

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIFECORE FITNESS, INC.
d/b/a ASSAULT FITNESS
Petitioner,

v.

WOODWAY USA, INC.
Patent Owner.

U.S. Patent No. 10,561,884 to Bayerlein et al.

Case No.: IPR2023-00843

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 311 *ET SEQ.* AND 37 C.F.R. § 42.100 *ET SEQ.*
(U.S. PATENT NO. 10,561,884)**

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List of Exhibits

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1002	U.S. Patent No. 10,561,884 File History (“the ‘884 Patent File History”)
1003	Declaration of Robert Giachetti, Ph.D. P.E. (“Giachetti”)
1004	Robert Giachetti, Ph.D. P.E. Curriculum Vitae (“Giachetti CV”)
1005	Complaint, <i>Woodway USA, Inc., v. LifeCORE Fitness, Inc. d/b/a Assault Fitness</i> , Case No. 3:22-cv-00492-JO-BLM, Southern District of California, Filed April 11, 2022 (“Complaint”) (Ex. 1005 at 1-8) Waiver of Service (April 13, 2022) (Ex. 1005 at 9-10)
1006	Amended Complaint, <i>Woodway USA, Inc., v. LifeCORE Fitness, Inc. d/b/a Assault Fitness</i> , Case No. 3:22-cv-00492-JO-BLM, Southern District of California, Filed October 24, 2022 (“Amended Complaint”)
1007	Treadmills: Supplier Guide © 2010. Trade Practices (Consumer Product Safety Standard) (Treadmills) Regulations 2009 (“ACCC Product Safety Supplier Guide”)
1008	U.S. Patent No. 641,424 to Ziebell (“Ziebell”)
1009	U.S. Patent No. 1,211,765 to Schmidt (“Schmidt”)
1010	U.S. Patent No. 4,614,337 to Schonenberger (“Schoenberger”)
1011	U.S. Patent No. 5,897,461 to Socwell (“Socwell”)
1012	U.S. Patent No. 5,538,489 to Magid (“Magid”)
1013	U.S. Patent No. 3,637,206 to Chickering (“Chickering”)
1014	U.S. Patent No. 3,642,279 to Cutter (“Cutter”)
1015	U.S. Patent No. 6,042,514 to Abelbeck (“Abelbeck”)
1016	Power Transmission Handbook, (Power Transmission Distributors Association 1993) (“PT Handbook”) (available at https://cod.on.worldcat.org/oclc/49571648)
1017	Neil Sclater and Nicholas P. Chironis, Mechanisms & Mechanical Devices Sourcebook, Third Ed., (McGraw-Hill 2001) (“Sclater”) (available at https://catalog.loc.gov/vwebv/holdingsInfo?searchId=26&recCount=25&recPointer=0&bibId=12308523)
1018	Mechanical Clutches and Torque Overload Devices, (Emerson Industrial Automation, 2001) (“Emerson”)

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1019	Standard Specification for Motorized Treadmills, (ASTM, 2005) (“ASTM Standard”)
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1021	U.S. Patent No. 8,986,169 File History (“the ‘169 Patent File History”)
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1023	United States District Courts – National Judicial Caseload Profile, December 2022
1024	Inhabitat, “HUMAN-POWERED GYMS in Hong Kong” (March 8, 2007) (available at https://inhabitat.com/human-powered-gyms-in-hong-kong/)
1025	Minute Order, <i>Woodway USA, Inc., v. LifeCORE Fitness, Inc. d/b/a Assault Fitness</i> , Case No. 3:22-cv-00492-JO-BLM, Southern District of California, March 30, 2023.
1026	<i>Intentionally blank</i>
1027	Claim Construction Brief, <i>Woodway USA, Inc., v. LifeCORE Fitness, Inc. d/b/a Assault Fitness</i> , Case No. 3:22-cv-00492-JO-BLM, Southern District of California, March 1, 2023
1028	Responsive Claim Construction Brief, <i>Woodway USA, Inc., v. LifeCORE Fitness, Inc. d/b/a Assault Fitness</i> , Case No. 3:22-cv-00492-JO-BLM, Southern District of California, March 14, 2023
1029	U.S. Patent No. 4,635,771 to Shoji (“Shoji”)
1030	U.S. Patent No. 6,923,746 to Skowronski (“Skowronski”)

Mandatory Notices under 37 C.F.R. § 42.8

Real Party-In-Interest - 37 C.F.R. § 42.8(b)(1)

Petitioner certifies that LifeCore Fitness, Inc. d/b/a Assault Fitness (“Petitioner”) is the real party-in-interest.

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

Petitioner identifies the following related judicial matter: *Woodway USA, Ind., v. LifeCORE Fitness, Inc. d/b/a Assault Fitness*, Case No. 3:22-cv-00492 (S.D. Cal.), served April 13, 2022. The ‘884 Patent is being asserted in this proceeding, along with three other patents within the same family: U.S. 9,039,580, U.S. 10,799,745, and U.S. 11,465,005.

Petitioner is also aware that the related ‘580 Patent was at issue in *Woodway USA, Inc. v. Samsara Fitness, LLC et al.*, Case No. 2-15-cv-00956 (D.W.I.), and *Chapco, Inc. et al v. Woodway USA, Inc.* Case No. 3-15-cv-01665 (DCT).

Lead and Back-Up Counsel - 37 C.F.R. § 42.8(b)(3)

LifeCore appoints the following lead and back-up counsel:

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An appropriate Power of Attorney is filed concurrently herewith.

Service Information - 37 C.F.R. § 42.8(b)(4)

Service information for lead and back-up counsel is provided in the designation of lead and back-up counsel above. Petitioner hereby consents to service by email at the following email address:
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Fees - 37 C.F.R. § 42.15(a)

The filing fees associated with this Petition are being charged to Deposit Account 023978. The Board is authorized to charge any additional fees or credit any refunds pertaining to this Petition to Deposit Account 023978.

I. Introduction

Petitioner (“LifeCORE”) requests *inter partes* review of claims 30-34, 37-54, 57, 59 of U.S. Patent No. 10,561,884 (“the ‘884 Patent”; Ex.1001) through this Petition. The Declaration of Dr. Robert Giachetti in support of this Petition, is filed as Exhibit 1003.

The ‘884 Patent is one of four related patents that Patent Owner (“Woodway”) asserted against LifeCORE in litigation. (Ex.1005, served on April 13, 2022, *id.* at 9-10, Ex.1006.¹) Patent Owner contends these patents teach “revolutionary” “manual treadmills that are self-propelled and allow a runner or walker to control his/her/their speed without the use of any motor.” (Ex.1005, ¶9.) Patent Owner further contends that this “treadmill was the first of its kind when it was introduced in 2009.” *Id.*

Patent Owner’s manual treadmill technology was actually well known in the art. For example, U.S. Patent Nos. 1,211,765 to Schmidt (Ex.1009), 3,637,206 to Chickering (Ex.1013), 5,897,461 to Socwell (Ex.1011), 5,538,489 to Magid (Ex.1012), and Patent Owner’s own patent, U.S. 4,614,337 to Schonenberger (Ex.1010), describe such manual treadmills. (Ex.1003, ¶¶52-57, 69.)

By the late 1900’s lightweight belts and electric motors were widely

¹ US 11,465,005 was first asserted on October 24, 2022. (Ex.1006.)

available and motorized treadmills began to be offered. (Ex.1003, ¶¶54-55.) However, manual treadmills were still in use because they reduce cost, complexity, and electricity consumption as compared to motorized treadmills. (Ex.1003, ¶¶57, 52-57.)

Treadmills have safety concerns, users may be injured by falling off while mounting or dismounting, or while using it. (Ex.1003, ¶71.) Falls may be caused by the treadmill belt moving in an unexpected direction or in such a way that the user loses equilibrium. (Ex.1003, ¶¶72-73, 75; Ex.1013, 1:24-39; Ex.1011, 1:28-41; 2:45-55.) Professional organizations have produced standards regarding treadmill safety. *See* ASTM Standard, Ex.1019, ISO Standard, Ex.1020, and ACCC Product Safety Supplier Guide, Ex.1007. For example, ASTM provides guidance regarding treadmill stability and requires treadmills to have handrails and footrails. (Ex.1019 at 3-4.) The '884 Patent claims start with the well-known manual treadmill, and then adds common features also well-known before 2009, such as a curved running surface, shaft assemblies, electrically insulating pulleys, one-way bearings/clutches, etc. (Ex.1003, ¶¶96, 102.)

Grounds 1 and 3 demonstrate how and why it would have been obvious to modify a manual treadmill with a flat running surface to provide a curved running surface, and to include a sprag-type one-way bearing assembly.

Grounds 2 and 3 demonstrate how and why it would have been obvious to

replace a metal pulley with a plastic pulley.

Ground 4 demonstrates how and why it would have been obvious to modify a manual treadmill with a curved running surface to include a sprag-type one-way bearing assembly.

II. Grounds for Standing Requirements under 37 C.F.R. § 42.104

A. Grounds for Standing - 37 C.F.R. § 42.104(a)

Pursuant to 37 C.F.R. § 42.104(a), Petitioner certifies that the '884 Patent is available for IPR and they are not barred or estopped from requesting IPR.

B. Challenged Claims - 37 C.F.R. § 42.104(b)(1)

Petitioner requests *inter partes* review for claims 30-34, 37-54, 57, and 59 of the '884 Patent and requests that the Patent Trial and Appeal Board ("PTAB") cancel those claims as unpatentable.

C. Prior Art Relied Upon

The '884 Patent is not entitled to the March 17, 2009 priority benefit of its earliest-filed provisional application, but even if it were, the following references are all prior art under 35 USC § 102(b):

- Chickering – US 3,637,206 (Ex.1013) issued January 25, 1972
- Magid – US 5,538,489 (Ex.1012) issued July 23, 1996
- Socwell – US 5,897,461 (Ex.1011) issued April 27, 1999
- Schonenberger – US 4,614,337 (Ex.1010) issued September 30, 1986

- Sclater – Mechanisms and Mechanical Devices Sourcebook 3rd Edition, McGraw-Hill (2001) (Ex.1017)
- Skowronski - US 6,923,746 to Skowronski (Ex.1030) issued August 2, 2005

Chickering, Magid, Socwell, Schonenberger, and Skowronski are cited on the '884 Patent; and the Examiner applied Magid and Skowronski as secondary references during examination. Sclater is not cited on the '884 Patent.

D. Grounds of Challenge – 37 C.F.R. § 42.104(b)(2)

The grounds of unpatentability presented in this petition are as follows:

Ground	Basis ²	References	Claims Challenged
1	§ 103	Schonenberger, Socwell, Magid, and Sclater	30-34, 37-43, 45-50, 52-54, 57, 59
2	§ 103	Schonenberger, Socwell, Magid, Sclater, and Skowronski	44, 51

² Post-AIA Sections 102, 103 and 112 apply.

Ground	Basis ²	References	Claims Challenged
3	§ 103	Schonenberger, Socwell, Magid, and Sclater	30-34, 37-54, 57, 59
4	§ 103	Chickering, Magid, and Sclater	30-34, 37-39, 41, 45-49, 57, 59

There is a reasonable likelihood that at least one Challenged Claim is unpatentable as explained herein. Petitioner requests institution on all of the Challenged Grounds. *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348 (2018).

III. Person of Ordinary Skill in the Art (POSA)

A person of ordinary skill in the art (POSA) of the '884 Patent would have had a bachelor's degree in mechanical engineering and at least one year of machine design experience related to power transmission equipment and a demonstrated understanding of the biomechanics of exercise, including knowledge in the field of anthropometry (i.e., the study of human proportion). (Ex.1003, ¶¶48, 44-49.) This description is approximate and additional development experience could make up for less education and vice versa. (*Id.*)

IV. The Challenged '884 Patent

A. Effective Filing Date

The '884 Patent matured from U.S. Application 15/958,339 that was filed on April 20, 2018. The '884 Patent is part of a patent family that claims priority back to Provisional application No. 61/161,027, which was filed on March 17, 2009. A graphic of the '884 Patent Family is provided below, with the '884 Patent highlighted in yellow and the related asserted patents shaded in gray. (Ex.1003, ¶103.)

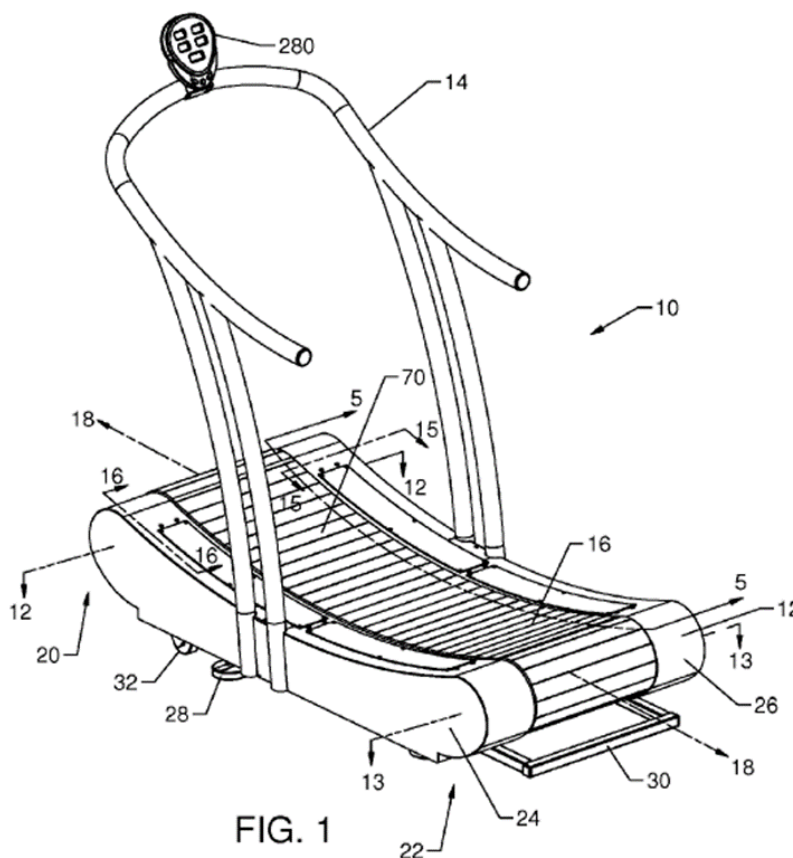
PRV	61/161,027 - 17MAR2009		
PCT	PCT/US2010/027543 - 16MAR2010 WO2010/107840 - 23SEPT2010		
CIP	CIP - Abandoned 13/235,065 - 16SEPT2011 US2012/0010053 - 12JAN2012		
	14/243,716 - 2APRIL2014 US8,986,169	14/076,912 - 11NOV2013 US9,114,276	
	14/656,942 - 13MAR2015 US9,039,580 - 26MAY2015	14/832,708 - 21AUG2015 US10,265,566	
		15/958,339 - 20APRIL2018 US10,561,884 - 18FEB2020	15/957,721 - 19APRIL2018 US10,561,883
		16/792,426 - 17FEB2020 US10,799,745 - 13OCT2020	16/792,444 - 17FEB2020 US10,850,150
			17/247,101 - 30NOV2020 US11,465,005 - 11OCT2022

The '884 Patent Family

B. Overview

The '884 Patent relates to manually operated treadmills and mechanisms for controlling the motion of a running belt of the treadmill. ('884 Patent, Ex.1001,

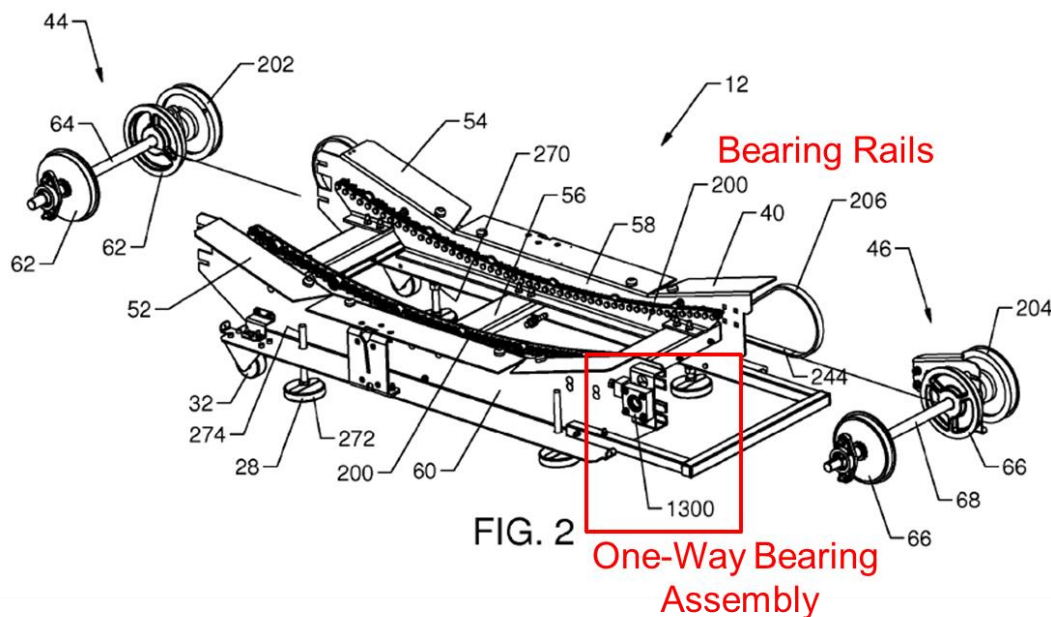
Abstract.) The '884 Patent discloses a manual treadmill 10 with “a running belt 16 that extends substantially longitudinally along a longitudinal axis 18” of a base 12. (Ex.1001, 4:52-54; Ex.1003, ¶92.)



