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.

Case IPR2024-01214
Patent 8,286,750

PATENT OWNER'S REPLY TO PETITIONER'S OPPOSITION TO MOTION TO AMEND UNDER 37 C.F.R. § 42.121

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Exhibit	Description
2001	Declaration of G. Paul Neitzel, Ph.D. Pursuant to 37 C.F.R. § 1.68
2002	Transcript of the Deposition of John Nixon
2003	Second Declaration of G. Paul Neitzel, Ph.D. Pursuant to 37 C.F.R. § 1.68
2004	Definition of "around" from Merriam-Webster Online Dictionary, available at https://www.merriam-webster.com/dictionary/around, last accessed September 2, 2025

Patent Owner files this Reply in support of its Motion to Amend ("MTA") to address issues raised in Petitioner's Opposition to the MTA and the Board's Preliminary Guidance.

I. PROPOSED SUBSTITUTE CLAIM 43 DOES NOT ENLARGE THE SCOPE OF THE CLAIMS.

Proposed Substitute Claim 43, corresponding to original claim 22, replaces "high energy device" with "weapon." The Board's Preliminary Guidance (Paper 22 at 5) indicated this broadens claim scope because PO had not shown all weapons are high energy devices. PO respectfully disagrees. "[A] claim 'is broader in scope than the original claim[] if it contains within its scope any conceivable apparatus or process which would not have infringed the original patent.'" *Sisvel Int'l S.A. v. Sierra Wireless, Inc.*, 81 F.4th 1231, 1237 (Fed. Cir. 2023). The claims and specification show that any "weapon" that practices Proposed Substitute Claim 43 must be a high-energy weapon, so Proposed Substitute Claim 43 is narrower than original claim 22. Ex. 2003, ¶¶ 19-25.

Proposed Substitute Claim 43 requires "discharging a high energy material comprising a projectile and gases from the weapon." If the weapon discharges "a high energy material," it must be a high-energy weapon. Ex. 2003, ¶¶ 21-22.

The specification reinforces that the "weapon" claimed in Proposed Substitute Claim 43 is a high-energy weapon. The entire specification describes a device that receives "a high energy material" and "dissipates energy transferred from the high

energy material." Ex. 1001 at Abstract; *see also id.* at 4:10-10:10. It describes the device specifically in the context of firearms, and never in the context of a weapon that is not high energy. *Id.* at 1:13-52, 3:65-4:9, 5:41-49, 5:55-57, 8:35-67, 9:16-18, 9:21-24, 9:45-49, 10:22-25. For these reasons, a POSITA would understand that a "weapon" must be a high-energy weapon. Ex. 2002, ¶¶ 24-25; *see also HD Silicon Sols. LLC v. Microchip Tech. Inc.*, 127 F.4th 919, 921 (Fed. Cir. 2025). Thus, replacing "high energy device" with "weapon" *narrows* the claim, not broadens it.

II. THE PROPOSED SUBSTITUTE CLAIMS[1] DO NOT INTRODUCE NEW SUBJECT MATTER.

In its Preliminary Guidance, the Board indicated that the MTA introduces new subject matter because PO has not "provided written description support for a radially serpentine fluid pathway." Paper 22 at 6. The Board preliminarily construed "radially serpentine" as "a back and forth flow around a radius of the off axis chamber," and PO agrees. Paper 22 at 5. The Board, however, believes that PO has not identified written description support because the MTA "identifies a back and forth flow path around a longitudinal axis of the off axis chamber; that is, a circumferentially serpentine pathway." Paper 22 at 6. The Board appears to be

[1] PO confirms that the MTA's reference to "Proposed Substitute Claims 23-42" was a typographical error that should have read "Proposed Substitute Claims 23-43." Paper 22 at 4 n.1.

referring to PO's discussion of Figure 14 of the '750 Patent. *See* Paper 7 at 14.

