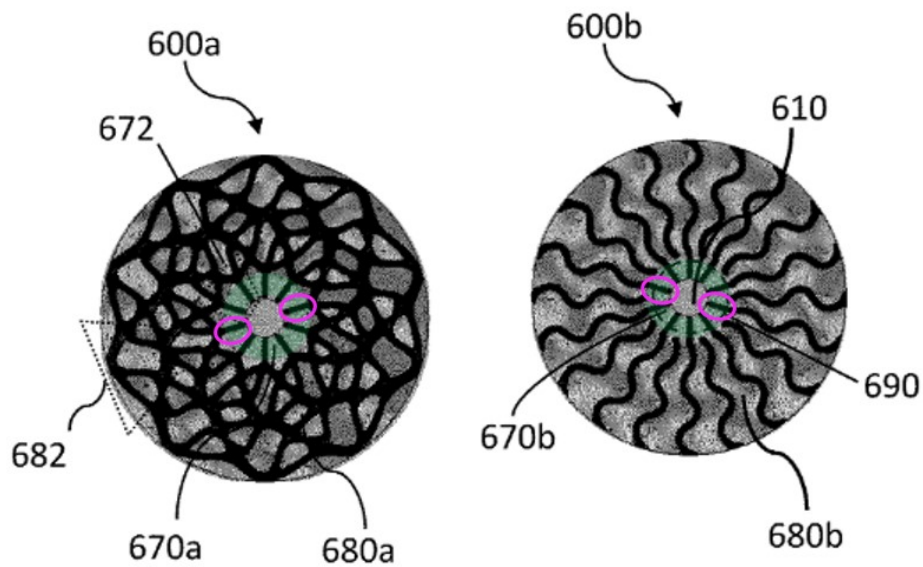


Muceus, Fig. 13 (annotated)

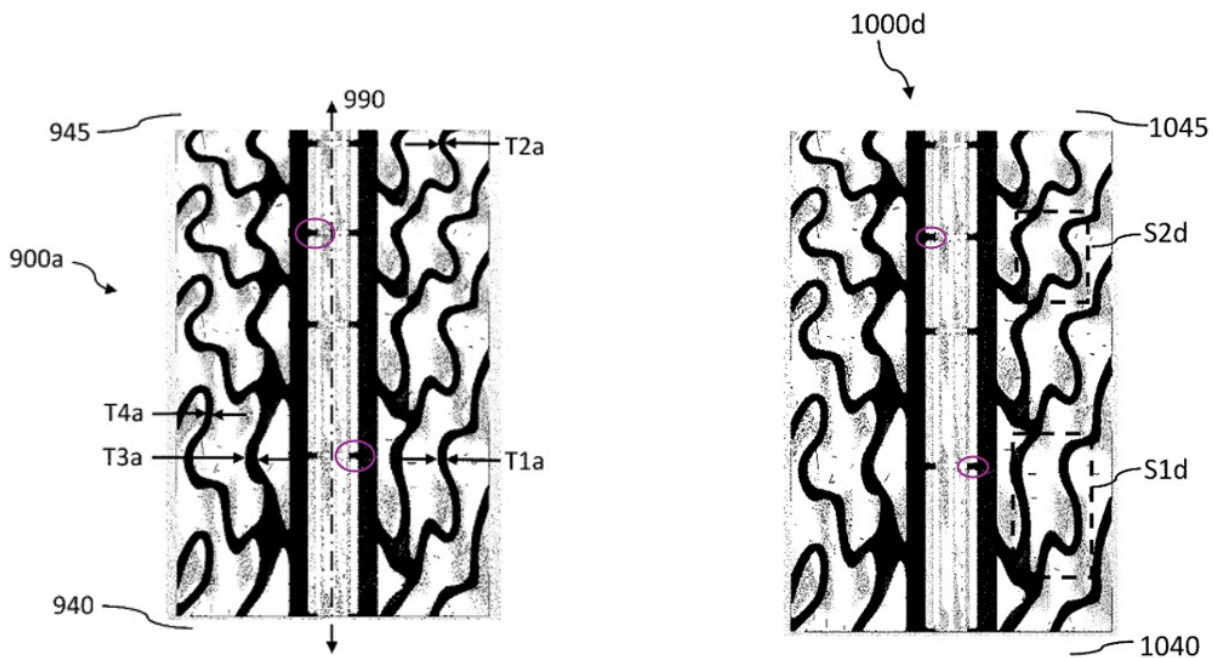
5. Claim 10

Muceus discloses that “[i]n this disclosure, suppressor cores (which may also be referred to herein as suppression cores) are the suppressor structures that fill all or some of an annular chamber in a suppression device, to serve as baffles.” Ex. 1005 ¶31; Ex. 1008 ¶408. Thus, the body of the core itself (both inner portion and outer portion) comprises the baffles from the center bore (e.g., center bore 610 shown in annotated Figs. 7A-7B below) to the exterior openings and surfaces on the outside of the core. Ex. 1008 ¶408.

Muceus shows and describes baffles in all of its cores examples of which are circled in magenta below. Ex. 1005 Figs. 6A, 6B, 7A, 7B, 8A, 8B, 9A, 9B, 10C, 10D, 12; Ex. 1008 ¶409-411.



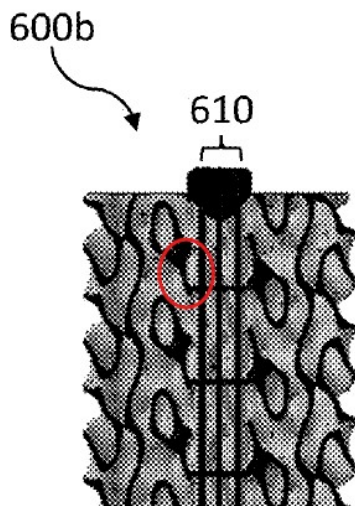
Muceus, Fig. 7A (annotated) **Muceus, Fig. 7B (annotated)**



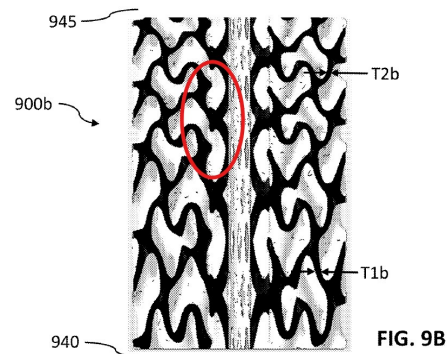
Muceus, Fig. 9A (annotated, excerpt) **Muceus, Fig. 10D (annotated)**

Further, referring to annotated excerpts of Figs. 6B and 9B below, the baffles (red circle) along the interior of the central bore (labeled 610 in Fig. 6B)

extend inward towards the firearm muzzle and radially toward the central bore from an inner surface (i.e., the surface outward of the indicated baffles). Ex. 1005 Figs 6B, 9B; Ex. 1008 ¶411.