Ex.1001, Fig.1

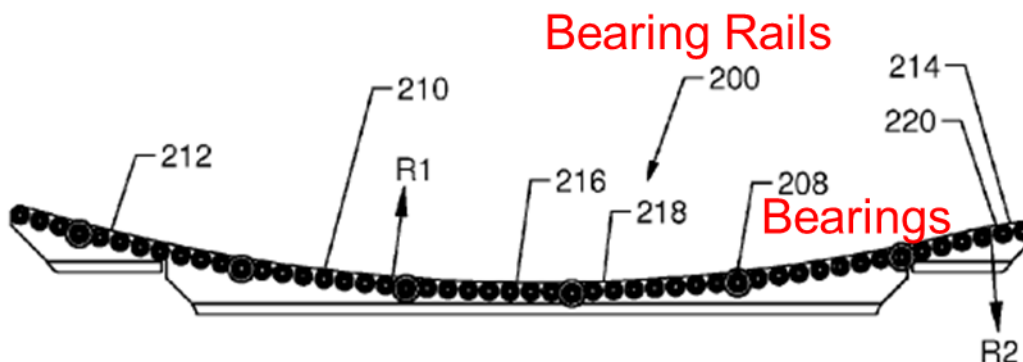
The treadmill includes a “front shaft assembly 44 [that] includes a pair of front running belt pulleys 62 interconnected with . . . a shaft 64, and the rear shaft assembly 46 includes a pair of rear running belt pulleys 66 interconnected with, and preferably directly mounted to, a shaft 68.” (Ex.1001, 5:34-39.) The treadmill also includes bearing rails 200 that include a plurality of bearings 208. (Ex.1001,

11:20-23.) The “running belt 16 is disposed about the front and rear running belt pulleys 62, 66” and “moves substantially along the top profile 210 of the bearing rails 200.” (Ex.1001, 5:41-43, 11:36-39.) “Accordingly, the running surface 70 has a shape that substantially corresponds to the shape of the top profile 210 of the bearing rails 200.” (‘884 Patent, Ex.1001, 11:50-54.)



Ex.1001, Fig.2³

³ Annotations added in color.



Ex.1001, Fig.9

As illustrated in Figure 2 above, and Figure 36 below, the treadmill 12 includes a “safety device shown as a one-way bearing assembly 1300 . . . that is configured to permit rotation of at least one of the front and rear shaft assemblies 44, 46 (and hence the running belt 16) in only one direction.” (Ex.1001, 27-13-19.) The ‘884 Patent further discloses that “[t]he one-way bearing assembly 1300 comprises a housing 1302 which supports an inner ring 1304 that cooperates with the rear shaft 68 and supports an outer ring 1306 fixed relative to the housing 1302.” (*Id.*, 27:22-26.) The one-way bearing assembly includes a “plurality of sprags (not shown) [that] are disposed between the inner ring 1304 and the outer ring 1306.” (*Id.*, 27:26-27.)

One-Way Bearing Assembly

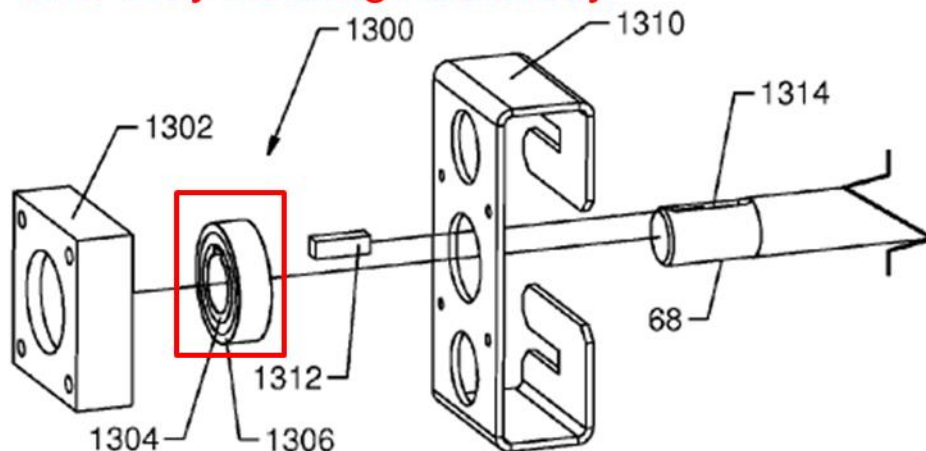


FIG. 36

Ex.1001, Fig.36

The '884 Patent provides scant detail on the one-way bearing design. For example, it does not illustrate the sprags, nor explain their interaction with the inner and outer rings 1304, 1306. Instead, the '884 Patent simply states that each sprag has an “asymmetric” shape to “provide for motion in one direction and prevent rotation in the opposite direction.” (Ex.1001, 27:21-23.) And that the “sprags become wedged between the inner ring 1304 and the outer ring 1306, preventing the counterclockwise rotation of the inner ring and key 1312 disposed therein.” (*Id.*, 27:61-64.)

Independent claims 30, 37, 50, and 57 of the '884 Patent are directed to a common manual treadmill topology that includes a belt supported by bearings to provide a curved running surface. The running belt is disposed about rotatable

front and rear shaft assemblies and constrained by a safety device so that it moves in only one direction. (Ex.1003, ¶¶95-97.) Independent claim 37 is representative and reproduced below:

37. A **manually powered treadmill**, comprising:

a frame;

a first plurality of bearings coupled to the frame;

a second plurality of bearings coupled to the frame and spaced a distance from the first plurality of bearings;

a front shaft assembly coupled to the frame;

a rear shaft assembly coupled to the frame;

a running belt at least partially supported by the first plurality of bearings and the second plurality of bearings, the running belt being at least partially disposed about the front and rear shaft assemblies, and **comprising a running surface, at least a portion of which is curved;**
and

a safety device coupled to the frame and the running belt, the safety device **having a first rotatable element and a second rotatable element**, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;

wherein one of the first and second rotatable elements of the safety device and the running belt **freely rotate** relative to the other of the one of the first and second rotatable elements of the safety device **in a first direction** of rotation relative to the frame, however, in a second

direction of rotation, opposite the first direction of rotation, **interference** between the safety device and at least one of the first rotatable element and the second rotatable element substantially **prevents rotation of the running belt** and the one of the first and second rotatable elements relative to the other of the one of the first and second rotatable elements.

The technology of the challenged independent claims of the ‘884 Patent was old and well-known in the art by March 2009. (Ex.1003, ¶96.) The “*manually powered treadmill⁴*” with a “*running belt . . . comprising a running surface, at least a portion of which is curved*” has been around since at least 1917 (*see e.g.*, Schmidt, Ex.1009, Fig.1; Ex.1003, ¶96.)

The use of “*shaft assembl[ies]*” and a “*plurality of bearings*” to support the running belt is also old and well known (Ex.1003, ¶67; *see e.g.*, Chickering, Ex.1013, Fig.3; Schonenberger, Ex.1010, Fig.7.)

The wherein clause is unclear because it requires “*interference between the safety device and at least one of the first rotatable element and the second rotatable element substantially prevents rotation of the running belt,*” without identifying a third element of the safety device to create the interference.

The ’884 Patent does not provide much detail on the structure of the safety

⁴ Petitioner uses italics to indicate claim language.

device. For example, it describes the safety device as a one-way bearing assembly that includes a “plurality of sprags (not shown) [that] are disposed between the inner ring 1304 and the outer ring 1306,” and that the “sprags become wedged between the inner ring 1304 and the outer ring 1306, preventing the counterclockwise rotation of the inner ring and key 1312 disposed therein.” (Ex.1001, 27:26-27, 27:56-58.)

The “*safety device*” and subsequent “*wherein*” clause, is just a verbose way of claiming a conventional sprag-type one-way bearing assembly arranged in a backstop mode of operation. A POSA would have understood that a conventional sprag-type one way bearing assembly, such as that disclosed in Sclater, teaches such limitations. (Ex.1017 at 316; Ex.1003, ¶100.)

Further, the need to limit the motion of the treadmill belt for user stability and safety was also well known. (See, e.g., Ex.1013, 1:24-39; Ex.1011, 1:28-41.) (Ex.1003, ¶97.) And using a “*safety device*,” such as a one-way clutch, to permit only unidirectional movement of a treadmill belt dates back to at least 1996. (Ex.1012, 4:46-59, Fig.5.) And sprag-type one-way bearings were commercially available for exercise equipment since at least 2001. (Ex.1018, 52-53.) (Ex.1003, ¶101.)

The dependent claims add additional common treadmill features, such as pulleys (claims 39, 41, 42, 43, 52, 53), plastic pulleys (claims 44, 51), cross-

members (claims 31, 48), one-way bearings (claims 33, 38, 54), and support structures to adjust elevation (claim 34, 45, 59). (Ex.1003, ¶102.)

C. Prosecution History

1. The ‘884 Patent File History

U.S. Patent Application No. 15/958,339 was filed on April 20, 2018, with 30 claims, including independent claims 1, 8, 21, and 28. (Ex.1002 at 1 - 115.) Each independent claim included a broad “*safety device*” limitation. For example, claim 1 as filed required:

a safety device coupled to at least one of the front shaft and the rear shaft, wherein the safety device is structured to restrict movement of at least one of the running belt, the front shaft, and the rear shaft in a first rotational direction while permitting movement of the at least one of the running belt, the front shaft, and the rear shaft in a second rotational direction opposite the first rotational direction

(*Id.* at 62.)

On July 19, 2018, the Examiner issued a non-final office action rejecting most claims as obvious over US 5,492,517 to Bostic, US 3,642,279 to Cutter (Ex.1014), and US 4,334,676 to Schonenberger (“Schoenenberger ‘676.”).⁵ The Examiner also rejected claims 15 and 22 as obvious over Bostic, Cutter,

⁵ Schonenberger ‘676 is related to Schonenberger (Ex. 1010).

Schonenberger ‘676 and US 6,923,746 to Skowronski (Ex.1030). (*Id.* at 136, 141.)

The Examiner relied on Bostic’s disclosure of a one-way clutch for satisfying the “*safety device*” limitations. (*Id.* at 136.)

On October 18, 2018, Patent Owner filed a response with significant amendments to the “*safety device*” limitations to specify that the safety device “*freely rotates*” in a first direction and “*substantially prevents rotation*” in an opposite direction. (Ex.1002 at 568.) Patent Owner argued that Bostic did not teach this limitation because:

[T]he one-way clutch of Bostic does not provide for rotation in only one direction. The Bostic one-way clutch freewheels in one direction and transmits torque in the other direction. As a result, the treadmill belt of Bostic is free to move in both directions.

(*Id.* at 581.⁶)

The Examiner issued a final office action on February 20, 2019 rejecting most claims as obvious over Bostic, Cutter, Schonenberger ‘676, and US 5,538,489 to Magid (Ex.1012.) The Examiner now relied on Magid’s control means disclosure for satisfying the “*safety device*” limitations. (*Id.* at 2225.)

Patent Owner filed a response on April 22, 2019, amending the independent

⁶ All emphasis added by Petitioner unless indicated otherwise.

claims to require that “*interference*” between the “*safety device*” and a “*housing*” or “*rotatable elements*” prevents rotation in the second direction. (*Id.* at 2263-2274.) Patent Owner argued that Magid does not disclose such “*interference*.” (*Id.* at 2278, 2281.)

On August 5, 2019, the Examiner issued another office action rejecting most claims over Bostic, Cutter, Schonenberger ‘676 and US 2005/0009668 to Savettiere. (*Id.* at 2335.) The Examiner now relied on Savettiere, not Magid, for satisfying the “*safety device*” limitations. (*Id.* at 2235-2236.) On October 16, 2019 Patent Owner filed a response arguing that Savettiere does not teach “enabling or allowing only one rotational direction of movement” and accordingly does not teach a “‘*safety device*’ that ‘substantially prevents rotation of the running belt’.” (*Id.* at 2463-2464.) On January 3, 2020 the Examiner issued a notice of allowance without explaining the reasons for allowance. (*Id.* at 2492-2494.)

2. The ‘169 Patent File History

U.S. Application No. 14/243,716 (the ‘716 Application) issued as the ‘169 Patent, and is related to the ‘884 Patent. The ‘716 Application was filed on April 2, 2014 with independent claims 1, 10, and 14, that included similar safety device / bearing limitations as those in the ‘884 Patent. (*Id.* at 54-59.)

The USPTO rejected original claims 1-11 as obvious over US 2006/0287165 to Pasqualin in view of US 3,642,279 to Cutter (Ex.1014) in view of US 5,538,489

to Magid (Ex.1012.) (*Id.* at 125-130.) The Examiner relied on Cutter and Schmidt for satisfying the “*curved*” running surface limitations, Magid’s disclosure of control means for satisfying the “*one-way bearing*” claim limitations. (Ex.1021 at 126, 132.)

Patent Owner argued against the Examiner’s rationale for combining Magid with Pasqualin and Cutter. (*Id.* at 149-172.) More specifically, Patent Owner argued that: 1) Magid’s disclosure of two-belts “teaches away from the use of a single, wide belt”); and 2) combining Magid with a curved running surface reference like Cutter would render Magid inoperable because “a curved running surface would add difficulty walking for uncoordinated, thereby rendering Magid unsatisfactory for its intended purpose.” (*Id.* at 160-163.) (Ex.1003, ¶116.)

In response, the Examiner issued a final office action rejecting all of Patent Owner’s arguments regarding combining Magid with Cutter or Schmidt. (*Id.* at 202-203.) The Examiner rejected Patent Owner’s teaching away argument and inoperability arguments stating:

Magid does not explicitly reject using the safety device on a single-belt treadmill. As discussed above, there is a need for a safety device to prevent the user from accidentally or unexpectedly propelling the belt the wrong direction. By Applicant’s own admission, Applicant acknowledges this risk.

(*Id.* at 202-203; Ex.1003, ¶117.)

On January 16, 2015, the Patent Owner filed an amendment amending the independent claims to include the allowable subject matter of dependent claims not at issue here. The application then proceeded to allowance. (*Id.* at 223-225, 245.) (Ex.1003, ¶118.)

V. Claim Construction — 37 C.F.R. § 42.104(B)(3)

In an IPR proceeding, the claims are construed “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. §42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

The related litigation is in early stages and the parties are pursuing multiple claim construction positions, shown in Ex.1022. The Markman Hearing is scheduled for April 24, 2023, after this Petition is filed. (Ex.1025.) Accordingly, Petitioner is pursuing the following alternate claim construction positions for Grounds 3 and 6 only.

A. “substantially prevent[]”

In the related litigation, Patent Owner proposed that the term “*substantially prevent[]*” be construed under its plain and ordinary meaning; and provided the following examples: “entirely/largely/mostly/generally though not necessarily entirely.” (Ex.1022, at 5.) During prosecution of the related ‘884 Patent, Patent

Owner disavowed such a broad construction (*i.e.*, “generally though not necessarily entirely”) by arguing a narrower interpretation that basically removes the word “*substantially*” to distinguish prior art. (*See e.g.*, Ex.1027 at 5-6; Ex.1028 at 6-7.)

Accordingly, Petitioner is pursuing a construction of “*substantially prevent*[],” as “prevent any movement after allowing no or minimal movement” in the litigation; and proposes the same construction here for claims 1, 7, 11, and 25. (*See* Ex.1028 at 6-7.) Regardless, the cited art teaches both constructions.

B. “safety device”

Patent Owner proposed construing the term “*safety device*” as a “device that permits movement in only one direction” in the related litigation. (Ex.1022 at 5.) Petitioner proposes that “*safety device*,” as recited in claims 30, 33, 37, 38, 50, 54, and 57 be construed as a “device having two ring-shaped components.” (*Id.*) Regardless, the cited art teaches both constructions.

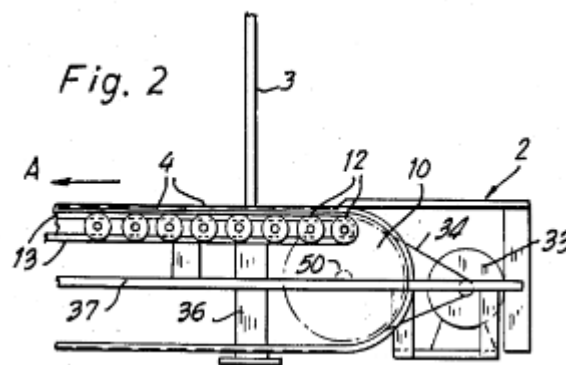
C. “shaft”

Petitioner asserts “*shaft*” should be construed to mean “a rotating element used to transmit power from one part to another” while Patent Owner asserts it means a “hollow or solid element/part/rod/tube/member/piece.” (Ex.1022 at 4.) Regardless the cited art teaches both constructions.

VI. Prior Art Overview

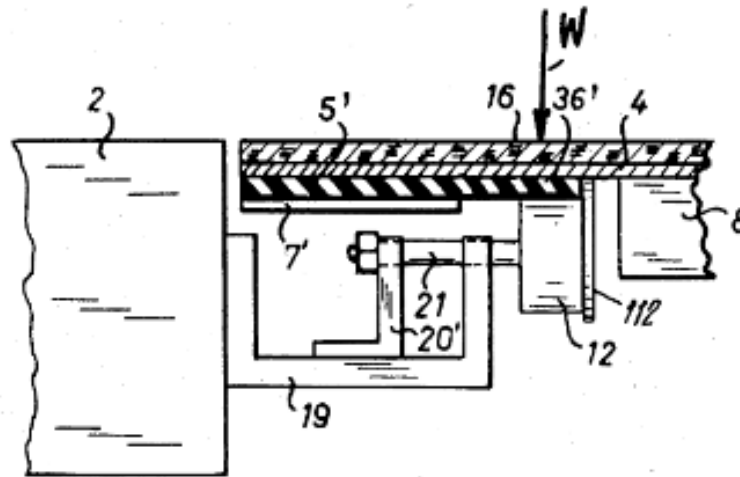
A. U.S. Patent No. 4,614,337 (“Schonenberger”)

Schonenberger discloses a manual treadmill having a movable surface looped around drums mounted on front and rear shafts. (Ex.1010, 4:14-17, 6:16-18.)



