

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SILENCERCO WEAPONS RESEARCH, LLC

Petitioner,

v.

HUXWRX SAFETY CO. LLC,

Patent Owner.

IPR2024-01214

Patent 8,286,750 B1

**PETITION FOR *INTER PARTES* REVIEW OF:
U.S. PATENT NO. 8,286,750 B1**

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MANDATORY NOTICES

Under 37 CFR 42.104, this Petition submitted by SILENCERCO WEAPONS RESEARCH, LLC (“Petitioner” or “SilencerCo”) includes the Mandatory Notices required under 37 CFR 42.8.

Real Parties-In-Interest. In accordance with 37 CFR 42.8(b)(1), each real party-in-interest for Petitioner is identified. SilencerCo is a real party-in-interest with regard to the above-captioned proceeding. SilencerCo's parent company, SILENCE HOLDINGS, LLC, is also a real party-in-interest with regard to the above-captioned proceeding.

Related Matters. In accordance with 37 CFR 42.8(b)(2), Petitioner notes the following judicial matter that may affect, or be affected by, a decision in this proceeding: *HuxWrx Safety Co. LLC v. SilencerCo Weapons Research, LLC*, Case No. 2:24-cv-00130-DBB-DAO (D. Utah).

Petitioner is unaware of any administrative matters that may affect, or be affected by, a decision in this proceeding.

Lead and Backup Counsel. In accordance with 37 CFR 42.8(b)(3), Petitioner notes lead counsel and back-up counsel as follows:

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Petitioner hereby requests authorization to file a motion for Timothy P. Getzoff and Jeffrey R. Roeser to appear *pro hac vice*, as Mr. Getzoff and Mr. Roeser are experienced litigating attorneys; have established familiarity with the subject matter at issue in this proceeding; and have established a relationship with Petitioner in this proceeding, with Petitioner expecting Mr. Getzoff and Mr. Roeser to participate as attorneys of record in view of their experience.

Service Information. In accordance with 37 CFR 42.8(b)(4), Petitioner notes all correspondence can be addressed to the lead and backup counsel as shown *supra*. Under 37 CFR 42.6(e)(1), Petitioner consents to electronic service by e-mail at the e-mail addresses shown *supra*.

I. INTRODUCTION

In this Petition¹, SILENCERCO WEAPONS RESEARCH, LLC (“Petitioner” or “SilencerCo”) requests *inter partes* review (IPR) of all Claims (1-22) of U.S. Patent No. 8,286,750 (“the ’750-Patent”), which issued on October 16, 2012, after allowance of U.S. Application No. 13/025,989 (filed on February 11, 2011). The ’750-Patent is assigned² to HUXWRX SAFETY CO. LLC (“Patent Owner (PO)” or “HuxWrx”).

The ’750-Patent is directed to an energy suppression device (ESD)³ (with an emphasis on firearms), the ESD including a “central chamber” in fluid communication with a “common off axis chamber,” (1) where *at least two* deflectors in the central chamber provide *separate and direct* fluid connections between the central chamber and the common off-axis chamber,⁴ and (2) where the common off-axis chamber includes *a serpentine fluid pathway* for dissipating the energy transferred from a high energy material received by the central chamber. *See EX1001, Claims.* In the ’750-Patent’s first claim set (Claims 1-18) and second claim set (Claims 19-21), the common off-axis chamber includes a “serpentine fluid pathway which is *at least one of* axially serpentine *and* radially serpentine.”

¹ Accompanying exhibits listed in Appendix A.

² *See* Reel/Frame: 066217/0254.

³ Referred to as an “energy capture and control” device in the ’750-Patent.

⁴ A “common off axis chamber” is *common* to at least two deflectors.

See id., Claims 1, 19 (emphasis added).⁵ In the '750-Patent's third claim set (Claim 22), the common off-axis chamber includes a serpentine fluid pathway which is "axially serpentine." *See id.*, Claim 22.

As set forth in the '750-Patent and by PO during prosecution, an "axially serpentine fluid pathway" is a fluid pathway through which fluid "travel[s] back and forth *along a length of the [common] off axis chamber*."⁶ *Id.*, 4:31-34. And, as set forth in the '750-Patent and by PO during prosecution, a "radially serpentine fluid pathway" is a fluid pathway through which fluid "flow[s] back [(e.g., counterclockwise)] and forth [(e.g., clockwise) (1)] *around a radius of the [common] off axis chamber*" (*Id.*, 4:34-37) or (2) through "a series of annular spaces which are connected and progressively larger." *Id.*, 9:11, 12; *see also* EX1004, 093; III.A.4.c) *infra*.

The ESDs and techniques claimed in the '750-Patent were well-known in the art nearly a century before the '750-Patent's earliest possible effective filing date (EFD): February 11, 2010. Indeed, a central chamber in fluid communication with a **common** off-axis chamber that is used for dissipating energy transferred from a high energy material received by the central chamber was a feature common in

⁵ Emphasis added herein unless otherwise noted.

⁶ *See* EX1004, 094 (PO stating, mathematically speaking, "this would be described by an oscillating velocity vector along the axial direction").

numerous historical ESDs.⁷ Also, a central chamber including multiple deflectors providing *separate and direct* fluid connections between the central chamber and a common off-axis chamber was well-established before the '750-Patent's earliest possible EFD.⁸ As was an off-axis chamber including a fluid pathway — such as *an axially serpentine fluid pathway, a radially serpentine fluid pathway*, a helical fluid pathway, a helically-reversing fluid pathway, or combinations thereof — for separately dissipating energy transferred from a high energy material received by the central chamber.⁹

For example, German Patent No. 305,012 to Eichenseher¹⁰ (in 1917), U.S. Patent No. 1,000,702 to Thurler (in 1911), and French Patent No. 493,462 to Barlowatz¹¹ (in 1917) each disclosed an ESD (in the firearm context) that includes a central chamber in fluid communication with a *common* off-axis chamber, where the central chamber includes a series of deflectors that provide *separate and direct* fluid connections between the central chamber and the common off-axis chamber for dissipating energy transferred from a high energy material received by the

⁷ See e.g., EX1015, FIG. 1; EX1017, FIG. 1; EX1019, FIG. 1; EX1021, FIG. 1; EX1022, 1; EX1023, 14; EX1024, FIG. 1; EX1027, FIGs. 1, 10, 14.

⁸ See e.g., EX1015, FIG. 1; EX1017, FIG. 1; EX1021, FIG. 1; EX1027, FIGs. 1, 10, 14.

⁹ See fn. 7; see also, e.g., EX1008, FIGs. 5-7; EX1009, FIG. 1; EX1016, FIG. 2; EX1025, FIG. 1; EX1026, FIGs. 1, 4, 5.

¹⁰ Translation at EX1021.

¹¹ Translation at EX1018.

central chamber. *See* (Eichenseher: EX1021, FIGs. 1, 2; III.B.2.d) *infra*); (Thurler: EX1015, FIGs. 1, 2; III.B.2.a), *infra*); (Barlowatz: EX1018, FIG. 1; III.B.2.c), *infra*).

In Thurler, the common off-axis chamber is composed of encapsulated, progressively larger tubes that form an ***axially and radially serpentine fluid pathway*** for dissipating energy transferred from a high energy material received by the central chamber. *See* EX1015, FIGs. 1, 2; III.B.2.a), *infra*. *See also* U.S. Patent No. 748,157 to Bouton,¹² which disclosed, in 1903, an ESD (in the combustion engine context) including a common off-axis chamber composed of encapsulated progressively larger tubes that form an ***axially and radially serpentine fluid pathway*** for dissipating energy transferred from a high energy material received by Bouton's central chamber. *See* EX1016, FIG. 2; III.B.2.b), *infra*.

In Barlowatz, the common off-axis chamber is composed of encapsulated, progressively larger tubes supporting helical coils that form an ***axially and radially serpentine fluid pathway*** for dissipating energy transferred from a high energy material received by the central chamber. *See* EX1018, FIG. 1; III.B.2.c), *infra*.

Also, U.S. Patent No. 582,485 to Reeves, in 1897, disclosed encapsulated, progressively larger tubes that are alternately perforated to form an ***axially and radially serpentine fluid pathway*** for dissipating energy transferred from a high

¹² Cited on the '750-Patent's face but not applied during examination.

energy material received by Reeves' central chamber. *See* EX1019, FIGs. 1–3; III.B.2.d), *infra*.

As demonstrated in this Petition, individually and in various combinations, the foregoing prior art references, which predate the earliest claimed priority date of the '750-Patent by nearly a century, anticipate and/or render obvious the challenged claims.

II. GROUNDS FOR STANDING

Under 37 CFR 42.104(a), Petitioner certifies that the '750-Patent is available for IPR and that Petitioner is not barred or estopped from requesting an IPR challenging the '750-Patent on the grounds identified in this Petition.

III. IDENTIFICATION OF CHALLENGE

Under 37 CFR 42.104(b), Petitioner provides, for each challenged claim, a statement of the precise relief requested that identifies (A) how the challenged claim is to be construed; (B) how the construed claim is unpatentable under 35 U.S.C. 102 and/or 103 and the prior art relied upon for each statutory ground; and (C) where each limitation of the claim is found in the relevant prior art reference with reference to the exhibit number and specific portions thereof.

A. Construction Of Each Challenged Claim

Claim terms in IPRs “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action.” 37 CFR 42.200(b); Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005). Under *Phillips*,

claim terms are given their ordinary and customary meaning (“OCM”) as understood by one of ordinary skill in the art in the context of the entire patent, including the patent specification and the figures, and the prosecution history.

Philips, 415 F.3d at 1313.

1. Level Of Ordinary Skill In The Art

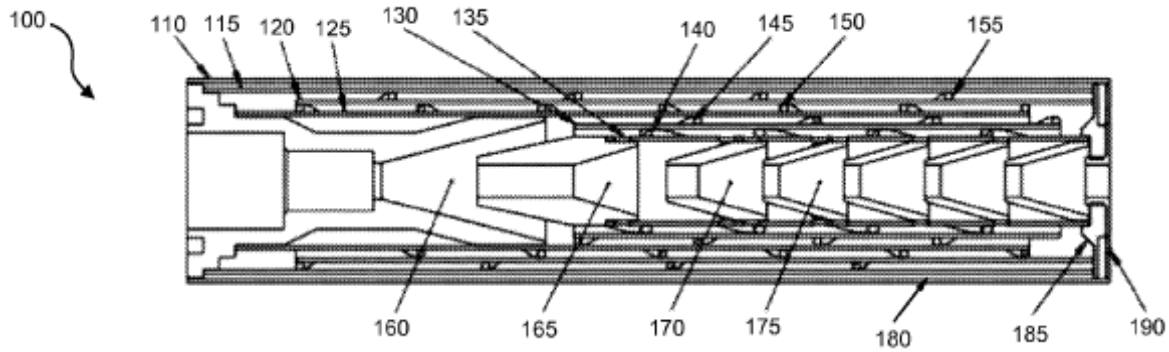
A person of ordinary skill in the art of the '750-Patent at the time of the alleged invention would have had a relevant technical degree in Mechanical Engineering, Fluid Engineering, or the like, and 2-3 years of experience researching, designing, manufacturing, or assessing ESDs, though less education may be sufficient with additional experience, and *vice versa*. See EX1013, VII.C.

2. The '750-Patent

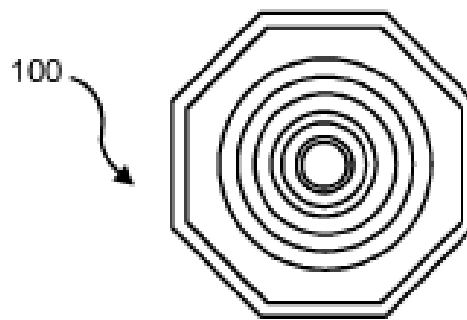
a) The Disclosure (EX1001)

The '750-Patent discloses ESDs that include a central chamber in fluid communication with an off-axis chamber that includes a fluid outlet and internal walls that produce a serpentine fluid pathway. EX1001, 4:10-18. Specifically, the '750-Patent discloses three examples of such ESDs in the illustrations and descriptions of FIGs. 1a and 1b, FIG. 14, and FIG. 16.

The first ESD described of the '750-Patent is illustrated in FIGs. 1a and 1b (reproduced *infra*).



Id., FIG. 1a



Id., FIG. 1b

Specifically, the '750-Patent describes that:

The off axis chamber can include multiple internal walls 115, 120, 125, 130, 140, 145, 150, and/or 155 defining a serpentine or winding fluid pathway. The multiple internal walls can provide an increased volume for fluid expansion and increased acoustic absorbent path length. The fluid pathway can be[:]

an *axially serpentine* fluid pathway which causes fluids received in the off axis chamber to travel back and forth *along a length of the off axis chamber*.

. . . a *radially serpentine* fluid pathway which causes the fluids received in the off axis chamber to flow back and forth *around a radius of the off axis chamber*.

. . . a *radially serpentine* pathway which causes the fluids to flow back and forth *around a radius of the off axis chamber* while also traversing a length of the off axis chamber.

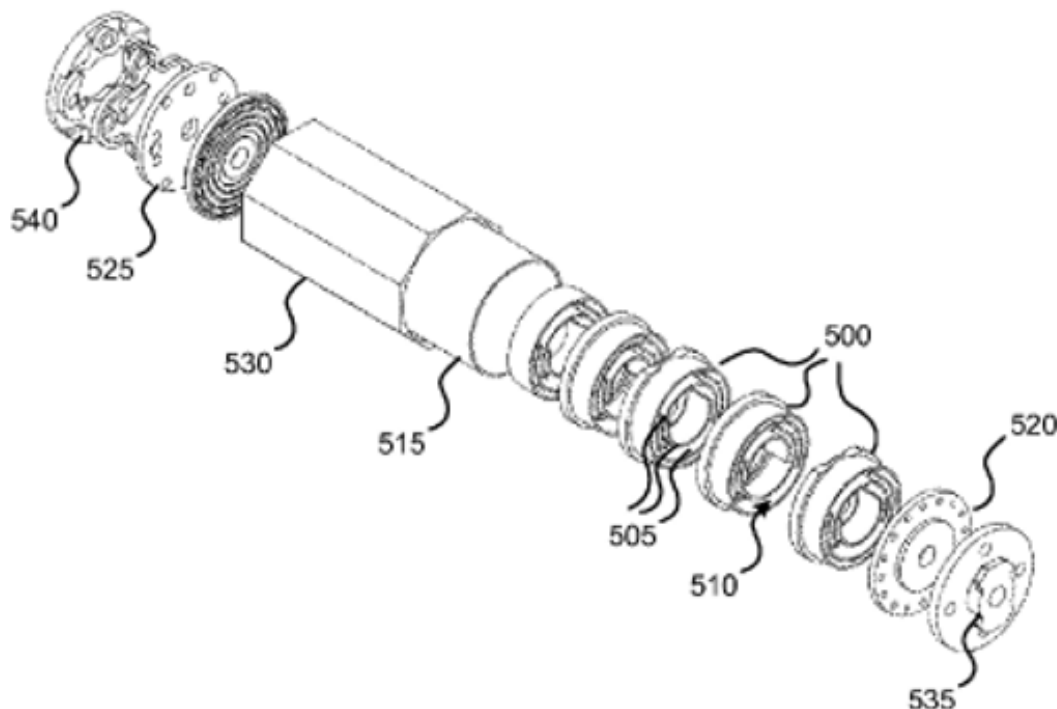
... a ***helical*** fluid pathway which causes the fluids to spiral around the central chamber within the off axis chamber ***along a length of the off axis chamber***.

The various configurations can be integrated into various combinations as well to produce more complex flow paths. *Id.*, 4:27-45 (formatting added).

As further explained in the '750-Patent:

FIG. 1a illustrates an example configuration where the internal walls define an ***axially serpentine fluid pathway which helically spirals around the central chamber*** along a length of the off axis chamber. *Id.*, 4:60-63.

After the first ESD illustrated in FIG. 1a, the second ESD of the '750-Patent is illustrated in FIG. 14 (reproduced *infra*).

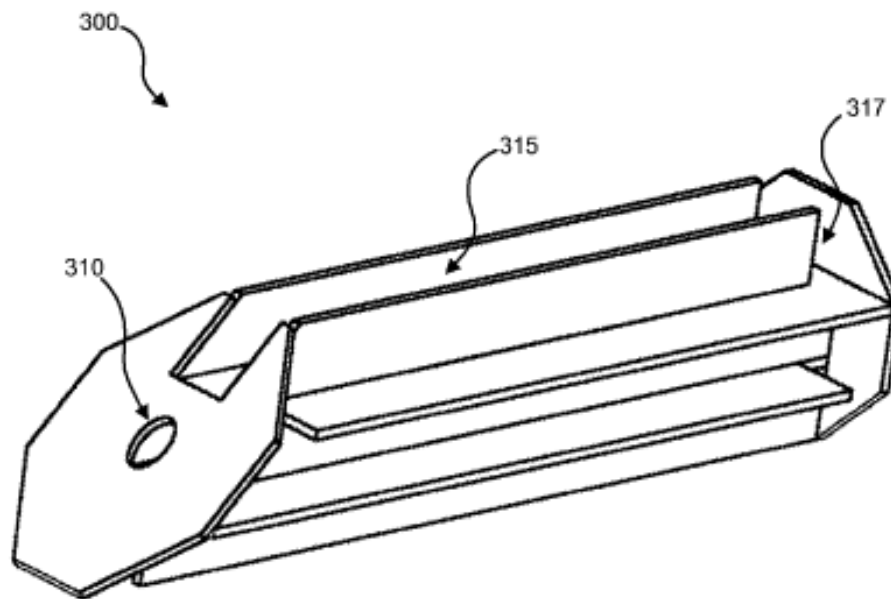


***Id.*, FIG. 14**

Specifically, the '750-Patent describes that:

Another alternative configuration for the internal walls to form *the serpentine pathway* can be concentric incomplete cylinders . . . ***One example of such a configuration is shown in FIG. 14.*** In this configuration, the device includes multiple segments 500 which *each* have concentric offset cylinders 505. Gases flow into a serpentine path 510 created by the offset and spaced cylinders. ***The serpentine path in this case is a series of annular spaces which are connected and progressively larger. Id., 9:1-13.***

The third ESD in the '750-Patent is illustrated in FIG. 16 (reproduced *infra*).



EX1001, FIG. 16

Specifically, the '750-Patent describes that:

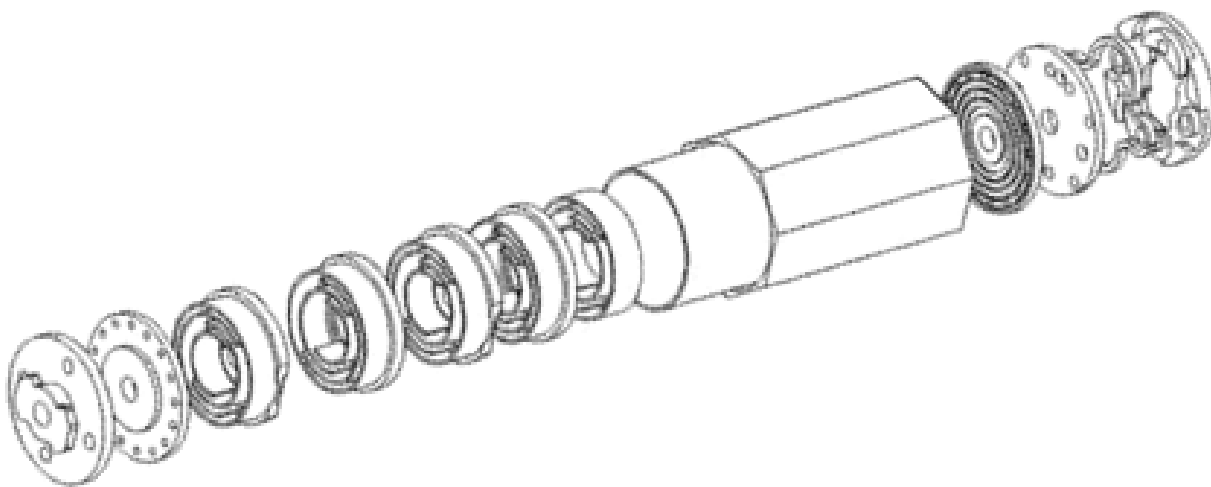
[A]nother optional configuration for the multiple internal walls which form a plurality of longitudinal chambers. For purposes of illustration, the outer shell shown in previous figures is not shown. The *longitudinal* chambers can be each off set from the central axis and fluidly connected to [form] *the axially serpentine fluid pathway. Id., 9:50-55.*

b) The Priority Applications (EX1002; EX1003)

The '750-Patent claims the benefit of the earliest-filed U.S. Provisional Application No. 61/303,553 (“the '553-Provisional”), filed on February 11, 2010, and the later-filed U.S. Provisional Application No. 61/418,285 (“the '285-Provisional”), filed on Nov. 30, 2010.

The '553-Provisional (EX1002) includes a set of figures corresponding to FIGs. 1a-13, 15, and 16 of the '750-Patent — but there is no figure or description in the '553-Provisional related to FIG. 14 of the '750-Patent. *See EX1002, FIGs. 1-17.*

The '285-Provisional (EX1003) includes a set of figures (FIGs. 1-5) related to FIG. 14 of the '750-Patent, with the '285-Provisional's FIG. 1 (reproduced *infra*) closely corresponding to FIG. 14 of the '750-Patent. *See EX1003, FIGs. 1-5.*



Id., FIG. 1 (compare with EX1001, FIG. 14 reproduced in III.A.2.a) supra)

The '285-Provisional describes the fluid flow through the ESD in FIG. 14 as a "*laterally serpentine fluid pathway*." *Id.*, 018.

Accordingly, the *radially serpentine fluid pathway* terminology makes its first, albeit cursory, appearance in the '750-Patent's original specification and claims — at page 7, lines 20-24 (EX1004, 252) and in original dependent claim 7.¹³ (*Id.*, 263).

c) The Prosecution History (EX1004)

In its response to the first Non-Final Office Action mailed September 30, 2011 ("Non-Final Office Action"), PO amended independent claim 1 (and similarly amended independent claim 17¹⁴) to include "an off axis chamber . . . having a fluid outlet and multiple internal walls configured to produce a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine." EX1004, 88, 90 (amendment markings therein). PO also amended independent claim 20¹⁵ to include a common off-axis chamber comprising "~~a winding~~ an axially serpentine fluid pathway and a fluid outlet." *Id.*, 91 (amendment markings therein).

In support of these amendments, PO represented that "each of the independent claims requires 'at least one of an axially serpentine and radially serpentine' fluid pathway" representing that, for "radially serpentine flow . . . fluid

¹³ Compare with EX1001, Claim 9.

¹⁴ Compare with EX1001, Claim 18.

¹⁵ Compare with EX1001, Claim 22.

would flow *back and forth from clockwise to counter-clockwise around the axis* as described in page 7, lines 20-22 and shown in Figure 14 (*See* units 500, 505 and 510) [of the '750-Patent's specification as filed].” *Id.*, 93.

After failing to persuade the Examiner of the amended claims' patentability, PO amended, in its response to the subsequent Final Office Action mailed February 8, 2012 (“Final Office Action”), independent claim 1 to include “a common off axis chamber” and “c) a plurality of deflectors oriented in series along the central axis of the central chamber and configured to deflect the energy from the high energy material to the common off axis chamber.” *Id.*, 48 (amendment markings therein). In support of these amendments, PO represented that “the off axis chamber is a ‘*common*’ off axis chamber into which *a plurality of deflectors* direct energy.” *EX1004*, 54. PO further represented that “the [claimed] off axis chamber *spans and is connected to multiple deflectors.*” *Id.*, 54.

The Notice of Allowance was then issued on June 12, 2012. *Id.*, 31.

3. *No Specific Constructions Needed*

Petitioner does not assert that any specific constructions are required at this time. Thus, in this Petition, all terms of the '750-Patent claims have been given their ordinary and customary meaning (OCM) as understood by a person of

ordinary skill in the art (“POSITA”) in the context of the entire patent, including the patent specification and the prosecution history.¹⁶ *Philips* at 1313.

4. ***Ordinary And Customary Meanings (OCMs)***

For clarity, the OCMs for the following claim limitations are explained in more detail *infra*.

a) ***“a common off axis chamber”***

In its Final Office Action response, PO amended the independent claims to recite “a common off axis chamber.” EX1004, 48 (amendment markings therein). In support of these amendments, PO represented that “the off axis chamber is a ‘*common*’ off axis chamber into which *a plurality of deflectors* direct energy.” EX1004, 54. PO further represented that “the [claimed] off axis chamber *spans and is connected to multiple deflectors*.” Id., 54.

Accordingly, the OCM of “a *common* off axis chamber” is “an off-axis chamber into which *at least two* deflectors *separately and directly* deflect energy transferred from a high energy material received by the central chamber.” See EX1013, VIII.A.1.

