

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NXTGEN TOYS, LLC,
PETITIONER,

v.

ZIPSTRING, LLC,
PATENT OWNER.

Case IPR2024-01213
Patent 11,674,774

**PETITIONER’S OPPOSITION TO PATENT OWNER’S CONTINGENT
MOTION TO ADD SUBSTITUTE CLAIMS 21-26 AND 28¹**

¹ Petitioner’s opposition does not address substitute claim 27 since it incorporates the limitations of claim 20 which was not challenged in the underlying Petition.

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	OPPOSITION ARGUMENTS	1
A.	Substitute Claims 21-26 and 28 are rendered Obvious Over Wagner in view of Yeany and Scorch (Grounds 3 and 4 in the Petition)	1
B.	Substitute Claims 25, 26 and 28 are rendered Obvious Over Abello in view of Yeany (Ground 2 in the Petition).....	11
III.	INDEFINITESS OF SUBSTITUTE CLAIM 25	14
IV.	CONCLUSION.....	16

LIST OF EXHIBITS

Exhibit 1001	U.S. Patent No. 11,674,774 (“the ’774 patent”)
Exhibit 1002	Declaration of Dr. Barry Kudrowitz
Exhibit 1003	CV for Dr. Barry Kudrowitz
Exhibit 1004	B. Yeany, String shooter-String launcher – physics of toys – Homemade Science with Bruce Yeany, YouTube video, June 11, 2014 (available at https://www.youtube.com/watch?v=rffAjZPmkuU) (“Yeany”)
Exhibit 1005	Abello, Margaux, <i>et al.</i> , String Shooter’s Overall Shape in Ambient Air, Volume 4, <i>Emergent Scientist</i> , 1-8, January 14, 2020 (“Abello”)
Exhibit 1006	Daerr, Adrian, <i>et al.</i> , The Charmed String: Self-Supporting Loops Through Air Drag, Volume 877, <i>Journal of Fluid Mechanics</i> , 1-12, August 20, 2019 (“Daerr”)
Exhibit 1007	Scorch Works, String Shooter, YouTube video, July 4, 2018 (available at https://www.youtube.com/watch?v=IGIDy-IJxmo) (“Scorch”)
Exhibit 1008	U.S. Patent No. 6,537,126 to Wagner (“Wagner”)
Exhibit 1009	C.C.L. Gregory, Theory of a loop revolving in air, with observations on the skin-friction, Q. J. Mech. Appl. Math. 2 (1949) (“Gregory”)
Exhibit 1010	Sunita Sharma, <i>et. al.</i> , <i>Yarn Hairiness Determination Using Image Processing</i> , IOSR Journal of Electronics and Communication Engineering, Volume 11, Issue 5, Ver. II (Sep.-Oct. 2016), pages 48-52 (“Sharma”)
Exhibit 1011	Anderson, Fundamentals of Aerodynamics, Sixth Edition, published by McGraw-Hill Education, 2017 (“Anderson”)
Exhibit 1012	G. K. Tyagi, <i>Yarn structure and properties from different spinning techniques</i> , Chapter 5 of Advances in Yarn Spinning Technology, pages 119-154, published by Woodhead Publishing Limited, 2010 (“Tyagi”)

Exhibit 1013	Screen shot taken at 6 minutes and 54 seconds into video from d’Art of Science, How to make a String Shooter? DIY String <i>Shooter</i> <i>dArtofScience</i> , YouTube video, June 29, 2018 (available at https://www.youtube.com/watch?v=bsZ93j_nUVc&t=283s) (“d’Art of Science”)
Exhibit 1014	Print out of Yeany Youtube webpage (printed from https://www.youtube.com/watch?v=rffAjZPmkuU)
Exhibit 1015	Print out of Scorch Youtube webpage (printed from https://www.youtube.com/watch?v=IGIDy-IJxmo)
Exhibit 1016	Print out of d’Art of Science Youtube webpage (printed from https://www.youtube.com/watch?v=bsZ93j_nUVc&t=283s)
Exhibit 1017	First Amended Complaint in <i>ZipString, LLC v NxtGen Toys, LLC</i> , case 1:24-cv-00136-TCB, filed on April 8, 2024
Exhibit 1018	Prosecution history of the ’774 patent
Exhibit 1019	Copy of ZipString Youtube webpage, <i>The Science of ZipString</i> , YouTube video, January 3, 2023 (available at https://www.youtube.com/watch?v=9MtrcXZbHh8))
Exhibit 1020	Print out of ZipString’s FAQ webpage (printed from https://zipstring.com/pages/faqs)
Exhibit 1021	Print out of Google support website (printed from https://support.google.com/youtube/answer/57407?hl=en&ref_topic=9257439&sjid=7169604476855613924-NC)
Exhibit 1022	Print out of ZipString Patents webpage (printed from https://zipstring.com/pages/patents)