Ex.1010, Fig.2

The movable surface is supported by rollers positioned under the belt along the left and right sides. The rollers are mounted to brackets, which are connected to the frame. The brackets extend longitudinally along the left and right sides of the frame. (Ex.1010, 8:34-51; Ex.1003, ¶¶125-126.)



Ex.1010, Fig.10

B. U.S. Patent No. 5,897,461 (“Socwell”)

Socwell discloses a manual curved treadmill. (Ex.1011, 11:52-60.)

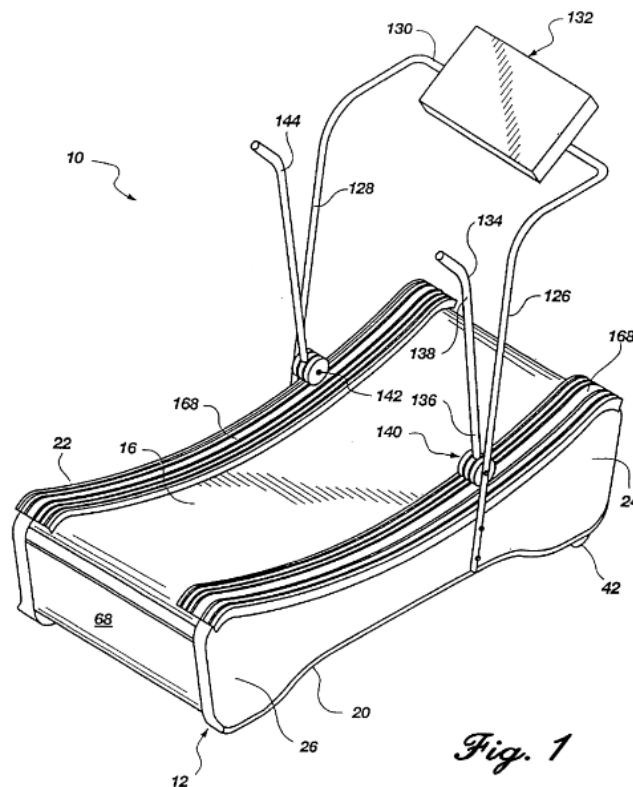


Fig. 1

Ex.1011, Fig.1

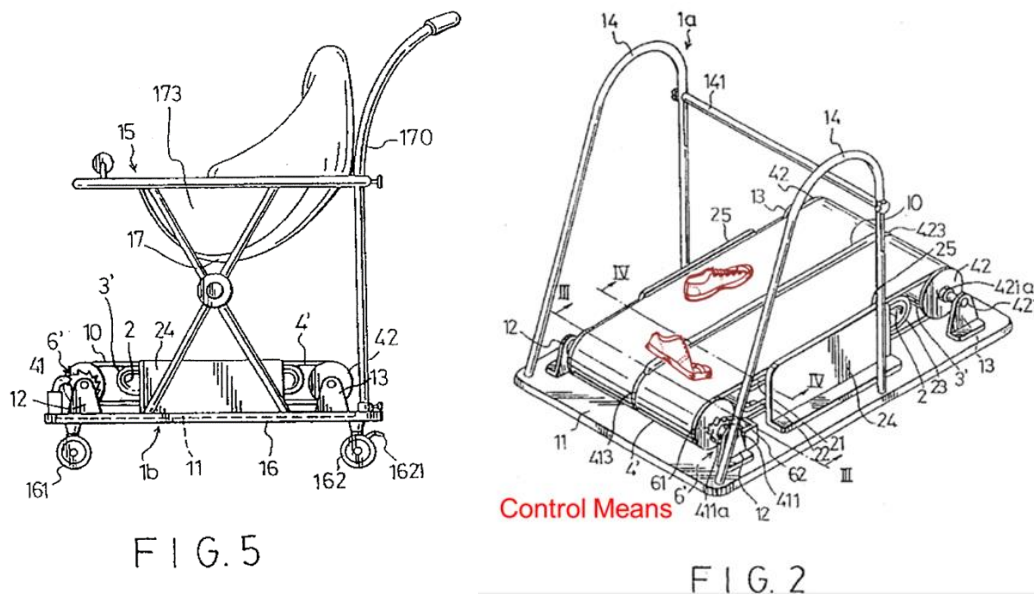
Ex.1011, Fig.2

The bearings are mounted to the sides of the frame by cover members that are elongated and extend longitudinally. The cover members are bolted to the frame. (Ex.1011, 10:49-60, 11:15-33.) Socwell discloses adjustable support feet to adjust inclination of the running surface. (Ex.1011, 9:29-56; Ex.1003, ¶¶128-131.)

C. U.S. Patent No. 5,538,489 (“Magid”)

Magid discloses a manual treadmill with a belt supported by a plurality of

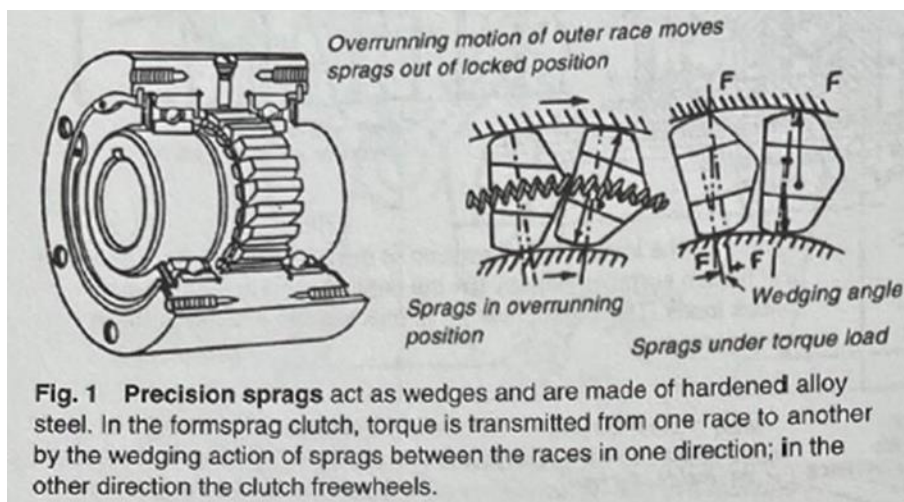
rollers or a flat bearing surface. (Ex.1012, Figs.8, 1.) Magid also discloses a one-way clutch with a ratchet-and-pawl mechanism coupled to a front shaft or a rear shaft to permit only unidirectional belt movement. (Ex.1012, Fig.5, 4:46-59; Ex.1003, ¶¶132-133.)



Ex.1012, Figs.2,5

**D. Neil Sclater, Mechanisms & Mechanical Devices
Sourcebook, Third Ed. (McGraw-Hill 2001) (“Sclater”)**

Sclater is a reference sourcebook that “contains drawings and descriptions of more than 2000 different mechanisms and mechanical devices that have proven themselves in modern products, machines, and systems.” (Ex.1017 at 24, Back Cover.) Sclater describes different types of coupling, clutching, and braking devices in Chapter 9, including ratchet clutches and one-way bearing assemblies that include sprags. (Ex.1017, 311-312.)

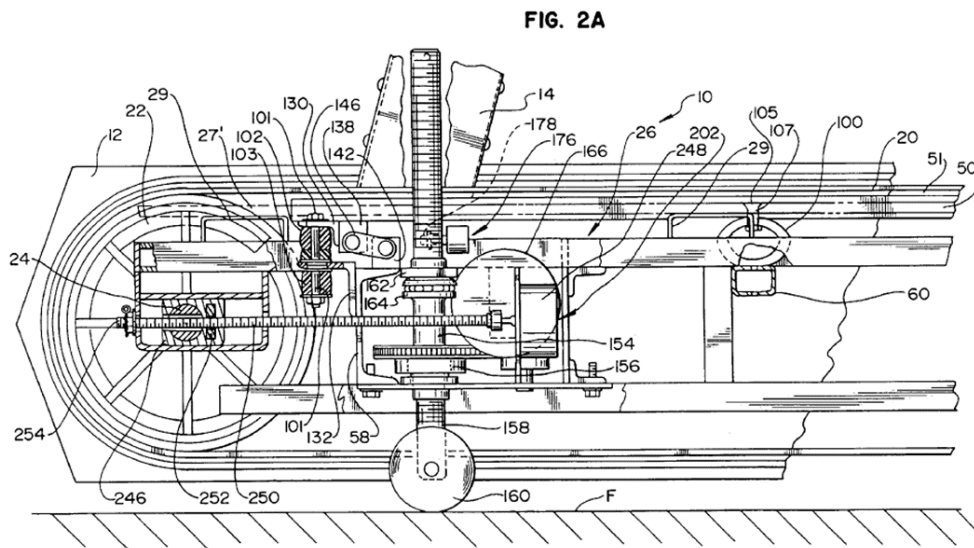


Ex.1017, 318

Sclater explains deficiencies of pawl and ratchet clutches as compared to roller and friction-type clutches, including noise and speed limitations. (Ex.1017, 302-303, 316; Ex.1003, ¶¶134-136.)

E. U.S. Patent No. 6,923,746 (“Skowronski”)

Skowronski discloses a treadmill having front and rear pulleys that support a belt. (Ex.1030, 6:46-52.) The pulleys are “preferably of a molded plastic construction.” (*Id.* 7:49-50.)



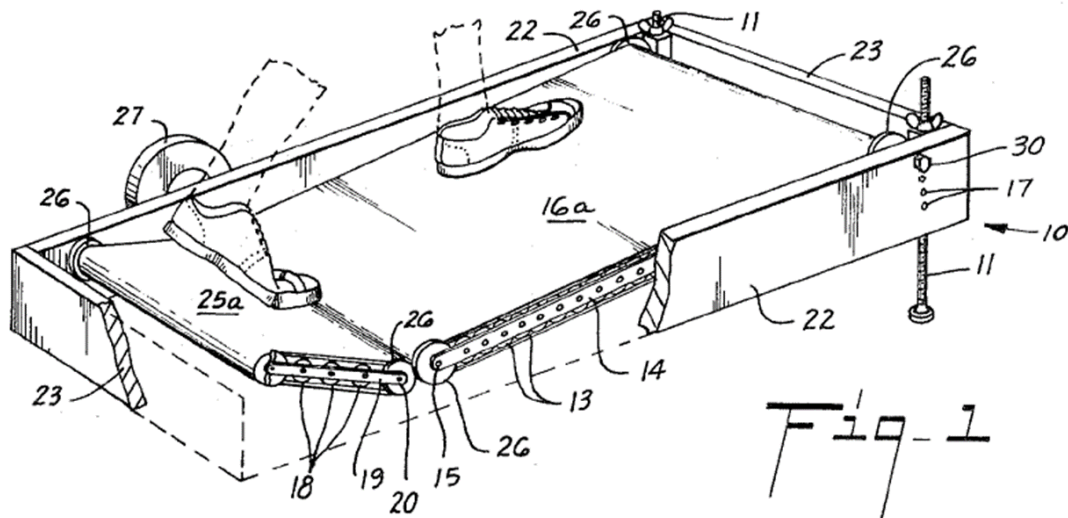
Ex.1030, Fig.2A

One benefit from using plastic is that the size of the pulleys can be increased, which in turn, allows for a thicker and heavier belt. (Ex.1030, 7:20-31.) Another benefit of larger pulleys is enhanced gripping between the pulleys and the belt due to increased contact area. (Ex.1030, 7:32-39.) Skowronski further explains that plastic pulleys are lighter and less expensive than metal pulleys. (Ex.1030, 2:10-15; Ex.1003, ¶¶137-139.)

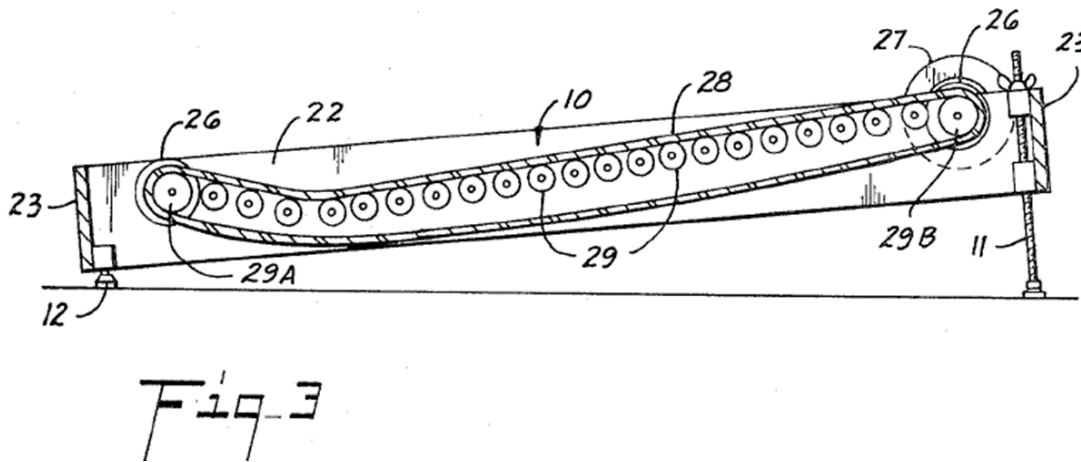
F. U.S. Patent No. 3,637,206 (Chickering")

Chickering discloses a manual treadmill with a belt supported by a plurality of rollers to form a curved running surface. (Ex.1013, Fig.3; 2:73-3:10.) Chickering further discloses that each end of the rollers is rotatably mounted to a support arm which is mounted to the frame. (Ex.1013, 1:72-2:12, Fig.1; Ex.1003,

¶141.)



Ex.1013, Fig.1



Ex.1013, Fig.3

VII. Unpatentability Grounds

The references below render the claimed subject matter invalid under 35 U.S.C. §103 and the Petitioner therefore has a reasonable likelihood of prevailing as to each of the following grounds of unpatentability. 35 U.S.C. §314(a); 37 C.F.R. §42.104(b)(4).

A. Ground 1: Claims 30-34, 37-43, 45-50, 52-54, 57, and 59 Are Obvious Over Schonenberger, Socwell, Magid, and Sclater

1. Independent Claims 30, 37, 50, 57

... [30.0]/[37.0]/[50.0] *A manually powered treadmill, comprising:*

... [57.0] *A method, comprising: [57.1] [a] providing a manually powered treadmill,*

Schonenberger discloses a “physical exercise apparatus” (“*treadmill*”) that “is driven by motor 33, or by gravity of earth,” (“*manually powered*”) (Ex.1010, 4:34-37.) “This invention allows a runner to use the apparatus at a 5% elevation position **without any external motor power**” (Ex.1010, 6:16-18; Ex.1003, ¶¶143-145, 237, 273, 291.)

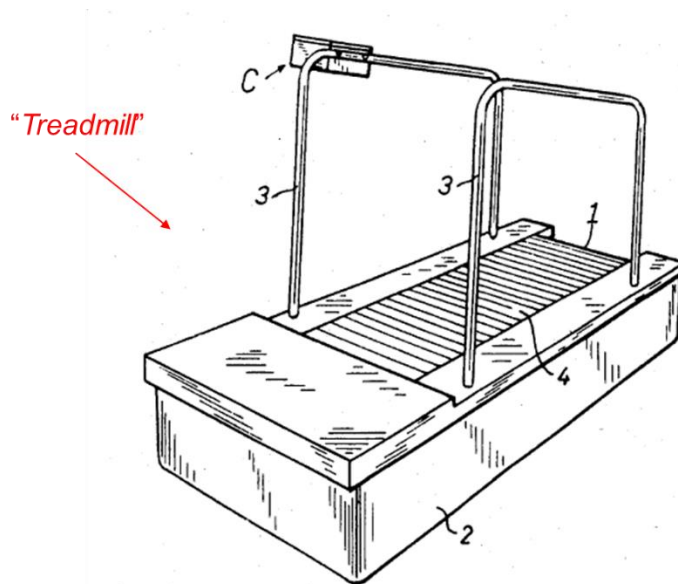


Fig. 1

Ex.1010, Fig.10

... [30.1] *a frame having a front end and a rear end positioned opposite the front end;*

... [37.1]/[50.1] *a frame;*

... [57.1][b] *the manually powered treadmill having a frame with a front end and a rear end;*

Schonenberger discloses a housing 2 (“frame”) that “includes frame members . . . which provide for physical and structural support.” (Ex.1010, 4:10-17.) As illustrated in Figure 1 below, the housing 2 (“frame”) includes “a front end and a rear end positioned opposite the front end.” (Ex.1003, ¶¶146-147, 238, 274, 291.)

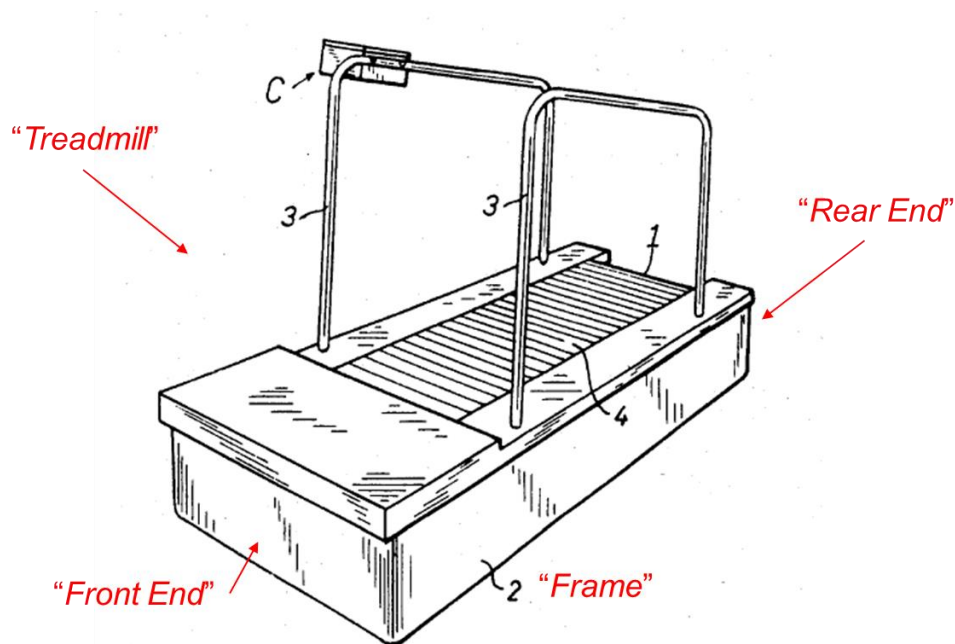


Fig. 1

Ex.1010, Fig.1.