The Board need not resolve this issue for two reasons. First, the Proposed Substitute Claims do not introduce the term "radially serpentine"; that term also appears in the original claims, so the MTA could not have introduced subject matter. Ex. 2003, ¶ 30. Second, the construction of "radially serpentine" that the parties agree to and that the Board applied is disclosed nearly verbatim in the application. *See* Paper 7 at 12; Paper 17 at 10; Paper 20 at 9. The application states that a "radially serpentine" pathway can be one in which the fluids "flow back and forth around a radius of the off axis chamber." Ex. 1004 at 7:20-22 (pg. 252). PO relied on this part of the application in its MTA. Paper 18 at 11. This discussion provides written description support for "radially serpentine" by itself. Ex. 2003, ¶ 31.

If Board believes questions regarding Figure 14 are relevant to this issue, it should find that what it calls a "circumferentially serpentine pathway" is in fact a "radially serpentine" pathway. The Board appears to interpret "radially serpentine" to mean only a flow path that circles a radius drawn from the central chamber to a point in the outer shell and changes directions at least once. Ex. 2003, ¶ 32. This understanding is inconsistent with the specification, which discloses *two* embodiments of "radially serpentine." The '750 Patent first discloses that a "radially serpentine" pathway can be one "which causes the fluids to flow back and forth around a radius of the off axis chamber." Ex. 1004 at 7:20-22 (pg 252). It also

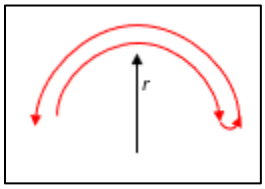
discloses that a "radially serpentine" path can be one "which causes the fluids to flow back and forth around a radius of the off axis chamber *while also traversing a length of the off axis chamber*."[2] *Id.* at 7:22-24 (emphasis added). If a "radially serpentine" pathway were one that required rotation encircling a radius, then fluid would never "travers[e] a length of the off axis chamber," improperly omitting a preferred embodiment. *See PPC Broadband, Inc. v. Corning Optical Commcn's RF, LLC*, 815 F.3d 747, 755 (Fed. Cir. 2016); Ex. 2003, ¶ 33.

The only way to harmonize these two examples is to recognize that Figure 14 is in fact a "radially serpentine" flow path. Ex. 2003, ¶ 34. SilencerCo's own expert originally opined that the flow path of Figure 14 is "radially serpentine." Ex. 1013, ¶¶ 127-29. And for good reason, as the prosecution history makes clear that Figure 14 discloses a "radially serpentine" flow path. When the applicant added the term "radially serpentine" to the independent claims, it made clear that Figure 14 provides support for "radially serpentine" and that "axially serpentine flow is different from radially serpentine flow in which fluid would flow back and forth from clockwise to counter-clockwise *as described in page 7, lines 20-22 and shown in figure 14 (see*

[2] PO believes that this second example falls within the first, which is why PO agrees with the Board's construction of "radially serpentine." If the Board disagrees, its construction should make clear that "radially serpentine" covers both examples.

units 500, 505 and 510.)." Ex. 1004 at 093 (emphasis added). This statement makes clear what the applicant intended "radially serpentine" to mean. *See Univ. of Mass v. L'Oréal S.A.*, 36 F.4th 1374, 1379 (Fed. Cir. 2022); Ex. 2003, ¶ 34.

Petitioner argues that this view "disregards the patent's plain language by suggesting that 'radially serpentine' requires fluid to flow ***across*** rather than ***around***, a radius." Paper 20 at 13. In other words, Petitioner argues, and the Board appears to agree, that "around" requires rotation encircling the radius. But the plain meaning of "around" does not require rotation. For example, Merriam-Webster online provides several definitions of "around," including "in, along, or through a circuit," "here and there: from one place to another," and "in or to an opposite direction or position." Ex. 2003, ¶ 35; Ex. 2004. And, even if "around" implies rotation, the view of Petitioner and the Board regarding what constitutes rotation is unduly narrow. A flow that moves back and forth over the top of a radius does indeed rotate around the radius, as shown in the image to the right. This is exactly what is described in Figure 14. Ex. 2003, ¶ 36; *see also id.* ¶ 39.