I. INTRODUCTION

Petitioner opposes Patent Owner's Motion to Amend (Mot. to Amend) to add Substitute Claims 21-26 and 28.² Substitute Claims 21-26 and 28 generally incorporate aspects of the issued dependent claims into issued independent claims and as such the patentability of these claims has already been addressed in the Petition and Petitioner's Reply. The only exception is claim 25, which adds a new limitation to a "mechanism" to load and unload the string. While the overall breadth of the scope of the claimed "mechanism" is unclear and indefinite, the prior art teaches the same loading slot structure and function for the mechanism as disclosed in the '774 Patent and thus renders obvious this limitation as well.

II. OPPOSITION ARGUMENTS

A. Substitute Claims 21-26 and 28 are rendered Obvious Over Wagner in view of Yeany and Scorch (Grounds 3 and 4 in the Petition)

1. Substitute Claim 21 – "wherein the housing covers, at least partially, the pair of wheels, and wherein the housing defines

² Substitute Claim 27 is identical to issued claim 16 except it adds the additional limitations of issued claim 20. PO Mot. to Amend at 9. The Petition did not challenge issued claim 20 and Petitioner has no interest in this claimed subject matter. As such, Petitioner has not considered or addressed whether Substitute Claim 27 is patentable or not. *See* 37 CFR §42.121(d)(3) (regarding Board's discretion if Petitioner does not oppose an amendment).

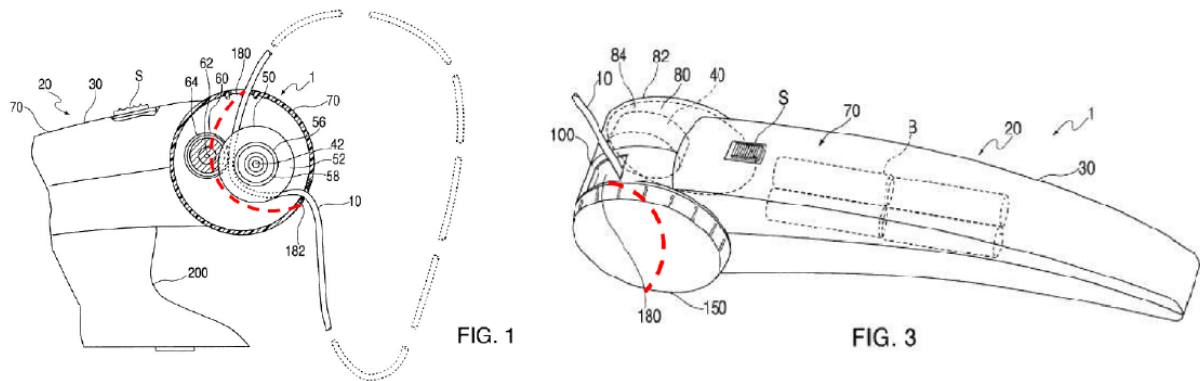
**a loading slot therein through which the string is loaded from
between the pair of wheels”**

The proposed amendment for Substitute Claim 21, shown above, incorporates portions of issued claim 4 into issued claim 1.³ As such, Substitute Claim 21 is obvious over the combination of Wagner, Yeany and Scorch for the same reasons as discussed in the Petition and Petitioner’s Reply for claims 1 and 4, respectively discussed in Grounds 3 and 4. *See* Petition at 71-78 (motivation to combine Wagner and Yeany and discussion of obviousness of claim 1) and 83-87 (motivation to combine Wagner, Yeany and Scorch and discussion of obviousness of claim 4); Petition Reply at 16-24.

Petitioner’s proposed combination is to add a loading slot to Wagner’s housing, comprised of rotatable cup 100 and cover 150, that at least partially covers wheels 50 and 60 to improve the convenience of replacing a loop of string. *See* Petition at 83-85. As explained in the Petitioner, this modification is based in part on the teaching in Scorch of a loading strings in “a slot in the side” that allows one to “swap them [the strings] out really quick.” Ex.1007, 3:00-3:53; Ex.1002, ¶¶172-173. This combination would render obvious the added limitation of the Substitute

³ Substitute claim 21 does not incorporate all of the limitations of claim 4 as at least the word “removed” recited in claim 4 is not recited in substitute claim 21.

