

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

**PETITIONER'S OPPOSITION TO
PATENT OWNER'S MOTION TO AMEND**

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I. INTRODUCTION¹

Recognizing the deficiencies in the challenged claims² of the '750-Patent, Patent Owner HuxWrx Safety Co. LLC ("PO") seeks to amend those claims by adding limitations in a futile attempt to distance them from the asserted prior art. Specifically, PO seeks to amend the claims by adding the requirements that: (1) the "energy capture and control device" be "for use with a weapon"; (2) the outer shell be "oriented along the central axis," which is the same central axis along which the central chamber is oriented; (3) the "high energy material" comprise a "projectile and gases" and "high energy material" be received from a high energy outlet "of the weapon"; and (4) "the fluid outlet is located at an opposite end of the energy capture and control device as the inlet."

As detailed below, these amendments do not save the challenged claims because the claims, even with these amendments, are still directed to decades-old teachings that have long been in the public domain. Each of PO's proposed amendments are disclosed and rendered obvious by the prior art. As such, PO's Motion to Amend should be denied.

¹ Accompanying exhibits listed in Appendix A.

² PO's Motion to Amend ("MTA") is contingent as to Claims 2, 3, 6, 9, 12-14, and 20, and non-contingent as to Claims 1, 4, 5, 7, 8, 10, 11, 15-17, 19, 21, and 22. PO does not seek to amend Claim 18.

II. LEGAL STANDARD

A motion to amend must: (1) propose a reasonable number of substitute claims (37 C.F.R. § 37.121(a)(3)); (2) propose substitute claims that do not enlarge the scope of the claims or introduce new subject matter (37 C.F.R. § 37.121(a)(2)(ii)); (3) respond to a ground of unpatentability involved in the trial (37 C.F.R. § 37.121(a)(2)(i)); and (4) set forth written description support for each substitute claim (37 C.F.R. § 42.121(b)(1)). Although a Petitioner has the burden of persuasion to show that any proposed substitute claims are unpatentable by a preponderance of the evidence, the Board may, *sua sponte*, question the patentability of the proposed substitute claims in view of the prior art of record. *See Hunting Titan, Inc. v. DynaEnergetics Europe GmbH*, Case IPR2018-00600, Paper 67, at 10 (PTAB July 6, 2020). Thus, although Petitioner provides prior art and accompanying arguments supporting obviousness of the proposed substitute claims, the Board may, *sua sponte*, question the patentability of the proposed substitute claims. *Id.*

III. PRIOR ART REFERENCES AND IDENTIFICATION OF CHALLENGE

Petitioner requests that the Board deny PO's MTA for all of the proposed amended claims because these claims are unpatentable under 35 U.S.C. § 103 (pre-AIA).

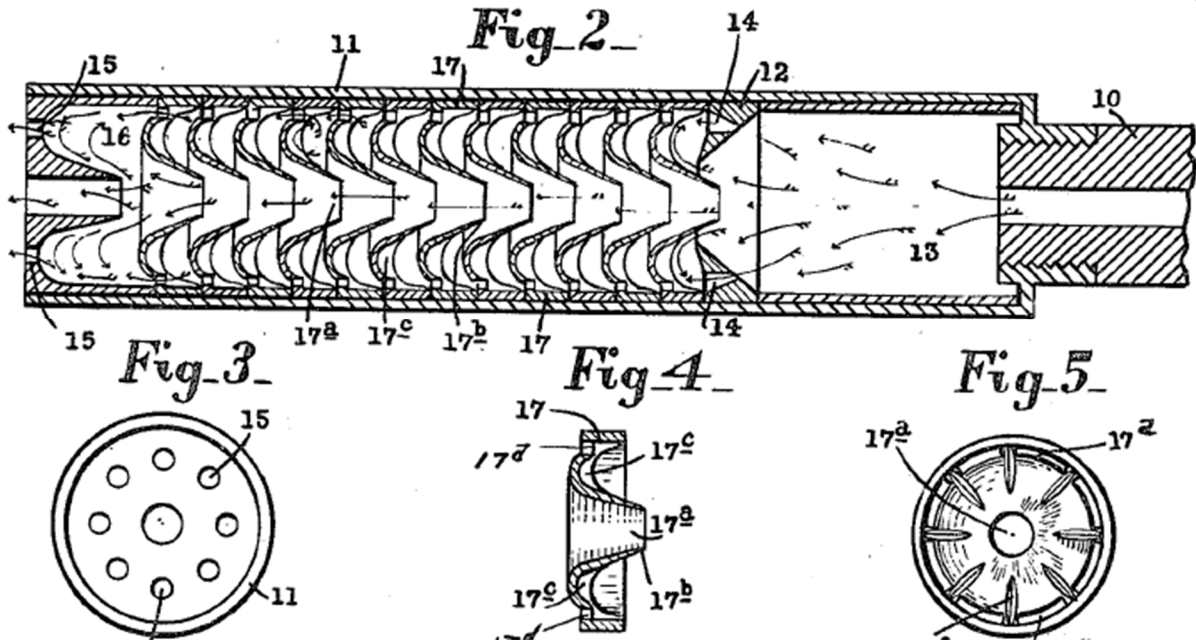
A. Newly Relied-Upon Prior Art References