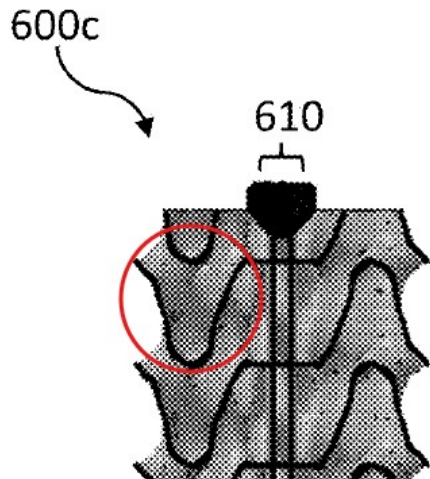


Muceus Fig. 6B (excerpt, annotated)

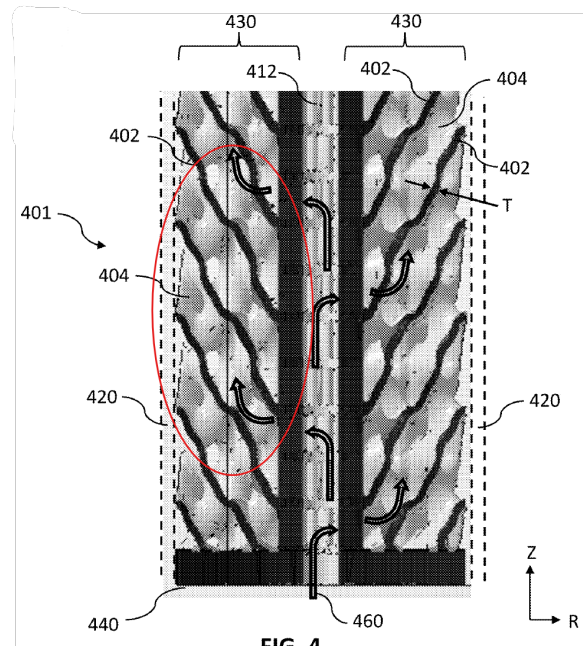


Muceus Fig. 9B (annotated)

An “inner surface” can refer to any surface within the exterior perimeter of the core, such that Figs. 4 and 6C also include inwardly extending baffle surfaces that extend from an inner surface. Ex. 1005 Figs. 4, 6C; Ex. 1008 ¶412.



Muceus Fig. 6C (excerpt, annotated)



Muceus Fig. 4 (excerpt, annotated)

Referring to annotated Fig. 3 below, the TPMS structure includes inner surfaces that define the “suppressor structures . . . [that] serve as baffles” and similarly interact with the core apertures as they are intertwined as discussed above with respect to claim 1. Ex. 1005 ¶31, Figs. 2-3; Ex. 1008 ¶413. Fig. 2 of Muceus, also reproduced below, shows an example of a TPMS gyroid surface showing layers each having a portion facing inwardly from an inner surface. Ex. 1008 ¶413. Each of the foregoing baffle examples is immediately adjacent to and/or part of the channels leading to the openings in the exterior of the core (i.e., plurality of core apertures) and thus interact with the core apertures. Ex. 1008 ¶¶413-414.

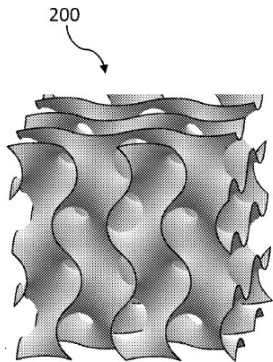


FIG. 2
(Prior Art)

Muceus, Fig. 2

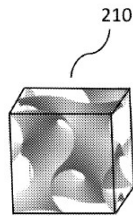
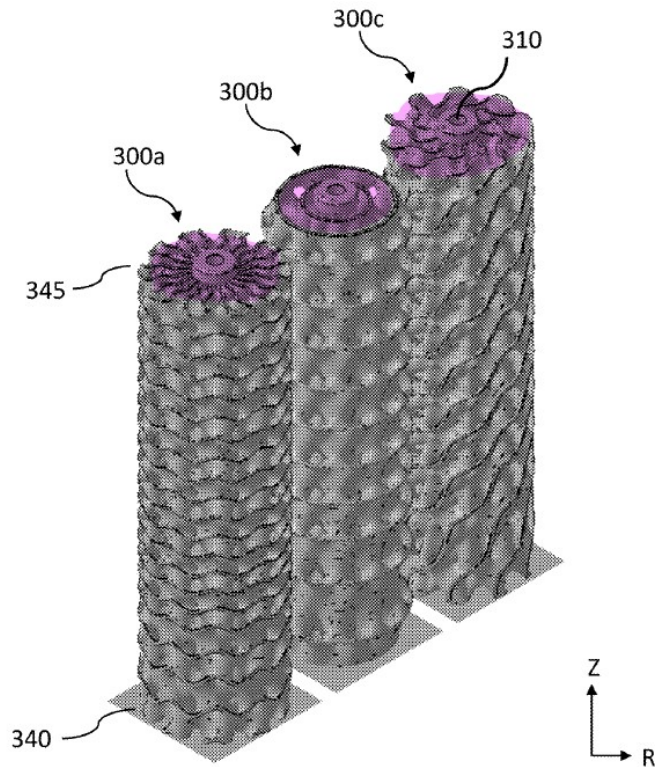