Claim 21 as shown in the annotated figure below where an exemplary location of the loading slot in the housing is represented by the dotted red line:



Petition at 86; Ex. 1002 at ¶175; *see* PO Mot. to Amend at 7-8 (Substitute Claim 21 amended to recite “wherein the housing covers, at least partially, the pair of wheels, and wherein the housing defines a loading slot therein through which the string is loaded from between the pair of wheels.”).

As Dr. Kudrowitz explained, a POSITA would use their knowledge to make the modifications of Wagner required to provide sufficient access around flanges of wheel to allow for quick replacement of the string while reducing inadvertent exiting of the string through the loading slot. Ex. 1002 at ¶174-176. On the other hand, in its reply, Patent Owner and Dr. Janet appear to contend that a POSITA could not modify Wagner to “allow[] the string to slide between top flange 54 and the top surface of wheel 60.” PO Resp. at 20; Ex. 2002 at ¶188. However, a “person of

ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. 420-21. Patent Owner’s argument that a POSITA could not modify the simple mechanical components of the Wagner device to accommodate the use of a loading slot for the string treats a POSITA as an automaton rather than a person of ordinary creativity.

While Patent Owner and Dr. Janet argue with respect to claim 4 that the proposed modification to add a loading slot to Wagner would result in certain drawbacks such as “a more complicated and overall less functional design.” PO Resp. at 21; Ex. 2002 at ¶191. It is not clear how Patent Owner arrives at these drawbacks since Dr. Janet agrees with Dr. Kudrowitz that Wagner’s disclosed method to remove and replace the cover is an “inconvenient process.” Ex. 2002 at ¶187 (Dr Janet stating “I agree that removing Wagner’s cover and then reinstalling the cover after the loop of string has been replaced may be viewed as an inconvenient process,...”). As Dr. Kudrowitz explains, a loading slot would provide “easier and quicker” replacement of a string compared to requiring a user to overcome a friction fit to remove the cover and then lining up complementary structures on the cover and the cup to replace the cover. Ex. 1002 at ¶144. Neither Patent Owner nor Dr. Janet explains why a loading slot is more complicated or less functional than a design requiring the removal and replacement of a cover.

Nonetheless, even assuming the modification to add a loading slot resulted in some drawbacks there is no dispute that a loading slot would provide benefits to convenience in loading the string as testified to by both parties' experts and stated expressly in Scorch. Ex. 1002 at ¶144; Ex. 2002 at ¶187; Ex. 1007 at 3:30-3:53. This benefit is enough to motivate a POSITA to pursue the modification of Wagner as set out in the Petition even assuming other drawbacks existed. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1075 (Fed. Cir. 2015) (motivation requires a POSITA to "recognize the potential benefits and pursue the variation."); *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004) (obviousness does not require that the proposed combination "is the preferred, or most desirable, combination"); *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) ("Likewise, a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine").

In addition, Patent Owner also notes that an "extra piece" of wire cone is used in one embodiment of Scorch to help prevent the string from exiting the device. PO Resp. at 18. It is not clear what relevance Patent Owner places on this "extra piece" as it does not negate Scorch's teaching of using loading slot, but in any event Scorch notes that this extra piece is merely optional. Ex.1007 at 4:00-4:30. Perhaps more importantly, Patent Owner cannot overcome obviousness of a combination "by attacking references individually." *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032,

1050 (Fed. Cir. 2019). As explained by Dr. Kudrowitz, the problem of inadvertent exiting of the string in the modified Wagner device is addressed by the flanges already in Wagner which form a channel with the wheels that would help keep the string contained. Ex. 1001 at ¶176. Moreover, Dr. Kudrowitz notes that additional structures can be added to the intake aperture of Wagner’s device if desired to provide “a similar function” as the wire cone disclosed in Scorch to further reduce string exits (rather than proposing bodily incorporation of Scorch’s wire cone or extra piece). *Id.*

Patent Owner’s Reply also argues against a completely different combination than what Petitioner proposed. Namely, Patent Owner argues against a combination that “place[s] Scorch’s slotted funnel tube on Wagner’s body.” PO Resp. at 21. Patent Owner’s proposed combination is irrelevant as it is not the argument relied on by Petitioner. *See PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1366 (Fed. Cir. 2018) (“[Patent Owner’s] argument relies on the presumption that one of ordinary skill would blindly incorporate [secondary reference’s] exact methodology into [primary reference]. But the Board properly did not view [Ppetitioner’s] proposed combination to be so limited.”).

