

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARETECH, LLC,
Petitioner,
v.

BIONESS INC.,
Patent Owner.

IPR2023-00492

U.S. Patent No. 9,682,000

PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 9,682,000

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EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 9,682,000 to Behnke et al. (“the ’000 Patent”)
1002	Prosecution File History for the ’000 Patent (“File History”)
1003	Declaration of Dr. David Reinkensmeyer (“Reinkensmeyer Decl.”)
1004	U.S. Pat. No. 7,883,450 (“Hidler”)
1005	DE3300202 (A1) (“Knevels”)
1006	U.S. Pat. No. 4,781,665 (“Walker”)
1007	U.S. Pat. No. 8,701,226 (“Faucher”)
1008	U.S. Pat. No. 2,991,336 (“Shaw”)
1009	JPS57126732A (“Sugiyama”)
1010	U.S. Pat. No. 4,843,971 (“Braunagel”)
1011	U.S. Pat. Pub. 2012/0000876 (“Bergenstrale”)
1012	Artemiadis, Panagiotis, On the Potential Field-based Control of the MIT-Skywalker, IEEE (June 2011) (“Artemiadis”)
1013	Qi Lu, et. al., A New Active BWS System Capable of Virtually Offloading Partial Body Mass (February 2013) (“Lu”)
1014	1-29-23, Motion to Dismiss Hearing Transcript (Dkt. 60)

Petitioner Aretech, LLC requests *inter partes* review of Claims 1-8 and 12-20 (the “Challenged Claims”) of U.S. Patent No. 9,682,000 (“the ’000 Patent”).

I. SUMMARY OF THE ’000 PATENT

A. Overview and Summary of the Alleged Invention

The ’000 Patent relates to a body-weight support (“BWS”) system used for rehabilitation of patients suffering from walking deficiencies (e.g., as a result of a stroke, spinal cord injury, etc.). *See* Ex-1001, Abstract. The ’000 Patent describes the invention as generally including “a trolley, a powered conductor operative [sic] coupled to a power supply, and a patient attachment mechanism. The trolley can include a drive system, a control system, and a patient support system.” Ex-1001, Abstract.

Figure 1 of the ’000 Patent is a block diagram showing components of an exemplary BWS system:

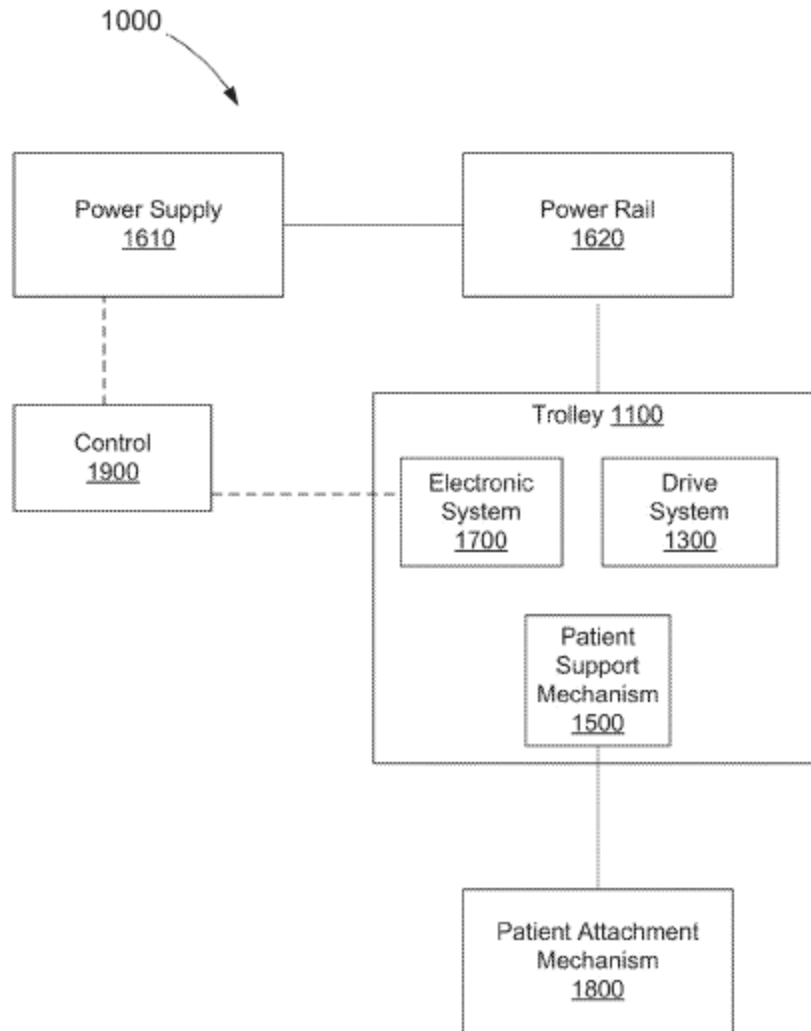


FIG. 1

BWS systems were well-known at the time of the application for the '000 Patent. The '000 Patent purports to improve on prior art BWS systems, focusing on three features.

1. The Powered Conductor Feature

The Challenged Claims of the '000 Patent require a portion of the trolley being disposed within a powered conductor, and in contact with a conductive inner surface to electrically couple the trolley to the powered conductor (hereafter, the “Powered Conductor Feature”). *Id.*, 35:11-22. An example of a powered conductor is depicted in Figures 2 (element 2620) and 10:

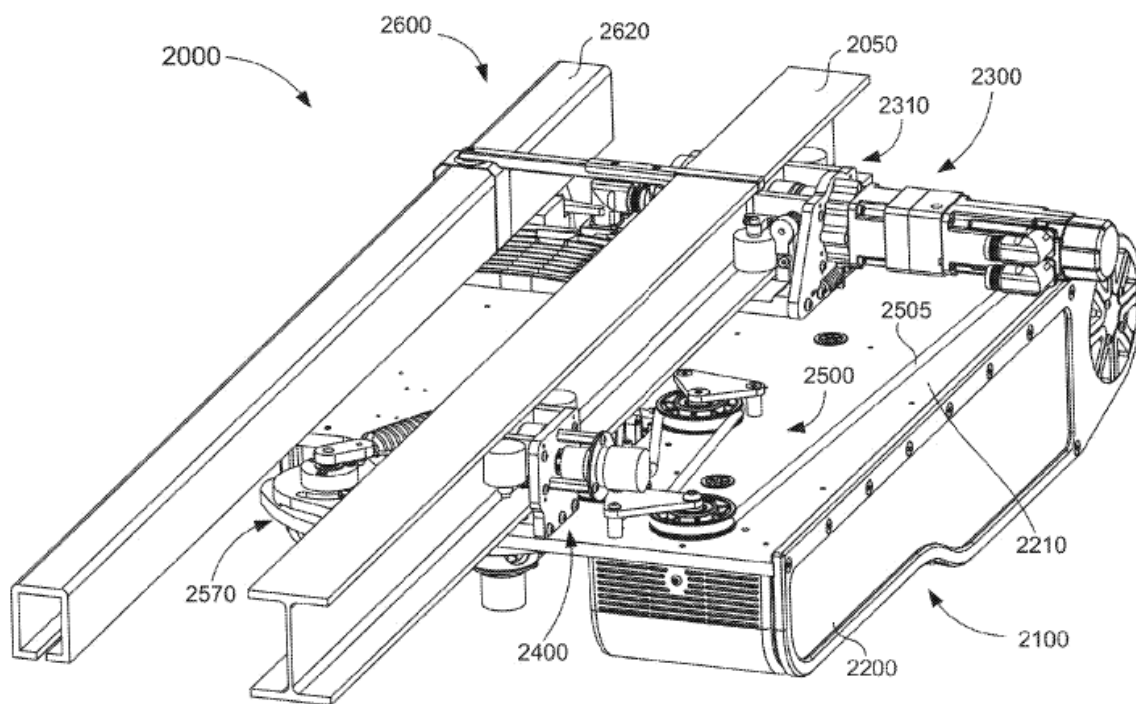
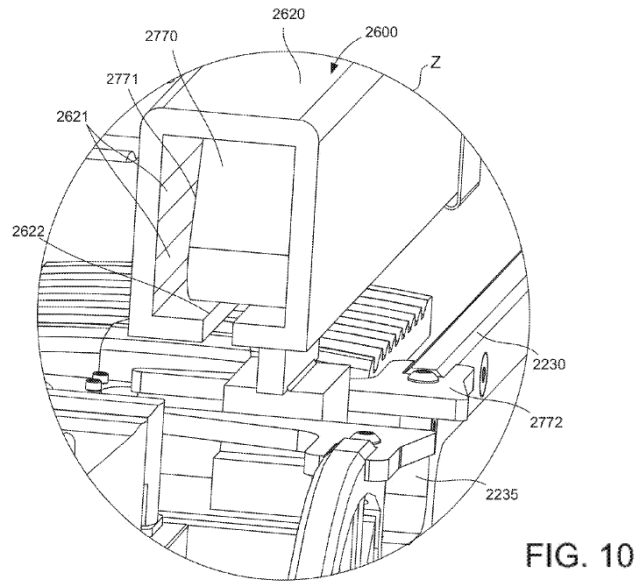
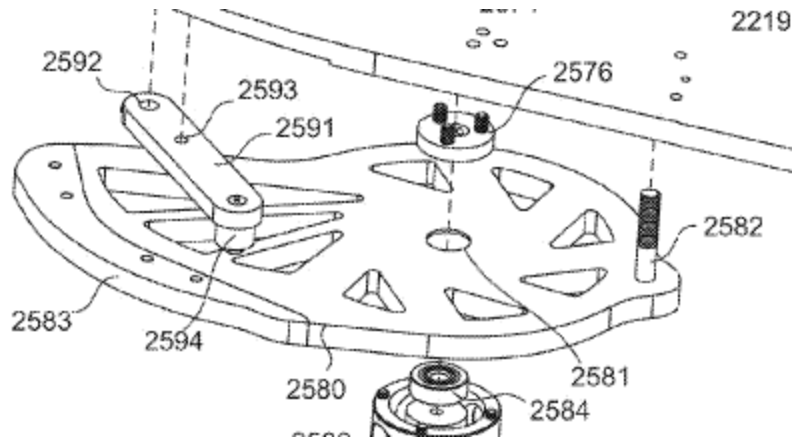


FIG. 2



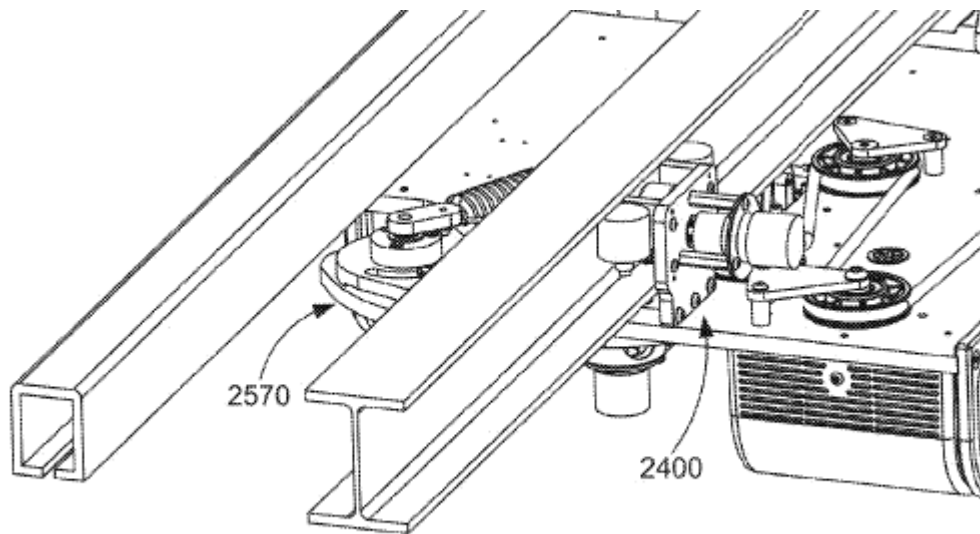
2. The Cam Feature

The '000 Patent also explains that the tether is coupled to a pulley system with a moveable “cam” so that the patient support assembly can pivot with the movement of a patient (the “Cam Feature”). *See* Ex. 1001, 35:57-36:4. A cam is a well-known mechanical component that rotates and, in doing so, is often used to make contact with another component in a way that transforms the rotary motion into a linear motion. Ex-1003, ¶24. An example of a cam (element 2583) is depicted in Fig. 33 of the '000 Patent.



3. The Wheel Feature

The '000 Patent teaches that the trolley includes wheels to allow movement along the track, and also that a portion of the track is disposed between the wheels and the powered conductor to isolate these elements from one another. *See Ex. 1001, 36:24-34.* An example of the Wheel Feature is depicted in Figure 2 (showing the web of an I-beam track disposed between wheels of the drive assembly 2400 and the powered conductor:



B. Prosecution History

The '000 Patent issued from U.S. Patent Application No. 13/745,830 (the “'830 Application”), which was filed on January 20, 2013.¹ Ex-1001.

The Office issued a Non-Final Rejection on June 15, 2015, rejecting claims of the '830 Application as anticipated by the Hidler Publication (2008/0287268). Ex-1002, 237-44. The applicant amended the claims and requested reconsideration. Claim 1 was amended to include a version of the Powered Conductor Feature, while claim 17 (later renumbered as claim 8) was amended to include a version of the Cam Feature. *Id.*, 253-60. Applicant argued that the added features distinguished the claims from Hidler. *Id.*

The Office issued a Final Rejection on December 17, 2015. Ex-1002, 263-68. Based on Applicant's amendments, the Examiner chose to rely on a new primary reference Bergenstrale (2012/0000876) as anticipating application claims 1-3 and 6-8 and further rejected application claims 4, 5, 17, 20 and 21 as obvious over Bergenstrale in view of Hidler. *Id.* Here, the Examiner relied only on Hidler as teaching: (i) a torque transfer assembly and drive assembly being driven simultaneously; (ii) a housing for protecting certain components; (iii) a clutch or

¹ Without acknowledging the validity of Applicant's priority claim, for purposes of this proceeding only, Petitioner adopts the earliest possible priority date of January 20, 2013 as the priority date of the '000 Patent (hereafter, the “Critical Date”).

brake element; and (iv) a second drive element couple to a patient support assembly. *Id.*

In response, Applicant again amended the claims and requested continued examination on March 15, 2016. Ex-1002, 272-81. Applicant argued claim 1 was patentable because “[n]owhere ... does *Bergenstrale* disclose or suggest a drive assembly of a trolley and a track from which the trolley is suspended being disposed *outside* of a powered conductor.” *Id.* Applicant further argued claim 17 was patentable because “*Bergenstrale* alone or in combination with *Hidler* fails to disclose or suggest a cam pivoting relative to a housing and about a vertical axis in response to a force exerted on a tether.” *Id.* Applicant also added new claims 22-29, which included a Wheel Feature limitation. *Id.*

The Office issued a Non-Final Rejection on June 2, 2016. Ex-1002, 304-12. Application claims 22-24 and 28 were rejected as being anticipated by *Bergenstrale*, and application claims 17, 20, and 21 were rejected as obvious over *Bergenstrale* in view of *Hidler*. *Id.* Application claims 1-4 and 6-8 were allowed on account of the added Powered Conductor Feature. *Id.*

After an Examiner interview and subsequent amendment, the Office issued a Notice of Allowance on December 13, 2016. Ex-1002, 325-27. In the Notice, the Examiner indicated that the pending claims of the '000 Patent were allowed based

on the inclusion of the Powered Conductor Feature (patent claims 1-7), the Cam Feature (patent claims 8 and 12), and the Wheel Feature (patent claims 13-20). *Id.*

II. IDENTIFICATION OF CHALLENGE

A. Statutory Grounds

Petitioner requests *inter partes* review and cancelation of the Challenged Claims on the following grounds:

Ground No.	References	Statutory Basis	Claims Challenged
1	Hidler (Ex-1004) in view of Knevels (Ex-1005)	Obviousness (pre-AIA §103(a))	1-7, 13-20
2	Hidler (Ex-1004) in view of Faucher (Ex-1007) and Walker (Ex-1006)	Obviousness (pre-AIA §103(a))	8, 12

1. Hidler

U.S. Patent No. 7,883,450 (“Hidler”) is prior art under pre-AIA 35 U.S.C. §102(a) at least because it was filed on May 14, 2008 and later issued to Joseph Hidler on February 8, 2011, about two years before the Critical Date of the ’000 Patent. The publication of Hidler was cited and considered during prosecution, however, Hidler was applied in a different way, to a different set of elements, and in different combinations than those presented here in this petition

Hidler teaches a BWS system that allows individuals with severe gait impairments to practice over-ground walking in a safe, controlled manner, where the support system includes rides along a driven trolley and can be controlled in response to the movement of the subject using the system. Ex-1003, ¶39. Hidler is

analogous art because it is from the same field of endeavor, i.e., physical rehabilitation systems using an overhead trolley system with pulleys, tracks and conductors. *Id.*

2. Knevels

German patent DE3300202A1 to Knevels, et. al., (“Knevels”) is prior art under pre-AIA 35 U.S.C. §102(a) at least because it was filed on May 1, 1984 and published on May 7, 1984, long before the Critical Date of the ’000 Patent.

Knevels was neither cited nor considered during prosecution.

Knevels teaches an overhead trolley system where a conductor is enclosed in a power rail, whereby a trolley can be driven along a track by the conductance of the power rail. Ex-1003, ¶42. Knevels is analogous art to the alleged invention of the ’000 Patent because it is it is an overhead trolley system using tracks and conductors. *Id.*

3. Faucher

U.S. Patent No. 8,701,226 (“Faucher”) is prior art under pre-AIA 35 U.S.C. §102(e) at least because it was filed on February 4, 2009 more than three years before the Critical Date of the ’000 Patent. Faucher itself was not cited or considered before the Office, but the publication of Faucher (2011/0000015) was cited on the face of the ’000 Patent. Neither Faucher nor Publication

2011/0000015 were discussed by either the Applicant or Examiner during prosecution.

Faucher teaches a conductive connection for track-riding patient hoists, where a patient hoist on a trolley rides along a track. The hoist is powered by a conductor extending along the track. Ex-1003, ¶46; Ex-1007, 1:25-29, Figs. 2-4. A contact carrier fits within the trolley and is free to move along the contour of the track with the trolley. Ex-1003, ¶46. The contact carrier is physically situated in the trolley so that, as it moves along the track with the trolley, its electrical contact is always touching part of the track conductor. Ex-1003, ¶46. Maintaining continuous contact with the track conductor in this way enables a continuous flow of electricity (and thus, power) during trolley movements. Ex-1007, Abstract. Faucher is analogous art because it relates to physical rehabilitation systems using trolleys, pulleys, tracks and conductors. Ex-1003, ¶47.

4. Walker

U.S. Patent No. 4,781,665 (“Walker”) is prior art under pre-AIA 35 U.S.C. §102(a) at least because it was filed on August 31, 1987, and later issued to Dean M. Walker on November 1, 1988, more than twenty-four years before the Critical Date of the ’000 Patent. Walker was neither cited nor considered during prosecution.

Walker teaches a power-delivery belt-tensioning system, where a first pulley is coupled by a flexible belt to a second pulley for delivering power from a source to a driven device. Ex-1003, ¶50, 239-41. The system includes a cam, idler pulley, and spring to maintain a pre-selected degree of tension in the belt. *Id.* Walker is analogous art to the alleged invention of the '000 Patent because relates to using a pulley system to maintain a selected tension in a tether. *Id.*, ¶51

III. DISCRETIONARY ANALYSIS FOR REVIEW

A. Institution Should Not Be Denied Under *Fintiv*

Consistent with *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential), Petitioner stipulates that if this IPR proceeding is instituted, Petitioner will not pursue in the district court litigation any grounds it brought or could have brought here.² See 35 U.S.C. §315(e)(2). This stipulation is dispositive of the *Fintiv* analysis. See *USPTO Interim Procedure for Discretionary Denials in AIA Post-Grant Proceeding with Parallel District Court Litigation*, at 3 (June 21, 2022) (“[T]he PTAB will not discretionarily deny institution in view of parallel district court litigation where a petition presents a [*Sotera*-style] stipulation”).

² This stipulation is not intended, and should not be construed, to limit Petitioner’s ability to assert invalidity of the Challenged Claims in the district court litigation on any ground that could not have been brought here, regardless of whether *inter partes* review is instituted.

B. The Board Should Not Exercise Discretion to Deny the Petition Under § 325(d)

The Board should also decline to exercise its discretion to deny institution under 35 U.S.C. §325(d). The Section 325(d) analysis follows a two-part framework. *See Amazon.com, Inc. v. VB Assets, LLC*, IPR2020-01346, slip op. at 6-7 (P.T.A.B. Feb. 4, 2021) (Paper 7). Part one determines “whether the art or arguments presented in the Petition are the same or substantially the same as those previously presented to the Office.” *Id.* Part two, which is only considered if part one is answered affirmatively, asks “whether the petitioner has demonstrated a material error by the Office in its prior consideration of that art or arguments.” *Id.*

1. Part One

Of the four references relied upon in Petitioner’s grounds for unpatentability (Hidler, Knevels, Faucher, and Walker), two were neither cited during prosecution nor relied upon or discussed by the Examiner in any Office Action (Knevels and Walker). One reference—Faucher—was not cited or considered before the Office, but the publication was cited on the face of the ’000 Patent. The publication, however, was not relied on or substantively considered by the Office in any way. Thus, the Knevels, Faucher, and Walker references all fail to satisfy part one.

The PTAB has “consistently held that a reference that was neither applied against the claims nor discussed by the Examiner does not weigh in favor of exercising our discretion under § 325(d)” because such references fail part one.

Solvay USA Inc. v. WorldSource Enterprises, LLC, PGR2019-00046, slip op. at 14 (P.T.A.B. Aug. 13, 2019) (Paper 7). This includes “[m]ere citation,” as in the case of the Faucher publication. *Id.* Indeed, “mere citation to a reference by the Examiner does not establish that the Examiner substantively considered the merits of” the reference. *Zip Top, LLC v. Stasher, Inc.*, IPR2018-01216, slip op. at 35 (P.T.A.B. Jan. 17, 2019) (Paper 14) (collecting cases); *See, e.g., Microsoft Corp. v. Parallel Networks Licensing LLC*, IPR2015-00486, Paper 10 at 14-15 (July 15, 2015).

Thus, the Hidler-Knevels and Hidler-Faucher-Walker combinations were never considered by the Office because Knevels, Faucher, and Walker were never considered by the Office. This fact alone supports declining Section 325(d) discretion to deny institution. *See Celco P'ship v. Huawei Device Co., Ltd.*, IPR2020-01117, slip op. at 12 (PTAB Feb. 3, 2021) (Paper 10); *Comcast Cable Communications, LLC v. Rovi Guides, Inc.*, IPR2019-01434, slip op. at 13 (PTAB Feb. 12, 2020) (Paper 14).

The Hidler-Knevels and Hidler-Knevels-Walker combinations are also not cumulative of the art relied upon by the Examiner. Indeed, the Hidler-Knevels and Hidler-Knevels-Walker combinations teach the precise elements that the Examiner found missing from other prior art references cited during prosecution. For example, the Examiner allowed claims (1-7 and 13-20) after determining that

Bergenstrale does not disclose (i) a portion of a trolley disposed within a powered conductor (claims 1-7); or (ii) isolating wheels of the trolley from the powered conductor (claims 13-20). Ex-1002, 326-27. Unlike the Examiner's determination with respect to Bergenstrale, Knevels teaches an enclosed powered conductor that unambiguously includes a portion of the trolley within the conductor. Knevels also teaches the other element the Examiner found missing when used in combination with Hidler—by isolating wheels of the trolley from the powered conductor by the track.

Inclusion of Hidler also does not render the grounds advanced in this Petition cumulative of those considered during prosecution. The Examiner ultimately cited Hidler only as a secondary reference to teach ancillary limitations in combination with Bergenstrale, including, but not limited to a housing, a second drive element, and a torque transfer assembly. The Examiner never found the applicant traversed any of these findings with respect to Hidler, and thus, the Petition does not seek to provide cumulative prior art to what the examiner already rejected. Rather, the Petition agrees with the Examiner's original findings as to the content of Hidler and combines Hidler with new prior art that teaches the elements the Examiner found missing from the prior art he had considered (e.g., Bergenstrale).

The grounds presented in this petition use the starting point of Hidler's trolley and add one or more of: (1) Knevels' power rail (which a POSITA would have understood teaches a portion of the trolley within the power rail); (2) Faucher's housing (which was never alleged to be a novel feature during prosecution nor alleged to be missing from the prior art in prosecution); and (3) Walker's explicit disclosure of a "cam" (which again was never alleged to be a novel feature during prosecution or alleged to be missing from Bergenstrale). The Hidler-Knevels and Hidler-Faucher-Walker combinations are "solving a problem that is closer to that of the '[000] Patent' using "different structures that serve different purposes." *See Oticon Medical AB v. Cochlear Limited*, IPR2019-00975, slip op. at 15-16 (P.T.A.B. Oct. 16, 2019) (Precedential) (Paper 15).

In sum, the prior art grounds considered during prosecution are materially different from the Hidler-Knevels and Hidler-Faucher-Walker combinations presented in this Petition.

2. Part Two

Given that "the art or arguments presented in the Petition" is not "the same or substantially the same as those previously presented to the Office," part two of the Section 325(d) framework does not need to be considered. *Amazon.com*, IPR2020-01346, slip op. at 6-7 (P.T.A.B. Feb. 4, 2021) (Paper 7).

For these reasons, the Board should not deny institution under Section 325(d).