FIG. 3

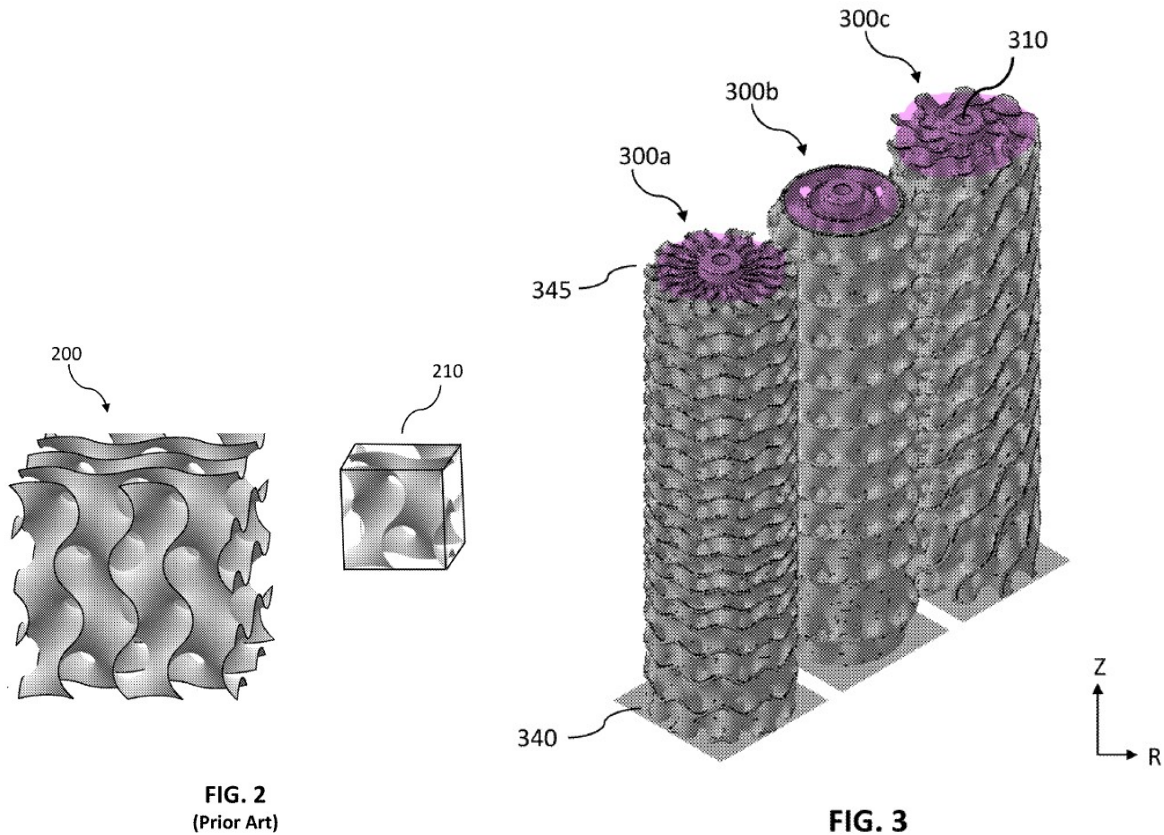
Muceus, Fig. 3 (annotated)

6. Claim 11

The POSITA would have understood that the baffles being “extruded inwardly” refers to the direction toward the shooter (e.g., aft towards the firearm muzzle) and/or radially inward towards a center axis. Ex. 1001 6:26-29; 10:51-53. Ex. 1008 ¶¶415-416. Muceus’ Figs. 7A-B, 9A and 10D disclose baffles that are extruded radially inward. Ex. 1008 ¶416.

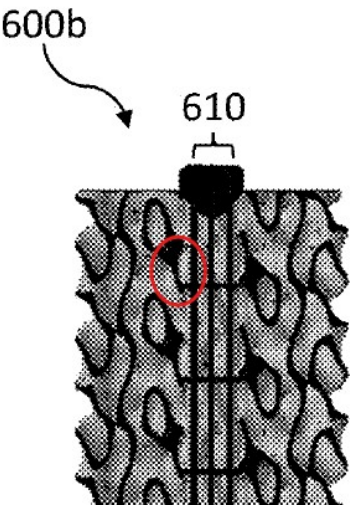
As described above, the various patterns of the suppressor cores, such as the gyroid pattern demonstrated in Fig. 2 and the examples in Figs. 3, 4, 6B, 6C, 7A,

7B, 9A, 9B, and 10D illustrated above include numerous surfaces oriented inwardly towards the center axis of the suppressor core and towards the shooter, as can be seen, for example, by the layer pattern of Fig. 2 and the baffles of at least Figs. 3, 4, 6B, 6C, 9B, and 10D. Ex. 1005 ¶31, Fig. 2. Ex. 1008 ¶417-420.

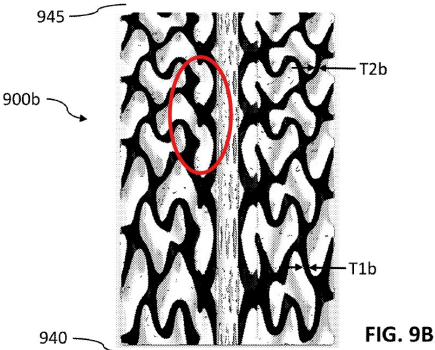


Muceus, Fig. 2

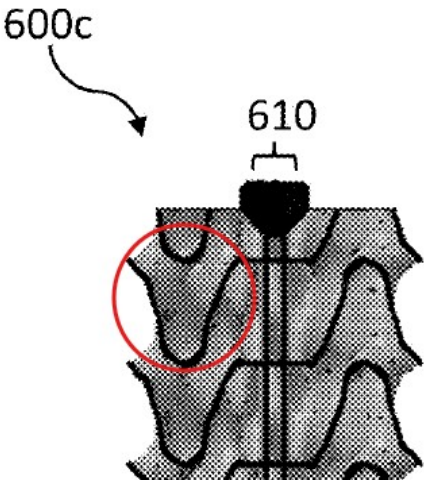
Muceus, Fig. 3 (annotated)



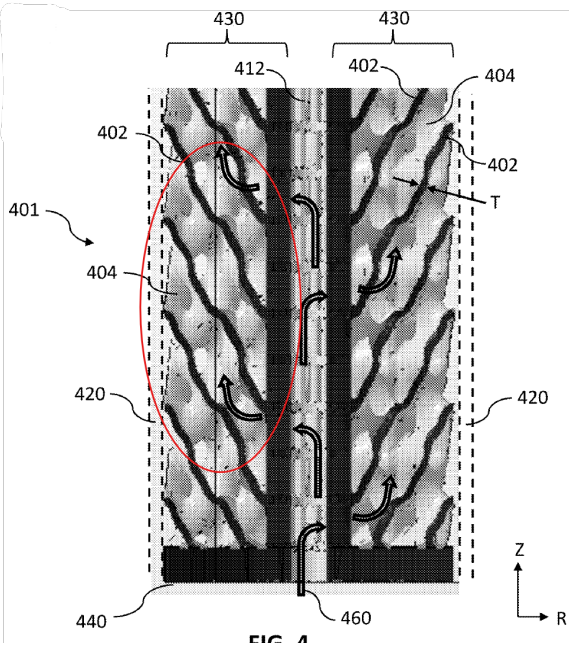
Muceus Fig. 6B (excerpt, annotated)



Muceus Fig. 9B (annotated)



Muceus Fig. 6C (excerpt, annotated)



Muceus Fig. 4 (excerpt, annotated)

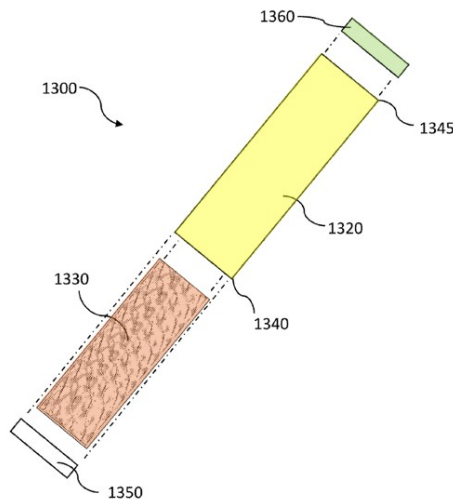
G. Ground 7: Claims 3 and 4 are rendered obvious by Muceus in view of Slack and Belykov