... [30.2] *a front shaft coupled to the frame proximate the front end;*

... [37.4] *a front shaft assembly coupled to the frame;*

... [50.2] *at least one front running belt pulley coupled to the frame;*

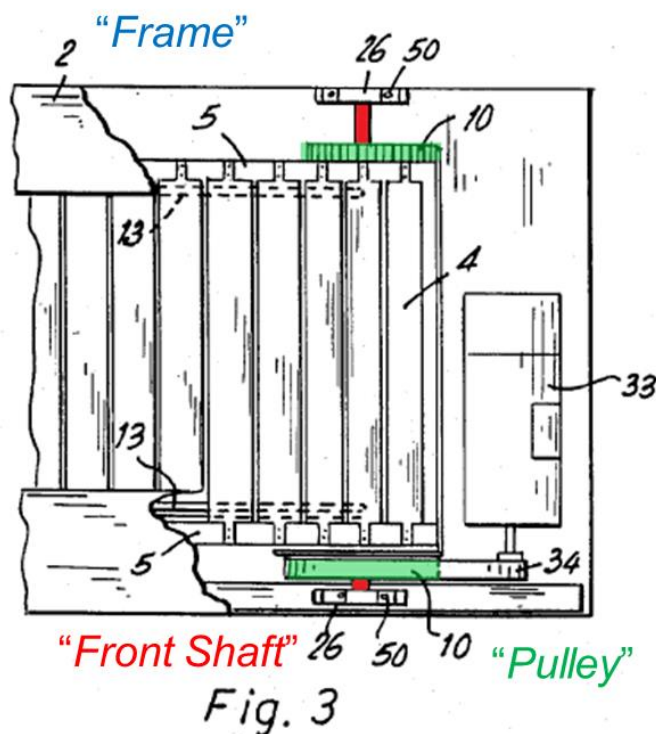
Schonenberger discloses a “front shaft assembly” that includes two “pulleys” that are connected by a transverse “shaft” 26 and journalled (“coupled”) to the “frame.” (Ex.1003, ¶¶149-151, 244-245, 275.)

At either end of the apparatus (see FIGS. 3 and 12), and within the housing 2 are located rotatable drums, rollers, sheaves, sprockets, or the like, about which the surface 1, which is an endless loop, is placed. The rotatable elements, preferably in the form of two operating drums or rollers 10, are suitably journalled in the frame as seen at 50, FIG. 3. If two sheaves or pulleys are provided at either end of the apparatus, one will be located at either side thereof, suitably journalled and, connected by a transverse shaft 26 (FIG. 8).

(Ex.1010, 4:10-23.)

The element 114 is formed, at least at one lateral side, with a ribbed or toothed portion 117, corresponding to the regions 7' in FIG. 10, destined for engagement by sprockets or toothed wheels or **pulleys 10** (FIGS. 2,3).

(Ex.1010, 9:31-35.)



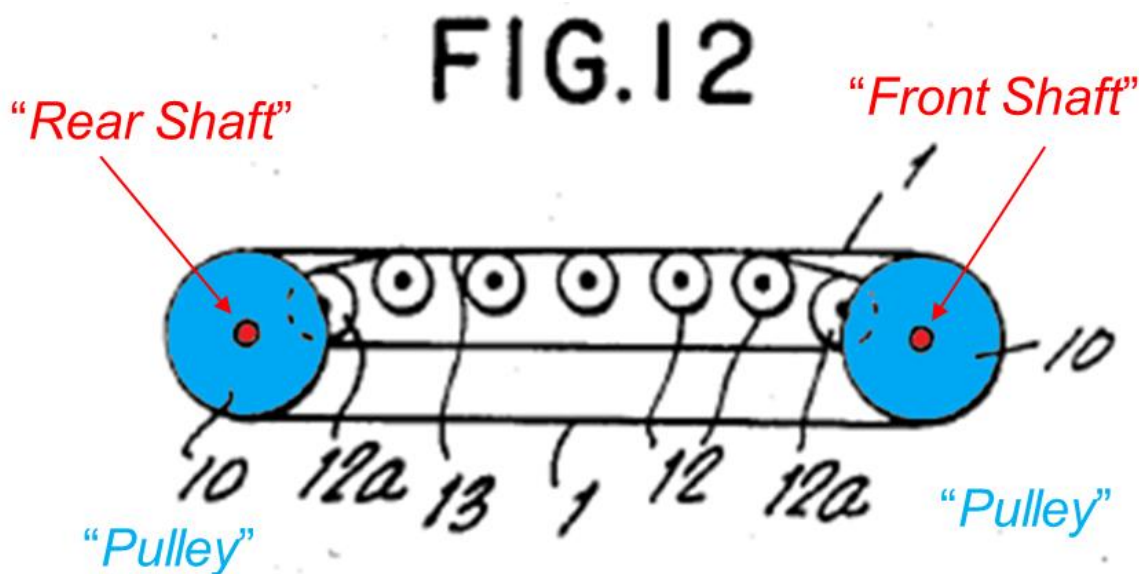
Ex.1010, Fig.3

... [30.3] a rear shaft coupled to the frame proximate the rear end;

... [37.5] a rear shaft assembly coupled to the frame;

... [50.3] at least one rear running belt pulley coupled to the frame and spaced a distance from the at least one front running belt pulley;

Schonenberger discloses a “shaft assembly” that includes two “pulleys” that are connected by a transverse “shaft” 26 and journaled (“coupled”) to the “frame” at “either end of the apparatus.” (Ex.1010, 4:10-23.) Thus, Schonenberger discloses a “rear shaft assembly” that is “spaced a distance from” the “front shaft assembly.” (Ex.1003, ¶¶152-153, 246-247, 277-278.)



Ex.1010, Fig.12

... [30.4]/[50.4] a plurality of bearings coupled to the frame;

... [37.2] a first plurality of bearings coupled to the frame;

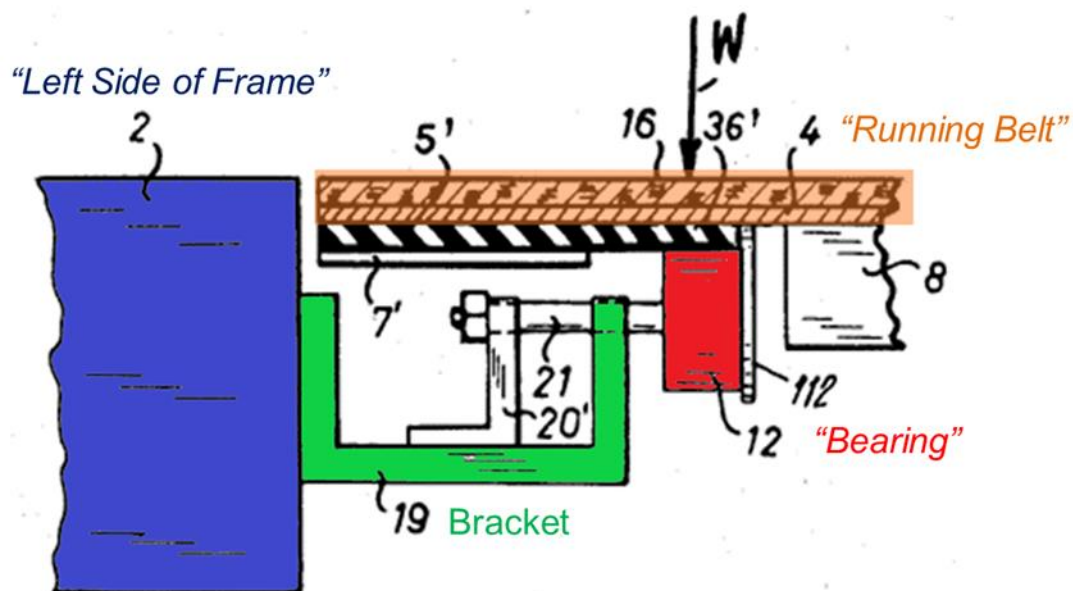
... [37.3] a second plurality of bearings coupled to the frame and spaced a distance from the first plurality of bearings;

... [57.2][a] providing a plurality of bearings coupled to the frame;

Schonenberger discloses rollers 12, 12' ("plurality of bearings") that are "coupled to the frame" by a bracket 19:

Rollers 12, 12', respectively are **carried on shafts 21 secured to a bracket 19 which is attached to the sidewall 2 of the apparatus;** a second arm 20' provides for lateral guidance of the bolt 21. The connections of the bracket elements to each other and to the sidewall, or to the **frame** of the apparatus, may be by welding, for example."

(Ex.1010, 8:45-51.)



Ex.1010, Fig.10

As illustrated below, Schonenberger discloses rollers 12, 12' (*"a first plurality of bearings"*) that are coupled to the left side of the *"frame"* and rollers 12, 12' (*"a second plurality of bearings"*) that are coupled to the right side of the *"frame."* As shown below, the *"second plurality of bearings"* are *"spaced a distance from the first plurality of bearings."* (Ex.1003, ¶¶154-158, 279, ¶¶239-243, 293.)

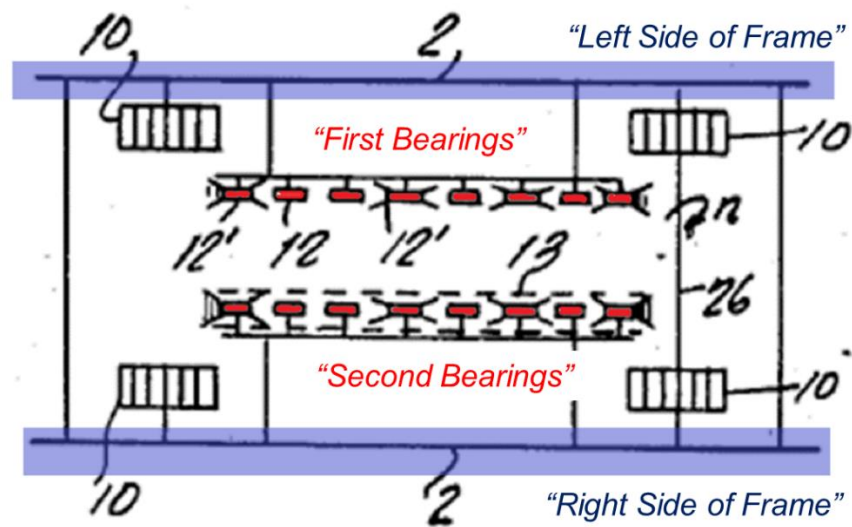
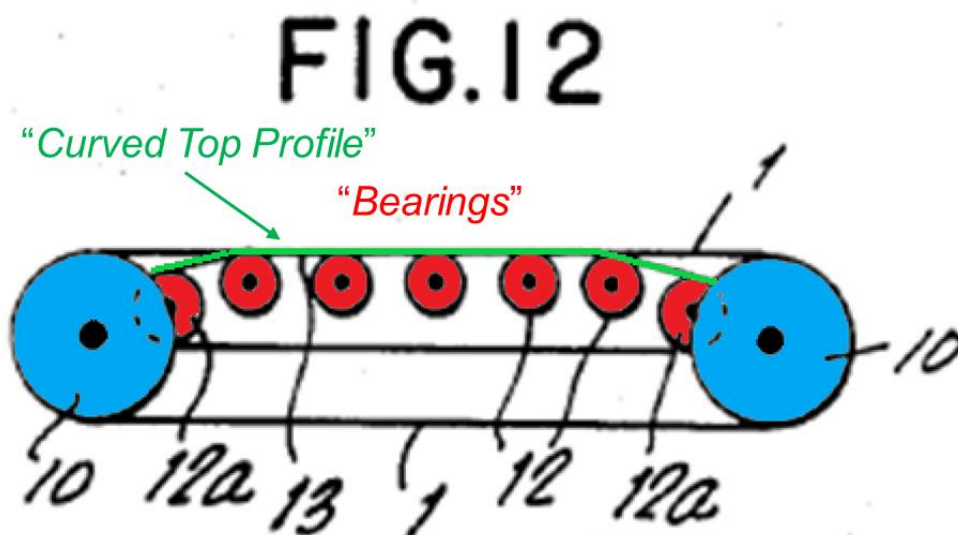


FIG. 19

Ex.1010, Fig.19

... [57.2][b] wherein the plurality of bearings define at least a portion of a curved top profile;

As shown below, Schonenberger discloses that the “bearings” define a “curved top profile.” (Ex.1003, ¶293.)



Ex.1010, Fig.12

... [30.5] a running belt at least partially supported by the plurality of bearings, wherein the running belt comprises a curved running surface; and

... [37.6] a running belt at least partially supported by the first plurality of bearings and the second plurality of bearings, the running belt being at least partially disposed about the front and rear shaft assemblies, and comprising a running surface, at least a portion of which is curved; and

... [50.5] a running belt at least partially supported by the plurality of bearings and at least partially supported by at least one of the at least one front running belt pulley and the at least one rear running belt pulley, wherein the running belt includes a running surface, at least a portion of which is curved;

... [57.3] *disposing a running belt on the plurality of bearings such that the curved top profile of plurality of bearings define at least a portion of a curved running surface of the running belt;*

Schonenberger discloses a movable surface 1 (“running belt”) on which a user may run or walk for exercise. (Ex.1010, 2:6-9; Ex.1003, ¶¶159, 248, 280, 293.)

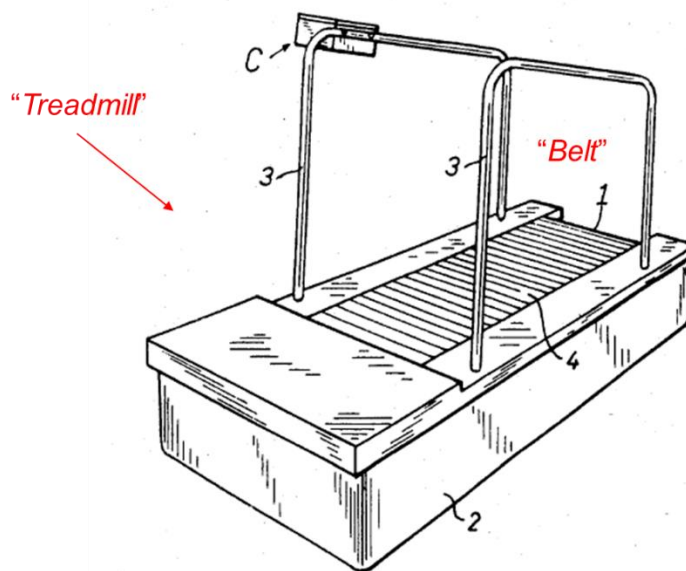
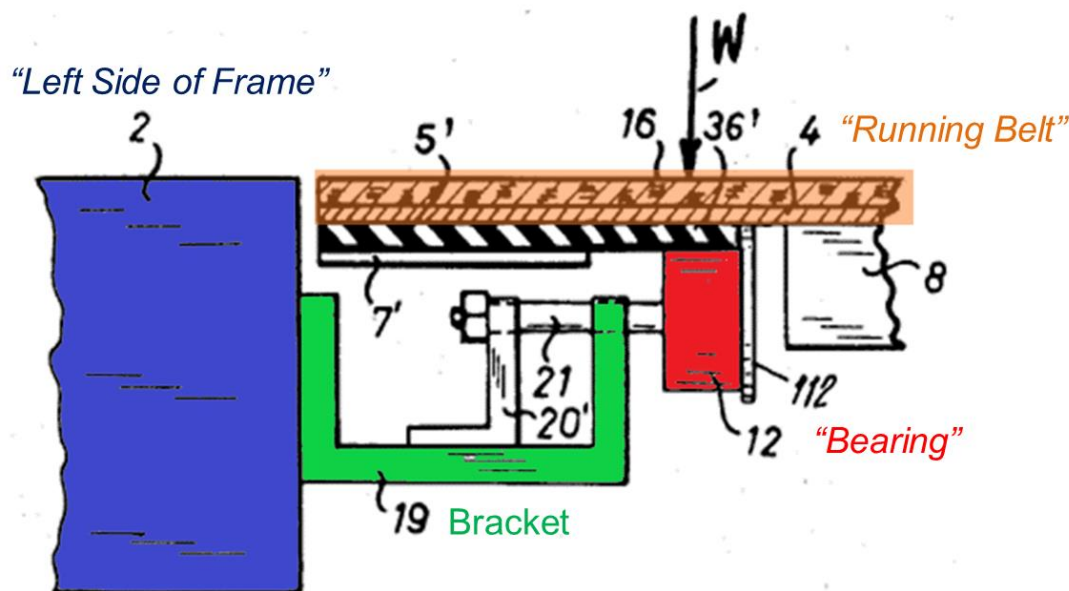


Fig. 1

Ex.1010, Fig.1

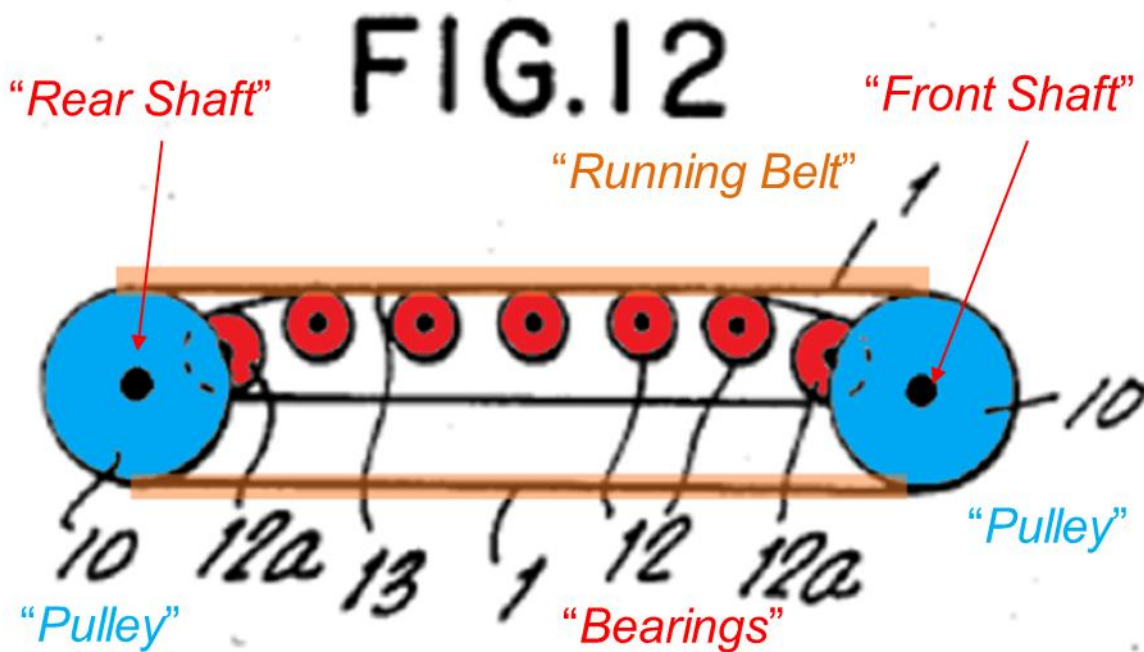
The movable surface 1 (“running belt”) is formed of a plurality of individual slats 4. (Ex.1010, 4:38-41.) The movable surface 1 is supported by the rollers 12, 12’ (“plurality of bearings”). (Ex.1010, 8:34-44) The rollers 12, 12’ (“bearings”) are attached to the frame by a bracket. (Ex.1010, 8:45-51; Ex.1003, ¶¶160-163.)



