PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,156,127

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the *Inter Partes* Review of U.S. Patent No. 7,156,127

Trial No.: Not Yet Assigned

Issued: January 2, 2007

Filed: December 17, 2001

Inventors: Gregory Moulton, *et al.*

Assignee: Flexible Technologies, Inc.

Title: CURRENT CARRYING STRETCH HOSE

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United States Patent & Trademark Office
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PETITION FOR *INTER PARTES* REVIEW UNDER 37 C.F.R. § 42.100

On behalf of SharkNinja Operating LLC ("SharkNinja" or "Petitioner") and in accordance with 35 U.S.C. § 311 and 37 C.F.R. § 42.100, *inter partes* review is respectfully requested for claims 1 and 6-10 of U.S. Patent No. 7,156,127 ("the '127 patent"), attached hereto as Exhibit 1001.

The undersigned representative of Petitioner authorizes the Patent Office to charge the $30,500 Petition and Post-Institution Fees, along with any additional fees, to Deposit Account 503013, ref: 417676-600020.

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I. Introduction

The ’127 patent is currently being wielded by the patent owner, Flexible Technologies, Inc. (“FTI”), in an attempt to cover a long-known current carrying stretch hose for a vacuum cleaner. (Ex. 1001 at 5-7.) The patent’s Background section acknowledges that “[o]ne type of vacuum hose that is currently available is a current carrying hose” but states that this hose was “rather rigid and . . . incapable of stretching to extend its length a significant distance.” (*Id.* at 2:31-42.) The Background section further acknowledges that “[a]nother type of hose that is presently available is . . . a stretch hose” that can stretch “a distance 2 to 6 times its at rest length.” (*Id.* at 2:43-46.) The alleged invention of the ’127 patent is a “current carrying stretch hose” that combines the features of these prior art hoses. (*See*, *e.g.*, *id.* at 2:60-3:5.)

But as recognized by the Patent Office during prosecution, current carrying stretch hoses similar to that of the ’127 patent have been common knowledge since at least the 1950s. (*See, e.g.*, U.S. Patent No. 2,890,264 to Duff (Ex. 1008) applied during prosecution, filed December 21, 1956, titled “Electrically Conductive Extensible Hose.”) Further, many of the features that FTI asserted as conferring patentability on the claims (e.g., wire gauges, distances between hose corrugations, etc.) were nothing more than obvious design choices, as recognized by the Patent Office. (*See, e.g.*, Ex. 1009 at 202.)

The only features of the ’127 patent that were arguably not found in the prior art considered by the Patent Office were the specific hose configurations illustrated in Figs. 3 and 5 of the patent:

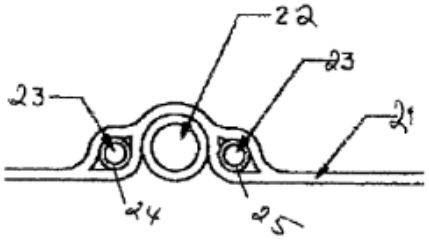


Fig. 3

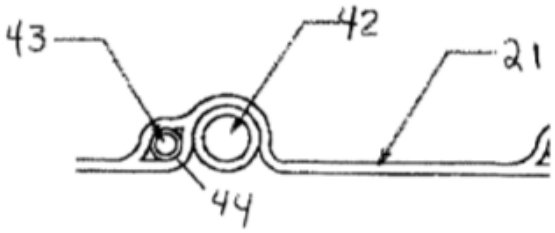
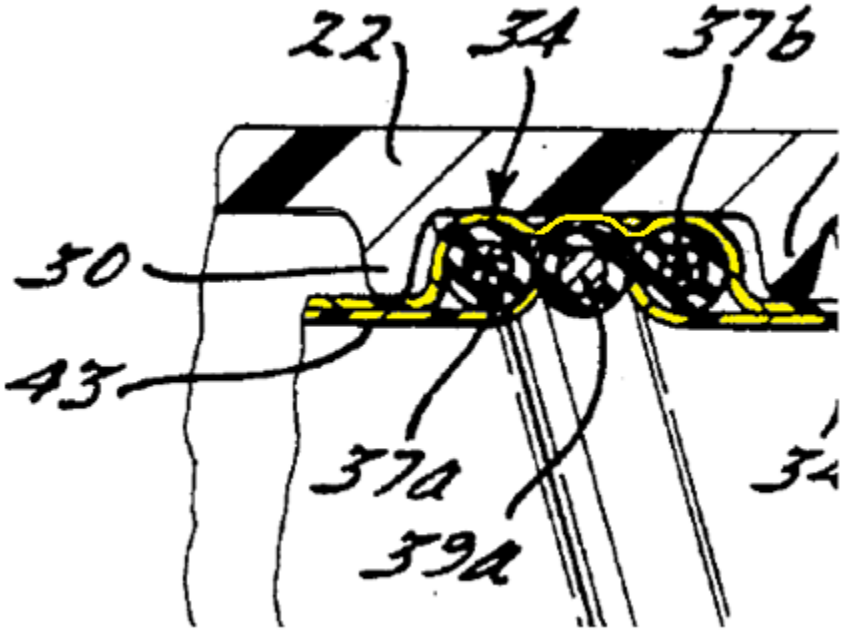


Fig. 5

(Ex. 1001 at Figs. 3, 5.)

These hose configurations, however, were not new when the ’127 patent was filed. The Rohn prior art reference (Ex. 1004) discloses a hose configuration that is *identical* to that of the ’127 patent in all relevant respects:



(Ex. 1004 at Fig. 3 (highlighting added).) Like Fig. 3 of the '127 patent, Rohn's hose includes helically wound conductors 37a and 37b embedded within a vinyl cover (highlighted in yellow above) on opposite sides of a helical support wire 39. (*See id.* at 3:20-30.) Rohn was not considered by the Patent Office during prosecution.

Another prior art reference not considered by the Office, Nagayoshi (Ex. 1003), discloses a similar hose configuration and provides a detailed description of how to manufacture the hose, including how to embed a conductor wire within the thermoplastic cover. (*Id.* at 4:4-5:16, Figs. 1 and 2.) Nagayoshi's embedding of the conductor wire within the thermoplastic cover provides abrasion resistance for the wire and enables a more durable, long-lasting hose. (Ex. 1011 at ¶¶78, 146.)

Petitioner submits that had these references been considered by the Patent Office during prosecution, claims 1 and 6-10 of the '127 patent would not have issued, and therefore this petition for *inter partes* review should be granted.

II. Grounds for Standing Pursuant to 37 C.F.R. § 42.104(a)

Petitioner certifies that the '127 patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting *inter partes* review challenging the patent claims on the grounds identified herein.

III. Background Information for the '127 patent

A. Overview of the '127 patent

The '127 patent is directed to a "flexible hose that has the ability to stretch

when a pulling force is applied . . . [and] is also a current carrying hose." (Ex. 1001 at 3:13-16.) The hose of the '127 patent is in a fully retracted condition when no pulling force is placed on the hose (*id.* at 3:45-51):

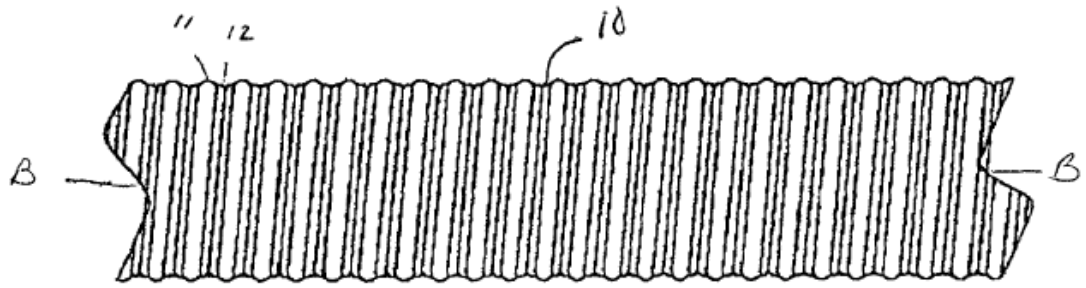


Figure 1

(*Id.* at Fig. 1.) The hose expands to an extended condition when a pulling force is applied (*id.* at 3:51-54):

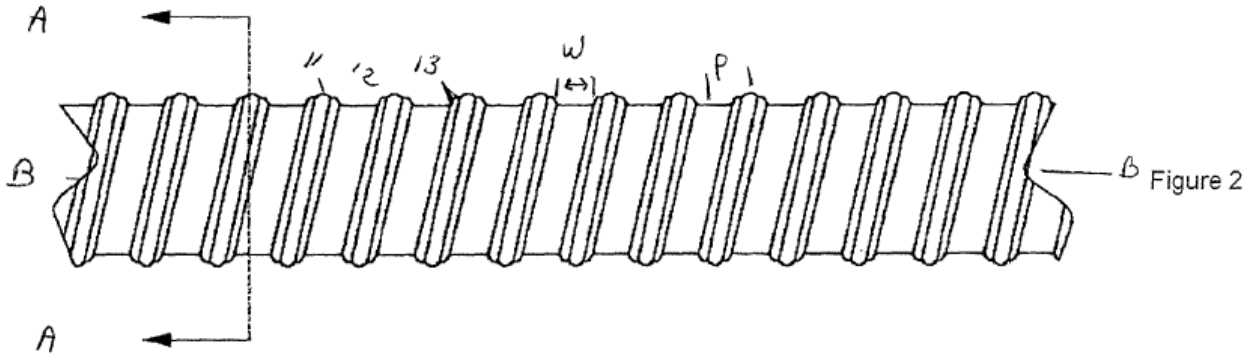


Figure 2

(*Id.* at Fig. 2.)

The hose of the '127 patent includes a thermoplastic cover 21 formed over a helix 22 (referred to in the claims as a "helical member"):

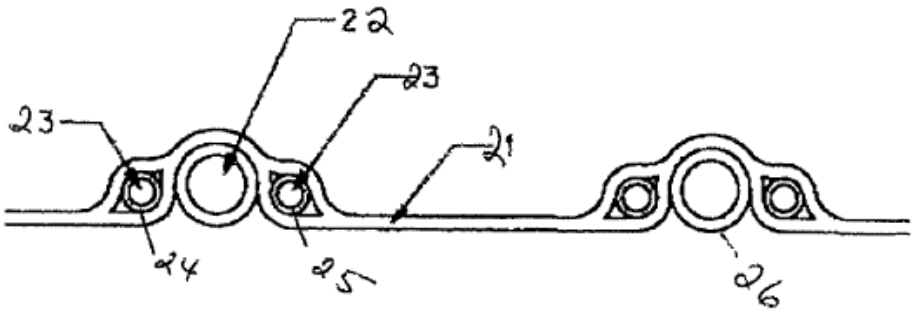


Figure 3

(*Id.* at Fig. 3.) The hose also includes "on opposite sides of the helix 22 . . . two insulated conductor wires 24 and 25." (*Id.* at 4:43-47.) As seen above, the conductor wires 24, 25 are embedded in the thermoplastic cover 21, while the cover 21 is formed over the helix. (*See id.* at 4:57-65.)

B. Overview of the Prosecution History

The '127 patent was filed on December 17, 2001. (Ex. 1009 at 19-22.) In Office Actions dated October 7, 2003 (*id.* at 74-81) and July 13, 2004 (*id.* at 120-27), all pending claims were rejected as being anticipated or obvious.

In response to the July 13, 2004 Office Action, FTI presented new independent claim 26 for consideration by the Patent Office. (*Id.* at 134-47.) The claim was allowed without rejection (Ex. 1009 at 171-81) and later issued as claim 1 of the '127 patent. The claim included a number of limitations not previously recited in the independent claims: "having a thickness of between about 10 mil to 50 about [sic] mil," "said helical member having a gauge between 12 and 21," "the distance from one peak to an adjacent peak in the hose is about 1/4" to 3/4" when there is no pulling

force on a section of said hose and the distance from one peak to an adjacent peak is about ½" to 2" when a pulling force is placed on a section of said hose," and "with a gauge in the range of about 10 to about 30." (*Id.* at 141-42.) Throughout the entirety of the prosecution, the Office maintained the position that each of these limitations was nothing more than an obvious design choice. (*See*, *e.g.*, *id.* at 191, 201-03; *see also id.* at 76-80, 125, 153, 177-179.) (*See also id.* at 229-32 (Notice of Allowance).)

IV. Identification of Challenge Pursuant to 37 C.F.R. § 42.104(b)

A. 37 C.F.R. § 42.104(b)(1): Claims for Which *Inter Partes* Review Is Requested

Inter partes review is requested for claims 1 and 6-10 of the '127 patent.

B. 37 C.F.R. § 42.104(b)(2): The Prior Art and Specific Grounds on Which the Challenge to the Claims Is Based

Inter partes review is requested in view of the following prior art references:

- U.S. Patent No. 5,109,568 to Rohn ("Rohn") (Ex. 1004). Rohn was filed June 15, 1990 and published May 5, 1992, and is prior art to the '127 patent under at least 35 U.S.C. §§ 102(a) and 102(b).

- Japanese Patent Application Publication No. JP H3-93676 ("Nagayoshi") (Ex. 1003). Nagayoshi was filed January 12, 1990 and published September 25, 1991, and is prior art to the '127 patent under at least 35 U.S.C. §§ 102(a) and 102(b).

- U.S. Patent No. 5,555,915 to Kanao ("Kanao") (Ex. 1002). Kanao was filed March 27, 1995 and published September 17, 1996, and is prior art to the '127 patent

under at least 35 U.S.C. §§ 102(a) and 102(b).[1]

- U.S. Patent No. 2,961,007 to Martin ("Martin") (Ex. 1007). Martin was filed November 24, 1954 and published November 22, 1960, and is prior art to the '127 patent under at least 35 U.S.C. §§ 102(a) and 102(b).