Moreover, Patent Owner’s combination relies on a discredited approach that requires bodily incorporation of Scorch’s loading slot into Wagner’s device. *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381

(Fed. Cir. 2016) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.”); *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (“It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.”).

Therefore, Wagner in view of Yeany and Scorch renders obvious Substitute Claim 21 for substantially the same reasons that issued claims 1 and 4 are obvious in view of the same prior art.

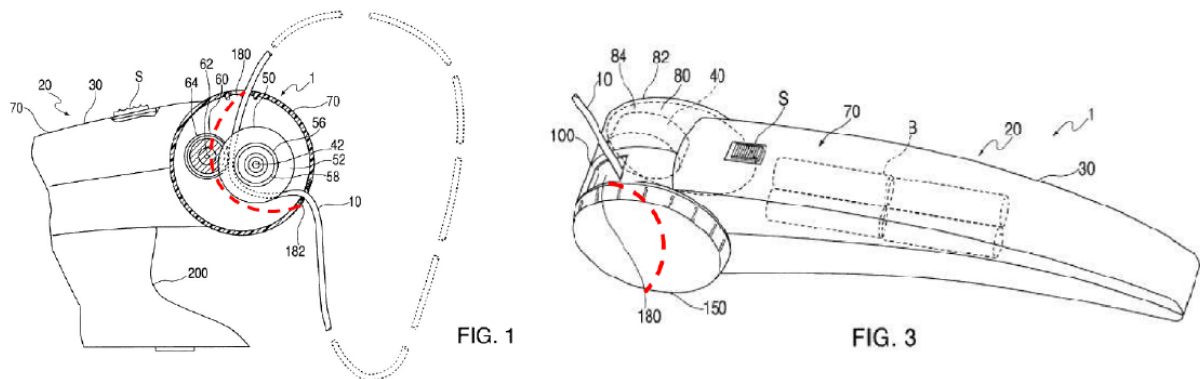
2. Substitute Claims 22 and 23

Substitute Claims 22 and 23 are the same as issued claims 2 and 3, but change their dependency to Substitute Claim 21 instead of issued claim 1. PO Mot. to Amend at 8. Substitute Claim 21 is obvious as discussed above and the subject matter of Substitute Claims 22 and 23 are obvious for the reasons provided in the Petition for issued claims 2 and 3 under Ground 3. Petition at 39-45. Patent Owner did not separately contest the patentability of issued claims 2 and 3 in its Reply.

3. Substitute Claim 24 - “the body is configured to be handheld and the loading slot is further configured for removal of the string from between the pair of wheels”

Wagner indisputable teaches “the body is configured to be handheld,” as seen in the images reproduced below which disclose a “handle” that is configured to be gripped by a user’s hand. *See* Ex. 1008 at Fig. 1, Figs. 3-5, 2:23-33 (Wagner’s body

“comprises a handle 30 for gripping” the device), 2:60-61 and 6:32-34 (device “is portable and may be operated while hand cared [sic] by the user.”) The combined teachings of Wagner, Yeany, and Scorch also teach a loading slot, shown as a dotted red line below, configured for loading and removal of the string from between a pair of wheels as discussed above with respect to Substitute Claim 21. *See* Ex. 1002 at ¶¶174-176 (Dr. Kudrowitz discussing how loading slot “allows for quick replacement of the loop of string”).



4. Substitute Claim 25 – “including a loading slot... wherein said loading slot provides a mechanism to load and unload said looped string”

Substitute claim 25 is identical to issued claim 12 except it adds the additional limitation quoted above. PO Mot. to Amend at 8-9. The subject matter of claim 12 is obvious for the reasons provided in the Petition for claims 1 and 12 under Ground 3 (claim 12 recites overlapping subject matter with claim 1 and thus the Petitioner refers to its analysis of claim 1 when addressing claim 12). Petition at 71-78 and 79-

82. To the extent the added limitation of a “loading slot provides a mechanism” is definite, it is taught by the combination of Wagner, Yeany, and Scorch.