Petitioner's argument that PO's understanding of "radially serpentine" requires multiple radii (Paper 20 at 13) ignores cylindrical geometry. The '750 Patent describes cylindrical devices. *See, e.g.*, Ex. 1001, 4:63-64, 9:1-11, Figs. 1a, 2, 14. In a cylindrical coordinate system, a radius extends at some angle (theta) from a fixed reference line perpendicular to the common axis that extends along the length

of the cylinder. Ex. 2001, ¶ 61; Ex. 2003, ¶ 37. In other words, a radius at a constant angle (theta) in a cylindrical coordinate system is the same, regardless of where it begins on the axis that extends the length of the cylinder (i.e., regardless of its z-axis location). Ex. 2003, ¶¶ 37, 39. Thus, Petitioner's argument that PO's understanding of "radially serpentine" requires reference to multiple radii is incorrect—any specific radius extends along the entire z-axis (device length). *Id.*, ¶¶ 38-39.

In sum, a "radially serpentine" path encompasses a back and forth path around a longitudinal axis of the off axis chamber. Thus, Figure 14 and the accompanying description provide written description support for this term. Ex. 2003, ¶ 38.

III. PETITIONER HAS NOT SHOWN UNPATENTABILITY.

A. Proposed Substitute Claims 23, 26, 26-30, 32, 33, 37-39, 40, and 43 Are Patentable Over Ground 1.

The Board's Preliminary Guidance correctly indicated Petitioner has not shown these claims are unpatentable. *First*, Petitioner has failed to show that a POSITA would combine Thurler, Kenney, and Werbell to achieve the limitation requiring "a central chamber oriented along a central axis within an outer shell oriented along the central axis." In its Preliminary Guidance, the Board "question[ed] whether 'along' means 'concentric with.'" Paper 22 at 9-10. PO submits that the claims require that the central axis and outer shell be concentric, but not because of the word "along." The claims require a "central axis"—an axis that is in the center—and that the outer shell be oriented along this "central axis." If the

axis were not at the center of the outer shell, it would not be a "central axis."

Petitioner argues a POSITA would modify Thurler to be concentric because "Kenney explains that a centered housing for a suppressor is desirable so that the exhaust forms 'a jacket of gases, substantially concentric with the axial center of the path of the bullet' to retard vacuum collapse after the shot," linking concentricity to symmetric gas expansion. Paper 21 at 9; *see also* Ex. 2003, ¶¶ 44-49. But Petitioner has not explained why vacuum collapse matters, whether Thurler has this problem, or why a POSITA would be motivated to modify Thurler to solve it. Ex. 2003, ¶¶ 52-53.

Petitioner also has not explained *how* a POSITA would modify Thurler in view of Kenney. Thurler's device quickly strips gases from the central chamber, leading them through an axially serpentine path to exit the side. Ex. 1015 at 1:53-58, 1:83-99. Kenney, conversely, relies on concentricity to form a "jacket of gases" around the bullet's path, both inside the device and upon exit of the bullet, to prevent "rapid destruction of the vacuum." Ex. 1039 at 1:19-28, 2:10-19. Petitioner has not explained how Thurler and its axially serpentine pathway could be modified to form a "jacket" or "cylindrical wall" of gases around the pathway of the bullet in the device or as it exits the device. Ex. 2003, ¶ 54-55. Indeed, sending the gases on a different pathway from the bullet would separate the gases from the path of the bullet. *Id.*, ¶ 55. Moreover, if the gases exit the side of the device as Thurler discloses, they could not form a jacket of gases around the bullet. *Id.*