The specific statutory grounds on which the challenge to the claims is based and the prior art relied upon for each ground are as follows:

a) Claim 1 is unpatentable under 35 U.S.C. § 103(a) over Rohn in view of Martin and Nagayoshi;

b) Claim 1 is unpatentable under 35 U.S.C. § 103(a) over Rohn in view of Kanao and Nagayoshi;

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[1] Although Kanao was applied in the first of four Office Actions issued during prosecution (Ex. 1009 at 74-82), the reference is being used differently in this Petition than it was during prosecution. Kanao was never applied to the issued claims or claims similar thereto. (*See id.* at 38-41 (claims pending as of first Office Action).) Further, Kanao was applied during prosecution as a primary reference (*id.* at 76-77, 79-80) and for its disclosure of certain dependent claim features (*id.* at 79). By contrast, in this Petition, Kanao is applied as a secondary reference in combination with two references not previously considered by the Office, and Kanao is not being applied herein to meet the aforementioned dependent claim features.

c) Claim 6 is unpatentable under 35 U.S.C. § 103(a) over Rohn in view of Martin and Nagayoshi, and over Rohn in view of Kanao and Nagayoshi;

d) Claim 7 is unpatentable under 35 U.S.C. § 103(a) over Rohn in view of Martin, Nagayoshi, and Kanao, and over Rohn in view of Kanao, and Nagayoshi;

e) Claim 8 is unpatentable under 35 U.S.C. § 103(a) over Rohn in view of Martin and Nagayoshi, and over Rohn in view of Kanao and Nagayoshi;

f) Claim 9 is unpatentable under 35 U.S.C. § 103(a) over Rohn in view of Martin and Nagayoshi, and over Rohn in view of Kanao and Nagayoshi; and

g) Claim 10 is unpatentable under 35 U.S.C. § 103(a) over Rohn in view of Martin and Nagayoshi, and over Rohn in view of Kanao, Nagayoshi, and Martin.

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

Claims are to be given their "broadest reasonable construction in light of the specification." 37 C.F.R. § 42.100(b). The constructions proposed below are intended only for this proceeding. Petitioner does not waive, and expressly reserves, its claim scope arguments, constructions, and evidence that it may raise in other proceedings.

1. "a single layer of thermoplastic material" – Claim 1

The term "a single layer of thermoplastic material" should be interpreted to mean "*a layer formed by a single covering of thermoplastic material*," which encompasses, for example, a layer formed by helically wound thermoplastic material that partially overlaps itself (*e.g.*, like tape on a hockey stick). This interpretation is

consistent with FTI's position in related district court litigation, where FTI is asserting the '127 patent against products having a cover formed by helically winding thermoplastic material around a mandrel with each successive winding partially overlapping a preceding winding. (Ex. 1010 (complaint) at 11-15 and Exhibit C to the complaint; Ex. 1012 at ¶¶43-45.) *See*, *e.g.*, *Hulu, LLC v. Chinook Licensing DE, LLC*, IPR2015-00625, Paper No. 8 at 5-6 (PTAB Aug. 12, 2015). The Office concluded that disclosure of a thermoplastic material that partially overlaps itself meets the limitation. (*See*, *e.g.*, Ex. 1009 at 180.) Further, the only embodiment of a hose disclosed in the '127 patent was also formed by mandrel wrapping. (Ex. 1001 at 4:57-65.)

2. "said thermoplastic cover having been extruded around said conductive wire" – Claim 1

The term "said thermoplastic cover having been extruded around said conductive wire" should be interpreted to mean "*the conductive wire being included within the single covering of thermoplastic material*." This interpretation encompasses, for example, a conductive wire included within thermoplastic material that is helically wound, with the conductive wire being disposed between a preceding winding and a successive winding that that partially overlaps the preceding winding. This interpretation is consistent with FTI's position in related district court litigation, where FTI is asserting the '127 patent against products having this configuration. (Ex. 1010 (complaint) at 11-15 and Exhibit C to the complaint; Ex. 1012 at ¶¶43-45.)

See, *e.g.*, *Hulu*, IPR2015-00625, Paper No. 8 at 5-6. This interpretation is also consistent with the specification of the '127 patent. (*See* Ex. 1001 at 4:57-62.) As shown in Figs. 3 and 5 of the '127 patent, extruding the cover around conductive wire(s) during mandrel wrapping embeds the conductive wire(s) within the thermoplastic material.

D. 37 C.F.R. § 42.104(b)(4): How the Construed Claims are Unpatentable

An explanation of how claims 1 and 6-10 are unpatentable, including identification of how each claim feature is found in the prior art and the motivation to combine the prior art, is set forth below in Section V.

E. 37 C.F.R. § 42.104(b)(5): Supporting Evidence

An Appendix of Exhibits supporting this Petition is attached. Exhibit 1011 is a supporting Declaration of Charles A. Reed Jr., and Exhibit 1012 is a supporting Declaration of Robert Bentley.

V. There Is a Reasonable Likelihood That Claims 1 and 6-10 of the '127 Patent Are Unpatentable

A. Independent Claim 1 Is Obvious Over Rohn in View of Martin and Nagayoshi

1. Preamble: "A flexible hose for carrying fluids said hose being in a retracted condition when no tensile force is placed on said hose and in an extended condition when a tensile force of a pulling nature is placed on a section of said hose, said hose consisting essentially of"[2]

To the extent that the preamble of claim 1 is limiting, Rohn and Martin disclose it or render it obvious. Rohn discloses the claim language "[a] flexible hose for carrying fluids." (Ex. 1004 at 2:48-51 ("Further shown is a flexible, ribbed, vacuum hose 12 . . . .").) (Ex. 1011 at ¶91.)

To the extent that Rohn does not explicitly disclose the claim language "said hose being in a retracted condition when no tensile force is placed on said hose and in an extended condition when a tensile force of a pulling nature is placed on a section of said hose," these limitations are disclosed by Martin, as well as the admitted prior art (APA) set forth in the Background section of the '127 patent, which describes a

[2] The transitional phrase "consisting essentially of" limits the scope of the claim to the specified components "and those that do not materially affect the basic and novel characteristic(s)" of the claimed flexible hose. *In re Herz*, 537 F.2d 549, 551-52 (CCPA 1976).

stretch hose that can stretch a distance 2 to 6 times its at-rest length (*see, e.g.*, Ex. 1001 at 2:43-57). (Ex. 1011 at ¶92.) Martin "relates to [a] flexible hose and more particularly to an extensible hose for use with suction cleaners." (Ex. 1007 at 1:18-20.) Martin specifically discloses a stretch hose that is in a retracted or extended condition depending on whether a pulling force is applied to it. (*Id.* at 3:1-16, 3:17-32, 3:52-55, 3:67-73, 4:23-30, 6:33-37.) Martin's stretch hose is in a retracted condition when no pulling force is applied to it. (*See*, *e.g.*, *id.* at 3:17-32.) By contrast, the stretch hose is in an extended condition when a tensile force of a pulling nature is placed on it. (*See*, *e.g.*, *id.* at 3:67-73.)

The POSITA would have been motivated to modify the hose of Rohn to make it a stretch hose, as taught by Martin and the APA. (Ex. 1011 at ¶¶93-95.) Although Rohn states that its hose is "flexible" (Ex. 1004 at 2:48-51), there is no disclosure that the hose is able to extend lengthwise when pulled and then return to its fully contracted position when released, as taught by Martin. However, such features were commonly known in the art at the time of the '127 patent, as evidenced at least by Martin's 1960 date of issuance, and by the APA (Ex. 1001 at 2:43-57). The POSITA would be motivated to implement Rohn's hose as a stretch hose, as taught by Martin and the APA, for a variety of reasons. As detailed in Mr. Reed's declaration (Ex. 1011 at ¶93), for instance, implementing the Rohn hose as a stretch hose addresses the cracking problem discussed in Rohn, whereby portions of the hose near the hose ends

crack. (*See* Ex. 1004 at 1:28-31.) The POSITA would recognize that implementing Rohn's hose as a stretch hose causes the hose to be more flexible and extensible, thus preventing or mitigating the cracking problem. (Ex. 1011 at ¶93.)

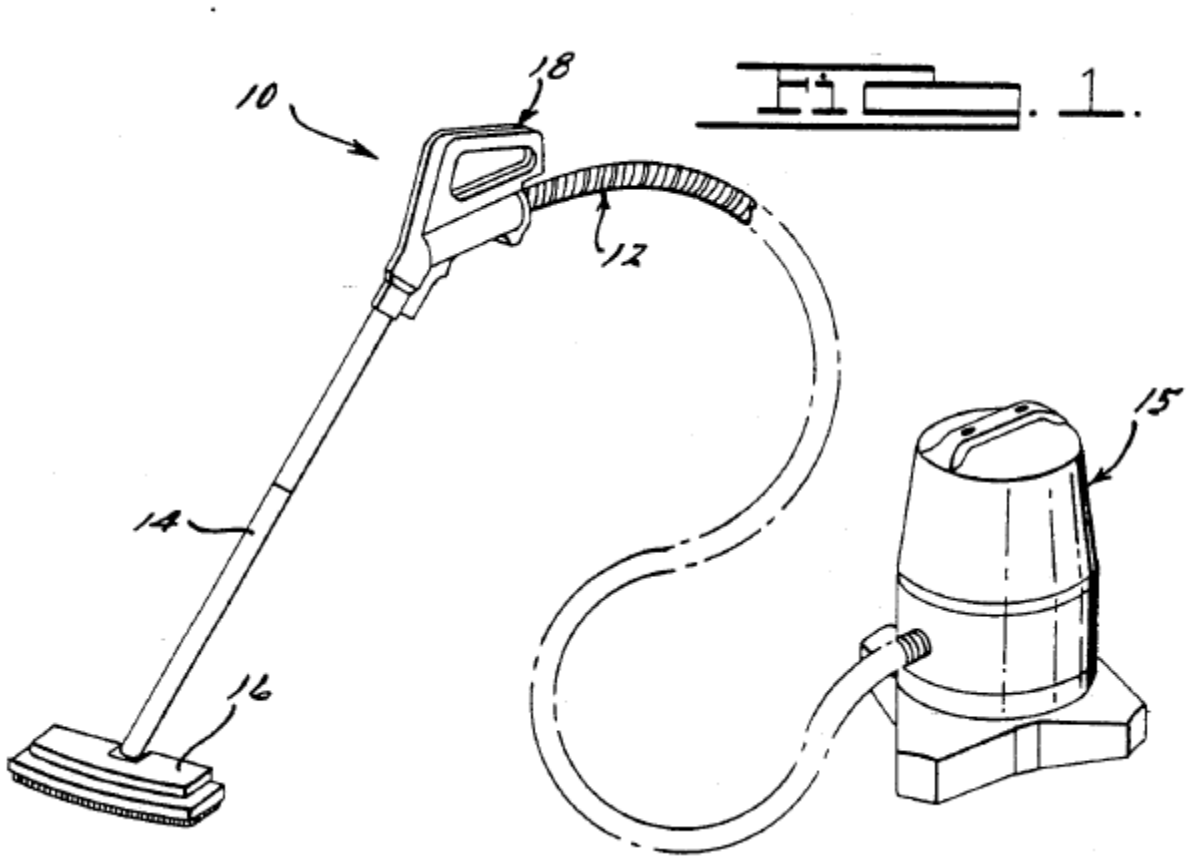
Further, the POSITA would recognize that implementing Rohn's hose as a stretch hose would offer the benefits of longer hose reach and a more convenient storage length. (*Id.* at ¶94.) The Background section of the '127 patent acknowledges these advantages and others of stretch hoses:

> The benefit of a stretch hose is that as the user is working a manageable length of hose is carried. . . . In addition, for both upright, canister and built-in systems the stretch hose is useful on stairs or to reach the tops of cabinets, drapes and other high areas where an ordinary hose cannot reach without additional wands or extensions. Once the extra length of hose is no longer needed the stretched hose retracts to its normal, more compact configuration.

(Ex. 1001 at 2:43-57.) These advantages would motivate the POSITA to implement Rohn's hose as a stretch hose. (Ex. 1011 at ¶94.) The POSITA would also recognize that the use of a stretch hose is consistent with the purpose of Rohn's hose and handle assembly. (*Id.* at ¶95.)

2. Elements 1 and 2: "a first end" and "a second end"

Rohn discloses or renders obvious the first and second elements of claim 1. (Ex. 1011 at ¶¶96-97.) The vacuum hose 12 of Rohn includes "a first end" and "a second end," such as those shown in Fig. 1:

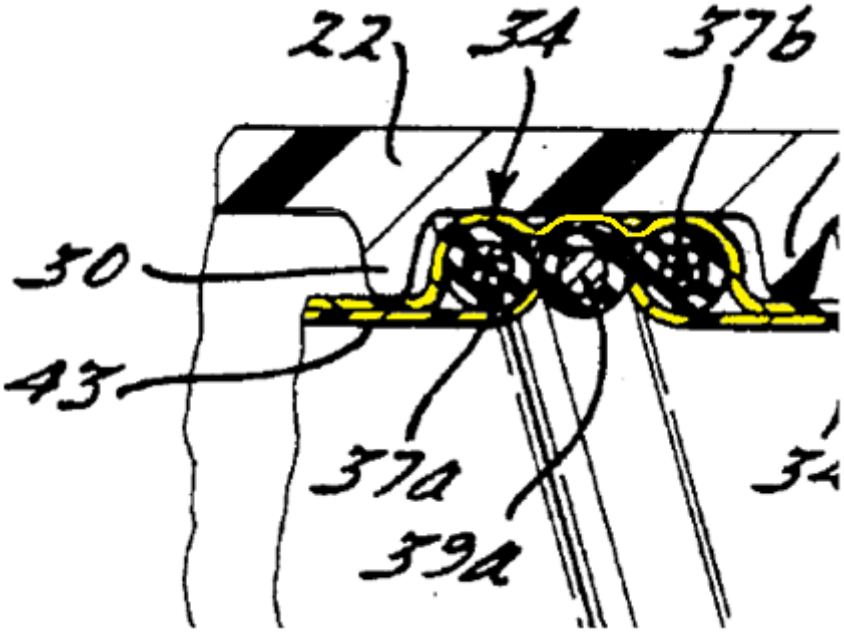


(Ex. 1004 at Fig. 1; *see also id.* at 2:46-62.)