In addition to Thurler (EX1015), Barlowatz (EX1017, 1018), Eichenseher (EX1020, 1021), and Reeves (EX1019), which are described in detail in the Petition and relied upon in this Opposition, the following patents, which are also relied upon in this Opposition, were publicly available long before the '750-Patent's earliest possible effective filing date 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
EX1039	Kenney	US 1,017,003	02/13/1912	05/16/1910	(a), (b), (e)
EX1038	WerBell	US 3,667,570	06/06/1972	03/16/1972	(a), (b), (e)

1. Kenney (EX1039)

Kenney discloses a silencer for firearms that are “symmetrical and reasonably cheap.” EX1039, 1:1–18. Of the features described by Kenney, important features “consist of means for so controlling and directing the exhaust and discharge of the gases that a jacket of said gases, substantially concentric with the axial center of the path of the bullet, is provided around said path, thus preventing, or rather retarding, the rapid destruction of the vacuum in the atmosphere incident to the discharge of the arm.” *Id.*, 1:20–28.



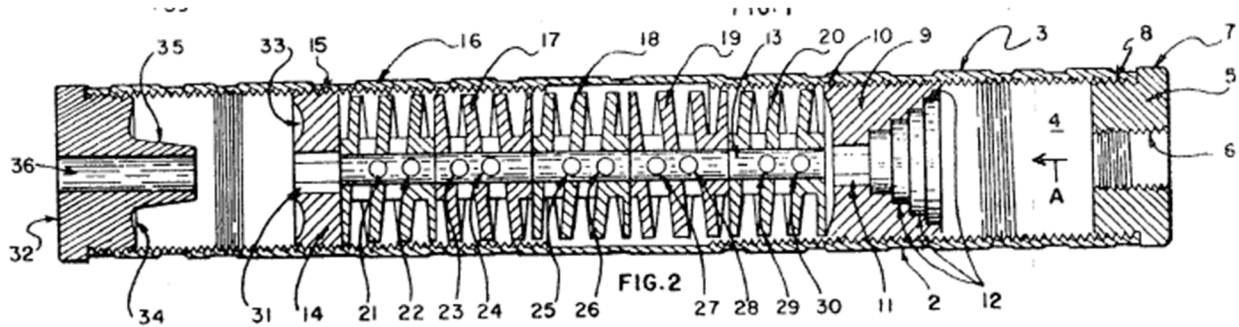
Id., FIGS. 2–5.

Kenney further discloses a plurality of discs orientated along a central axis that “separate portions of the gases and direct the same radially from the bore, and then direct the said gases forwardly and discharge them into the free atmosphere through openings 15, in the muzzle end of the silencer; said openings 15 being arranged substantially concentric with the normal bore of the arm and with the path of the bullet.” *Id.*, 1:91–103. Kenney discloses an end cap (FIG. 3) at the opposite end of the gun’s muzzle through which a majority of the gases escape the silencer. *Id.*, 1:104–108.