While the full scope of the “mechanism” in Substitute Claim 25 is not clear, Patent Owner’s argument and the specification of the ’774 Patent seem to indicate that the loading slot itself is the mechanism. For instance, Patent Owner contends that substitute claim 25 adds “a loading slot *which is the mechanism* by which a user can load and unload the looped string.” Mot. to Amend at 6. In addition, the ’774 Patent states that “[t]he loading mechanism described herein functions as a guide to guide the looped string into the device and into engagement with the drive wheel” which are functions performed by a loading slot. Ex. 1008 at 8:44-46; *see also id.* at 10:42-11:2 (“a mechanism by which a user can load and unload a looped string from the device quickly and easily”). Regardless of the “mechanism” being the loading slot itself or some feature of the loading slot to performs these functions, it is taught by the prior art.

As explained by Dr. Kudrowitz, the proposed loading slot of the combination likewise functions to guide the looped string into the Wagner device and into engagement with drive wheel 50 of the Wagner device that “allows for quick replacement of the loop of string.” Ex. 1002 at ¶¶174-175. An exemplary loading slot configured to perform these functions (i.e. a mechanism) is shown as the dotted red line below:

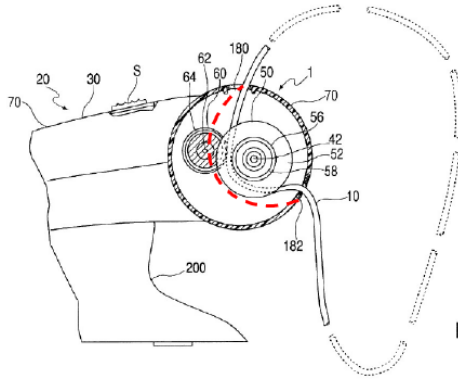


FIG. 1

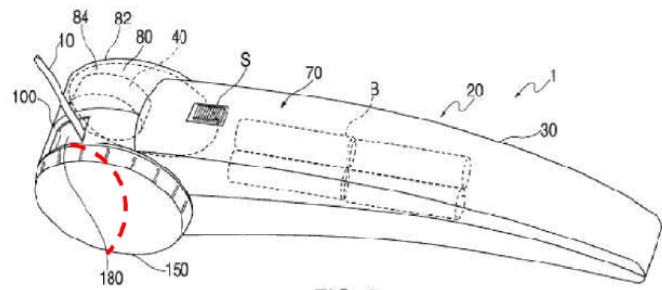


FIG. 3

Ex. 1002 at ¶175.

Therefore, the proposed combination of Wagner, Yeany, and Scorch teach “a housing including a loading slot between a pair of wheels, wherein said loading slot provides a mechanism to load and unload said looped string” consistent with the description of the mechanism in the ’774 Patent. *See Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1570 (Fed. Cir. 1997) (prior art need only “disclose the level of detail” that the challenged patent discloses).

5. Substitute Claim 26

Substitute Claims 26 is the same as issued claim 15, but changes dependency to Substitute Claim 25 instead of issued claim 12. PO Mot. to Amend at 9. Substitute Claim 25 is obvious as discussed above and the subject matter of Substitute Claim 26 is obvious for the reasons provided in the Petition for issued claim 15 under Ground 3. Petition at 82. Patent Owner did not separately contest the patentability of issued claim 15 in its Reply.

6. Substitute Claim 28

Substitute Claim 28 is the same as issued claim 17, but depends from Substitute Claim 25 instead of issued claim 16. PO Mot. to Amend at 9. Substitute Claim 25 is obvious as discussed above and the subject matter of Substitute Claim 28 is obvious for the reasons provided in the Petition for issued claims 2 and 17 (claim 17 recites substantially similar subject matter as claim 2 and thus the Petition relies on the analysis for claim 2 to also address claim 17). Petition at 39-41, 79, and 91-92. Patent Owner did not separately contest the patentability of issued claims 2 or 17 in its Reply.