3. Element 3: "a thermoplastic cover consisting essentially of a single layer of thermoplastic material having a thickness of between about 10 mil to 50 about [sic] mil wherein said thermoplastic cover further comprises an interior surface and an exterior surface"

Rohn, Nagayoshi, and Martin disclose or render obvious the third element of claim 1. Rohn discloses the claim language "a thermoplastic cover . . . wherein said thermoplastic cover further comprises an interior surface and an exterior surface." (Ex. 1011 at ¶¶99-100.) Specifically, Rohn's vacuum hose 12 includes a cover formed of vinyl, which is a thermoplastic material. (Ex. 1004 at 3:28-30.) The vinyl

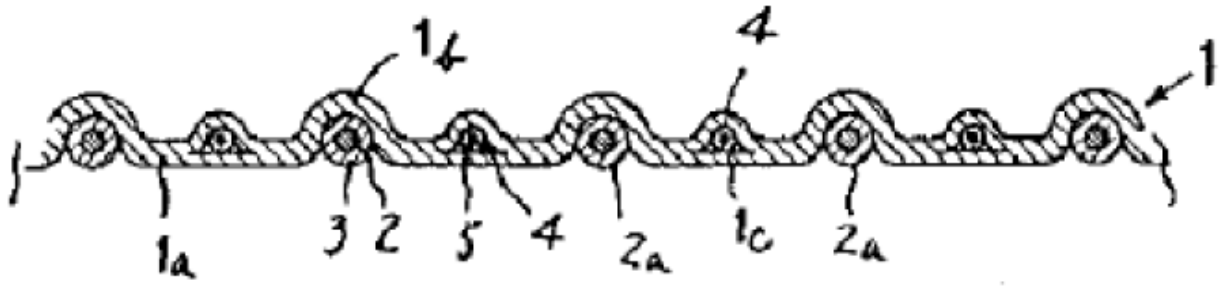
cover of Rohn's vacuum hose 12 thus meets the "thermoplastic cover" claim language and is highlighted below in yellow:



(*Id.* at Fig. 3 (highlighting added).) As seen above, Rohn's vinyl cover includes an "interior surface" and an "exterior surface," and thus meets the claim language "wherein said thermoplastic cover further comprises an interior surface and an exterior surface." (Ex. 1011 at ¶100.)

To the extent that Rohn does not explicitly disclose the claim language requiring the thermoplastic cover to "consist[] essentially of a single layer of thermoplastic material," Nagayoshi discloses or renders obvious this limitation. (Ex. 1011 at ¶¶101-03; Ex. 1012 at ¶¶61-62.) Like Rohn, Nagayoshi discloses a vacuum cleaner suction hose with a steel wire 2 and a resin-covered wire 4. (*See, e.g.*, Ex. 1003 at Title, 4:4-26.) Nagayoshi's hose further includes a single-layer tube wall

1a that is "made of a soft synthetic resin such as polyvinyl chloride [PVC]." (*Id.* at 4:5-7.) As explained above, PVC is a thermoplastic material, such that Nagayoshi's tube wall 1a is a single-layer thermoplastic cover. Nagayoshi's tube wall 1a is shown, for example, in Fig. 2:



(*Id.* at Fig. 2.)

As explained above, for purposes of this review, the term "a single layer of thermoplastic material" should be interpreted to mean "a layer formed by a single covering of thermoplastic material." The tube wall 1a of Nagayoshi is a layer formed using a mandrel-wrapping process, whereby thermoplastic material "in a half-melted state having a certain width . . . is continuously wound in a spiral . . . so an edge portion of the ribbon material wound next overlaps a central portion of the ribbon material wound first." (*Id.* at 5:4-16.) Accordingly, this disclosure of Nagayoshi meets the claim language requiring the thermoplastic cover to "consist[] essentially of a single layer of thermoplastic material." (Ex. 1011 at ¶¶102-03; Ex. 1012 at ¶¶61-62.)

Further, Nagayoshi's tube wall 1a is similar to the covers of the accused

products in the related district court litigation, which include a layer formed by helically wound thermoplastic material that partially overlaps itself (*e.g.*, like tape on a hockey stick). (Ex. 1012 at ¶¶43-45.) Nagayoshi's tube wall 1a is also similar to the covers disclosed in prior art references applied by the Office during prosecution (*see*, *e.g.*, Ex. 1009 at 180) and similar to the covers disclosed in the '127 patent (*see*, *e.g.*, Ex. 1001 at Figs. 3, 5).

The POSITA would be motivated to use Nagayoshi's mandrel-wrapping process to form the hose's cover as a single layer of thermoplastic material. (Ex. 1011 at ¶104; Ex. 1012 at ¶¶64-68.) First, as detailed below with respect to the tenth element of claim 1, Rohn teaches embedding a conductive wire within a thermoplastic cover but includes no disclosure as to how the embedding is achieved. Nagayoshi teaches how to embed a conductive wire within a thermoplastic cover using the mandrel-wrapping technique, and this technique results in the cover being "a single layer of thermoplastic material," as construed herein. Because Nagayoshi teaches the same feature as Rohn (*i.e.*, a conductive wire embedded in a thermoplastic cover), the POSITA would be motivated to use Nagayoshi's mandrel-wrapping technique to achieve the embedding, and the use of this technique would result in a single-layer thermoplastic cover. (Ex. 1011 at ¶104; Ex. 1012 at ¶64.) Accordingly, it would be obvious to the POSITA to use Nagayoshi's mandrel-wrapping process to form the hose's cover as a single layer of thermoplastic material. (*Id.*)

Second, the POSITA would recognize that Nagayoshi's mandrel-wrapping process is the most preferable technique for forming a stretch hose. (Ex. 1012 at ¶¶65-68.) As explained in Mr. Bentley's declaration, the mandrel-wrapping technique was a known technique for forming a stretch hose (*see*, *e.g.*, Ex. 1013 (U.S. Patent No. 6,024,132), Ex. 1014 (GB 1419841)) that provides advantages over other techniques for forming a stretch hose. (Ex. 1012 at ¶¶19-32, 65-68.) For instance, the mandrel-wrapping process has a lower cost, allows a larger number of hoses to be manufactured in a given amount of time, and requires less manual effort than other techniques for manufacturing a stretch hose. (*Id.*) Further, a stretch hose manufactured using the mandrel-wrapping process is typically more flexible than a stretch hose manufactured via other techniques. (*Id.* at ¶65.) Accordingly, in modifying the hose of Rohn to be a stretch hose, the POSITA would be motivated to use Nagayoshi's mandrel-wrapping technique to achieve these advantages, and the mandrel-wrapping technique results in the thermoplastic cover being "a single layer of thermoplastic material," as explained above. (*Id.* at ¶¶61-62, 65-68.) It would thus be obvious to the POSITA to use Nagayoshi's mandrel-wrapping process to form the hose's cover as a single layer of thermoplastic material.

To the extent that Rohn and Nagayoshi do not explicitly disclose the claim language requiring the thermoplastic cover to "hav[e] a thickness of between about 10 mil to 50 about [sic] mil," Martin discloses or renders obvious this limitation.

(Ex. 1011 at ¶105.) Martin's hose includes a thermoplastic tube 10 (*i.e.*, "a thermoplastic cover"). (*See*, *e.g.*, Ex. 1007 at 2:61-68, Figs. 1, 2.) The thermoplastic tube 10 is formed of PVC (*id.* at 2:61-68) and has a thickness of 0.022 to 0.026 inch (22 mil to 26 mil) (*id.* at 6:45-50), thus meeting the claim limitation.

The POSITA would have been motivated to form the Rohn/Martin/Nagayoshi stretch hose with the thermoplastic cover having a thickness of between about 10 mil to about 50 mil, as taught by Martin, and this thickness would be nothing more than an obvious design choice. (Ex. 1011 at ¶¶106-07.) As detailed in Mr. Reed's declaration, for typical household vacuum hose designs, a thermoplastic cover thickness greater than 50 mil would result in hose that is very robust but also inflexible and incapable of stretching. (*Id.* at ¶106.) A thermoplastic cover thickness less than 10 mil (0.01 inch) would result in a hose that is flexible but lacking in durability and subject to tearing caused by bending or stretching the hose. (*Id.*) In designing the Rohn/Martin/Nagayoshi stretch hose, the POSITA would select the thermoplastic cover thickness, in combination with other parameters such as helical wire gauge, to achieve a hose that is flexible but also durable. (*Id*.) The POSITA would recognize that selecting a value within the claimed range would result in a hose having both of these desirable properties, such that the range is nothing more than an obvious design choice. (*Id.* at ¶¶106-07.)

Further, thermoplastic covers with thicknesses within the claimed range of

"between about 10 mil to 50 about [sic] mil" were known in the art at the time of the '127 patent and were disclosed in references besides Martin. (*See*, *e.g.*, Ex. 1008 at 3:68-72; *see also* Ex. 1011 at ¶107.) Additionally, during prosecution of the '127 patent, the Office rejected a dependent claim including the "between about 10 mil to 50 about [sic] mil" limitation as nothing more than an obvious design choice. (Ex. 1009 at 191, 201-03.)

4. Element 4: "a single helical member, capable of retaining its shape in said hose adhered to said interior surface of said thermoplastic cover, said helical member being comprised of a material capable of carrying a current of electricity said helical member being capable of extending when a tensile force of a pulling nature is applied and then retracting to roughly the original shape when a force is not applied said helical member having a gauge between 12 and 21"

Rohn, Nagayoshi, and Martin disclose or render obvious the fourth element of claim 1. Rohn discloses the claim language "a single helical member, capable of retaining its shape in said hose[,] . . . said helical member being comprised of a material capable of carrying a current of electricity." (Ex. 1011 at ¶¶108-10.) Specifically, Rohn discloses a support wire 39 having a helical shape, thus meeting the "helical member" limitation. (Ex. 1004 at 3:20-28 and Fig. 3.) The support 39 is "made from a single strand of resilient steel wire and help[s] to maintain the shape of the vacuum hose and to keep the hose 12 from collapsing inwardly," thus meeting the "capable of retaining its shape in said hose" limitation. (*Id.*) Because the support

wire 39 is made of the conductive metal steel, it further meets the "said helical member being comprised of a material capable of carrying a current of electricity" limitation. (*Id*.; *see also* Ex. 1011 at ¶110.)

Although Rohn's vacuum hose 12 includes two support wires 39a and 39b in embodiments, the reference also discloses that a single support wire 39 is used in other embodiments. (*Id.* at 4:32-37.) Accordingly, Rohn discloses a "single" helical member, as required by the claims. (Ex. 1011 at ¶110.)

To the extent that Rohn does not explicitly disclose the claim language requiring the helical member to be "adhered to said interior surface of said thermoplastic cover," Nagayoshi discloses or renders obvious this limitation. (Ex. 1011 at ¶111.) Specifically, Nagayoshi discloses a steel wire 2 that has a helical shape and is adhered to an interior surface of the tube wall 1a. (Ex. 1003 at 4:8-14.) The POSITA would have been motivated to form the Rohn/Martin/Nagayoshi stretch hose with this feature. (*Id.* at ¶112.) The POSITA would recognize that it is not unusual for vacuum cleaner users to sharply flex the vacuum's stretch hose in performing certain cleaning tasks. (*Id.*) Accordingly, the stretch hose should be constructed such that the helical member does not slip out of folds in the thermoplastic cover when such flexing occurs. (*Id.*) The POSITA would recognize that adhering the helical member to the interior surface of the thermoplastic cover is a simple, effective way of achieving this goal that was well-known in the art at the time

of the '127 patent. (*Id*.)

To the extent that Rohn and Nagayoshi do not explicitly disclose the claim language "said helical member being capable of extending when a tensile force of a pulling nature is applied and then retracting to roughly the original shape when a force is not applied said helical member having a gauge between 12 and 21," Martin discloses or renders obvious these limitations. (Ex. 1011 at ¶¶113-16.) Martin discloses a steel reinforcing element 11 that is "cylindrically spirally wound" and capable of retaining its shape in the hose. (Ex. 1007 at 2:61-72, 6:40-45.) The reinforcing element 11 has a diameter of 0.058 inch, which equates to a steel wire gauge between 16-17 and thus meets the claim limitation "said helical member having a gauge between 12 and 21." (Ex. 1007 at 6:40-45; *see also* Ex. 1011 at ¶113.)

Further, Martin's hose can be "stretched or extended to three or four times its static unextended normal length, the amount of stretch depending upon the stretch given to the reinforcing element 11 during the manufacture of the hose as will presently appear" (*id.* at 3:67-73), thus meeting the limitation "said helical member being capable of extending when a tensile force of a pulling nature is applied." (Ex. 1011 at ¶114.) Martin also states that "[u]pon release the hose 9 will return to its fully contracted position" (*id.* at 3:23-26), thus meeting the limitation "said helical member . . . then retracting to roughly the original shape when a force is not applied." (*See also id.* at 3:1-16, 3:17-32, 3:52-55, 4:23-30, 6:33-37; Ex. 1011 at ¶114.) Further, the

APA of the '127 patent acknowledges that stretch hoses were already known, and that in these known stretch hoses, "[o]nce the extra length of hose is no longer needed the stretched hose retracts to its normal, more compact configuration." (Ex. 1001 at 2:43-57.)

As explained in Section V.A.1 above, the POSITA would have been motivated to make the Rohn/Martin/Nagayoshi hose as a stretch hose with the claimed extension and retraction properties, as taught by Martin and the APA. (Ex. 1011 at ¶¶93-95, 115.) Further, the POSITA would have been motivated to form the Rohn/Martin/Nagayoshi stretch hose with the helical member having a gauge between 12 and 21, as taught by Martin. (Ex. 1011 at ¶¶115-16.) As explained in Mr. Reed's declaration, the claimed range encompasses all practical gauge values for a helical wire of a stretch hose, as well as some values that are not practical. (*Id.* at ¶115.) Covering such an expansive range, it would be obvious to the POSITA to choose a value within the claimed range in designing the Rohn/Martin/Nagayoshi stretch hose. (*Id.*) Helical members with gauges within the claimed range of "between 12 and 21" were known in the art at the time of the '127 patent and were disclosed in references besides Martin. (*See*, *e.g.*, Ex. 1015 (U.S. Patent No. 4,693,324) at 1:66-2:1.) Additionally, during prosecution of the '127 patent, the Office rejected a dependent claim including the "helical member having a gauge between 12 and 21" limitation as nothing more than an obvious design choice. (Ex. 1009 at 191, 201-03.)