2. *WerBell (EX1038)*

WerBell, entitled, “Silencers for Firearms, Internal Combustion Engines, or the Like” discloses silencers with entry, suppression and resonant chambers

arranged coaxially within a tubular housing. EX1038, Abstract. WerBell discloses a plurality of helical suppressor elements axially disposed in the suppression chamber and arranged in opposition to each other, and that the entry and resonate chambers may be provided with baffles. *Id.*



Id., FIG. 2

WerBell further discloses that a “silencer constructed according to one embodiment of this invention may comprise a plurality of helical suppressor elements disposed about an axial passageway together with a plurality of radially disposed ports arranged to establish communication from the passageway to the suppressor elements so that out-of-phase vibrations are supplied from the axial passageway to the suppressor units in such manner as substantially to neutralize each other.” *Id.*, 1:12–20.

WerBell provides that “In order to provide for the application of out-of-phase vibrations to the oppositely disposed reversely wound helical suppressor elements 16-20 inclusive, a plurality of radial ports designated by the numerals 21-30 are spaced along passageway 13 so that these ports are progressively uncovered.

Fluid is thus admitted first through radial port 30 and subsequently through radial port 29 and so on as the fluid proceeds from right to left as viewed in FIG. 2.” *Id.*, 3:32–39. WerBell discloses a suppressor with a concentric orientation for use with a rifle, including one with a tall sight (Fig. 1), and further discloses that the suppressor can be attached to the rifle using an adapter that secures to the rifle sight (Fig. 7, 4:37–66). WerBell demonstrates that a larger/higher rifle sight can be used to see over a concentric suppressor without changing the attachment mechanism of the silencer to the rifle.

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

The specific statutory grounds under 35 U.S.C. § 103 (pre-AIA) on which each proposed amended claim is challenged, and the patents relied upon for each ground, are provided *infra*.

Grounds	35 U.S.C.
GROUND 1: Proposed Amended Claims 23, 26, 27–30, 32, 33, 37–39, 40, and 43 are rendered obvious by Thurler in view of Kenney and WerBell.	103 (pre-AIA)
GROUND 2: Proposed Amended Claims 34–36, 41 and 42 are rendered obvious by Thurler in view of Kenney, WerBell, and Barlowatz.	103 (pre-AIA)
GROUND 3: Proposed Amended Claim 24 is rendered obvious by Thurler in view of Kenney, WerBell, Barlowatz and Reeves.	103 (pre-AIA)
GROUND 4: Proposed Amended Claims 25 and 31 are rendered obvious by Thurler in view of Kenney, WerBell, Barlowatz and Eichenseher.	103 (pre-AIA)

C. Grounds Of Unpatentability For Each Proposed Amended Claim With Specificity

1. GROUND 1: Proposed Amended Claims 23, 26, 27–30, 32, 33, 37–39, 40, and 43 are rendered obvious by Thurler in view of Kenney and WerBell.

Thurler in view of Kenney and WerBell disclose all limitations of Proposed Amended Claims 23, 26, 27–30, 32, 33, 37–39, 40, and 43.

a) Proposed Amended Claim 23 (Independent)

The Board has preliminarily found, based on the arguments set forth in the Petition, which are incorporated herein, that Thurler discloses the following elements of Claim 1, each of which is also present in Proposed Amended Claim 23: (1) an energy capture and control device; (2) 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; (3) 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 (4) 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. *See* ID at 22–27. PO does not challenge these positions or the Board's preliminary findings (apart from the radially serpentine element discussed below). EX1036, 54:5–58:24.

Thus, with respect to Proposed Amended Claim 23, the only elements at issue (apart from the claim construction issues detailed in the briefing related to the Petition) are PO's proposed amendments thereto. However, because Thurler in view of Kenney and WerBell renders these limitations in the proposed amended claims obvious, the Board should deny PO's MTA with respect to this claim.

[23Pre] “An energy capture and control device for use with a weapon”

Thurler is entitled “Device for the Suppression of the Report of Firearms” and “relates to devices for lessening the report of fire-arms.” EX1015, 1:9–10.

Both Kenney and WerBell are also directed to energy capture and control devices for use with a weapon. EX1038, entitled “Silencers for Firearms, Internal Combustion Engines, or the Like”, Abstract; EX1039, entitled “Silencer for Firearms”, 1:9–12. As such, the combination of Thurler, Kenney and WerBell discloses this amended claim element. EX1037, ¶105.