¹⁶ Petitioner reserves the right to contend that any of the limitations in the Challenged Claims are invalid under 35 U.S.C. 112 in related proceedings.

b) “a plurality of deflectors . . . configured to deflect the energy from the high energy material to the common off axis chamber”

As noted in III.A.4.a) *supra*, a “common off axis chamber” is an off-axis chamber into which *at least two* deflectors *separately and directly* deflect energy transferred from a high energy material received by the central chamber.

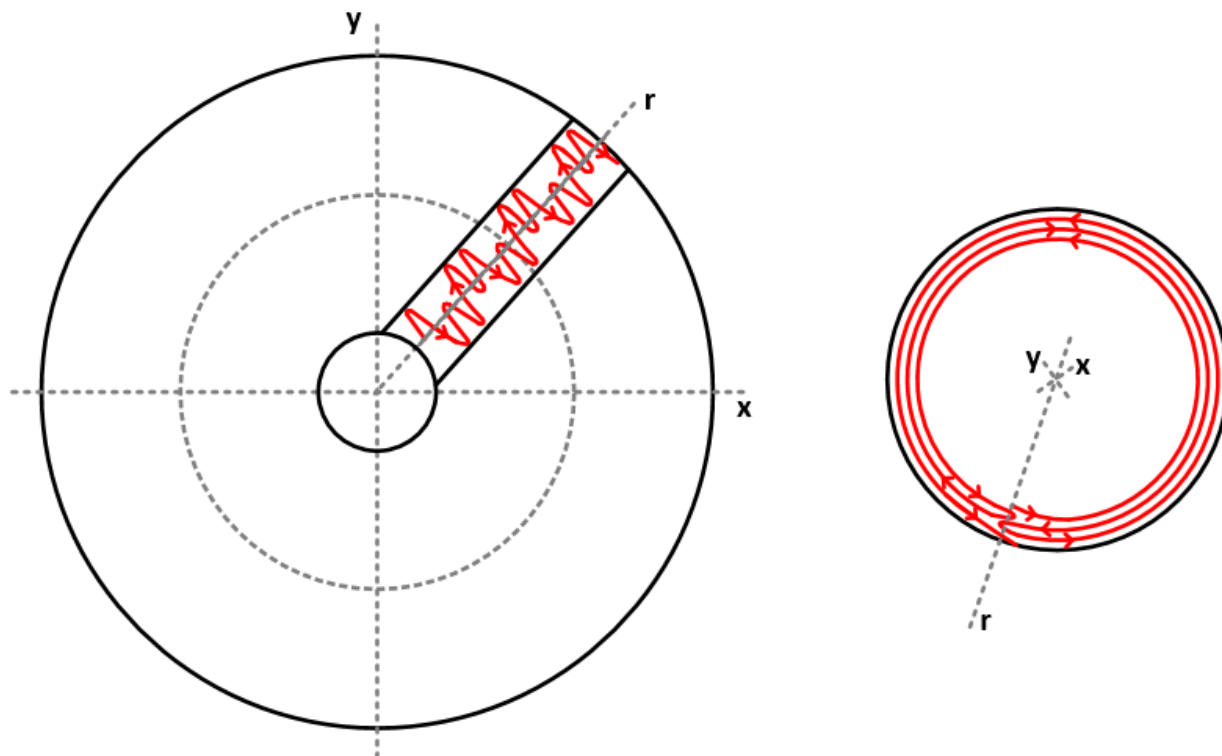
Accordingly, the OCM of “a plurality of deflectors . . . configured to deflect the energy from the high energy material *to the common off axis chamber*” is “at least two deflectors *each* configured to deflect energy from a high energy material to the common off axis chamber via respective *separate and direct* fluid connections.” See EX1013, VIII.A.2.

c) “a serpentine fluid pathway which is . . . radially serpentine”

PO has set forth, in the related litigation, that the OCM of a “radially serpentine” fluid pathway is simply *a pathway that causes fluid to change direction (e.g., from clockwise to counterclockwise)*.¹⁷ See EX1033, 4. PO has further set forth that a “radially serpentine” fluid pathway requires *a single change of direction*. See EX1034, 4. However, PO’s definition ignores 1) the text of the ’750-Patent, including PO’s own definition supplied therein, 2) PO’s representations in the prosecution history, and 3) the OCM of “back and forth”.

¹⁷ And in other litigation, PO (under its prior O.S.S. Suppressors name) has set forth another, even broader, definition as merely a helical fluid pathway. EX1035, 34, 42.

The '750-Patent provides that a “radially serpentine fluid pathway . . . causes the fluids received in the off-axis chamber to flow *back and forth around a radius of the off axis chamber.*” EX1001, 4:34-37.



EX1013, 53, Figure 1 (Depiction of “radially serpentine” given in lines 34-37 of column 4 of the '750-Patent)

In the prosecution history, PO misrepresented that for “radially serpentine flow . . . fluid would flow *back and forth from clockwise to counter-clockwise around the axis* as described in page 7, lines 20-22¹⁸ and shown in Figure 14 (See units 500, 505 and 510) [of the '750-Patent's specification as filed].”

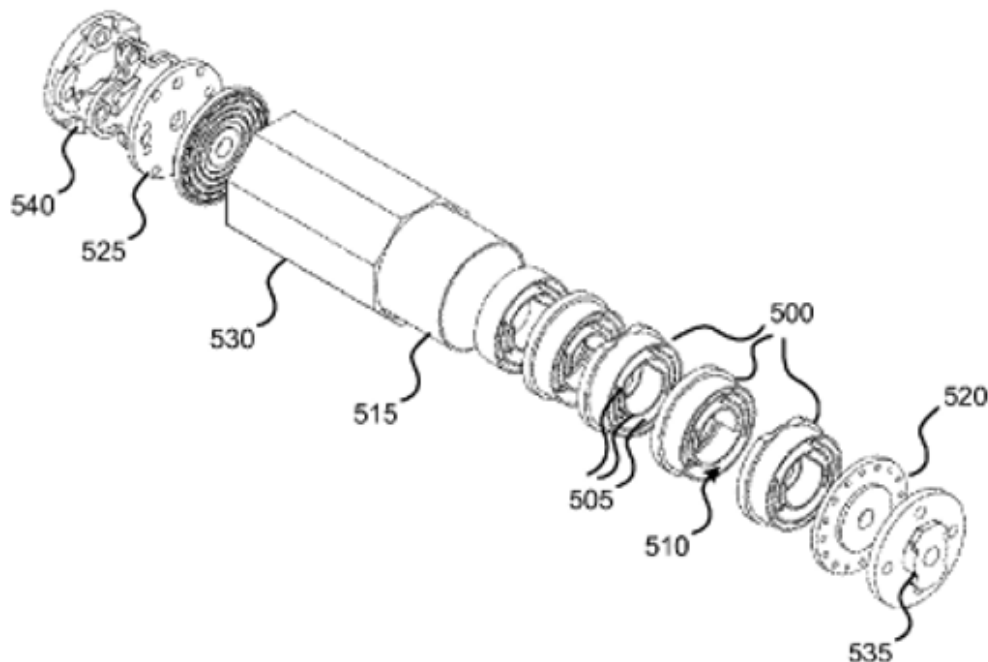
EX1004, 093. It is unclear from the Non-Final Office Action response what “the

¹⁸Compare EX1004, 252, EX1001, 4:34-37.

axis” in “around the axis” refers to. What is clear is that PO’s arguments to the Examiner misstated¹⁹ the express language in the specification, specifically that a radially serpentine flow is that which flows “***around the radius of the off axis chamber***” — *as is consistent with lines 20-22 on page 7 of the ’750-Patent’s specification as filed.*

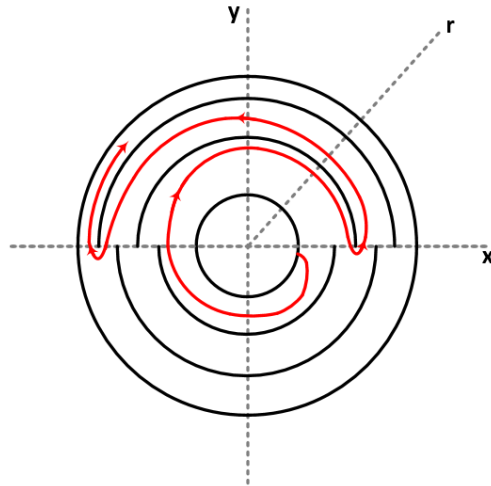
The ’750-Patent provides that the ESD in FIG. 14 (reproduced *infra*) has “a serpentine path 510 created by the offset and spaced cylinders [505] . . . [that] is a series of annular spaces which are connected and progressively larger.”

EX1001, 9:11-13.



EX1001, FIG. 14

¹⁹ Such a misstatement also adds new matter not previously disclosed.



EX1013, 55, Figure 2 (Depiction of “radially serpentine” in FIG. 14 and prosecution history context)

Moreover, “back and forth” movement requires at least two changes in direction. Specifically, to come “back,” an object must have first gone “forth.”

Accordingly, the OCM of “a serpentine fluid pathway which is . . . radially serpentine” is “a fluid pathway that causes fluids to flow back (e.g., counterclockwise) and forth (e.g., clockwise) in alternate rotational directions, changing direction at least twice, *while advancing outwardly* along a radius of the off-axis chamber.” See EX1013, VIII.A.4.

d) “a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine.”

PO has set forth, in the related litigation, that the OCM of “a serpentine fluid pathway which is *at least one* of axially serpentine *and* radially serpentine” is a pathway that can be axially serpentine *or* radially serpentine. See EX1033, 3, 4, 6. However, PO’s definition ignores Federal Circuit jurisprudence and the plain wording of the claims.

When “[t]he phrase ‘at least one of’ precedes a series of *categories* of criteria, and . . . the term ‘and’ [is used] to separate the *categories* of criteria,” “a conjunctive list” is connoted. *SuperGuide Corp. v. DirecTV Enters.*, 358 F.3d 870, 886 (Fed. Cir. 2004). Applying this rule to the facts in *SuperGuide*, the Federal Circuit found that “the phrase ‘at least one of’ [in “at least one of a desired program start time, a desired program end time, a desired program service, and a desired program type”] modified *each* member of the list, i.e., each *category* in the list.” *SuperGuide*, 358 F.3d at 876.

Like, in *SuperGuide*, the phrase “at least one of” precedes a list of categories: (1) axially serpentine fluid pathways and (2) radially serpentine fluid pathways. Specifically, as set forth by PO during prosecution, “fluid pathways [that cause fluid flow] having an oscillating velocity vector along the axial direction” can be categorized as “axially serpentine fluid pathways.” See EX1013, VII.A.5 (citing EX1004, 094). And, as set forth in III.A.4.c) *supra*, fluid pathways that cause fluids to flow back (*e.g.*, counterclockwise) and forth (*e.g.*, clockwise) while advancing outwardly along a radius of the off-axis chamber can be categorized as “radially serpentine fluid pathways.” See *id.* Fluid pathways having both an oscillating vector along the axial direction and causing fluid to flow back and forth while advancing outwardly along a radius can be categorized as “fluid pathways which are axially serpentine and radially serpentine.” See *id.*

Indeed, the ESD illustrated in the '750-Patent's FIG. 1a includes a fluid pathway that causes fluid to flow back (*e.g.*, backward and counterclockwise) in a first chamber, then radially outward into a second chamber, and then forth (*e.g.*, forward and clockwise) in the second chamber and can, thus, be categorized as both axially serpentine and radially serpentine. *See* EX1001, FIG. 1a.

Accordingly, the OCM of "a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine" is "a fluid pathway that is *both* axially serpentine *and* radially serpentine." *See* EX1013, VII.A.5.

B. Statement Identifying Grounds Of Unpatentability For Each Challenged Claim And Prior Art References Relied Upon

Petitioner requests IPR and cancellation of all the '750-Patent's Claims (1-22) because these claims are unpatentable under 35 U.S.C. 102 (pre-AIA), 35 U.S.C. 103 (pre-AIA), or both.

| 1. *The '750-Patent's Effective Filing Date*

As noted in III.A.2.b) *supra*, support for the '750-Patent's FIG. 14 was first introduced on November 30, 2010 in the '285-Provisional. Also, the "radially serpentine" language was first introduced on February 11, 2011 in the '750-Patent's original specification filed. *See* EX1004, 252, 263. Accordingly, the '750-Patent is not entitled to an EFD corresponding to the earliest filed '553-Provisional. Instead, the '750-Patent is entitled only to an EFD corresponding

to the '750-Patent's filing date: February 11, 2011. Nevertheless, the relevant prior art references in this Petition qualify as prior art under either date.

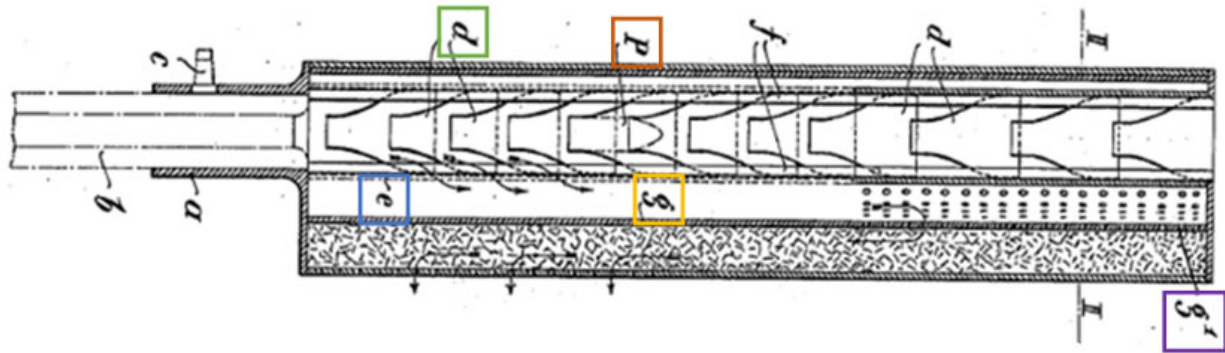
2. Relied-Upon Prior Art References

Regardless of the assigned EFD, the following patents or printed publications, which are relied upon in this Petition, were publicly available roughly a century before the '750-Patent's earliest possible EFD and, thus, qualify as prior art under 35 U.S.C. 102 (pre-AIA) as shown in the following table.

RELIED-UPON PRIOR ART REFERENCES					
Exhibit	Name	Serial No.	Published	Filed	§ 102
EX1015	Thurler	US 1,000,702	08/15/1911	11/02/1910	(a), (b), (e)
EX1016	Bouton	US 748,157	12/29/1903	04/03/1903	(a), (b), (e)
EX1017 (EX1018)	Barlowatz (translation)	FR 493,462	08/09/1919	05/09/1917	(a), (b)
EX1019	Reeves	US 582,485	05811/1897	01/11/1897	(a), (b), (e)
EX1020 (EX1021)	Eichenseher (translation)	DE 305,012	01/07/1920	01/09/1917	(a), (b)

a) Thurler (EX1015)

Thurler's FIG. 1 (reproduced *infra*) "represents a horizontal longitudinal section" of a device for lessening the report of firearms. EX1015, 2:40, 41.



Id., FIG. 1 (Petitioner-annotated²⁰)

Thurler's FIG. 2 (reproduced *infra*) "shows a cross section along the line II-II (See FIG. 1)." *Id.*, 2:41-43.



Id., FIG. 2 (Petitioner-annotated)

Thurler provides the following description of the device illustrated in FIGs. 1 and 2:

The interior of the apparatus is provided with a series of tubular sleeves *d* placed coaxially in the tube *e*.²¹ This tube *e* is doublewalled and it is

²⁰ The reproduced figures and subsequent description are annotated to highlight the correspondence between specific parts in the figures and their description in the specification.

²¹ Thurler also refers to the tubes as "mantles." EX1015, 2:27-30.

made for two-thirds of its height of fine net-work²², the remaining third being of sheet metal. The sleeves *d* are conically enlarged toward the front end. The narrow rear ends are all turned toward the barrel and constitute together a canal for the projectile *P* . . . The tube *e* is surrounded by a second tube *g* of a greater diameter than [tube] *e*, the position of which is eccentric with regard to the common axis of the tubular sleeves *d*. This tube *g* is perforated at the first part *g'* for one-third of its length. A third tube *h* perforated at its rear part for one-third of its length surround the tube *g*. The space between *g* and *h* is filled with shaving of metal, such as aluminum. The position of the tube *h* is also eccentric with regard to the axis of the sleeves *d* so that the sight *c* projects over the device for a few millimeters. *Id.*, 2:53-82 (italics therein; bolded coloring added).

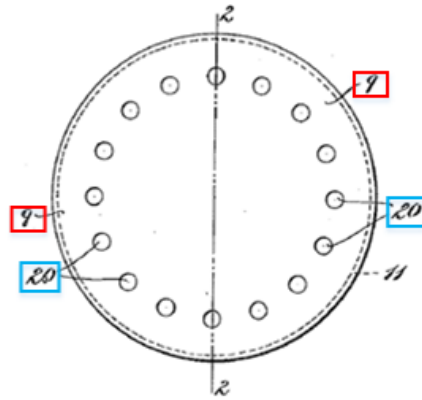
Thurler additionally provides the following description of the operation of the device illustrated in FIGs. 1 and 2:

The direction followed by the compressed gas is shown by the arrows [in FIG. 1]. The projectile *P*, on leaving the barrel *b*, enters into the channel formed by the narrow extremities of the sleeves *d* closing this channel to the compressed gas which rushes consequently through the annular openings of the tube *e* into the space between the tubes *e* and *g* where it partially expands. From there the gas escapes through the narrow openings of the first or forward third of the tube *g* into the space between *g* and *h* where the gas is prevented from expanding instantly owing to the filling of metal shavings, the escape of gas through the openings in the tube *h* taking place without any report. The solid wall of the forward part of the tube *e* prevents the gas from entering the sleeves *d* thus escaping by the central channel before the shot. *Id.*, 2:83-102 (italics therein; bolded coloring added).

²² Thurler's Claim 1 describes tube *e* as "perforated for two third of its length from the front end to the rear." EX1015, Claim 1.

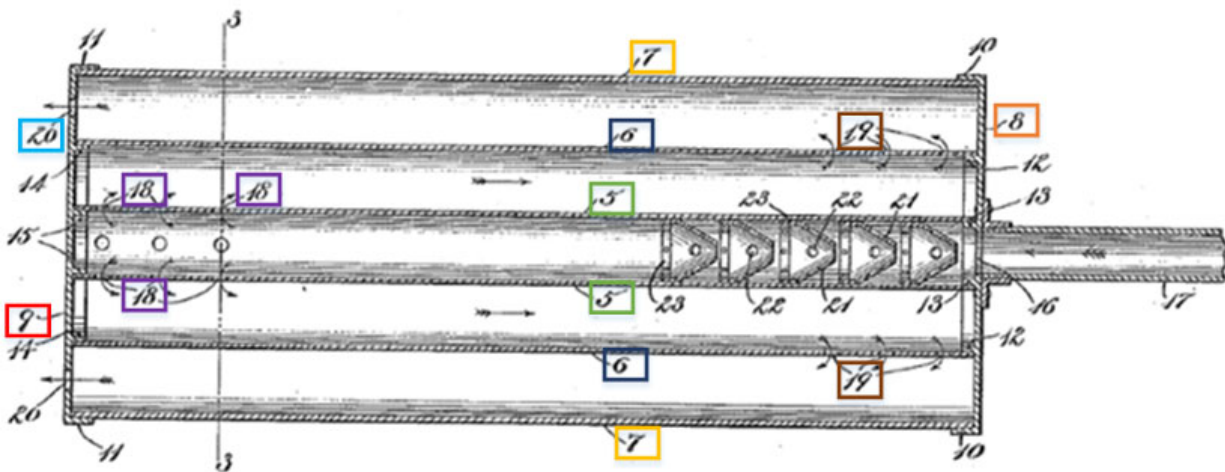
b) Bouton (EX1016)

Bouton's FIG. 1 (reproduced *infra*) "is an end elevation of [an] improved muffler." EX1016, 2:38, 39.



***Id.*, FIG. 1 (Petitioner-annotated)**

Bouton's FIG. 2 (reproduced *infra*) "is a longitudinal section taken on line 2 of FIG. 1, looking toward the left." *Id.*, 2:39-41.



***Id.*, FIG. 2 (Petitioner-annotated)**

Bouton provides the following description of the device illustrated in

FIGs. 1 and 2:

In the drawings, **5**, **6**, and **7** are cylindrical tubes of different diameters, the outermost tube **7** being screw-threaded at each end thereof to receive the heads **8** [and] **9**, each of said heads being provided with . . . flanges holding the tubes **5** and **6** concentric with each other and with the outermost tube **7**. Id., 2:47-60 (bolding and coloring added).

The head **8** is provided with an inlet-orifice 16 and has fastened thereto the exhaust-pipe 17 . . . At the end of the innermost tube **5** opposite to the inlet-orifice 16 are provided outlet-orifices **18** . . . and at the right-hand end of the tube **6** are provided [outlet-]orifices **19** . . . In the head **9** are provided outlet-orifices **20** . . . opening out of the annular spaces adjacent to the outermost tube **7**. Id., 2:61-73 (bolded coloring added).

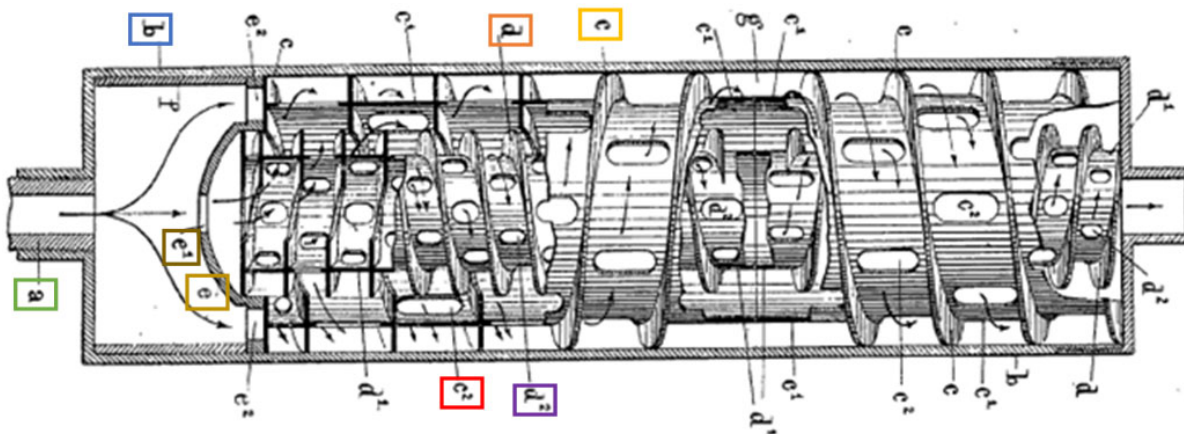
Bouton additionally provides the following description of the operation of the device illustrated in FIGs. 1 and 2:

The exhaust gasoline [sic] vapor or steam . . . enters the innermost tube **5** through the pipe 17 and inlet-orifice 15 and first encounters the truncated cones 21. These decrease the velocity of the exhaust-vapor and after said vapor has passed said cones it has to travel the entire length of the innermost tube **5**, thence passing outwardly through the orifices 18 into the tube **6**, thence passing toward the right . . . to the opposite end of said tube **6** . . . passing outwardly therefrom through the orifices 19 into the tube **7**, then passing toward the left . . . into the annular space between the tube **6** and the tube **7** and outwardly through the orifices **20** . . . provided in the head[] **9**. It will be seen that **during the passage of the exhaust-vapor the velocity is constantly reduced, both by the distance which it has to travel, by the different obstacles in its path or the changing of the direction in which the vapor is traveling and the increased area of the tubes to which it is alternately admitted so that when the vapor finally passes out of the muffler . . . there is no perceptible sound** caused thereby. Id., 2:82 - 3:5 (bolded coloring added).

Bouton further notes that “[i]t is evident that the number of tubes may be increased according to the necessities of the case.” *Id.*, 3:6-8.

c) *Barlowatz (EX1017; EX1018)*

Barlowatz's sole figure (referred to as “FIG. 1” and reproduced *infra*) shows, of a silencer device, “parts in axial vertical section [and] parts in external view with tearing.” *EX1018*, 1.



Id., FIG. 1 (Petitioner-annotated)

Barlowatz provides the following description of the device illustrated in FIG. 1.

At or near the end of the gun barrel *a*, a cylindrical sleeve *b* is fastened, by screwing or any other suitable means, inside which two coils are nested, one external *c*, the other internal *d*, **whose turns are oriented in different directions**; These coils are supported by a part *e* . . . This cap *e* has a hole *e1* at its center, slightly larger in diameter than the projectile, which passes through an axial channel left free in the inner coil *d*. *Id.*, 1 (italics therein; bolded coloring added).