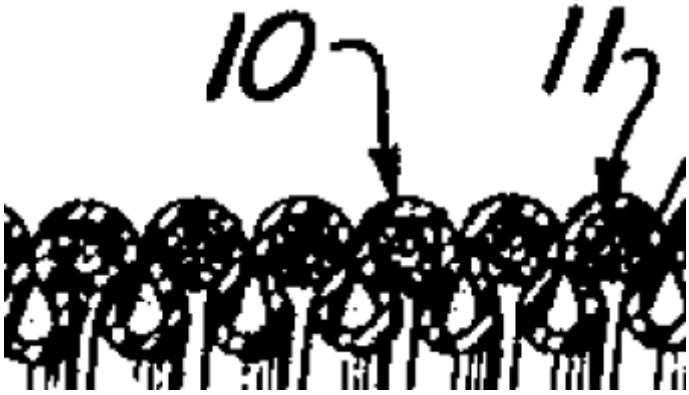
5. Element 5: "a plurality of peaks and valleys in said thermoplastic cover caused by said helical member, said peaks having a distance between them"

Rohn discloses or renders obvious the fifth element of claim 1. (Ex. 1011 at ¶¶117-19; Ex. 1012 at ¶¶69-71.) The vinyl cover of Rohn's vacuum hose 12 includes a plurality of rib portions 34 (*i.e.,* "peaks") and inner surfaces 43 (*i.e.,* "valleys"), thus meeting the claim language "a plurality of peaks and valleys in said thermoplastic cover." (Ex. 1004 at 3:16-24, 4:33-5:1, 5:8-20, 5:54-62, Figs. 3 and 4.) The rib portions 34 have a distance between them, thus meeting the claim language "said peaks having a distance between them." (*See id.*) Further, the rib portions 34 and inner surfaces 43 are caused by the support wire 39, thus meeting the claim language requiring the peaks and valleys to be "caused by said helical member." (*Id.* at 3:20-24; *see also id.* at 4:33-37; Ex. 1011 at ¶¶117-19; Ex. 1012 at ¶¶69-71.)

6. Element 6: "said helical member being interconnected by sidewalls that extend at an angle to the peaks and valleys wherein when said hose is in a retracted condition, the valleys generally U-shaped and when a pulling force is applied to a section of said hose, the valleys become wider and the angle of the sidewalls stay generally the same"

Martin discloses or renders obvious the sixth element of claim 1. (Ex. 1011 at ¶¶120-28.) This element recites, *inter alia*, "said helical member being

interconnected by sidewalls."[3] When the hose of Martin is in the retracted condition, adjacent corrugations caused at least in part by the reinforcing element 11 (*i.e.*, "helical member") are in contact with each other via their sidewalls. (Ex. 1007 at 3:1-40; Ex. 1011 at ¶122.) This is shown, for example, in Fig. 1:



(Ex. 1007 at Fig. 1.) The accused products in the related district court litigation also have adjacent corrugations that are in contact with each other at their sidewalls, similar to what is seen above in Martin.[4] (*See* Ex. 1010 at 11-15 and Exhibit C to the complaint.) For purposes of this proceeding, FTI's interpretation of the limitation "said helical member being interconnected by sidewalls" should apply, and Martin

[3] The specification of the '127 patent describes a hose having sidewalls 13 that interconnect peaks 11 and valleys 12 (Ex. 1001 at 4:4-7) but includes no description of sidewalls that interconnect a helical member.

[4] Petitioner disagrees with FTI's contention that this configuration meets the "said helical member being interconnected by sidewalls" limitation.

therefore meets the limitation. *See*, *e.g.*, *Hulu*, IPR2015-00625, Paper No. 8 at 5-6.

As seen in the portion of Fig. 1 reproduced above and in Fig. 2 of Martin, the sidewalls of the corrugations "extend at an angle to the peaks and valleys," as required by the claim. (Ex. 1011 at ¶123.) Further, as seen in the portion of Fig. 1 reproduced above, when Martin's hose is in the retracted condition, the valleys are generally U-shaped, thus meeting the claim language "wherein when said hose is in a retracted condition, the valleys [are] generally U-shaped." (*Id.*)

When a pulling force is applied to a section of Martin's hose, "the valleys become wider," as required by the claims:

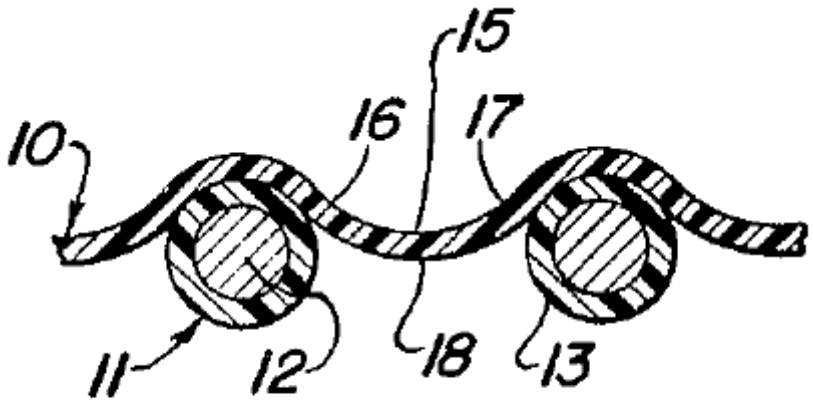


Fig. 2

(*Id.* at Fig. 2; Ex. 1011 at ¶¶124-25.)

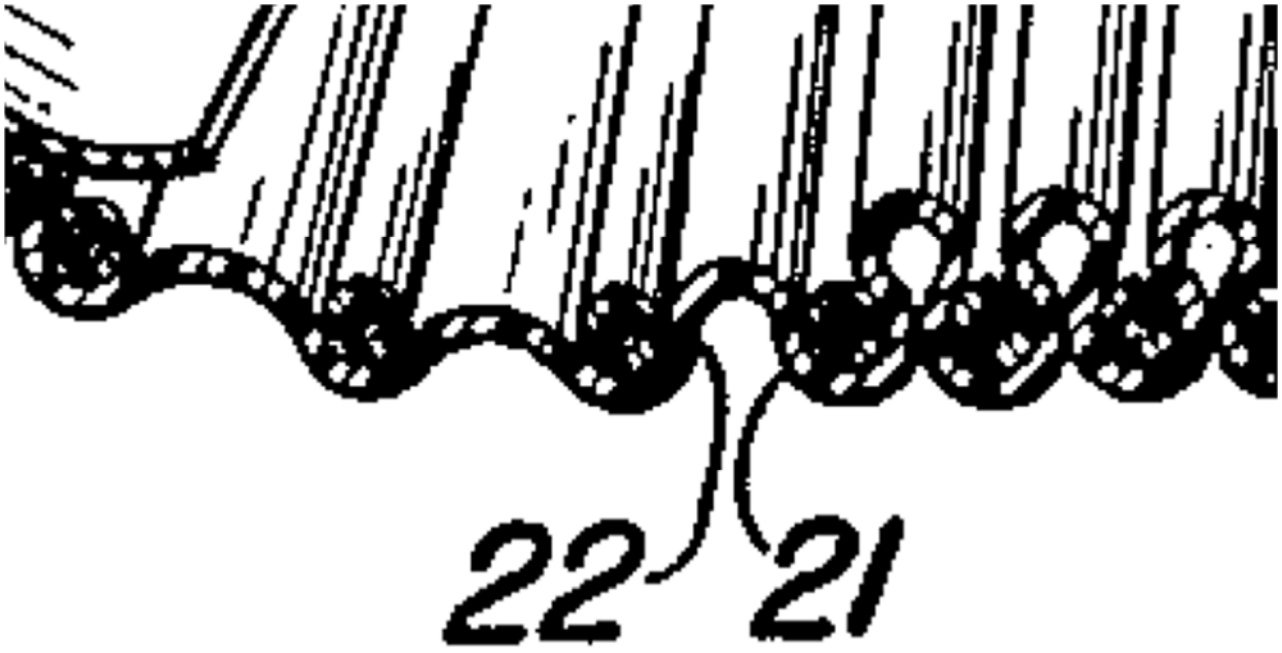
It would have been obvious to the POSITA to form the Rohn/Martin/Nagayoshi stretch hose with these features of the sixth element of claim 1, as taught by Martin.

(Ex. 1011 at ¶126.) Specifically, in modifying the hose of Rohn to make it a stretch hose, as proposed herein, these features would necessarily result. (*Id.*) The extensibility of a stretch hose is a result of pleating the hose cover to allow it to more readily stretch axially along the length of the hose. (*Id.* at ¶¶48, 126.) Further, pleating the hose cover reduces stiffness in the hose and thus enables the hose to be flexible enough between the helix spirals to allow it to collapse when a pulling force is removed from the hose. (*Id.*) In forming the Rohn hose with the pleating properties of a stretch hose, the hose would necessarily have the above-described features of the sixth element of claim 1, *i.e.*, adjacent corrugations of the hose would be in contact in the retracted condition, and the valleys between corrugations would have the properties recited in the claims. (*Id*.) Because these features are present in all stretch hoses, it would have been obvious to the POSITA to form the Rohn/Martin/Nagayoshi stretch hose with these features. (*Id.*)

The sixth element of claim 1 further recites that when a pulling force is applied to a section of the hose, "the angle of the sidewalls stay generally the same." Although the meaning of this limitation is not clear from the specification,[5] the Office

[5] The specification and figures of the '127 patent do not clearly indicate where the sidewalls start and end, nor do they provide any indication as to which angle or portion of the sidewalls must "stay generally the same." Further, the word

found that it was met when "at least the upper part of the sidewalls stays 'generally' the same." (Ex. 1009 at 76-78.) That is exactly what Martin discloses:



(Ex. 1007 at Fig. 1; Ex. 1011 at ¶127.) The picture above is a magnified portion of Martin's Fig. 1 showing one part of the hose in a retracted condition (right side), and another part of the hose in an extended condition (left side). As seen above, in transitioning from the retracted portion to the extended portion, at least the angles of the upper parts of the sidewalls stay generally the same.[6] Thus, in Martin, when the

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"generally" is a term of degree, but the specification provides no standard for measuring that degree.

[6] The Office's reference to "upper part[s] of the sidewalls" (Ex. 1009 at 76-78)

pulling force is applied, at least the angles of the upper parts of the sidewalls stay generally the same. (Ex. 1011 at ¶127.)

When the specification fails to provide guidance on the meaning of a limitation, the limitation should be interpreted broadly under the broadest reasonable interpretation (BRI) standard. *See*, *e.g.*, *Kamada, Ltd. v. Grifols Therapeutics Inc.*, IPR2014-00899, Paper No. 43 at 14 (PTAB Dec. 15, 2015); *see also Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1581 (Fed. Cir. 1996). Here, because the meaning of "the angle of the sidewalls stay generally the same" is not clear from the specification, the limitation should be interpreted broadly, as the Office did during original prosecution. Martin meets the limitation, as interpreted by the Office, for at least the above reasons. Further, the disclosure of the references applied by the Office to meet this limitation (*see*, *e.g.*, Ex. 1009 at 76-78) is very similar to that of Martin, further evidencing that Martin meets it. (*See*, *e.g.*, Ex. 1002 (Kanao) at Figs. 2 and 3, as applied by the Office.)

Additionally, as explained by Mr. Reed, the hose configuration of Rohn is nearly identical to that of the '127 patent, and therefore, when Rohn is implemented as

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appears to refer to sidewall parts near the exterior portion of the hose. Thus, in the portion of Martin's Fig. 1 shown above, the upper parts are depicted near the bottom of the illustration.

a stretch hose, it necessarily includes the feature "the angle of the sidewalls stay generally the same." (Ex. 1011 at ¶128.) As Mr. Reed further explains, what is shown above in Martin for the sixth element is present in the mandrel-wrapped stretch hose formed by the combination of Rohn, Nagayoshi, and Martin. (*Id.* at ¶¶120-28.)

7. Element 7: "the distance from one peak to an adjacent peak in the hose is about ¼″ to ¾″ when there is no pulling force on a section of said hose and the distance from one peak to an adjacent peak is about ½″ to 2″ when a pulling force is placed on a section of said hose"

Martin discloses or renders obvious the seventh element of claim 1. (Ex. 1011 at ¶¶129-34.) Martin indicates that a distance from one peak to an adjacent peak in the hose is approximately 0.55 inches when a pulling force is applied. (Ex. 1007 at 4:42-47.) This peak-to-peak distance meets the "½″ to 2″" limitation. (Ex. 1011 at ¶131.)

To the extent that Martin does not explicitly disclose "the distance from one peak to an adjacent peak in the hose is about ¼″ to ¾″ when there is no pulling force on a section of said hose," this limitation is nothing more than an obvious design choice. (Ex. 1011 at ¶132.) As explained in Mr. Reed's declaration, given the breadth of the claimed range, the selection of typical thermoplastic cover thicknesses and wire gauges for a stretch hose's helical member and conductive wire would yield a peak-to-peak distance within the claimed range. (*Id.*) The claimed range is thus nothing more than an obvious design choice. (*Id.*) Further, the expansiveness of the

range makes the claim feature essentially non-limiting, such that it should be given little to no patentable weight. (*Id*.)

Additionally, peak-to-peak distances within the claimed range of "about ¼″ to ¾″" were known in the art at the time of the '127 patent (*see*, *e.g.*, Ex. 1006 (U.S. Patent No. 2,822,857 to Rothermel) at 6:40-46), and the Office recognized during prosecution that the range was nothing more than an obvious design choice (Ex. 1009 at 191, 201-03). Neither the '127 patent nor its file history provide any evidence that the claimed range of "about ¼″ to ¾″" is critical or produces new or unexpected results. (*See generally* Exs. 1001, 1009.)

In any case, Martin meets the limitation "the distance from one peak to an adjacent peak in the hose is about ¼″ to ¾″ when there is no pulling force on a section of said hose." (Ex. 1011 at ¶133.) In embodiments, Martin's hose can be stretched to a length that is approximately two times its at-rest length (Ex. 1007 at 6:33-37), and the hose has a peak-to-peak distance of approximately 0.55 inches when a pulling force is applied (*id.* at 4:42-47). For this hose, a peak-to-peak distance of approximately 0.275 inches when there is no pulling force on the hose would be required, such that the extended peak-to-peak distance of 0.55 inches could be achieved upon stretching. (Ex. 1011 at ¶133.) Martin's peak-to-peak distance of approximately 0.275 inches meets the claimed range of "about ¼″ to ¾″."