Ex.1010, Fig.10

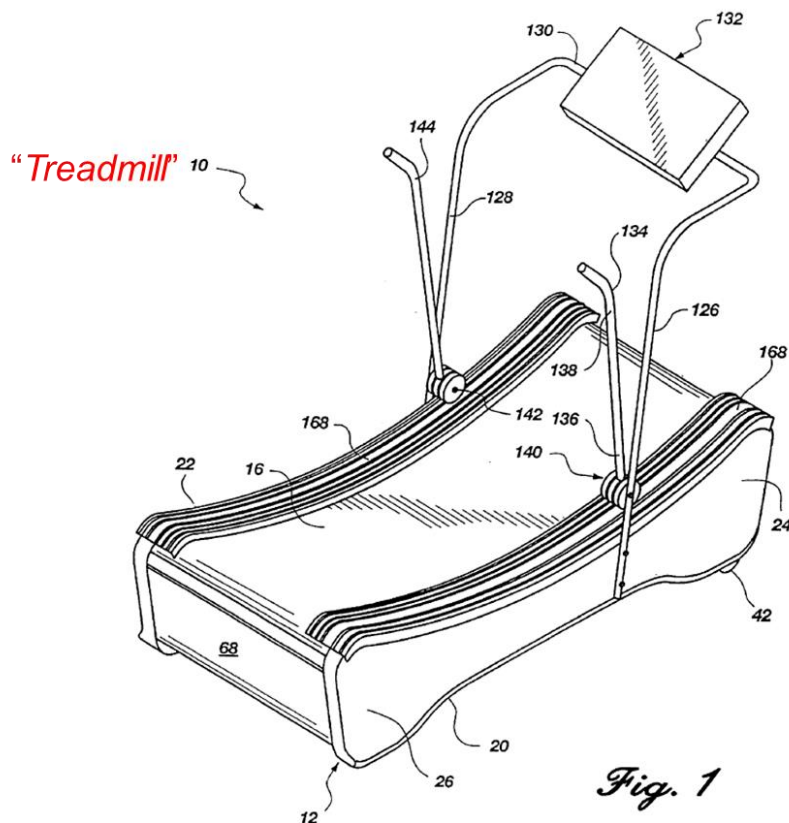
Schonenberger also discloses that the movable surface 1 (“*running belt*”) is looped around the “*pulleys*” 10, “An elongated support frame has rotatable driving elements, such as drums, sheaves, pulleys or the like at either end, **around which the movable surface is looped.**” (Ex.1010, 2:6-9; Ex.1003, ¶159.)

As illustrated below, the movable surface 1 (“*running belt*”) is supported by the “*front shaft assembly*” and the “*rear shaft assembly*,” and follows a top profile defined by rollers 12 (“*plurality of bearings*”) to provide a running surface. (Ex.1003, ¶¶285, 293, 222.)



Ex.1010, Fig.12

Socwell discloses a “novel curved deck treadmill which provides a structurally supported arcuate shaped, moveable surface on which a user may exercise.” (Ex.1011, 3:26-29; Ex.1003, ¶165.)



Ex.1011, Fig.1.

It would have been obvious to POSA to modify Schonenberger's brackets 19 and rollers 12, 12' (*"plurality of bearings"*) to provide a curved support surface such that the movable surface 1 (*"running surface"*) *"follows a curved running surface"* as taught by Socwell. (Ex.1003, ¶¶166-167.)

2. Rationale to Combine Schonenberger with Socwell

It would have been obvious to a POSA to combine the flat manual treadmill topology of Schonenberger with the curved manual treadmill topology of Socwell to increase safety and reduce impact loading of the user's joints. (Ex.1011, 2:11-

29, 2:45-55, 3:1-9; Ex.1003, ¶168.)

Schonenberger and Socwell are from the same field – manual treadmills for exercise. (Ex.1011, 1:10-12; Ex.1010, 1:64-68.) Both Schonenberger and Socwell disclose treadmills with a belt supported by front and rear shaft assemblies. (Ex.1010, 4:14-17, 6:16-18; Ex.1011, 5:33-44; 8:8-27, Fig.3; Ex.1003, ¶169.)

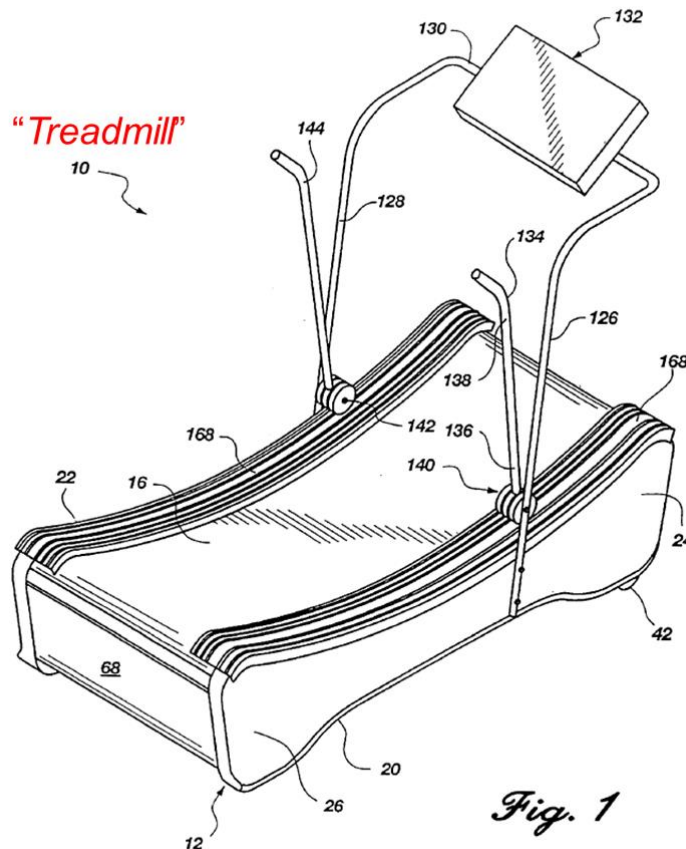
It has long been recognized that users may be injured by falling off the back of the treadmill:

Another meaningful disadvantage of exercise treadmills of the prior art is the inherent danger associated with users tending to fall off the back end of the treadmill and become injured.

(Ex.1011, 2:45-48; *see also* 3:40-45.)

A POSA would have recognized that the flat running surface of Schonenberger does not inhibit a user from falling off the back. Indeed, Schonenberger's flat movable surface 1 does not inform the user when they are about to fall off the back nor does it provide any frictional or angular resistance to falling off the back. Schonenberger discloses support bars 3, but, according to Socwell, "having to grasp the handle [while running] severely interferes with one's natural body motion and further abdicate the inherent physical advantages of the exercise routine." (Ex.1010, 4:1-6; Ex.1011, 2:56-67.) Thus, most users do not hold the handle when running on a treadmill. (Ex.1003, ¶171.)

The curved belt of Socwell solves these problems. The curvature of the running surface “substantially prevents a user from falling off the back end of the treadmill and whereby serving to keep the user centered on the upper surface of the treadmill without encumbering the natural body motion of the user exercising thereon.” (Ex.1011, 3:40-45; Ex.1003, ¶172.)



Ex.1011, Fig.1

A POSA would have further recognized that the flat running surface of Schonenberger is harder on the user's joints than a curved running surface.

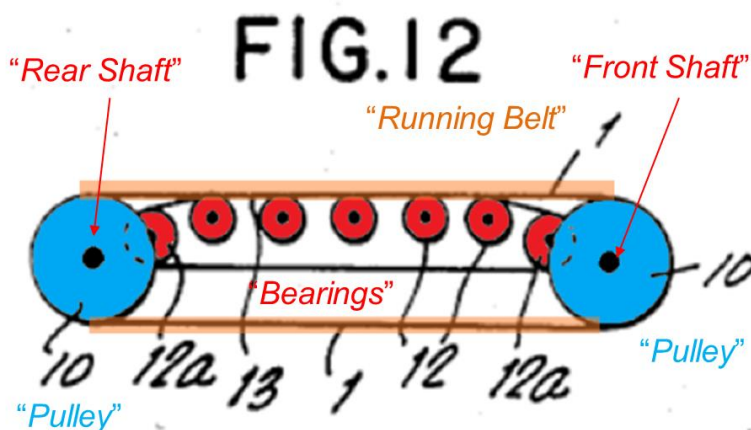
Whereas Socwell's "curved deck treadmill . . . is capable of reducing the physical impact to the joints and muscles (e.g., the knees and back) of a user, thus providing an operative device having rehabilitative functionality." (Ex.1011, 3:53-57.)

Socwell also teaches that its curved running surface "provides a continuous, smooth exercising motion capable of providing meaningful exercise comfort, thereby facilitating an upper surface which supportably provides for a longer stride with more flexibility." (Ex.1011, 13:43-47.) Thus, a POSA would have understood that modifying the movable surface 1 of Schonenberger to provide a curved running surface would result in not only a more comfortable treadmill that is less taxing on the human body, but also a more versatile treadmill that can be used for exercise and rehabilitation. (Ex.1011, 3:53-57; Ex.1003, ¶173.)

It was well within the ordinary skill in the art to modify the flat running surface of Schonenberger with the curved running surface of Socwell. In both Schonenberger and Socwell, the running surface is supported from underneath by bearings: rollers 12 in Schonenberger; and a linear bearing, curved deck 56, combined with rotary bearings, rollers 94 in Socwell. A POSA would have understood that by arranging the rollers 12 of Schonenberger in a curved alignment, similar to the curved deck 56 of Socwell, a curved running surface would result. (Ex.1003, ¶174.)

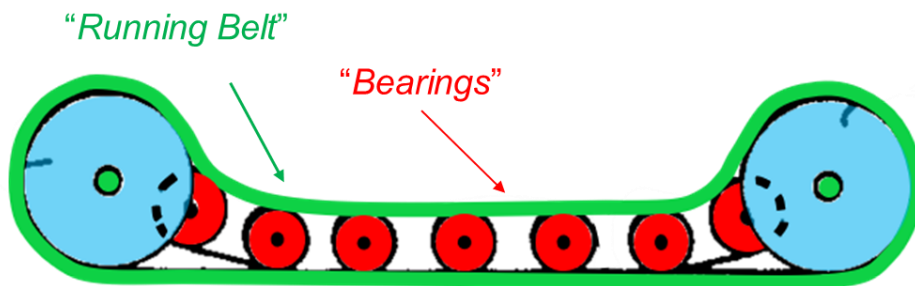
In fact, Schonenberger already discloses arranging the rollers 12 along a

curved profile – in this case such that the end rollers 12 adjacent to the pulleys 10 are located lower than the central rollers 12 to accommodate the path of support belt. (*Id.*)



Ex.1010, Fig.12

A POSA would have understood that lowering the rollers 12 relative to the front and rear shaft assemblies would result in a curved running surface, as shown below, and such that the movable surface 1 (“*running belt*”) follows the profile defined by the rollers 12. (Ex.1003, ¶175.)



Ex.1010, Fig.12

The movable surface 1 of Schonenberger is comprised of individual slats 4

that are rigid, interconnected, and movable relative to each other. As such, the movable surface 1 (“*running belt*”) would conform to the profile of the supporting rollers 12. (Ex.1010, 4:38-66, Fig.3; Ex.1003, ¶176.)

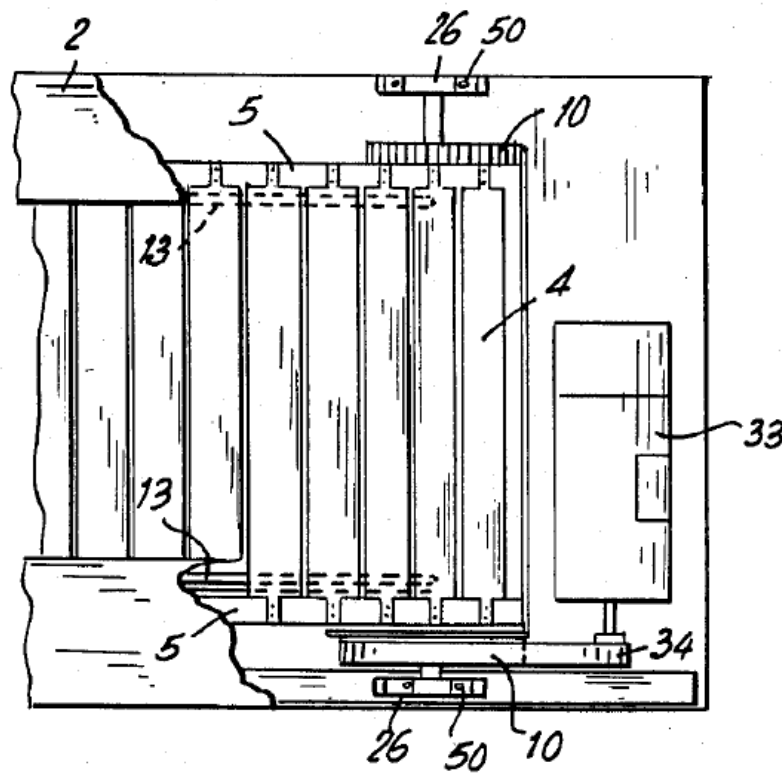
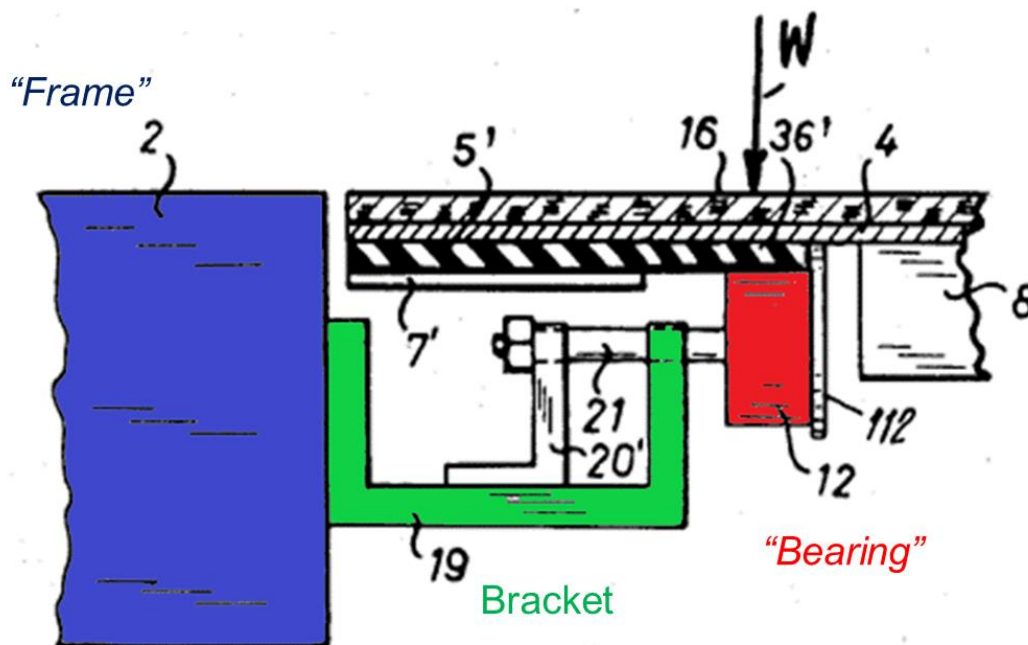


Fig. 3

Ex.1010, Fig.3

Schonenberger discloses mounting the rollers 12, 12' to the sidewalls of the housing 2 (“frame”) with brackets 19. (Ex.1010, 8:45-51.)