[E]ach coil is [] divided into two helical ducts: the outer coil *c*, into a duct between the coils of the coil, the inner wall of the sleeve *b* and the outer wall of the strip *c1*, and into a duct between the coils, the inner wall of the strip *c1* and the inner coil *d*; the latter is likewise divided into a helical duct between its coils, the outer coil and the outer wall of

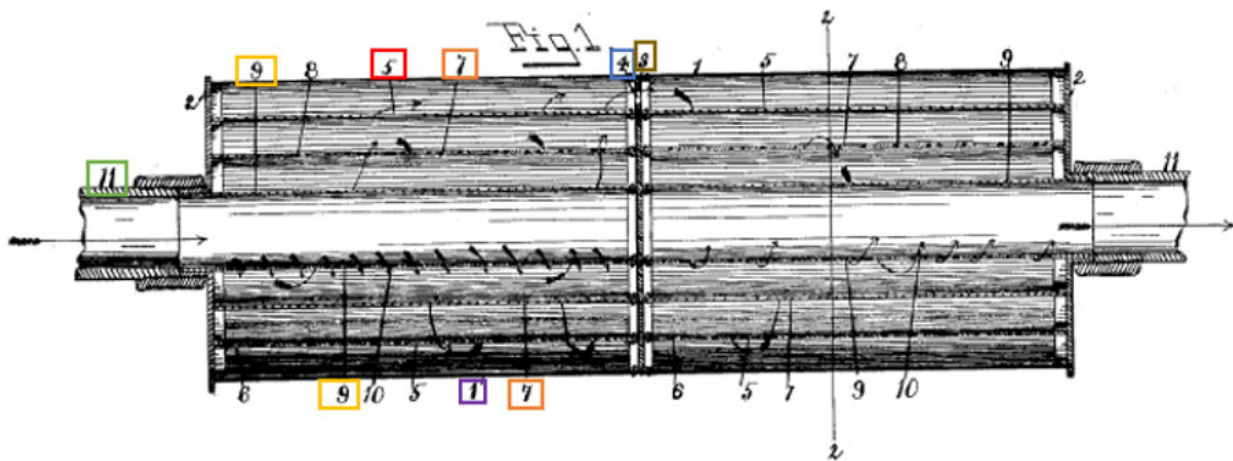
the strip *d1*, and a helical duct between the coils, the inner wall of the strip *d1*, and the axial channel for the passage of the projectile. These strips *c1* and *d1* have perforations, holes or notches of any desired shape, respectively *c2* and *d2*, making the two helical parts or ducts of each coil communicate with each other, as well as the inner coil *d* with the outer coil *c*. *Id.*, 2 (italics therein; bolded coloring added).

...

To increase efficiency, several of these groups of two coils can be mounted one after the other . . . in this case, the two outer coils *c* have coils oriented in opposite directions, as do the two inner coils *d*, so that the gas flows leaving the first group have the same flow direction of two coils *c*, *d* at an already reduced speed, ***are forced to change direction in both the outer and inner coils.*** *Id.*, 2 (italics therein; bolded coloring added).

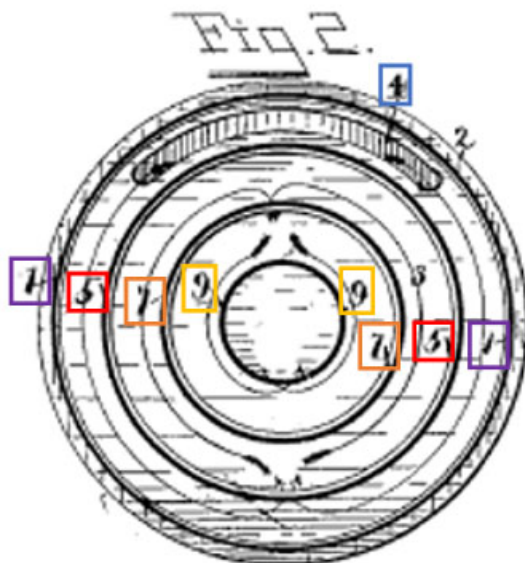
d) Reeves (EX1019)

Reeves's FIG. 1 (reproduced *infra*) shows a central vertical section of an "exhaust-muffler." EX1019, 2:32, 33.



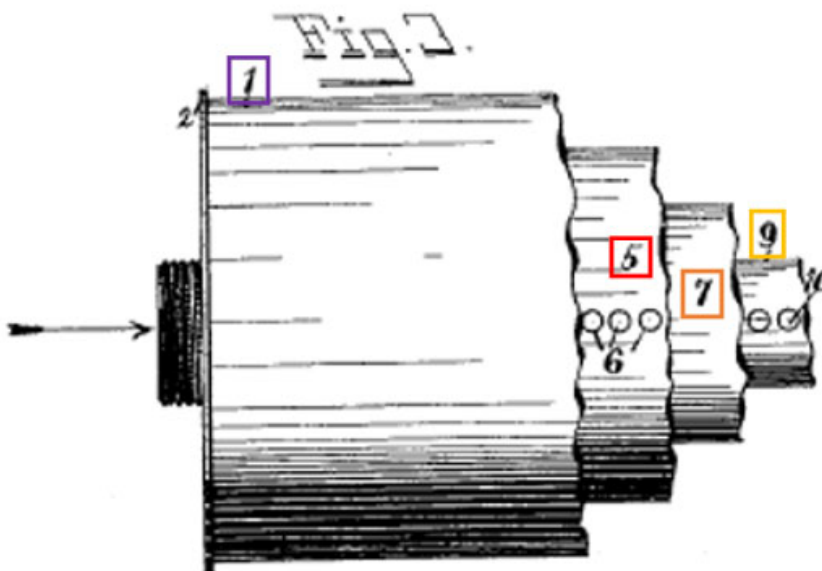
Id., FIG. 1

Reeves's FIG. 2 (reproduced *infra*) shows a section on line 2-2 of Reeves' FIG. 1. Id., 2:33, 34.



EX1019, FIG. 2

Reeves's FIG. 3 (reproduced *infra*) shows a side elevation of Reeves' FIG. 1, broken away. Id., 2:34, 35.



EX1019, FIG. 3

Reeves generally describes:

an exhaust-muffler of a series of concentric chambers formed of a series of concentric shells of different diameters, openings longitudinally disposed upon alternate sides of adjacent shells, an inlet for the smaller chamber, an outlet for the larger leading into a series of concentric chambers similar to the first series. Id., Claim 1.

Reeves provides the following description of the operation of the device illustrated in FIGs. 1-3:

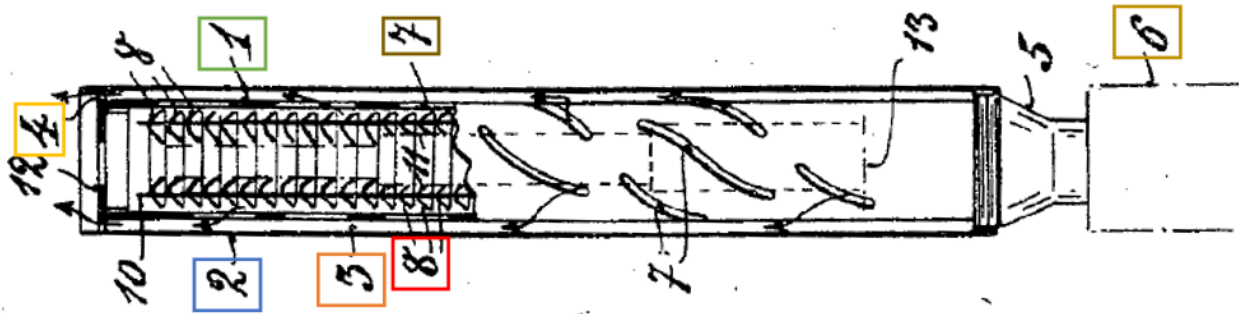
[S]uppose the pipe 11, at the left, is connected with the exhaust of an engine. The exhaust product first passes into the small chamber, then through perforations 10 into the annular chamber between shells 9 and 7, around within this chamber, through perforations 8, into the chamber between shells 7 and 5, thence to perforations 6, into the chamber between shells 5 and 1, thence through opening 4 in partition 3 into the chamber at the right-hand side. In this latter chamber the gas passes from the larger to the smaller chamber through a path similar to that described, only reversed. Id., 2:54-73.

Reeves also explains that:

. . . it is obvious that the same results would be attained if the partitions were perforated circumferentially at alternate ends, so as to provide a long path. Id., 2:85-90.

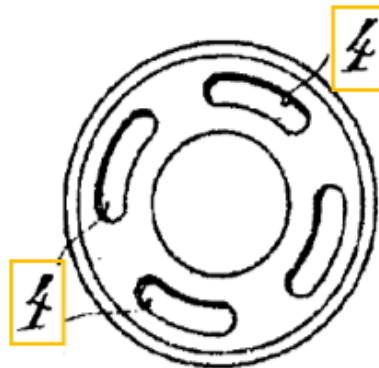
e) Eichenseher (EX1020; EX1021)

Eichenseher's FIG. 1 (reproduced *infra*) shows a longitudinal section of a silencer for firearms. EX1021, 1.



***Id.*, FIG. 1 (Petitioner-annotated)**

Eichenseher's FIG. 2 (reproduced *infra*) depicts a “top view.” EX1021, 1.



***Id.*, FIG. 2 (Petitioner-annotated)**

Eichenseher provides the following description of the device illustrated in FIG. 1:

The hollow body is formed . . . by the two cylinders **1** and **2** placed one inside the other and held at a suitable distance . . . while slots **4** . . . are provided at the top in the ring closing off cavity **3**. The double-walled hollow body **1** and **2** is screwed onto rifle barrel **6** by means of a mouthpiece **5** . . . Inner cylinder **1** is provided with slots **7** along its entire length, which run parallel to the twist (*See Fig. 1*). *Id.*, 1 (bolded coloring added).

Inner cylinder **1** serves to accommodate known silencers **8** which, as shown in Fig. 4, have a slightly trough-shaped cross-section and are slightly retracted. *Id.*, **1** (bolded coloring added).

Eichenseher concludes by noting that:

The mode of operation is such that sound is effectively intercepted by sound absorbers **8**, while the powder gases can escape through 9, **7**, **3** and **4**, whereby the resistance is reduced to a minimum. *Id.*, **2** (bolded coloring added).

3. *The Relied-Upon Prior Art References Are Analogous To The '750 Patent.*

The '750-Patent is related to suppressing "high velocity/high temperature gases, projectiles, heat or sound energy." EX1001, 10:22-27.

Thurler, Barlowatz, and Eichenseher each disclose devices for suppressing energy caused by explosions during firearm operation. Bouton and Reeves disclose devices for suppressing energy caused by explosions during combustion engine operation. It has long been recognized that designs for suppressing energy caused by operating a firearm device are applicable to suppressing energy caused by other devices (such as combustion engines), and *vice versa*. See e.g., EX1001, 10:22-27; EX1004, 124, 125; EX1018, 2; EX1024, 1:12, 13; EX1013, 62.

Thus, each of the foregoing references is related to the same field of endeavor and/or reasonably pertinent to the problem faced by the '750-Patent (EX1013, IX.C) and is, therefore, analogous to the '750-Patent. MPEP § 2141.01(a) (citing *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)).

4. *Specific Statutory Grounds With Reference To Relied-Upon Prior Art References*

Regardless of the assigned EFD, pre-AIA law applies. The specific statutory grounds under 35 U.S.C. 102 (pre-AIA) and 35 U.S.C. 103 (pre-AIA) on which each claim is challenged, and the patents or printed publications relied upon for each ground, are provided *infra*.

Grounds	35 U.S.C.
GROUND 1: Claims 1, 4, 5, 7-9, 15-17, 19, and 22 are anticipated by Thurler.	102 (pre-AIA)
GROUND 2: Claims 1, 4-11, 15-17, 19, 21, and 22 are rendered obvious by Thurler.	103 (pre-AIA)
GROUND 3: Claim 18 is rendered obvious by Thurler in view of Bouton.	103 (pre-AIA)
GROUND 4: Claims 1, 4-17, and 19-22 are rendered obvious by Thurler in view of Barlowatz.	103 (pre-AIA)
GROUND 5: Claims 1, 9, 19, and 20 are anticipated by Barlowatz.	102 (pre-AIA)
GROUND 6: Claims 1, 9, 19, and 20 are rendered obvious by Barlowatz.	103 (pre-AIA)
GROUND 7: Claim 2 is rendered obvious by Barlowatz in view of Reeves.	103 (pre-AIA)
GROUND 8: Claims 1, 3-5, 8, 9, 18, and 19 are rendered obvious by Eichenseher in view of Barlowatz.	103 (pre-AIA)

C. Grounds Of Unpatentability For Each Challenged Claim With Specificity

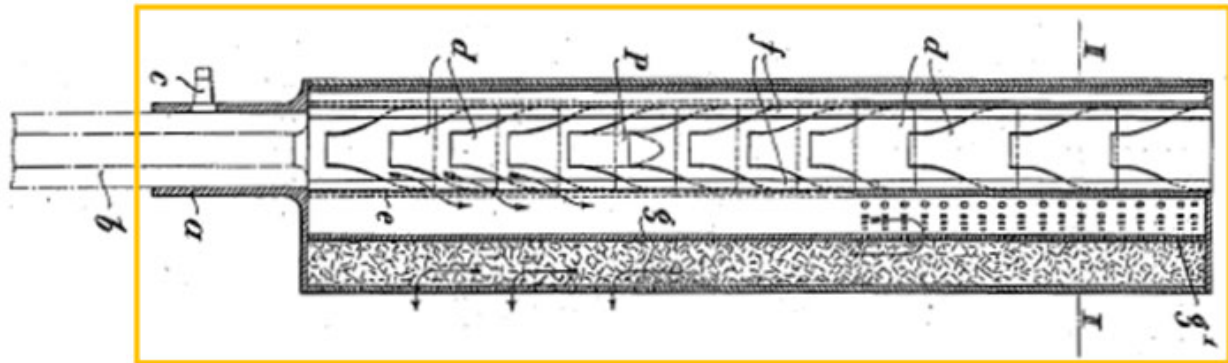
1. *GROUND 1: Claims 1, 4, 5, 7-9, 15-17, 19, and 22 are anticipated by Thurler.*

Thurler discloses all limitations of Claims 1, 4, 5, 7-9, 15-17, 19, and 22.

a) Claim 1 (Independent)

(1) [1Pre] “**An energy capture and control device, comprising:**”

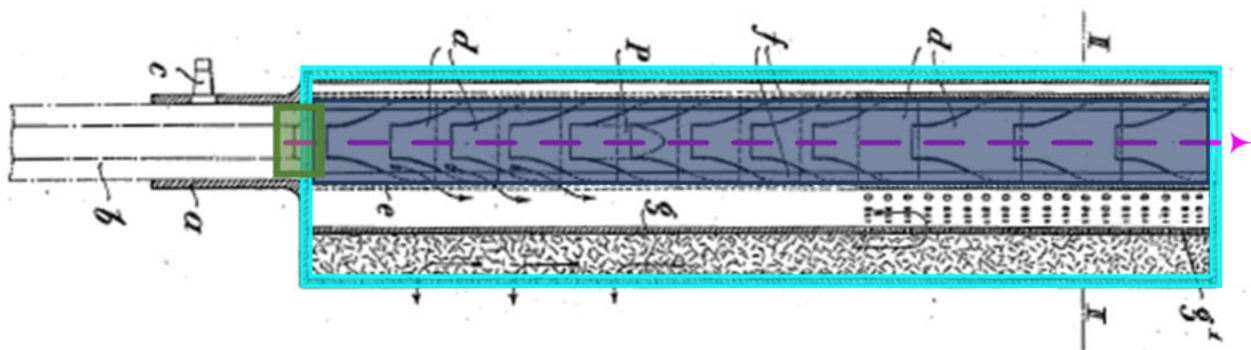
Thurler's FIG. 1 illustrates an ESD (“Thurler's ESD”) that discloses this limitation. See EX1015, 2:9, 10 (Thurler is related to “devices for lessening the report of firearms”) & FIG. 1 (annotated *infra*); EX1013, X.A.1.a)(1).



EX1015, FIG. 1 (Petitioner-annotated)

(2) [1A] “a) **a central chamber oriented along a central axis within an outer shell, said central chamber having an inlet configured to receive a high energy material from a high energy outlet;**”

Thurler's ESD discloses this limitation. See EX1015, FIGs. 1, 2 (annotated *infra*); EX1013, X.A.1. a)(2).



EX1015, FIG. 1 (Petitioner-annotated)



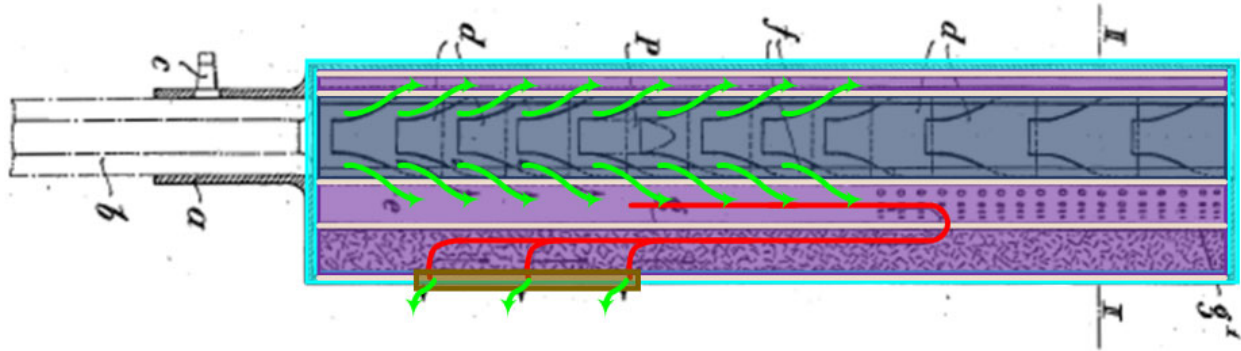
EX1015, FIG. 2 (Petitioner-annotated)

(3) [1B] “b) a common off axis chamber oriented within the outer shell in fluid communication with the central chamber and having a fluid outlet and multiple internal walls defining a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine and which dissipates energy transferred from the high energy material; and”

Thurler's ESD discloses this limitation.²³ See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.1. a)(3).

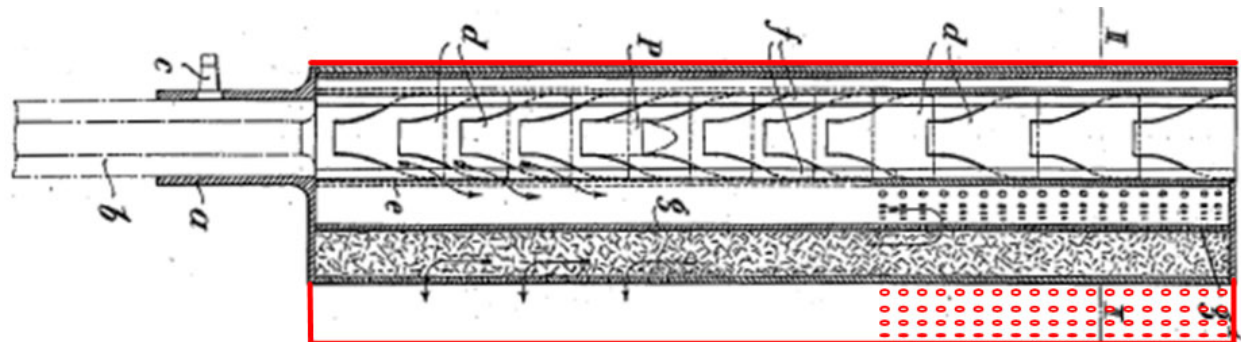
²³ “[A] serpentine fluid pathway which is . . . radially serpentine” requires the fluid pathway to cause fluids to flow back (e.g., clockwise) and forth (e.g., counterclockwise) in alternate rotational directions, **changing direction at least twice, while advancing outwardly** along a radius of the off-axis chamber. See III.A.4.c) *supra*.

“[A] serpentine fluid pathway which is at least one of axially serpentine and radially serpentine” requires a fluid pathway to be **both** axially serpentine **and** radially serpentine. See III.A.4.d) *supra*.

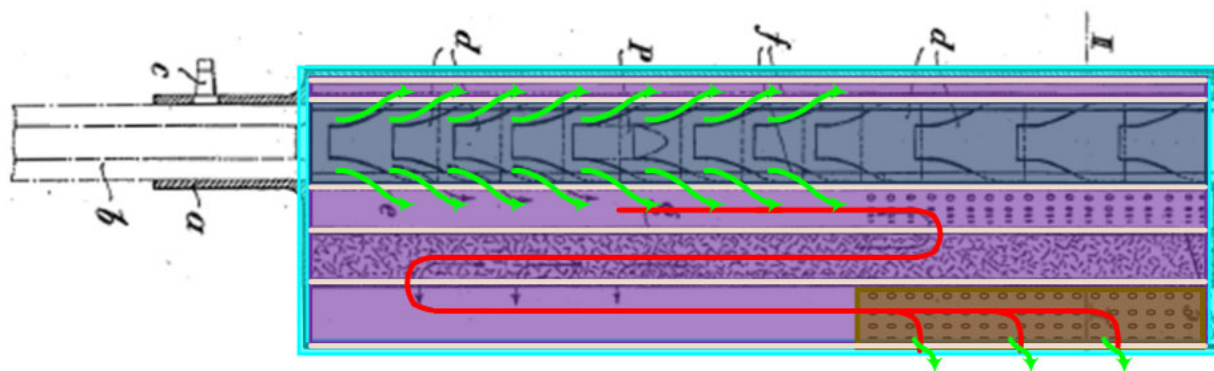


EX1015, FIG. 1 (Petitioner-annotated)

Thurler generally discloses that the “inner casing [e] is further inclosed [sic] in *one or more* mantles which are alternately perforated at the front or rear end.” EX1015, 2:27-30. Thus, in addition to the ESD disclosed in FIG. 1, Thurler discloses embodiments that include a common off-axis chamber having three or more tubes that are alternately perforated. EX1013, 174. See a rendering of Thurler’s ESD, as modified (“Thurler’s modified ESD_1”), and a mapping of the same to the above limitation *infra*.



EX1013, 74, Figure 3 (Thurler’s modified ESD_1 with modifications in red)



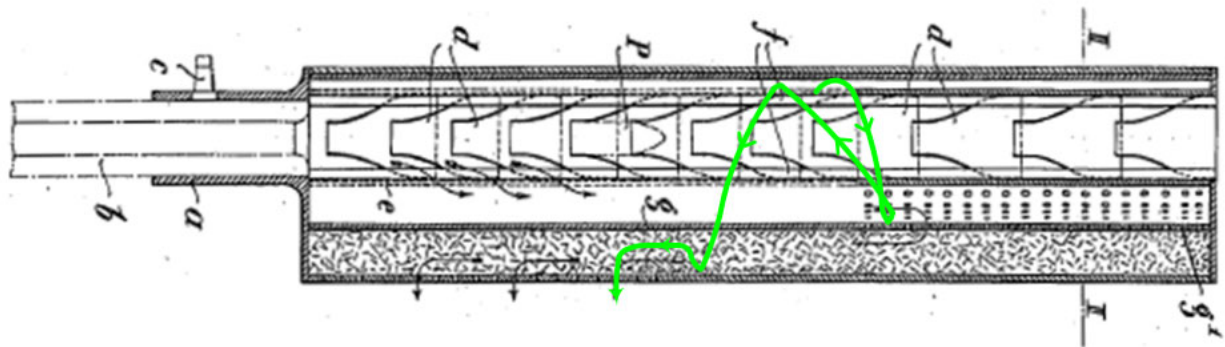
Id., Figure 4 (mapping to Thurler's modified ESD_1)

Thus, applying the OCM that a serpentine fluid pathway that causes “back and forth” fluid flow requires *multiple changes in direction* (see III.A.4.c) *supra*), the aspect of Thurler's fluid pathway that extends back and forth along the walls of Thurler's tube *g*, *h* and the additional disclosed tube discloses “a serpentine fluid pathway which is . . . axially serpentine.” EX1013, 175. Specifically, the walls of tubes *e* and *g* will cause gas that escapes from tube *e* to travel in a first (e.g., forward) direction on its path to the perforations at the end of tube *g* before entering tube *h*, where the walls of tubes *g* and *h* will cause the gas to travel *back* in a second (e.g., backward) direction on its path to the perforations at the beginning of tube *h* before entering the added tube, where the walls of tube *h* and the added tube will cause the gas to travel *forth* in the first direction on its path to the perforations at the end of the added tube. *Id.*

Additionally, the aspect of Thurler's fluid pathway that extends radially through the tube *g*, the larger tube *h*, and the yet larger added tube discloses “a

serpentine fluid pathway which is . . . radially serpentine.” *Id.*, 176. Specifically, the walls of tubes *e* and *g* will cause gas that escapes from the top of tube *e* to travel in a first (e.g., clockwise) direction before traveling radially outward into the larger tube *h*, where the walls of tubes *g* and *h* will cause the gas to travel **back** in an opposing (e.g., counterclockwise) direction before traveling radially outward into the larger added tube, where the gas will travel **forth** in the first direction. *Id.*

Should PO argue, as PO has in the related litigation, that a serpentine fluid pathway only requires **a single change of direction** (See EX1034, 4), then Thurler’s unmodified (*i.e.*, not including the additionally-disclosed tube) ESD similarly discloses “a serpentine fluid pathway which is . . . axially serpentine and radially serpentine.” See EX1015, FIG. 1, *infra*.