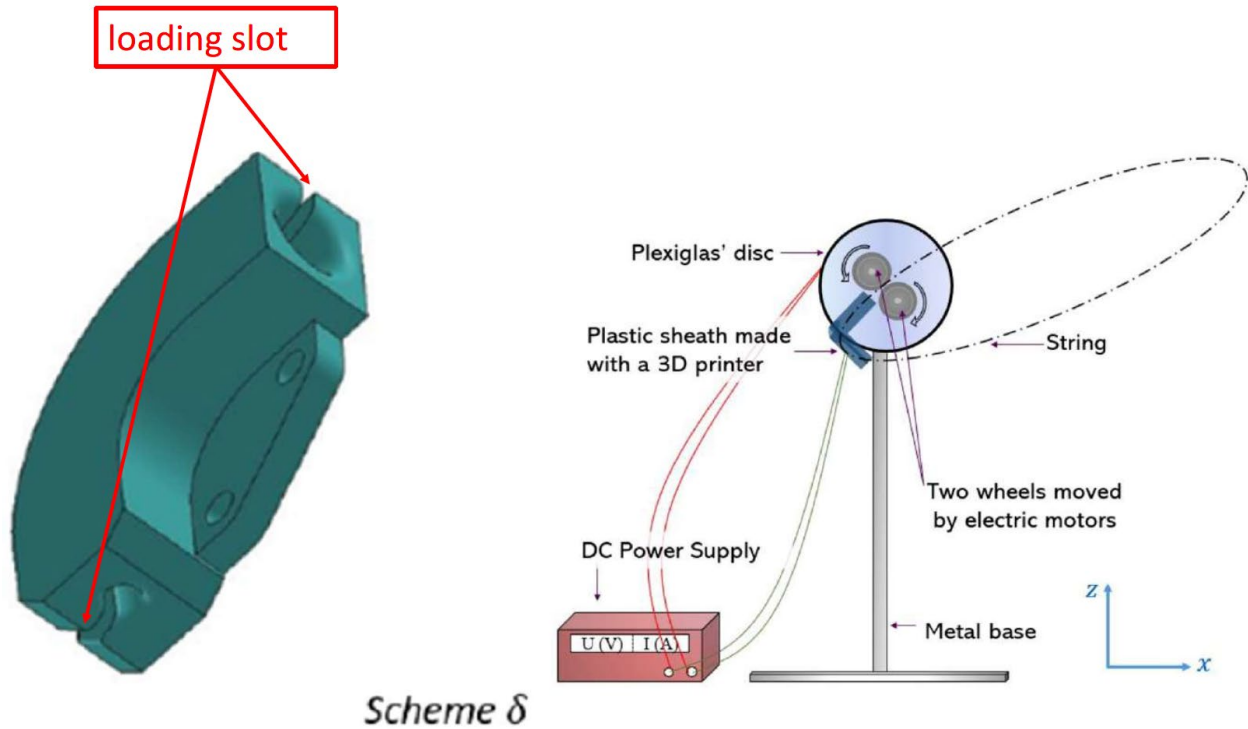
B. Substitute Claims 25, 26 and 28 are rendered Obvious Over Abello in view of Yeany (Ground 2 in the Petition)

1. Substitute Claim 25 – “including a loading slot... wherein said loading slot provides a mechanism to load and unload said looped string”

Substitute claim 25 is identical to issued claim 12 except it adds the additional limitation quoted above. PO Mot. to Amend at 8-9. The subject matter of issued claim 12 is obvious for the reasons provided in the Petition and Petitioner’s Reply for claims 1 and 12 under Ground 2 (claim 12 recites overlapping subject matter with claim 1 and thus the Petitioner refers to its analysis of claim 1 when addressing claim 12). Petition at 53-61 and 64-67; *see also* Petitioner’s Reply at 12-15. To the extent the added limitation of “loading slot provides a mechanism” is definite, it is taught by the combination of Abello and Yeany.

While the full scope of Substitute Claim 25’s “mechanism” is not clear, Patent Owner’s argument and the specification of the ’774 Patent seem to indicate that the loading slot itself is the mechanism. For instance, Patent Owner contends that Substitute Claim 25 adds “a loading slot *which is the mechanism* by which a user can load and unload the looped string.” Mot. to Amend at 6. In addition, the ’774 Patent states that “[t]he loading mechanism described herein functions as a guide to guide the looped string into the device and into engagement with the drive wheel” which are functions performed by a loading slot. Ex. 1008 at 8:44-46; *see also id.* at 10:42-11:2 (“a mechanism by which a user can load and unload a looped string from the device quickly and easily”). Regardless of the “mechanism” being the loading slot itself or some feature of the loading slot to performs these functions, it is taught by the prior art.