Ex.1010, Fig.10

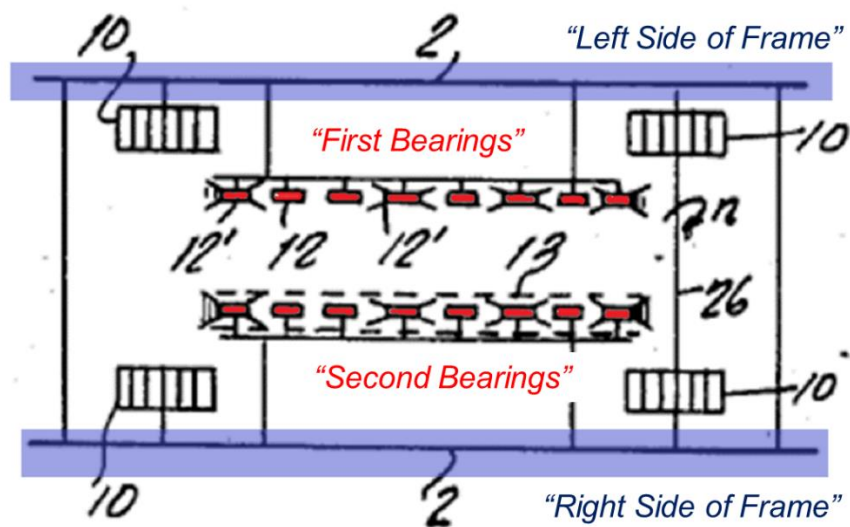


FIG. 19

Ex.1010, Fig.19

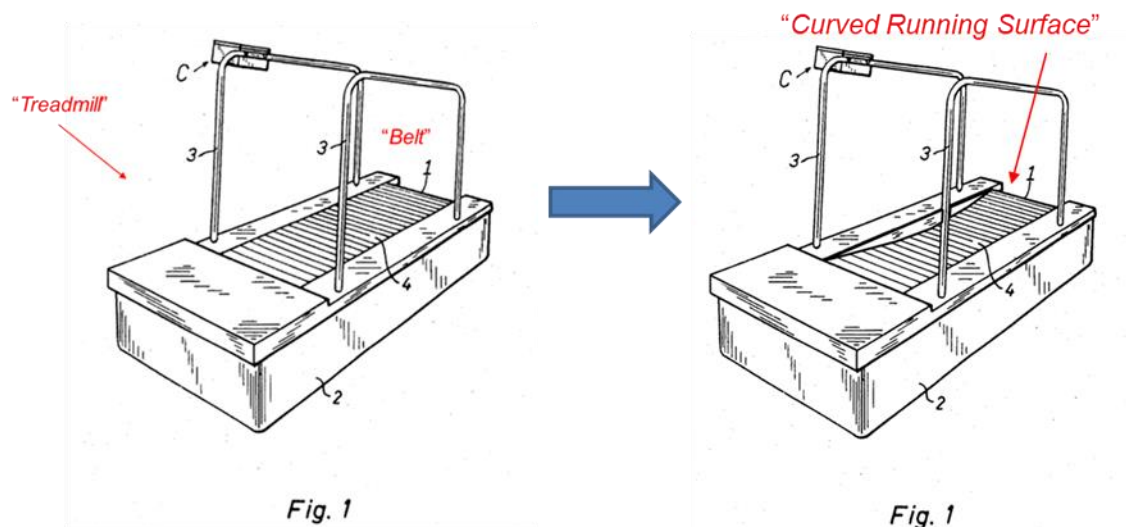
A POSA would have known how to modify these brackets 19 to have a

curved shape to arrange the rollers 12 in a curved profile. The modification would be the use of a known technique – using a curvilinear arrangement of bearings, as taught by Socwell – to improve similar devices (treadmills), in the same way, i.e., to produce a curved running surface. Schonenberger discloses a well-known type of flat treadmill. Socwell discloses a curved-type treadmill that is otherwise comparable to the treadmill of Schonenberger albeit with the added benefits provided by the curved running surface. (See Ex.1003 ¶¶61-64.) A POSA would have understood that the known technique of arranging the bearings in a curvilinear arrangement could be applied to Schonenberger. (Ex.1003, ¶¶177-178.)

Both Schonenberger and Socwell teach structural side members that support bearings. The only difference is the shape: Schonenberger has the rollers 12 arranged in a straight line, whereas Socwell has the rollers 98 arranged in a curved profile and a corresponding curved deck for supporting the belt 16 from underneath. A POSA would have understood the brackets 19 of Schonenberger could have been curved like the cover members 168 of Socwell and the rollers 12 of Schonenberger could have been arranged in a curved profile like the rollers 98 of Socwell. This modification would have predicatively resulted in the movable surface 1 of Schonenberger being curved. (Ex.1003, ¶178.)

Thus, Schonenberger modified by the teachings of Socwell would have a belt 1 with a curved running surface in which a central portion of the belt would be

closer to the ground than front and rear belt portions. (Ex.1003, ¶179.)

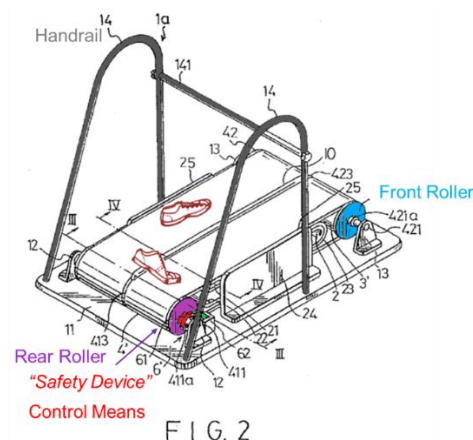
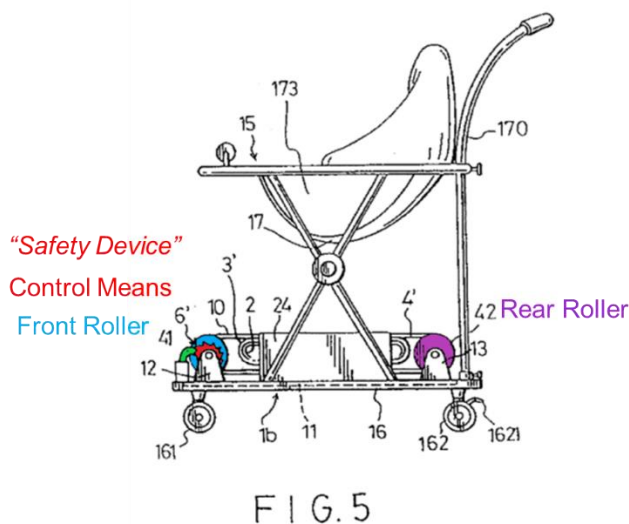


Ex.1010, Fig.1, Fig.1

... [30.6]/[37.7]/[50.6]/[57.4] [providing] a safety device coupled to the frame and the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;

Magid discloses mounting a unidirectional control means 6,6' ("safety device") to a front shaft assembly (Fig.5) or a rear shaft assembly (Fig.2) of a treadmill to "prevent[] bidirectional movement of" the treadmill belt. (Ex.1012, 4:46-60; Ex.1003, ¶¶180-183, 249, 281, 294.) Majid's "safety device" includes "a first rotatable element and a second rotatable element." More specifically, Magid discloses that the ratchet gear 61 ("a first rotatable element") rotates with the front or rear shaft relative to the frame, and the pawl 62 ("a second rotatable element")

pivots, or rotates, relative to the frame to engage the ratchet gear 61. (*Id.*)



Ex.1012, Figs.5,2

A POSA would have known that mounting a one-way clutch in this manner improves the stability of the user on the treadmill by preventing forward treadmill belt motion, thereby providing a “*safety device.*” (Ex.1003, ¶185.)

3. Rationale to Combine Schonenberger and Socwell with Magid

It would have been obvious to a POSA to combine the manual treadmill with a curved running surface of Schonenberger in view of Socwell (“the modified Schonenberger treadmill”), with the known technique of a one-way clutch to prevent treadmill belt motion in a forward direction as disclosed in Magid. (Ex.1003, ¶187.)

Schonenberger, Socwell, and Magid are from the same field – exercise equipment, more specifically, manual treadmills for home exercise use. (Ex.1010,

1:63-68; Ex.1011, 1:10-12; Ex.1012. 1:53-56; 3:23-28.) Schonenberger, Socwell, and Magid all disclose treadmills with a moving endless running belt. (Ex.1010, 4:14-17, 6:16-18; Ex.1011, 5:33-44; 8:8-27, Fig.3; Ex.1012, 4:64-5:18, Fig.2.) (Ex.1003, ¶188.)

It has long been recognized that users may be injured by falling off a treadmill while mounting, dismounting, or during use:

In particular, if the rollers supportably disposed in relation to the endless belt are so easily moveable, the user may potentially lose his equilibrium or balance and fall from the exercise treadmill resulting in possible injuries.

(Ex.1011, 1:33-36.)

Another meaningful disadvantage of exercise treadmills of the prior art is the inherent danger associated with users tending to fall off the back end of the treadmill and become injured.

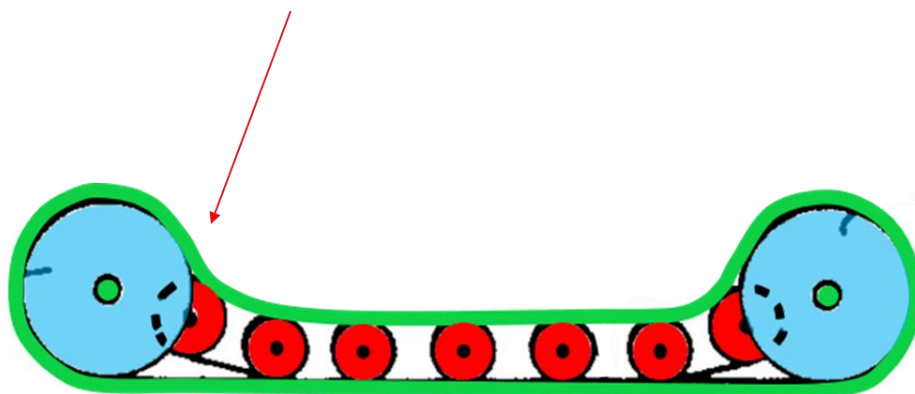
(Ex.1011, 2:45-48; Ex.1003, ¶189.)

Professional organizations have produced standards regarding exercise equipment safety generally, and for treadmill safety. See ASTM Standard, Ex.1019; ISO Standard, Ex.1020; and ACCC Product Safety Supplier Guide, Ex.1007. (Ex.1003, ¶190.)

Socwell recognizes that it is difficult to stabilize the running belt in manual treadmills. According to Socwell, this is due to the difficulty in balancing the

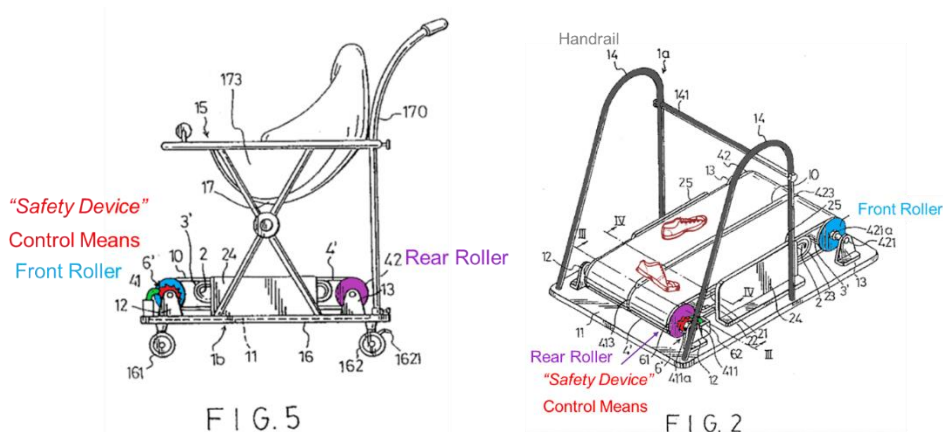
frictional and inertial qualities of belt supporting devices. (Ex.1011, 1:28-56). The modified treadmill of Schonenberger in view of Socwell includes a curved running surface, which inhibits a user from falling off the back of the treadmill. (Ex.1011, 3:40-45.) Socwell explains the curved running surface prevents a user from falling off the back. (Ex.1003, ¶191.)

However, the modified treadmill of Schonenberger in view of Socwell does not fully address the risk of a user falling forward due to reverse rotation of the running surface. For example, with a manual curved running surface, such as that disclosed in modified Schonenberger, forward motion is likely to occur if a user were to step onto the rearward end of the running surface (indicated by the red arrow), causing the foot to unexpectedly move towards the lowest portion of the treadmill. In the condition where the user adjusts the frame to a generally horizontal position using the front elevating mechanism, as depicted in the image below, this unexpected motion would be exacerbated and could result in a fall. (Ex.1003, ¶192.)



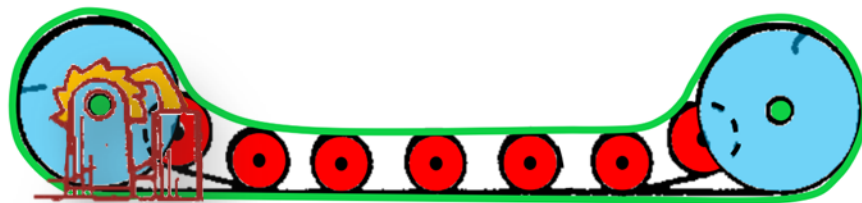
Ex.1010, Fig.12

Magid discloses a one-way clutch (unidirectional control means 6, 6') that is coupled to a front shaft (Fig.5) or a rear shaft (Fig.2) to permit only unidirectional movement of the belt. (Ex.1012, Fig.5, 4:46-59.) (Ex.1003, ¶193.)



Ex.1012, Figs.5,2

A POSA would have been motivated to further modify Schonenberger to include Magid's control means to prevent the risk of a user stepping onto the belt and losing their balance when the belt unexpectedly moves forward. For example, the below image shows Magid's control means attached to the rear shaft assembly. (Ex.1003, ¶¶194-195.)



Ex.1010, Fig.12

The modification would include mounting a one-way ratchet clutch to the front or rear shaft assembly. The ratchet gear would be mounted coaxially with the shaft 26 and the pawl would be secured to the frame. (Ex.1003, ¶196.)

This modification would have been a simple combination of known elements in the prior art: the modified Schonenberger manual treadmill with a curved running surface and Magid's one-way ratchet clutch. The pawl is arranged forward of the ratchet gear and biased to engage the ratchet between adjacent teeth. The profile of the ratchet gear teeth is swept forward to yield predictable results: allowing the ratchet gear to overrun in a first direction with rearward motion of the belt and providing a backstop in the opposite direction to prevent forward motion of the belt. (Ex.1003, ¶197.)

The modification would also be the use of known technique—using a one-way clutch in a backstopping mode of operation—to improve similar devices, i.e., treadmills and conveyor belts, in the same way, i.e., to provide unidirectional belt motion. (Ex.1012, 4:48-54; Ex.1003, ¶198.)

... [30.7] wherein the running belt and one of the first and second rotatable elements of the safety device freely rotate in a first direction of rotation relative to the other of the first and second rotatable elements of the safety device, but interference between the safety device and at least one of the first and second rotatable elements substantially prevents rotation in a second direction of rotation, opposite the first direction of rotation, of the running belt and the one of the first and second rotatable elements relative to the other of the one of the first and second rotatable elements.

... [37.8] wherein one of the first and second rotatable elements of the safety device and the running belt freely rotate relative to the other of the one of the first and second rotatable elements of the safety device in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, interference between the safety device and at least one of the first rotatable element and the second rotatable element substantially prevents rotation of the running belt and the one of the first and second rotatable elements relative to the other of the one of the first and second rotatable elements.

... [50.7] wherein one of the first and second rotatable elements of the safety device and the running belt freely rotate in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, interference between the safety device and at least one of the first rotatable element and the second rotatable element substantially

prevents rotation of the one of the first and second rotatable elements of the safety device and the running belt relative to the frame.

... [57.5] permitting rotation of one of the first and second rotatable elements of the safety device and the running belt in a first direction of rotation; and

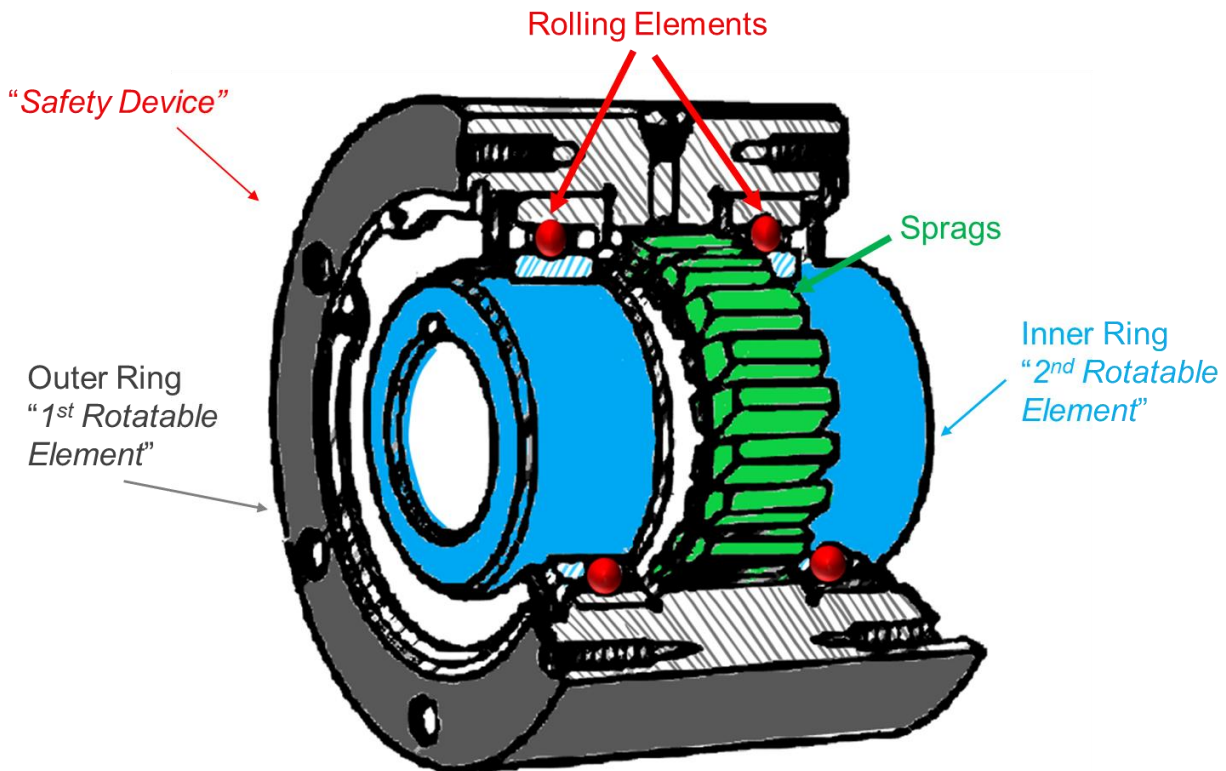
... [57.6] substantially preventing rotation in a second direction, opposite the first direction, of the running belt and the one of the first and second rotatable elements by interference between the safety device and at least one of the first rotatable element and the second rotatable element.