[23A] “a central chamber oriented along a central axis within an outer shell oriented along the central axis, said central chamber having an inlet configured to receive a high energy material comprising a projectile and gases from a high energy outlet of the weapon”

PO's amendment adds the requirement that the outer shell be oriented along the central axis and that the high energy material comprises a projectile and gases from the outlet of a weapon. *See* MTA at Appendix A, Claim 23. Thurler in view of Kenney and WerBell discloses these limitations. EX1037, ¶¶106–112.

PO has argued that Thurler fails to disclose “a central chamber” due to the eccentric configuration of the tubes in the energy suppression device (“ESD”) disclosed in Thurler. However, when viewed in light of the teachings of both Kenney and WerBell, a POSITA would have been motivated to modify Thurler’s eccentric outer shell to be oriented along the central axis, i.e., in a concentric orientation. EX1037, ¶¶106–112. Specifically, Thurler teaches an ESD configuration that includes “a central chamber” concentric with the barrel of a firearm that is surrounded by two tubes, which are eccentric to the central chamber for one reason only: “so that the sight *c* projects over the device for a few millimeters.” EX1015, 1:70–81; Fig. 2.

Kenney explains that a centered housing for a suppressor is desirable so that the exhaust forms “a jacket of the gases, substantially concentric with the axial center of the path of the bullet” to retard vacuum collapse after the shot. EX1039, 1:19–28. Kenney thus teaches that concentricity is linked directly to predictable, symmetric gas expansion. EX1037, ¶109.

Meanwhile, WerBell teaches rifles with high sights useable even with a concentric suppressor, and that such a suppressor may still be attached in precisely the same manner as taught by Thurler. EX1038, FIGs. 1–3; *compare id.*, Fig. 7, 4:37-66, *with* EX1015, Fig. 3, 1:50-53. As noted above, the offset in Thurler merely solves a sight-clearance problem intrinsic to early iron sights; it offers no

acoustic or ballistic benefit, introduces asymmetry only necessary for firearms with low iron sights; and is easily modifiable. EX1037, ¶¶106–112. By the priority date of the '750-Patent, however, high iron sights and scopes displaced low iron sights as standard on high-powered rifles, specifically sniper rifles, used with silencers, and those high iron sights and scopes typically sit *about 2.5 inches above the bore*. EX1037, ¶84. As a result, modifying the Thurler suppressor to be concentric so as to achieve the benefits taught by Kenney would yield a device useable with any rifle having high iron sights or a scope, obviating Thurler's only rationale for eccentricity. EX1037, ¶¶106–112. A POSITA would have been motivated, then, to modify Thurler as described above, which would not have obstructed the user's line of sight in light of WerBell's disclosure and would have resulted in symmetric gas flow and even, protective gas jacket formed by the concentric suppressor's exhaust, as taught by Kenney. *Id.*; *see also*, EX1013, ¶¶209–10.

Because WerBell explicitly depicts that a concentric orientation will not interfere with high sights, Kenney demonstrates the functional benefits of concentric orientations, and scope heights made eccentric mounting unnecessary, a POSITA would have had a reasonable expectation of success in converting Thurler's eccentric shell to a concentric one. The combination of these references therefore renders this amended claim element obvious. EX1037, ¶84, ¶¶106–112.

With respect to the remaining proposed amendments to Proposed Amended Claim 23, namely that the high energy material comprise a projectile and gases from a weapon, Thurler, Kenney and WerBell all disclose such limitations, as all are directed to firearm suppressors. *See* EX1015, 1:9–37, 1:64–91; *see also*, EX1038; EX1039. Dr. Neitzel agrees. EX1036, 55:11–19.

[23B] “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, wherein the fluid outlet is located at an opposite end of the energy capture and control device as the inlet; and”

Thurler's ESD, in view of Kenney and WerBell, further discloses or renders obvious all limitations recited in Claim 23. *See* EX1037, ¶¶113–18. 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 id.*; EX1015, FIG. 1; EX1013, ¶227.

As noted above, Kenney discloses a silencer with an end cap for the gases to forwardly discharge the device at the opposite end than where the high energy material enters, and that the benefits of keeping the gases concentric throughout the device, including upon the gases' exit, is linked directly to predictable, symmetric gas expansion. EX1039, 1:91–103; 1:104–108; 1:19–28; EX1037, ¶¶113–18.