The POSITA would have been motivated to form the Rohn/Martin/Nagayoshi

stretch hose with peak-to-peak distances within the claimed ranges. (Ex. 1011 at ¶134.) Because non-extended peak-to-peak distances within the claimed range of about ¼″ to ¾″ result naturally from the selection of typical cover thicknesses and wire gauges for a stretch hose's helical member and conductive wire (as explained above), it would have been obvious to the POSITA to form the Rohn/Martin/Nagayoshi stretch hose with a non-extended peak-to-peak distance within this range. (*Id*.) Further, implementing the Rohn/Martin/Nagayoshi stretch hose with a stretch ratio typically used at the time of the '127 patent would result in an extended peak-to-peak distance within the claimed range of about ½″ to 2″. (*Id.*) The APA of the '127 patent states that prior art stretch hoses "typically can stretch a distance 2 to 6 times its at rest length." (Ex. 1001 at 2:44-46.) Typical combinations of (i) non-extended peak-to-peak distance within the range of about ¼″ to ¾″, and (ii) stretch ratio in the typical range of 2 to 6 result in extended peak-to-peak distances within the range of about ½″ to 2″. (Ex. 1011 at ¶134.) Because these extended peak-to-peak distances result from the selection of typical cover thicknesses, stretch hose wire gauges, and stretch ratios, it would have been obvious to the POSITA to form the Rohn/Martin/Nagayoshi stretch hose with an extended peak-to-peak distance within the claimed range. (*Id.*)

8. Element 8: "wherein the length of said hose in said extended condition is about two to about six times greater than the length in said retracted position"

Martin discloses or renders obvious the eighth element of claim 1. (Ex. 1011 at ¶¶135-37.) Martin's hose, "by the application of a 6-pound axial pull can be stretched to 165 inches and when the force is released it will return to a free length of 77 inches . . . ." (Ex. 1007 at 6:33-37), thus meeting the claim element. (*See also id.* at 3:67-73; Ex. 1011 at ¶136.) This element is also disclosed in APA of the '127 patent, which states that prior art stretch hoses "typically can stretch a distance 2 to 6 times [their] at rest length." (Ex. 1001 at 2:44-46.)

The POSITA would have been motivated to form the Rohn/Martin/Nagayoshi stretch hose with a stretch ratio within the range of "about two to about six," as taught by Martin and the APA. (Ex. 1011 at ¶137.) For typical home vacuum cleaner hose designs, a stretch hose ratio less than two would result in a hose with good airflow but relatively poor stretch capabilities. (*Id.*) A stretch hose ratio greater than six would result in a hose with excellent stretch capabilities but poor airflow, due to the excessive pleating of the hose cover required to achieve this stretchability. (*Id.*) In designing the Rohn/Martin/Nagayoshi stretch hose, the POSITA would select the stretch ratio to achieve a hose that can stretch an adequate amount while also maintaining acceptable airflow. (*Id.*) The POSITA would recognize that selecting a value within the claimed range of "about two to about six" would result in a hose

having both of these desirable properties, such that the range is nothing more than an obvious design choice. (*Id.*) Further, the APA of the '127 patent indicates that the claimed range was well known and an obvious, typical design choice. (Ex. 1001 at 2:44-46.)

9. Element 9: "a conductor wire, capable of carrying a current of electricity with a gauge in the range of about 10 to about 30 said conductive wire being disposed on at least one side of said helical member"

Rohn discloses or renders obvious the ninth element of claim 1. (Ex. 1011 at ¶¶138-43.) Rohn discloses the claim language "a conductor wire, capable of carrying a current of electricity . . . disposed on at least one side of said helical member." Rohn's conductor 37a is disposed on at least one side of the support wire 39 and thus meets the claim language "a conductor wire . . . disposed on at least one side of said helical member." (Ex. 1004 at 3:20-28, Fig. 3). The conductor 37a is described as being "current carrying" and thus meets the claim language "capable of carrying a current of electricity." (*Id.*; *see also id.* at 3:64-4:18; Ex. 1011 at ¶140.)

To the extent that Rohn does not explicitly disclose the claim language requiring the conductor wire to have "a gauge in the range of about 10 to about 30," this feature is an obvious design choice and should be given little to no patentable weight. (Ex. 1011 at ¶¶141-43.) As explained in Mr. Reed's declaration, the claimed range encompasses all practical gauge values for a conductor wire of a stretch vacuum hose, as well as some values that are not practical. (*Id.* at ¶141.) Covering such an

expansive range, it would be obvious to the POSITA to choose a value within the claimed range in designing the Rohn/Martin/Nagayoshi stretch hose. (*Id.*) Further, given the range's breadth, the claim feature is essentially non-limiting and should be given little to no patentable weight. (*Id.*) Conductive wires with gauges within the claimed range of "about 10 to about 30" were well known in the art at the time of the '127 patent. (*See*, *e.g.*, Ex. 1002 (Kanao) at 4:55-56 and Ex. 1008 (Duff) at 3:73-75.) Neither the '127 patent nor its file history provide any evidence that the claimed range of "about 10 to about 30" is critical or produces new or unexpected results (*see generally* Exs. 1001 and 1009), and during prosecution of the '127 patent, the Office recognized that this limitation was nothing more than an obvious design choice (*see*, *e.g.*, Ex. 1009 at 191, 201-03).

10. Element 10: "said thermoplastic cover having been extruded around said conductive wire"

Rohn and Nagayoshi disclose or render obvious the tenth element of claim 1. (Ex. 1011 at ¶¶144-48; Ex. 1012 at ¶63.) In Rohn's vacuum hose 12, the conductor 37a (*i.e.*, the "conductive wire") is embedded within the vinyl cover (*i.e.*, the "thermoplastic cover"). (Ex. 1004 at Fig. 3.) In forming the Rohn/Martin/Nagayoshi stretch hose, the POSITA would be motivated to use the embedded wire feature of Rohn to achieve abrasion resistance for the wire, improved hose durability, and decreased accumulation of dust within the interior portion of the hose. (*See*, *e.g.*, *id.* at 6:29-7:4; Ex. 1011 at ¶146.)

To the extent that Rohn does not explicitly disclose the claim language requiring the thermoplastic cover to be "extruded around said conductive wire," Nagayoshi discloses this limitation. (Ex. 1011 at ¶147; Ex. 1012 at ¶63.) Nagayoshi states that its resin-covered wire 4 is embedded within the tube wall 1a. (Ex. 1003 at 4:15-19, 5:4-16.) The tube wall 1a is made of thermoplastic material that is helically wound, and the resin-covered wire 4 is disposed between a preceding winding and a successive winding that partially overlaps the preceding winding. (*Id.* at 5:4-16.) This disclosure meets the "thermoplastic cover having been extruded around said conductive wire" limitation, as construed herein. (Ex. 1011 at ¶147; Ex. 1012 at ¶63.) Additionally, the embedding of the resin-covered wire 4 in the tube wall 1a is similar to the accused products in the related district court litigation (*see* Ex. 1010 (complaint) at 11-15 and Exhibit C to the complaint), which further evidences that Nagayoshi meets this limitation. (Ex. 1012 at ¶¶43-45.)

In modifying the hose of Rohn to make it a stretch hose, the POSITA would be motivated to use Nagayoshi's teaching of how to embed a conductive wire within a single-layer thermoplastic cover. (Ex. 1011 at ¶147; Ex. 1012 at ¶¶64-68.) Rohn teaches embedding a conductive wire within a thermoplastic cover (*see*, *e.g.*, Ex. 1004 at Fig. 3) but includes no disclosure as to how the embedding is achieved. Nagayoshi also teaches embedding a conductive wire within a thermoplastic cover and provides a detailed description of how to achieve the embedding using the

mandrel-wrapping technique. Because Nagayoshi teaches the same feature as Rohn (*i.e.*, an embedded conductive wire), the POSITA would be motivated to use Nagayoshi's mandrel-wrapping technique to achieve this feature. Additionally, as explained above, the POSITA would recognize that Nagayoshi's mandrel-wrapping process is the most preferable technique for forming a stretch hose and would thus be motivated to use this technique to form the stretch hose and achieve the embedded conductive wire shown in Rohn. (Ex. 1012 at ¶¶64-68.) Indeed, the '127 patent teaches that a mandrel is used to manufacture its hose and states that use of the mandrel is "well known in the art." (Ex. 1011 at 4:57-65.)

Independent claim 1 is obvious over Rohn in view of Martin and Nagayoshi for at least these reasons. (*See also* Ex. 1011 at ¶¶81-87.)

B. Independent Claim 1 Is Obvious Over Rohn in View of Kanao and Nagayoshi

1. Preamble

To the extent that the preamble of claim 1 is limiting, Rohn and Kanao disclose it or render it obvious. Rohn discloses the claim language "[a] flexible hose for carrying fluids," as explained in Section V.A.1 above. (Ex. 1011 at ¶154.)

The remaining claim language of the preamble is disclosed by Kanao, as well as the APA set forth in the Background section of the '127 patent (*see, e.g.*, Ex. 1001 at 2:43-44). (Ex. 1011 at ¶155.) Kanao discloses a stretch hose that is in a retracted or extended condition depending on whether a tensile force is placed on it. (Ex. 1002

at 1:5-9, 2:53-3:2, 6:55-7:8.) Specifically, Kanao's stretch hose includes "extension/contraction zones" that are in a retracted condition when no tensile force is placed on the hose. (*See id.* at 2:53-3:2, 4:5-11, 6:55-7:8, Fig. 4.) By contrast, when a tensile force of a pulling nature is placed on the extension/contraction zones, these zones are in an extended condition. (*Id.* at 2:60-62; *see also id.* at 7:3-8.)

The POSITA would have been motivated to modify the hose of Rohn to make it a stretch hose for at least the reasons provided above in Section V.A.1. (Ex. 1012 at ¶156.)

2. Elements 1 and 2[7]

Rohn discloses or renders obvious the first and second elements of claim 1 as explained above in Section V.A.2. (Ex. 1011 at ¶¶157-58.)

3. Element 3

Rohn, Nagayoshi, and Kanao disclose or render obvious the third element of claim 1. Rohn discloses the claim language "a thermoplastic cover . . . wherein said thermoplastic cover further comprises an interior surface and an exterior surface," as explained in Section V.A.3 above. (Ex. 1011 at ¶161.)

To the extent that Rohn does not explicitly disclose the claim language

[7] The text of elements 1-10 of claim 1 is presented above with reference to the Rohn/Martin/Nagayoshi ground.

requiring the thermoplastic cover to "consist[] essentially of a single layer of thermoplastic material," Nagayoshi discloses or renders obvious this limitation, as explained above in Section V.A.3. (Ex. 1011 at ¶162; Ex. 1012 at ¶¶61-62.) In modifying the hose of Rohn to be a stretch hose, the POSITA would have been motivated to use Nagayoshi's mandrel-wrapping process to form the hose's cover as a single layer of thermoplastic material, as explained above in Section V.A.3. (Ex. 1011 at ¶162; Ex. 1012 at ¶¶64-68, 75.)

To the extent that Rohn and Nagayoshi do not explicitly disclose the claim language requiring the thermoplastic cover to "hav[e] a thickness of between about 10 mil to 50 about [sic] mil," as explained above in Section V.A.3, this limitation is nothing more than an obvious design choice, and the POSITA would be motivated to implement a stretch hose with the thermoplastic cover thickness within the claimed range. (Ex. 1011 at ¶163.) In any case, Kanao discloses the limitation. (*Id.* at ¶¶164-66.) In the embodiment of Kanao's Figs. 1-4, the cleaner hose has a hose wall 6 that is a single layer. (Ex. 1002 at 2:44-45.) The hose wall 6 of Kanao is made of polyvinyl chloride (PVC) (*id.* at 3:53-59) and is a layer formed using a mandrel-wrapping process (*id.* at 3:57-4:11). (Ex. 1011 at ¶164.)

Although Kanao does not disclose the thickness of the hose wall 6, other hose walls of Kanao are described as having a thickness of between about 10 mil (0.254 mm) to about 50 mil (1.27 mm). (Ex. 1011 at ¶165.) The embodiment of

Figs. 6 and 7 includes a hose wall "constituted by an inner layer 6a and an outer layer 6b." (Ex. 1002 at 4:34-41; *see also id.* at Figs. 6 and 7.) The inner and outer layers 6a, 6b have thicknesses of 0.35 mm and 0.25 mm, respectively (*id.* at 4:63-66), such that the hose wall has a total thickness equal to approximately 0.60 mm (23.6 mil), which reads on the limitation. (*See id.*; Ex. 1011 at ¶165.)

The POSITA would have been motivated to combine the embodiment of Kanao Figs. 1-4 with the embodiment of Kanao Figs. 6 and 7. (Ex. 1011 at ¶166.) Specifically, the POSITA would have been motivated to implement the single-layer hose wall 6 with a thickness of approximately 0.60 mm because Kanao indicates that this hose wall thickness is suitable for making a stretch hose (*see* Ex. 1002 at 1:35-55, 1:58-3:2, 6:44-7:8), and the POSITA would recognize that the thickness of 0.60 mm would work equally well with both the double- and single-layer constructions. (Ex. 1011 at ¶166.) The POSITA would further recognize that the respective embodiments of Figs. 1-4 and Figs. 6 and 7 are very similar and would thus be motivated to use features from one embodiment in the other. (*Id.*)

4. Element 4

Rohn and Kanao disclose or render obvious the fourth element of claim 1. Rohn discloses the claim language "a single helical member, capable of retaining its shape in said hose[,] . . . said helical member being comprised of a material capable of carrying a current of electricity," as explained above in Section V.A.4. (Ex. 1011 at

¶169.)

The remaining claim language of the fourth element is disclosed or rendered obvious by Kanao. (Ex. 1011 at ¶¶170-75.) Kanao discloses a steel reinforcement wire material 1 that has a helical shape and is capable of retaining its shape in the hose. (Ex. 1002 at Figs. 1-3, 1:5-23; 3:44-52. Abstract.)

Kanao's reinforcement wire material 1 is adhered to the interior surface of the hose wall 6, thus meeting the claim language "adhered to said interior surface of said thermoplastic cover." (*Id.* at 4:42-44, Figs. 1-3; Ex. 1011 at ¶170.) In modifying the hose of Rohn to be a stretch hose, the POSITA would have been motivated to adhere the helical member to the interior surface of the thermoplastic cover to ensure that the helical member does not slip out of folds in the thermoplastic cover when flexing occurs, as explained above in Section V.A.4. (Ex. 1011 at ¶170.)

Additionally, Kanao's reinforcement wire material 1 has "a diameter of about 1 mm," which equates to a gauge of 19 steel wire gauge and thus meets the claim language "said helical member having a gauge between 12 and 21." (Ex. 1002 at 4:42-44, Figs. 1-3; Ex. 1011 at ¶171.) The POSITA would have been motivated to form the Rohn/Kanao/Nagayoshi stretch hose with the helical member having a gauge within the claimed range, as taught by Kanao, for the same reasons discussed above in Section V.A.4 with respect to the Rohn/Martin/Nagayoshi stretch hose. (Ex. 1011 at ¶171.)