Magid does not expressly disclose that the control means (“safety device”) includes a third element to create “interference” with the ratchet gear 61 (“first rotatable element”) or the pawl 62 (“second rotatable element”). (Ex.1003, ¶¶199, 250, 282, 295.)

Sclater discloses sprag-type one-way bearing assemblies that include sprags combined with rolling elements, such as cylindrical rollers or balls. “Sprags combined with cylindrical rollers in a bearing assembly can provide a simple, low-cost method for meeting the torque and bearing requirements of most machine applications.” (Ex.1017 at 312; Ex.1003, ¶200.)

As illustrated in the image below, Sclater discloses that the sprag-type one-way bearing assembly includes an inner ring, an outer ring, and a plurality of

sprags and rolling elements disposed between the inner ring and the outer ring.



Ex.1017 at 318

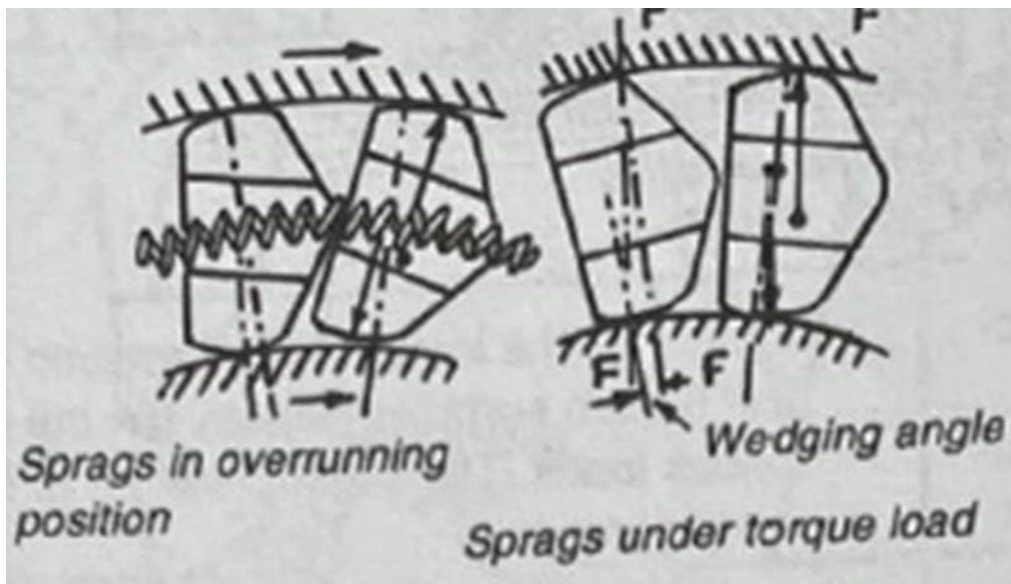
Sclater discloses that the inner ring defines a center hole that is sized to receive a shaft and defines a keyway on the inner diameter. The keyway provides means for rotatably coupling the inner ring to a shaft via a key. The inner ring and/or the outer ring of a one-way bearing assembly rotate about a central axis; therefore both rings are “*rotatable elements*.” (Ex.1003, ¶202.)

Sclater further discloses that this sprag-type bearing assembly functions as a one-way bearing by providing “one-direction only torque transmission in an

overrunning clutch.” (Ex.1017 at 312.)

Sclater discloses that the sprags have a “sprag profile, which is composed of two nonconcentric curves of different radius” that provide “a locking ramp.” (Ex.1017 at 312.) Sclater further discloses that “torque is transmitted from one race to another by the wedging action of sprags between the races in one direction; in the other direction the clutch freewheels.” (Ex.1017 at 318; Ex.1003, ¶204.)

The movable surface 1 (“*running belt*”) is coupled to the inner ring (“*second rotatable element*”) through the front shaft assembly or the rear shaft assembly. As illustrated in the figure below on the left, the movable surface 1 (“*running belt*”) and the inner ring (“*second rotatable element*”) rotate in a first direction relative to the outer ring (“*first rotatable element*”) to overrun. However, as illustrated in the figure below on the right, wedging or “*interference*” between the sprags and the inner and outer rings prevents rotation of the inner ring in an opposite direction, which prevents the movable surface 1 (“*running belt*”) from moving forward. (Ex.1003, ¶205.)



Ex.1017 at 318

4. Rationale to Combine Schonenberger, Socwell, and Magid with Sclater

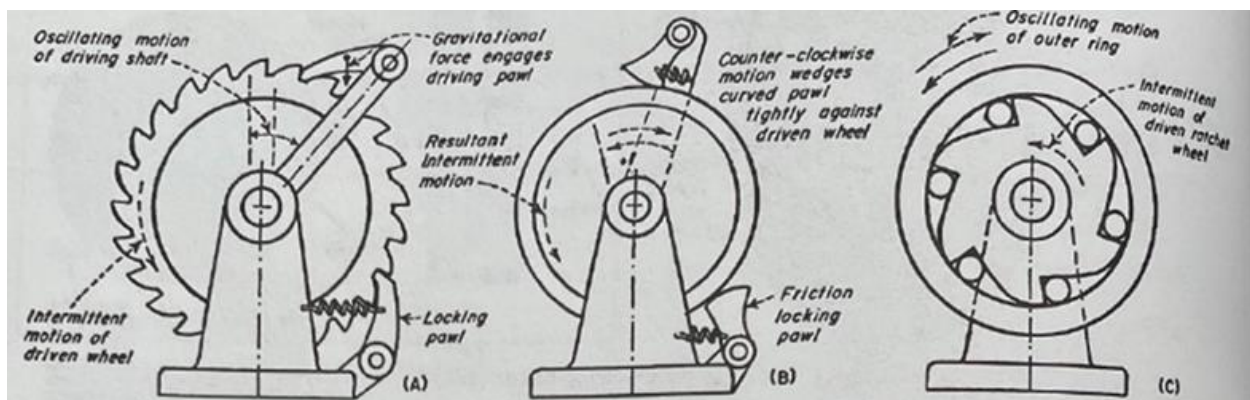
A POSA would have been motivated to substitute Sclater's one-way sprag-type bearing assembly for Magid's ratchet-and-pawl one-way clutch mechanism to obtain predictable results, e.g., reduced noise and improved durability. (Ex.1003, ¶1207.)

Ratchet and pawl clutch mechanisms make noise during operation. For example, the pawl engages each ratchet gear tooth and makes an audible "click" when passing over each tooth. (Ex.1003, ¶1208.) Sclater teaches that a "friction-type clutch is quieter" than a ratchet-type clutch:

Fig. 1 Elementary overriding clutches: (A) A ratchet and pawl mechanism converts reciprocating or oscillating movement to

intermittent rotary motion. This motion is positive but limited to a multiple of the tooth pitch. (B) **A friction-type clutch is quieter**, but it requires a spring device to keep the eccentric pawl in constant engagement. (C) Balls or rollers replace the pawls in this device. Motion of the outer race wedges the rollers against the inclined surfaces of the ratchet wheel.

(Ex.1017 at 316.)



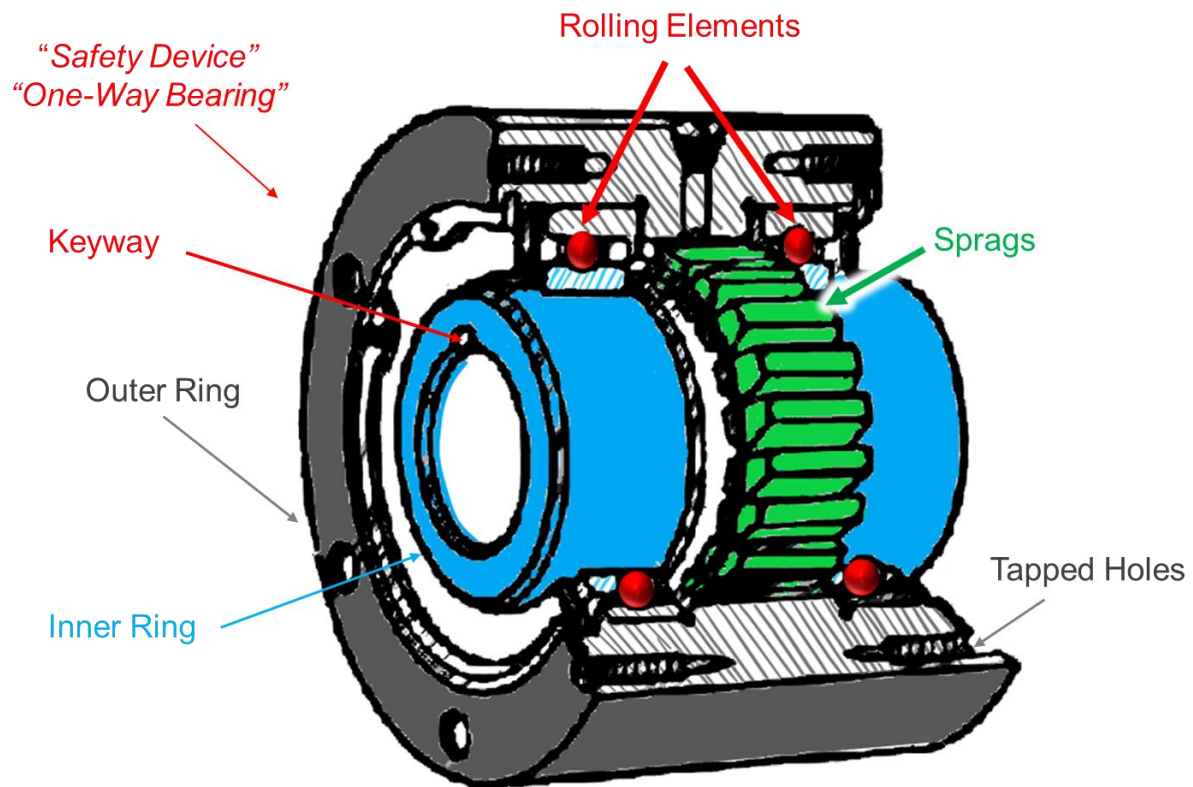
Ex.1017 at 316

Sclater further discloses that an “over-running clutch is better suited for higher-speed free-wheeling than a pawl-and-ratchet clutch.” (Ex.1017 at 303.) This is because the pawl may skip past a few teeth before backstopping the ratchet gear, whereas the sprags are always in contact with the rings and do not need to wait for a gear tooth to engage. Additionally, because there are multiple sprags, they distribute the load over a larger surface area. (Ex.1003, ¶209.)

A POSA would have considered a sprag-type one-way clutch bearing for an exercise equipment application, such as a treadmill. For example, Emerson is a

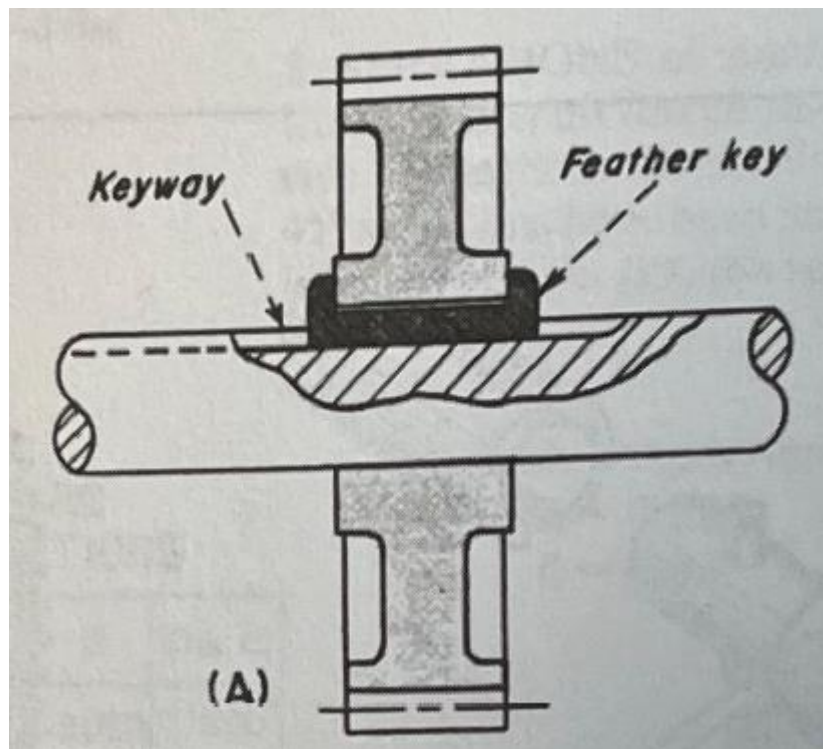
bearing catalog from 2001 that describes its NSS Series sprag-type one-way clutch as an option for multiple “Field Applications,” e.g., as “Exercise equipment,” “Food processing equipment,” “Printing presses,” and “Roll conveyors.” (Ex.1018 at 52-53; Ex.1003, ¶¶90, 211.)

A POSA would have known how to replace Magid’s control means with Sclater’s one-way bearing assembly. For example, the outer ring would be fixed to the frame either directly or through one or more intermediaries, e.g., a bracket, support structure, or torque arm. Sclater illustrates below that the outer ring includes tapped holes for receiving fasteners for mounting the one-way bearing to a support structure, and Emerson describes examples of commercially available brackets or torque arms. (See Ex.1018 at 38-43.) (Ex.1003, ¶212.)



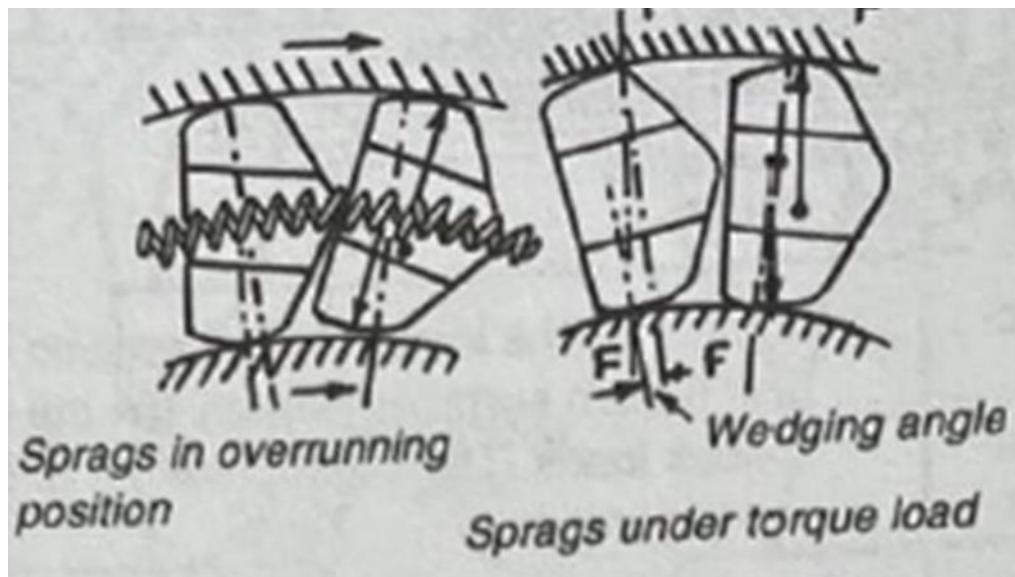
Ex.1017 at 318

The inner ring of the one-way bearing would be secured to the front roller or rear roller, e.g., with a key/keyway interface, such as that disclosed by Sclater. (Ex.1017 at 420; Ex.1003, ¶213.)



Ex.1017 at 420

With this arrangement, rearward motion of the movable surface 1 would rotate the front/rear roller and inner ring in a first direction and the inner ring would overrun and move the sprags out of the locked position. However, forward motion of the movable surface 1 would rotate the inner ring in a second direction and move the sprags into the locked position to backstop and prevent forward motion of the movable surface. (Ex.1003, ¶214.)



Ex.1017 at 318

A POSA would have been motivated to substitute Sclater's one-way sprag-type bearing for Magid's ratchet-and-pawl one-way mechanism to obtain predictable results, *e.g.*, reduced noise and improved durability. (Ex.1003, ¶215.)

5. Dependent Claims 31-34, 38-43, 45-49, 53-54, and 59

... [31.] [a]/[48.] The manually powered treadmill of claim 30 [claim 37], wherein the frame includes a left side member, a right side member [spaced a distance from the left side member], and at least one cross-member extending between the left side member and the right side member,

Schonenberger discloses that the housing 2 (“*frame*”) “includes frame members . . . which provide for physical and structural support.” (Ex.1010, 4:10-17.) As illustrated in Figure 1 below, the housing 2 (“*frame*”) includes a left side member, a right side member spaced a distance from the left side member, and at

least one cross-member extending between the left side member and the right side member. (Ex.1003, ¶¶218, 269-270.)