Thus, in view of Kenney's disclosed benefits related to concentricity throughout the device until and including the gases' exit from the silencer, it would

have been obvious to a POSITA to implement an endcap that allows the energy to escape from the outlet end of the central chamber. EX1037, ¶¶113–18. Doing so would improve predictable symmetric gas expansion, increase noise suppression by increasing a path length, and improve the expansion area for the deflected energy. *See* EX1001, 4:29–31; EX1037, ¶¶113–18. Additionally, PO's proffered expert Dr. Neitzel further explained that mufflers are intended to direct noxious gases away from an operator, and that suppressors emit noxious gases as well, thus identifying an additional motivation for modifying Thurler in view of Kenney. EX1036, 51:14–52:22.

b) Proposed Amended Claim 26

(1) [26] **“The device of claim 23, 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 Proposed Amended Claim 26, which is identical to Claim 4 other than its dependence from Proposed Amended Claim 23. *See* Petition at 37–38; EX1013, Claim 4; EX1037, ¶119; *supra* at Proposed Amended Claim 23. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 4 herein.

c) Proposed Amended Claim 27

(1) [27] **“The device of claim 26, wherein the plurality of deflectors include a primary deflector, a secondary deflector, and a first tertiary deflector”**

Thurler's ESD discloses all limitations recited in Proposed Amended Claim 27, which is identical to Claim 5 other than its dependence from Proposed Amended Claim 26. *See* Petition at 38; EX1013, Claim 5; EX1037, ¶120; *supra* at Proposed Amended Claims 23, 26. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 5 herein.

d) Proposed Amended Claim 28

(1) [28] **“The device of claim 27, 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 all limitations recited in Proposed Amended Claim 28, which is identical to Claim 6 other than its dependence from Proposed Amended Claim 27. *See* Petition at 38; EX1013, Claim 6; EX1037, ¶121; *supra* at Proposed Amended Claims 23, 26, 27. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 6 herein.

Thurler's ESD further renders obvious all limitations recited in Claim 28.

See EX1015, FIG. 1; EX1013, Claim 6.

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. However, Thurler contemplates various lengths of

perforations. EX1013, ¶212. For example, Thurler discloses that “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...” See EX1015, 1:73–76. As such, Thurler does disclose other lengths of perforations, albeit with respect to its additional tubes rather than the deflectors. A POSITA would have appreciated this disclosure as teaching or suggesting shorter or longer lengths of perforation 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*. EX1037, ¶¶67–75. Thus, Thurler teaches or suggests different 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 is found to not disclose, teach, or suggest a shorter perforation configuration that limits fluid communication between the central chamber and common off-axis chamber 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; EX1037, ¶¶67–75. 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.*** EX1037, ¶¶67–75. This is

because the '750-Patent teaches no benefit to limiting the fluid communication to just the first, second, and third deflectors. Instead, the '750-Patent teaches that “any desired number of deflectors may be used.” EX1015, 6:23–24. Given that the disclosed purpose of a deflector is to “enable passage of a high energy material therethrough while redirecting at least a portion of gases, sound/shock waves, and/or particulates into the off-axis chamber,” (*id.*, 4:23-26), the teaching that any desired number of deflectors may be used indicates that the number ultimately used is nothing more than a matter of design choice. EX1037, ¶¶67–75.

As of the '750-Patent's EFD, then, 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, and to limit the amount of fluid transferred to Thurler's off-axis chamber. *Id.* Even in the absence of such motivations, however, a POSITA would have opted to limit fluid communication to the first three sleeves as a simple matter of design choice. *Id.*

e) Proposed Amended Claim 29

(1) [29] “**The device of claim 27, 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 Proposed Amended Claim 29, which is identical to Claim 7 other than its dependence from Proposed Amended Claim 27. *See* Petition at 39; EX1013, Claim 7; EX1037, ¶122; *supra* at

Proposed Amended Claims 23, 27. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 7 herein.

f) Proposed Amended Claim 30

(1) [30] **“The device of claim 26, wherein the plurality of deflectors span substantially the entire central axis along the central chamber.”**