1. Motivation to Combine Muceus, Slack, and Belykov

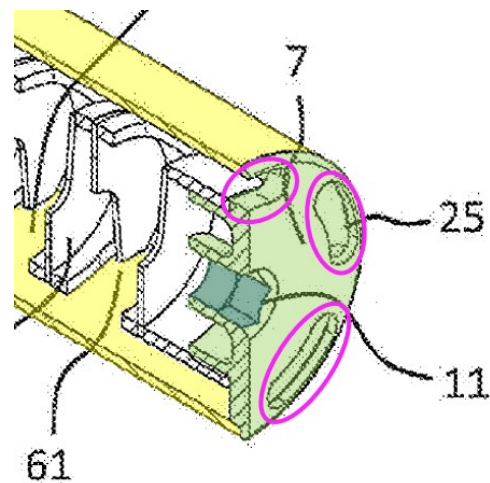
A POSITA would find it obvious to combine Muceus and Slack for the reasons discussed in §VII(F)(1). Ex. 1008 ¶¶326-339, 421-423. The POSITA would further find it obvious to combine Muceus, as modified by Slack, with Belykov, each of which are in the same field of endeavor related to managing noise and gas in firearm suppressors. *See* Ex. 1005 ¶2; Ex. 1006 ¶2, 4; Ex. 1003 ¶¶1, 49; Ex. 1008 ¶¶422-425.

A POSITA would have been motivated to combine the teachings of Muceus, Slack, and Belykov to include a plurality of vent apertures in the end cap of the suppressor of Muceus as modified by Slack. Ex. 1008 ¶426. For example, Belykov discloses venting openings 25 (i.e., vent apertures) on a front end wall 7 (i.e., end cap). Ex. 1003 ¶32, 49; Ex. 1008 ¶¶426-427. A POSITA would have been motivated to use the venting openings, as taught by Belykov with the endcaps of Muceus (e.g., as modified by Slack) and/or Slack to reduce gas formation, spark formation, and overheating in the suppressor, to improve performance of Muceus' suppressor when firing multiple rounds in short intervals, and to enhance gas dissipation and cooling, particularly during high-rate firing. Ex. 1003 ¶5, 49; Ex. 1008 ¶¶427-428.

Referring to annotated Figs. 13 of Muceus and 5 of Belykov below, a POSITA would have had a reasonable expectation of success in combining these teachings based on the similar structure of the endcap 1360 (green highlight) of Muceus and the front end wall 7 (green highlight) of Belykov, each of which is separate from and configured to engage a respective housing structure (e.g., main body 1320 of Muceus (yellow highlight) and outer tube 3 of Belykov (yellow highlight)). Ex. 1005 ¶59, Fig. 13; Ex. 1003 ¶32, Figs. 1, 3-7; Ex. 1008 ¶¶429-430.



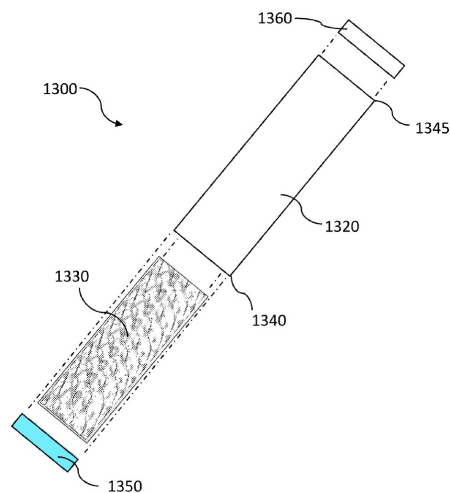
Muceus, Fig 13 (annotated)



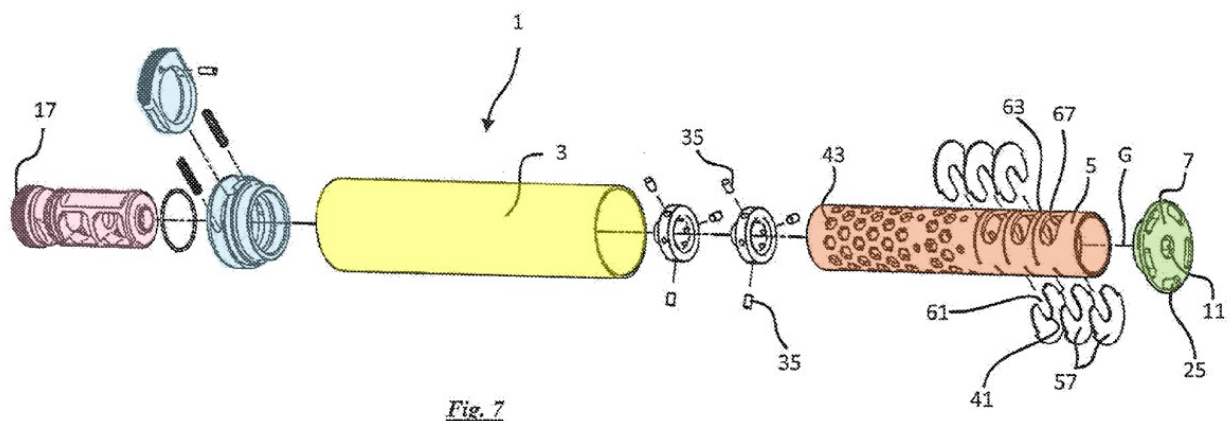
Belykov, Fig. 5 (annotated, excerpt)

In addition, assuming *arguendo* that Muceus is alleged to lack a muzzle adapter, a POSITA would have been motivated to combine the teachings of Muceus, Slack, and Belykov with a reasonable expectation of success to include a muzzle adapter. Ex. 1008 ¶431. As discussed in Ground 6, the baseplate 1350 of Muceus (blue highlight in annotated Fig. 13 below) is a muzzle adapter “for