IV. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art as of January 20, 2013 (“POSITA”) would have a bachelor’s degree in biomedical engineering, electrical engineering, mechanical engineering, or similar field with at least two years of experience in the research, development, or practice of using robotic medical devices/systems in human rehabilitative therapy. A person with less education but more relevant practical experience may also meet this standard. *Id.*

V. CLAIM CONSTRUCTION

For the purpose of deciding the grounds of invalidity presented by this Petition, Petitioner does not believe any of the terms in the Challenged Claims require construction.³

VI. CHALLENGED CLAIMS

A. Ground 1: Obviousness over Hidler in view of Knevels

Claims 1-7 and 13-20 of the ’000 Patent are invalid because they are obvious over the teachings of Hidler in view of Knevels. Ex-1003 ¶¶57-220.

³ Petitioner’s application of prior art to the Challenged Claims is not a waiver of any argument in parallel litigation that any claim term in the ’000 Patent is indefinite or otherwise invalid on other grounds. Nor does Petitioner waive its rights to raise additional issues of claim construction in any parallel litigation.

1. Overview of the Proposed Combination

With respect to independent claims 1 and 13, Hidler teaches a BWS apparatus, consisting of a trolley, drive assembly, patient attachment, and control system. Ex-1003, ¶58. Hidler, however, does not teach the use of a fixed power rail (a “powered conductor”) to supply power the trolley. Instead, Hidler powers the trolley through a power cable (326). But it was well-known prior to the Critical Date that power rail systems (such as the Knevels system) could be used to replace power cables used in overhead trolley systems (such as in the Hidler system). *Id.*, ¶¶59-75. The combination of Hidler and Knevels teaches the “powered conductor” limitations in the ’000 Patent. *Id.*, ¶¶60-61. The combination of Hidler and Knevels also meets each dependent claim from claims 1 and 13, which are generally directed to wheel assemblies, specific couplies, torque transfer, or basic operation of the powered trolley. *Id.*

a. Motivation to Combine and Expectation of Success (Hidler/Knevels)

Hidler and Knevels are analogous art since they both relate to overhead trolley systems. Ex-1003, ¶62. Hidler discloses a BWS system that uses a trolley mounted to a track hung from a ceiling. Hidler’s trolley is powered by a flexible power cable. Knevels teaches a fixed power rail specifically designed to power (and run next to) such a trolley. Knevels also specifically teaches that a portion of the trolley is disposed within its power rail. A POSITA would have had

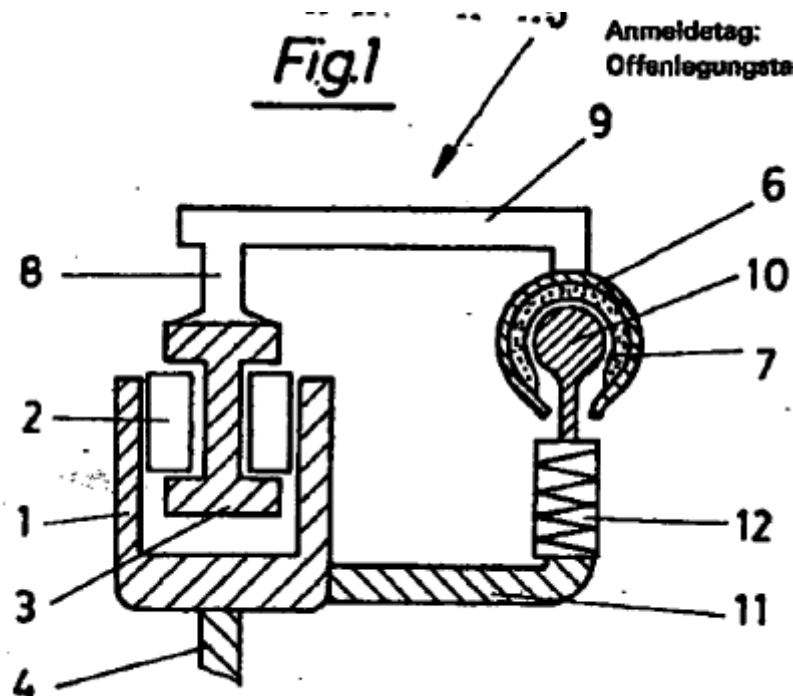
knowledge of a vast number of power rail systems as an alternative to a cable for providing power to a trolley.

(1) POSITAs Were Well-Aware of Power Rails

Power rails, such as the one taught in Knevels, were developed at least as early as in the late 1950s, and were well-known to POSITAs as of January 2013.

Ex-1003, ¶¶63-71. Knevels teaches a powered conductor for powering an overhead trolley system. Ex-1005, 13-17, Figs. 1-2; Ex-1003 at ¶¶63-66.

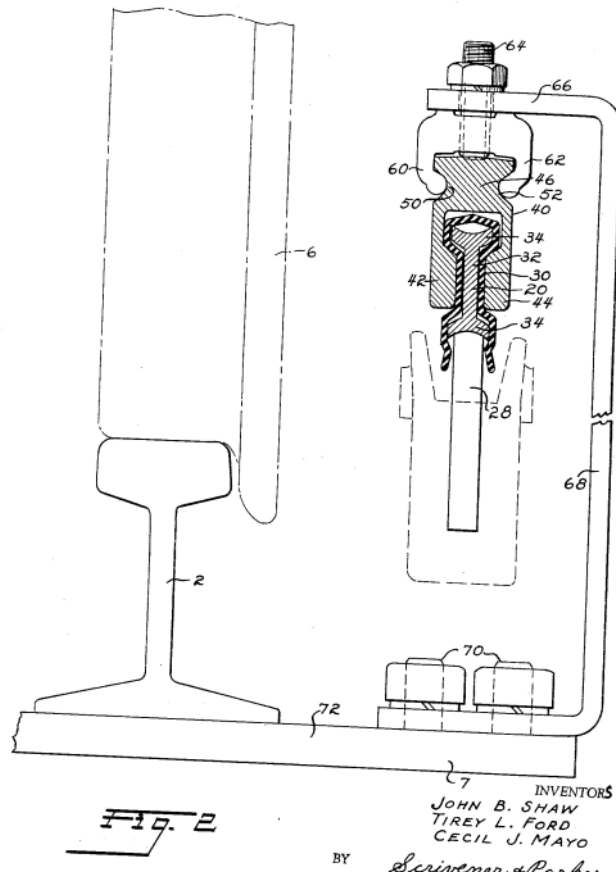
Specifically, Knevels teaches that its conductor system is used “in conjunction with a transport means,” such as a suspended track. *Id.* Like Hidler, Knevels teaches that a trolley travels along said suspended track.



Ex-1005 at Fig. 1.

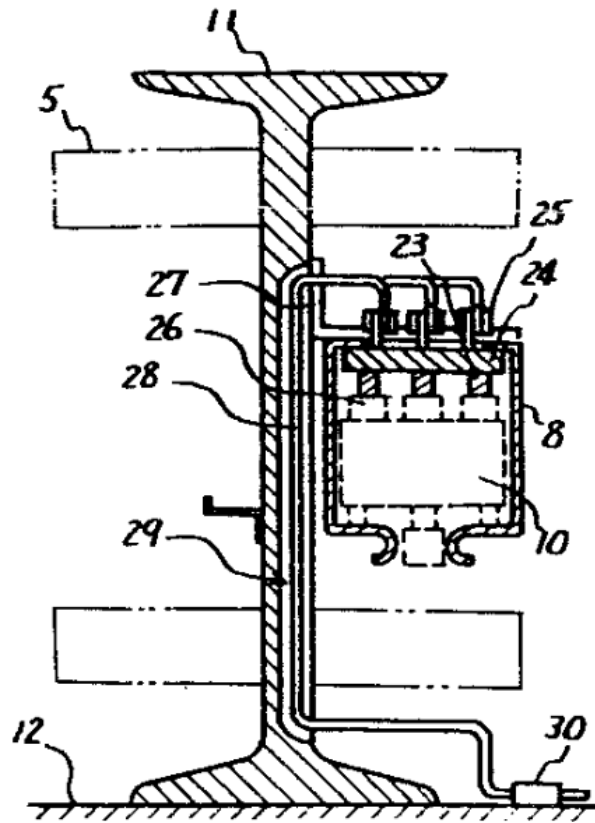
Figure 1 of Knevels shows that the power rail is used in conjunction with the trolley (1), which has wheels/castors (2) riding on a suspension I-beam track (3). Ex-1003 at ¶64; Ex-1005, 17-19. Figure 1 also teaches the power rail (i.e., a powered conductor) comprises a wire guide tube (6) and contact bar (7). *Id.* The power rail works by directly connecting inner conductive surfaces (7 and 7') (as shown in Fig. 2), with the current collector wiper contact (10) extending from the trolley's support arm and casing (11 and 12). *Id.*

The prior art is replete with other examples of power rail systems used to power trolleys. Ex-1003, ¶¶65-70. For example, U.S. Patent No. 2,991,336A ("Shaw"), teaches an electrical trolley system with a power rail to power an electric motor. Ex-1008 at 2:16-41; Ex-1003, ¶65-66. Shaw separately teaches placing a power rail (item 20) next to a track (item 2):



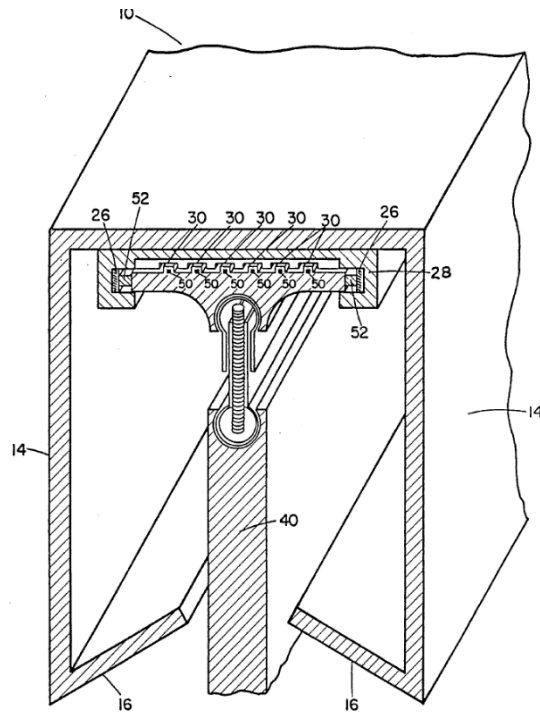
Id. (citing Shaw Fig. 2).

Other power rails for trolley systems can be found in JPS57126732A (“Sugiyama”) and U.S. Patent No. 4,843,971 (“Braunagel”). Ex-1003, ¶¶67-69 (citing Exs-1009-1010). Sugiyama teaches a power rail enclosing a current collector that moves within the power rail and alongside the track:



Id.; Ex-1009 at Abstract (teaching a powered conductor (the duct 8 that encloses current collector 10) that is affixed to a track 11).

Similarly, Braunagel teaches a suspended monorail track system with power and signal conductors extending along the interior surfaces of the track in order to provide electrical contact with vehicles moving along the track.

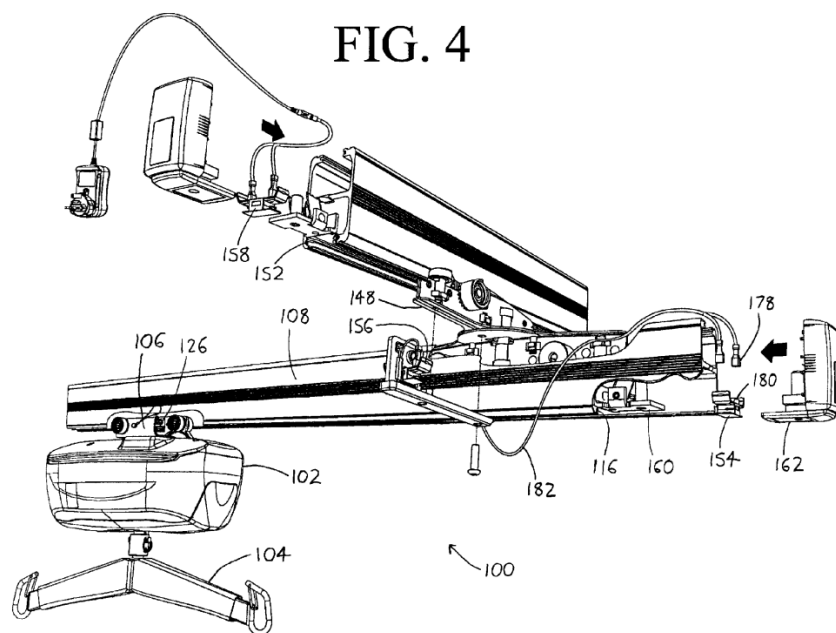


Ex-1010 at Fig. 8, Abstract; Ex-1003 at ¶69. In short, POSITAs were well-aware of power rails (including enclosed power rails) and how to use power rails to power vehicles or trolleys on a track prior to the filing of the '000 Patent.

(2) The Prior Art Expressly Suggests Replacing a Power Cable with a Power Rail in Overhead Support Systems

The prior art expressly suggests using power rails (such as Knevels) as a replacement for power cables in BWS systems (such as Hidler). For example, Faucher explains that replacing cables with a power rail improves the functionality of a BWS system: “elongated flexible cables that follow the hoists along their tracks ... can cause difficulties owing to the length of cable needed where the hoists are to travel long distances, and owing to the desire to avoid cable slack and

dangling cable.” Ex-1007, 1:25-64 (teaching a BWS system with use of a power rail based on a long felt need of a system “without the need for umbilical cables”); Ex-1003 at ¶73. To avoid this problem, Faucher suggests that a power rail can be used instead, and then expressly teaches how to use such a power rail with a trolley in a BWS system:



Id.; Ex-1007 at Fig. 4 (teaching the use of a power rail (items 116 (track conductor), 154 (contact carriers) and leads 182)) to power a patient support hoist trolley 106 via the trolley's mobile contact carrier 126).

The power rail in Faucher is illustrated in Figures 2-4 and detailed in the accompanying specification description, which teaches that the power rail has “track conductors 116” that touch “trolley contacts 118” to directly power the trolley. *Id.* at Figs. 2-4, 2:22-48; Ex-1003 at ¶73.

In another example, Bergenstrale, discloses fixed power rails being used in connection with BWS systems. Ex-1011; Ex-1003 at ¶70. Bergenstrale's BWS systems includes a rail having at least one conductor positioned on an upper interior surface of the rail, where a carriage is slidably disposed in the rail. Ex-1011 at Abstract; Ex-1003 at ¶70. Bergenstrale's BWS system and accompanying power rail are shown in Figures 1 and 6:

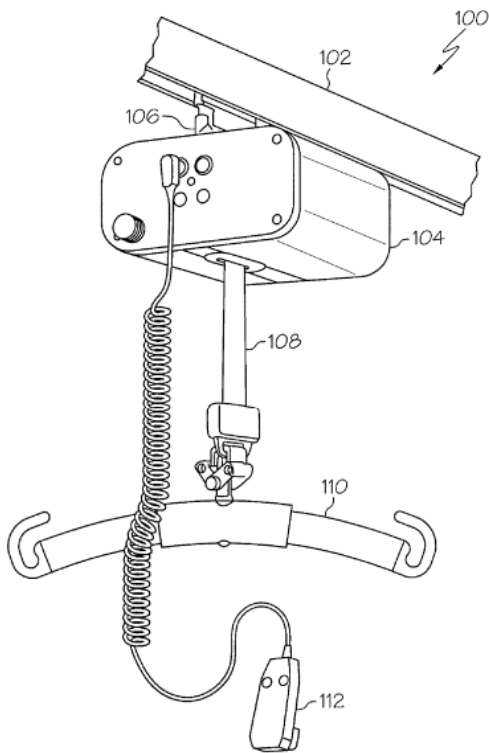


FIG. 1

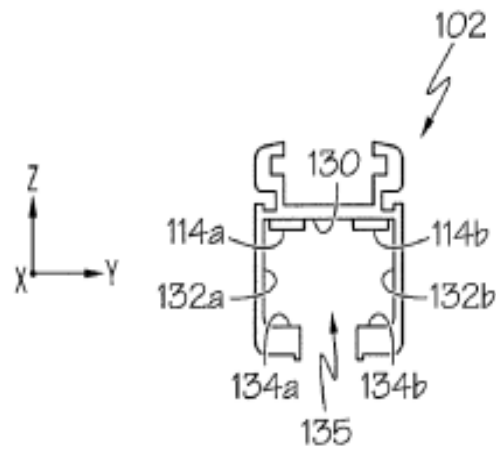


FIG. 6

Ex-1011 at Fig. 1 (teaching a patient “lift unit 104” coupled to rail 102); *id.* at Fig. 6, [0034-36] (teaching conductors 114a-b for use in the rail 102, within which the lift carriage 106 is “slidably disposed”).

Accordingly, the prior art: (1) explains the problems faced when using power cables to power trolleys in BWS systems (e.g., “cable slack and dangling cable”); (2) explicitly suggests using a fixed power rail as the solution to the problem; and (3) taught how to use such power rails in BWS systems. Ex-1003 at ¶74. At least on account of these teachings, a POSITA would have been motivated to modify Hidler’s BWS by replacing its elongated power cables with the power rail solution in Knevels. *Id.*, ¶¶74-75.

(3) It Would Have Been Obvious To Try Use Of Knevels’ Power Rail With The Overhead Trolley System Of Hidler

As reflected from the above background and wide-spread use of power rails with overhead BWS trolley systems, it would have been obvious to a POSITA to try using Knevels’ powered rail to supply power to the overhead trolley system of Hidler. Ex-1003, ¶¶76-80. A POSITA would have understood a limited number of options existed for powering a trolley system—primarily power cables, open power rails, and enclosed power rails. *Id.* A POSITA would have also understood that power rails were one of the well-known options to power a BWS system. *Id.*

The Patent Owner even admitted in the parallel district court litigation that using a power rail with overhead gait systems was well-known:

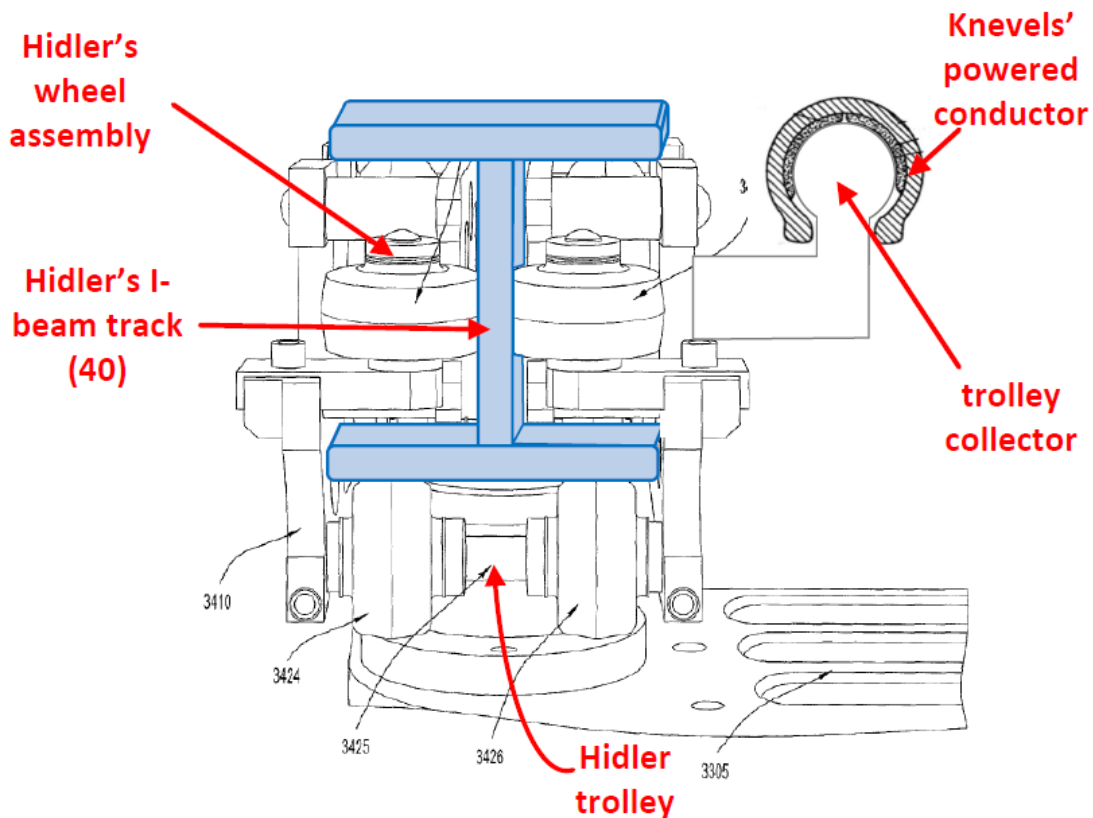
[P]owered rails, in this context, were known at the time of the prosecution of the '000 patent, and this Bergenstrale reference specifically discloses a powered rail in that context.

Ex-1014 at 23:24-24:6.

Given that power rails were so well-known, it would have been obvious for a POSITA to try replacing Hidler's power cables with such a power rail. Ex-1003 at ¶81; *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) ("When there is a design need and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp."); *see also id.* at 416. This is especially the case where POSITAs were well-aware of the benefits of power rails over elongated powered cables, such as avoiding long cables that slack as the trolley moves back and forth, avoiding dangling cables for persons to run into, and reducing the load on a trolley. Ex-1003 at ¶81; Ex-1007, 1:25-64. Furthermore, it would have been obvious for a POSITA to try different types of power rails (such as enclosed vs non-enclosed) depending on different design parameters (e.g., space, safety, appearance, and the shape of a trolley's collector). Ex-1003 at ¶79-83.

(4) Expectation of Success

A POSITA would have had a reasonable expectation of success in incorporating Knevel's power rail in Hidler's BWS system. A POSITA would have recognized that adding Knevel's power rail to Hidler's BWS system could routinely be accomplished by adding a support arm and current collector to Hidler's trolley. Ex-1003, ¶¶82-84.



Id. (showing the modification of the Hidler trolley combined with Knevels' power rail); Ex. 1004, Fig. 43 (and the I-Beam track from Figs. 2-4 superimposed) with Knevels' powered conductor); Ex-1005, Fig. 1 (teaching a power rail); Ex-1004 at Figs. 2 (teaching an I-Beam track that the wheel assemblies move on) and 43

(teaching the location of the wheel assembly). In combination, as Hidler’s trolley advances on the track, its current collector moves within the power rail via the support arm. *Id.* A POSITA would choose this option as it would requires a limited amount of work and redesign to Hidler’s trolley. *Id.*

For all of the foregoing reasons, a POSITA would have been motivated to combine Hidler and Knevels as proposed.

2. Claim 1

a. Limitation 1[pre]

1[pre]	<i>An apparatus, comprising:</i>
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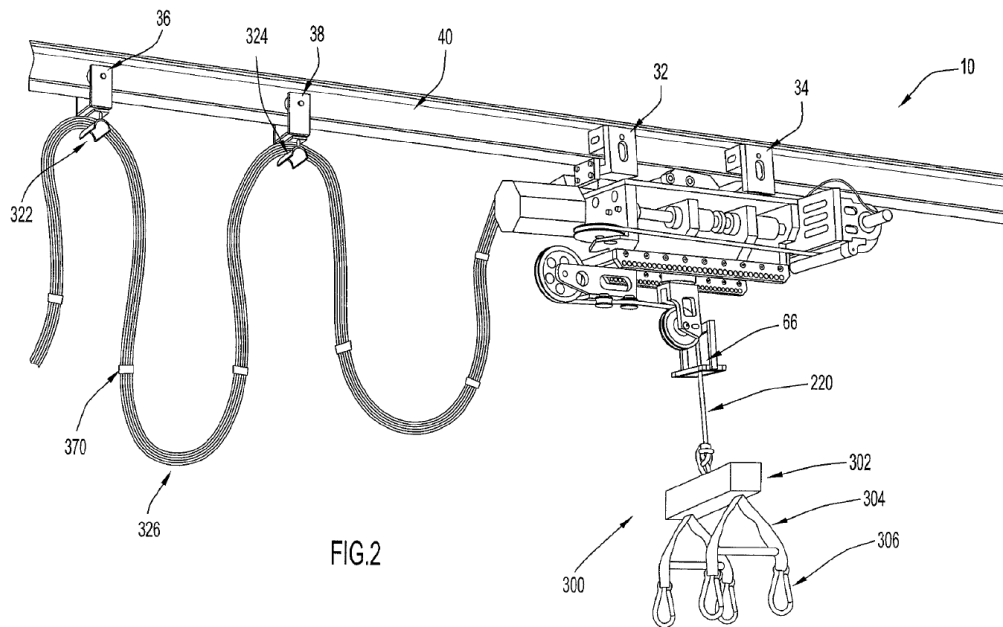
To the extent the preamble is a limitation, Hidler teaches an apparatus: “[t]he system according to the present invention is a BWS system that allows individuals with severe to minor gait impairments to freely practice over-ground walking in a safe, controlled manner.” Ex-1004, 4:9-12; Ex-1003, ¶86.

b. Limitation 1[a]

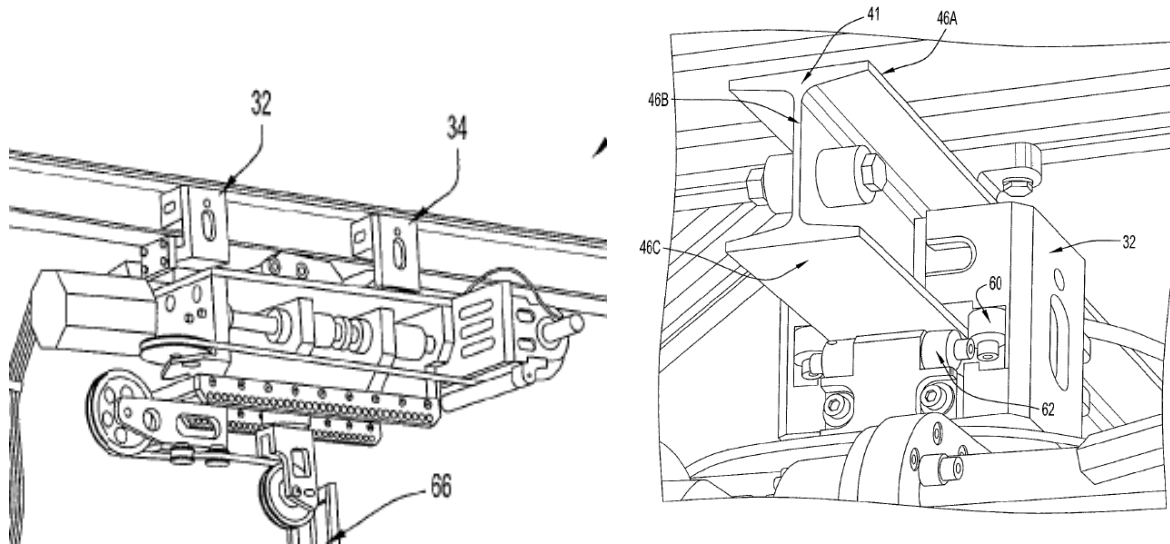
1[a]	<i>a trolley having a drive assembly configured to movably suspend the trolley from a track;</i>
------	--

Hidler teaches 1[a] because Hidler teaches a trolley (30) that has a drive assembly (3300) that moves the trolley (30) suspended from a track (40). Ex-1003, ¶¶88-94.