Thurler's ESD discloses all limitations recited in Proposed Amended Claim 30, which is identical to Claim 8 other than its dependence from Proposed Amended Claim 26. *See* Petition at 39–40; EX1013, Claim 8; EX1037, ¶123; *supra* at Proposed Amended Claims 23, 26. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 8.

g) Proposed Amended Claim 32

(1) [32] **“The device of claim 23, 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 all limitations recited in Proposed Amended Claim 32, which is identical to Claim 10 other than its dependence from Proposed Amended Claim 23. *See* Petition at 51-2; EX1013, Claim 10; EX1037, ¶124; *supra* at Proposed Amended Claim 23. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 10 herein.

h) Proposed Amended Claim 33

(1) [33] **“The device of claim 32, 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 all limitations recited in Proposed Amended Claim 33, which is identical to Claim 11 other than its dependence from Proposed Amended Claim 32. *See* Petition at 52-3; EX1013, Claim 11; EX1037, ¶125; *supra* at Proposed Amended Claims 23, 32. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 11 herein.

i) Proposed Amended Claim 37

(1) [37] **“The device of claim 23, 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 Proposed Amended Claim 37, which is identical to Claim 15 other than its dependence from Proposed Amended Claim 23. *See* Petition at 40-1; EX1015, 2:77–88 (“the space between [tubes] g and h is filled with metal shavings, such as aluminium”); EX1013, Claim 15; EX1037, ¶126; *supra* at Proposed Amended Claim 23. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 15 herein.

j) Proposed Amended Claim 38

(1) [38] **“The device of claim 37, wherein the dampening chamber is oriented adjacent the outer shell.”**

Thurler's ESD discloses all limitations recited in Proposed Amended Claim 38, which is identical to Claim 16 other than its dependence from Proposed Amended Claim 37. *See* Petition at 41–2; EX1013, Claim 16; EX1037, ¶127;

supra at Proposed Amended Claims 23, 37. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 16.

k) Proposed Amended Claim 39

(1) [39] **“The device of claim 37, 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 Proposed Amended Claim 39, which is identical to Claim 17 other than its dependence from Proposed Amended Claim 37. *See* Petition at 42; EX1013, Claim 17; EX1037, ¶128; *supra* at Proposed Amended Claims 23, 37. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 17 herein.

l) Proposed Amended Claim 40 (Independent)

Thurler's ESD discloses all limitations recited in Proposed Amended Claim 40, which is identical to Claim 19 other than the identical amendments proposed by PO for Proposed Amended Claim 23. *See* PO's MTA at Appendix A, Claims 23, 40; *supra* at Proposed Amended Claim 23. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 19, as well as those set forth herein with respect to Proposed Amended Claim 23.

m) Proposed Amended Claim 43 (Independent)

Thurler's ESD discloses all limitations recited in Proposed Amended Claim 43, which is identical to Claim 22 other than the substantively identical amendments

(differing slightly in wording because Proposed Amended Claim 43 is a method claim, *see* MTA at 4) proposed by PO for Proposed Amended Claim 23. *See* PO's MTA at Appendix A, Claims 23, 43; *supra* at Proposed Amended Claim 23. As such, Petitioner relies on the arguments set forth in this Opposition and Petition with respect to Claim 22, as well as those set forth herein with respect to Proposed Amended Claim 43.

2. GROUND 2: Proposed Amended Claims 34–36, 41 and 42 are rendered obvious by Thurler in view of Kenney, WerBell, and Barlowatz.

As noted above with respect to Ground 1, Thurler in view of Kenney and WerBell renders all elements of at least Proposed Amended Claim 23 obvious. Further, 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. This is akin to the helical coils disclosed in WerBell, which also change direction. *See* EX1038, Fig. 2. 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. EX1018, 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.