As explained by Dr. Kudrowitz, Abello teaches a looped string would be loaded into or unloaded via a loading slot of the sheath (e.g., the housing) into a rounded channel which “guides the returning string back in between the wheels” and thus guides the string into engagement with a drive wheel. Ex. 1002 at ¶¶117-119 (citing Ex. 1005 at Fig. 2, Fig. 3 and 2). An exemplary loading slot configured to perform these functions (i.e. a mechanism) is shown below:



Therefore, the proposed combination of Abello and Yeany teach “a housing including a loading slot between a pair of wheels, wherein said loading slot provides a mechanism to load and unload said looped string” consistent with the description of the mechanism in the ’774 Patent. *See Lockwood*, 107 F.3d at 1570 (Fed. Cir. 1997).

2. Substitute Claim 26

Substitute Claim 26 is the same as issued claim 15, but depends from Substitute Claim 25 instead of issued claim 12. PO Mot. to Amend at 9. Substitute Claim 25 is obvious as discussed above and the subject matter of Substitute Claim 26 is obvious for the reasons provided in the Petition for issued claim 15 under

Ground 2. Petition at 67-68. Patent Owner did not separately contest the patentability of issued claim 15 in its Reply.

3. Substitute Claim 28

Substitute Claim 28 is the same as issued claim 17, but changed dependency to Substitute Claim 25 instead from issued claim 16. PO Mot. to Amend at 9. Substitute Claim 25 is obvious as discussed above and the subject matter of Substitute Claim 28 is obvious for the reasons provided in the Petition for issued claims 2 and 17 (claim 17 recites substantially similar subject matter as claim 2 and thus the Petition relies on the analysis for claim 2 to also address claim 17). Petition at 62 and 71. Patent Owner did not separately contest the patentability of issued claims 2 or 17 in its Reply.

III. INDEFINITENESS OF SUBSTITUTE CLAIM 25

Substitute Claim 25 is unpatentable as indefinite since it fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898 (2014). In particular, claim 25 recites “including a loading slot... wherein said loading slot provides a mechanism to load and unload said looped string.” PO Mot. to Amend at 8-9.

The full scope of Substitute Claim 25’s “mechanism” is not reasonably certain. The claim is written that a loading slot “provides a mechanism” but Patent Owner’s argument and the specification of the ’774 Patent seem to indicate that the

loading slot “is the mechanism.” For instance, Patent Owner contends that substitute claim 25 adds “a loading slot *which is the mechanism* by which a user can load and unload the looped string.” Mot. to Amend at 6. In addition, the ’774 Patent states that “[t]he loading mechanism described herein functions as a guide to guide the looped string into the device and into engagement with the drive wheel” which are functions performed by a loading slot. Ex. 1008 at 8:44-46; *see also id.* at 10:42-11:2 (“a mechanism by which a user can load and unload a looped string from the device quickly and easily”).

To the extent that the claimed “mechanism” is something other than the loading slot itself, it is not reasonably certain what that something else is. For example, there is no guidance on if the loading slot requires some specific structure to provide the claimed “mechanism” (and what that structure would be) or if any loading slot that functions to guide looped string into the device and engagement with the drive wheel provides the claimed “mechanism.” Thus, the outer boundaries of the claimed “mechanism” are not reasonably certain. *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014) (under *Nautilus*, “[t]he claims, when read in light of the specification and the prosecution history, must provide objective boundaries for those of skill in the art.”)

Although the outer boundaries of the claimed “mechanism” are indefinite, the prior art teaches a loading slot have a structure that

guides looped string into the device and engagement with the drive wheel consistent with the example embodiments provided in the '774 Patent and thus would still render this limitation obvious.

IV. CONCLUSION

Substitute Claims 21-26 and 28 of the '774 patent are not patentable for the reasons provided in the Petition as further addressed in this Opposition.

Dated September 2, 2025

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CERTIFICATION OF PAGE COUNT

Petitioner certifies that the page count in this Opposition to Patent Owner's Motion to Amend is 25 pages or less, where such page count excludes the table of contents, list of exhibits, certificate of service, and this certificate of page count. This Opposition is in compliance with the 25-page limit set forth in 37 C.F.R. § 42.24.

CERTIFICATE OF SERVICE UNDER 37 CFR § 42.6(e)(4)

The undersigned hereby certifies that a copy of the accompanying Petitioner's Reply to Patent Owner's Response and all accompanying exhibits, are being served via electronic mail on September 2, 2025 upon the following:

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