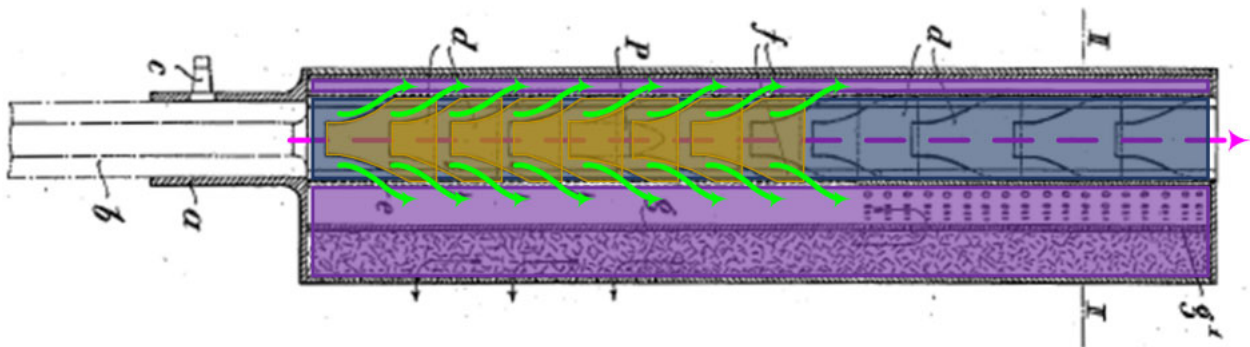
EX1015, FIG. 1 (Petitioner-annotated)

Also, should PO argue, as PO has in the related litigation, that “a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine” can be axially serpentine **or** radially serpentine (see EX1033, 3, 4, 6), Thurler

anticipates this limitation by disclosing an axially serpentine fluid pathway, a radially serpentine pathway, or both.

(4) [1C] “c) a plurality of deflectors oriented in series along the central axis of the central chamber and configured to deflect the energy from the high energy material to the common off axis chamber.”

Thurler's ESD discloses this limitation.²⁴ See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.1.a)(3).



EX1015, FIG. 1 (Petitioner-annotated)

b) Claim 4

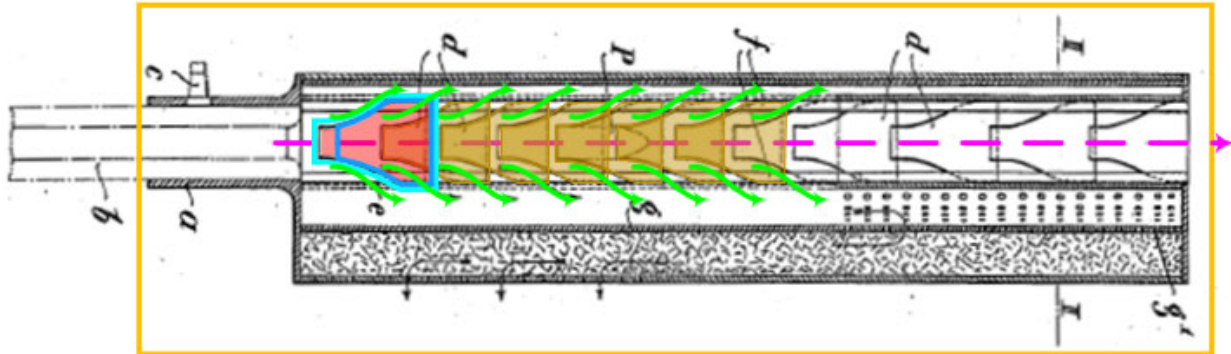
(1) [4A] “The device of claim 1, wherein the plurality of deflectors each comprise a frustoconical shape having a hollow interior along the central axis and a flared exit portion.”

Thurler's ESD discloses all limitations recited in Claim 1. See III.C.1.a) *supra*.

²⁴ “[A] plurality of deflectors . . . configured to deflect the energy . . . to the common off axis chamber” requires *each* of “the plurality of deflectors” to be configured to deflect energy from a high energy material to the common off axis chamber via respective *separate and direct* fluid connections. See III.A.4.b) *supra*.

Thurler's ESD further discloses all limitations recited in Claim 4.

See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.1.b).



EX1015, FIG. 1 (Petitioner-annotated)

c) *Claim 5*

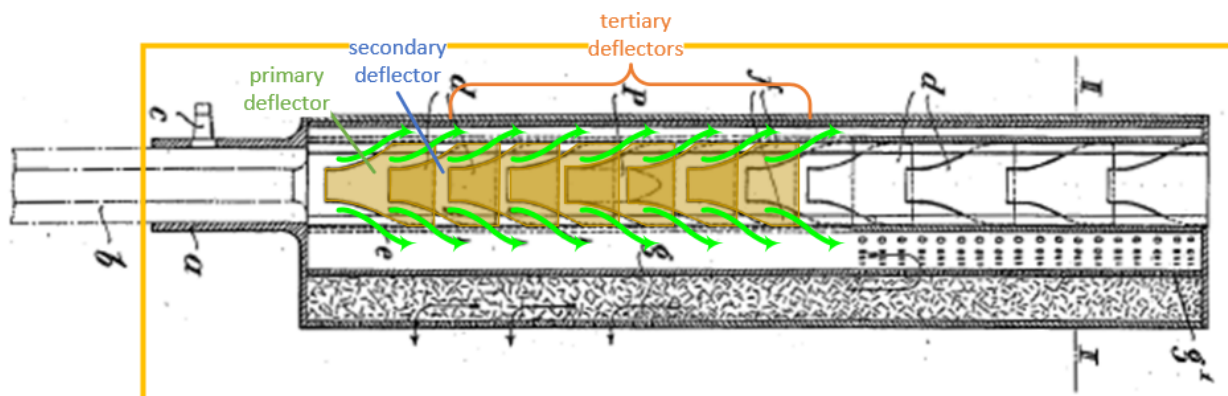
(1) [5A] “**The device of claim 4**, wherein **the plurality of deflectors include a primary deflector, a secondary deflector, and at least one tertiary deflector.**”

Thurler's ESD discloses all limitations recited in Claims 1 and 4.

See III.C.1.a), III.C.1.b) *supra*.

Thurler's ESD further discloses all limitations recited in Claim 5.

See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.1.c).



EX1015, FIG. 1 (Petitioner-annotated)

d) Claim 7

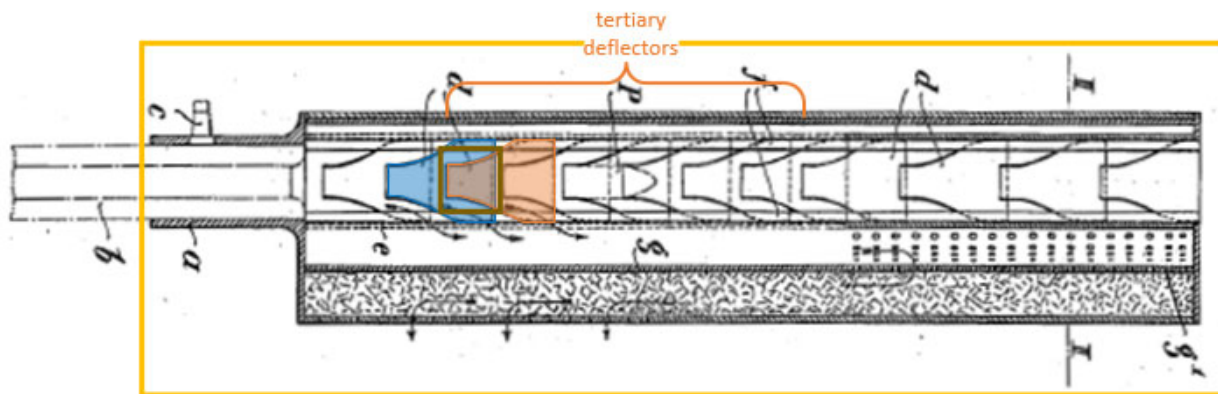
(1) [7A] “**The device of claim 5**, wherein **at least one tertiary deflector is at least partially engaged within the flared exit portion of an adjacent deflector.**”

Thurler's ESD discloses all limitations recited in Claims 1, 4, and 5.

See III.C.1.a), III.C.1.b), and III.C.1.c) *supra*.

Thurler's ESD further discloses all limitations recited in Claim 7.

See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.1.d).



EX1015, FIG. 1 (Petitioner-annotated)

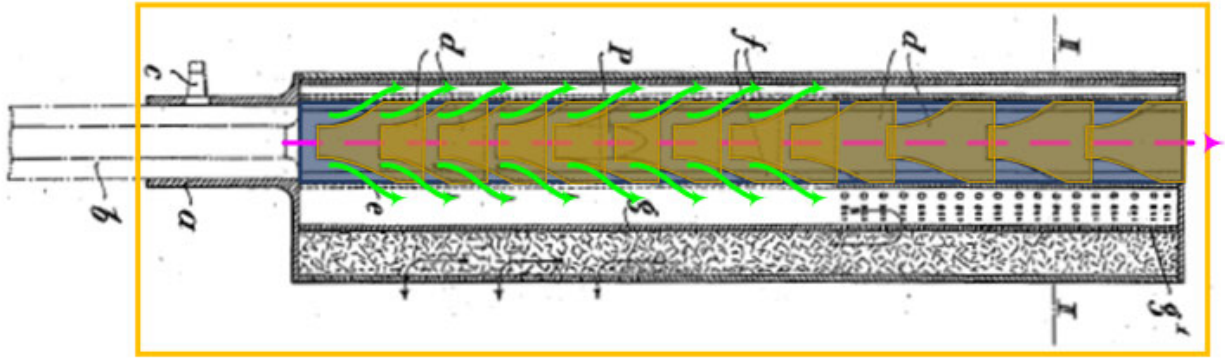
e) Claim 8

(1) [8A] “**The device of claim 4**, wherein **the plurality of deflectors span substantially the entire central axis along the central chamber.**”

Thurler's ESD discloses all limitations recited in Claims 1 and 4.

See III.C.1.a), III.C.1.b) *supra*.

If “the plurality of deflectors” is construed as including all the deflectors in the central chamber rather than only the deflectors in the central chamber that directly deflect energy into the common off-axis chamber, Thurler's ESD further discloses this limitation. See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.1.e).



EX1015, FIG. 1 (Petitioner-annotated)

f) Claim 9

(1) [9A] “**The device of claim 1**, wherein **the multiple internal walls are formed to produce a radially serpentine fluid pathway.**”

Thurler’s ESD discloses all limitations recited in Claims 1 and 9.

See III.C.1.a), III.C.1.a)(3) *supra*.

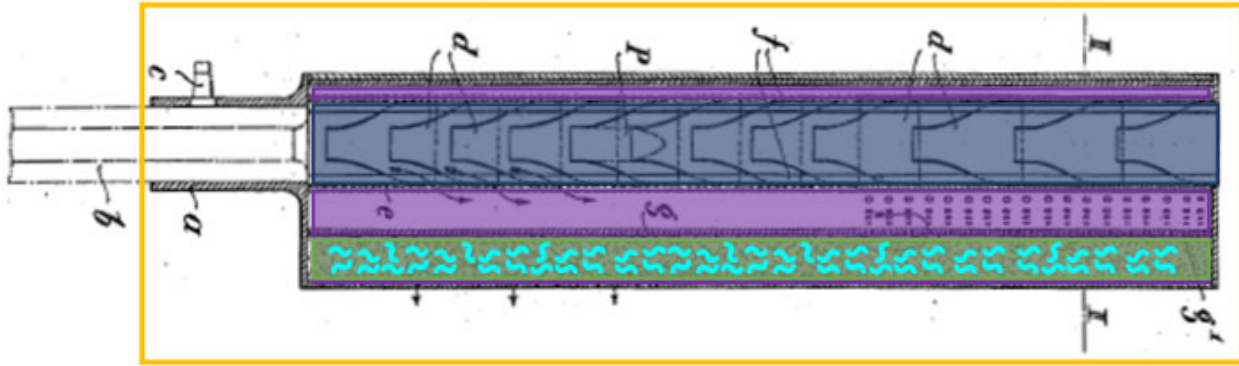
g) Claim 15

(1) [15A] “**The device of claim 1**, wherein **the common off axis chamber further includes an annular dampening chamber oriented about the central chamber and being filled with an energy absorbent material.**”

Thurler’s ESD discloses all limitations recited in Claim 1. See III.C.1.a) *supra*.

Thurler’s ESD further discloses all limitations recited in Claim 15.

See EX1015, 2:77-88 (“the space between [tubes] g and h is filled with metal shavings, such as aluminium”) & FIG. 1 (annotated *infra*); EX1013, X.A.1.g).



EX1015, FIG. 1 (Petitioner-annotated)

h) Claim 16

(1) [16A] “**The device of claim 15**, wherein **the dampening chamber is oriented adjacent the outer shell.**”

Thurler's ESD discloses all limitations recited in Claims 1 and 15.

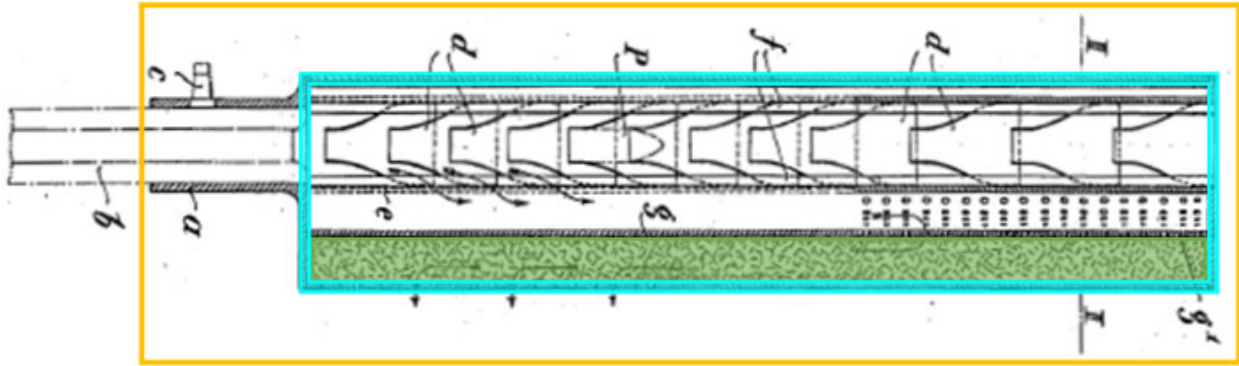
See III.C.1.a), III.C.1.g) *supra*.

Thurler's ESD further discloses all limitations recited in Claim 15.

See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.1.h). As can be seen from

Thurler's FIG. 1, the metal shavings are included in Thurler's exterior tube g.

Thus, in the event Thurler's ESD is modified to include a common off-axis chamber having three or more tubes (as disclosed therein), Thurler discloses including the metal shavings in the outermost tube. EX1013, 193.



EX1015, FIG. 1 (Petitioner-annotated)

i) Claim 17

(1) [17A] “**The device of claim 15**, wherein the energy absorbent material is selected from the group consisting of powder tungsten filament, heavy metal powder, graphite, polymer, **aluminum**, stainless steel, carbon steels, iron, copper, tantalum, titanium, vanadium, chromium, zirconium, carbides of these, alloys of these, and combinations thereof.”

Thurler’s ESD discloses all limitations recited in Claims 1 and 15.

See III.C.1.a), III.C.1.g) *supra*.

Thurler’s ESD further discloses all limitations recited in Claim 17.

See EX1013, X.A.1.i). Claim 17 is a “Markush” claim reciting a list of alternatively useable members. MPEP § 2117. Thurler discloses that “the space between [tubes] g and h is filled with metal shavings, such as **aluminium**.”

(EX1015, 2:77-88).

j) Claim 19 (Independent)

(1) [19Pre]

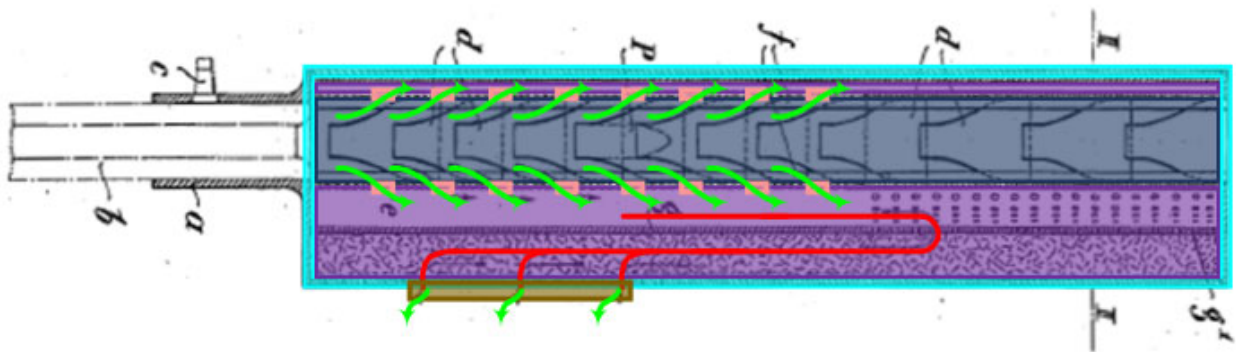
Thurler’s ESD discloses this limitation. *See* III.C.1.a)(1) *supra*.

(2) [19A]

Thurler’s ESD discloses this limitation. *See* III.C.1.a)(2) *supra*.

(3) [19B] “b) a common off axis chamber oriented within the outer shell in fluid communication with the central chamber via a plurality of orifices and further includes a fluid outlet, the common off axis chamber comprising a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine; and”

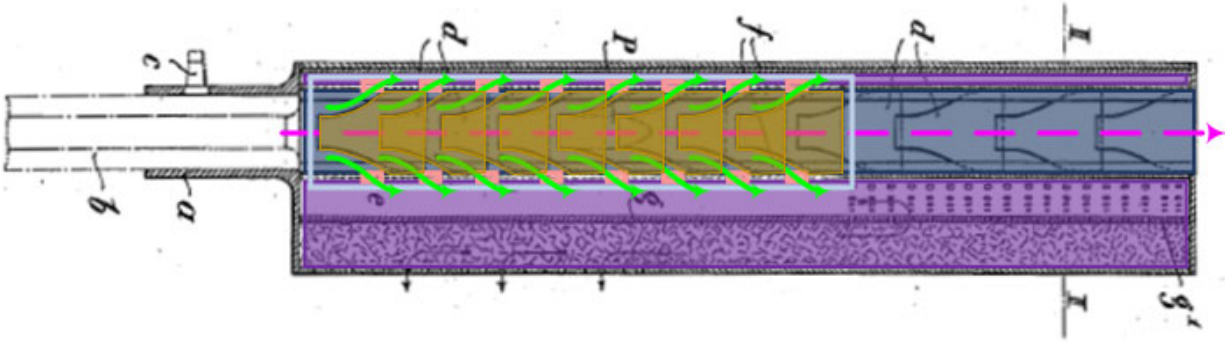
Thurler's ESD discloses this limitation. See III.C.1.a)(3) *supra*; EX1015, Claim 1 (identifying “perforations” in Thurler's tube *e*) & FIG. 1 (annotated *infra*); EX1013, X.A.1.j)(3).



EX1015, FIG. 1 (Petitioner-annotated)

(4) [19C] “c) a plurality of deflectors oriented in series along the central axis of the central chamber, wherein a position of multiple individual deflectors of the plurality of deflectors corresponds with the individual orifices of the plurality of orifices to the common off axis chamber.”

Thurler's ESD discloses this limitation. See III.C.1.a)(4) *supra*;
EX1015, 2:84-90, Claim 1 (“sleeves *d* clos[e] th[e] channel to the compressed gas which rushes consequently through the annular openings of the tube *e*” which is “perforated for two thirds of its length”) & FIG. 1 (annotated *infra*);
EX1013, X.A.1.j)(4).

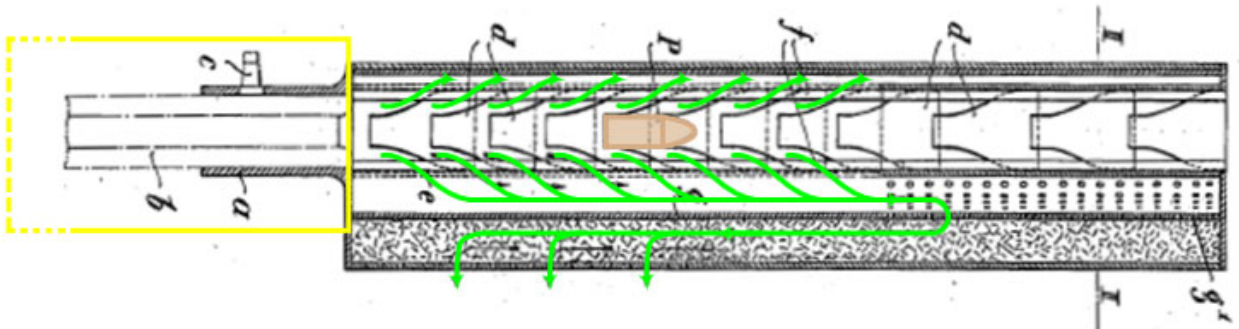


EX1015, FIG. 1 (Petitioner-annotated)

k) Claim 22 (Independent)

(1) [22Pre] “A method for **energy capture and control from a high energy device**, comprising:”

The operation of Thurler’s ESD described in Thurler’s specification and illustrated in Thurler’s FIG. 1 discloses this limitation. See EX1015, 2:37-39, 84-86 & FIG. 1 (annotated *infra*) (describing and illustrating the capture and control of energy caused by discharging the projectile *P* from the barrel *b* of a rifle through Thurler’s ESD); EX1013, X.A.1.k)(1).

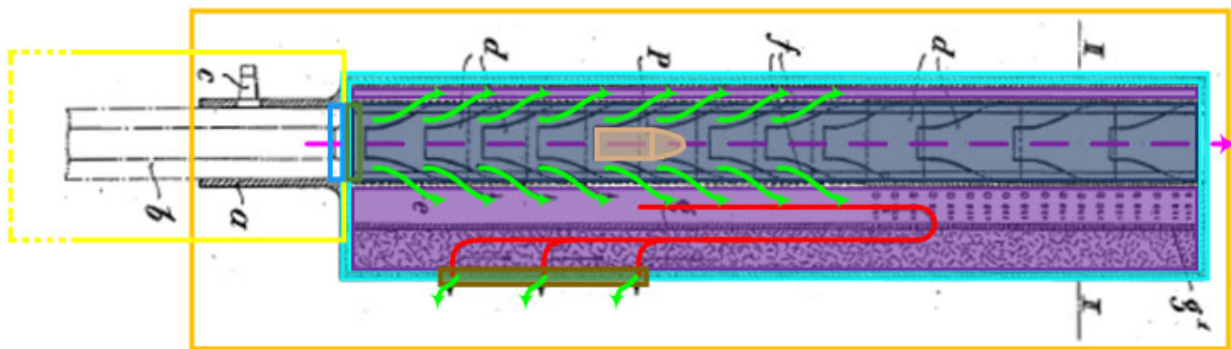


EX1015, FIG. 1 (Petitioner-annotated)

(2) [22A] “a) discharging **a high energy material** from **the high energy device** through **an energy capture and control device comprising a central chamber oriented along a central axis within an outer shell**, said central chamber having an inlet configured to receive a high energy material from **a high energy outlet**, **and a common off axis chamber oriented within the**

outer shell in fluid communication with the central chamber, the common off axis chamber comprising an axially serpentine fluid pathway and a fluid outlet; and”

The operation of Thurler's ESD described in Thurler's specification and illustrated in Thurler's FIG. 1 discloses this limitation. See EX1015, 2:37-39, 84-86 & FIG. 1 (annotated *infra*) (describing and illustrating the discharge of the projectile *P* from the barrel *b* of a rifle through Thurler's ESD); EX1013, X.A.1.k)(2). Thurler further discloses all limitations of the “energy capture and control device.” See III.C.1.a) *supra*.