In view of Barlowatz, it would have been obvious to a POSITA to modify Thurler's ESD (modified by Kenney and WerBell, *see* Ground 1, *supra*) to include one or more helical coils (*e.g.*, Barlowatz's inner coil *d* or WerBell's coils) in one or more exterior tubes (*e.g.*, Thurler's tube *g*), thereby forming a fluid pathway directed by Barlowatz's helical walls in Thurler's annular spaces. EX1037, ¶¶131–35. Likewise, A POSITA would have found it obvious to modify Thurler's modified ESD to include helical coils that change direction (which, according to Dr. Neitzel discloses a radially serpentine fluid pathway, EX1036, 62:16–64:3), as taught by Barlowatz and WerBell. *Id.* A POSITA would have known that doing so would have improved noise suppression by increasing the path length for the deflected energy and further slowing the speed of the deflected gases. *See* EX1016, 2:99–3:5; EX1018, 2; EX1001, 4:29–31; EX1037, ¶¶131–35.

a) Proposed Amended Claim 34

(1) [34] “**The device of claim 33, 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 discloses all limitations recited in Proposed Amended Claim 34, which is identical to Claim 12 other than its dependence from Proposed Amended Claims 23 and 33. *See* Petition at 60–1; EX1013, Claim 12; EX1037,

¶136; *supra* at Proposed Amended Claims 23, 33. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 12.

b) Proposed Amended Claim 35

(1) [35] **“The device of claim 34, wherein the helical wall has a quadrilateral cross-section or a circular cross-section.”**

Thurler's modified ESD discloses all limitations recited in Proposed Amended Claim 35, which is identical to Claim 13 other than its dependence from Proposed Amended Claims 23 and 34. *See* Petition at 61; EX1013, Claim 13; EX1037, ¶137; *supra* at Proposed Amended Claims 23, 34. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 13 herein.

c) Proposed Amended Claim 36

(1) [36] **“The device of claim 34, wherein the helical wall has a winding ratio (windings:diameter) of about 3:1 to about 8:1.”**

Thurler's modified ESD discloses all limitations recited in Proposed Amended Claim 36, which is identical to Claim 14 other than its dependence from Proposed Amended Claims 23 and 34. *See* Petition at 62; EX1013, Claim 14; EX1037, ¶138; *supra* at Proposed Amended Claims 23, 34. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 14 herein.

d) Proposed Amended Claim 41

(1) [41] **“The device of claim 40, 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 modified ESD discloses all limitations recited in Proposed Amended Claim 41, which is identical to Claim 20 other than its dependence from Proposed Amended Claims 40. *See* Petition at 62–3; EX1013, Claim 20; EX1037, ¶139; *supra* at Proposed Amended Claims 23, 40. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 20.

e) Proposed Amended Claim 42

(1) [42] **“The device of claim 40, 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 modified ESD discloses all limitations recited in Proposed Amended Claim 42, which is identical to Claim 21 other than its dependence from Proposed Amended Claim 40. *See* Petition at 53; EX1013, Claim 21; EX1037, ¶140; *supra* at Proposed Amended Claims 23, 40. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 21.

3. GROUND 3: Proposed Amended Claim 24 is rendered obvious by Thurler in view of Kenney, WerBell, Barlowatz and Reeves.

a) Proposed Amended Claim 24

(1) [24] **“The device of claim 23, 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.”

As noted in its Reply to PO's Response, Petitioner agrees with the Board that Fig. 14 of the '750-Patent and the related disclosures teach a circumferential flow, not a radially serpentine fluid flow, as Fig. 14 does not direct the fluid to flow around a radius. If, however, the Board agrees with PO and construes “radially serpentine” fluid flow as encompassing this “circumferential” fluid flow, as PO tries to suggest, Petitioner will rely on its Petition and arguments and exhibits supporting the same with respect to this Claim 2, which is identical to Claim 24 other than its dependence from Claim 23.

Reeves discloses a series of compartments that each include encapsulated shells forming “radially serpentine fluid pathways,” where the encapsulated shells are connected by an outermost opening 4. EX1019, 2:40–53 & FIG. 1. Reeves also discloses partitions that are perforated at opposite ends to increase the path length. EX1019, 2:85–93. Thus, it would have been obvious to a POSITA to modify Thurler's ESD (further modified by Kenney, WerBell and Barlowatz) to be partitioned into three chambers that are connected along alternating outermost points, because it provides additional opportunities for gas expansion and cooling through multiple discrete chambers, thereby disclosing the above limitation. *See* Petition, 71; EX1013, Claim 2; EX1037, ¶¶142–46.