Second, Petitioner has not shown a POSITA would combine Thurler and Kenney to achieve a "fluid outlet [that] is located at an opposite end of the energy capture and control device as the inlet." Petitioner essentially equates Kenney's end cap with a fluid outlet. Paper 21 at 11-12. Kenney, however, does not disclose a "fluid outlet" because, as the parties agree, a "fluid outlet" must be an outlet for fluids to escape the off axis chamber and device without returning to the central chamber, and Kenney lacks an off axis chamber. Paper 17 at 18; Paper 20 at 17-18. While Kenney's disks redirect gases from the bore, they direct them "into the spaces between the confronting faces of the stack of shearing disks" which have "circumferential cut-away portions" allowing flow toward the muzzle end. Ex. 1039 at 1:91-100, 2:8-19. In other words, the disks redirect the fluids to an area around the edges of the disks, but not to a separate off axis chamber. Ex. 2003, ¶¶ 56-57.

Moreover, Petitioner's purported reasons for combining Thurler with Kenney do not hold water. Petitioner contends that modifying Thurler in view of Kenney "would improve predictable symmetric gas expansion." Paper 21 at 12. But, as discussed above, Petitioner has not explained why or how a POSITA would modify Thurler to make a symmetrical device. Ex. 2003, ¶ 58.

Petitioner's contention that a POSITA would modify Thurler in view of Kenney to increase path length and improve expansion is also unpersuasive. Thurler and Kenney operate fundamentally differently, with Thurler using a circuitous gas

path and Kenney employing a linear path. Thurler discloses that its goal is to destroy the energy in combustion gases "by guiding said gases through a certain number of chambers which are arranged at a certain distance apart the one before the other and which have passages for the projectile." Ex. 1015 at 1:11-17. Kenney discloses that, in its silencer, "the gases are at no time blocked or trapped within the housing but are traveling constantly toward the discharge opening in the muzzle end of the silencer." Ex. 1039 at 2:39-44. The mechanisms of Thurler and Kenney are thus incompatible, and Petitioner does not explain why or how a POSITA would combine their two very different flow paths. Ex. 2003, ¶ 59; Paper 22 at 11; *see also Plas-Pak Indus. v. Sulzer Mixpac AG*, 600 F. App'x 755, 758 (Fed. Cir. 2015).

With respect to the dependent claims at issue in Ground 1, Petitioner attempts to incorporate by reference arguments from its Petition. However, incorporation by reference is impermissible under 37 C.F.R. § 42.6(a)(3). Petitioner has not explained how those arguments apply to this Ground, and they should be disregarded. Ex. 2003, ¶ 60-62, 67-69, 72, 74-76.

With respect to dependent Proposed Substitute Claim 28, Petitioner also adds that "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," and that, even if it does not, "it would have been obvious to a POSITA

to modify Thurler's ESD to achieve such a configuration." Paper 21 at 14-15. However, Thurler discloses that tube *e* is perforated for two-thirds of its length, and nothing in Thurler suggests a shorter or longer perforation. Ex. 2003, ¶¶ 63-65. Moreover, Thurler does not disclose or suggest any particular connection between the sleeves *d*, which Petitioner points to as the deflectors, and the length of the perforations. *Id.*, ¶ 66. A generic allegation that limiting fluid communication to the first three sleeves is a matter of design choice is insufficient to show obviousness. S*ee Cutsforth, Inc. v. Motivepower, Inc.*, 636 F. App'x 575, 578 (Fed. Cir. 2016).

B. Proposed Substitute Claims 34-36, 41, and 42 Are Patentable Over Ground 2.

Proposed Substitute Claims 34-36, 41, and 42 depend from the independent claims at issue in Ground 1 and are thus patentable. In addition, Petitioner impermissibly incorporates by reference arguments in its Petition, and Petitioner does not explain how these arguments apply to this ground. 37 C.F.R. § 42.6(a)(3). These arguments should be disregarded. Ex. 2003, ¶¶ 77, 87, 89, 91, 93.