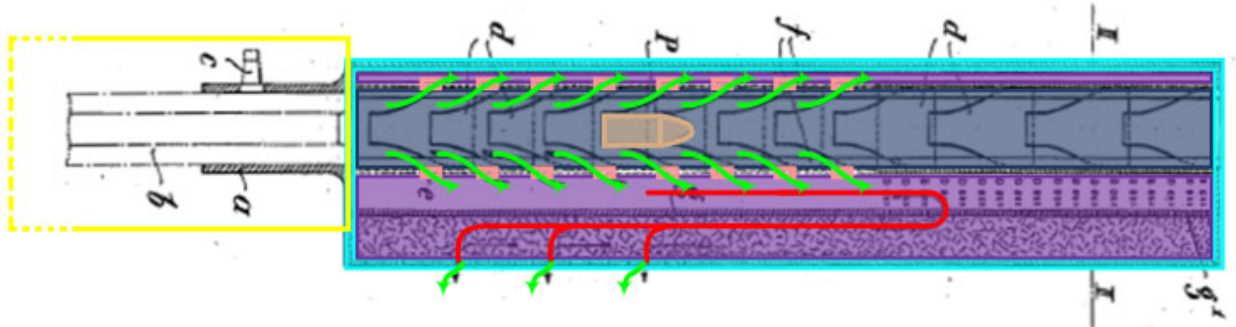
EX1015, FIG. 1 (Petitioner-annotated)

(3) [22B] “(b) capturing energy within the common off axis chamber via a plurality of orifices from the central chamber using the axially serpentine fluid pathway, the energy being associated with discharge of the high energy material from the high energy discharge device.”

The operation of Thurler's ESD described in Thurler's specification and illustrated in Thurler's FIG. 1 discloses this limitation. See EX1015, 2:83-102 & FIG. 1 (annotated *infra*) (describing and illustrating the guiding of the compressed gas, caused by discharging the projectile *P* through Thurler's ESD, through the annular openings of the tube *e* into the space between tubes *e* and *g* and then into

the space between tube *g* and *h* before exiting the openings in the tube *h*);

EX1013, X.A.1.k)(3).



EX1015, FIG. 1 (Petitioner-annotated)

2. GROUND 2: Claims 1, 4-11, 15-17, 19, 21, and 22 are rendered obvious by Thurler.

a) Claims 1, 4, 5, 7-9, 15-17, 19, and 22

Thurler's ESD discloses all limitations recited in Claims 1, 4, 5, 7-9, 11, 15-17, 19, and 22. *See* III.C.1 *supra*.

To the extent PO argues that Thurler fails to disclose any limitations of Claims 1, 4, 5, 7-9, 11, 15-17, 19, and 22, Thurler renders obvious²⁵ any such limitations. Thurler further renders obvious all limitations of Claims 6, 10, 11, and 21.

b) Claims 1, 19, and 22 (Independent)

Thurler's ESD discloses all limitations recited in Claims 1, 19, and 22. *See* III.C.1.a), III.C.1.j), III.C.1.k) *supra*.

²⁵ --- teaches, suggests, or otherwise renders obvious ---

Should PO argue that Thurler fails to disclose “a central chamber” due to the eccentric configuration of the tubes in the ESD disclosed in Thurler, Thurler teaches or suggests an ESD configuration that includes “a central chamber” that is surrounded by concentric tubes. Thurler discloses that “the position of [the second tube *g*] is eccentric with regard to the common axis of the tubular sleeves *d* . . . [and the] position of the tube *h* is also eccentric with regard to the axis of the sleeves *d* so that the sight *c* projects over the device for a few millimeters.” EX1015, 2:70-81. Accordingly, Thurler teaches concentric configurations for the outer tubes but opted to use an eccentric configuration to enable its ESD to be used with existing iron sights on a firearm. EX1013, 209. Thus, Thurler at least teaches or suggests concentric configurations for the outer tubes, which could be used with suppressor-height sights on a firearm. *Id.*

Moreover, even if Thurler fails to disclose, teach, or suggest concentric configurations for an ESD, it would have been obvious to a POSTA, as of the '750-Patent's EFD, to modify Thurler's ESD to achieve such a configuration. Id., 210. Modifying Thurler's ESD to achieve such a configuration would have been a simple matter of design choice resulting from a finite number of possibilities: *eccentric or concentric*. *Id.* As of the '750-Patent's EFD, the motivations for modifying Thurler's ESD to have a concentric configuration include, at least, seeking to increase the fluid path area in a balanced way, to

simplify the machining process, to modernize Thurler's ESD design, or any combination thereof. *See id.*

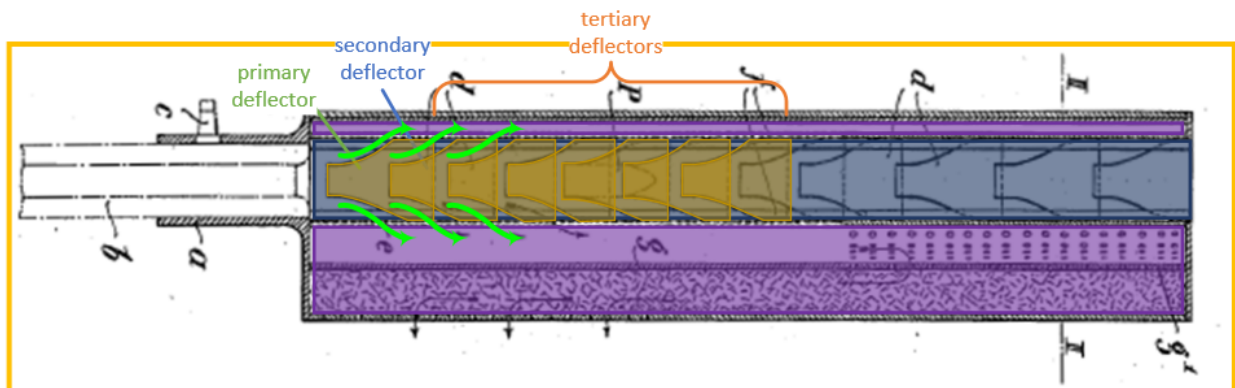
c) Claim 6

(1) [6A] “**The device of claim 5**, wherein **the fluid communication between the common off axis chamber and the central chamber occurs only at the primary deflector, the secondary deflector and a first tertiary deflector.**”

Thurler's ESD discloses or renders obvious all limitations recited in Claims 1, 4, and 5. *See* III.C.1.a), III.C.1.b), III.C.1.c) *supra*.

Thurler's ESD further renders obvious all limitations recited in Claim 6.

See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.2.c).



EX1015, FIG. 1 (Petitioner-annotated)

Thurler discloses that the tube *e* (which separates the central chamber in Thurler from the off-axis chamber in Thurler) is “perforated for two thirds of its length.” EX1015, Claim 1. Accordingly, Thurler contemplates other lengths of perforations but opted to use a perforation configuration that extends two thirds of the length. EX1013, 212. Thus, Thurler at least teaches or suggests shorter and longer perforation configurations for the tube *e*, including a shorter perforation

configuration that limits fluid communication between the central chamber and common off-axis chamber of Thurler to the first three sleeves *d*. *Id.*

Moreover, even if Thurler fails to disclose, teach, or suggest a shorter perforation configuration that limits fluid communication between the central chamber and common off-axis chamber of Thurler to the first three sleeves *d*, it would have been obvious to a POSITA to modify Thurler's ESD to achieve such a configuration. EX1013, 213. Modifying Thurler's ESD to achieve such a configuration would have been a simple matter of design choice resulting from a finite number of possibilities: *permitting fluid communication from one, two, . . . or all of Thurler's deflectors*. *Id.* As of the '750-Patent's EFD, the motivations for modifying Thurler's ESD to limit the fluid communication to the first three sleeves *d* include, at least, seeking to increase the fluid path length, to limit the amount of fluid transferred to Thurler's off-axis chamber, or both. *See id.*

d) Claim 8

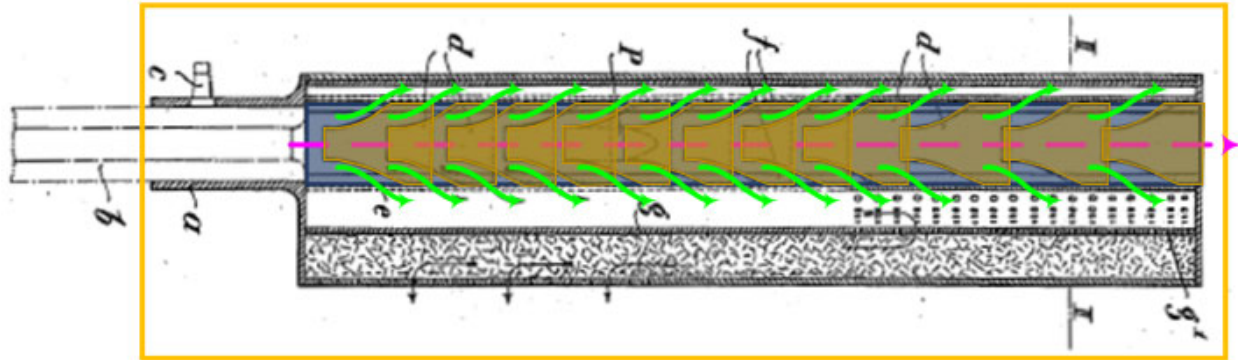
(1) [8A] “**The device of claim 4**, wherein **the plurality of deflectors span substantially the entire central axis along the central chamber**.”

Thurler's ESD discloses or renders obvious all limitations recited in Claims 1 and 4. *See* III.C.1.a), III.C.1.b) *supra*.

Regardless of whether “the plurality of deflectors” is construed as including all the deflectors in the central chamber or as including only the deflectors in the central chamber that directly deflect energy into the common off-axis chamber,

Thurler's ESD further renders obvious all limitations recited in Claim 8.

See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.2.d).



EX1015, FIG. 1 (Petitioner-annotated)

As noted in III.C.2.c) *supra*, Thurler at least teaches or suggests shorter and longer perforation configurations for the tube *e*, including a longer perforation configuration that allows fluid communication between Thurler's central chamber and common off-axis chamber via all (or nearly all) the sleeves *d*. EX1013, 216.

Moreover, even if Thurler fails to disclose, teach, or suggest a longer perforation configuration that allows fluid communication between Thurler's central chamber and common off-axis chamber via all (or nearly all) the sleeves *d*, it would have been obvious to a POSITA to modify Thurler's ESD to achieve such a configuration. Id., 217. Modifying Thurler's ESD to achieve such a configuration would have been a simple matter of design choice resulting from a finite number of possibilities: ***permitting fluid communication from one, two, . . . or all of Thurler's deflectors.*** Id. As of the '750-Patent's EFD, the motivations for modifying Thurler's ESD to allow fluid communication via all (or nearly all) the

sleeves *d* include, at least, seeking to increase the amount of fluid transferred to Thurler's off-axis chamber. See *id.*

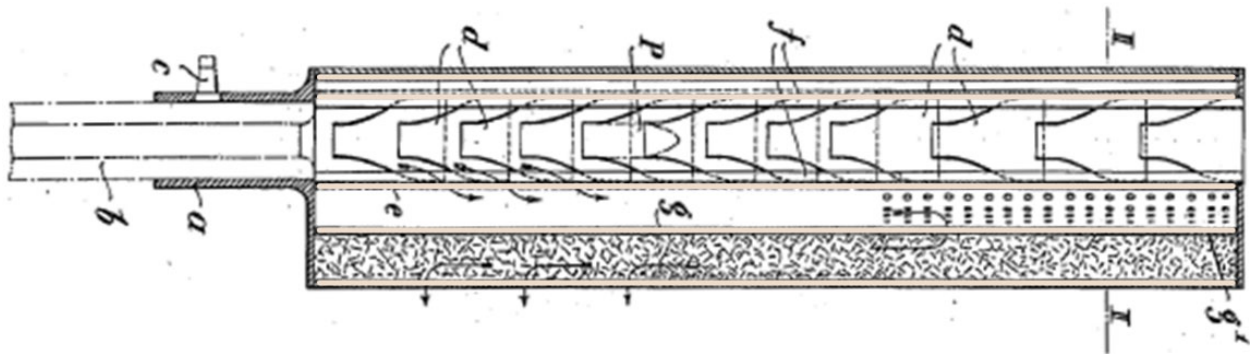
e) Claim 10

(1) [10A] “**The device of claim 1**, wherein **the multiple internal walls are formed by multiple concentric tubes having progressively larger diameters so as to form annular spaces between each adjacent tube**, and having alternating ends offset so as to produce the axially serpentine fluid annular pathway.”

Thurler's ESD discloses or renders obvious all limitations recited in Claim 1. See III.C.1.a), III.C.1.b) *supra*.

Thurler's ESD further renders obvious all limitations recited in Claim 10.

See EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.2.e).



EX1015, FIG. 1

The **multiple tubes *e*, *g*, and *h*** illustrated in Thurler's FIG. 1 disclose “the multiple internal walls are formed by multiple concentric tubes having progressively larger diameters so as to form annular spaces between each adjacent tube.” See EX1015, FIG. 1; EX1013, 219.

Additionally, Thurler's tube *g* is perforated for one-third of its length (EX1015, 2:74, 75) to allow fluid to flow from the tube *g* into the outermost tube *h*. Accordingly, though Thurler explicitly discloses a single technique (perforations at an end of the tube *g*) for creating a fluid path between the second tube *g* and the outermost tube *h*, Thurler's approach teaches or suggests alternative approaches to achieving this result that would have been obvious to a POSITA at the time of the '750-Patent, including offsetting an end of the tube *g* to allow a path at the end of tube *g* for fluid to flow from the tube *g* into the outermost tube *h*. EX1013, 220.

Moreover, even if Thurler fails to disclose, teach, or suggest offsetting the ends of the tubes to produce the axially serpentine fluid pathway, it would have been obvious to a POSITA to modify Thurler's ESD to achieve such a configuration. Id., 221. Modifying Thurler's ESD to achieve such a configuration would have been a simple matter of design choice resulting from a finite number of possibilities. Id. As of the '750-Patent's EFD, the motivations for modifying Thurler's ESD such that an end of the tube *g* is offset from an end of the tube *h* include, at least, seeking to elongate the fluid pathways, to simplify the machining process, or both. *See id.*

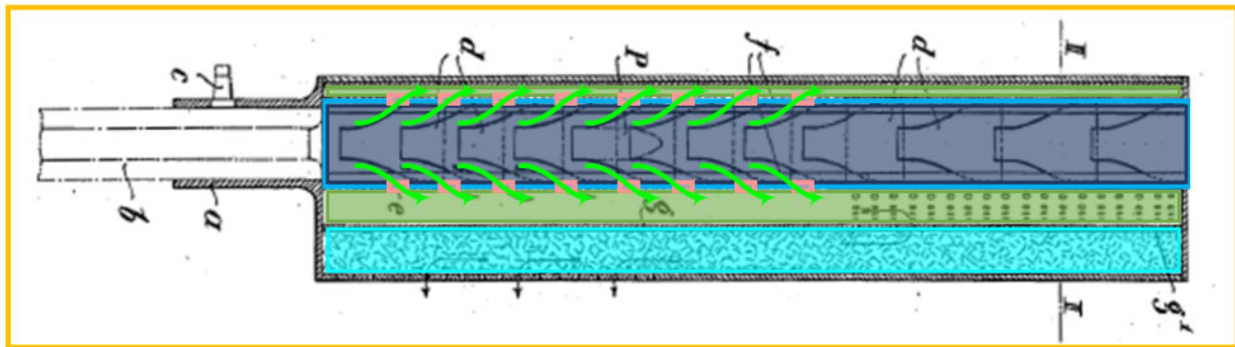
f) Claim 11

(1) [11A] “**The device of claim 10**, wherein **the multiple concentric tubes include an innermost tube which includes orifices oriented to allow fluid to pass from the central chamber into a first annular space adjacent the**

innermost tube and through the annular spaces of progressively larger diameter.”

Thurler's ESD discloses or renders obvious all limitations recited in Claims 1 and 10. *See* III.C.1.a), III.C.2.e) *supra*.

Thurler's ESD further discloses or renders obvious all limitations recited in Claim 11. *See* EX1015, Claim 1 & FIG. 1 (annotated *infra*, disclosing **multiple tubes e, g, and h**); EX1013, X.A.2.f).



EX1015, FIG. 1 (Petitioner-annotated)

g) Claim 21

(1) [21A] “The device of claim 19, further comprising multiple internal walls defining the axially serpentine fluid pathway, the multiple internal walls being formed by multiple concentric tubes having progressively larger diameters so as to form annular spaces between each adjacent tube, and having alternating ends offset so as to produce a serpentine fluid annular pathway.”

Thurler's ESD discloses or renders obvious all limitations recited in Claim 19. *See* III.C.1.j), III.C.2.b) *supra*.

Thurler's ESD further renders obvious all limitations recited in Claim 21. *See* III.C.2.e) *supra*; EX1013, X.A.2.g).

3. GROUND 3: Claim 18 is rendered obvious by Thurler in view of Bouton.

a) Claim 18

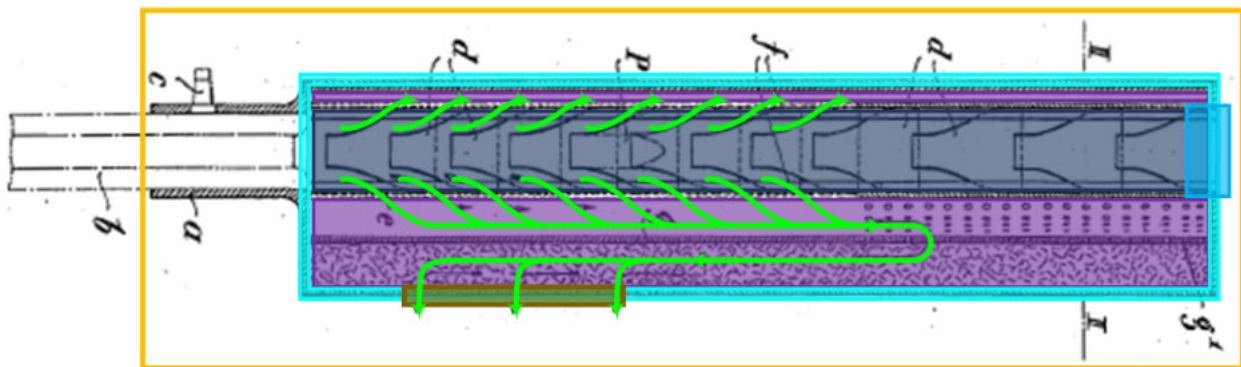
(1) [18A] “**The device of claim 1**, wherein **the outer shell includes an end cap assembly at an outlet end of the central chamber and which allows fluid to escape from the common off axis chamber through the fluid outlet, the fluid outlet being only accessible to the fluid in the common off axis chamber.**”

Thurler's ESD discloses or renders obvious all limitations recited in Claim

1. See III.C.1.a), III.C.2.b) *supra*.

Thurler's ESD, in view of Bouton, further discloses or renders obvious all limitations recited in Claim 18. See EX1013, X.A.3.a).

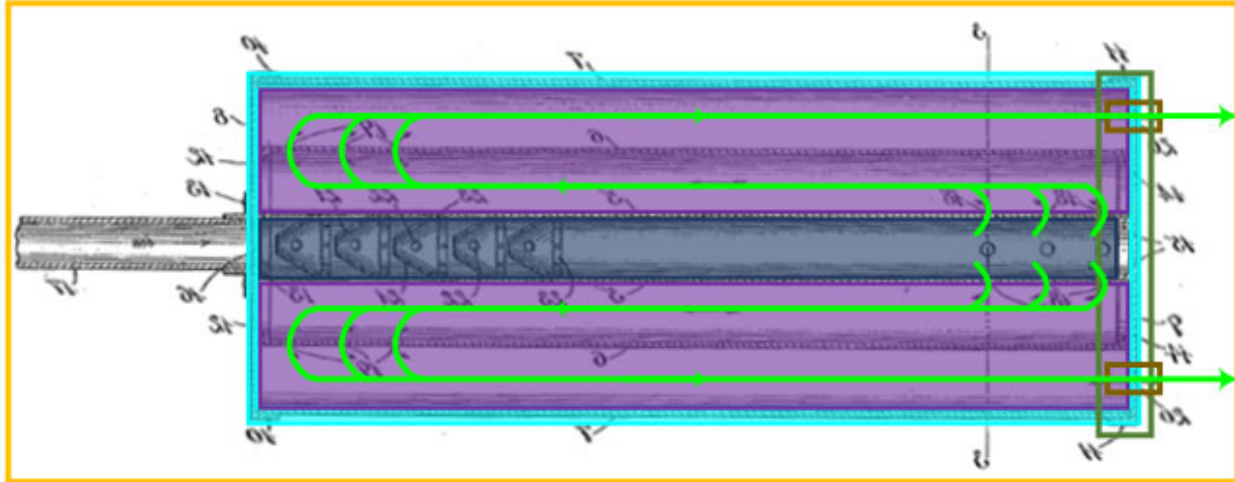
Thurler discloses an ESD having three tubes, with the innermost tube *e* forming the central chamber, and the intermediate tube *g* and outermost tube *h* forming the off-axis chamber. See EX1015, FIG. 1 (annotated *infra*); EX1013, 227.



EX1015, FIG. 1 (Petitioner-annotated)

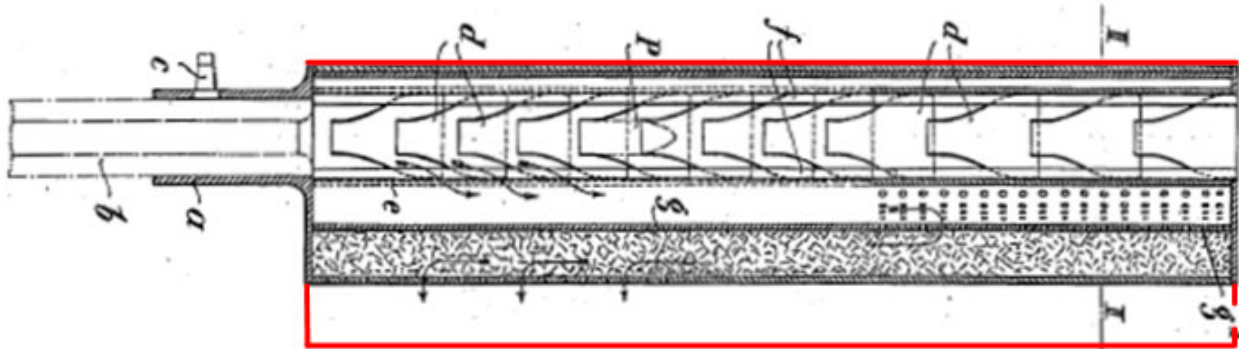
Bouton discloses a muffler device including concentric tubes of progressively larger diameters that are used to at least form an axially serpentine

fluid pathway that directs fluids to exhaust out of a front end cap (referred to in Bouton as head 9). See EX1016, FIG. 2 (annotated *infra*); EX1013, 228.

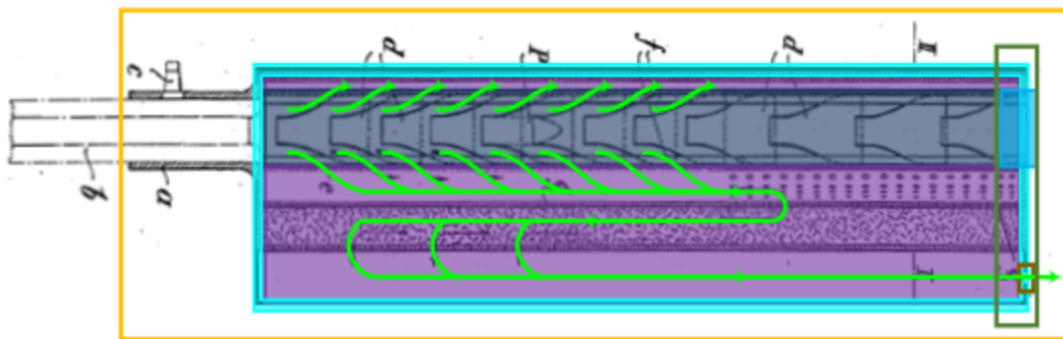


EX1016, FIG. 2 (Petitioner-annotated)

Thus, in view of Bouton, it would have been obvious to a POSITA to modify Thurler's ESD to include an additional outermost tube (which is similarly disclosed within Thurler itself) and to implement an endcap that allows the energy to escape from the outlet end of the central chamber. EX1013, 229. For example, to improve noise suppression by increasing a path length and expansion area for the deflected energy. See EX1016, 2:99 - 3:8; EX1001, 4:29-31; EX1013, 229. See a rendering of Thurler's ESD, as modified in view of Bouton ("Thurler's modified ESD_2"), and a mapping of the same to Claim 18 *infra*.



EX1013, Figure 5 (Thurler's modified ESD_2 with modifications in red)



***Id.*, Figure 6 (mapping to Thurler's modified ESD_2)**

4. GROUND 4: Claims 1, 4-17, and 19-22 are rendered obvious by Thurler in view of Barlowatz.

a) Claims 1, 4-11, 15-17, 19, 21, and 22

Thurler's ESD discloses or renders obvious all limitations recited in Claims 1, 4-11, 15-17, 19, 21, and 22. *See* III.C.1, III.C.2 *supra*.