The reinforcement wire material 1 of Kanao is "capable of extending when a tensile force of a pulling nature is applied and then retracting to roughly the original shape when a force is not applied," as required by claim 1. (Ex. 1011 at ¶¶172-74.) Specifically, the reinforcement wire material 1 is a component of the hose's extension/contraction zones and "can be extended in the direction of the hose axis by pulling the hose," thus meeting the limitation "said helical member being capable of extending when a tensile force of a pulling nature is applied." (Ex. 1002 at 2:53-3:2, 3:36-4:11, 6:55-7:8 Figs. 1-4; *see also* Section V.B.1 above.) Further, the reinforcement wire material 1 is made of "hard steel wire" that "keep[s] the shape of the hose body," thus meeting the claim language requiring the helical member to "retract[] to roughly the original shape when a force is not applied." (*Id.* at 1:5-23, 3:44-52, 3:64-66;Ex. 1011 at ¶172.) Further, the APA of the '127 patent acknowledges that stretch hoses were already known, and that in these known stretch hoses, "[o]nce the extra length of hose is no longer needed the stretched hose retracts to its normal, more compact configuration." (Ex. 1001 at 2:43-57.)

To the extent that FTI disputes that the reinforcement wire material 1 of Kanao retracts to roughly the original shape when a force is not applied, that argument is belied by the similar disclosures of the '127 patent and Kanao. (Ex. 1011 at ¶¶173-74.) Kanao's reinforcement wire material 1 is identical to the helical member of the '127 patent in all relevant respects, with both helices being coated steel wires and

having the same gauge. (Ex. 1001 at 4:29-31, 4:66-5:1; Ex. 1002 at 3:44-52.) Accordingly, Kanao's reinforcement wire material 1 is capable of retracting to roughly its original shape when a force is not applied, just as the '127 patent's helical member is. (Ex. 1011 at ¶¶173-74.)

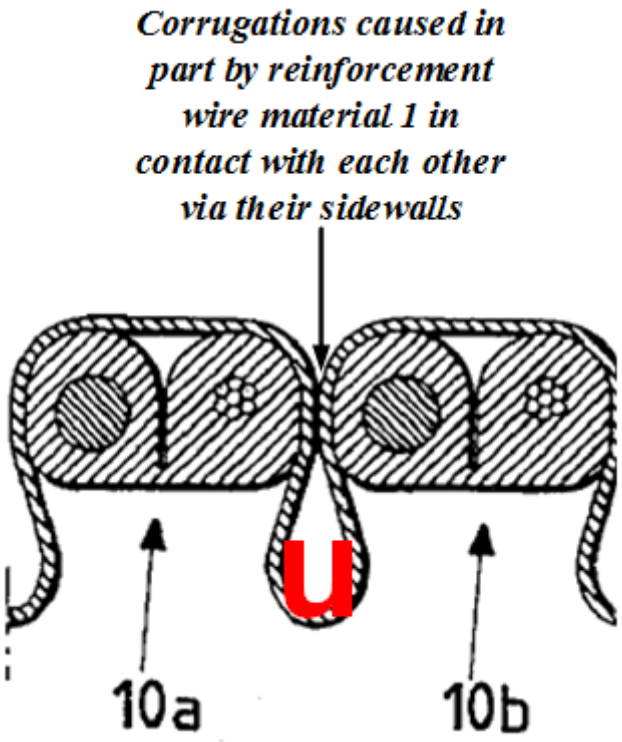
In modifying the hose of Rohn to be a stretch hose, the POSITA would have been motivated to implement the stretch hose with the claimed extension and retraction properties taught by Kanao for the reasons provided above in Section V.A.1. (Ex. 1011 at ¶175.)

5. Element 5

Rohn discloses or renders obvious the fifth element of claim 1, as explained in Section V.A.1 above. (Ex. 1011 at ¶¶176-77.)

6. Element 6

Kanao discloses or renders obvious the sixth element of claim 1. (Ex. 1011 at ¶¶178-84.) This element recites, *inter alia*, "said helical member being interconnected by sidewalls." When the hose of Kanao is in the retracted condition, adjacent corrugations caused at least in part by the reinforcement wire material 1 (*i.e.*, "helical member") are in contact with each other via their sidewalls. This is shown, for example, in Fig. 3:

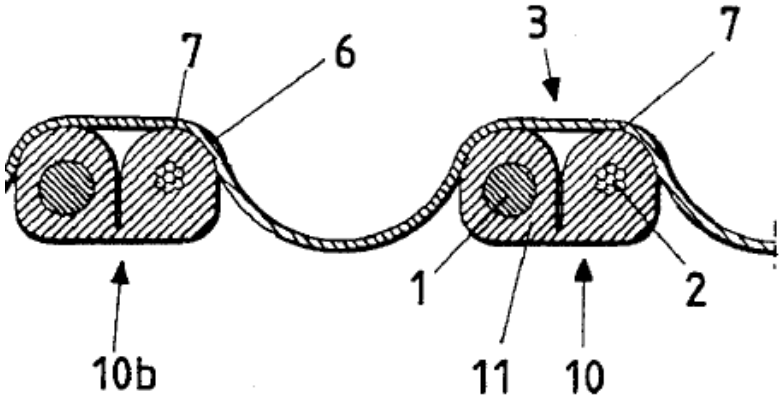


(Ex. 1002 at Fig. 3 (annotations added); Ex. 1011 at ¶180.) The accused products in the related district court litigation also have adjacent corrugations that are in contact with each other at their sidewalls, similar to what is seen above in Kanao. (Ex. 1012 at ¶¶43-45.) For purposes of this proceeding, FTI's interpretation of the limitation "said helical member being interconnected by sidewalls" should apply, and Kanao therefore meets the limitation. *See*, *e.g.*, *Hulu*, IPR2015-00625, Paper No. 8 at 5-6.

As seen in the portion of Fig. 3 reproduced above and in Fig. 2 of Kanao, the sidewalls of the corrugations "extend at an angle to the peaks and valleys," as required by the claim. (Ex. 1011 at ¶181.) Further, as seen in the portion of Fig. 3 reproduced above, when Kanao's hose is in the retracted condition, the valleys are generally U-shaped, thus meeting the claim language "wherein when said hose is in a retracted

condition, the valleys generally U-shaped." (*Id.*)

When a pulling force is applied to a section of Kanao's hose, "the valleys become wider," as required by the claims:

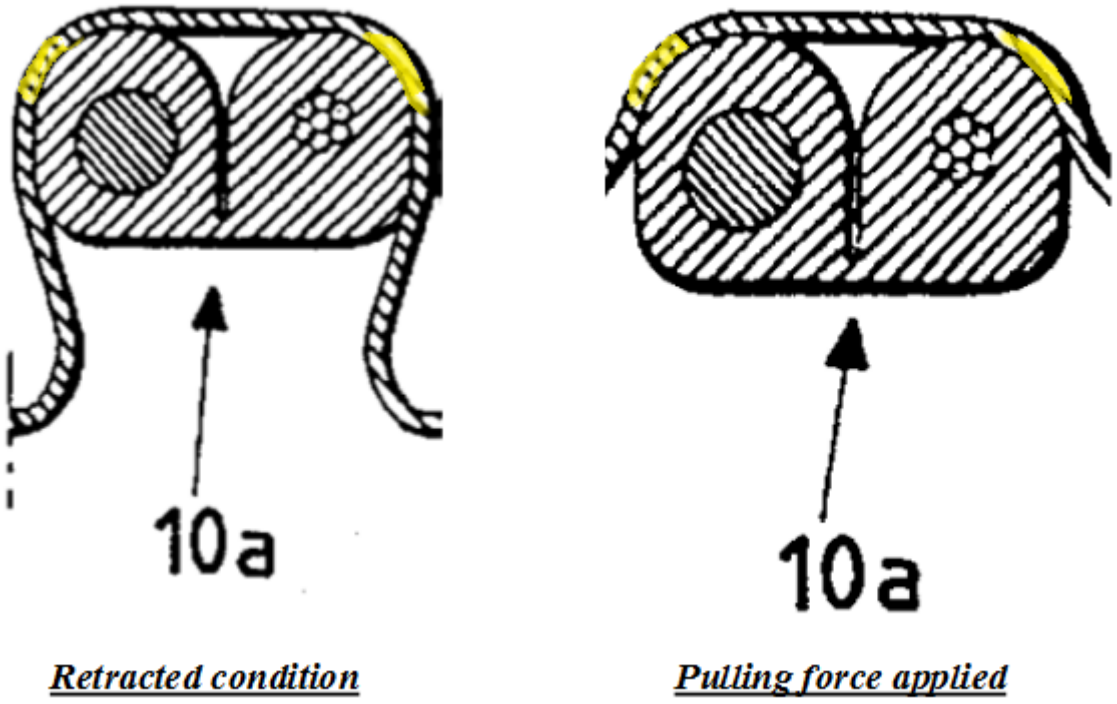


(Ex. 1002 at Fig. 2; Ex. 1011 at ¶181.)

It would have been obvious to the POSITA to form the Rohn/Kanao/Nagayoshi stretch hose with these features of the sixth element of claim 1, as taught by Kanao. Specifically, in modifying the hose of Rohn to make it a stretch hose, as proposed herein, these features would necessarily result, as explained above in Section V.A.6. (Ex. 1011 at ¶181.) Accordingly, it would have been obvious to the POSITA to form the Rohn/Kanao/Nagayoshi stretch hose with these features. (*Id.*)

The sixth element of claim 1 further recites that when a pulling force is applied to a section of the hose, "the angle of the sidewalls stay generally the same." During original prosecution, the Office addressed this limitation and concluded that Kanao meets it. (Ex. 1009 at 76.) As recognized by the Office, when a pulling force is applied to Kanao's hose, at least the upper parts of the sidewalls stay generally the

same. The upper parts of the sidewalls that stay generally the same are shown in yellow highlighting below:



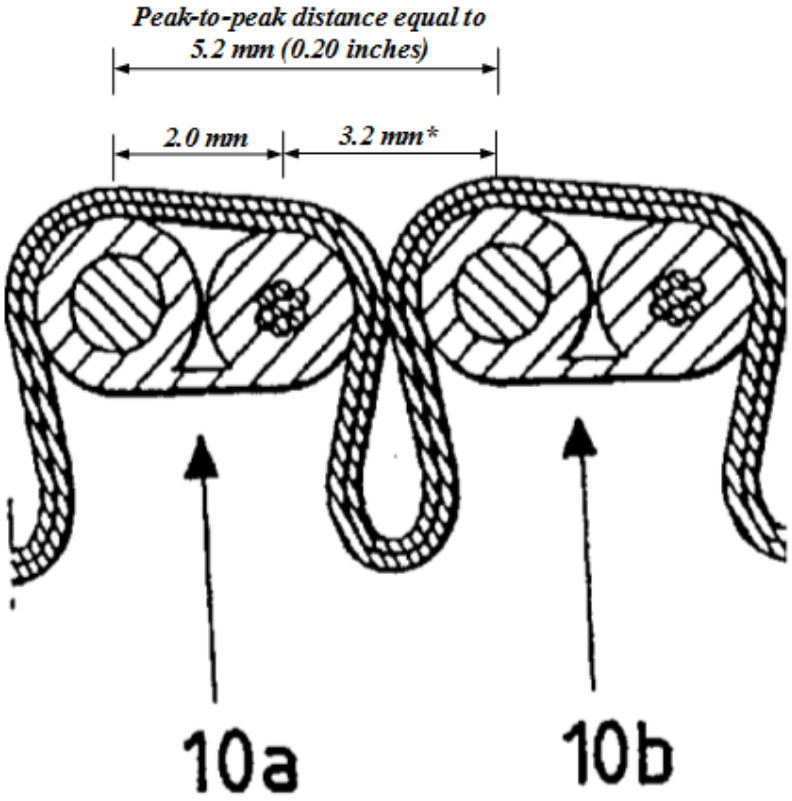
(Ex. 1002 at Figs. 2 and 3 (annotations added); Ex. 1011 at ¶¶182-83.) The Office concluded that this disclosure meets the limitation "the angle of the sidewalls stay generally the same." (Ex. 1009 at 76.) The limitation should be given a broad interpretation consistent with the Office's position during original prosecution, as explained above in Section V.A.6. Kanao therefore meets the limitation. (Ex. 1011 at ¶¶182-83.)

Additionally, due to the similarities between Rohn and the '127 patent, the limitation "the angle of the sidewalls stay generally the same" is necessarily met when Rohn is implemented as a stretch hose. (Ex. 1011 at ¶184.)

7. Element 7

As explained above in Section V.A.7 and as recognized by the Office, the limitations of the seventh element are nothing more than obvious design choices and should be given little to no patentable weight. (Ex. 1011 at ¶186.)

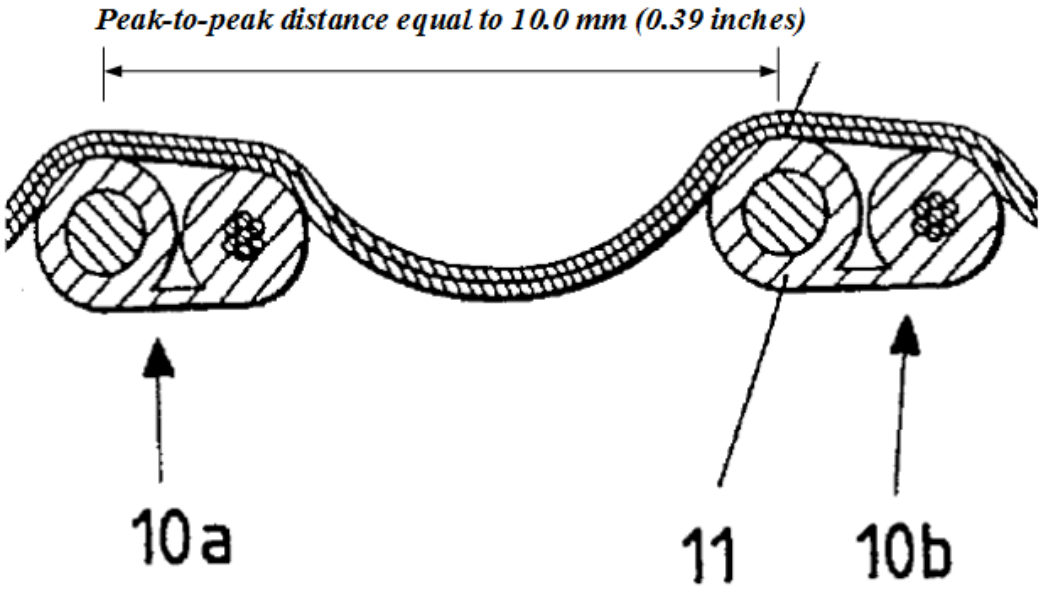
In any case, Kanao meets these limitations. (*Id.* at ¶¶187-92.) With reference to the embodiment of Figs. 6 and 7, Kanao provides dimensions indicating that the peak-to-peak distance is approximately 0.20 inches when no pulling force is applied. (Ex. 1002 at 4:50-67):



** 3.2 mm determined by summing 2.0 mm (distance between center lines of reinforcement wire material 1 and conductive wire 2) and 1.2 mm (thickness of two hose walls separating adjacent coils, where each hose wall includes inner layer 6a of thickness 0.35 mm and outer layer 6b of thickness 0.25 mm)*

(*Id.* at Fig. 7 (annotations added), 4:50-67; Ex. 1011 at ¶187.) Kanao's peak-to-peak distance of 0.20 inches in the retracted condition is "about" 0.25 inches and thus meets the "about ¼″ to ¾″" claim limitation.