As shown in Figures 1-2, Hidler teaches a trolley (30) having a drive assembly (detail shown below) configured to movably suspend the trolley from a track (40):



Hidler expressly teaches that the trolley is “driven” and “rides along a track 40, which in one implementation, can be mounted to a ceiling or other support structure.” Ex-1004, 4:9-16; Figs. 1-3; Ex-1003, ¶90. The drive assembly in Hidler consists of the wheel assemblies and support structures shown in Figures 2 and 14 (and motor as discussed in more detail below):



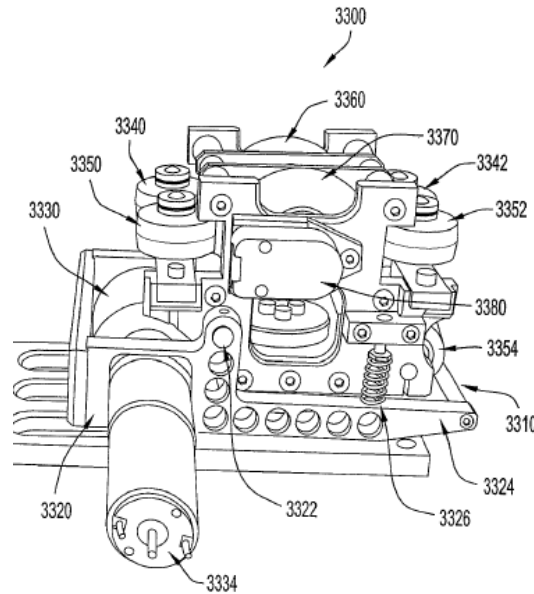
Ex-1004 at Figs. 2, 14 (showing placement of wheel assemblies 32 and 34 as they move the trolley along the track); Ex-1003, ¶92. The wheel assemblies are mounted to the trolley and mounted to a DC motor (either directly on or between the wheel assemblies). Ex-1003, ¶93; Ex-1004 at Fig. 25 (showing block diagram coupling of motor to the wheels via a controller and encoder); *id.* at 6:61-7:13.

Together, these structures consist of the claimed drive assembly. Ex-1003 at ¶¶92-94.

Hidler also teaches that the “assembly 3300 includes a trolley motor 3334 that is coupled to a drive wheel 3330 that engages the track 3150 to move the trolley 3100 along the track 3150. As shown in FIG. 41, the drive wheel 3330 includes an outer surface 3332 and is rotatably mounted on an axle 3334. Ex-1003, ¶94. The drive wheel 3330 is mounted in a drive wheel body 3320 that is

pivotally mounted to the housing 3310 by an axle 3322.” *Id.*; Ex-1004, 18:53-59.

This drive assembly is shown in Figure 40:



Ex-1004 at Fig. 40 (showing drive wheel 3330 coupled to the support structure and motor axle 3334). A POSITA would recognize that this wheel, motor and support structure also teaches limitation 1[a]. Ex-1003, ¶94.

c. Limitation 1[b]

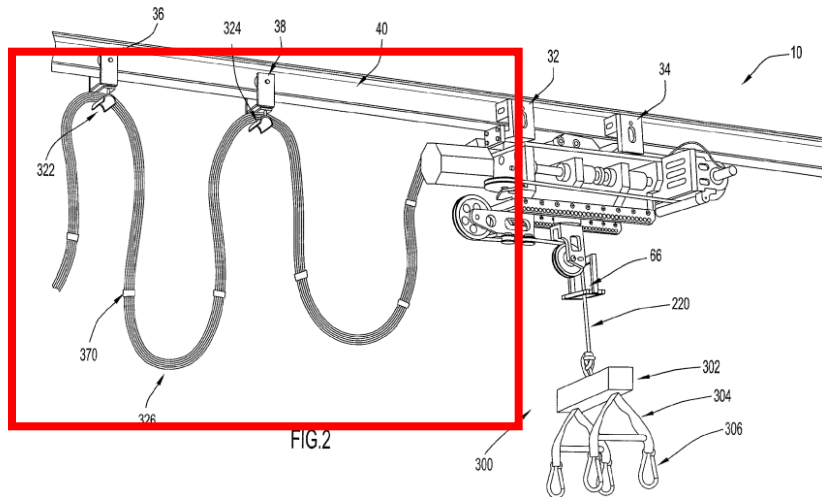
1[b1]	<i>a powered conductor operatively coupled to the track, the powered conductor being substantially parallel to the track,</i>
-------	---

Hidler, in view of Knevels, teaches 1[b1] because the Hidler-Knevels structure includes a powered conductor that: (1) runs parallel to Hidler’s track; and (2) provides power to Hidler’s trolley as it moves along the track.

A POSITA would understand the plain and ordinary meaning of “operatively coupled” to mean interconnected in some manner, for example, electrically connected. *See* Ex-1001 at 7:19-24 (“... control 1900 can be operatively coupled (e.g., electrically connected) to the one or more motors ...”); Ex-1003, ¶100.

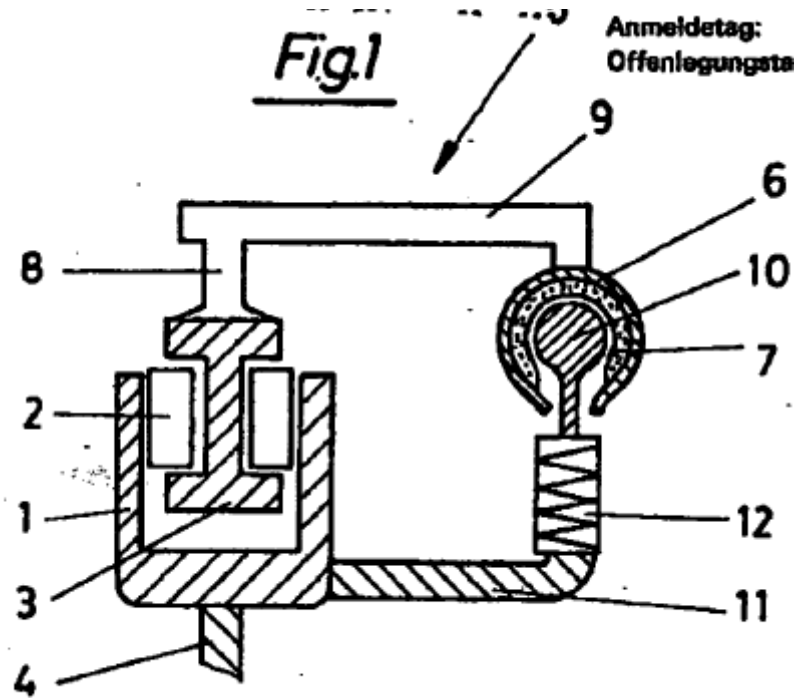
As explained above, Hidler teaches an apparatus with a trolley having a drive assembly configured to movably suspend the trolley from a track. Ex-1003, ¶96. Hidler’s drive assembly, however, is powered through power *cables* that run substantially parallel to the track (and bunch up as needed), rather than through an enclosed *powered conductor* coupled to the track (that runs substantially parallel to the track).⁴ Hidler’s power cable is shown below in Figure 2:

⁴ An enclosed powered conductor rail, rather than power cables, is described here to meet this limitation because limitation1[b3] (described below) requires a portion of the trolley to be *disposed within the powered conductor* which is not possible if cables are used as a powered conductor.



See Fig. 2 (annotated; Ex-1004 at Fig. 2 (showing power cable wires 326); see also *id.* at 5:38-42. A POSITA would have been motivated to modify Hidler to replace the cables with a power rail as taught in Knevels. See Section VI.A.a (Motivation to Combine); Ex-1003, ¶97.

Knevels teaches a powered conductor capable of powering an overhead trolley system. Ex-1005; Ex-1003, ¶¶98-99. Specifically, Knevels teaches that its conductor system is used “in conjunction with a transport means,” such as a suspended track. *Id.* Knevels teaches that a trolley travels alongside the suspended track, including by way of the example configuration shown below.

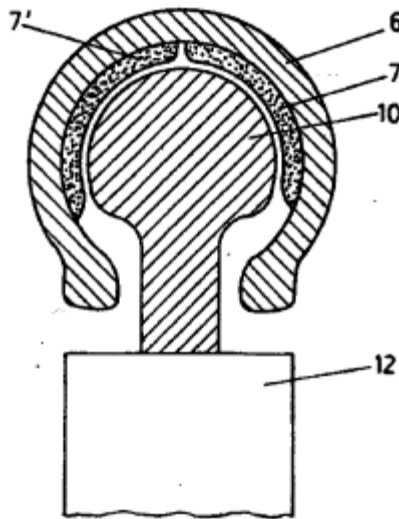


Id., Fig. 1.

Figure 1 of Knevels shows that the power rail is used in conjunction with the trolley (1), which has wheels/castors (2) riding on a suspension I-beam track (3).

Ex-1003, ¶99. Figure 1 also teaches that the power rail (i.e., a powered conductor) comprises a wire guide tube (6) and contact bar (7). *Id.* The Knevels power rail works by directly connecting inner conductive surfaces (7 and 7') (shown in Fig. 2, below), with the current collector wiper contact (10) extending from the trolley's support arm and casing (11 and 12). *Id.*

Fig.2



Ex-1005 at Fig. 2 (showing the inner conductive surfaces of the power rail). A POSITA would have understood Knevel's power rail to be a powered conductor as claimed. Ex-1003, ¶¶98-102.

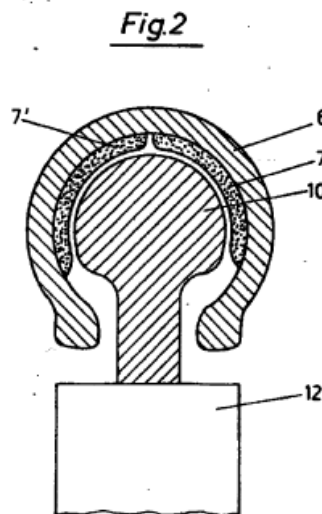
A POSITA would have understood that Knevels' power rail/powered conductor is also operably coupled a track because the trolley traveling along the track directly contacts the power rail using the support arm (11) extending from the trolley. Ex-1003, ¶100. Therefore, there is an electrical connection between the powered conductor and the track. *Id.* The '000 Patent provides a similar exemplary embodiment of operatively coupling the power rail to the track. *See* Ex-1001 at 7:19-24.

Knevel's power rail is also designed to be substantially parallel to the track, as is shown in Figure 1, above. Ex-1003, ¶101 (citing Ex-1005 at Fig. 1).

Knevels expressly teaches that “electrical power is fed to the traction means via current collectors and a shockproof contact wire” and is “positioned in parallel to the rail track (3) of such a transport means....” Ex-1005, p. 2; Ex-1003, ¶101.

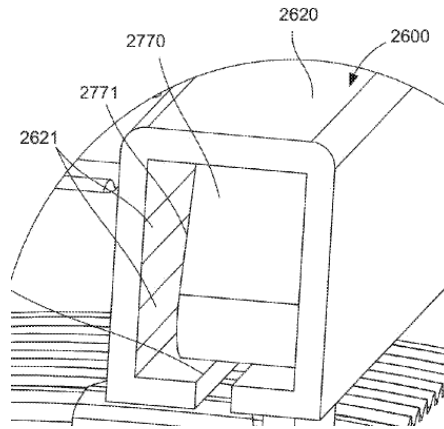
1[b2]	<i>the powered conductor including at least one conductive inner surface,</i>
-------	---

Hidler, in view of Knevels, teaches 1[b2]. In particular, Knevels teaches “the powered conductor including at least one conductive inner surface” because the inner surface on Knevels' power rail (6) includes multiple conductive inner surfaces (i.e., contact wires 7 and 7') that transfer power to the trolley's drive assembly through the current conductor (10):



Ex-1005, Fig. 2; *id.* at 3 (“As is shown by the detailed depiction of the wire guide tube 6 in figure 2, a contact wire 7, 7’ broken into two or more current conductors is suggested within the slotted tube 6.”); Ex-1003, ¶104.

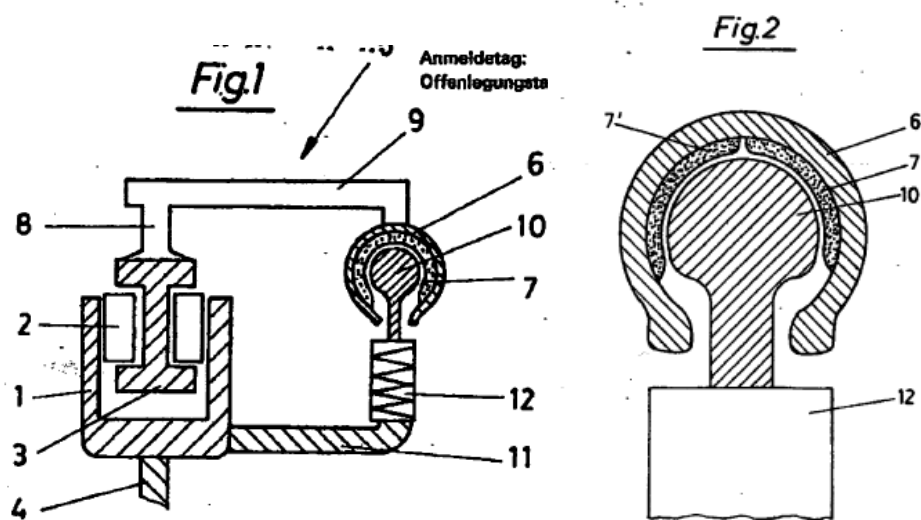
Knevels’ teaching of 1[b2] closely tracks examples provided in the ’000 Patent. In particular, the ’000 Patent provides an example of a powered conductor (2620) including a conductive inner surface (2771) in Figure 10:



Ex-1001 at Fig. 10, 13:39-49; Ex-1003, ¶105.

1[b3]	<i>a portion of the trolley being disposed within the powered conductor and in contact with the at least one conductive inner surface to electrically couple the trolley to the powered conductor,</i>
-------	--

Hidler, in view of Knevels, teaches 1[b3] because a portion of Hidler’s trolley will be disposed within the power rail and in contact with a conductive inner surface of the power rail. In particular, Knevels teaches an enclosed power rail (6) with a conductive inner surface (7, 7’) that electrically couples a trolley to the powered conductor:



Ex-1005 at 6; Ex-1003, ¶109.

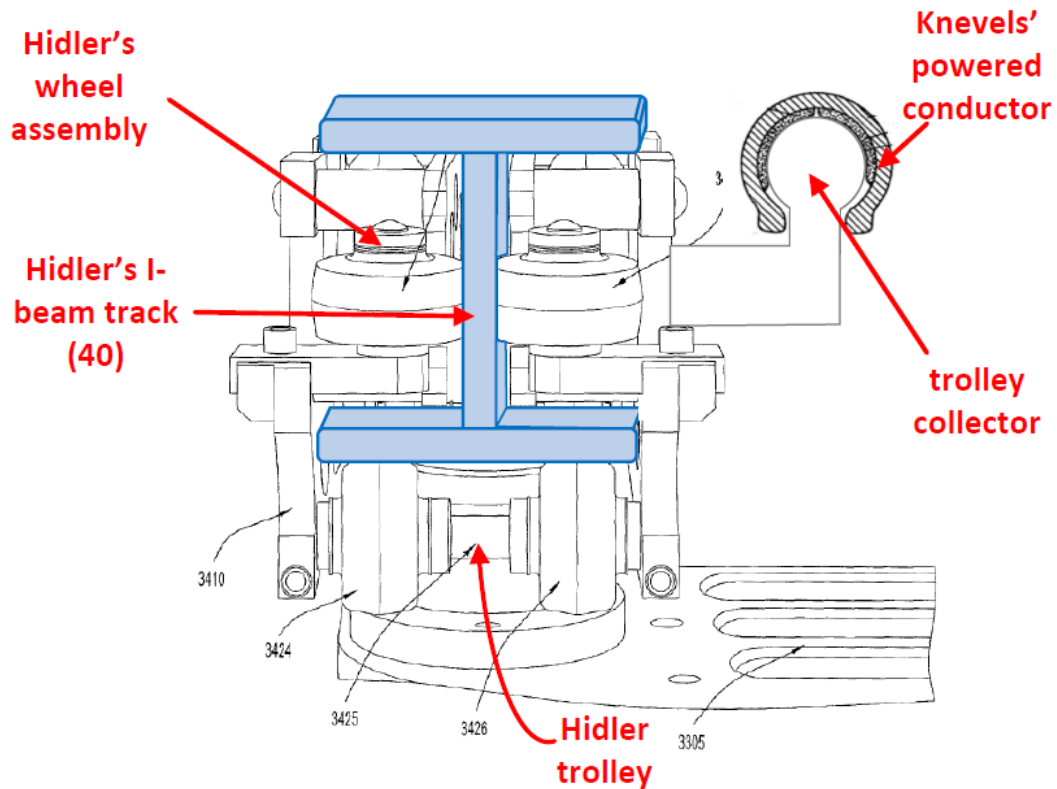
In combination, a POSITA would have understood that the collector (i.e., a portion) of the Hidler-Knevels trolley is disposed within the powered conductor and in contact with the at least one conductive inner surface to electrically couple the trolley to the powered conductor. Ex-1003, ¶110. The trolley's current conductor is in contact with at least one conductive inner surfaces (elements 7 and 7' in Knevels), which together operate to electrically couple the trolley to the powered conductor. See Section 1[b2]; Ex-1005 at 14-19; Ex-1003, ¶¶109-10.

1[b4]	<i>the portion of the trolley configured to move within the powered conductor and along the at least one conductive surface when the trolley is moved along the track</i>
-------	---

Hidler, in view of Knevels, teaches 1[b4] because the Hidler-Knevels trolley's current collector will move along the power rail as the trolley moves along the track. Ex-1003, ¶¶113-17. Specifically, Knevels teaches that its contact

wire system runs parallel to the suspended monorail track coupled to it. Ex-1005, 14-16; Ex-1003, ¶114. Within the system, the trolley's current collector wiper contact is within the wire guide tube and is "guided with the transport means" that moves down the track. *Id.* Further, Knevels teaches that the "contact wire guide tube has lengths which correspond to the sections of the suspended monorail provid[ing] the corresponding contact wire guide tubes with couplings so that a **smooth sliding surface is provided** on the contact wire guide tube ends for the current collector wiper contact. *Id.*

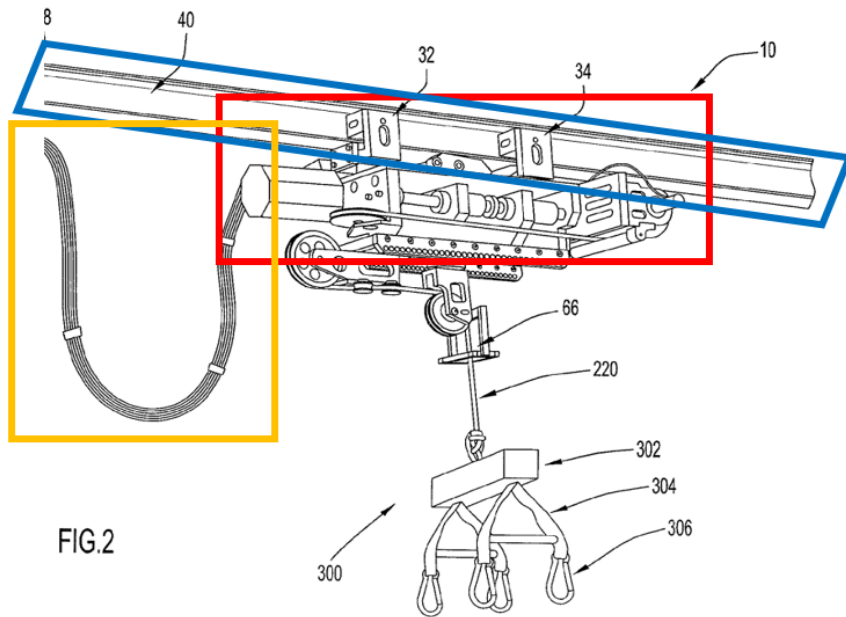
Thus, the Hidler-Knevels combination would include the track and trolley from Hidler modified to include a collector and powered conductor that runs parallel to the track, as taught in Knevels. Ex-1003, ¶115. The current collector that would be incorporated into the trolley of Hidler (as taught in Knevels) and would move through the wire guide tube inside the powered conductor, sliding along the contact wire 7 and 7' (i.e., the inner conductive surface):



Id.; Ex-1003, ¶115; Ex-1005, Fig. 1; Ex-1004 at Figs. 2 and 43.

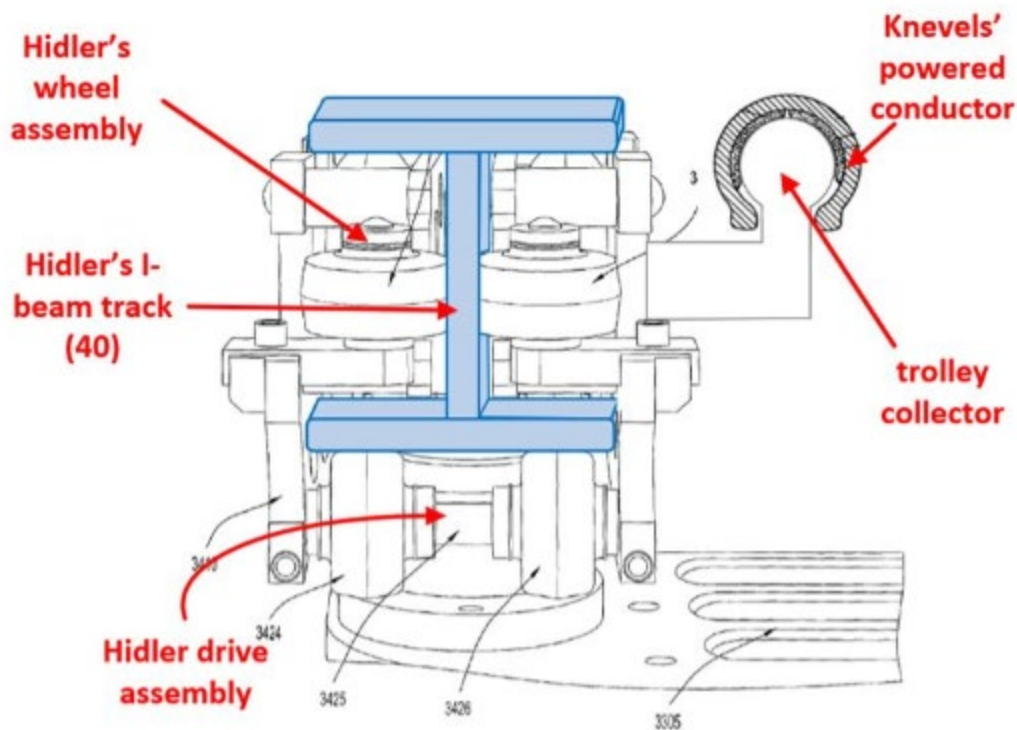
1[b5]	<i>the track and the drive assembly each disposed outside of the powered conductor;</i>
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Finally, the Hidler-Knevels combination teaches 1[b5]. Ex-1003. Figure 2 in Hidler teaches a track (annotated in blue below) and a drive assembly (annotated in red):



Ex-1004, Fig. 2, 4:12-14; Ex-1003, ¶119. As shown above, the drive assembly in Hidler is located under the main track. *Id.*

In the Hidler-Knevels combination, Knevel's power rail (6) merely replaces the Hidler cable (annotated in yellow above) and is separate from the main track (3) (which supports the drive assembly in Hidler) as shown below:



Ex-1003 at ¶¶120-21; Ex-1005, Fig. 1; Ex-1004, Figs. 2 and 43. Accordingly, combining Hidler’s BWS with Knevels’ power rail results in a track and drive assembly being “disposed outside of the powered conductor,” thus satisfying 1[b5]. Ex-1003, ¶122.