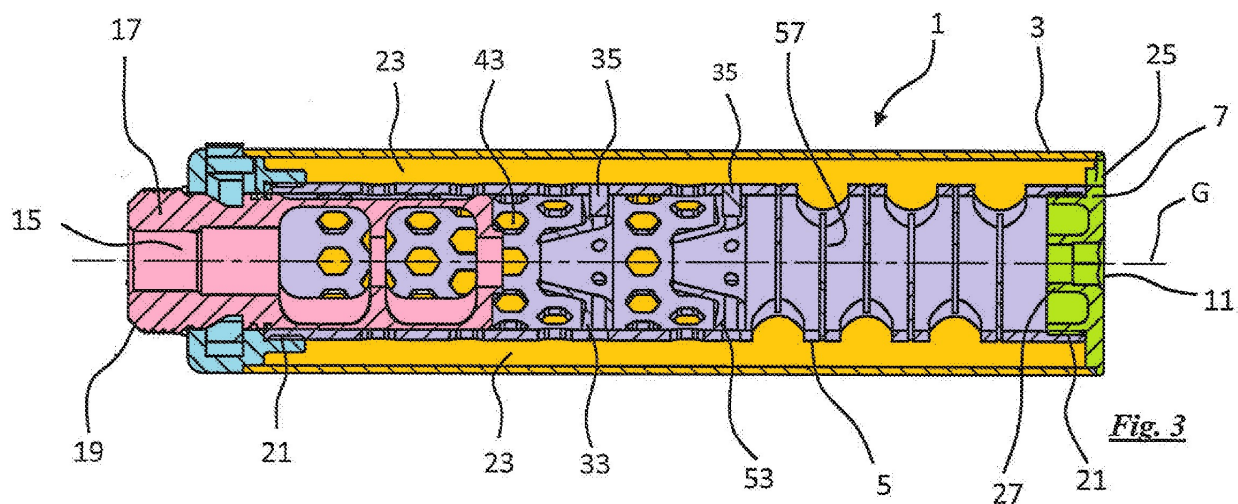
attaching the suppressor to a firearm barrel”. *See supra* §VII(F)(4); Ex. 1005 ¶59; Ex. 1008 ¶¶431-432. Belykov also discloses two different muzzle adapters: (a) a front wall 13 (i.e., muzzle adapter) (blue highlight in annotated Fig. 6) configured to engage a firearm and (b) an alternate assembly including an unlabeled “detachable fastening device” (blue highlight in annotated Figs. 3, 7) that receives a muzzle brake 17 (pink highlight). Ex. 1003 ¶28, Figs. 3, 6-7; Ex. 1008 ¶¶431-432. A POSITA would have been motivated to incorporate any of the foregoing features from Belykov into Muceus to configure Muceus’ suppressor for the same functionality as Belykov, which would improve the device of Muceus by making the baseplate more versatile and configurable and would allow interchangeability of muzzle attachment mechanisms and intermediate devices between the barrel and the suppressor. Ex. 1008 ¶433.



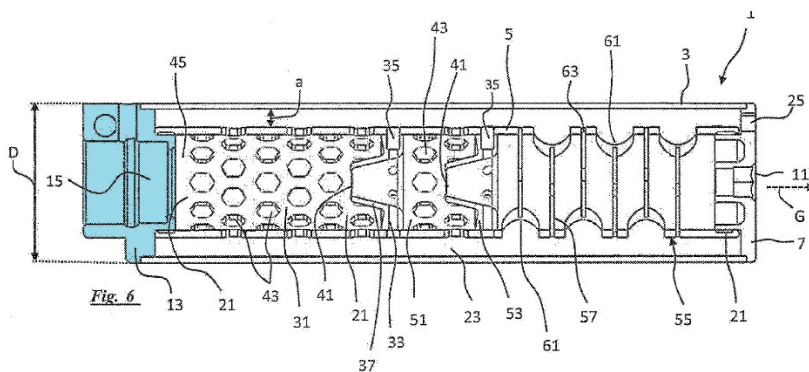
Muceus, Fig. 13 (annotated)



Belykov, Fig. 7 (annotated)



Belykov, Fig. 3 (annotated)



Belykov, Fig. 6 (annotated)

The POSITA would have had a reasonable expectation of success in combining Muceus, Slack, and Belykov without undue experimentation because the respective suppressors include baseplate like structures (e.g., the baseplate 1350 of Muceus, the muzzle end with flange 150 of Slack, and the end wall 13 of Belykov) that are each configured to adapt the corresponding suppressor to a firearm barrel and thus interchangeable. Ex. 1005 Fig. 13; Ex. 1006 Fig. 9, Ex. 1003 Fig. 3, 6-7; Ex. 1008 ¶¶434-435.

2. Claim 3

Belykov discloses this limitation for the same reasons as explained in Ground 1. *See supra*, §VII(A)(4), Ex. 1003 ¶ 32, Figs. 3, 5; Ex. 1008 ¶¶ 436-440; *see* Motivation to Combine.

3. Claim 4

As discussed in Ground 6, Muceus discloses a muzzle adapter. *See supra* §VII(F)(4). In addition, Belykov discloses this limitation for the same reasons as explained in Ground 1. *See supra*, §VII(A)(5); Ex. 1003 ¶ 28, Figs. 3, 6; Ex. 1008 ¶ 441; *see* Motivation to Combine.

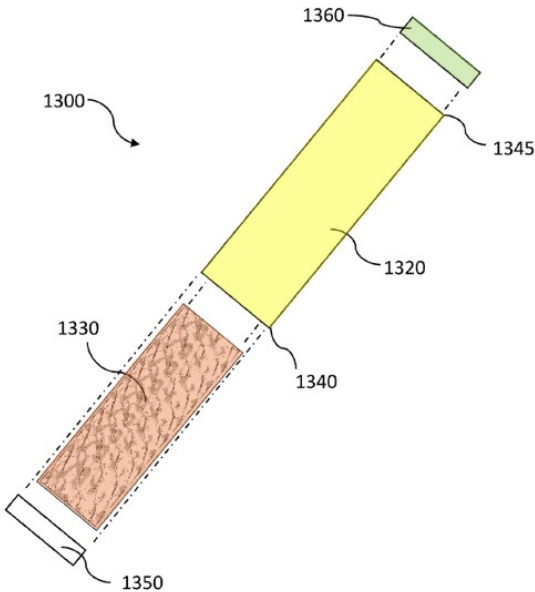
H. Ground 8: Claims 6 and 7 are rendered obvious by Muceus in view of Slack and Noonan.

1. Motivation to Combine Muceus, Slack, and Noonan

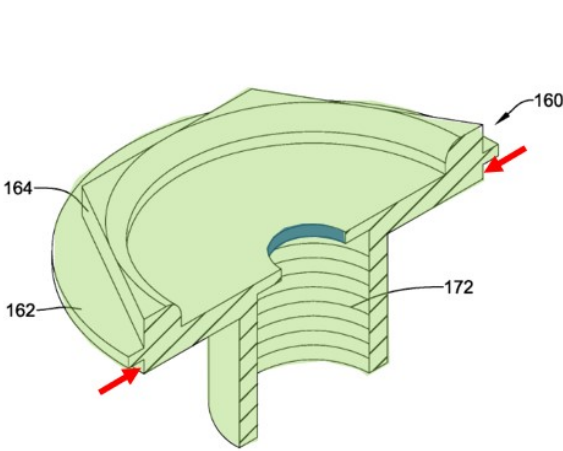
A POSITA would find it obvious to combine Muceus and Slack for the reasons discussed in Ground 6. *See supra* §VII(F)(1); Ex. 1008 ¶¶326-339, 422-

423. The POSITA would further find it obvious to combine Muceus, as modified by Slack, with Noonan to arrive at the subject matter of claims 6 and 7 of the '906 patent. Ex. 1008 ¶¶442-455. Muceus, Slack, and Noonan are directed to the same field of endeavor, firearm suppressors, and address similar problems related to, *inter alia*, noise and gas management. *See* Ex. 1005 ¶2; Ex. 1006 ¶2, 4; Ex. 1004 1:26-29; 2:56-58; Ex. 1008 ¶¶443-445.