Additionally, Barlowatz's coils *c* and *d* and strips *c1* and *d1*, as explained above, disclose three progressively larger helical ducts within Barlowatz's off-axis chamber that are oppositely wound. EX1018, FIGs. 1, 2; EX1013, ¶238. PO's position is that a reversing helical flow is a radially serpentine fluid flow. EX1036, 62:16–64:3. Thus, using PO's definition of radially serpentine fluid flow, both Barlowatz and WerBell disclose such flow.

4. GROUND 4: Proposed Amended Claims 25 and 31 are rendered obvious by Thurler in view of Kenney, WerBell, Barlowatz and Eichenseher.

a) Proposed Amended Claim 25

(1) [25] “The device of claim 23, 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.”

Thurler's modified ESD discloses all limitations recited in Proposed Amended Claim 25, which is identical to Claim 3 other than its dependence from Proposed Amended Claim 23. *See* Petition at 76-7; EX1013, Claim 3; EX1037, ¶¶148–51; *supra* at Proposed Amended Claims 23. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 3.

Additionally, Eichenseher's ESD further discloses an ESD where “double-walled hollow body 1 and 2 is screwed onto rifle barrel 6 by means of a mouthpiece 5.” EX1021, 1 & FIG. 1; EX1013, Claim 3. As noted by Mr. Nixon, a POSITA would have been motivated to modify Thurler's modified ESD to include Eichenseher's mounting mechanism for several reasons, including increased

mounting security, and in order to achieve “an instantaneous accumulation and subsequent rapid discharge of the powder gases and thus effective silencing ... without the accumulation of detrimental gas or similar residues.” EX1021, 1; EX1037, ¶¶148–51.

b) Proposed Amended Claim 31

(1) [31] **“The device of claim 23, wherein the multiple internal walls are formed to produce a radially serpentine fluid pathway.”**

Thurler's modified ESD discloses all limitations recited in Proposed Amended Claim 31, which is identical to Claim 9 other than its dependence from Proposed Amended Claim 23. *See* Petition at 79; EX1013, Claim 9; EX1037, ¶152–53; *supra* at Proposed Amended Claims 23. As such, Petitioner relies on the arguments set forth in this Opposition and the Petition with respect to Claim 9.

IV. CONCLUSION

For all these reasons, Petitioner respectfully requests that the Board deny Patent Owner's Motion to Amend.

SIGNATURE PAGE

Respectfully submitted:

By: /Philip W. Harris/
Philip W. Harris

On: July 22, 2025

For: Petitioner

Holland & Hart LLP
222 South Main Street, Suite 2200
Salt Lake City, UT 84101
Tel: 801.799.5767
Email: pwharris@hollandhart.com

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>
1036	July 9, 2025, Neitzel Deposition Transcript
1037	Second Declaration of Mr. Nixon
1038	US Pat. No. 3,667,570 to WerBell
1039	US Pat. No. 1,017,003 to Kenney

CERTIFICATE OF COMPLIANCE

Under 37 CFRs 42.24(d) and 104, the undersigned certifies that this Opposition to Patent Owner's Motion to Amend complies with the page limitation of 37 CFR 42.24(a)(1)(vi), (b)(3) of 25 pages.¹

Respectfully submitted:

By: /Phillip W. Harris/
Phillip W. Harris

On: July 22, 2025

For: Petitioner

Holland & Hart LLP
222 South Main Street, Suite 2200
Salt Lake City, UT 84101
Tel: 801.799.5767
Email: pwharris@hollandhart.com

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, a certificate of service or page limits, and appendix of exhibits.

CERTIFICATE OF SERVICE

Under 37 CFRs 42.6, 104, and 105, the undersigned certifies that a copy of this Opposition to Patent Owner's Motion to Amend and all associated exhibits have been electronically¹ served, as of the date noted below on counsel for Patent Owner as follows:

Brent Bumgardner (brent@nelbum.com)
David DeZern (david@nelbum.com)
Hux-IPR (Hux-IPR@nelbum.com)
NELSON BUMGARDNER CONROY PC

Respectfully submitted:

By: /Philip W. Harris/
Philip W. Harris

On: July 22, 2025

For: Petitioner

Holland & Hart LLP
222 South Main Street, Suite 2200
Salt Lake City, UT 84101
Tel: 801.799.5767
Email: pwharris@hollandhart.com

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