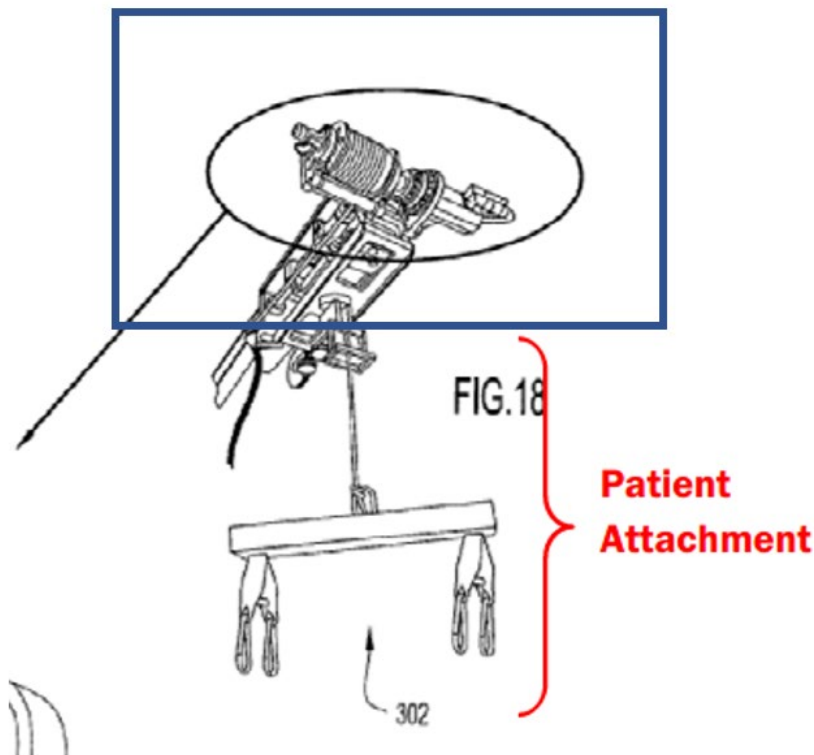
d. Limitation 1[c]

1[c]	<i>at least one patient attachment coupled to the trolley, the at least one patient attachment configured to support a single patient; and</i>
------	--

Hidler teaches 1[c] because it describes a trolley with a patient attachment mounted to it that can support one patient (subject). Ex-1003, ¶125. Specifically,

Hidler states that “[t]he system according to the present invention is a [BWS] system that allows individuals with severe to minor gait impairments to freely practice over-ground walking in a safe, controlled manner. The system 10 includes **an unloading system 20 (see FIG. 1) that is attached to a driven trolley or movable support 30** that rides along a track 40.” Ex-1004, 4:9-25 (emphasis added); Ex-1003, ¶126.

Hidler specifically teaches figures depicting the patient attachment coupled to the trolley (annotated in blue):



Ex-1004, Fig. 18; Ex-1003, ¶¶127-30; Ex-1004, 5:6-24.

e. Limitation 1[d]

1[d]	<i>a control system coupled to the trolley and at least operably coupled to the powered conductor.</i>
------	--

Hidler, as modified in view of Knevels, teaches 1[d] because Hidler teaches a control system that is coupled to the trolley and to the power source and (as explained above) Knevels teaches using the powered conductor as the power source. Ex-1003, ¶132.

Hidler teaches a “user interface 100 [that] allows the therapist to monitor and control all of the features of the system 10.” *Id.*, ¶133; Ex-1004, 5:57-67. That user interface includes “[l]arge pushbuttons on a touch screen such as that shown in FIG. 5 allow the therapist to raise and lower the patient, to start the constant BWS, engage the trolley (e.g. have the trolley track the subjects).” *Id.*

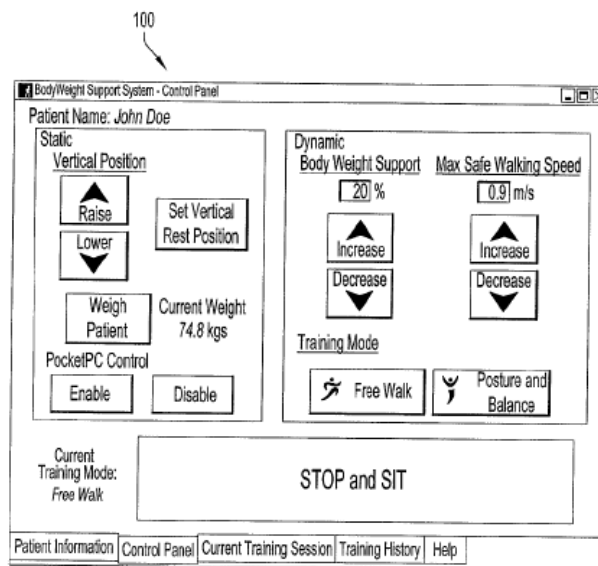


FIG.5

Ex-1004 at Fig. 5.

The controls above are provided via Hidler's "control system 500" which is coupled to the trolley:

the control system 500 includes a controller 510 that is configured to receive various inputs from the sensors or detectors of the system....

The system 500 includes the drive motor 50, the winch motor 230, and the ball-screw motor 240. Each of the motors 50, 230, and 240 is controlled based on the inputs from the corresponding sensors."

Ex-1004, 13:62-14:18; Ex-1003, ¶134.

The combination of Hidler and Knevels also teaches that the control system is operatively coupled (e.g., electrically coupled) to the powered conductor. Hidler teaches the control system 500 "controls all aspects of the system" (including the trolley's motors) and receives inputs from the trolley's sensors. Ex-1004, 5:57-67; 13:62-14:18; Ex-1003, ¶136. The Hidler-Knevels trolley motors and sensors are powered by the powered conductor. Therefore, the control system is operably coupled to the powered conductor in order to move the trolley along the track and adjust tension of the support tether in response to patient movement, in satisfaction of limitation 1[d]. *Id.*

3. Claim 2

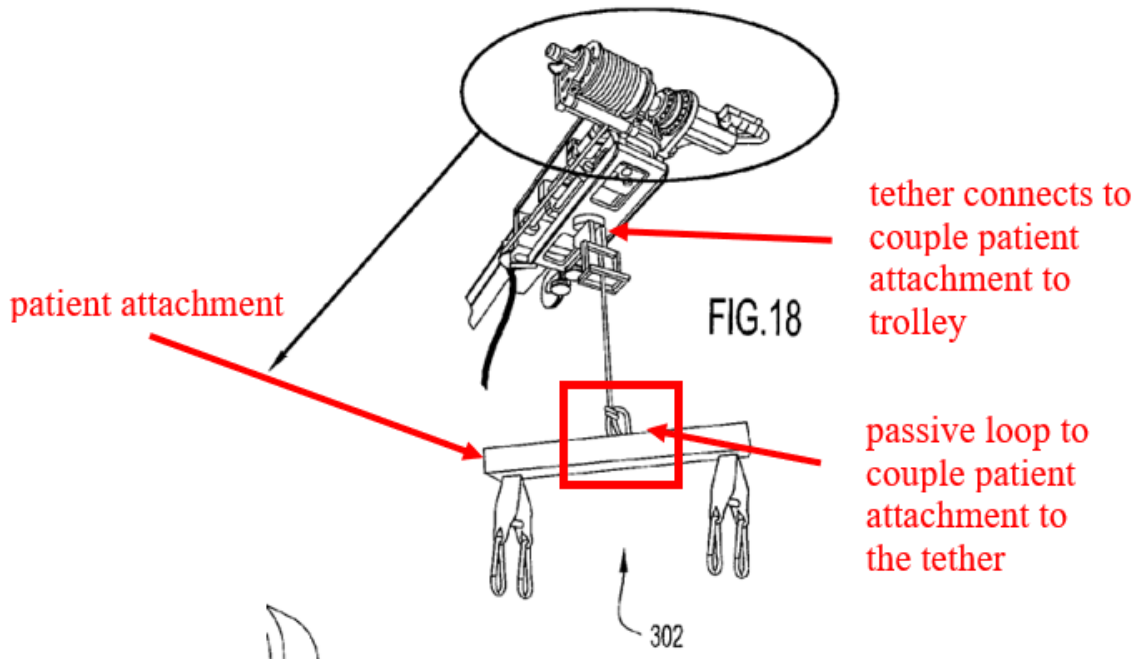
2	<i>The apparatus of claim 1, wherein the patient attachment includes one of a passive coupling and an active coupling, the passive coupling configured to be coupled to a tether to couple the patient attachment to the trolley, the active coupling configured to be coupled to a patient harness.</i>
---	--

Hidler teaches the additional limitations recited in claim 2 through its descriptions of the coupling of the patient attachment to the trolley. A POSITA would understand the plain and ordinary meaning of “one of a passive coupling and an active coupling” to mean “a passive coupling or an active coupling.”⁵ The ’000 Patent specification does not define “active coupling” or “passive coupling.” Ex-1003, ¶¶140-41. While a POSITA may not understand the complete scope of the terms “active” and “passive” as used in the claims, a POSITA would understand that the ’000 Patent and Hidler both disclose hook/loop passive couplings configured to a tether to couple the patient attachment to the trolley. Ex-1003, ¶¶141-42.

Specifically, the ’000 Patent describes the coupling 2810 as including “a coupling mechanism 2811 configured to couple to ... the tether.... [via] a loop or a hook configured to couple to an attachment device of the tether.” *Id.* at 28:6-12. A POSITA understands a “loop” or a “hook” to be a passive coupling. Ex-1003,

⁵ Any other interpretation of claim 2 (such as an interpretation requiring a passive coupling and an active coupling) would read “one of” out of the claim.

¶143. Hidler also teaches using loop or hook that is configured to be coupled to a tether to couple the patient attachment to the trolley:



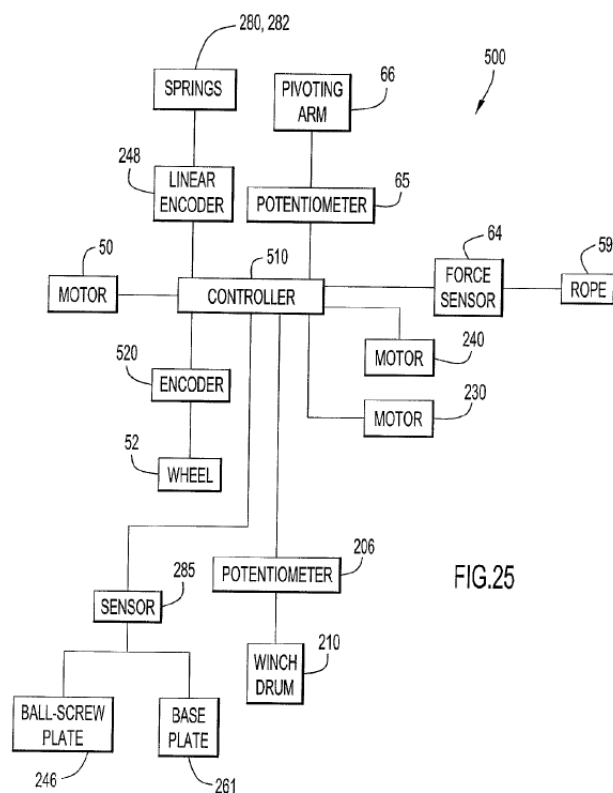
Ex-1003, ¶143; Ex-1004 at Fig. 18. Hidler separately teaches that the patient harness is connected to the unloading system by a rope (i.e., a tether) which is connected to the harness. *Id.* at Fig. 1, 5:11-13; Ex-1003, ¶143. The tether is connected to the harness in the same manner as described in the '000 Patent, with a “passive coupling,” and therefore, Hidler teaches the claimed “passive coupling configured to be coupled to a tether to couple the patient attachment to the trolley” in satisfaction of claim 2. *Id.*; Ex-1002, 241 (examiner finding Hidler disclosed a passive coupling).

4. Claim 3

3

The apparatus of claim 1, wherein the trolley includes a patient support system, the patient support system configured to actively support a patient.

Hidler also teaches the additional limitations in claim 3 because Hidler teaches a patient support system (Figs. 17-25) that actively supports a patient by dynamically adjusting a tether to maintain constant force and prevent patient falls. Ex-1003, ¶145. The control system of Hidler actively controls the tension on the tether (rope 59) based on inputs from a variety of sensors and other components, including motors, potentiometers, encoders, springs, controllers, a winch drum, and a ball screw plate:



Id., ¶146; Ex-1004 at Fig. 25. Hidler teaches that its BWS system is actively supports a patient as it configured to “provide[] constant rope tension (e.g. constant BWS) ... as the subject walks” *Id.* at 10:4-22; Ex-1003, ¶147.

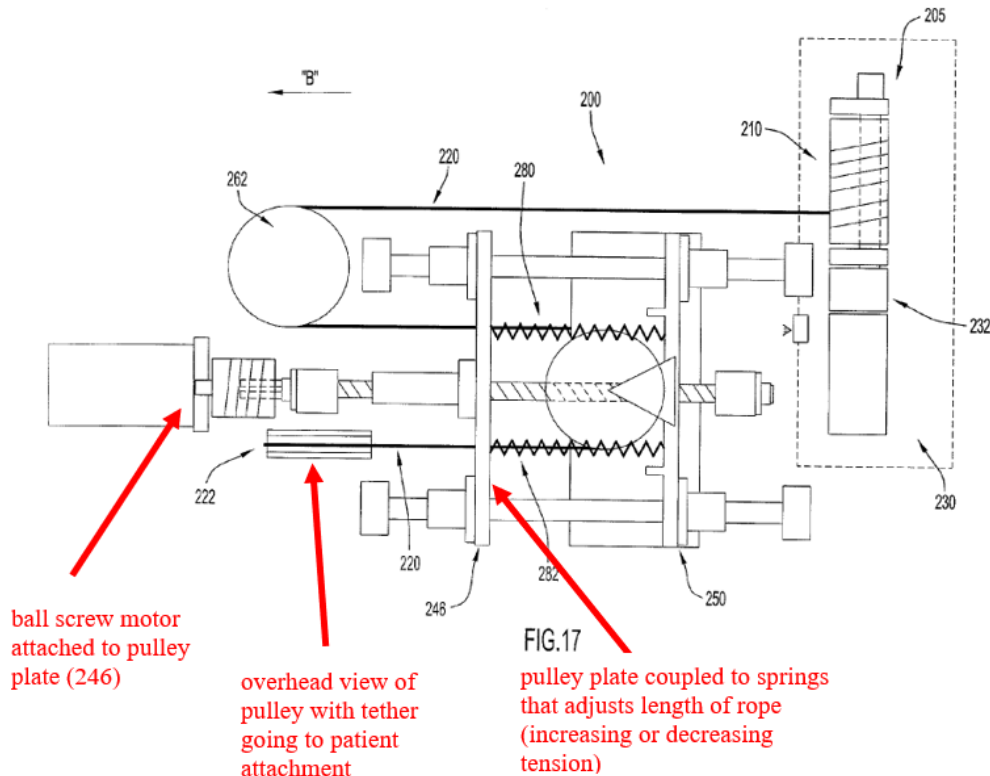
5. Claim 4

4	<i>The apparatus of claim 1, wherein the trolley includes the drive assembly and a torque transfer assembly, the drive assembly and the torque transfer assembly being driven simultaneously.</i>
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Hidler also teaches the additional limitations recited in claim 4 because Hidler teaches that its trolley includes a drive assembly (1[a]) and a torque transfer assembly (used for maintaining pre-selected tension in the tether) (as discussed below) that are driven simultaneously when a patient moves. Ex-1003, ¶¶149-50.

As explained above, Hidler includes a drive assembly to move the trolley. *Supra*, 1[a]. Hidler also teaches es a torque transfer assembly (as part of its system for actively supporting the weight of a patient) that is driven simultaneously with the drive assembly when the trolley is tracking a patient. Ex-1003, ¶151-53.

In particular, Hidler further teaches an unloading system that transfers torque from the ball screw motor to the tether coupling the patient attachment using pulley plates and springs move its pulley plates in order to maintain a pre-selected tension in the tether:



Id.; Ex-1004 at Figs. 17-22.

A POSITA would understand that as a patient walks, “the pulley plate 246 will move back and forth. In order to maintain the force in the rope 220 constant, the spring deflection, dx , must remain constant.” *Id.* at 11:46-59; Ex-1003, ¶152-53. The pulley plate moving back and forth is result of a linear force. *Id.* When this happens, the “ball-screw motor 240 turns on and moves the ball-screw plate” to maintain the pre-selected tension. *Id.* Converting the motor’s rotational force requires the ability to transfer torque. Ex-1003, ¶152. In Hidler, this is done with the ball-screw/plate mechanism (i.e., a torque transfer assembly). *Id.*; See Ex-1003, Fig. 20A. Accordingly, the system described above is a torque transfer

assembly as the rotational energy from the motor is converted to linear energy at the tether. Ex-1003, ¶152.

While the patient is moving, Hidler’s torque transfer assembly is being driven to constantly maintain the tether’s pre-selected tension. Under this condition, the trolley’s drive assembly also being driven as it is tracking the patient’s movement. *Id.* at 4:22-25 (“As the subject 15 ambulates, the trolley 30 automatically moves forward or back.”); Ex-1003, ¶153. As a result, the drive assembly and the torque transfer assembly of Hidler are driven simultaneously. *Id.*

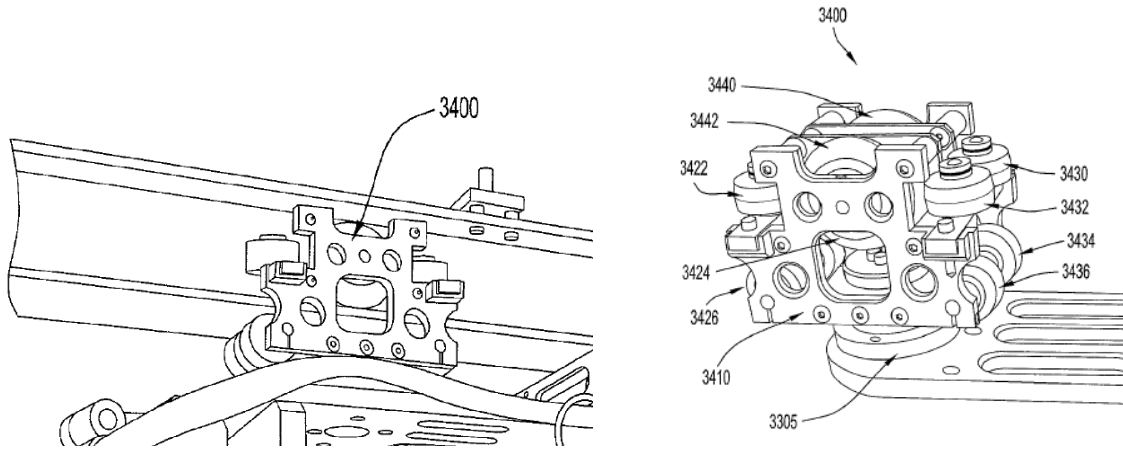
Notably, during original prosecution the Examiner agreed that Hidler taught “a torque transfer assembly, the drive assembly and the torque transfer assembly being driven simultaneously.” Ex-1002 at 265-66.

6. Claim 5

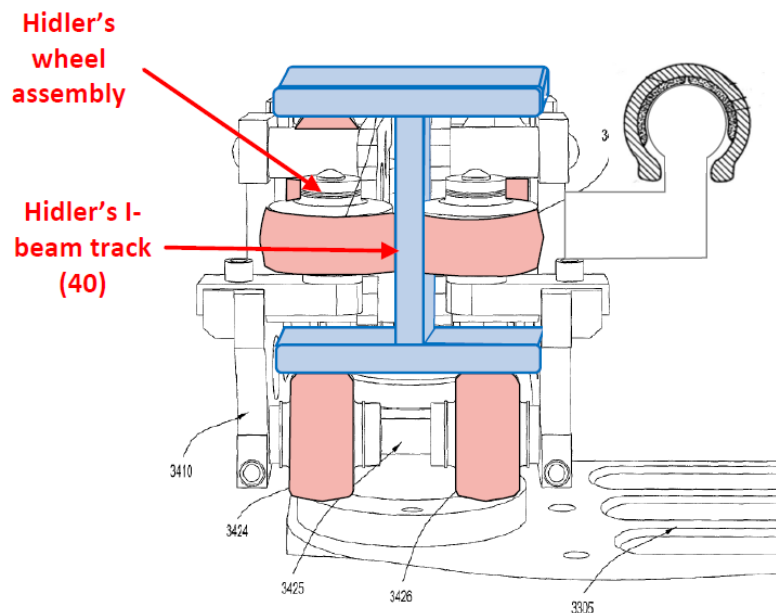
5	<i>The apparatus of claim 1, wherein the drive assembly includes a plurality of wheels, at least a portion of the plurality of wheels disposed above at least a portion of the track.</i>
---	---

Hidler also teaches the additional limitations recited in claim 5 because Hidler teaches that the drive assembly has a “pivoting wheel assembly 3400” that “includes wheels 3440 and 3442” (i.e., a “plurality of wheels”) and those wheels “rest on the upper inner surface of the lower flange of the track 3150” (i.e., the wheels are “disposed above at least a portion of the track”). Ex-1004, 18:32-43;

Ex-1003, ¶156. The disposition of wheels 3440 and 3442 are above at least a portion of the track as depicted in Figures 39-40, and annotated Fig. 43:



Ex-1004, Figs. 39 (showing placement of wheel assembly 3400 on the track) and 40 (showing placement of wheels (including wheels 3442 and 3440) within the wheel assembly); Ex-1003, ¶157.



Ex-1004, Fig. 43 (annotated to show cross-section of the Hidler wheel assembly (with superimposed track), which demonstrates that some of Hidler’s wheels are disposed above a portion of the track); Ex-1003, ¶157.

7. Claim 6

6	<i>The apparatus of claim 1, wherein the trolley is configured to be powered only from the powered conductor.</i>
---	---

Hidler, in view of Knevels, teaches the additional limitations recited in claim 6. As explained in claim 1, a POSITA would have found it desirable to remove Hidler’s power cable and replace it with Knevels’ power rail. Ex-1003, ¶160. Once replaced, there is no other power source for the trolley than through the Knevels’ powered conductor. *Id.*, ¶160-61.

8. Claim 7

7	<i>The apparatus of claim 1, wherein the trolley is configured to be moved from a first position at an end of the track to a second position spaced apart from the end of the track.</i>
---	--

Hidler teaches the additional limitations recited in claim 7. Specifically, Hidler teaches that its BWS trolley “rides along a track” (Ex-1003 at 4:15), “moves along the track” (*id.* at 5:31), “moves in a direction along the track” (*id.* at 19:10) and enables patients “to practice walking around and/or over obstacles” (*id.* at 4:18). A POSITA would have understood the foregoing to teach the additional limitations recited in claim 7. Ex-1003, ¶¶164-65.

9. Claim 13

f. Limitation 13[pre]

13[pre]	<i>An apparatus, comprising:</i>
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To the extent the preamble is a limitation, Hidler teaches 13[pre] for the same reasons detailed for claim 1[pre]. *Supra*, claim 1[pre]; Ex-1003, ¶166.

g. Limitation 13[a]

13[a]	<i>a trolley having a drive assembly, the drive assembly including a plurality of wheels configured to move along at least one surface of a track to move the trolley relative to the track;</i>
-------	--

Hidler also teaches 13[a]. Ex-1003, ¶167.

For the same reasons as claim 1[a], Hidler teaches a trolley having a drive assembly. *Id.*, ¶168.

As discussed above with respect to claim 5, Hidler also teaches that the drive assembly includes a plurality of wheels. Ex-1003, ¶169. The plurality of wheels is shown below in modified/annotated Figures 40 (showing side view of wheel assembly and plurality of wheels in red) and 43 (including superimposed I-Beam and Knevels' power rail):

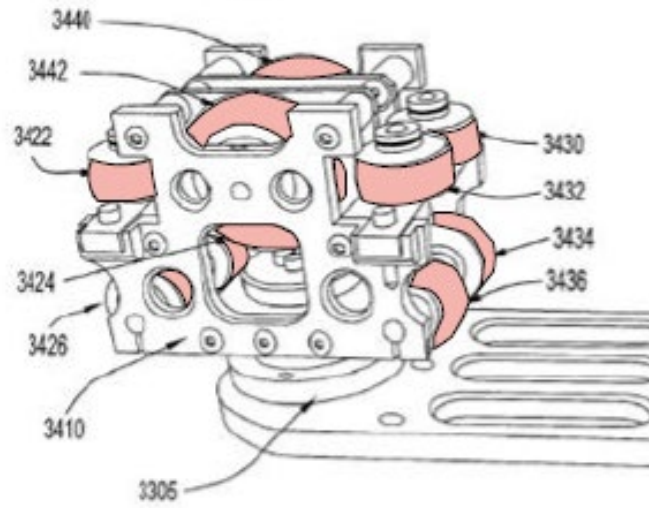
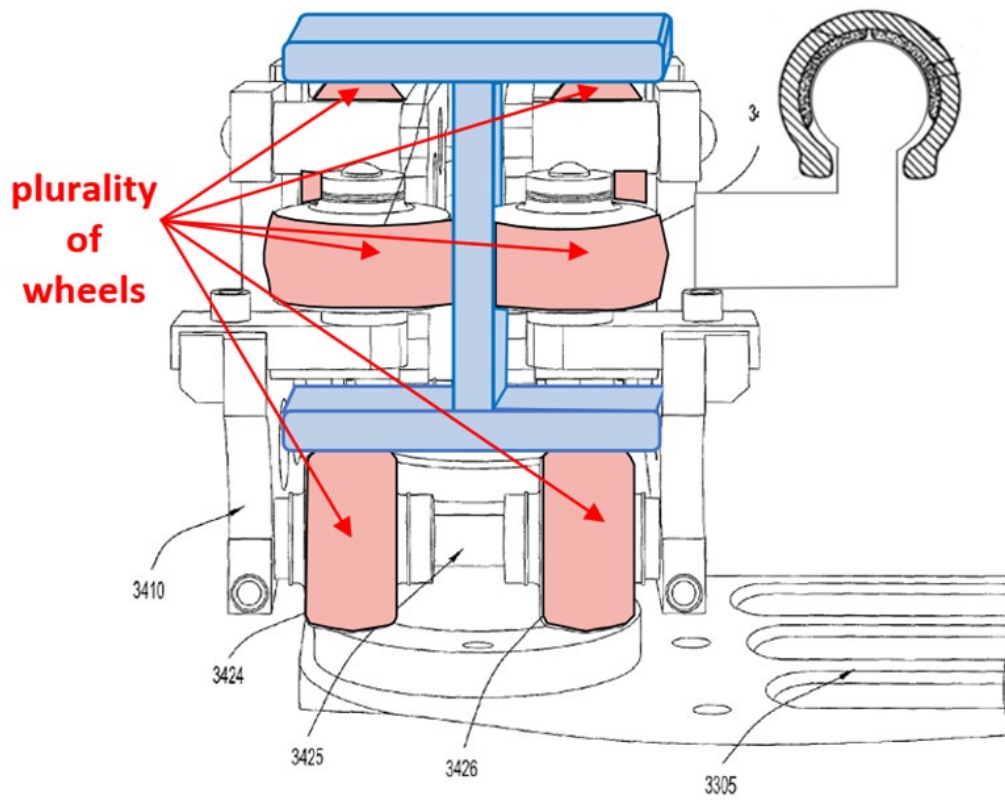


FIG. 40



Id.; Ex-1004 at Figs. 40 and 43 (both annotated).