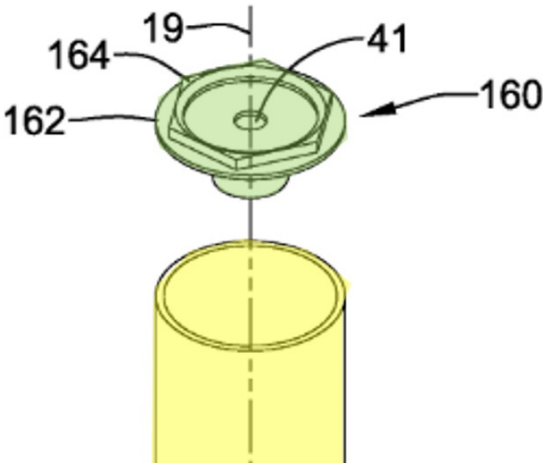
Muceus discloses that the various components of its assembly may be “screwed” together. *See* Ex. 1005 ¶58. A POSITA would have been motivated to combine Muceus, as modified by Slack, and Noonan to have an end cap with a sidewall and threads that rest against and couple to an inner surface of the housing and the POSITA would have had a reasonable expectation of success in the combination for the same reasons that POSITA would modify Belykov, in view of Sclafani, based on Noonan as discussed above in Ground 2. *See supra* §VII(B)()(3); Ex. 1008 ¶446-449. Noonan would also motivate the POSITA to modify the end cap of Muceus as modified by Slack to include the foregoing sidewall and threads to secure the end cap 160 to the main body 1320 and/or core 1330, to improve the seal between the exterior components of the suppressor, and to facilitate easier and more cost effective manufacture of the core of Muceus by not requiring threading or other fastening mechanisms. *See* Ex. 1004 3:29-39, 45-47, 59-62, Figs. 3a-3b; Ex. 1008 ¶449-451.



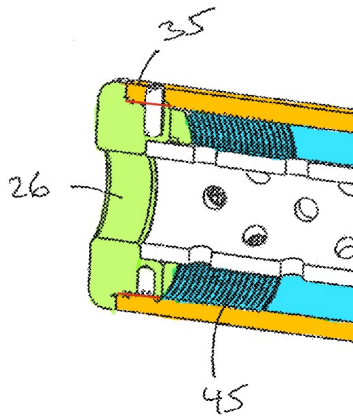
Muceus, Fig. 13 (annotated)



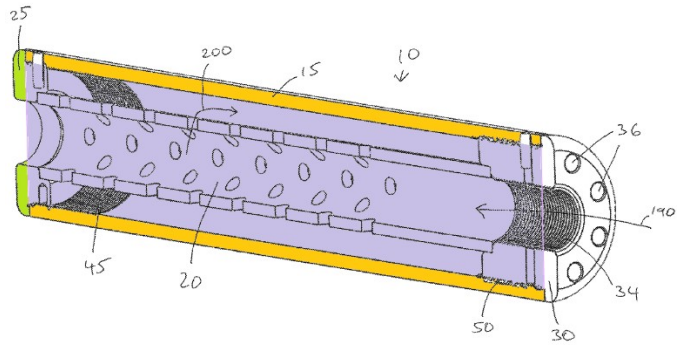
Slack, Fig. 10 (annotated)



Slack, Fig. 9 (annotated, excerpt)



Noonan, Fig. 3a (excerpt, annotated)



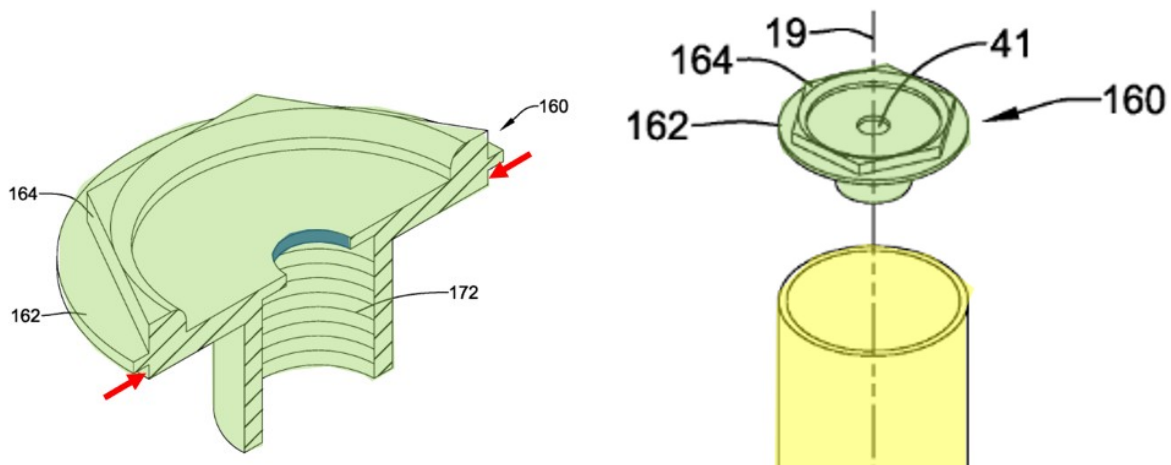
Noonan, Fig. 3b (annotated)

Moreover, a POSITA would recognize that the structural elements and features of the housing and endcaps of Muceus, Slack, and Noonan are compatible and complementary and, as such, a POSITA would have had a reasonable expectation of success in combining them. *See* Ex. 1005 ¶¶51, Figs. 11, 13; Ex. 1006 ¶42, Figs. 2, 9; Ex. 1004 3:12-14, Figs. 1a-1b, 3a-3c; Ex. 1008 ¶¶448-453.

In addition, a POSITA could have substituted Muceus' endcap 1360 (i.e., end cap) with an end cap that comprised a sidewall as taught by Slack's end cap 160 (i.e., end cap) or sidewall and threading of Noonan's front cap 25 (i.e., end cap) and corresponding housing (e.g., the external component 22 of Slack and the outer tube 15 of Noonan) and the results of the substitution would be predictable. Ex. 1008 ¶454-455.