With reference to the embodiment of Figs. 6 and 7, Kanao states that the distance from one peak to an adjacent peak is about 10 mm (0.39 inches) when a pulling force is placed on the hose (Ex. 1002 at 4:61-63):



(*Id.* at Fig. 6 (annotations added); Ex. 1011 at ¶189.) Kanao's peak-to-peak distance of 0.39 inches in the extended condition is about 0.5 inches and thus meets the "about ½″ to 2″" limitation.

Although the peak-to-peak distances of 0.20 inches and 0.39 inches are described with reference to Kanao's alternative embodiment of Figs. 6 and 7, the POSITA would be motivated to implement these same dimensions in the embodiment of Figs. 1-4 discussed above. (Ex. 1011 at ¶¶188, 190.) Kanao indicates that the peak-to-peak distances of 0.20 inches and 0.39 inches are suitable for a stretch hose (*see* Ex. 1002 at 4:34-67), thus providing guidance to the POSITA in selecting the peak-to-peak distance of the Figs. 1-4 embodiment. (Ex. 1011 at ¶¶188, 190.) Further, the POSITA would recognize that the respective embodiments of Figs. 1-4 and Figs. 6 and 7 are very similar and would thus be motivated to use features from

one embodiment in the other. (*Id.*)

Should the Board determine that Kanao's peak-to-peak distances of 0.20 inches and 0.39 inches do not meet the claimed ranges of "about ¼″ to ¾″" and "about ½″ to 2″," respectively, Kanao's disclosures render the claimed ranges obvious. A *prima facie* case of obviousness exists where the claimed ranges and the disclosures of the prior art do not overlap, but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 782-83 (Fed. Cir. 1985). Here, the peak-to-peak distances disclosed in Kanao (0.20 inches and 0.39 inches in retracted and extended conditions, respectively) are sufficiently close to the claimed ranges, such that the POSITA would recognize that the hoses of Kanao and the '127 patent would have the same properties.

The POSITA would have been motivated to form the Rohn/Kanao/Nagayoshi stretch hose with peak-to-peak distances within the claimed ranges for the same reasons provided above in Section V.A.7 with respect to the Rohn/Martin/Nagayoshi stretch hose. (Ex. 1011 at ¶¶191-92.)

8. Element 8

Kanao discloses or renders obvious the eighth element of claim 1. (Ex. 1011 at ¶¶193-97.) As explained above, Kanao's hose has peak-to-peak distances of 5.2 mm (0.20 inches) and 10.0 mm (0.39 inches) in retracted and extended conditions, respectively. Kanao thus discloses that the peak-to-peak distances in the extended

condition are approximately double what they are in the retracted condition, thus meeting the claim language "wherein the length of said hose in said extended condition is about two to about six times greater than the length in said retracted position." (Ex. 1011 at ¶195.) This element is also disclosed in APA of the '127 patent. (Ex. 1001 at 2:44-46.)

Although Kanao only indicates that the hose's extension/contraction zones can extend to this degree (Ex. 1002 at 2:60-62), the POSITA would nonetheless be motivated to implement the Rohn/Kanao/Nagayoshi hose with these extension properties over the entire length of the hose. (Ex. 1011 at ¶¶196-97.) Kanao describes the advantages provided by the extension/contraction zones, including increased hose durability and reduced user fatigue due to the low-resistance bending and extension provided by these zones. (Ex. 1002 at 2:58-3:2.) These advantages would have motivated the POSITA to implement the Rohn/Kanao/Nagayoshi hose with these properties over the entire length of the hose. (Ex. 1011 at ¶196.) Implementing the entirety of the hose with these properties would allow the hose to have a length in the extended condition that is approximately double what it is in the retracted condition, thus meeting the limitation "wherein the length of said hose in said extended condition is about two to about six times greater than the length in said retracted position." (*Id.*)

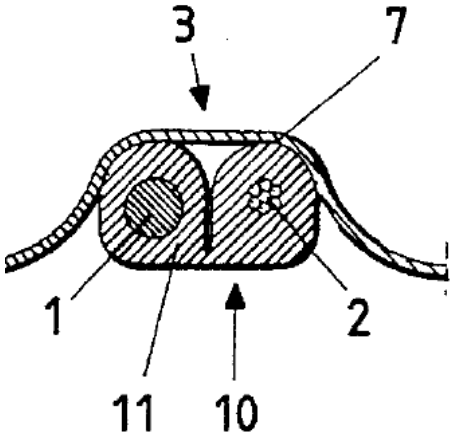
It would be obvious to the POSITA to implement the Rohn/Kanao/Nagayoshi

stretch hose with the claimed level of extendibility for the same reasons provided above in Section V.A.8 with respect to the Rohn/Martin/Nagayoshi stretch hose. (Ex. 1011 at ¶197.) Further, hoses that could be stretched a distance 2 to 6 times their at-rest length were well known in the art at the time of the '127 patent, as indicated by the '127 patent's APA and other prior art references. (Ex. 1001 at 2:43-46; Ex. 1007 (Martin) at 4:23-30; *see also* 6:33-37.) Neither the '127 patent nor its file history provide any evidence that the claimed range "about two to about six times" is critical or produces new or unexpected results. (*See generally* Exs. 1001 and 1009.)

9. Element 9

Rohn and Kanao disclose or render obvious the ninth element of claim 1. As explained above in Section V.A.9, Rohn discloses the claim language "a conductor wire, capable of carrying a current of electricity . . . disposed on at least one side of said helical member." (Ex. 1011 at ¶200.)

The remaining claim language of the ninth element is disclosed by Kanao. (Ex. 1011 at ¶¶201-02.) Similar to Rohn's conductor 37a, Kanao discloses a conductive wire 2 disposed on at least one side of the reinforcement wire material 1:



(Ex. 1001 at Fig. 2, 3:47-48.)

As seen above, seven (7) copper fine wires are twisted together to form the conductive wire 2. (*See also id.* at 4:55-56.) Kanao states that each of the copper fine wires has a diameter of 0.18 mm (*id.*), and the wires are arranged to have an effective diameter of approximately three wires across or 0.54 mm as seen in Fig. 2 above. (Ex. 1011 at ¶¶201-02.) The diameter of 0.54 mm equates to a gauge of approximately 22-23 AWG and thus meets the claim language "a conductor wire . . . with a gauge in the range of about 10 to about 30." (*Id.* at ¶202.) The POSITA would be motivated to form the Rohn/Kanao/Nagayoshi stretch hose with the conductive wire having a gauge in the claimed range for at least the reasons provided above in Section V.A.9 with respect to the Rohn/Martin/Nagayoshi stretch hose. (*Id.* at ¶203.)

10. Element 10

Rohn and Nagayoshi disclose or render obvious the tenth element of claim 1, as explained above in Section V.A.10. (Ex. 1011 at ¶¶204-05.) Further, in modifying

the hose of Rohn to be a stretch hose, the POSITA would be motivated to use Nagayoshi's teaching of how to embed a conductive wire within the single-layer thermoplastic cover, as explained above in Section V.A.10. (Ex. 1011 at ¶205; Ex. 1012 at ¶¶64-68, 75.)

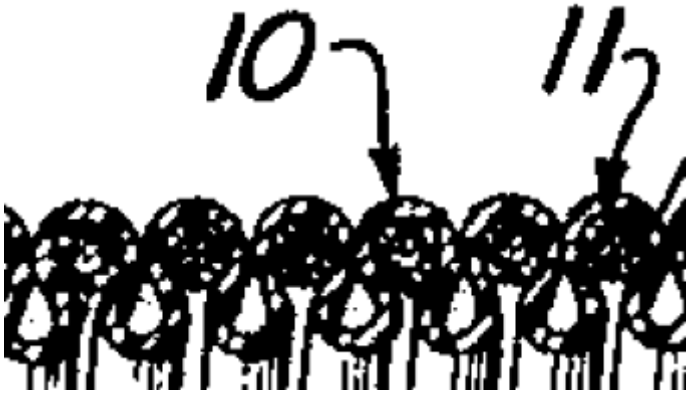
Independent claim 1 is obvious over Rohn in view of Kanao and Nagayoshi for at least these reasons. (*See also* Ex. 1011 at ¶¶149-51.)

C. Claim 6 Is Obvious Over the Combination of Rohn, Martin, and Nagayoshi, and Over the Combination of Rohn, Kanao, and Nagayoshi

Claim 6 depends from claim 1 and adds the limitations "wherein the valleys are virtually eliminated and the sidewalls on opposite sides of a valley are generally in contact with each other when said flexible hose is in a retracted position."[8] Both Martin and Kanao disclose these limitations.

Specifically, Martin discloses that when its hose is in the retracted condition, adjacent corrugations caused at least in part by the reinforcing element 11 are in contact with each other via their sidewalls, as explained above in Section V.A.6 (Ex. 1007 at 3:1-40):

[8] The words "virtually" and "generally" recited in this claim are terms of degree, but the specification provides no standards for measuring those degrees.

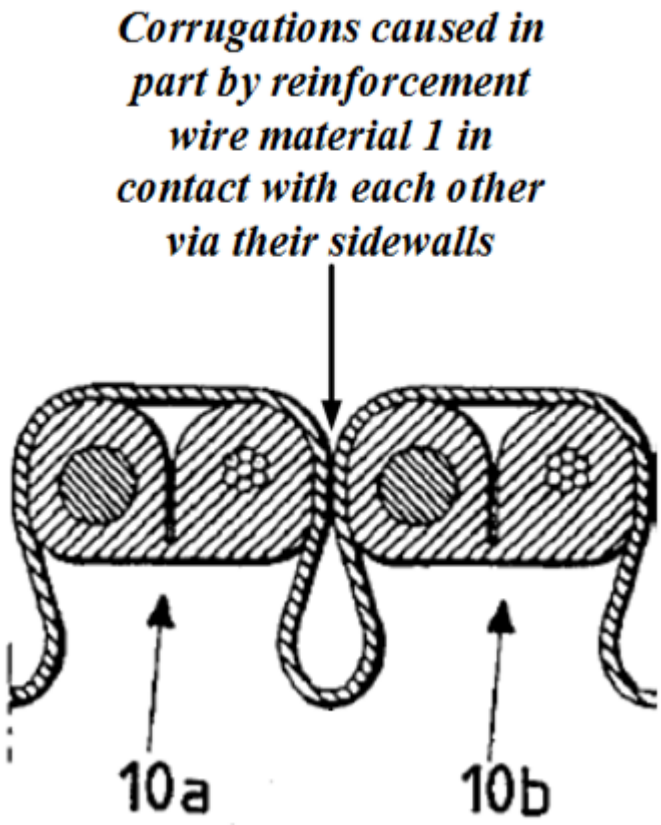


(Ex. 1007 at Fig. 1.) This disclosure meets the claim language "the sidewalls on opposite sides of a valley are generally in contact with each other when said flexible hose is in a retracted position." (Ex. 1011 at ¶208.)

Further, this disclosure meets the claim language "the valleys are virtually eliminated . . . when said flexible hose is in a retracted position." In the context of the '127 patent, the valleys are virtually eliminated from a perspective outside of the hose. (*See* Ex. 1001 at 4:4-20; Figs. 1, 2; Ex. 1011 at ¶209.) Specifically, Fig. 2 of the '127 patent shows a hose in an extended condition with visible valleys 12. (*See id.*) In the retracted condition shown in Fig. 1 of the '127 patent, the valleys 12 are pleated and folded into an interior portion of the hose, such that they are not visible from a perspective outside the hose. (Ex. 1011 at ¶209.) This is what is meant by "the valleys are virtually eliminated" in the '127 patent, and this is what is shown in Martin. (*Id.*) As seen in Martin's Fig. 1 (reproduced above), in the retracted condition, valleys between the coils are folded into an interior portion of the hose and are not visible from a perspective outside the hose. (*Id.* at ¶¶208-09.) Martin thus

meets the claim language "the valleys are virtually eliminated . . . when said flexible hose is in a retracted position." (*Id.*)

Kanao likewise discloses that when its hose is in the retracted condition, adjacent corrugations caused at least in part by the reinforcement wire material 1 are in contact with each other via their sidewalls, as explained above in Section V.B.6:



(Ex. 1002 at Fig. 3 (annotations added).) This disclosure meets the claim language "the sidewalls on opposite sides of a valley are generally in contact with each other when said flexible hose is in a retracted position." (Ex. 1011 at ¶210.) Further, as seen above, in the retracted condition, valleys between the coils are folded into an interior portion of the hose and are not visible from a perspective outside the hose,

thus meeting the claim language "the valleys are virtually eliminated . . . when said flexible hose is in a retracted position." (*Id*.)

In modifying the hose of Rohn to make it a stretch hose, as proposed herein, the features of claim 6 would necessarily result, such that they would have been obvious to the POSITA. (Ex. 1011 at ¶211.) As explained above in Section V.A.6, a stretch hose's extension and retraction properties are a result of pleating the hose cover. In forming the Rohn hose with the pleating properties of a stretch hose, the hose would necessarily have the features of claim 6, *i.e.*, in the retracted condition, adjacent corrugations of the hose would be in contact and the valleys between corrugations would be virtually eliminated. (Ex. 1011 at ¶211.) Because these features are present in all stretch hoses, the features would be obvious to the POSITA, and claim 6 is unpatentable over the combination of Rohn, Martin, and Nagayoshi, and over the combination of Rohn, Kanao, and Nagayoshi. (*Id.*)

D. Claim 7 Is Obvious Over the Combination of Rohn, Martin, Nagayoshi, and Kanao, and Over the Combination of Rohn, Kanao, and Nagayoshi

Claim 7 depends from claim 1 and adds the limitations "wherein the conductive wire is stranded copper wire of a gauge in the range of about 10 to about 30 with a thermoplastic jacket as the insulation." Rohn and Kanao disclose these limitations.