Hidler's plurality of wheels are configured to move on multiple surfaces of the track. For example, "pivoting wheel assembly 3400 includes wheels 3440 and 3442 that rest on the upper inner surface of the lower flange of the track 3150...." Ex-1004, 18:32-43. Hidler also teaches "wheels 3430 and 3432 and wheels 3420 and 3422 that roll on the web of the I-beam track to provide lateral stability." *Id.*; Ex-1003, ¶170

Accordingly, Hidler's plurality of wheels allow the trolley to "move[] along the track" (*id.* at 5:31), or in other words, move the trolley relative to the track. Ex-1003, ¶171.

h. Limitation 13[b]

For the reasons discussed below, Hidler, in view of Knevels, teaches 13[b].

13[b1]	<i>a powered conductor operatively coupled and substantially parallel to the track</i>
--------	--

For the same reasons as claim 1[b1], Hidler, in view of Knevels teaches 13[b1]. The combination of Hidler and Knevels, teaches a powered conductor physically contacting and electrically connected to the trolley as the trolley moves along the track. *See* Claim 1[b1]. As such, the Hidler-Knevels combination includes a powered conductor operatively coupled to the track. Ex-1003, ¶174-75. Knevels also teaches that its powered conductor is designed to run substantially parallel to the track. *See* Claim 1[b1]; Ex-1003, ¶176.

13[b2]	<i>the powered conductor including at least one conductive surface in contact with a portion of the trolley to electrically couple the trolley to the powered conductor</i>
--------	---

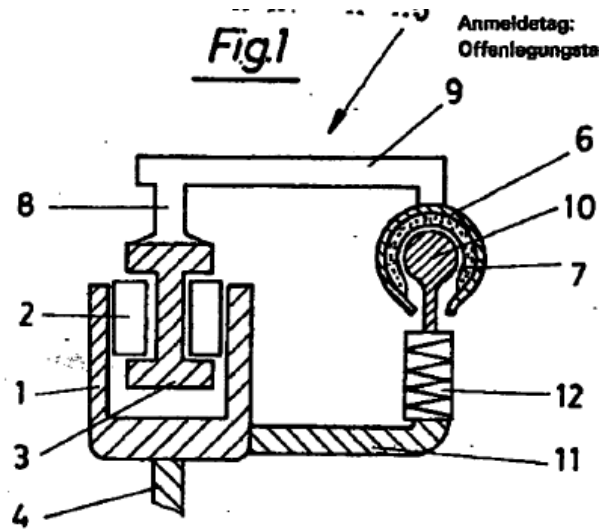
For the same reasons detailed in 1[b2] and 1[b3], Hidler, in view of Knevels, teaches “the powered conductor including at least one conductive surface in contact with a portion of the trolley to electrically couple the trolley to the powered conductor.” *Supra*, claim 1[b2]-1[b3]; Ex-1003, ¶178.

13[b3]	<i>the portion of the trolley configured to move along the at least one conductive surface when the trolley is moved along the track</i>
--------	--

For the same reasons as claim 1[b4], Hidler, in view of Knevels, teaches “the powered conductor including at least one conductive surface in contact with a portion of the trolley to electrically couple the trolley to the powered conductor.” *Supra*, claim 1[b4]; Ex-1003, ¶180.

13[b4]	<i>a portion of the track disposed between at least one wheel from the plurality of wheels and the powered conductor to isolate the at least one wheel from the powered conductor;</i>
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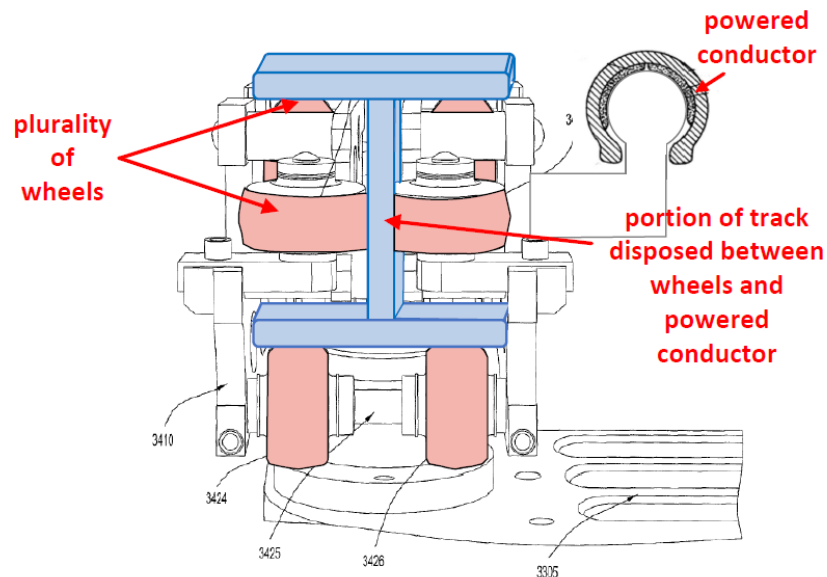
Hidler, in view of Knevels, teaches “a portion of the track disposed between at least one wheel from the plurality of wheels and the powered conductor to isolate the at least one wheel from the powered conductor.” As explained in claim 13[b1], the combination of Hidler and Knevels teaches that its power rail is separate from and runs parallel to the track. Ex-1003, ¶183. As shown below, Knevels’ power rail (i.e., powered conductor (6)) runs next to the track (3) (the I-beam):



Ex-1005, Fig. 1.

As discussed with respect to claim 5, Hidler teaches many wheels that roll on the web of the I-beam track to provide lateral stability.” *Supra*, claim 5.

Together, Hidler’s track, trolley, and wheels combined with the Knevels’ power rail results in the following combination cross-section:



Ex-1003, ¶¶184-87. In the annotated image above, a portion of the track (the I-beam web) is disposed between at least one wheel from the plurality of wheels (i.e., the leftmost wheels) and the powered conductor. *Id.* Thus, Hidler-Knevels isolates “at least one wheel from the powered conductor.” *Id.*

i. Limitation 13[c]

13[c]	<i>at least one patient attachment coupled to the trolley, the at least one patient attachment configured to support a single patient; and</i>
-------	--

For the same reasons as claim 1[c], Hidler teaches “at least one patient attachment coupled to the trolley, the at least one patient attachment configured to support a single patient.” *Supra*, claim 1[c]; Ex-1003, ¶189.

j. Limitation 13[d]

13[d]	<i>a control system coupled to the trolley and at least operably coupled to the powered conductor.</i>
-------	--

For the same reasons as claim 1[d], Hidler, in view of Knevels, teaches “a control system coupled to the trolley and at least operably coupled to the powered conductor. *Supra*, claim 1[d]; Ex-1003, ¶191.

10. Claim 14

14	<i>The apparatus of claim 13, wherein the trolley is configured to be powered only from the powered conductor.</i>
----	--

As shown above, Hidler, in view of Knevels, teaches the apparatus of claim 13. For the same reasons as claim 6, Hidler, in view of Knevels, also teaches

“wherein the trolley is configured to be powered only from the powered conductor.” *Supra*, claim 6; Ex-1003, ¶193.

11. Claim 15

15	<i>The apparatus of claim 13, wherein the trolley includes a patient support system, the patient support system configured to actively support a patient.</i>
----	---

As shown above, Hidler, in view of Knevels, teaches the apparatus of claim 13. For the same reasons as claim 3, Hidler also teaches “wherein the trolley includes a patient support system, the patient support system configured to actively support a patient.” *Supra*, claim 3; Ex-1003, ¶195.

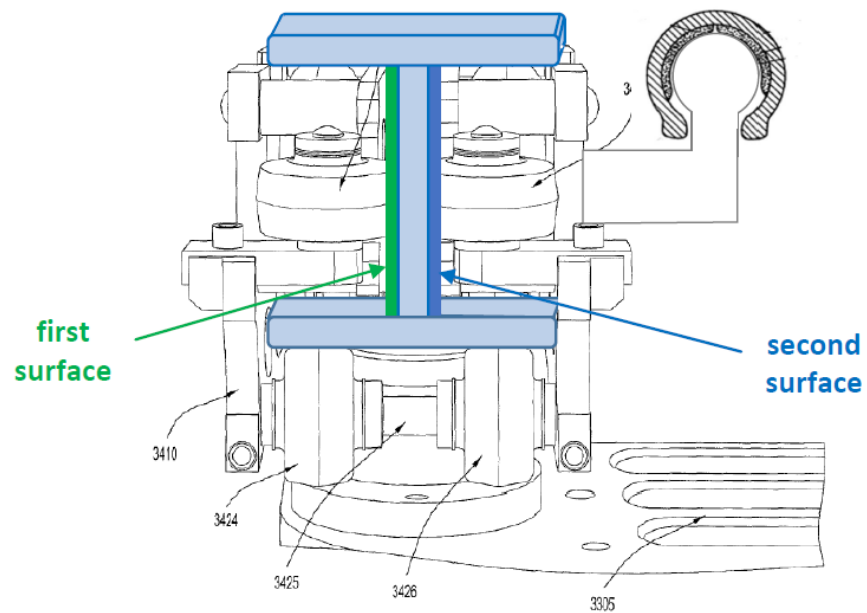
12. Claim 16

16	<i>The apparatus of claim 13, wherein the drive assembly includes a first wheel from the plurality of wheels and a second wheel from the plurality of wheels, the first wheel from the plurality of wheels being in contact with a first surface of the track and the second wheel from the plurality of wheels being in contact with a second surface of the track such that the portion of the track is disposed between the first wheel from the plurality of wheels and the second wheel from the plurality of wheels.</i>
----	--

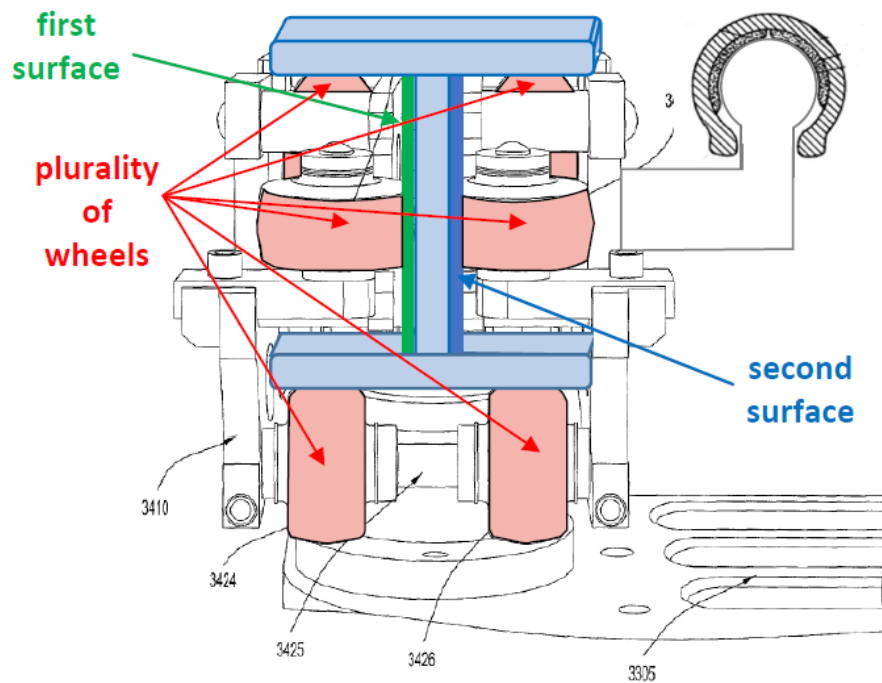
For similar reasons as claim 13[a] and 13[b4], Hidler, in view of Knevels, also teaches the additional limitations in claim 16. *Supra*, claim 13[a], 13[b4].

As explained in claim 13[a] and 13[b4], Hidler teaches a drive assembly with a plurality of wheels that move on multiple surfaces of the track. Ex-1003, ¶198. These include wheels rolling on the I-beam track to provide lateral stability.

The web of the I-beam has at least two surfaces (a surface on the left (annotated in green below) and a surface on the right (annotated in blue below)):



Ex-1004, Fig. 43 (annotated image); Ex-1003, ¶198. Therefore, the wheels “that roll on the web of the I-beam track,” roll on these two surfaces:



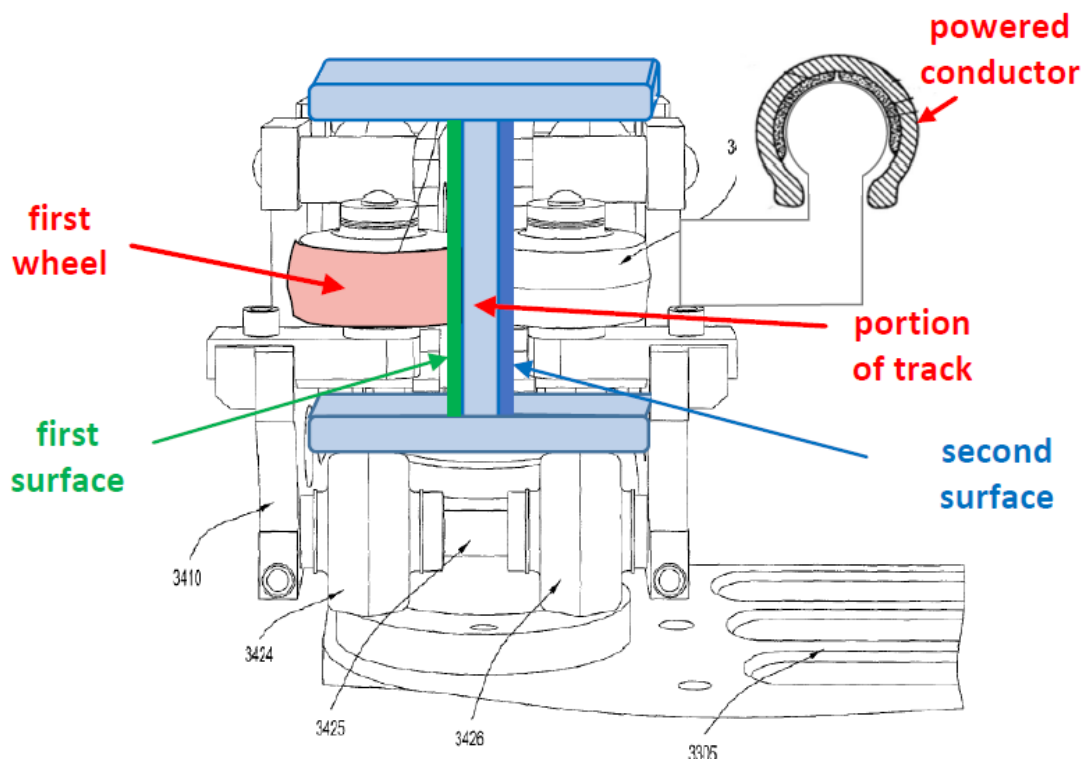
Ex-1004, Fig. 43 (annotated image); Ex-1003, ¶199.

One of the leftmost wheels is therefore “a first wheel from the plurality of wheels being in contact with a first surface of the track.” Ex-1004, 18:32-43, Fig. 43; Ex-1003, ¶200. Similarly, one of the rightmost wheels is “a second wheel from the plurality of wheels being in contact with a second surface of the track.” *Id.* A portion of the track (i.e., the web of the I-beam) is therefore disposed between the first wheel from the plurality of wheels and the second wheel from the plurality of wheels. *Id.*

13. Claim 17

17	<i>The apparatus of claim 16, wherein the portion of the track is disposed between the first wheel from the plurality of wheels and the powered conductor.</i>
----	--

For the same reasons as claims 13[b4] and 16, Hidler, in view of Knevels, also teaches the additional limitations of claim 17. Ex-1003, ¶292; *supra*, claim 13[b4] and claim 16. Annotated Fig. 43 shows each limitation is met:

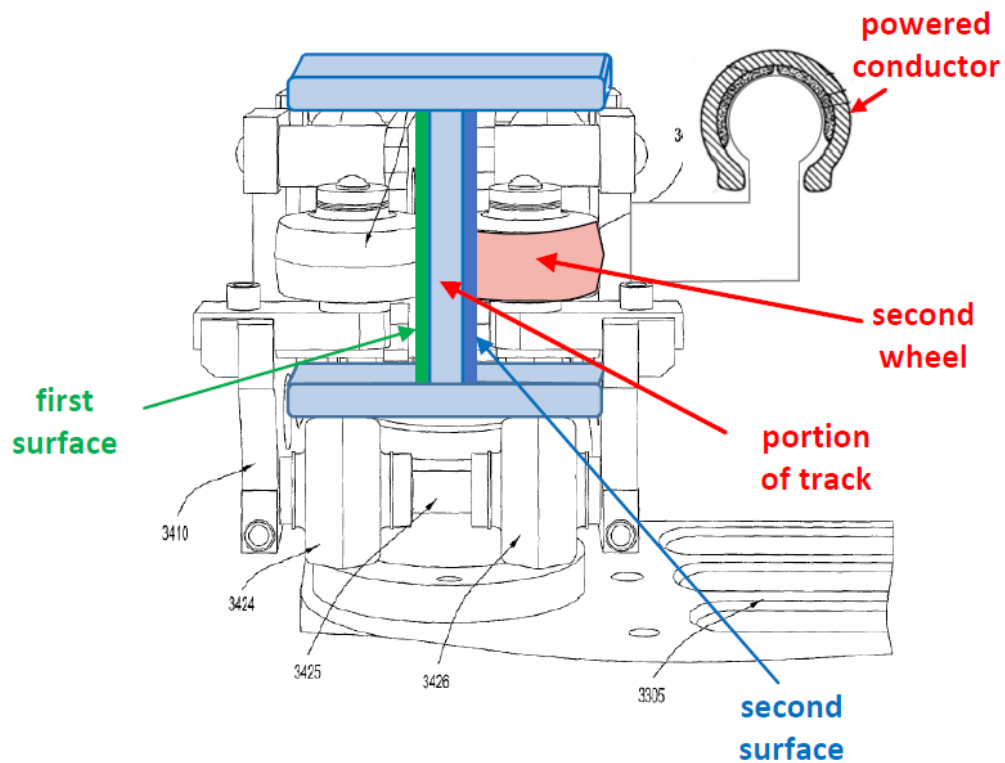


Ex-1003, Fig. 43; Ex-1003, 203.

14. Claim 18

18	<i>The apparatus of claim 17, wherein the second wheel from the plurality of wheels is disposed between the portion of the track and the powered conductor.</i>
----	---

For the same reasons as claims 13[b4], 16, and 17, Hidler, in view of Knevels, also teaches the additional limitations of claim 18. Ex-1003, ¶205; *supra*, claims 13[b4], 16 and 17. Annotated Fig. 43 shows each limitation is met:



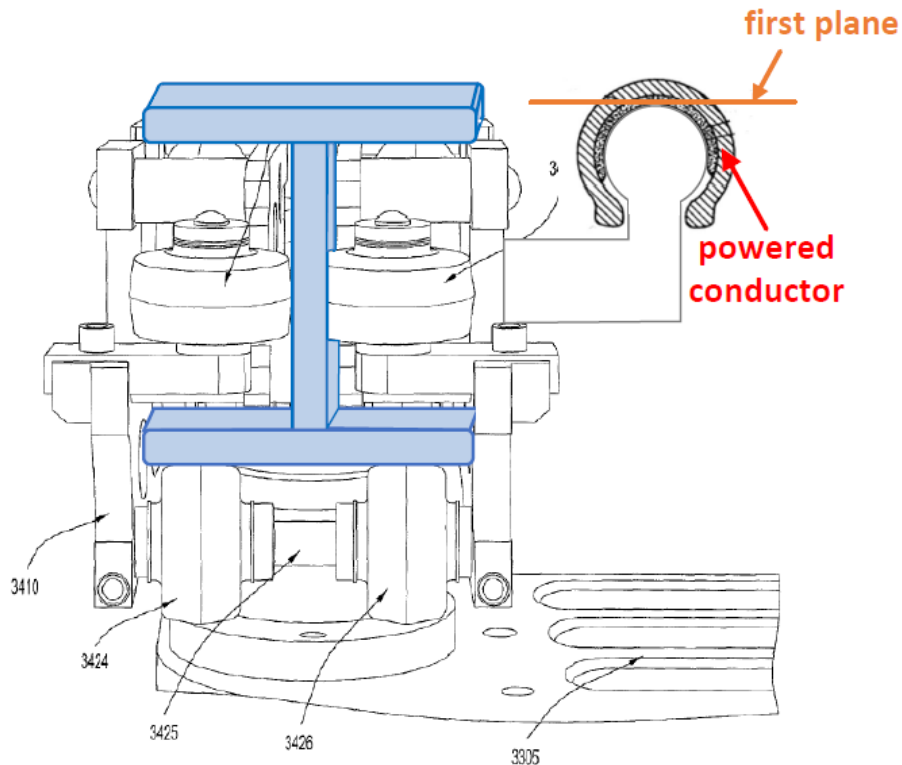
Ex-1004, Fig. 43; Ex-1003, ¶205.

15. Claim 19

19[a]	The apparatus of claim 13, wherein the conductive surface of the powered conductor defines a first plane, and
-------	---

Hidler, in view of Knevels, discloses the additional limitations recited in claim 19[a]. The '000 Patent does not explain special parameters for how the powered conductor “defines” a first plane. Ex-1003, ¶208. In geometry, a plane is a two dimensional surface that extends endlessly. *Id.*

A POSITA would understand that the Hidler and Knevels combination teaches a conductive surface of the powered conductor that defines a level, first plane (orange) at the uppermost point of the conductive surface:



Ex-1004, Fig. 43; Ex-1003, ¶209.

19[b]	<i>the drive assembly includes a first wheel from the plurality of wheels and a second wheel from the plurality of wheels, the first wheel from the plurality of wheels and the second wheel from the plurality of wheels being configured to move along at least one surface of the track to movably suspend the trolley from the track, the at least one surface of the track defining a second plane nonparallel to the first plane.</i>
-------	---

Hidler, in view of Knevels, teaches the additional limitations recited in claim 19[b]. For the reasons stated for claim 1[a], Hidler teaches a drive assembly. As

annotated below in Figure 40, the combination of Hidler and Knevels teaches a plurality of wheels (visible wheels in red), with a first wheel (3432) and a second wheel (3422) moving along a first surface of the track (the inner surfaces of the I-beam) to move the suspended trolley (30) along the track 40).