2. Claim 6

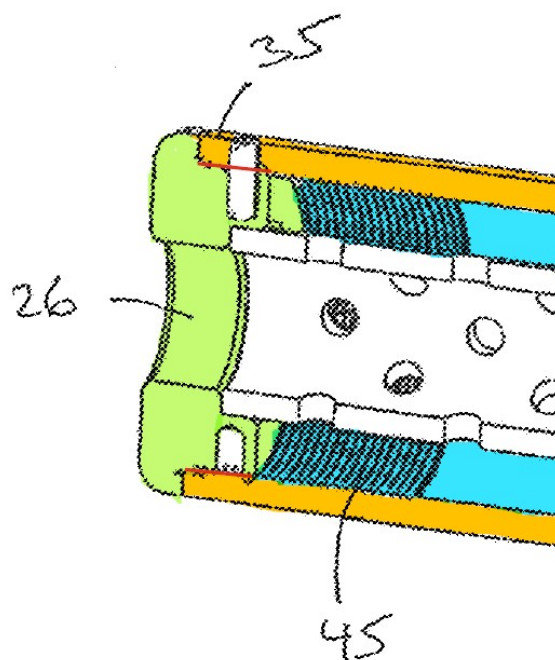
Referring to annotated Figs. 9 and 10, below, the flange 162 of the end cap 160 (i.e., end cap) (green highlight) of Slack includes a sidewall (red arrows). Ex. 1006 Figs. 9-10; Ex. 1008 ¶¶456-458; *see* Motivation to Combine.



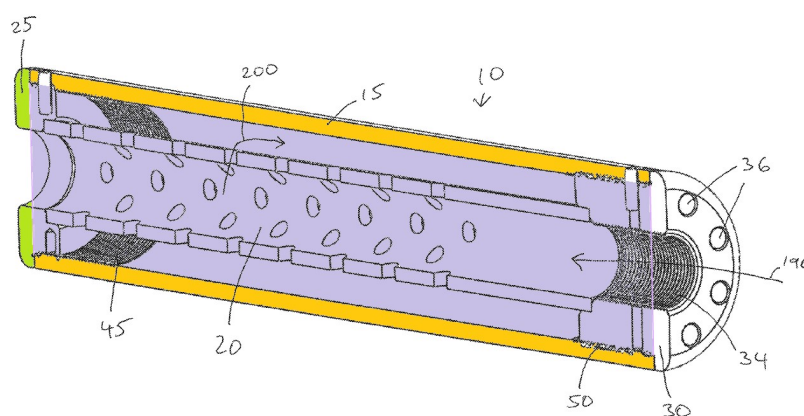
Slack, Fig. 10 (annotated)

Slack, Fig. 9 (annotated, excerpt)

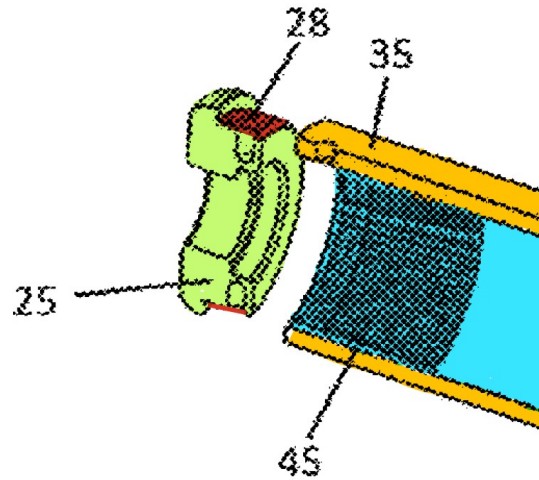
Referring to the annotated excerpts of Figs. 3a and 3c below, the front cap 25 (i.e., end cap) (green highlight) of Noonan discloses this limitation for the reasons discussed in Ground 3. *See supra* §VII(C)(5); Ex. 1004 Figs. 3a, 3c; Ex. 1008 ¶¶459-460; *see* Motivation to Combine.



Noonan, Fig. 3a (excerpt, annotated)



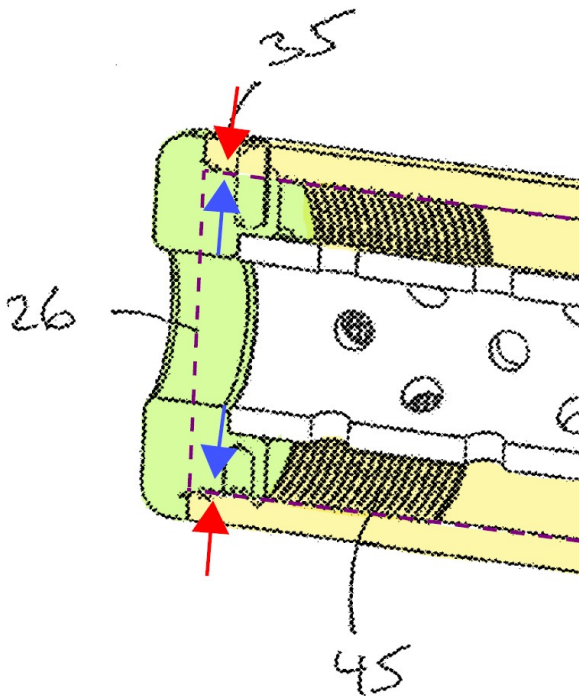
Noonan, Fig. 3b (annotated)



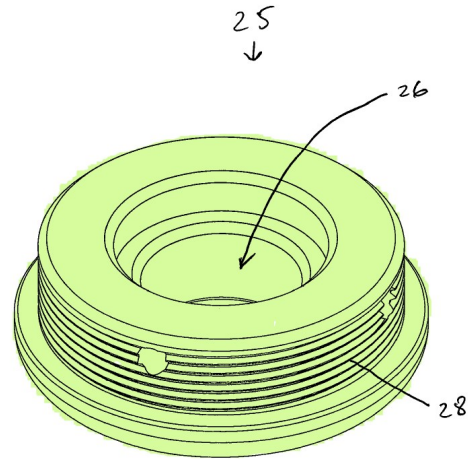
Noonan, Fig. 3c (excerpt, annotated)

3. Claim 7

With reference to annotated excerpts of Figs. 3a and 4a of Noonan below, Noonan discloses this limitation for the reasons described in Ground 3. *See supra* §VII(C)(6); Ex. 1004 3:36-39, Figs. 3a, 4a; Ex. 1008 ¶461; *see* Motivation to Combine.



Noonan, Fig. 3a (excerpt, annotated)



Noonan, Fig. 4a (annotated)

VIII. CONCLUSION

Petitioner respectfully requests cancellation of the Challenged Claims.

IX. MANDATORY NOTICES UNDER 37 C.F.R. §42.8

A. Real Party in Interest Under 37 C.F.R. §42.8(b)(1)

The real parties in interest are Dead Air Armament, LLC d/b/a Dead Air Silencers (“Dead Air”), Sound Moderation Technologies, LLC d/b/a Dead Air Silencers, and Sturm, Ruger and Co., Inc. (“Ruger”).