Rohn discloses the claimed "conductive wire," as explained above in Section V.A.9, but does not explicitly disclose the other limitations of claim 7.

However, Kanao discloses or renders obvious these limitations. Specifically, as explained above in Section V.B.4, Kanao discloses a conductive wire 2 with a gauge of approximately 16-17 AWG, thus meeting the claim language "a gauge in the range of about 10 to about 30." (Ex. 1002 at 3:47-48, 4:55-56; Ex. 1011 at ¶¶212-13.) Further, the conductive wire 2 is stranded copper wire (Ex. 1002 at 3:47-48) and has a thermoplastic jacket as insulation (*id.* at 3:48-49), thus meeting the claim language "stranded copper wire . . . with a thermoplastic jacket as the insulation." (Ex. 1011 at ¶213.)

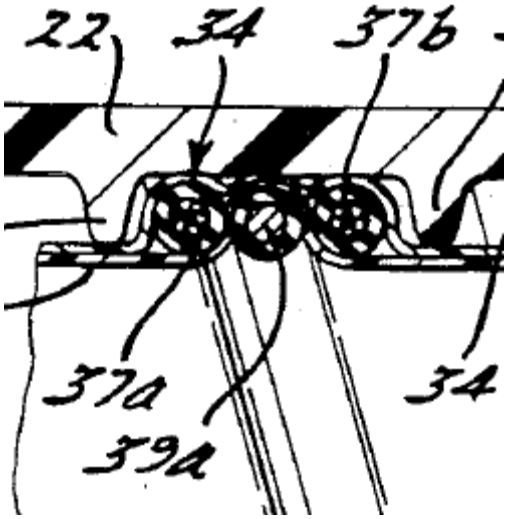
The POSITA would have been motivated to implement Rohn's conductive wire as a "stranded copper wire of a gauge in the range of about 10 to about 30 with a thermoplastic jacket as the insulation," as taught by Kanao. The POSITA would have been motivated to incorporate Kanao's insulated, stranded copper wire into the stretch hoses proposed herein because the POSITA would recognize that such wires are well-suited to applications requiring flexibility, such as stretch hoses. (Ex. 1011 at ¶214.) Further, insulated stranded copper wires were common knowledge in the art at the time of the '127 patent, as evidenced at least by Kanao (Ex. 1002 at 3:47-48) and GB 2322925 to Gibson (Ex. 1005 at 5), and it would have been obvious to the POSITA to select the well-known insulated, stranded copper wire of Kanao in creating the stretch hoses proposed herein. (Ex. 1011 at ¶214.) The POSITA would be motivated to form the stretch hose with the conductive wire having a gauge in the

claimed range of "about 10 to about 30" for the reasons provided in Section V.A.9 above. (Ex. 1011 at ¶215.)

Claim 7 is unpatentable over the combination of Rohn, Martin, Nagayoshi, and Kanao, and over the combination of Rohn, Kanao, and Nagayoshi for these reasons.

E. Claim 8 Is Obvious Over the Combination of Rohn, Martin, and Nagayoshi, and Over the Combination of Rohn, Kanao, and Nagayoshi

Claim 8 depends from claim 1 and adds the limitations "wherein the cross section of the helix is in the shape of a figure 8." Rohn discloses or renders obvious these limitations. (Ex. 1011 at ¶¶217-20.) The hose depicted in Fig. 3 of Rohn includes two conductors 37a and 37b:



(Ex. 1004 at Fig. 3.) Rohn explains, however, that in other embodiments, only a single conductor 37 is used. (*Id.* at 4:32-37.) In such an embodiment, the single conductor 37 and support wire 39 would form the shape of a figure 8, similar to what

is shown and described in the '127 patent. (*See* Ex. 1001 at 5:32-47 (referring to helix as including both structural steel wire and additional conductive wire), Figs. 7, 8.)

Claim 8 is unpatentable over the combination of Rohn, Martin, and Nagayoshi, and over the combination of Rohn, Kanao, and Nagayoshi for these reasons.

F. Claim 9 Is Obvious Over the Combination of Rohn, Martin, and Nagayoshi, and Over the Combination of Rohn, Kanao, and Nagayoshi

Claim 9 depends from claim 1 and adds the limitations "wherein said hose has a pitch that is constant along the length of the hose." Nagayoshi discloses these limitations. Specifically, Nagayoshi's hose includes the steel wire 2 that is wound at a constant pitch over the length of the hose. (Ex. 1003 at 2:4-11, 3:14-21, 4:8-14, 5:5-16, Figs. 1 and 2; Ex. 1011 at ¶22; Ex. 1012 at ¶¶72-74, 76-78.)

The POSITA would be motivated to implement the Rohn/Martin/Nagayoshi hose with a constant pitch along the length of the hose despite Martin's disclosure (Ex. 1007 at 4:42-47) of a hose with two different pitches. (Ex. 1011 at ¶¶223-24; Ex. 1012 at ¶¶73-74.) As detailed in Mr. Bentley's declaration, the use of a constant pitch along the length of the hose permits a continuous manufacturing process to be used that is easier and more efficient than the alternative processes required for implementing non-constant pitches. (Ex. 1012 at ¶¶73-74*; see also* Ex. 1011, ¶223.) Additionally, the reason for Martin's use of two different pitches is not present in the Rohn/Martin/Nagayoshi hose. (Ex. 1011 at ¶224.) Specifically, in embodiments,

Martin's hose uses (i) a larger pitch near the fittings at the ends of the hose, and (ii) a smaller pitch in the middle portion of the hose. (*See*, *e.g.*, Ex. 1007 at 4:42-47.) This configuration prevents the reinforcing element from slipping out of folds in the thermoplastic cover when the hose is flexed sharply. (*Id.* at 2:5-40.) This problem was present in the Martin hose because its reinforcing element was not adhered to the thermoplastic cover. (*Id.* at 3:26-32.) However, in the Rohn/Martin/Nagayoshi hose, this problem is not present because the helical member is adhered to the interior surface of the thermoplastic cover, as explained in Section V.A.4 above.

The POSITA would be motivated to implement the Rohn/Kanao/Nagayoshi hose with a constant pitch along the length of the hose despite Kanao's disclosure (Ex. 1002 at Fig. 4) of a hose with two different pitches. (Ex. 1011 at ¶225; Ex. 1012 at ¶¶77-78.) Kanao uses (i) a first pitch to implement "extension/contraction zones" at the ends of the hose, and (ii) a second pitch to implement a "general zone" in the middle of the hose. (*Id.* at 4:51-11.) But as described in Section V.B.8 above, the POSITA would have been motivated to implement the entirety of the Rohn/Kanao/Nagayoshi hose with the advantageous extendibility properties of the extension/contraction zones. (Ex. 1011 at ¶225.) Because the Rohn/Kanao/Nagayoshi hose would not have two types of zones, the POSITA would not be motivated to use different pitches over the length of the hose. (*Id.*) Rather, the POSITA would be motivated to use a constant pitch over the length of the hose to achieve the advantages

detailed in Mr. Bentley's declaration (*e.g.*, use of a manufacturing process that is easier and more efficient than the alternative processes required for implementing non-constant pitches). (Ex. 1012, ¶¶76-78.)

Claim 9 is unpatentable over the combination of Rohn, Martin, and Nagayoshi, and over the combination of Rohn, Kanao, and Nagayoshi for these reasons.

G. Claim 10 Is Obvious Over the Combination of Rohn, Martin, and Nagayoshi, and Over the Combination of Rohn, Kanao, Nagayoshi, and Martin

Claim 10 depends from claim 1 and adds the limitations "wherein said hose extends at least 100 percent over the fully retracted length of said hose when 10 pounds of pull is placed on an end of said flexible hose." Martin discloses these limitations. (Ex. 1011 at ¶¶227-28.)

Martin describes its stretch hose as follows: "Such a hose, by the application of a 6-pound axial pull can be stretched to 165 inches and when the force is released it will return to a free length of 77 inches . . . ." (Ex. 1007 at 6:33-37.) Accordingly, Martin's hose extends to more than double its at-rest length when 6 pounds of pull is placed on the hose. Placing 10 pounds of pull on Martin's hose would cause it to stretch even further, such that Martin meets the claim language of claim 10. (Ex. 1011 at ¶228.)

The POSITA would have been motivated to implement the stretch hoses proposed herein with the features of claim 10. (*Id.* at ¶229.) As described above, the

Rohn/Martin/Nagayoshi hose and the Rohn/Kanao/Nagayoshi hose can both be stretched to lengths that are two to six times their at-rest lengths. It would have been obvious to the POSITA to ensure that these hoses extend at least 100 percent (*i.e.*, extend 2 times) over their fully retracted lengths when 10 pounds of pull is applied, as taught by Martin. (*Id.*) As explained in Mr. Reed's declaration, for typical household cleaning operations, the use of 10 pounds of pull to stretch the hose is commonplace, and thus, it would be obvious to the POSITA to ensure that the desired level of hose stretchability within the range of 2-6 (as used in both the Rohn/Martin/Nagayoshi hose and the Rohn/Kanao/Nagayoshi hose) is met when 10 pounds of pull is applied. (Ex. 1011 at ¶229.) Further, because testing of hoses is often performed at 10 pounds of pull, the POSITA would be motivated to measure the hose's stretchability at 10 pounds of pull for consistency (*i.e.*, to perform hose testing and measure stretchability with the same pulling force applied). (*Id.*)

Claim 10 is unpatentable over the combination of Rohn, Martin, and Nagayoshi, and over the combination of Rohn, Kanao, Nagayoshi, and Martin for these reasons.

VI. Mandatory Notices Pursuant to 37 C.F.R. § 42.8(a)(1)

Pursuant to 37 C.F.R. § 42.8(a)(1), the mandatory notices identified in 37 C.F.R. § 42.8(b) are provided below as part of this Petition.

A. 37 C.F.R. § 42.8(b)(1): Real Parties-In-Interest

SharkNinja Operating LLC, SharkNinja Management Company, SharkNinja Sales Company, and Compass Cayman SPV, Ltd. are the real parties-in-interest for Petitioner.

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

The '127 patent is currently the subject of a patent infringement lawsuit brought by the assignee of the '127 patent, FTI. (*See Flexible Technologies, Inc. v. SharkNinja Operating, LLC, et al.*, U.S. District Court for the District of South Carolina, Civil Action No. 8:17-cv-00117-TMC.) FTI served SharkNinja with the complaint on April 11, 2017. (Ex. 1016.) This judicial matter may affect decisions made in this proceeding.

C. 37 C.F.R. § 42.8(b)(3) and (4): Lead and Back-up Counsel and Service Information

SharkNinja provides the following designation of counsel:

Lead Counsel	Back-up Counsel
Joseph M. Sauer Reg. No. 47,919 JONES DAY 901 Lakeside Avenue Cleveland, OH 44114 (216) 586-7506 jmsauer@jonesday.com	Joshua R. Nightingale Reg. No. 67,865 JONES DAY 500 Grant Street, Suite 4500 Pittsburgh, PA 15219 (412) 394-7950 jrnightingale@jonesday.com

Pursuant to 37 C.F.R. § 42.10(b), a Power of Attorney accompanies this Petition. Please address all correspondence to lead and back-up counsel at the addresses above. SharkNinja also consents to electronic service by email at the email

addresses listed above.

VII. Conclusion

Petitioner therefore requests that the Patent Office order an *inter partes* review trial and then proceed to cancel claims 1 and 6-10.

Dated: April 10, 2018

Respectfully submitted,

/s/ Joseph M. Sauer
Joseph M. Sauer
Reg. No. 47,919
Jones Day
901 Lakeside Avenue
Cleveland, OH 44114
(216) 586-7506

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 7,156,127, including all Exhibits, was served on April 10, 2018 via Express Mail delivery directed to the attorney of record for the patent at the following address:

Thomas A. O'Rourke
Bodner & O'Rourke, LLP
425 Broadhollow Road, Ste 120
Melville NY 11747

Additionally, a courtesy copy of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 7,156,127, including all Exhibits, was sent on April 10, 2018 to FTI's litigation counsel at the following address:

Jeffrey M. Fisher
FARELLA BRAUN + MARTEL LLP
235 Montgomery Street, 17th Floor
San Francisco, CA 94104
Telephone: (415) 954-4400
Facsimile: (415) 954-4480

Date: April 10, 2018 /Joseph M. Sauer/
Joseph M. Sauer

CERTIFICATE OF WORD COUNT UNDER 37 C.F.R. § 42.24(a)

I, the undersigned, do hereby certify that the attached Petition, including footnotes, contain 13,969 words, as measured by the Word Count function of Microsoft Word 2007. This is less than the limit of 14,000 words as specified by 37 C.F.R. § 42.24(a)(i).

Date: April 10, 2018 By: /Joseph M. Sauer/

APPENDIX OF EXHIBITS

EXHIBIT NO.	TITLE
1001	U.S. Patent No. 7,156,127 ('127 patent)
1002	U.S. Patent No. 5,555,915 ("Kanao")
1003	Japanese Patent Application Publication No. JP H3-93676 ("Nagayoshi")
1004	U.S. Patent No. 5,109,568 ("Rohn")
1005	United Kingdom Patent No. GB 2322925
1006	U.S. Patent No. 2,822,857
1007	U.S. Patent No. 2,961,007 ("Martin")
1008	U.S. Patent No. 2,890,264
1009	Prosecution History of U.S. Patent No. 7,156,127
1010	Complaint filed in *Flexible Technologies, Inc. v. SharkNinja Operating, LLC, et al.*, U.S. District Court for the District of South Carolina, Civil Action No. 8:17-cv-00117-TMC
1011	Declaration of Charles A. Reed, Jr.
1012	Declaration of Robert Bentley

1013	U.S. Patent No. 6,024,132
1014	United Kingdom Patent No. GB 1419841
1015	U.S. Patent No. 4,693,324
1016	Affidavit of Service of Complaint dated April 11, 2017
1017	U.S. Patent No. 2,895,001
1018	JPH02109551U