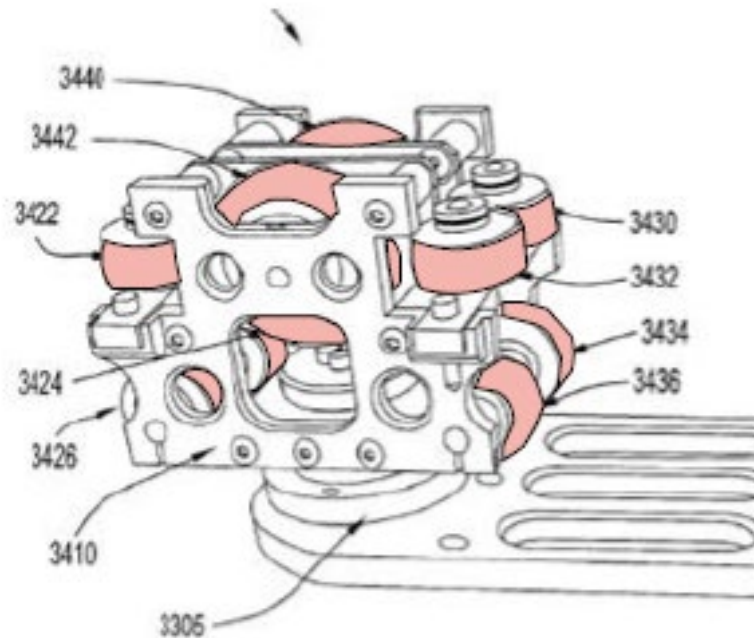
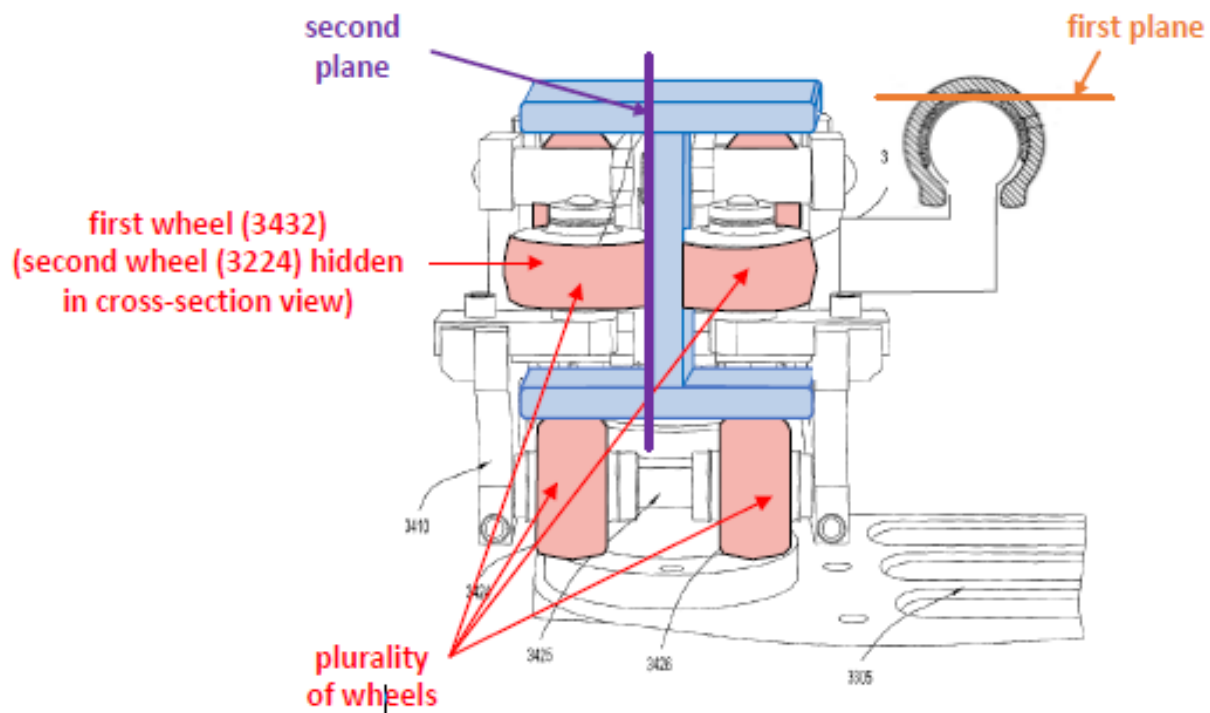


FIG.40

Ex-1003, ¶213; Ex-1004, Fig. 40.

Moreover, the combination of Hidler and Knevels teaches that the surface of the track along which the wheels move defines a second plane (purple below) that is perpendicular (i.e., nonparallel) to the plane defined by powered conductor (orange below):



Ex-1003, ¶¶ 213-15; Ex-1004 at Fig. 43 (the claimed second wheel (3422) (from Fig. 40) is present, but is hidden behind the first wheel (3432) and wheel (3442)).

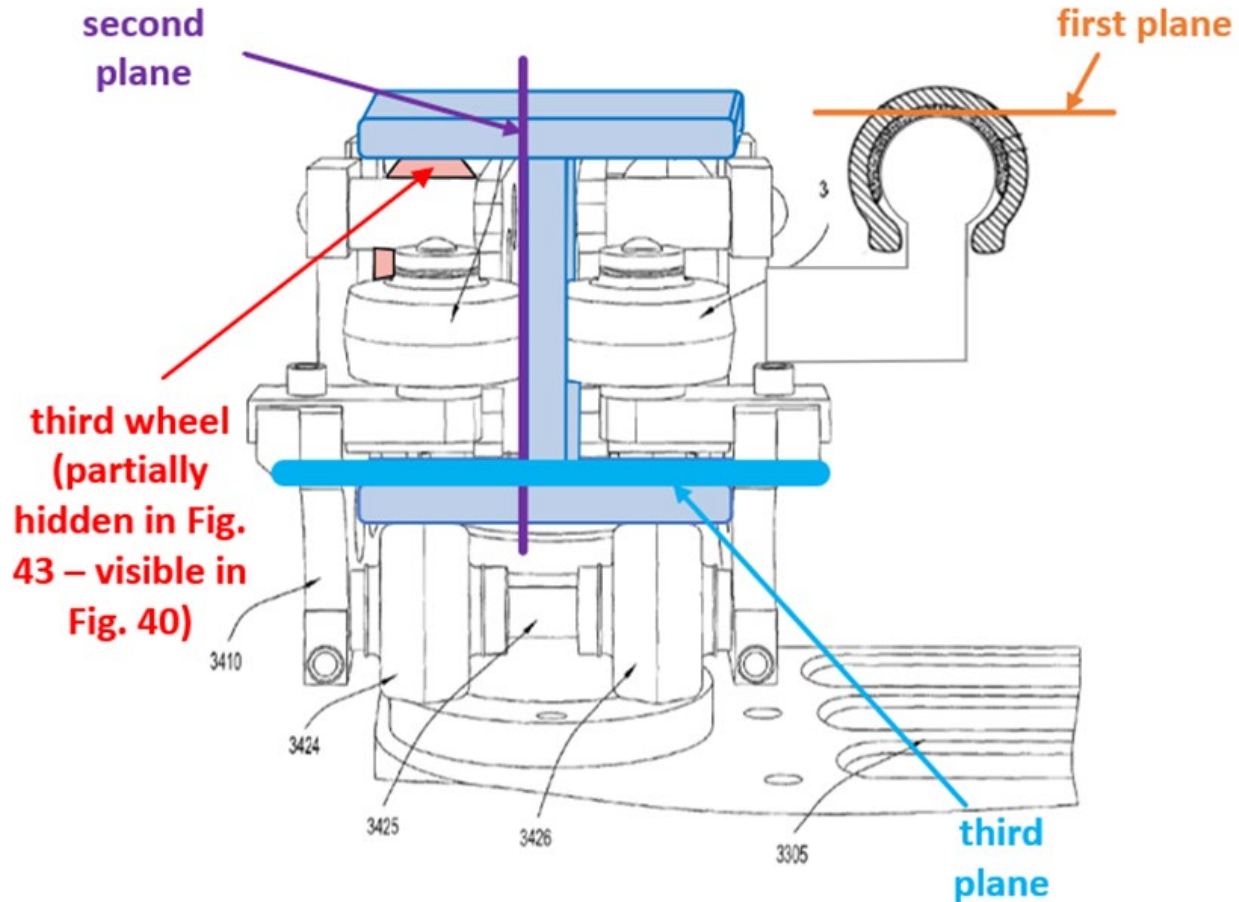
16. Claim 20

20	<i>The apparatus of claim 19, wherein the drive assembly includes a third wheel from the plurality of wheels, the third wheel from the plurality of wheels being configured to move along a surface of the portion of the track, the surface of the portion of the track defines a third plane parallel to the first plane.</i>
----	---

For the similar reasons detailed for claim 19, Hidler, in view of Knevels, also teaches the additional limitations recited in claim 20. *Supra*, claim 19.

The Hidler-Knevels combination teaches all of the limitations of claim 20, including the third wheel and the third, parallel plane defined by another surface of

the track (which is located on the upper surface of the lower flange of the I-beam track):



Ex-1003, ¶¶218-19; Ex-1004, Fig. 43.

B. Ground 2: Obviousness over Hidler in view of Faucher and Walker

Claims 8 and 12 of the '000 Patent are invalid because they are obvious over the teachings of Hidler, in view of Faucher and Walker. Exs-1004, 1006-07.

1. Overview of the Proposed Combination

With respect to independent claim 8, Hidler teaches a BWS apparatus, trolley, drive element, wheel assembly, patient support assembly, pulley system, tether, and sensor system. Hidler, however, does not expressly teach providing for a housing surrounding a portion of the drive element. Instead, Hidler teaches a housing certain elements, such as housing 3500 covering various cables. Hidler also does not teach the use of a cam as part of its system for dynamically supporting the body-weight of a patient.

However, a POSITA would have found it obvious to combine the teachings of Hidler, Faucher, and Walker by modifying the overhead trolley system of Hidler to include a housing and a cam.

a. Motivation to Combine and Expectation of Success (Hidler-Faucher-Walker)

Hidler and Faucher are analogous art because they are both from the same field of endeavor, *i.e.*, BWS trolleys. Ex-1003, ¶226. Hidler and Walker are also analogous art because they both relate to pulley tension systems. *Id.*

(1) Motivation To Modify Hidler To Include A Housing In View Of Faucher

A POSITA would have been motivated to modify Hidler to include a housing, based on a POSITA's own knowledge or as taught in Faucher, because that combination amounts to nothing more than applying a known technique

(housing a BWS trolley) to achieve predictable results/benefits—namely protection of equipment, safety of persons near equipment, and aesthetics. Ex-1003, ¶227-28.

The use of a housing with overhead trolley systems was a known technique prior to the Critical Date. *Id.* Indeed, Hidler itself teaches and suggests the use of housings as a means for protecting assemblies, providing support, and decoration. *Id.* Specifically, Hidler teaches the housing 3500 (to house wires) and a housing 3410 (surrounding the wheel assembly). Ex-1004 at 18:12-23, 44-48, Figs. 1 (showing housing surrounding cables) and 40 (showing housing 3410):

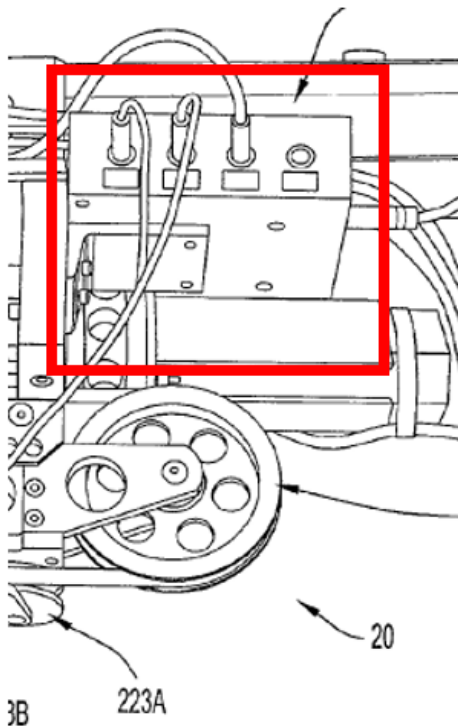


FIG.1

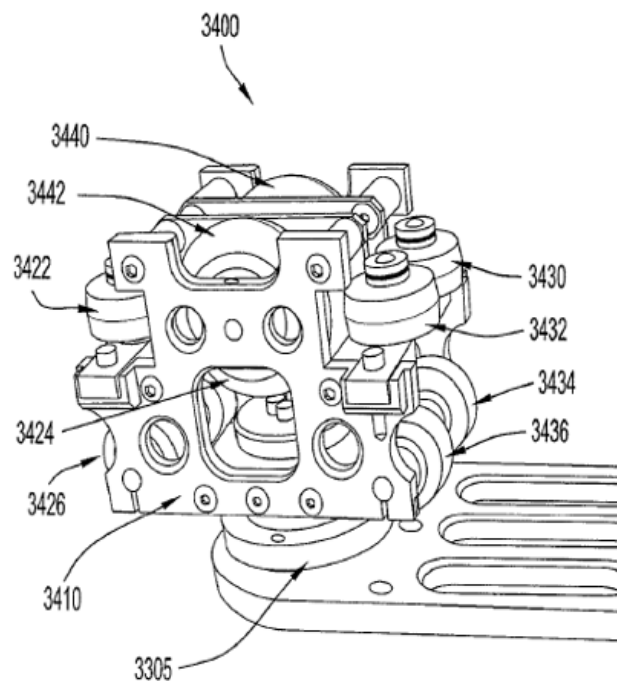
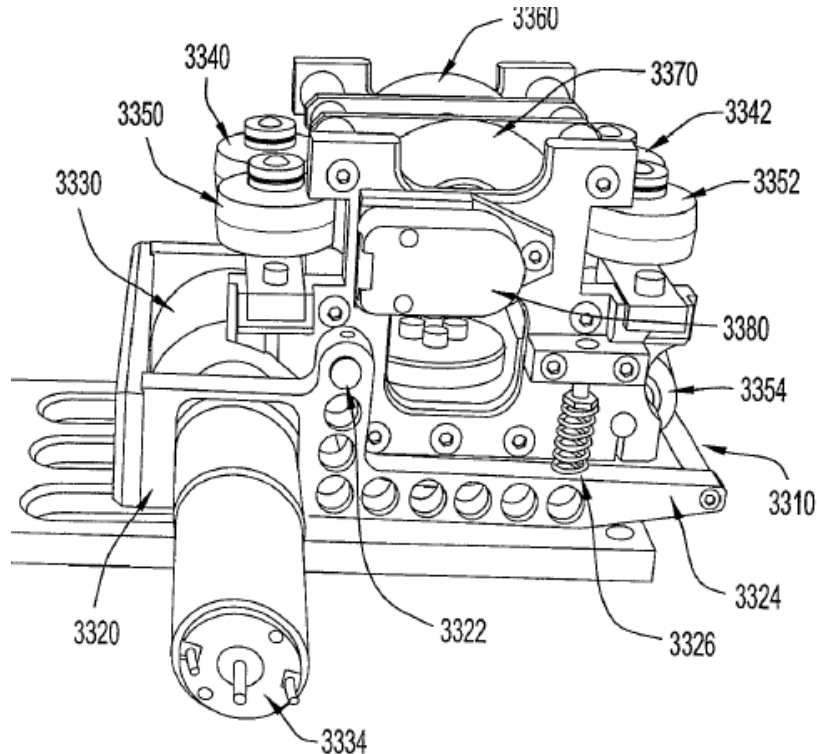
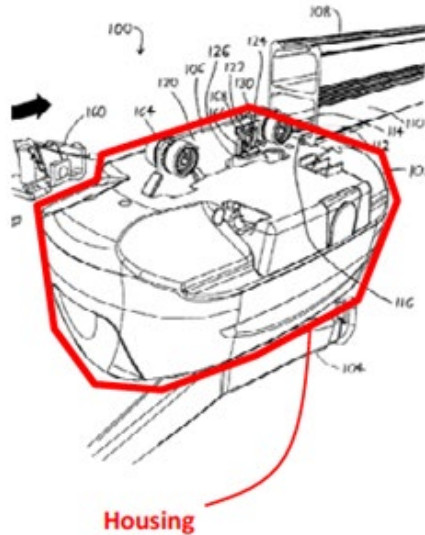


FIG.40

Hidler also already teaches a “drive wheel body” surrounding its drive element, which is another housing. Ex-1003, ¶229; Ex-1004 at 18:57-64 (“The drive wheel 3330 is mounted in a drive wheel body 3320 that is pivotally mounted to the housing”); Fig. 40 (showing the drive wheel body 3320 and housing 3310):

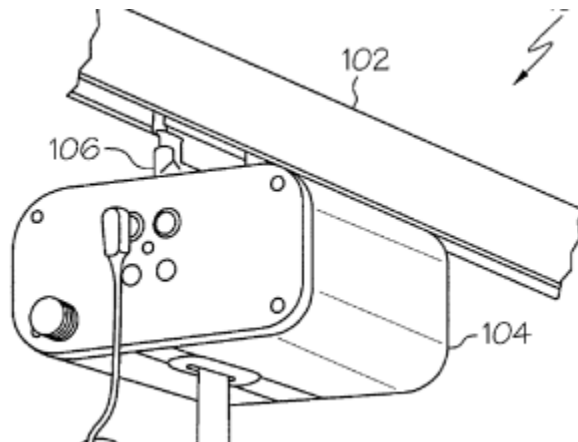


Other references also illustrate the wide-spread nature of using housings with overhead trolley systems. As noted above, Faucher expressly teaches a surrounding housing for an overhead trolley system.



Ex-1007, Fig. 1; Ex-1003, ¶230.

Bergenstrale also teaches a housing surrounding the trolley:



Ex-1011 at Fig. 1 (showing a housing surrounding lift unit 104); Ex-1003, ¶231.

The benefits of using housings with overhead trolleys were also well-known to POSITAs. Ex-1003, ¶231. In particular, a POSITA would have understood that housings were desirable to protect equipment, protect persons near equipment from accidental injury, and aesthetics. *Id.*

Given the express teachings and suggestions in Hidler, the routine use of housings with overhead trolleys, and the well-known and predictable benefits of such use, a POSITA would have found it obvious to combine Hidler's trolley with Faucher's housing. Ex-1003, Ex-1003, ¶232-34; KSR, 550 U.S. at 415-16. Adding a housing amounts to nothing more than applying a known technique (housing a BWS trolley) of a similar device. *Id.*

A POSITA would expect success in adding a housing to Hidler's trolley, as adding a housing to the outside of a trolley requires little design changes, and housings have already been added to portions of Hidler's trolley (demonstrating the ease and success of doing so). *Id.*

**(2) A POSITA Would Understand that Replacing
Hidler's Ball Screw Mechanism with Walker's Cam
Amounts To Nothing More Than a Simple
Substitution of One Known Element for Another**

Claim 8 requires use of a "cam." Ex-1003, ¶235. In the context of the '000 Patent's BWS system, the cam is used to transform the rotational force of the motor into a linear force that controls the tension on the tether attached to the patient. *Id.*

The trolley system of Hidler also transforms the rotational force of a motor into linear force on a tether, but Hidler does not teach using a cam to achieve this function. *Id.*, ¶236. Instead, Hidler teaches converting the rotational motion from a motor to linear motion on the tether by using a ball screw (242) and pulley plate

(246). *Id.* Ball screw assemblies are well-known mechanisms for transforming rotary motion to linear motion. *Id.* In such an assembly, a motor turns a ball screw, which then moves an attached plate. In Hidler, as the pulley plate moves pulley 263, the tension in the tether is increased or decreased as the length of the tether moving around the pulley changes:

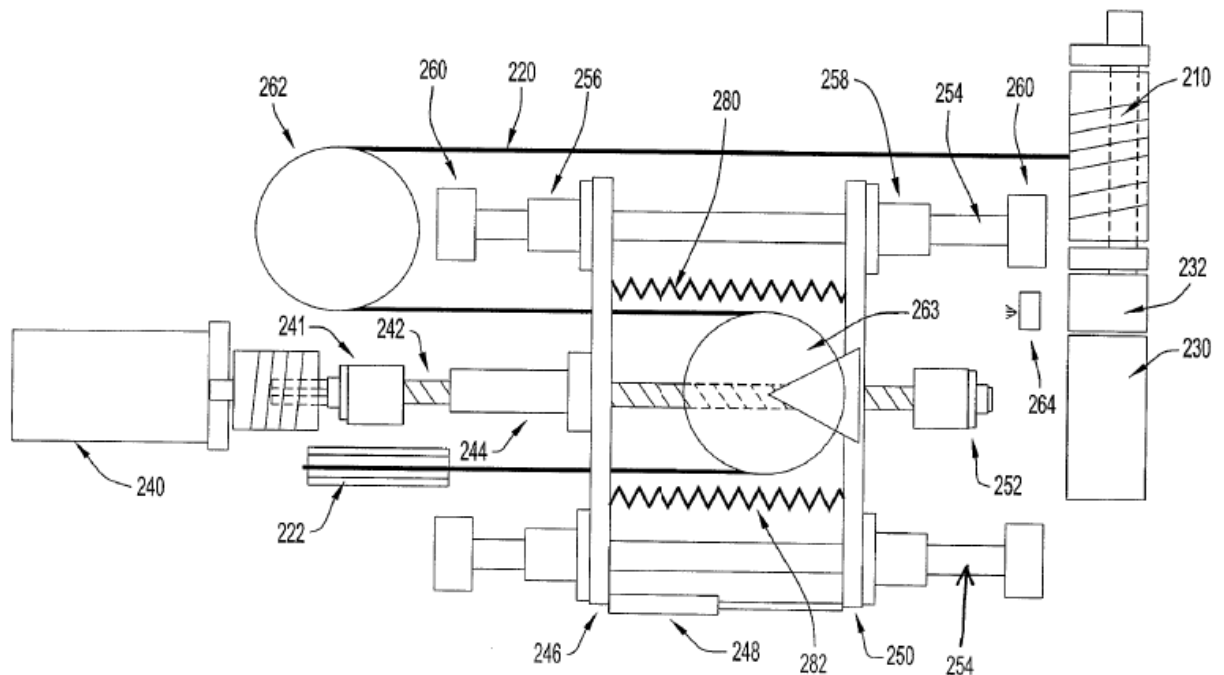
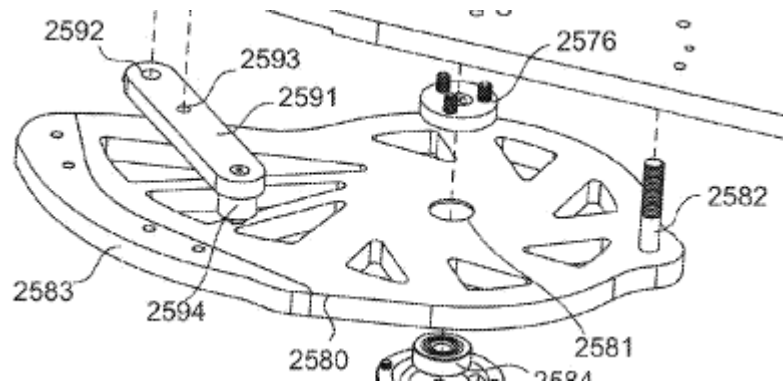


FIG. 20A

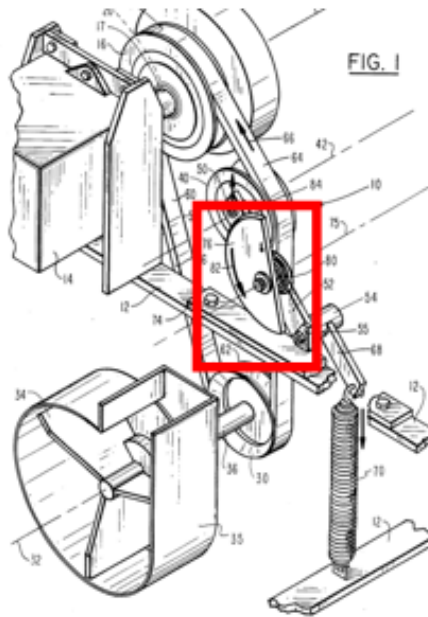
Id.; Ex-1004 at Fig. 20A, 11:5-36.

A POSITA would have found it obvious to modify Hidler to use a cam, such as the cam taught in Walker, instead of the ball screw/pulley plate mechanism described in Hidler. Ex-1003, ¶238; *KSR*, 550 U.S. at 416 (“[W]hen a patent claims a structure already known in the prior art that is altered by the mere

substitution of one element for another known in the field, the combination must do more than yield a predictable result.”). This is because a POSITA would have understood that cams are one of the most common ways for transforming the rotational force generated by a motor into a linear force. Ex-1003, ¶238. A cam is a well-known mechanical component that rotates and, in doing so, makes contact with another component in a way that transforms the rotary motion into a linear motion. *Id.* It is often a part of a rotating member (such as a semi-circle or an irregular shape) that moves or pushes a member around its rotating path. *Id.*; Ex-1001 at Fig. 33 (showing irregularly shaped cam member):



Walker teaches one such use of a cam in a pulley tensioning system as a means for maintaining a belt's tension:



Ex-1006 at Fig. 1; 4:1-11 (teaching that cam 76 has a shape that causes a variation in space between the guide 74 and pulley axis 42); Ex-1003, ¶239. Walker further teaches that the cam is used to “move idler pulley 40” to “maintain pre-selected tension.” *Id.* at 4:28-34. Thus, the ball screw system of Hidler and the cam system of Walker maintain tension in the same way, by moving a pulley to change the length of a tether/belt, which adjusts the tension of the tether. Ex-1003, ¶239-41.

Accordingly, a POSITA would have understood that modifying Hidler to use a cam as taught in Walker would have been an obvious substitution of one known element for another (replacing a ball screw assembly with a cam) to obtain predictable results (converting rotary motion into linear motion). Ex-1003, ¶239-41; *KSR*, 550 U.S. at 415-16.

Cams have been well-known in the art for hundreds of years, including in the BWS system industry. *Id.*, ¶242-43; *see also* Ex-1012 at Fig. 2; Ex-1013 at Fig. 7. Accordingly, the result of successfully using a cam to transform rotational force into linear force in a BWS system would have been obvious and predictable to a POSITA. Ex-1003, ¶244.