Out of an abundance of caution, Petitioner has identified all current plaintiffs in the below case, as well as additional involved parties, as potential real parties in interest only for the purpose of this proceeding and only to the extent that Patent Owner contends that the identified legal entity should be named a real party in interest in this IPR. Petitioner does so to avoid the potential expenditure of resources to resolve such a challenge. No unnamed entity is funding, controlling, or otherwise has an opportunity to control or direct this Petition or Petitioner’s participation in any resulting IPR.

B. Related Matters Under 37 C.F.R. §42.8(b)(2)

The ’906 Patent is the subject of the following litigation:

- *Dead Air Armament, LLC d/b/a Dead Air Silencers v. Jarvis Arms LLC d/b/a Mission Silencers, 4:25-CV-00497-BLW-DKG*

Unpublished applications nos. 18/669,297 and 19/356,383 appear to be related as continuations-in-part of the ’906 Patent based on the information

available in Patent Center. Petitioner is not aware of any other judicial or administrative matter that would affect or be affected by a decision in this IPR.

C. Designation of Counsel Under 37 C.F.R. §42.8(b)(3)

Petitioner provides the following designation of counsel.

Lead Counsel	Backup Counsel
Christopher TL Douglas Reg. No. 56,950 ALSTON & BIRD LLP Vantage South End 1120 South Tryon Street, Suite 300 Charlotte, NC 28203-6818 Phone: 704.444.1000 Fax: 704.444.1111 Email: christopher.douglas@alston.com	Ross R. Barton Reg. No. 51,438 Zachary A. Higbee Reg. No. 67,052 Alison A. Davis Reg. No. 74,675 ALSTON & BIRD LLP Vantage South End 1120 South Tryon Street, Suite 300 Charlotte, NC 28203-6818 Phone: 704.444.1000 Fax: 704.444.1111 Email: ross.barton@alston.com Email: zack.higbee@alston.com Email: alison.davis@alston.com

Pursuant to 37 C.F.R. § 42.8(b)(4), counsel agrees to service by mail as detailed above, and to electronic service by email at the following addresses:

christopher.douglas@alston.com, ross.barton@alston.com,

zack.higbee@alston.com, alison.davis@alston.com. Pursuant to 37 C.F.R.

§ 42.10(b), a Power of Attorney executed by Petitioner accompanies this Petition.

D. Service Information

Please address all correspondence and service to the addresses listed above.

Petitioner consents to electronic service at the addresses above.

Date: October 24, 2025

By: /Christopher TL Douglas/

Christopher TL Douglas

Reg. No. 56,950

ALSTON & BIRD LLP

Vantage South End

1120 S. Tryon Street, Suite 300

Charlotte, NC 28203

Phone: 704.444.1119

Fax: 704.444.1799

Email: christopher.douglas@alston.com

CLAIMS APPENDIX

Claim	Recitation
[1.PRE]	A firearm suppression system comprising:
[1.1]	a housing comprising a first end and a second end,
[1.1a]	the housing comprising: a first aperture at the first end, a second aperture at the second end;
[1.1b]	[the housing comprising:] an inner compartment interposed between the first aperture and the second aperture, the inner compartment being substantially the same circumference from the first end to the second end;
[1.2]	an end cap with a projectile aperture; and
[1.3]	a core removably attachable to the housing and positioned therein,
[1.4]	wherein the core comprises a plurality of core apertures on an outer surface that allow gas passing from a projectile and cartridge to pass to a channel between the inner surface of the housing and an outer surface of the core,
[1.5]	the channel circumscribes the outer surface of the core and equalizes pressure that begins at the first end of the housing and terminates at the second end of the housing.
Claim 2	Claim 1, wherein the core is printed from a three-dimensional printer.
Claim 3	Claim 1, wherein the end cap comprises a plurality of vent apertures.
Claim 4	Claim 1, further comprising a muzzle adapter.
Claim 5	Claim 1, wherein the end cap comprises a second side that comprises a ledge that rests upon and is flush with the second end.
Claim 6	Claim 1, wherein the end cap comprises a sidewall that is positioned in the inner compartment and rests against an inner surface of the housing.
Claim 7	Claim 6, wherein the sidewall comprises threads that couple to the housing.
Claim 9	Claim 1, wherein the plurality of core apertures is substantially

Claim	Recitation
	hexagonal shaped.
Claim 10	Claim 1, wherein the core comprises an inner surface that includes baffles that interact with the plurality of core apertures.
Claim 11	Claim 10, wherein the baffles are extruded inward.

CERTIFICATION UNDER 37 C.F.R. §42.24

Petitioner certifies that the word count in this Petition is 13,937 words, as counted by the word-processing program (Microsoft Word for Office 365) used to generate this Petition, where such word count excludes the table of contents, table of authorities, mandatory notices, certificate of service, appendix of exhibits, and this certificate of word count. This Petition is in compliance with the 14,000-word limit set in 37 C.F.R. § 42.24(a)(1)(i).

Date: October 24, 2025

By: /Christopher TL Douglas/

Christopher TL Douglas

Reg. No. 56,950

ALSTON & BIRD LLP

Vantage South End

1120 S. Tryon Street, Suite 300

Charlotte, NC 28203

Phone: 704.444.1119

Fax: 704.444.1799

Email:christopher.douglas@alston.com

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, the **Petition for *Inter Partes* Review of U.S. Patent No. 12, 018,906; Petitioner Dead Air Armament, LLC d/b/a Dead Air Silencers' Power of Attorney; and the associated Dead Air Exhibits 1001-1012** are being served via overnight courier on the 24th day of October 2025, the same day as the filing of the above-identified documents in the United States Patent and Trademark Office/Patent Trial and Appeal Board, upon the Patent Owner by serving the correspondence address of record with the USPTO as follows:

Brian D. Batt
Beard St. Clair Gaffney PA
520 First American Circle
Rexburg, Idaho 83440
Telephone: (208) 359-5885

and upon counsel of record for the Patent Owner in the litigation pending before the District of Idaho (E.D. Ida.) Case No. 4:25-CV-00497 and as follows:

Kessler Baker
Beard St. Clair Gaffney PA
955 Pier View Drive
Idaho Falls, ID 83402
Telephone: (208) 523-5171
Email: kbaker@beardstclair.com

Jeffrey Donald Brunson
Beard St. Clair Gaffney PA
2105 Coronado Street
Idaho Falls, id 83404
Telephone: (208) 523-5171
Email: jeff@beardstclair.com

Dated: October 24, 2025

Respectfully submitted,

/Christopher TL Douglas/
Christopher TL Douglas
Reg. No. 56,950
Alston & Bird LLP
1120 S. Tryon Street, Suite 300
Charlotte, NC 28203
christopher.douglas@alston.com

*Lead Counsel for Petitioner Dead Air
Armament, LLC d/b/a Dead Air
Silencers*