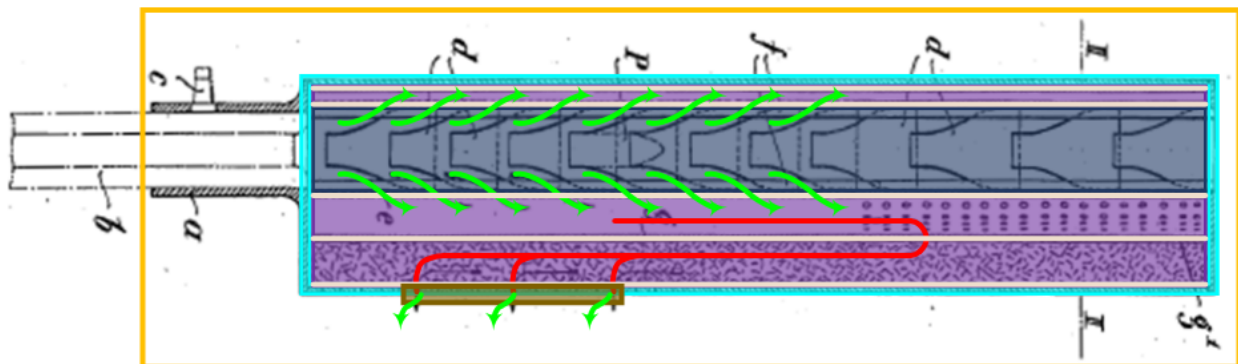
To the extent PO argues that Thurler fails to anticipate or render obvious any limitations of Claims 1, 4-11, 15-17, 19, 21, and 22, Thurler in view of Barlowatz renders obvious any such limitations. Thurler in view of Barlowatz further renders obvious all the limitation of Claims 12-14 and 20.

b) Claims 1 and 19 (Independent)

Thurler's ESD discloses or renders obvious all limitations recited in Claims 1 and 19. *See* III.C.1.a), III.C.1.j), III.C.2.b) *supra*.

Should PO argue that Thurler fails to disclose or render obvious “a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine” fluid pathway, Thurler in view of Barlowatz renders obvious this limitation.

Thurler discloses a serpentine fluid pathway which is at least axially serpentine. *See* EX1015, FIG. 1 (annotated *infra*); EX1013, X.A.4.b).



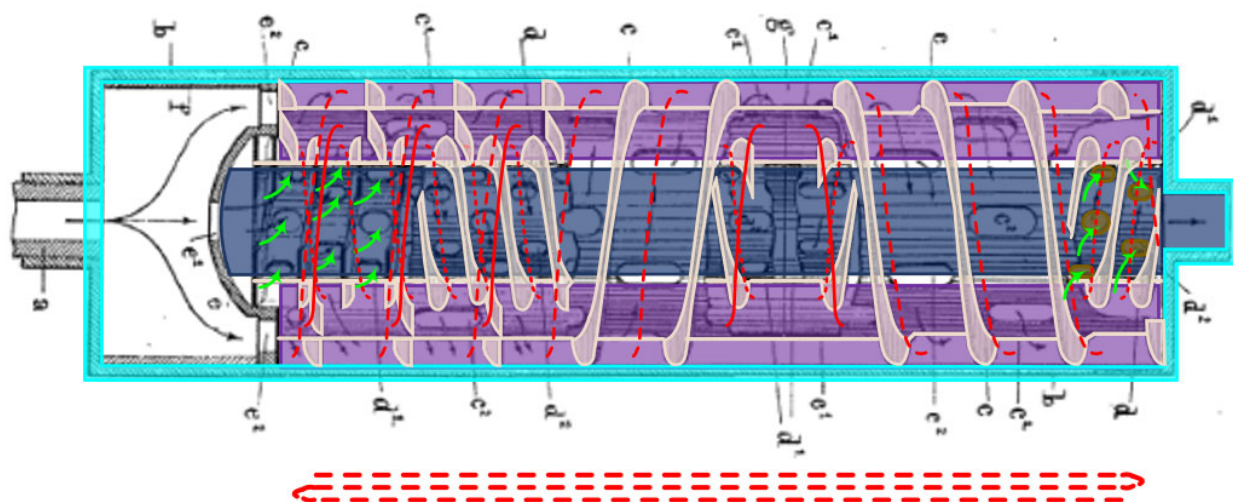
EX1015, FIG. 1 (Petitioner-annotated)

Barlowatz discloses a fluid pathway formed by inner and outer helical coils. EX1018, 1. Each of the helical coils reverses direction about midway along the central chamber. Id., 2; FIG. 1. Additionally, each of the helical coils is split at a midpoint by reinforcement strips *c1* and *d1* such that each helical coil forms two helical ducts. Id., 2; FIG. 1. Together the helical coils and strips form four helical

ducts, one helical duct being formed within Barlowatz's central chamber, and the other three helical ducts being formed within Barlowatz's off-axis chamber. *Id.*, 2.

Thus, Barlowatz's helical ducts form fluid pathways that would cause fluid to flow through progressively larger, and oppositely wound, helical ducts in clockwise and counterclockwise directions. EX1013, 238. Additionally, because the helical ducts are oppositely wound, the helical ducts would cause fluid to flow in different axial directions as the fluid moves to different helical ducts — e.g., the fluid would flow away from a shooter in the first helical duct, towards the shooter in the second helical duct, and away from the shooter in the third helical duct.

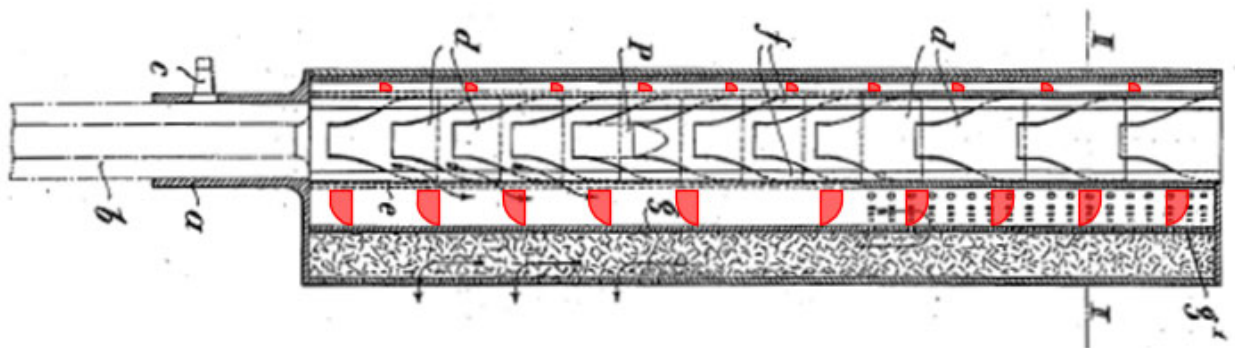
See EX1018, FIG. 1 (annotated *infra*); EX1013, 238.



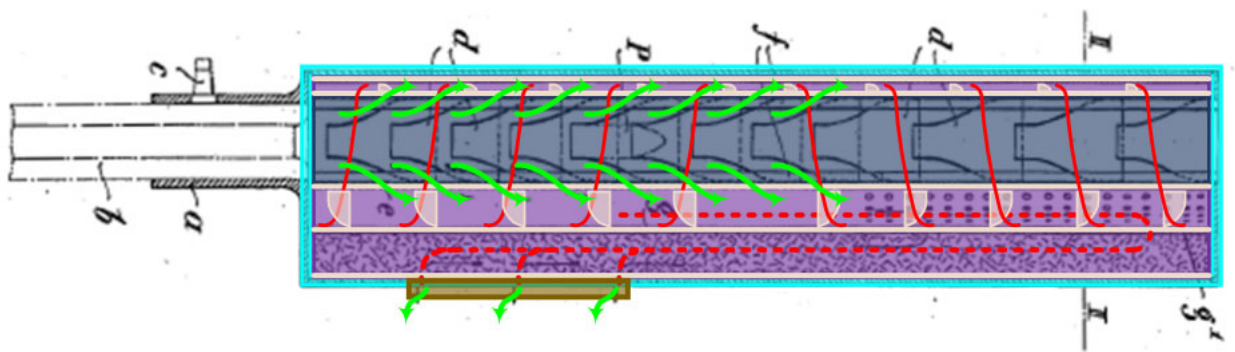
EX1018, FIG. 1 (Petitioner-annotated)²⁶

²⁶ The bottom dashed line represents the axially serpentine component of a fluid pathway in Barlowatz's ESD.

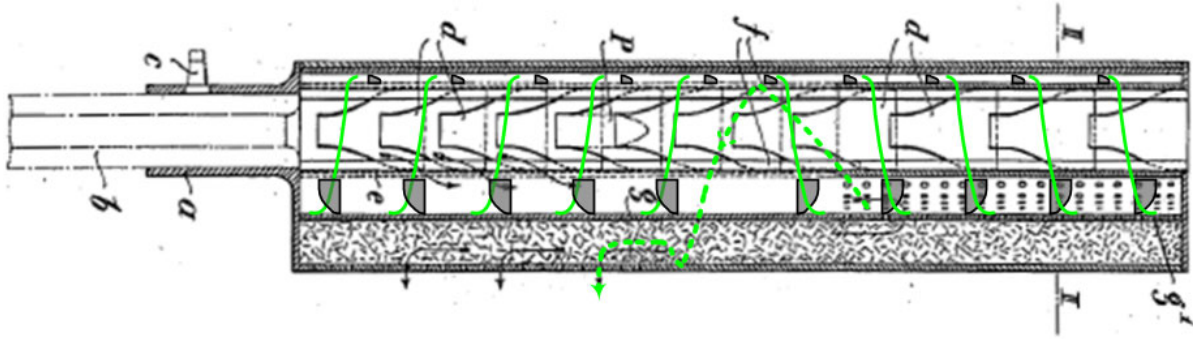
In view of Barlowatz, it would have been obvious to a POSITA to modify Thurler's ESD to include one or more helical coils (*e.g.*, Barlowatz's inner coil *d*) in one or more exterior tubes (*e.g.*, Thurler's tube *g*), thereby forming a fluid pathway that is both axially and radially serpentine. EX1013, 239. For example, to improve noise suppression by increasing a path length for the deflected energy and further slowing the speed of the deflected energy. *See* EX1016, 2:99 - 3:5; EX1018, 2; EX1001, 4:29-31; EX1013, 239. *See* a rendering of Thurler's ESD, as modified in view of Barlowatz ("Thurler's modified ESD_3"); a mapping of the same to limitation 1B of Claim 1; and a representation of radially serpentine fluid flow through Thurler's modified ESD_3 *infra*.



EX1013, Figure 7 (Thurler's modified ESD_3 with modifications in red)



***Id.*, Figure 8 (mapping to Thurler's modified ESD_3)**



Id., Figure 9 (radially serpentine fluid flow in Thurler's modified ESD_3)

c) Claim 9

- (1) [9A] “**The device of claim 1**, wherein **the multiple internal walls are formed to produce a radially serpentine fluid pathway.**”

Thurler's ESD, alone or in view of Barlowatz, discloses or renders obvious all limitations recited in Claims 1 and 9. *See* III.C.1.a), III.C.1.a)(3), III.C.2.b), III.C.4.b) *supra*.

d) Claim 12

- (1) [12A] “**The device of claim 11**, wherein **the annular spaces further include a helical wall oriented within at least one of the annular spaces to direct fluids along a helical path within the at least one annular space.**”

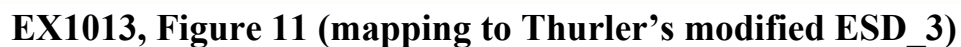
Thurler's ESD, alone or in view of Barlowatz, discloses or renders obvious all limitations recited in Claims 1, 10, and 11. *See* III.C.1.a), III.C.2.b), III.C.4.b), III.C.2.e), III.C.2.f) *supra*.

Thurler's ESD, in view of Barlowatz, further renders obvious all limitations recited in Claim 12. *See* Thurler's modified ESD_3 (annotated *infra*); EX1013, X.A.4.d).



(1) [13A] “**The device of claim 12**, wherein the helical wall has a quadrilateral cross-section or **a circular cross-section.**”

Thurler's ESD, in view of Barlowatz, further renders obvious all limitations recited in Claim 13. *See* Thurler's modified ESD_3 (annotated *infra*, having helical walls that travel around Thurler's tube *g* have a circular cross-section); EX1013, X.A.4.e).

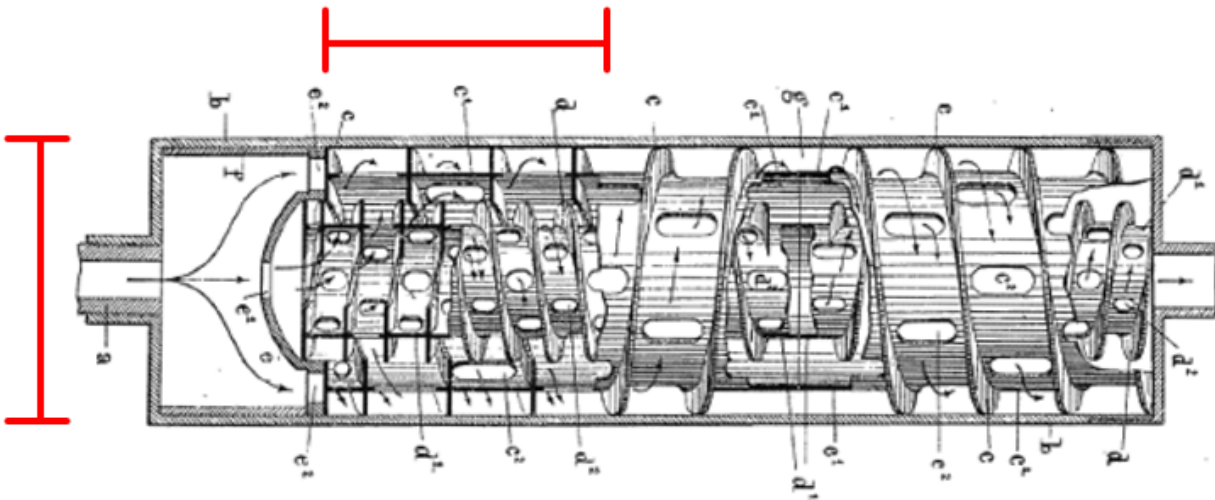


f) Claim 14

(1) [14A] “The device of claim 12, wherein the helical wall has a winding ratio (windings:diameter) of about 3:1 to about 8:1.”

Thurler's ESD, alone or in view of Barlowatz, discloses or renders obvious all limitations recited in Claims 1, 10, 11, and 12. *See* III.C.1.a), III.C.2.b), III.C.4.b), III.C.2.e), III.C.4.d) *supra*.

Thurler's ESD, in view of Barlowatz, further renders obvious all limitations recited in Claim 14. *See* EX1018, FIG. 1 (annotated *infra*, in which the helical walls have around four turns within a width of Barlowatz's ESD, *i.e.*, around a 4:1 windings:diameter ratio); EX1013, X.A.4.f).



EX1018, FIG. 1 (Petitioner-annotated)

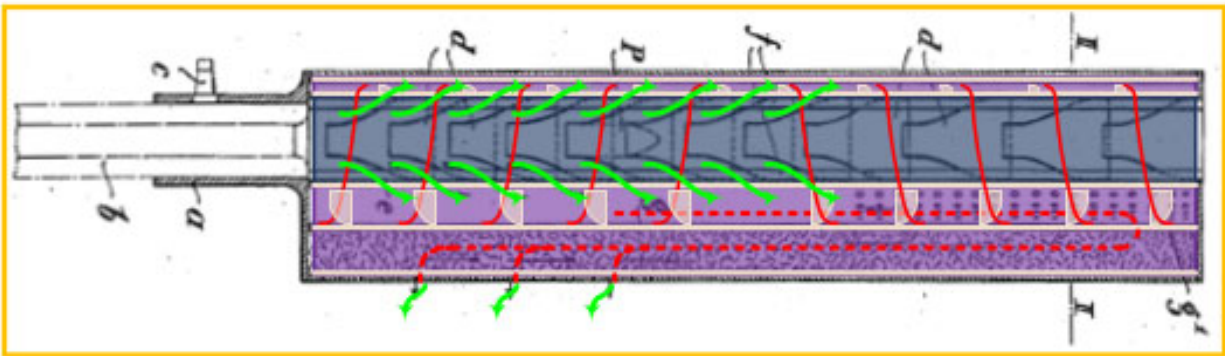
g) Claim 20

(1) [20A] “**The device of claim 19, wherein the common off axis chamber further comprises at least one helical wall defining the axially serpentine fluid pathway, the at least one helical wall being configured to produce an axially serpentine fluid pathway which helically spirals around the central**

chamber and which dissipates energy transferred from the high energy material."

Thurler's ESD, alone or in view of Barlowatz, discloses or renders obvious all limitations recited in Claim 19. *See* III.C.1.j), III.C.2.b), III.C.4.b) *supra*.

Thurler's ESD, in view of Barlowatz, further renders obvious all limitations recited in Claim 20. *See* Thurler's modified ESD_3 (annotated *infra*); EX1013, X.A.4.g).



EX1013, Figure 12 (mapping to Thurler's modified ESD_3)

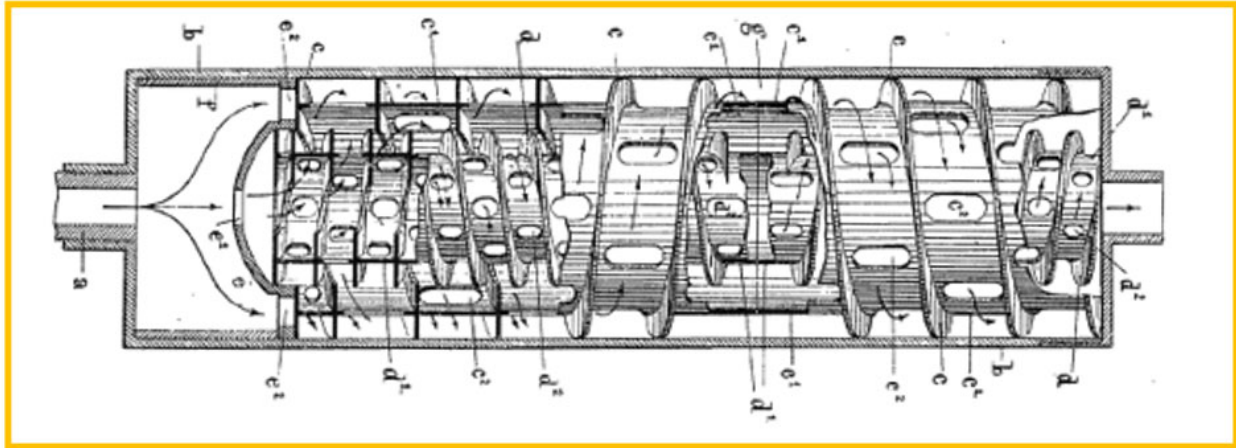
5. GROUND 5: Claims 1, 9, 19, and 20 are anticipated by Barlowatz.

Barlowatz discloses all limitations of Claims 1, 9, 19, and 20.

a) Claim 1 (Independent)

(1) [1Pre] **"An energy capture and control device, comprising:"**

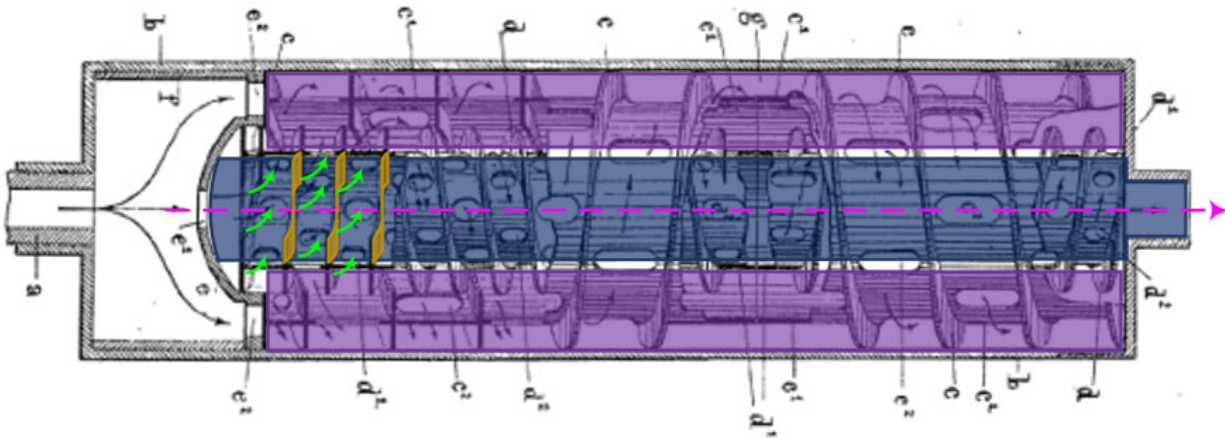
Barlowatz's FIG. 1 illustrates an ESD ("Barlowatz's ESD") that discloses this limitation. *See* EX1018, 1 (Barlowatz is related to "silencer device[s], particularly applicable to firearms") & FIG. 1 (annotated *infra*); EX1013, X.A.5.a)(1).



EX1018, FIG. 1 (Petitioner-annotated)

(2) [1A] “a) a central chamber oriented along a central axis within an outer shell, said central chamber having an inlet configured to receive a high energy material from a high energy outlet;”

Barlowatz’s ESD discloses this limitation. See EX1018, FIG. 1 (annotated *infra*); EX1013, X.A.5.a)(2).

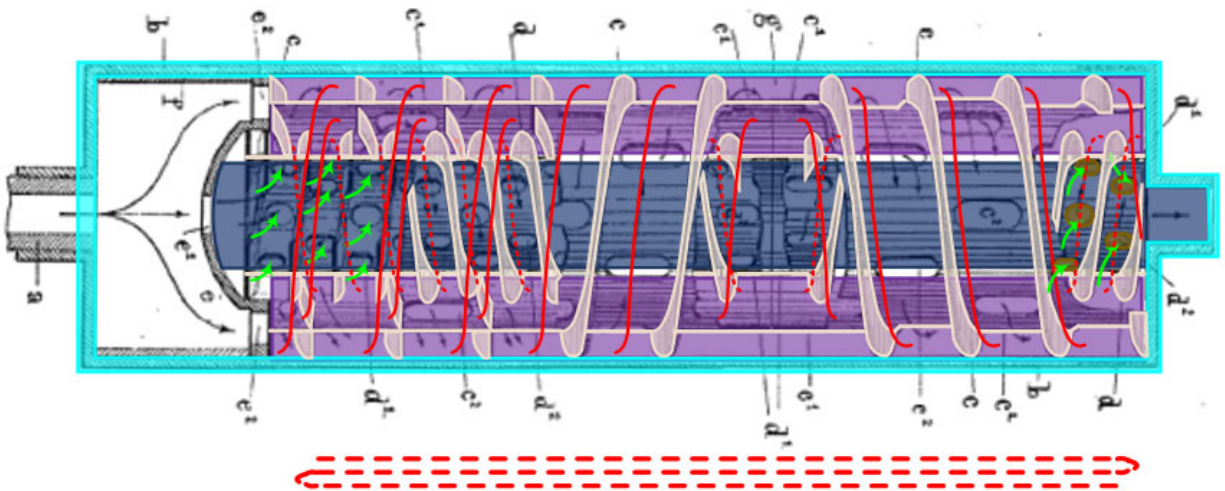


EX1018, FIG. 1 (Petitioner-annotated)

(3) [1B] “b) a common off axis chamber oriented within the outer shell in fluid communication with the central chamber and having a fluid outlet and multiple internal walls defining a serpentine fluid pathway which is at

least one of axially serpentine and radially serpentine and which dissipates energy transferred from the high energy material; and”

Barlowatz's ESD discloses this limitation.²⁷ See EX1018, FIG. 1 (annotated *infra*); EX1013, X.A.5.a)(3).



EX1018, FIG. 1 (Petitioner-annotated)

As noted in III.C.4.b), Barlowatz's coils *c* and *d* and strips *c1* and *d1* disclose three progressively larger helical ducts within Barlowatz's off-axis chamber that are oppositely wound.

Applying the OCM that a serpentine fluid pathway that causes “back and forth” fluid flow requires **multiple changes in direction** (See III.A.4.c) *supra*), the aspect of Barlowatz's fluid pathway that extends back and forth through the helical ducts in Barlowatz's off-axis chamber discloses “a serpentine fluid pathway which is . . . axially serpentine.” EX1013, 256. Specifically, the innermost helical duct in

²⁷ See fn. 23.

Barlowatz's off-axis chamber will cause gas that escapes from Barlowatz's central chamber to travel in a first (e.g., forward) direction on its path to perforations in the innermost helical duct before entering the intermediate helical duct, which will cause the gas to travel **back** in a second (e.g., backwards) direction on its path to perforations in the intermediate helical duct before entering the outermost helical duct, which will cause the gas to travel **forth** in the first direction on its path to perforations in the outermost helical duct. Id.

Additionally, the aspect of Barlowatz's fluid pathway that extends radially through the progressively larger helical ducts discloses "a serpentine fluid pathway which is . . . radially serpentine." EX1013, 257. Specifically, the innermost helical duct will cause gas to travel in a first (e.g., clockwise) direction before extending radially outward into the intermediate helical duct, which will cause the gas to travel **back** in a second (e.g., counterclockwise) direction before extending radially outward into the outermost helical duct, which will cause the gas to travel **forth** in the first direction. Id.