Even if cams had not previously been used in the art for this precise purpose, use of a cam with the system of Hidler would have nevertheless been obvious to try. Ex-1003, ¶¶245-46; *KSR*, 550 U.S. at 421. A POSITA would have understood that there were a limited number of well-known mechanical systems known for transforming rotary motion into linear motion (including ball screws, nut screws, cams, and slider cranks). *Id.* Each of these techniques was conventional prior to the Critical Date. *Id.* A POSITA would have expected success in applying each well-known technique for transforming rotational force into linear force. *Id.*

2. Claim 8

a. Limitation 8[pre]

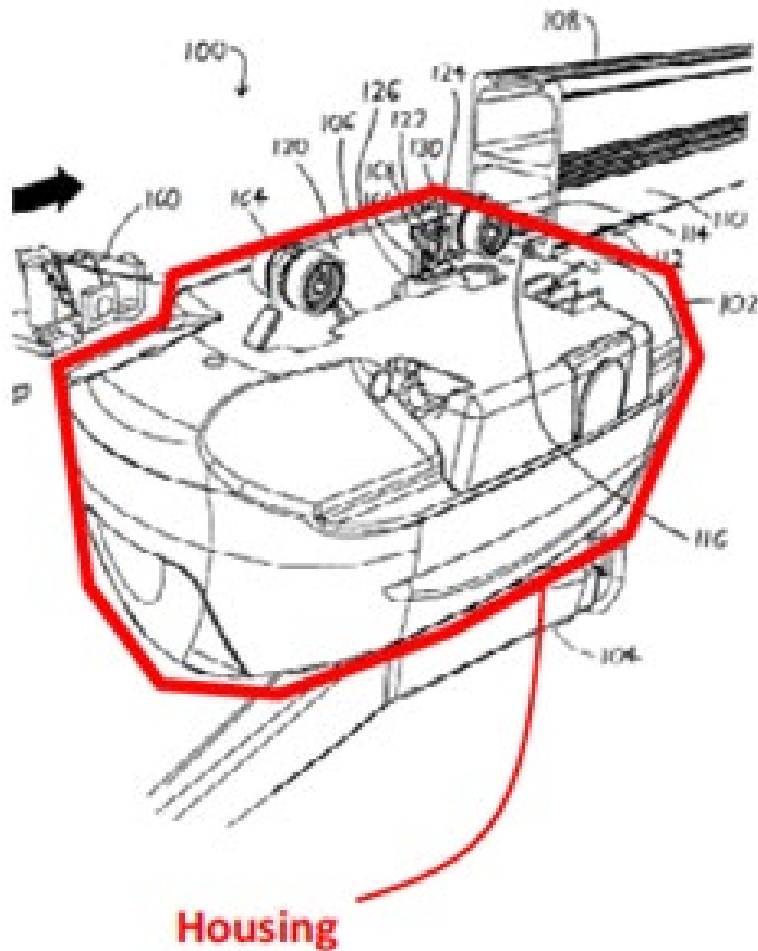
8[pre]	<i>An apparatus, comprising:</i>
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To the extent the preamble is a limitation, Hidler discloses an apparatus for the same reasons as claim 1[pre]. Ex-1003, ¶247.

b. Limitation 8[a]

8[a]	<i>a housing</i>
------	------------------

As noted above, Hidler does not teach the type of housing required by later limitations of claim 8. But, a POSITA would have found it obvious to modify Hidler to include a housing based on either a POSITA's own general knowledge of housings or in view of Faucher. *See* Section VI.B.a(1); Ex-1003, ¶248-49; *see* Ex-1002, 266-267 (examiner concluding the same). Faucher teaches a "housing" that surrounds the trolley of a body-weight system, as shown in Figure 1:



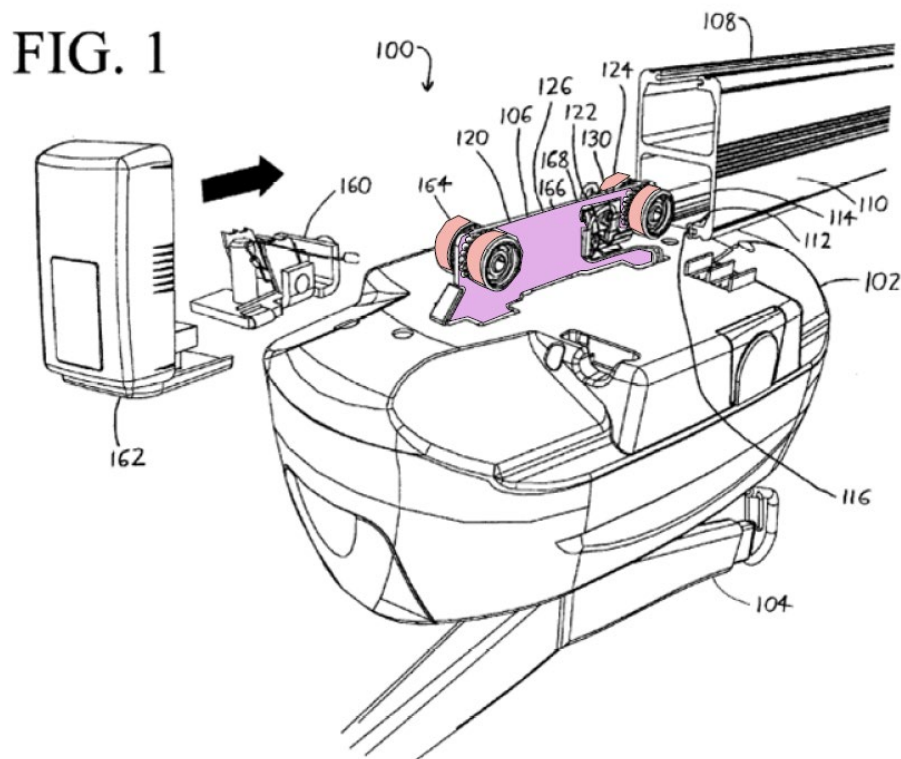
Ex-1003, ¶¶250-52; Ex-1007, Fig. 1.

c. Limitation 8[b]

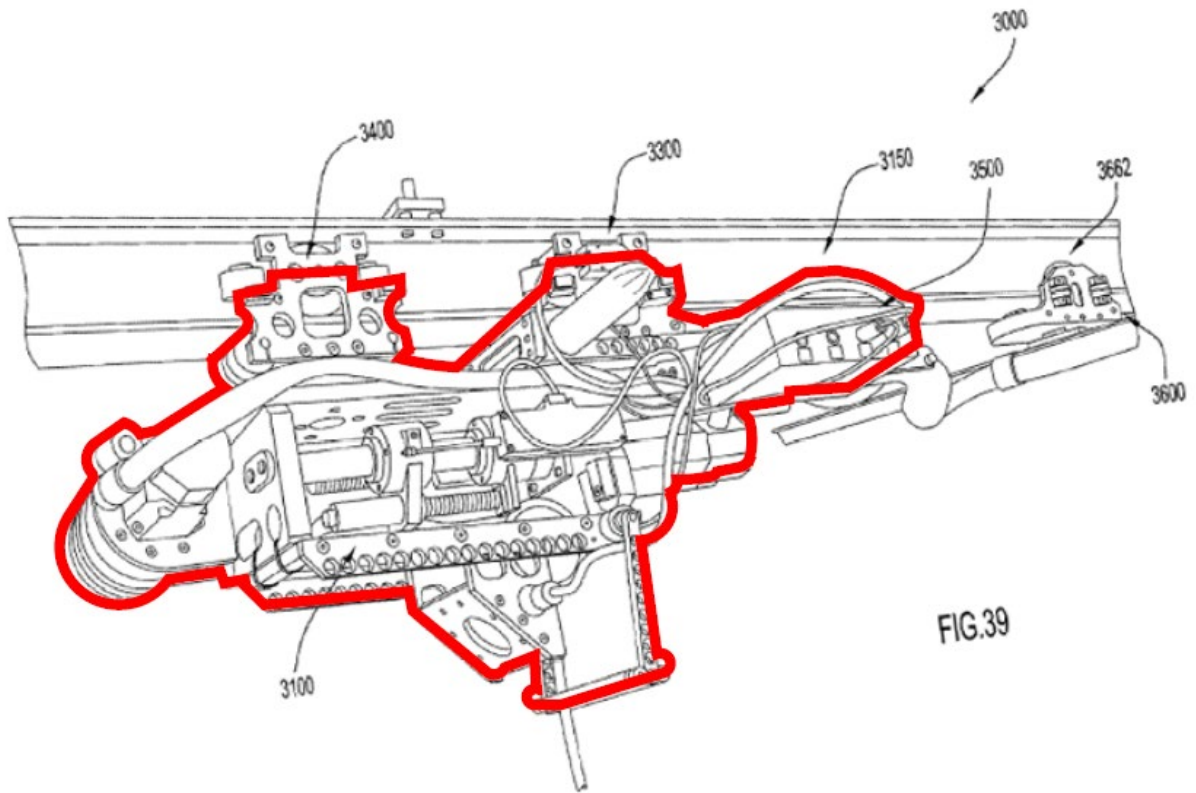
8[b]	<i>a drive element disposed at least partially within the housing;</i>
------	--

Hidler in view of Faucher teaches and renders obvious 8[b]. Hidler combined with Faucher teaches a “drive element disposed at least partially within the housing” because Faucher teaches a housing that encloses a trolley other than its wheels on the track, including the drive element. Ex-1003, ¶253. As explained

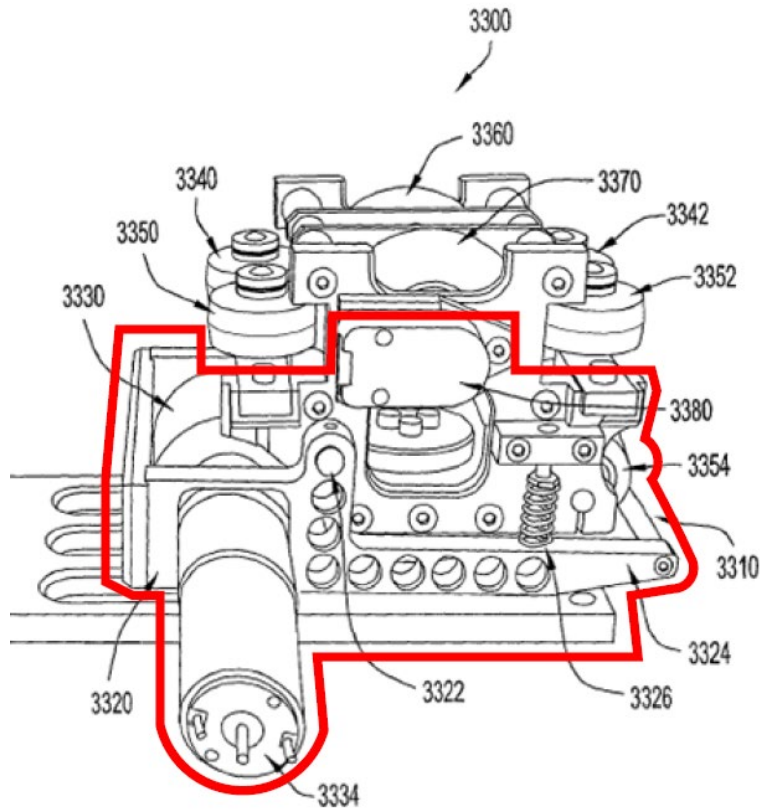
in claim 1[a], Hidler discloses a drive assembly (or element), which consists of a motor mounted to wheel assemblies, that allows the trolley to “ride[] along the track.” *Id.*, ¶254; Ex-1004, 6:61-7:13. Modifying Hidler to incorporate a housing as taught in Faucher would result in enclosing the drive element (and other components) of Hidler within the housing. *Id.*, ¶¶254-55. This configuration can be seen, for example, in Figure 1 of Faucher:



Ex-1007, Fig. 1 (the housing surrounding all but the wheels); *id.* at 5:28-32 (the wheels 164 “being driven by an appropriate drive situated on or within the hoist 102.”). Faucher’s housing in combination with Hidler’s drive element would result in at least a portion of Hidler’s drive element being enclosed within the housing:



Ex-1004 at Fig. 39 (annotated to show an example boundary of a housing on Hidler's trolley); Ex-1003, ¶256. As shown in Hidler Figure 40, such a combination would put portions of the drive element, including at least the drive wheel, within the housing:



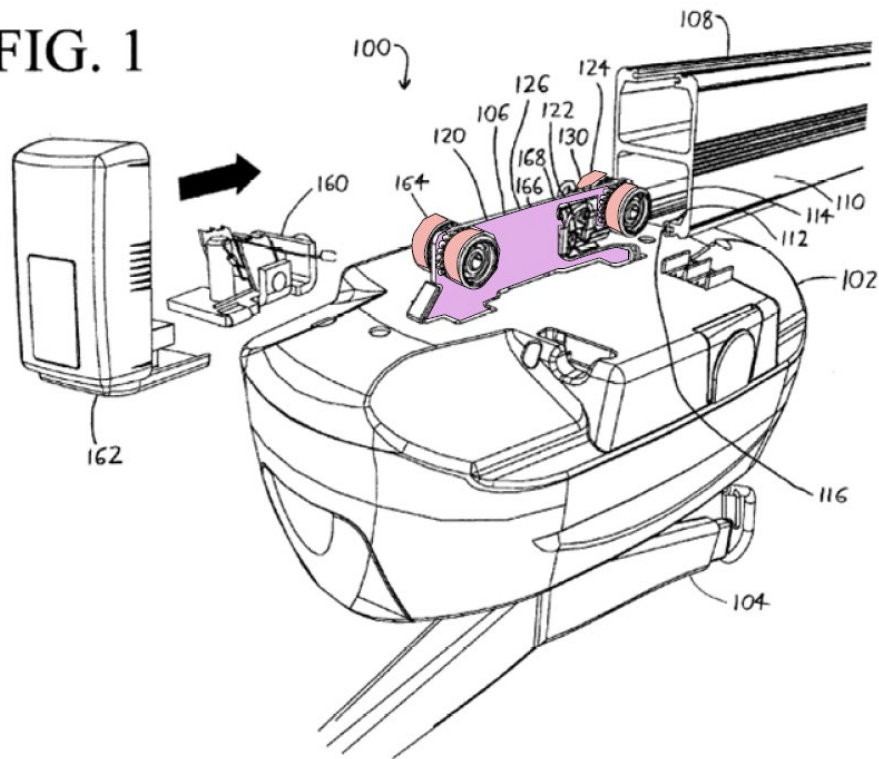
Ex-1004 at Fig. 40 (annotated to show an example boundary of a housing on Hidler's drive and wheel assembly); Ex-1003, ¶257.

d. Limitation 8[c]

8[c]	<i>a wheel assembly coupled to the drive element and disposed at least partially within the housing; and</i>
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For the same reasons as 8[b], Hidler in view of Faucher teaches 8[c] because Faucher teaches that the housing at least partially covers a wheel assembly, as shown in Figure 1:

FIG. 1



Ex-1007, Fig. 1 (showing only the two wheels of the entire wheel assembly outside the housing); Ex-1003, ¶260.

Hidler separately teaches that its existing housing 3410 already surrounds portions of the wheel assembly. Ex-1003, ¶261; Ex-1004 at 18:12-48, Fig. 40 (showing housing 3410):

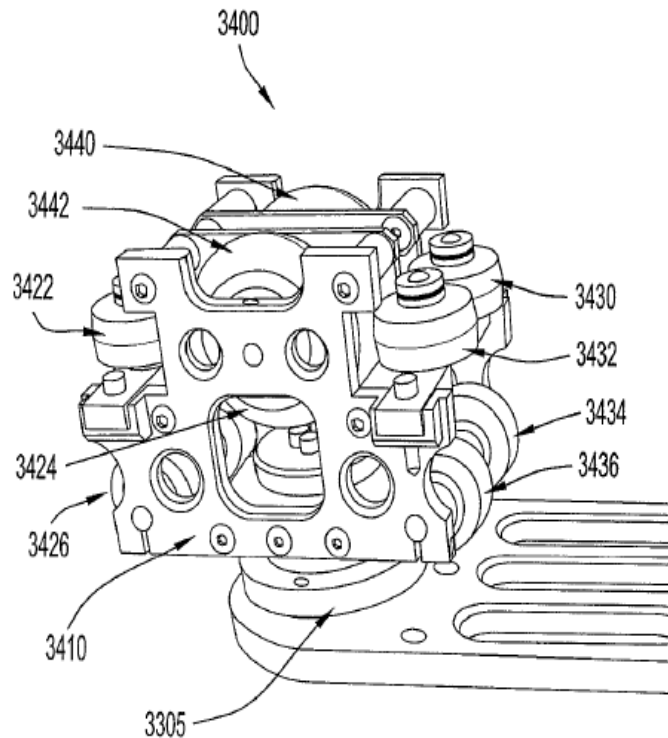


FIG. 40

Hidler also teaches that the wheel assembly's "drive wheel body 3320," surrounds the drive wheel (i.e., a portion of its wheel assembly).

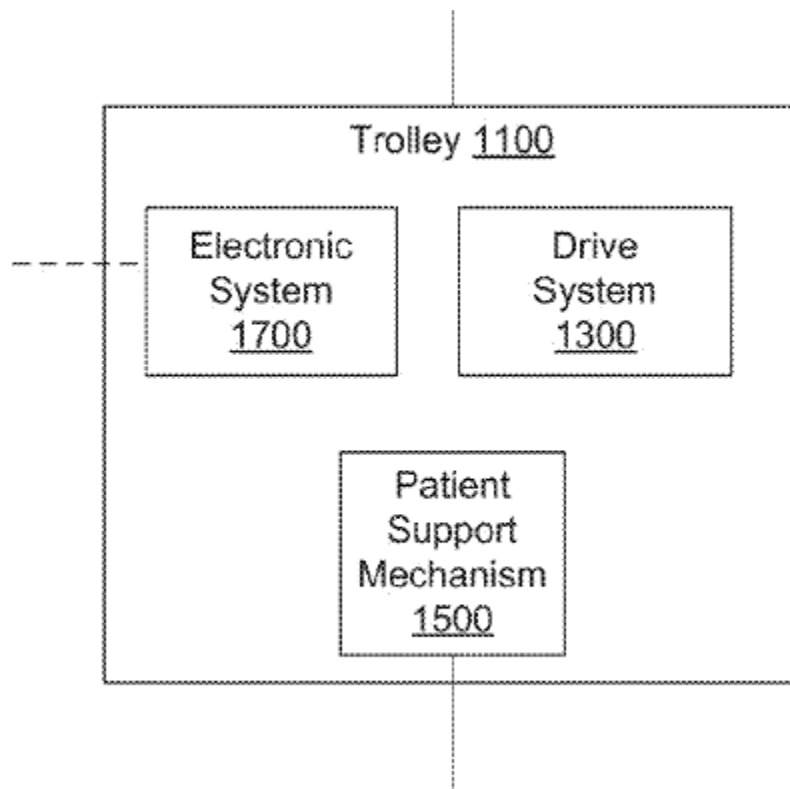
Finally, Hidler teaches that the wheel assembly is coupled to the drive element. Ex-1003, ¶¶261-62; Ex-1004 at 18:53-19:7 ("[A]ssembly 3300 includes a trolley motor 3334 that is coupled to a drive wheel 3330 that engages the track 3150 to move the trolley 3100 along the track 3150.").

e. Limitation 8[d]

8[d1]	<i>a patient support assembly coupled to the housing</i>
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Hidler, in combination with Faucher, teaches 8[d1] because Faucher teaches that the housing surrounds and is connected to “a patient support assembly”—i.e., the assembly that dynamically supports a patient’s weight (e.g., controls the tension in the tether that is attached to the patient). Ex-1003, ¶264.

The ’000 Patent does not define “patient support assembly,” but states that the patient support assembly is what is “configured to dynamically support [the] body weight of a patient.” *Id.*, ¶265; Ex-1001, 4:14-16. The specification further identifies a “patient support mechanism 1500,” which a POSITA would understand to be the patient support assembly. *Id.* The “patient support mechanism” is identified as a component of the trolley 1100:



Id.; Ex. 10001 at Fig. 1.

The '000 Patent further states that the patient support mechanism “can include a tether that can be temporarily coupled to a coupling portion of the patient attachment mechanism” and can be “configured to exert a reaction force in response to the force exerted by the patient.” *Id.*, 7:33-46, 8:36-48; Ex-1003, ¶266.

A POSITA would understand that Hidler teaches the claimed “patient support assembly” for the same reasons that Hidler teaches claim 3. Hidler’s patient support assembly is configured to dynamically support a patient. Ex-1003, ¶267-68; Ex-1001, 10:4-22. Modifying Hidler to add a housing surrounding the trolley, as taught in Faucher, would result in the housing being coupled to the trolley and, as such, the patient support assembly that is a component of the trolley. *Id.*

8[d2]	<i>the patient support assembly including a pulley movably coupled to a portion of the housing and a cam operably coupled to the pulley,</i>
-------	--

Hidler in view of Faucher and Walker teaches 8[d2].

The combination of Hidler and Faucher teaches “the patient support assembly including a pulley movably coupled to a portion of the housing” because Hidler specifically teaches that its pulley moves as a patient walks. Ex-1003, ¶270-71. The Hidler support system is shown below:

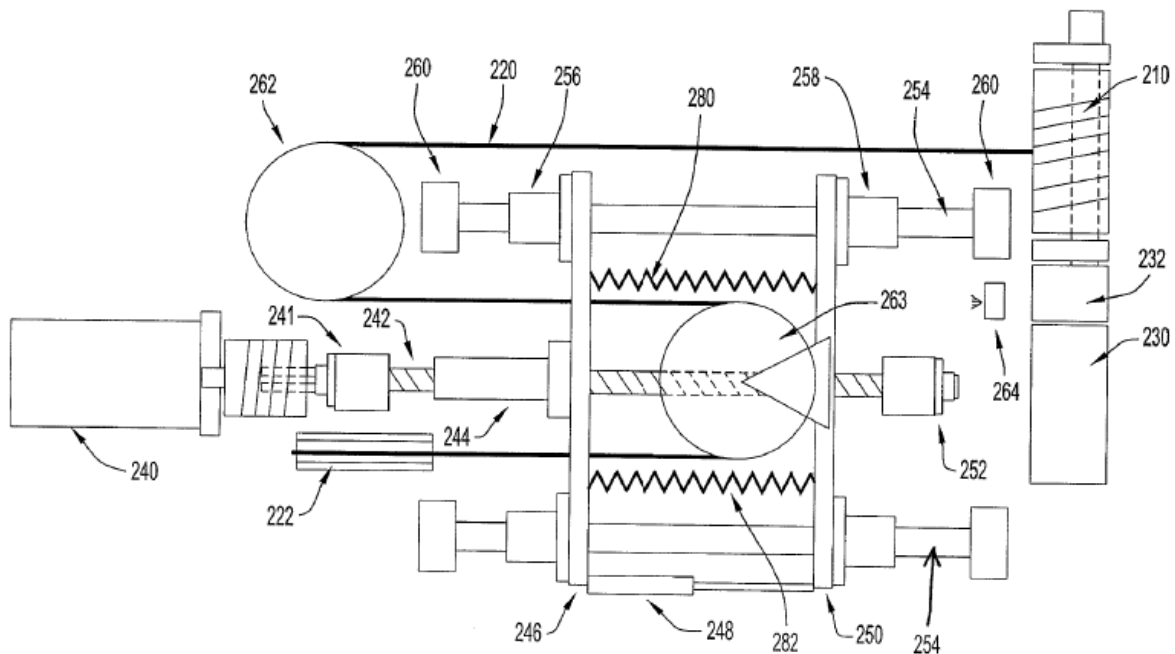
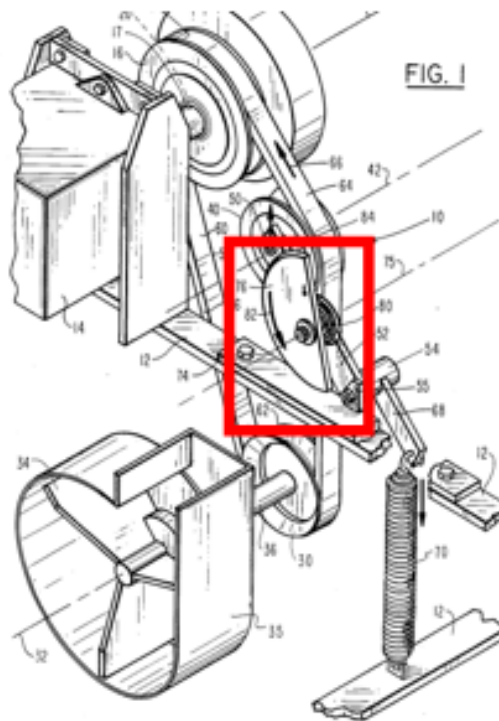


FIG.20A

Ex-1004, Fig. 20A. Hidler teaches that pulley plate 263 is mounted on pulley plate 250. Ex-1004, 11:5-13; Ex-1003, ¶270-71. Pulley plate 250 is coupled to rods 254 in a manner that allows the pulley to “slide freely.” *Id.* Hidler teaches that is possible for pulley plate 250 and pulley 263 to “move a significant amount.” *Id.*, 11:60-64; Ex-1003, ¶270-71. Pulley 263 needs to be movably coupled to the trolley (which includes the housing from Faucher) in order to work. Ex-1003, ¶270-71. As noted in the specification, the pulley plate 250 (which is pulley 263 is attached to) “moves back and forth” as a subject walks. *Id.*; Ex-1004, 11:5-65. As the pulley plates are moving, the springs distance is constantly measured, and if the

dimensions vary, the ball-screw motor 240 turns on and moves the ball-screw plate 246 to the left or to the right in order to maintain the spring deflection (dx) at the desired level of compression.” *Id.*

As explained above, a POSITA would have been further motivated to modify Hidler to incorporate a cam that is “operably coupled to the pulley” in view of the teachings of Walker. *See* Section VI.B.a(2); Ex-1003, ¶273. Specifically, Walker teaches a pulley tensioning system that uses a cam to manipulate the position of a pulley, as a means for controlling a the belt’s tension:



Id.; Ex-1006 at Fig. 1; 4:1-11 (teaching that cam 76 has a shape that causes a variation in space between the guide 74 and pulley axis 42). Walker further

teaches that the cam is used to “move idler pulley 40” to “maintain pre-selected tension.” *Id.* at 4:28-34. Thus, the ball screw system of Hidler and the cam system of Walker maintain tension in the same way, by moving a pulley to change the length of a tether/belt, which adjusts the tension of the tether. Ex-1003, ¶274.