In addition, Proposed Substitute Claims 34-36 and 41 add limitations relating to helical walls. Petitioner argues that it would have been obvious to modify Thurler to include one or more helical coils. Petitioner ignores that Thurler and Barlowatz (and WerBell) teach different approaches to lengthening pathways. Thurler teaches adding additional eccentric chambers. Ex. 2003, ¶ 81. Barlowatz relies on two coils oriented in different directions so that the gases "counteract each other." Ex. 1018 at

2. Inserting *one* of the coils of Barlowatz into Thurler would defeat this function. And inserting both coils would defeat Thurler's operation, as the gases flowing in different directions would counteract the desired flow. Ex. 2003, ¶¶ 82-86

Proposed Substitute Claims 32 (at issue in Ground 1) and 42 require "multiple concentric tubes." As Petitioner acknowledges, Thurler discloses an eccentric device. And, as discussed above, a POSITA would not modify Thurler in view of Kenney or WerBell to make a device with concentric tubes. Ex. 2003, ¶ 95.

C. Proposed Substitute Claim 24 Is Patentable Over Ground 3.

Proposed Substitute Claim 24 depends from an independent claim at issue in Ground 1 and is thus patentable. In addition, Petitioner impermissibly incorporates arguments in its Petition and does not explain how these arguments apply here. 37 C.F.R. § 42.6(a)(3). These arguments should be disregarded. Ex. 2003, ¶ 96.

Petitioner also contends that 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." Paper 21 at 23. Petitioner ignores, however, that Proposed Substitute Claim 24 requires that the "plurality of sub-chambers" is "defined by the plurality of deflectors." Reeves does not disclose deflectors, and thus cannot disclose sub-chambers that are defined by a plurality of deflectors. Ex. 2003, ¶ 97. Moreover, Proposed Substitute Claim 24 requires that each sub-chamber has a radially serpentine fluid pathway. Each

individual partition in Reeves, however, does not have a radially serpentine pathway—the fluids never change directions within each sub-chamber. *Id.* Thus, a POSITA would not modify Thurler in view of Reeves to achieve the this claim.

D. Proposed Substitute Claims 25 and 31 Are Patentable Over Ground 4.

Proposed Substitute Claims 25 and 31 depend from Proposed Substitute Claim 23 at issue in Ground 1 and are thus patentable. In addition, Petitioner impermissibly incorporates by reference arguments in its Petition, and Petitioner does not explain how these arguments apply to this ground. 37 C.F.R. § 42.6(a)(3). These arguments should be disregarded. Ex. 2003, ¶¶ 98, 100. With respect to Proposed Substitute Claim 25, Petitioner contends that a POSITA would have modified Thurler's modified device with Eichenseher's mounting mechanism. Paper 21 at 24-25. But Petitioner has not explained how the mounting mechanism of Eichenseher has a "hollow interior with a reducing throat portion and a flared outlet," as required by the claim. Ex. 2003, ¶ 100.

With respect to Proposed Substitute Claim 31, a POSITA would not have been motivated to modify Thurler in view of Barlowatz to achieve a radially serpentine fluid pathway. As discussed above, Barlowatz and Thurler are fundamentally incompatible and would not be combined. Ex. 2003, ¶ 101.

IV. CONCLUSION

For the reasons above and those in the MTA, the Board should grant the MTA.

Dated: September 2, 2025

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CERTIFICATE OF COMPLIANCE WITH PAGE LIMITS

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Response complies with the page limit requirements of 37 C.F.R. §§ 42.24(a)(1)(vi), (b)(3) because it contains 12 pages, excluding the parts of that are exempted.

Dated: September 2, 2025

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CERTIFICATE OF SERVICE

I hereby certify that on September 2, 2025 a copy of Patent Owner's Reply to Petitioner's Opposition to Motion to Amend Under 37 C.F.R. § 42.121 has been served in its entirety via email on the following:

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