Should PO argue, as PO has in the related litigation, that a serpentine fluid pathway requires only **a single change of direction** (See EX1034, 4), then Barlowatz's ESD similarly discloses "a serpentine fluid pathway which is . . . axially serpentine and radially serpentine."

(4) [1C] “c) a plurality of deflectors oriented in series along the central axis of the central chamber and configured to deflect the energy from the high energy material to the common off axis chamber.”

At least the first two interior turns of Barlowatz's inner coil d , which, in operation, would deflect energy to the space between the inner coil d and the outer coil c , disclose this limitation. EX1013, 260.

67

b) Claim 9

(1) [9A] “**The device of claim 1**, wherein **the multiple internal walls are formed to produce a radially serpentine fluid pathway.**”

Barlowatz's ESD discloses all limitations recited in Claims 1 and 9.

See III.C.5.a), III.C.5.a)(3) *supra*.

c) Claim 19 (Independent)

(1) [19Pre]

Barlowatz's ESD discloses this limitation. See III.C.5.a)(1) *supra*.

(2) [19A]

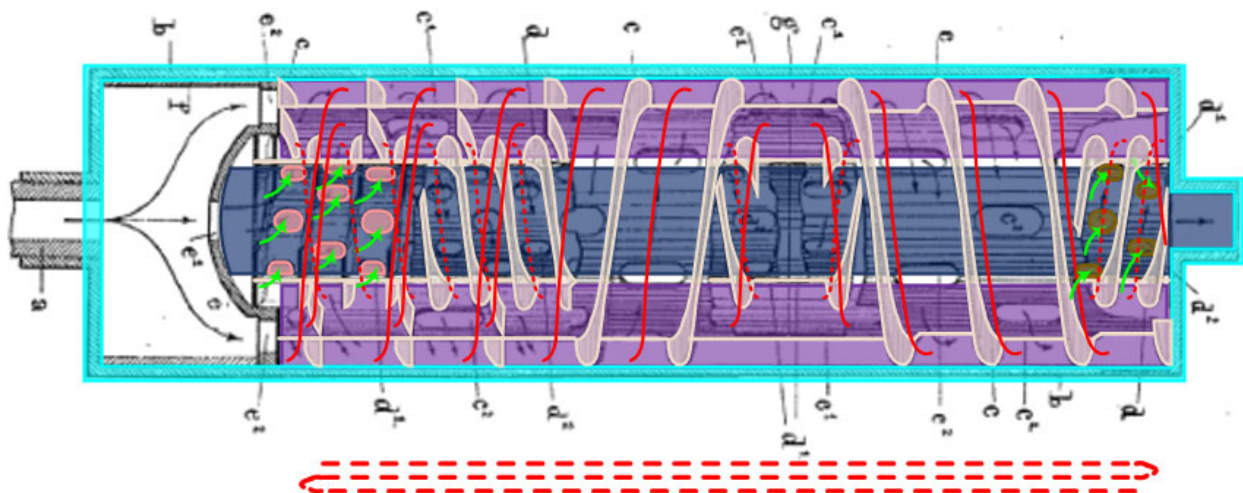
Barlowatz's ESD discloses this limitation. See III.C.5.a)(2) *supra*.

(3) [19B] “b) **a common off axis chamber oriented within the outer shell in fluid communication with the central chamber via a plurality of orifices and further includes a fluid outlet, the common off axis chamber comprising a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine;** and”

Barlowatz's ESD discloses this limitation. See III.C.5.a)(3) *supra*; EX1018,

Claim 1 (identifying “perforations” in Barlowatz's inner coil *d*) & FIG. 1

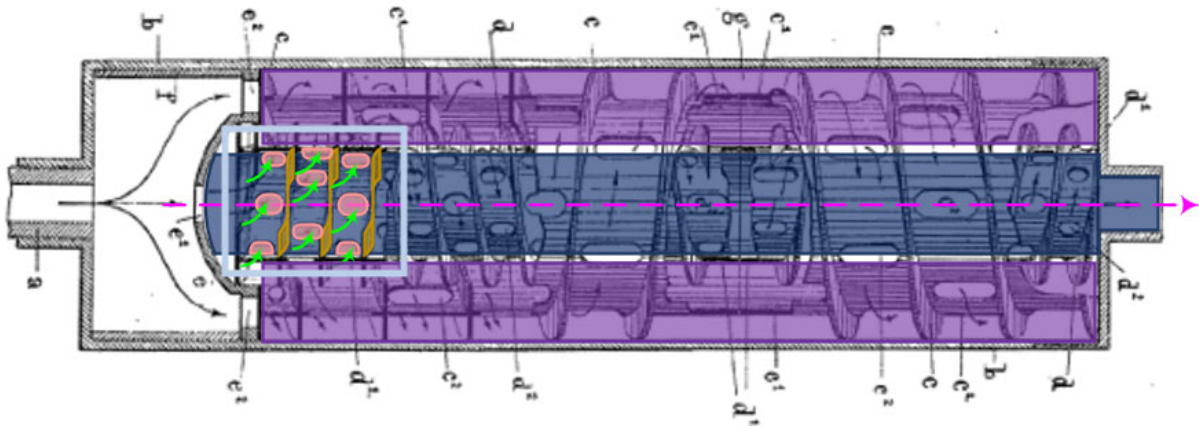
(annotated *infra*); EX1013, X.A.5.c)(3).



EX1018, FIG. 1 (Petitioner-annotated)

(4) [19C] “c) **a plurality of deflectors oriented in series along the central axis of the central chamber, wherein a position of multiple individual deflectors of the plurality of deflectors corresponds with the individual orifices of the plurality of orifices to the common off axis chamber.**”

Barlowatz's ESD discloses this limitation. See III.C.5.a)(4) *supra*; EX1018, 2 (identifying that “the perforations, holes or notches” in the strips *c1* and *d1* make “the two helical parts or ducts of each coil communicate with each other, as well as the inner coil *d* with the outer coil *c*”); & FIG. 1 (annotated *infra*); EX1013, X.A.5.c)(4).



EX1018, FIG. 1 (Petitioner-annotated)

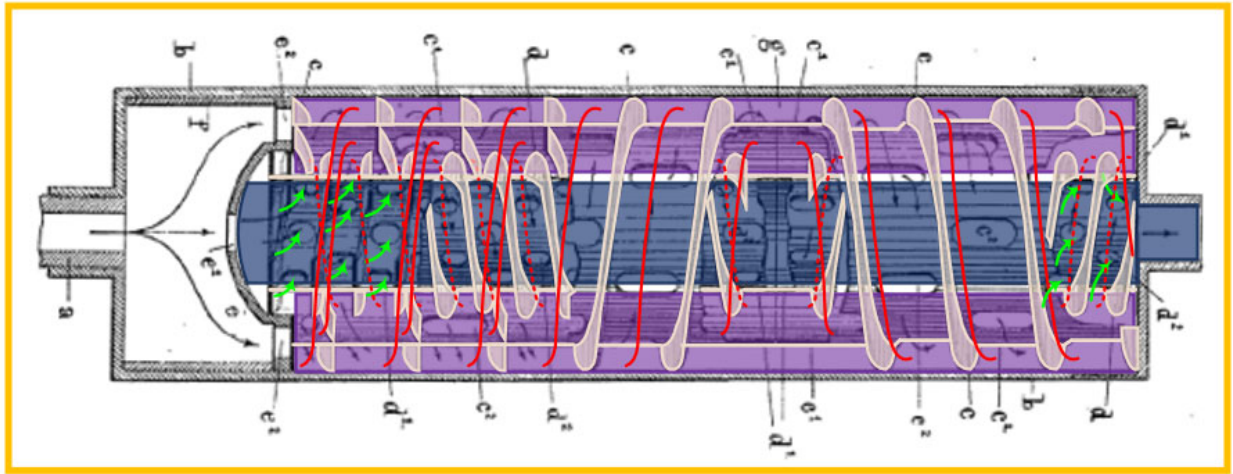
d) *Claim 20*

(1) [20A] “**The device of claim 19, wherein the common off axis chamber further comprises at least one helical wall defining the axially serpentine fluid pathway, the at least one helical wall being configured to produce an axially serpentine fluid pathway which helically spirals around the central chamber and which dissipates energy transferred from the high energy material.**”

Barlowatz's ESD discloses all limitations recited in Claim 19. See III.C.5.c) *supra*.

Barlowatz's ESD further discloses all limitations recited in Claim 20.

See EX1018, FIG. 1 (annotated *infra*); EX1013, X.A.5.d).




EX1018, FIG. 1 (Petitioner-annotated)

- 6. GROUND 6: Claims 1, 9, 19, and 20 are rendered obvious by Barlowatz.**
a) Claims 1, 9, 19, and 20

Barlowatz's ESD discloses all limitations recited in Claims 1, 9, 19, and 20.

See III.C.5 *supra*.

To the extent PO argues that Barlowatz fails to disclose any limitations of Claims 1, 9, 19, and 20, Barlowatz renders obvious any such limitations. For example, a POSITA would have been motivated, and it would have been obvious to a POSITA, to modify Barlowatz's ESD to include fewer or additional coils, perforations, or deflectors (e.g., by increasing or decreasing the winding of the coils), and the like. See III.C.2 *supra*; EX1013, X.A.6.a).

7. GROUND 7: Claim 2 is rendered obvious by Barlowatz in view of Reeves.

a) Claim 2

(1) [2A] “The device of claim 1, wherein the common off axis chamber comprises a plurality of sub-chambers defined by the plurality of deflectors, each with the radially serpentine fluid pathway, and wherein the radially serpentine fluid pathways of each of the deflectors are axially non-linearly interconnected along an outermost portion of the plurality of sub-chambers.”

Barlowatz's ESD discloses or renders obvious all limitations recited in

Claim 1. *See* III.C.5.a), III.C.6.a) *supra*.

As noted in III.C.5.a) *supra*, Barlowatz discloses “a serpentine fluid pathway which is . . . radially serpentine.” As noted in III.C.4.b) *supra*, Barlowatz further discloses that the coils are oppositely wound at a midpoint to force the gases to change direction.

Reeves discloses a series of compartments that each include encapsulated shells forming “radially serpentine fluid pathways,” where the encapsulated are connected by an outermost opening 4. EX1019, 2:40-53 & FIG. 1. Reeves also discloses that it would be obvious to perforate the partitions at opposite ends to increase the path length. EX1019, 2:85-93

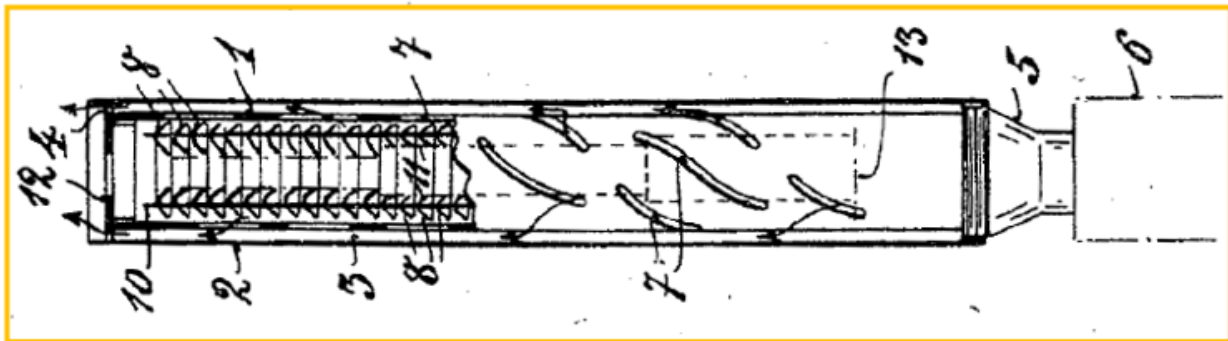
Thus, it would have been obvious to a POSITA to modify Barlowatz's ESD to be partitioned into three chambers that are connected along alternating outermost points, thereby disclosing the above limitation. *See* EX1013, X.A.7.a).

8. GROUND 8: Claims 1, 3-5, 8, 9, 18, and 19 are rendered obvious by Eichenseher in view of Barlowatz.

a) Claim 1 (Independent)

(1) [1Pre] “**An energy capture and control device, comprising:**”

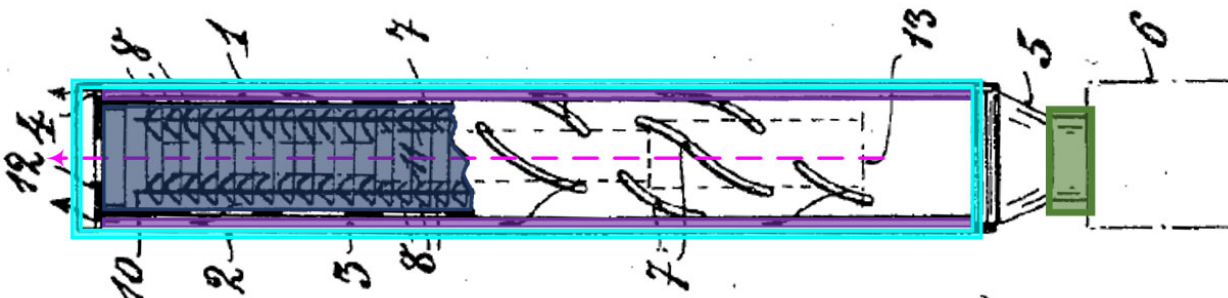
The device illustrated in Eichenseher's FIG. 1 (“Eichenseher's ESD”) discloses this limitation. See EX1021, 1 (Eichenseher is related to “silencers for firearms”) & FIG. 1 (annotated *infra*); EX1013, X.A.8.a)(1).



EX1021, FIG. 1 (Petitioner-annotated)

(2) [1A] “a) **a central chamber oriented along a central axis within an outer shell, said central chamber having an inlet configured to receive a high energy material from a high energy outlet;**”

Eichenseher's ESD discloses this limitation. See EX1021, 1 & FIG. 1 (annotated *infra*); EX1013, X.A.8.a)(2).



EX1021, FIG. 1 (Petitioner-annotated)

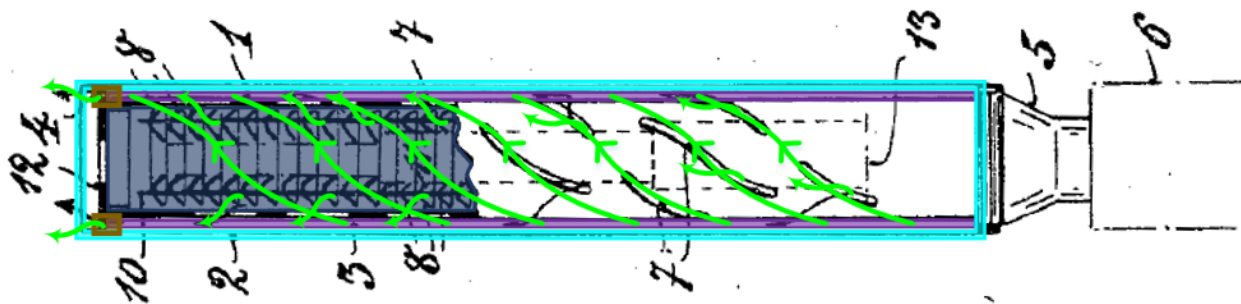
(3) [1B] “b) a common off axis chamber oriented within the outer shell in fluid communication with the central chamber and having a fluid outlet and multiple internal walls defining a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine and which dissipates energy transferred from the high energy material; and”

Eichenseher's ESD, in view of Barlowatz, discloses this limitation.²⁹

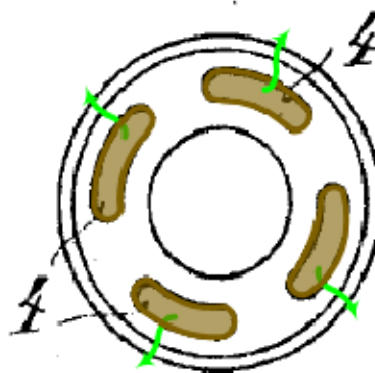
See EX1013, X.A.8.a)(3).

Eichenseher's ESD has two concentric tubes, with the inner cylinder 1 forming a central chamber and the outer cylinder 2 forming an off-axis chamber.

See EX1021, 1 & FIG. 1 (annotated *infra*); EX1013, X.A.8.a)(3).



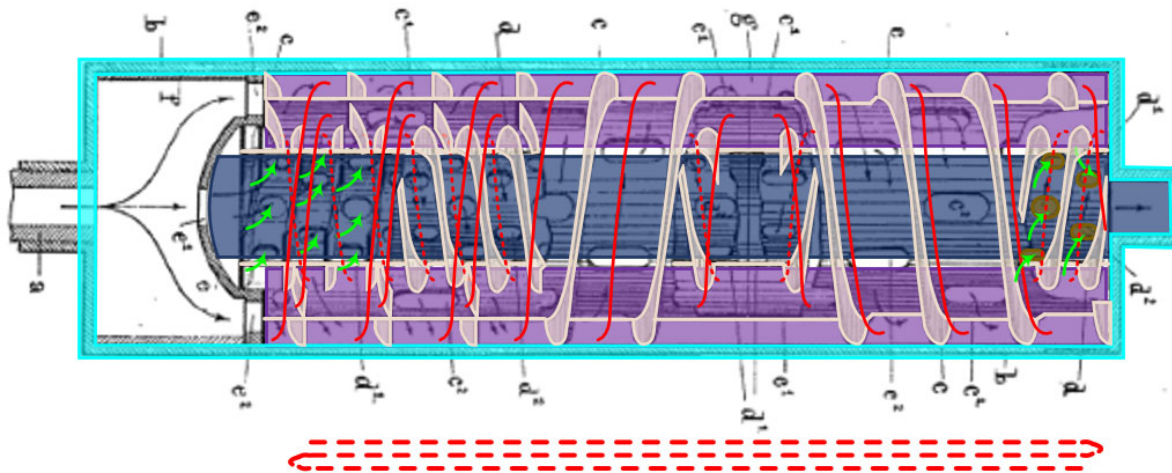
EX1021, FIG. 1 (Petitioner-annotated)



EX1021, FIG. 2 (Petitioner-annotated)

²⁹ See fn. 23.

Barlowatz's ESD has concentric coils, with Barlowatz's inner coil *d* forming a central chamber and an exterior of Barlowatz's inner coil *d* and an interior of Barlowatz's sleeve *b* forming an off-axis chamber. EX1013, 278. Barlowatz's inner coil *d* and Barlowatz's outer coil *d* form helical ducts which change directions at a midway point to force the gas to change directions, to further reduce the speed of the gas. See EX1018, 2 & FIG. 1 (annotated *infra*); EX1013, 278.

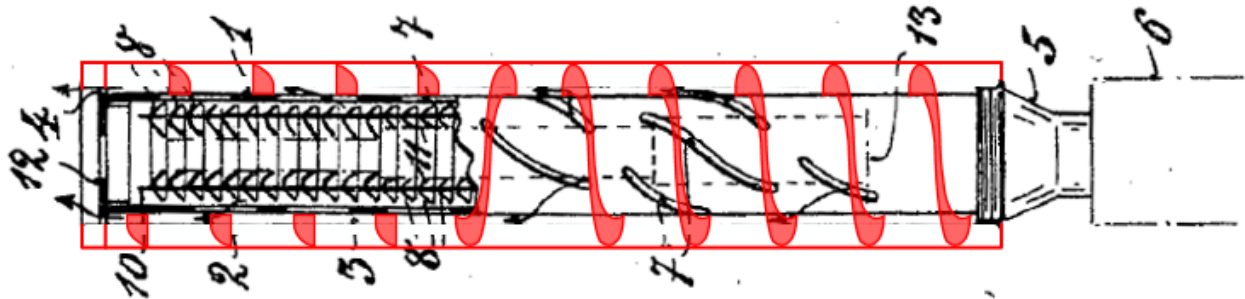


EX1018, FIG. 1 (Petitioner-annotated)

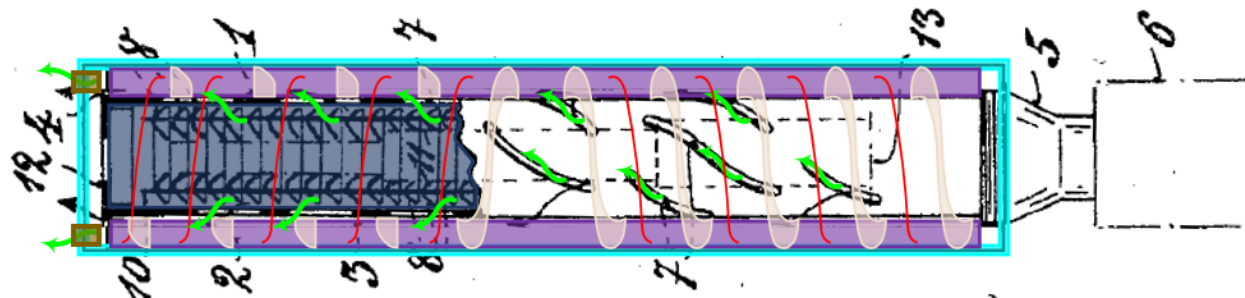
Thus, in view of Barlowatz, it would have been obvious to a POSITA to modify Eichenseher's ESD to include an outer coil (e.g., Barlowatz's outer coil *c*) in Eichenseher's cavity 3 that forms a first helical channel extending around the inner cylinder 1 in a first direction³⁰ (e.g., clockwise) and a second helical channel

³⁰ See also EX1009, FIG. 1; EX1022, 1; EX1023, 14; EX1024, FIG. 1; EX1025, FIG. 1; EX1026, FIGs. 1, 4, 5; and EX1027, FIGs. 1, 10, 14 (each having a helical channel extending around an inner chamber). EX1013, fn. 17.

extending around the inner cylinder 1 in an opposing direction³¹ (e.g., counterclockwise). See EX1013, 279. For example, to improve noise suppression by increasing a path length for the deflected energy and further slowing the speed of the deflected energy. See EX1016, 2:99 - 3:5, EX1018, 2; EX1001, 4:29-31; EX1013, 279. See a rendering of Eichenseher's ESD, as modified in view of Barlowatz ("Eichenseher's modified ESD"), and a mapping of the same to the above limitation *infra*.



EX1013, 118, Figure 13 (Eichenseher's modified ESD with modifications in red)



***Id.*, 119, Figure 14 (mapping to Eichenseher's modified ESD)**

³¹ See also EX1023, 14; EX1024, FIG. 1; 2:35-52; EX1025, FIG. 1; and EX1027, FIG. 14; 11:31-47, (each having a first helical channel extending in a first direction and a serial second helical channel extending in an opposing direction around the inner chamber.) EX1013, fn. 18.

Also, should PO argue, as PO has in the related litigation, that “a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine” can be axially serpentine *or* radially serpentine (*see* EX1033, 3, 4, 6), Eichenseher, in view of Barlowatz, renders obvious this limitation by rendering obvious a radially serpentine pathway.

Eichenseher's ESD discloses this limitation.³² See EX1021, 1 & FIG. 1

A technical drawing of a syringe, labeled as Figure 1. The syringe consists of a main barrel (1) and a plunger (2). The barrel has a series of internal vanes (3) that move back and forth as the plunger is pushed or pulled. The plunger is shown in two positions, with green arrows indicating its movement. The barrel is connected to a needle (4) at the front. The needle is shown in two positions, with green arrows indicating its movement. The syringe is labeled with numbers 1 through 13, corresponding to the parts listed in the legend.

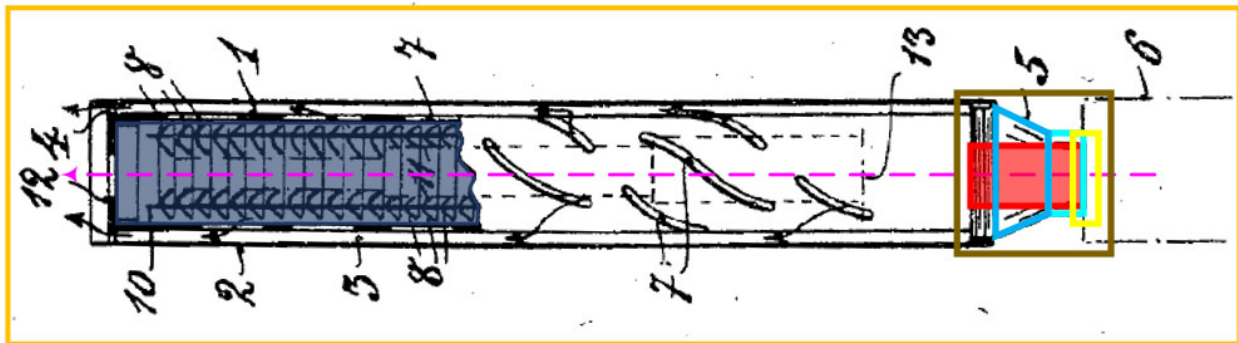
b) Claim 3

³² See fn. 24.

an engagement surface configured to attach to the high energy outlet and a hollow interior along the central axis, said hollow interior having a reducing throat portion and a flared outlet.”