Walker explains that a cam works in a way that when “relaxation in the tension within belt 44” occurs, it “will enable spring 80 to nudge cam 76 in the direction of arrow 82 thereby to move idler pulley 40 in this case upwardly and maintain the desired pre-selected tension.” Ex-1006, 4:1-11; Ex-1003, ¶275. In other words, as a tether changes tension, the position of the cam will rotate, and when rotated, the cam will cause a change in the pulley’s position, which allows for a constant, pre-selected tension to be maintain. *Id.* As such, the cam is “operatively coupled” to the pulley as claimed. *Id.* Substituting Walker’s cam (or any well-known cam) into Hidler’s trolley (in place of the ball screw mechanism) would still allow for constant tension to be maintained. *Id.* For the reasons set forth above, a POSITA would have expected success in making this modification.

8[d3]	<i>the patient support assembly including a tether engaged with the pulley and configured to dynamically support a body weight of a patient</i>
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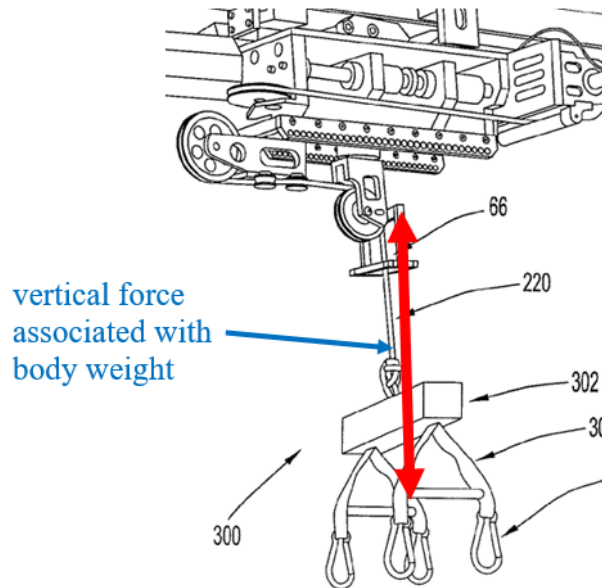
For the same reasons as claims 1c, 2, and 8[d1-d2], Hidler teaches the limitations of 8[d3]. Specifically, Hidler teaches the “patient support assembly” includes a tether (i.e., rope) that is engaged with the pulley and configured to

dynamically (i.e., actively) support a body weight of a patient,” stating that the “the unloading or adjustment system 20 includes a pulley 222 around which a rope 220 [i.e. tether] passes.” Ex-1004, 5:11-24, 11:46-59; Ex-1003, ¶279. Hidler’s rope is “coupled to a support assembly, such as a harness system or assembly.” *Id.*

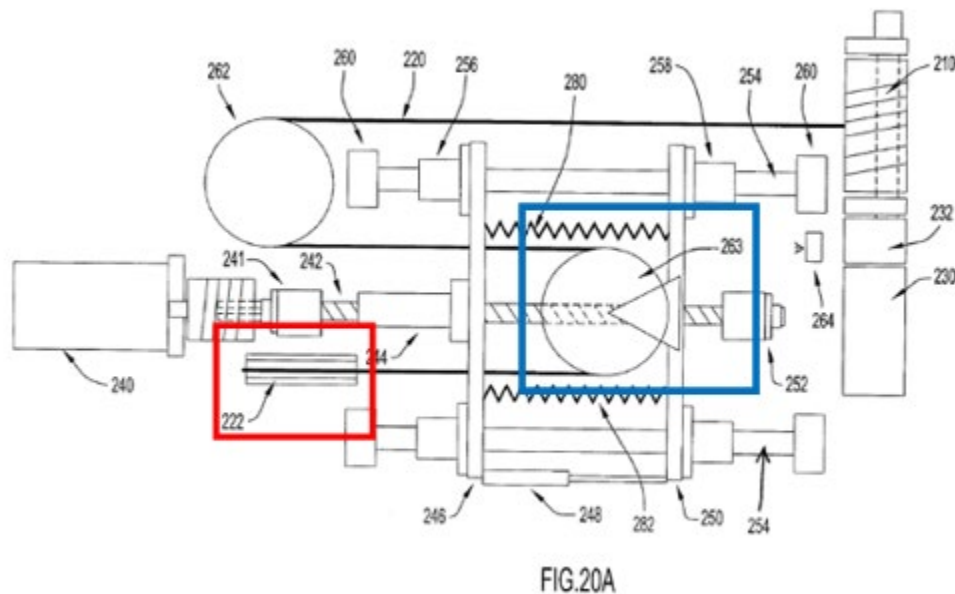
Hidler’s patient support system is also configured to dynamically support the body weight of a patient. Ex-1003, ¶280. Hidler teaches that as a patient walks when attached to the system, “the pulley plate 246 will move back and forth[, and keeps] force in the rope 220 constant” through its ball screw motor system (which can be substituted with Walker’s cam system). *Id.*; Ex-1004, 5:11-24, 11:46-59; Ex-1006, 4:1-11.

8[d4]	<i>the pulley configured to pivot relative to the housing and about a vertical axis in response to a force associated with the body weight of the patient exerted on the tether,</i>
-------	--

Hidler, in view of Faucher and Walker, teaches the limitations of 8[d4] because Hidler’s pulley is already configured to pivot relative to the housing and about a vertical axis in response to a force associated with the body weight of the patient exerted on the tether. Ex-1003, ¶282. The trolley’s tether experiences a force from the body weight of a patient:



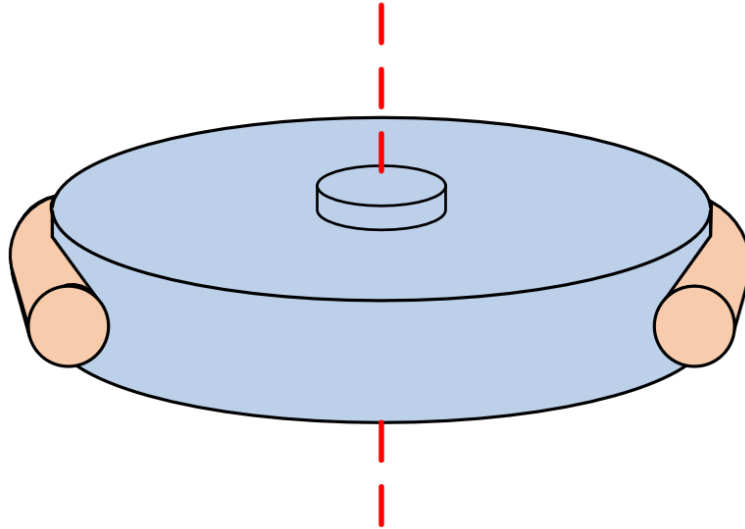
Id., ¶283; Ex-1004 at Fig. 2. The tether (220) attached to the Hidler trolley wraps around a first pulley 222 (in red) before wrapping around pulley 263 (in blue):



Ex-1004 at Fig. 20A (showing an overhead view of the trolley); Ex-1003, ¶284.

Hidler's pulley 263 meets claim limitation 8[d4] as it lies in a horizontal plane, and

as such, pivots around a vertical axis. Ex-1003, ¶¶284-85 (showing exemplary side view of a tether (orange), going around a pulley (blue), in same horizontal position as pulley 263, pivoting around a vertical axis (red):



A POSITA would understand that Hidler’s pulley 263 can be configured to pivot “relative to [Faucher’s] housing” as the pulley will move, pivot, and turn within Faucher’s housing surrounding Hidler’s trolley. Ex-1003, ¶286. In other words, the pulley will pivot and move in response to a force on the tether, independent from, and relative to, the housing. *Id.*

8[d5]	<i>the cam configured to pivot relative to the housing about the vertical axis in response to the pivoting of the pulley, the cam exerting a reaction force when the cam pivots relative to the housing,</i>
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Hidler, in view of Faucher and Walker, teaches 8[d5] because the combination uses a cam in place of Hidler’s ball screw system. Ex-1003, ¶288.

Hidler's active trolley support system works by moving a pulley 263 in a horizontal plane. Ex-1003, ¶¶289-91; see Ex-1004 at Fig. 20A.

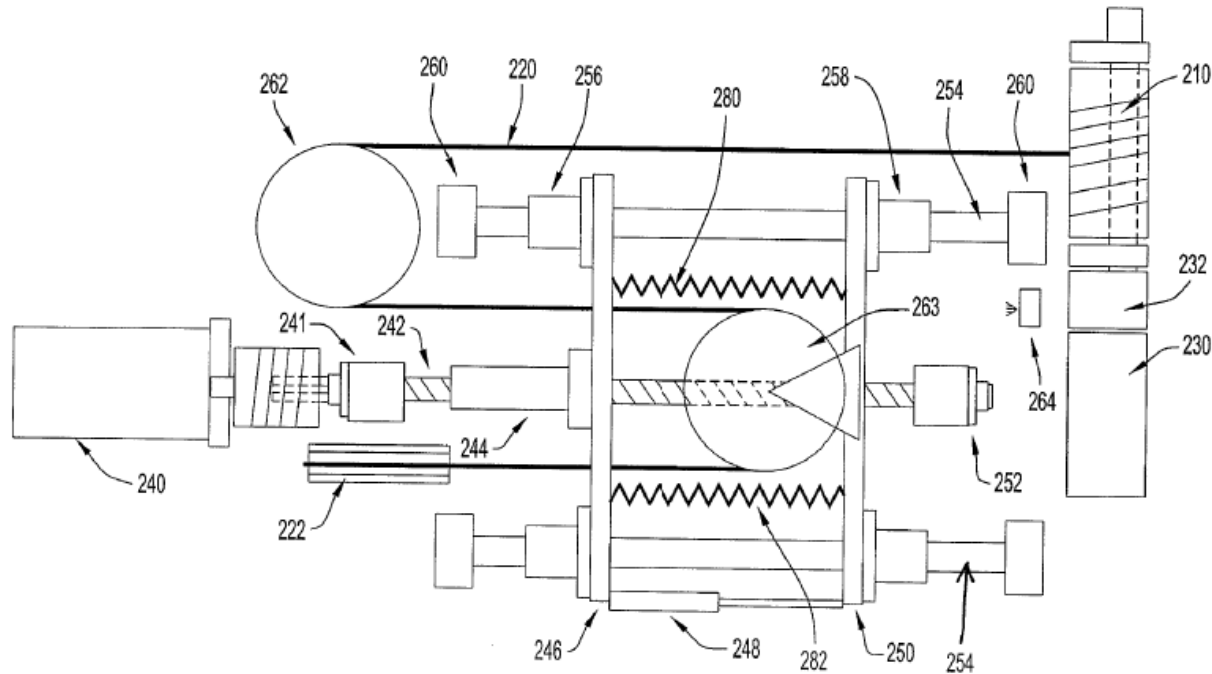


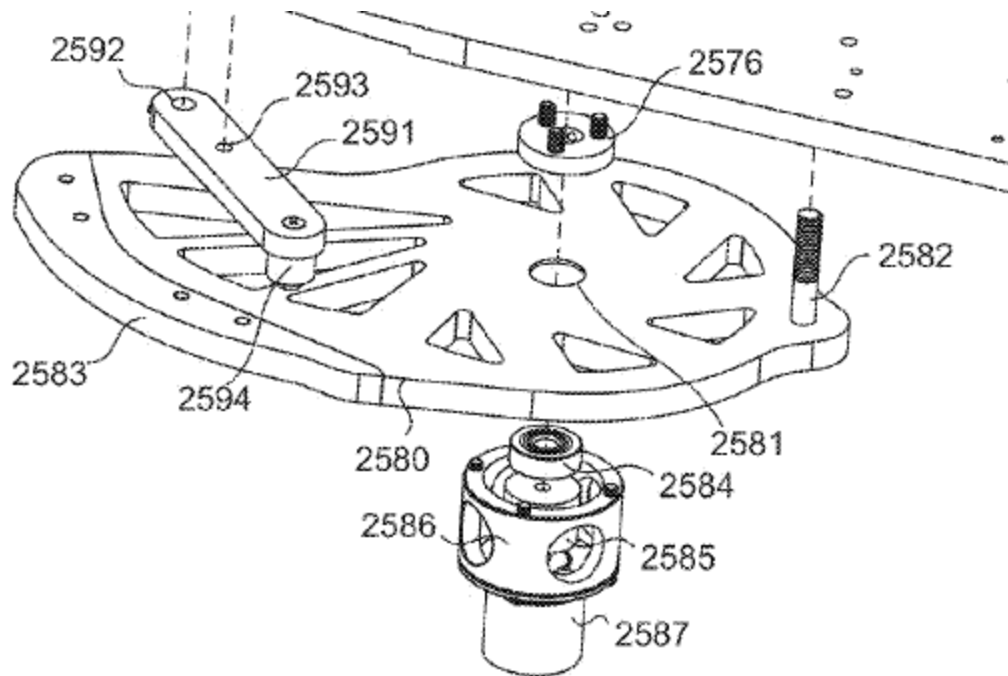
FIG.20A

As the pulley moves, the tension in the tether adjusts. *Id.* If pulley 263 moves closer to pulley 222, tension is relieved as the distance the tether must travel is shortened; if pulley 263 moves further from pulley 222, tension is increased as the distance the tether must travel is elongated. *Id.* The pulley must be moved by a power source (i.e., a motor). Hidler teaches converting the rotational force from a motor to linear force moving the tether by using a ball screw (242) and pulley plate (246). *Id.* As encoder (248) indicates that an increase or decrease in tether tension is needed, Hidler's control system moves pulley 262 in a linear manner by

converting the motor's rotational energy via the ball screw assembly (ball screw 242 and ball screw plate 246). *Id.*; *see also* Ex-1004 at Fig. 20A, 11:5-59.

While Hidler teaches moving pulley 263 linearly with a ball screw, a POSITA would have found it obvious to modify Hidler to use a cam instead, such as the cam taught in Walker. Ex-1003, ¶292. Cams were well-known in the art as a means for converting rotational energy to linear energy, which is what is required to use Hidler's motor to move pulley 263 in a horizontal plane. *Id.* Walker expressly teaches its cam is used to "move idler pulley 40" to "maintain pre-selected tension." *Id.*; Ex-1006, 4:28-34.

As pulley 263 is designed to be moved linearly in a horizontal plane, using Walker's cam in Hidler requires placing the cam in the same plan, such that it rotates on a vertical axis. Ex-1003, ¶293; *see also* Ex-1001 at Fig 33, showing how the orientation of a horizontal cam 2583 with engagement surface 2583 pivots around a vertical axis (opening 2581 and axle 2575 (not shown)):



Thus, when the Hidler-Walker combination pulley moves linearly in response to the motion of a patient, it will now engage the cam and force the cam to rotate around a vertical axis. Ex-1003, ¶294. Accordingly, the cam added to Hidler (in replace of the ball screw system) will be a cam “configured to pivot about the vertical axis in response to the pivoting of the pulley.” *Id.* As the cam’s movement will be independent from (and relative to) any housing, “the cam configured to pivot relative to the housing about the vertical axis in response to the pivoting of the pulley.” *Id.*

The cam also “exerts a reaction force when the cam pivots relative to the housing.” *Id.*, ¶295. This is because as a patient moves or falls, the tether changes direction and/or force which causes pulley 263 to pivot/try to move with pulley plate 250. *Id.* In response to the movement of the pulley pushing against the

irregularly shaped cam, the cam will pivot and exert a reaction force in order to counteract the pivoting pulley in order to maintain a constant tension. *Id.*

For similar reasons as stated in 8[d4], the Hidler-Faucher cam is configured to pivot relative to a housing. *Id.*, ¶294; *supra*, 8[d]. The cam's pivoting is independent from, and relative to, the Faucher housing. *Id.* As a patient moves or falls, the tether changes direction and/or force which causes pulley 263 to pivot/want to move. Ex-1003, ¶¶295-96. In response to the movement of the pulley, the cam pivots and exerts a reaction force to counteract the pivoting pulley in order to maintain a constant tension. *Id.*

8[d6]	<i>the cam operably coupled to a sensor configured to detect pivoting of the cam.</i>
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Hidler, in view of Faucher and Walker, teaches the limitations of 8[d6] because Hidler already teaches using sensors configured to detect movement with its ball-screw mechanism, which can be used in conjunction with Walker's cam for the same purpose. Ex-1003, ¶¶298-99. Specifically, Hidler teaches coupling sensors and pulleys relating to the force of a patient based on its disclosure of "sensors monitor[ing] the amount of unloading force and the subject's vertical position." *Id.*, Ex-1004, 10:21-23. Hidler further teaches that "ultrasonic sensor measures the location of the pulley plate 250" so that if "the ball-screw plate 246 or the pulley plate 250 moves too close to the rod support blocks 260, the winch motor 230 will turn on and either let rope 220 out or spool the rope 220 up...."

Ex-1003, ¶299; Ex-1004, at 11:55-12:7). Using the Hidler-Walker cam, as a substitute for the ball screw and pulley plate, allows for the same sensors disclosed in Hidler to be used for monitor pivoting of the cam (rather than movement of a pulley plate) in reaction to pulley 263 pivoting from a subject moving or falling. *Id.*

3. Claim 12

12	<i>The apparatus of claim 8, further comprising a second drive element coupled to the patient support assembly, the second drive element configured to dynamically support the patient.</i>
----	---

Hidler teaches the additional limitations of claim 12 by teaching a second drive assembly configured to dynamically support the patient, in addition to the drive assembly that moves the trolley along a track. Ex-1003 at 302.

The first drive element taught in Hidler is described in claims 1[a], 13[a], and 8[b]. That drive element allows for the trolley to move along the rail (in keeping up with/above the patient in the horizontal direction). Ex-1003, ¶303. Hidler also teaches the “a second drive element coupled to the patient support assembly, the second drive element configured to dynamically support the patient.” *Id.*, ¶304. That second drive element, includes a motor 230 that automatically maintains the spring length constant for springs 280 and 282, which results in constant rope tension via a winch drum, ball screw assembly (or Walker’s cam assembly after the substitution), and sensors monitor the amount of unloading

force and the subject's vertical position. *Id.*; Ex-1004, 10:4-23. In other words, the second drive element, the DC motor, allows for the BWS system to dynamically adjust the tension of the rope (or tether) in order to support the patient (i.e., from falling down in the vertical direction). Ex-1003, ¶305. Notably, the Examiner already found that Hidler taught “a second drive element coupled to the patient support assembly, the second drive element configured to dynamically support the patient.” Ex-1002, 242.

VII. CONCLUSION

For the foregoing reasons, claims 1-8 and 12-20 of the '000 Patent are obvious under pre-AIA 35 U.S.C. §103, and Petitioner respectfully requests cancelation of the same.

VIII. MANDATORY NOTICES AND FEES

A. Real Party In Interest

The real party-in-interest here is Aretech, LLC. No other parties directed, controlled, or funded this Inter Partes Review proceeding (IPR).

B. Related Matters

The '000 Patent is the subject of the following civil actions and administrative proceedings:

Bioness Inc. v. Aretech, LLC, No. 1:22-cv-00679-MSD-IDD (E.D. Va.).

C. Lead and Backup Counsel

Pursuant to 37 C.F.R. §42.8(b)(3) and 42.10(a), Petitioner designates Robert Master (Reg. No. 35,603) as lead counsel and Trevor Quist (Reg. No. 75,856) as back-up counsel, each of Sheppard, Mullin, Richter & Hampton LLP.

D. Service Information:

Petitioner consents to service by electronic mail addressed to:

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Petitioner's counsel may also be served by mail or hand delivery at Sheppard, Mullin, Richter & Hampton LLP, 2099 Pennsylvania Ave, Suite 100, NW Washington, DC 20006. Petitioner's counsel may be reached by telephone at (202) 747-1935 and by facsimile at (202) 747-3370.

E. Fees

The Office is authorized to charge fees for this Petition to Deposit Account 50-4561, Ref. 69ZR-356929.

Dated: February 13, 2023

Respectfully submitted,

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Counsel for Petitioner Aretech, LLC

CLAIM APPENDIX

1. An apparatus, comprising:

a trolley having a drive assembly configured to movably suspend the trolley from a track;

a powered conductor operatively coupled to the track, the powered conductor being substantially parallel to the track, the powered conductor including at least one conductive inner surface, a portion of the trolley being disposed within the powered conductor and in contact with the at least one conductive inner surface to electrically couple the trolley to the powered conductor, the portion of the trolley configured to move within the powered conductor and along the at least one conductive surface when the trolley is moved along the track, the track and the drive assembly each disposed outside of the powered conductor;

at least one patient attachment coupled to the trolley, the at least one patient attachment configured to support a single patient; and

a control system coupled to the trolley and at least operably coupled to the powered conductor.

2. The apparatus of claim 1, wherein the patient attachment includes one of a passive coupling and an active coupling, the passive coupling configured to be coupled to a tether to couple the patient attachment to the trolley, the active coupling configured to be coupled to a patient harness.
3. The apparatus of claim 1, wherein the trolley includes a patient support system, the patient support system configured to actively support a patient.
4. The apparatus of claim 1, wherein the trolley includes the drive assembly and a torque transfer assembly, the drive assembly and the torque transfer assembly being driven simultaneously.
5. The apparatus of claim 1, wherein the drive assembly includes a plurality of wheels, at least a portion of the plurality of wheels disposed above at least a portion of the track.
6. The apparatus of claim 1, wherein the trolley is configured to be powered only from the powered conductor.
7. The apparatus of claim 1, wherein the trolley is configured to be moved from a first position at an end of the track to a second position spaced apart from the end of the track.
8. An apparatus, comprising:
 - a housing;
 - a drive element disposed at least partially within the housing;

a wheel assembly coupled to the drive element and disposed at least partially within the housing; and

a patient support assembly coupled to the housing, the patient support assembly including a pulley movably coupled to a portion of the housing and a cam operably coupled to the pulley, the patient support assembly including a tether engaged with the pulley and configured to dynamically support a body weight of a patient, the pulley configured to pivot relative to the housing and about a vertical axis in response to a force associated with the body weight of the patient exerted on the tether, the cam configured to pivot relative to the housing about the vertical axis in response to the pivoting of the pulley, the cam exerting a reaction force when the cam pivots relative to the housing, the cam operably coupled to a sensor configured to detect pivoting of the cam.

9. The apparatus of claim 8, further comprising:

a light source coupled to the housing, the light source configured to project a light path on a surface opposite the housing.

10. The apparatus of claim 8, further comprising:

a light source configured to illuminate a target location on a surface opposite the housing.

11. The apparatus of claim 8, further comprising at least one of a clutch or a brake associated with the drive element configured to inhibit movement of the drive element.

12. The apparatus of claim 8, further comprising a second drive element coupled to the patient support assembly, the second drive element configured to dynamically support the patient.

13. An apparatus, comprising:

a trolley having a drive assembly, the drive assembly including a plurality of wheels configured to move along at least one surface of a track to move the trolley relative to the track;

a powered conductor operatively coupled and substantially parallel to the track, the powered conductor including at least one conductive surface in contact with a portion of the trolley to electrically couple the trolley to the powered conductor, the portion of the trolley configured to move along the at least one conductive surface when the trolley is moved along the track, a portion of the track disposed between at least one wheel from the plurality of wheels and the powered conductor to isolate the at least one wheel from the powered conductor;

at least one patient attachment coupled to the trolley, the at least one patient attachment configured to support a single patient; and

a control system coupled to the trolley and at least operably coupled to the powered conductor.

14. The apparatus of claim 13, wherein the trolley is configured to be powered only from the powered conductor.

15. The apparatus of claim 13, wherein the trolley includes a patient support system, the patient support system configured to actively support a patient.

16. The apparatus of claim 13, wherein the drive assembly includes a first wheel from the plurality of wheels and a second wheel from the plurality of wheels, the first wheel from the plurality of wheels being in contact with a first surface of the track and the second wheel from the plurality of wheels being in contact with a second surface of the track such that the portion of the track is disposed between the first wheel from the plurality of wheels and the second wheel from the plurality of wheels.

17. The apparatus of claim 16, wherein the portion of the track is disposed between the first wheel from the plurality of wheels and the powered conductor.

18. The apparatus of claim 17, wherein the second wheel from the plurality of wheels is disposed between the portion of the track and the powered conductor.

19. The apparatus of claim 13, wherein the conductive surface of the powered conductor defines a first plane, and

the drive assembly includes a first wheel from the plurality of wheels and a second wheel from the plurality of wheels, the first wheel from the plurality of wheels and the second wheel from the plurality of wheels being configured to move along at least one surface of the track to movably suspend the trolley from the track, the at least one surface of the track defining a second plane nonparallel to the first plane.

20. The apparatus of claim 19, wherein the drive assembly includes a third wheel from the plurality of wheels, the third wheel from the plurality of wheels being configured to move along a surface of the portion of the track, the surface of the portion of the track defines a third plane parallel to the first plane.

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. §42.24(d), Petitioner certify that this petition complies with the type-volume limitation of 14,000 words, includes 13,899 words, as measured by Microsoft Word, exclusive of the table of contents, table of authorities, mandatory notices under §42.8, certificates of service, word count, or appendix of exhibits.

Additionally, this petition complies with 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman.

Date: February 13, 2023

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on February 13, 2023, true and correct copies of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 9,862,000 and Exhibits 1001-1014 were served in entirety on the Patent Owner at the following addresses of record as listed in the Patent Center, via Priority Mail Express®:

COOLEY LLP
ATTN: IP Docketing Department
1299 Pennsylvania Avenue, NW
Suite 700
Washington, DC 20004-2400

BIONESS INC.
25103 Rye Canton Loop
Valencia, CA 91355

The undersigned certifies that true and correct copies of the Petition for *Inter Partes* Review of U.S. Patent No. 9,862,000 and Exhibits 1001-1014 were also sent via electronic mail to the attorneys of record for Plaintiff in the concurrent litigation matter(s):

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Dated: February 13, 2023

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