Eichenseher's modified ESD discloses or renders obvious all limitations recited in Claim 1. *See* III.C.8.a) *supra*.

Eichenseher's ESD further discloses all limitations recited in Claim 3. *See* EX1021, 1 (“double-walled hollow body 1 and 2 is screwed onto rifle barrel 6 by means of a mouthpiece 5”) & FIG. 1 *infra*; EX1013, X.A.8.b).



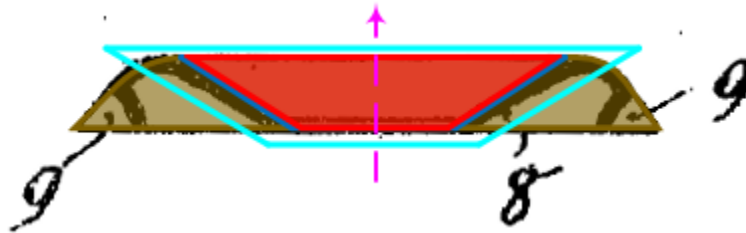
EX1021, FIG. 1 (Petitioner-annotated)

c) Claim 4

(1) [4A] “The device of claim 1, wherein **the plurality of deflectors each comprise a frustoconical shape having a hollow interior along the central axis and a flared exit portion.**”

Eichenseher's modified ESD discloses or renders obvious all limitations recited in Claim 1. *See* III.C.8.a) *supra*.

Eichenseher's ESD further discloses all limitations recited in Claim 4. *See* EX1021, FIG. 4 (annotated *infra*); EX1013, X.A.8.c).



EX1021, FIG. 4 (Petitioner-annotated)

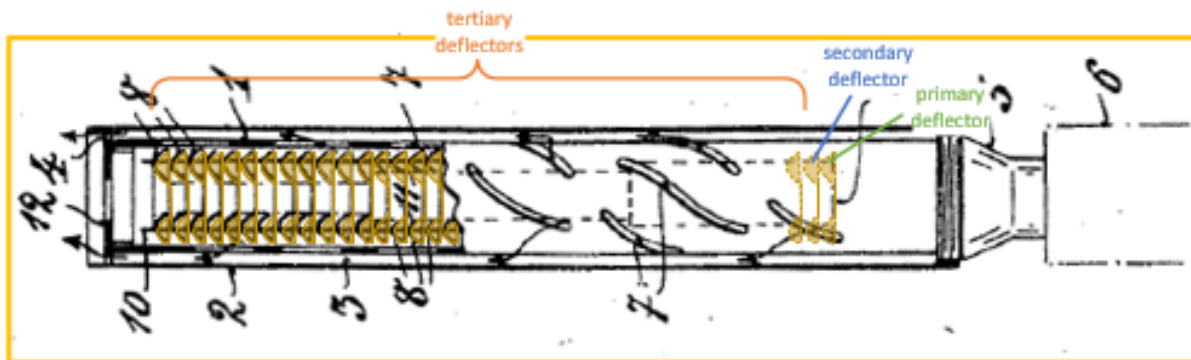
d) Claim 5

(1) [5A] “**The device of claim 4**, wherein **the plurality of deflectors include a primary deflector, a secondary deflector, and at least one tertiary deflector.**”

Eichenseher's modified ESD discloses or renders obvious all limitations recited in Claims 1 and 4. *See* III.C.8.a), III.C.8.c) *supra*.

Eichenseher's ESD further discloses all limitations recited in Claim 5.

See EX1021, 2 & FIG. 1 (annotated *infra*); EX1013, X.A.8.d).



EX1021, FIG. 1 (Petitioner-annotated)

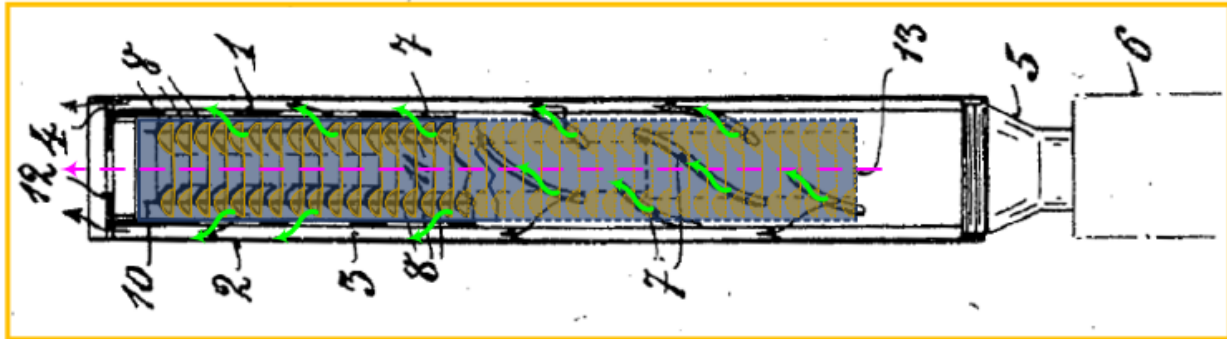
e) Claim 8

(1) [8A] “**The device of claim 4**, wherein **the plurality of deflectors span substantially the entire central axis along the central chamber.**”

Eichenseher's modified ESD discloses or renders obvious all limitations recited in Claims 1 and 4. *See* III.C.8.a), III.C.8.c) *supra*.

Eichenseher's ESD further discloses all limitations recited in Claim 8.

See EX1021, 2 & FIG. 1 (annotated *infra*); EX1013, X.A.8.e).



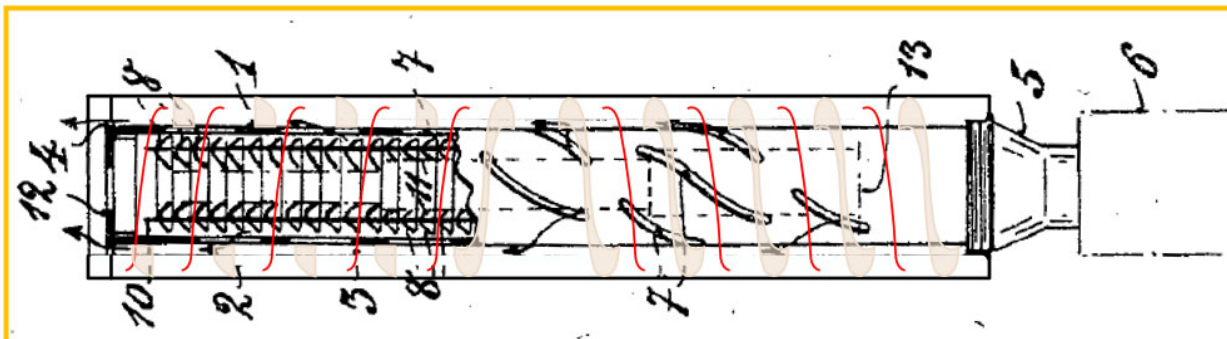
EX1021, FIG. 1 (Petitioner-annotated)

f) Claim 9

(1) [9A] “**The device of claim 1**, wherein **the multiple internal walls are formed to produce a radially serpentine fluid pathway.**”

Eichenseher's modified ESD discloses or renders obvious all limitations recited in Claim 1. See III.C.8.a) *supra*.

Eichenseher's modified ESD further discloses or renders obvious all limitations recited in Claim 9. See Eichenseher's modified ESD (annotated *infra*); EX1013, X.A.8.f).



EX1013, 123, Figure 15 (mapping to Eichenseher's modified ESD)

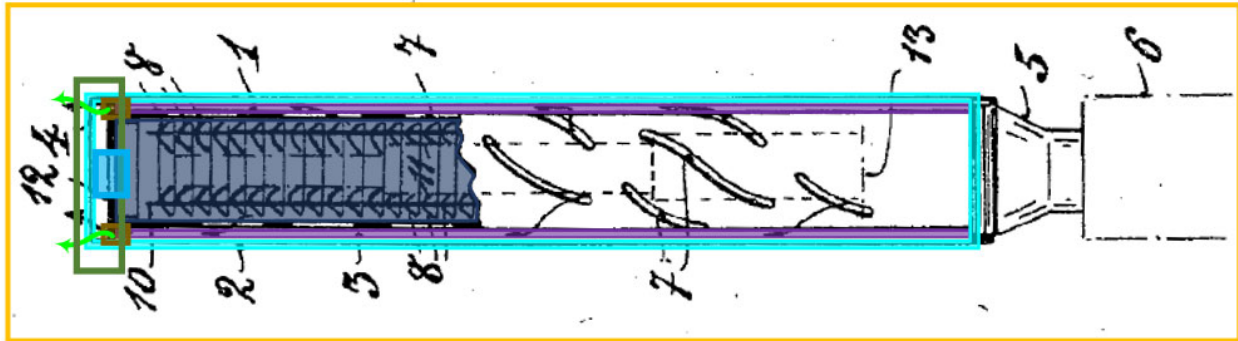
g) Claim 18

(1) [18A] “**The device of claim 1**, wherein **the outer shell includes an end cap assembly at an outlet end of the central chamber** and which allows **fluid to escape from the common off axis chamber through the fluid outlet**, **the fluid outlet being only accessible to the fluid in the common off axis chamber**.”

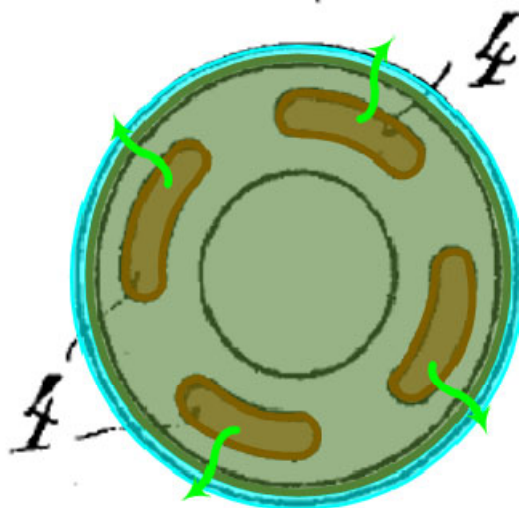
Eichenseher's modified ESD discloses or renders obvious all limitations recited in Claim 1. *See* III.C.8.a) *supra*.

Eichenseher's ESD further discloses all limitations recited in Claim 18.

See EX1021; FIGs. 1, 2 (annotated *infra*); EX1013, X.A.8.g).



EX1021, FIG. 1 (Petitioner-annotated)



EX1021, FIG. 2 (Petitioner-annotated)

h) Claim 19 (Independent)

(1) [19Pre]

Eichenseher's ESD discloses this limitation. *See* III.C.8.a)(1) *supra*.

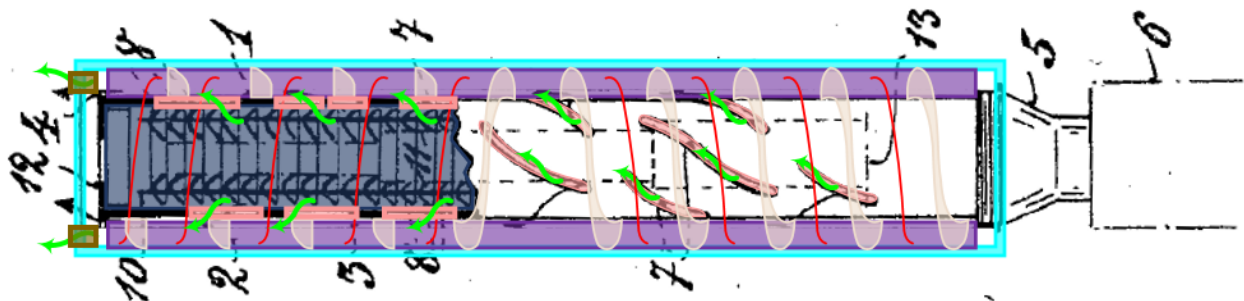
(2) [19A]

Eichenseher's ESD discloses this limitation. *See* III.C.8.a)(2) *supra*.

(3) [19B] “b) a common off axis chamber oriented within the outer shell in fluid communication with the central chamber via a plurality of orifices and further includes a fluid outlet, the common off axis chamber comprising a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine; and”

Eichenseher's modified ESD discloses or renders obvious this limitation.

See III.C.8.a)(3) *supra*; EX1021, 1 (identifying “slots” in Eichenseher's inner cylinder 1); Eichenseher's modified ESD (annotated *infra*); EX1013, X.A.8.h)(3).

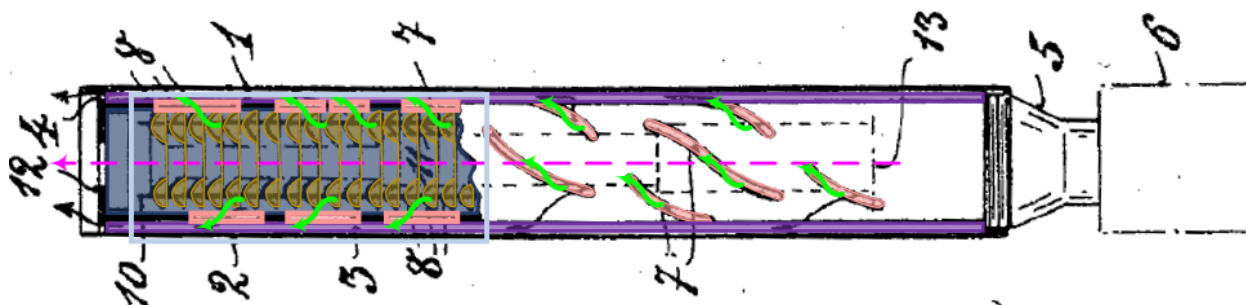


EX1013, 125, Figure 16 (mapping to Eichenseher's modified ESD)

(4) [19C] “c) a plurality of deflectors oriented in series along the central axis of the central chamber, wherein a position of multiple individual deflectors of the plurality of deflectors corresponds with the individual orifices of the plurality of orifices to the common off axis chamber.”

Eichenseher's ESD discloses this limitation. *See* III.C.8.a)(4) *supra*;

EX1021, 1 (identifying “silencers 8” aligned with “slots 4”) & FIG. 1 (annotated *infra*); EX1013, X.A.8.h)(4).



IV. DISCRETIONARY DENIAL IS INAPPROPRIATE

Institution of IPR requested in this Petition should not be discretionarily denied under *Fintiv* or 35 U.S.C. 325(d).

A. *Fintiv*

Discretionary denial under *Fintiv* is inappropriate at least because this Petition “presents compelling evidence of unpatentability.” See Interim Procedure, 2.³³

Discretionary denial under *Fintiv* is further inappropriate at least because Petitioner stipulates that, should institution be granted, Petitioner will not “pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” See *id.*, 3.

B. 35 U.S.C. 325(d)

Discretionary denial under 35 U.S.C. 325(d) is inappropriate because, under *Advanced Bionics* (part 1) and *Becton* factors (a), (b), and (c), Thurler, Barlowatz,

³³ Issued on June 21, 2022 and accessible at:
https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf

Eichenseher, Reeves,³⁴ or Bouton³⁵ are not the same as, nor cumulative of, any prior art reference substantively³⁶ applied during prosecution. Advanced Bionics, LLC v. MedEl Elektromedizinische Geräte GMBH, IPR2019-01469, Paper 6 (P.T.A.B. Feb. 13, 2020); Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 (P.T.A.B. Dec. 15, 2017). The individual prior art references and combinations in this Petition are materially different and not cumulative of the prior art references applied during prosecution³⁷ because, for example, they disclose or render obvious every limitation of the challenged claims. See EX1013, XI.

Additionally, under *Advanced Bionics* (part 1) and *Becton* factor (d), the grounds in this Petition are materially different and not cumulative of the arguments made during examination because, for example, they apply materially different references that were neither considered nor applied by the Examiner.

Accordingly, institution of IPR requested in this Petition should not be discretionarily denied under 35 U.S.C. 325(d).

³⁴ None of the foregoing references were disclosed to, or otherwise considered by, the Examiner.

³⁵ Though disclosed among 64 prior art references in PO's initial IDS on May 25, 2011 (EX1004, 137-139), Bouton was not applied by the Examiner.

³⁶ See Amgen Inc. v. Alexion Pharm., Inc., IPR2019-00739, Paper 15 at 62 (P.T.A.B. Aug. 30, 2019).

³⁷ EX1005-EX1012.

V. CONCLUSION

Petitioner respectfully requests IPR and cancellation of Claims 1-22 of the '750-Patent.

SIGNATURE PAGE

Respectfully submitted:

By: /Steven Avena/
 Steven A. Avena

On: August 1, 2024

For: Petitioner

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A. APPENDIX: EXHIBITS LISTING

Exhibit No.	Description
1001	US Pat. No. 8,286,750 to Oliver
1002	US Prov. App. No. 61/303,553 for U.S. Pat. No. 8,286,750
1003	US Prov. App. No. 61/418,285 for U.S. Pat. No. 8,286,750
1004	US Pat. No. 8,286,750 Prosecution History
1005	US Pat. No. 7,987,944 to Brittingham
1006	US Pat. No. 6,425,310 to Champion
1007	US Pat. No. 7,207,258 to Scanlon
1008	US Pat. No. 5,952,625 to Huff
1009	US Pat. No. 5,029,512 to Latka
1010	US Pat. No. 6,796,214 to Hausken
1011	US Pat. No. 5,078,043 to Stephens
1012	US Pat. No. 1,341,363 to Fiala
1013	Declaration of Mr. Nixon
1014	Curriculum Vitae of Mr. Nixon
1015	US Pat. No. 1,000,702 to Thurler
1016	US Pat. No. 748,157 to Bouton
1017	FR Pat. No. 493,462 to Barlowatz
1018	FR Pat. No. 493,462 to Barlowatz (Certified Translation)
1019	US Pat. No. 582,485 to Reeves
1020	DE Pat. No. 305,012 to Eichenseher
1021	DE Pat. No. 305,012 to Eichenseher (Certified Translation)
1022	Sound Suppressor for the MP40
1023	A MAC History Lesson
1024	US Pat. No. 3,500,955 to Werbell
1025	US Pat. No. 1,797,310 to Wright
1026	US Pat. No. 3,913,703 to Parker
1027	US Pat. No. 5,659,158 to Browning
1028	US Pat. No. 5,136,923 to Walsh
1029	US Pat. No. 8,096,222 to Silvers
1030	US Pat. No. 9,347,727 to Cler
1031	Compact Thermoelectric Converter by NASA
1032	Complaint in <i>HuxWrx Safety Co. LLC v. SilencerCo, LLC</i>
1033	Exhibit C of Complaint in <i>HuxWrx Safety Co. LLC v. SilencerCo, LLC</i>

1034	HuxWrx Initial Infringement Contentions in <i>HuxWrx Safety Co. LLC v. SilencerCo, LLC</i>
1035	Amended Complaint in <i>O.S.S. Holdings, LLC v. Thermal Defense Solutions, LLC</i>

B. APPENDIX: CLAIMS LISTING

1. An energy capture and control device, comprising:
 - a) a central chamber oriented along a central axis within an outer shell, said central chamber having an inlet configured to receive a high energy material from a high energy outlet;
 - b) a common off axis chamber oriented within the outer shell in fluid communication with the central chamber and having a fluid outlet and multiple internal walls defining a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine and which dissipates energy transferred from the high energy material; and
 - c) a plurality of deflectors oriented in series along the central axis of the central chamber and configured to deflect the energy from the high energy material to the common off axis chamber.
2. The device of claim 1, wherein the common off axis chamber comprises a plurality of sub-chambers defined by the plurality of deflectors, each with the radially serpentine fluid pathway, and wherein the radially serpentine fluid pathways of each of the deflectors are axially non-linearly interconnected along an outermost portion of the plurality of sub-chambers.
3. The device of claim 1, wherein the central chamber further comprises a locking block oriented at the inlet, said locking block having an engagement surface configured to attach to the high energy outlet and a hollow

interior along the central axis, said hollow interior having a reducing throat portion and a flared outlet.

4. The device of claim 1, wherein the plurality of deflectors each comprise a frustoconical shape having a hollow interior along the central axis and a flared exit portion.

5. The device of claim 4, wherein the plurality of deflectors include a primary deflector, a secondary deflector, and at least one tertiary deflector.

6. The device of claim 5, wherein the fluid communication between the common off axis chamber and the central chamber occurs only at the primary deflector, the secondary deflector and a first tertiary deflector.

7. The device of claim 5, wherein at least one tertiary deflector is at least partially engaged within the flared exit portion of an adjacent deflector.

8. The device of claim 4, wherein the plurality of deflectors span substantially the entire central axis along the central chamber.

9. The device of claim 1, wherein the multiple internal walls are formed to produce a radially serpentine fluid pathway.

10. The device of claim 1, wherein the multiple internal walls are formed by multiple concentric tubes having progressively larger diameters so as to form annular spaces between each adjacent tube, and having alternating ends offset so as to produce the axially serpentine fluid annular pathway.

11. The device of claim 10, wherein the multiple concentric tubes include an innermost tube which includes orifices oriented to allow fluid to pass

from the central chamber into a first annular space adjacent the innermost tube and through the annular spaces of progressively larger diameter.

12. The device of claim 11, wherein the annular spaces further include a helical wall oriented within at least one of the annular spaces to direct fluids along a helical path within the at least one annular space.

13. The device of claim 12, wherein the helical wall has a quadrilateral cross-section or a circular cross-section.

14. The device of claim 12, wherein the helical wall has a winding ratio (windings:diameter) of about 3:1 to about 8:1.

15. The device of claim 1, wherein the common off axis chamber further includes an annular dampening chamber oriented about the central chamber and being filled with an energy absorbent material.

16. The device of claim 15, wherein the dampening chamber is oriented adjacent the outer shell.

17. The device of claim 15, wherein the energy absorbent material is selected from the group consisting of powder tungsten filament, heavy metal powder, graphite, polymer, aluminum, stainless steel, carbon steels, iron, copper, tantalum, titanium, vanadium, chromium, zirconium, carbides of these, alloys of these, and combinations thereof.

18. The device of claim 1, wherein the outer shell includes an end cap assembly at an outlet end of the central chamber and which allows fluid to

escape from the common off axis chamber through the fluid outlet, the fluid outlet being only accessible to the fluid in the common off axis chamber.

19. An energy capture and control device, comprising:

a) a central chamber oriented along a central axis within an outer shell, said central chamber having an inlet configured to receive a high energy material from a high energy outlet;

b) a common off axis chamber oriented within the outer shell in fluid communication with the central chamber via a plurality of orifices and further includes a fluid outlet, the common off axis chamber comprising a serpentine fluid pathway which is at least one of axially serpentine and radially serpentine; and

c) a plurality of deflectors oriented in series along the central axis of the central chamber, wherein a position of multiple individual deflectors of the plurality of deflectors corresponds with the individual orifices of the plurality of orifices to the common off axis chamber.

20. The device of claim 19, wherein the common off axis chamber further comprises at least one helical wall defining the axially serpentine fluid pathway, the at least one helical wall being configured to produce an axially serpentine fluid pathway which helically spirals around the central chamber and which dissipates energy transferred from the high energy material.

21. The device of claim 19, further comprising multiple internal walls defining the axially serpentine fluid pathway, the multiple internal walls being formed by multiple concentric tubes having progressively larger diameters

so as to form annular spaces between each adjacent tube, and having alternating ends offset so as to produce a serpentine fluid annular pathway.

22. A method for energy capture and control from a high energy device, comprising:

a) discharging a high energy material from the high energy device through an energy capture and control device comprising a central chamber oriented along a central axis within an outer shell, said central chamber having an inlet configured to receive a high energy material from a high energy outlet, and a common off axis chamber oriented within the outer shell in fluid communication with the central chamber, the common off axis chamber comprising an axially serpentine fluid pathway and a fluid outlet; and

b) capturing energy within the common off axis chamber via a plurality of orifices from the central chamber using the axially serpentine fluid pathway, the energy being associated with discharge of the high energy material from the high energy discharge device.

CERTIFICATE OF COMPLIANCE

Under 37 CFRs 42.24(d) and 104, the undersigned certifies that this Petition complies with the type-volume limitation of 37 CFR 42.24(a)(1)(i) of 14,000 words as the word count application of the word processing program used to prepare this Petition indicates that this Petition¹ contains 13,939 words.

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¹ Excluding the cover page, signature page, and portions exempted under 37 CFR 42.24(a), which include a table of contents, a table of authorities, mandatory notices, a certificate of service or word count, and appendix of exhibits or claim listing.

CERTIFICATE OF SERVICE

Under 37 CFRs 42.6, 104, and 105, the undersigned certifies that a copy of this Petition and all associated exhibits have been electronically¹ served, as of the date noted below on the following parties:

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¹ Pursuant to 37 CFR 42.105, the parties have agreed to electronic service.