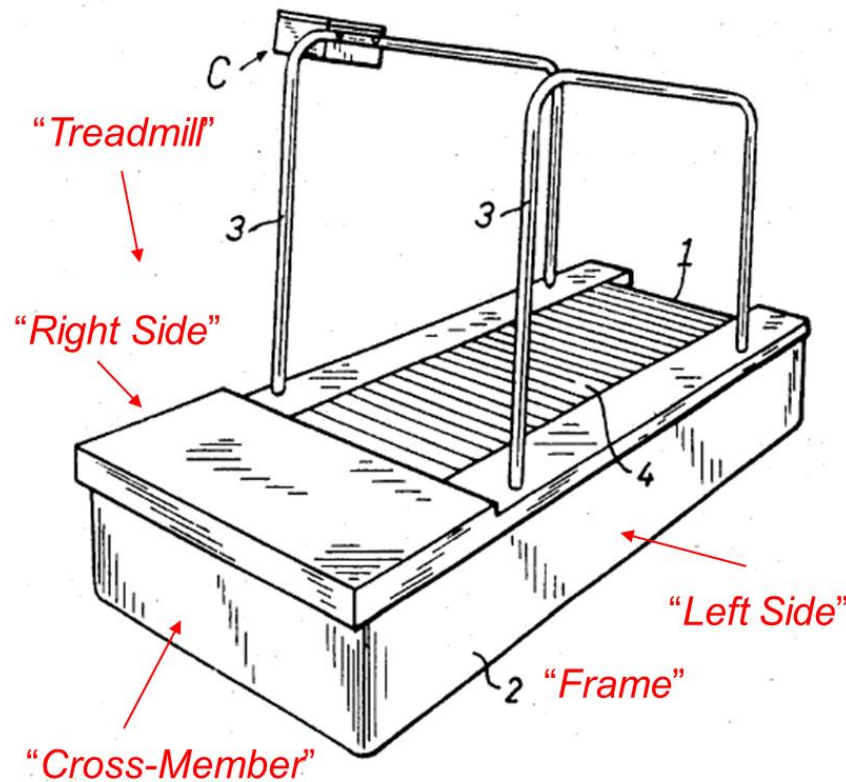


Fig. 1

Ex.1010, Fig.1

... [31.][b] wherein the plurality of bearings includes a first plurality of bearings coupled to a left-side of the frame and a second plurality of bearings coupled to a right-side of the frame.

... [49.] The manually powered treadmill of claim 48, wherein the first plurality of bearings are coupled the left side member and the second plurality of bearings are coupled to the right side member.

As illustrated below, Schonenberger discloses rollers 12, 12' a ("first plurality of bearings") that are coupled to the left side of the "frame" and rollers 12, 12' a ("second plurality of bearings") that are coupled to the right side of the "frame." (Ex.1003, ¶¶219-220, 269-270.)

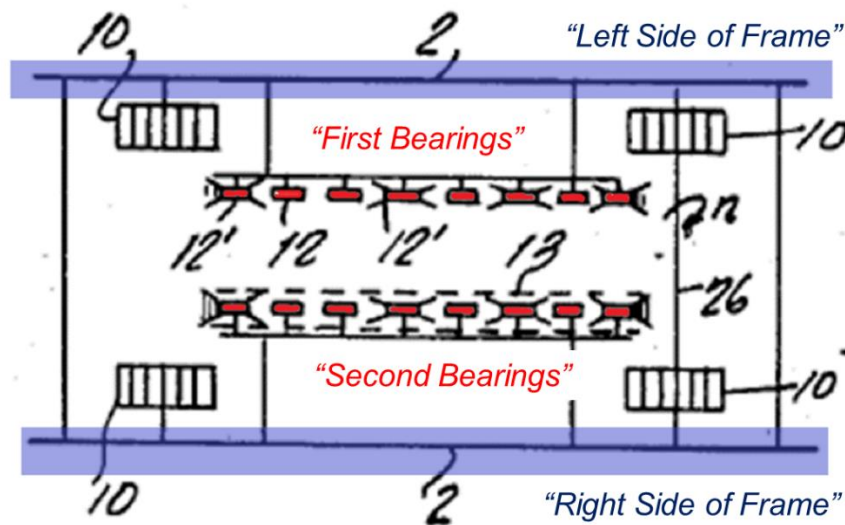


FIG. 19

Ex.1010, Fig.19

... [32.] *The manually powered treadmill of claim 31, wherein the first plurality of bearings and the second plurality of bearings each at least partially define a curved top profile, wherein the curved top profile substantially corresponds to at least a portion of the curved running surface.*

... [46.] *The manually powered treadmill of claim 37, wherein the running belt is at least partially supported by the first plurality of bearings and the second plurality of bearings.*

... [47.] *The manually powered treadmill of claim 46, wherein each of the first and second pluralities of bearings define a curved top profile and wherein the curved top profile substantially corresponds to at least a portion of the curved portion of the running surface.*

The rollers 12 (“the first plurality of bearings and the second plurality of bearings”) of modified Schonenberger treadmill are arranged in a curved alignment to define a “*curved top profile*.” The movable surface 1 (“*running belt*”) follows the profile defined by the rollers 12 to provide the “*curved running surface*.” (Ex.1003, ¶¶222-223, 265-266, 267-268.)

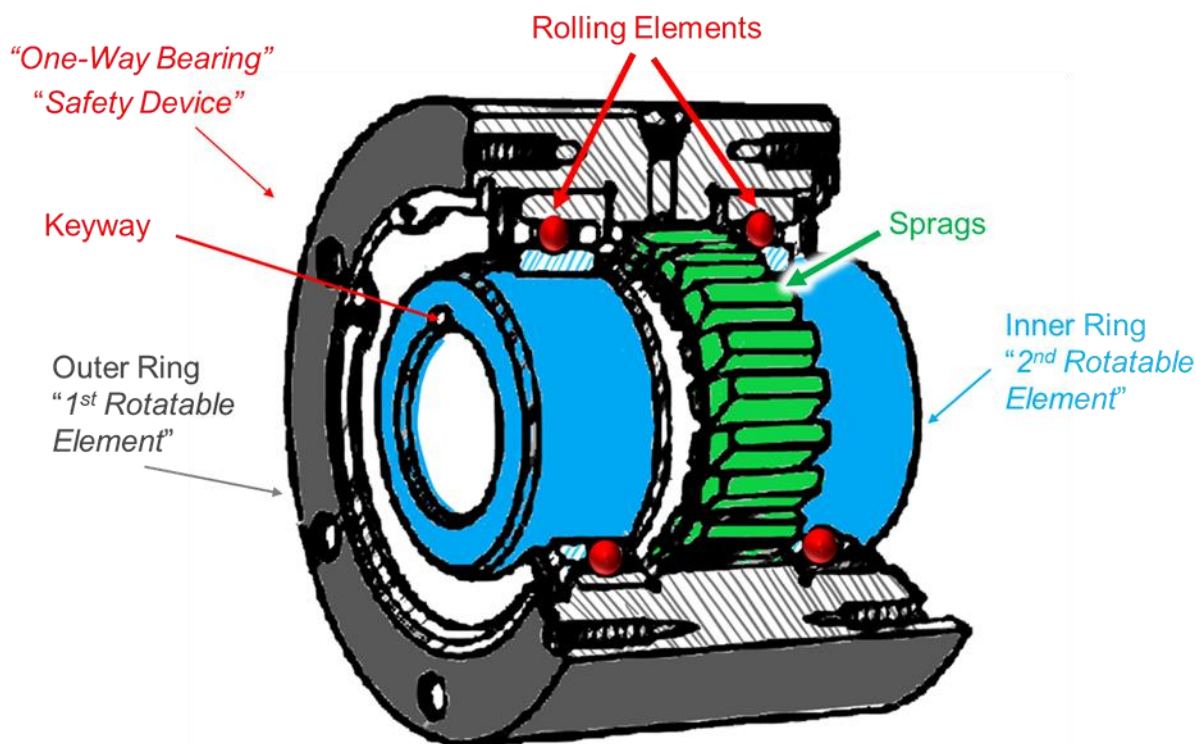


Ex.1010, Fig.12

... [33.]/[38.]/[54.] *The manually powered treadmill of claim 30 [37/50], wherein the first and second rotatable elements of the safety device at least partly form a one-way bearing.*

Sclater discloses a sprag-type one-way bearing assembly including sprags disposed between an inner ring (“*second rotatable element*”) and an outer ring (“*first rotatable element*”). Slater discloses that the sprags have a “sprag profile,

which is composed of two nonconcentric curves of different radius” that provide “a locking ramp.” (Ex.1017 at 312.) Sclater further discloses that “torque is transmitted from one ring to another by the wedging action of sprags between the ring in one direction; in the other direction the clutch freewheels.” (Ex.1017 at 318.) Sclater also discloses roller bearings acting between the inner and outer rings to provide low-friction rotation therebetween. The bearing assembly is a “one-way bearing” due to the interaction of the sprags and the rings (“rotatable elements”) and the roller bearings. (Ex.1003, ¶¶225-226, 251-252, 288-289.)



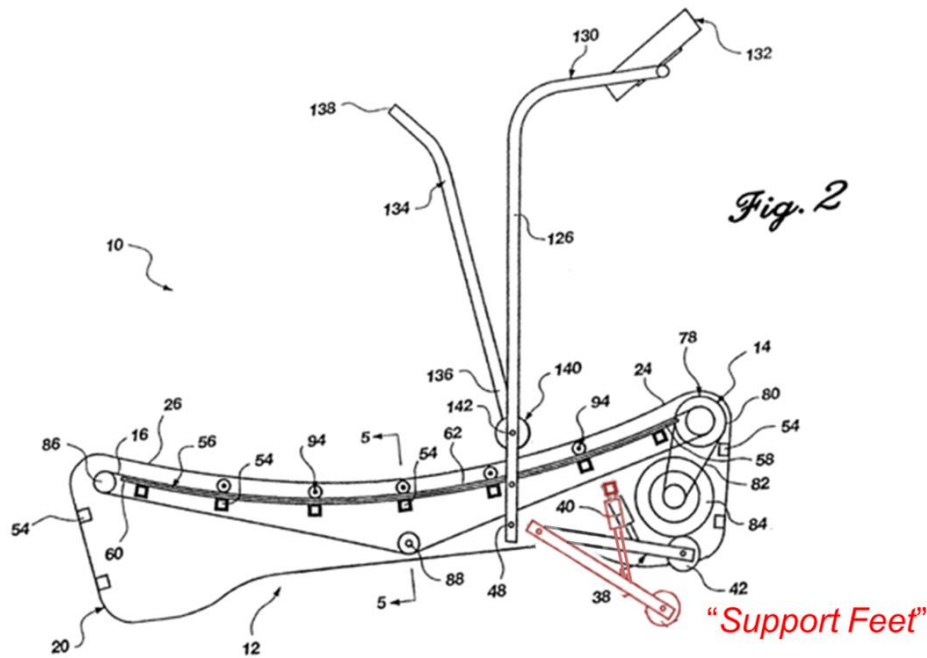
Ex.1017 at 318

... [34.]/[45] The manually powered treadmill of claim 30 [37], further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to enable an adjustment of the relative vertical incline of at least a portion of the manually powered treadmill in relation to a surface supporting the manually powered treadmill.

... [59.] A method according to claim 57, further comprising providing for the adjustment of the vertical incline of at least a portion of the running surface.

Schonenberger suggests adjusting the elevation of the treadmill, but does not disclose a mechanism for such adjustment: “This invention allows a runner to use the apparatus in a 5% elevation position without any external motor power.” (Ex.1010, 6:16-18.)

Socwell discloses adjustable wheels 42 (“support feet”). A “foot roller assembly 38 preferably includes one or more wheels 42 rotatably connected thereto in such a manner so as to provide a means for readily moving the curved deck treadmill 10.” (Ex.1011, 9:33-36.) “The foot roller assembly 38 may further comprise a force absorbing member 40 ... [that includes] “means for stabilizing the curved deck treadmill 10 at an elevated position so as to provide a means for inclining the front end 24 of the support frame 12 for increasing user workout.” (Ex.1011, 9:36-47; Ex.1003, ¶¶228-231, 264, 296-294.)



Ex.1011, Fig.2

A POSA would have known that with a manual treadmill, the incline of the running surface combined with gravity affects the user's pace. (Chickering, Ex.1013, 2:44-49.) A POSA would have been motivated to further modify Schonenberger to include Socwell's foot roller assemblies 38 for adjusting the inclination of movable surface 1 to adjust a user's pace and the effort required. Such a modification would involve simply mounting Socwell's foot roller assemblies 38 to the bottom of Schonenberger's housing 2 ("frame"). (Ex.1003, ¶¶232-233.)

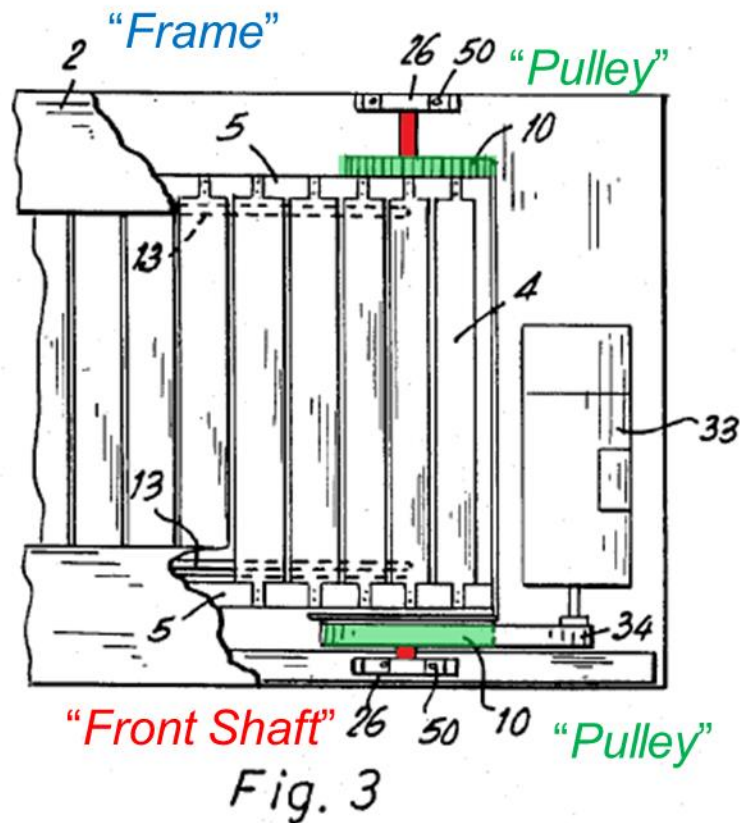
... [39.] The manually powered treadmill of claim 37, wherein the front shaft assembly comprises a front shaft coupled to frame.

... [40.] The manually powered treadmill of claim 39, wherein the front shaft assembly comprises at least one front running belt pulley coupled to the front shaft.

... [43.][b] and the front shaft assembly comprises at least one front running belt pulley.

... [52.] The manually powered treadmill of claim 50, further comprising a front shaft coupled to frame, the front shaft being adapted to support the at least one front running belt pulley.

Schonenberger discloses a “front shaft assembly” that includes two “running belt pulleys” 10 that are connected by a transverse “shaft” 26 and journalled (“coupled”) to the “frame”. (Ex.1010, 4:10-32, 9:31-35; Ex.1003, ¶¶253-254, 283-285.)



Ex.1010, Fig.3

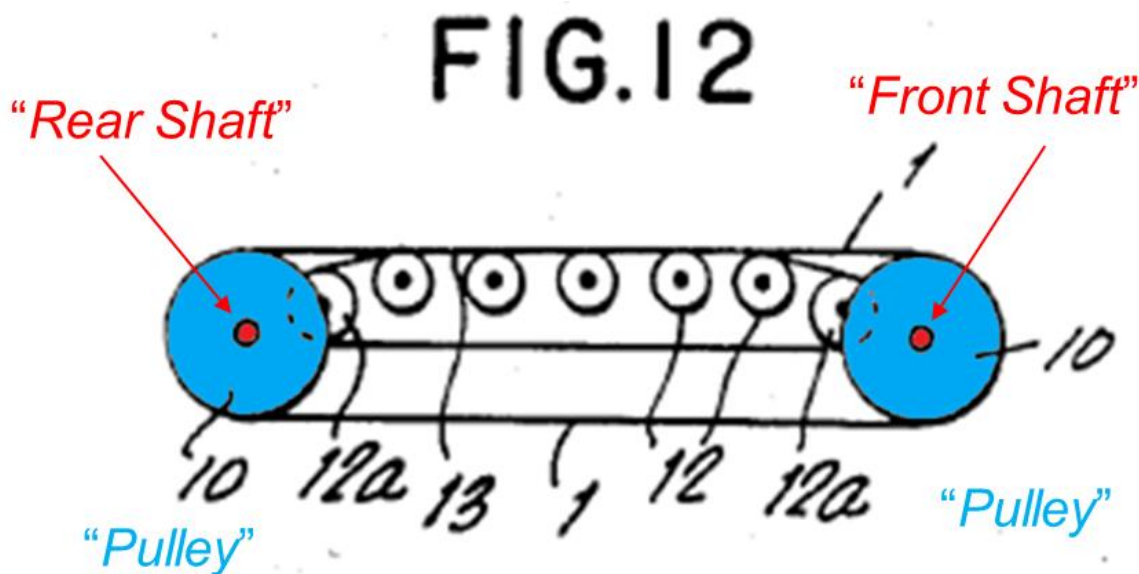
... [41.] The manually powered treadmill of claim 37, wherein the rear shaft assembly comprises a rear shaft coupled to the frame.

... [42.] The manually powered treadmill of claim 41, wherein the rear shaft assembly comprises at least one rear running belt pulley coupled to the rear shaft.

... [43.][a] The manually powered treadmill of claim 37, wherein the rear shaft assembly comprises at least one rear running belt pulley

... [53.] *The manually powered treadmill of claim 50, further comprising a rear shaft coupled to frame, the rear shaft being adapted to support the at least one rear running belt pulley.*

Schonenberger discloses a “shaft assembly” that includes two “pulleys” that are connected by a transverse “shaft” 26 and journaled (“coupled”) to the “frame” at “either end of the apparatus.” (Ex.1010, 4:10-23.) Thus, Schonenberger discloses a “rear shaft assembly” that is spaced a distance from the “front shaft assembly.” (Ex.1003, ¶¶257-262, 286-287.)

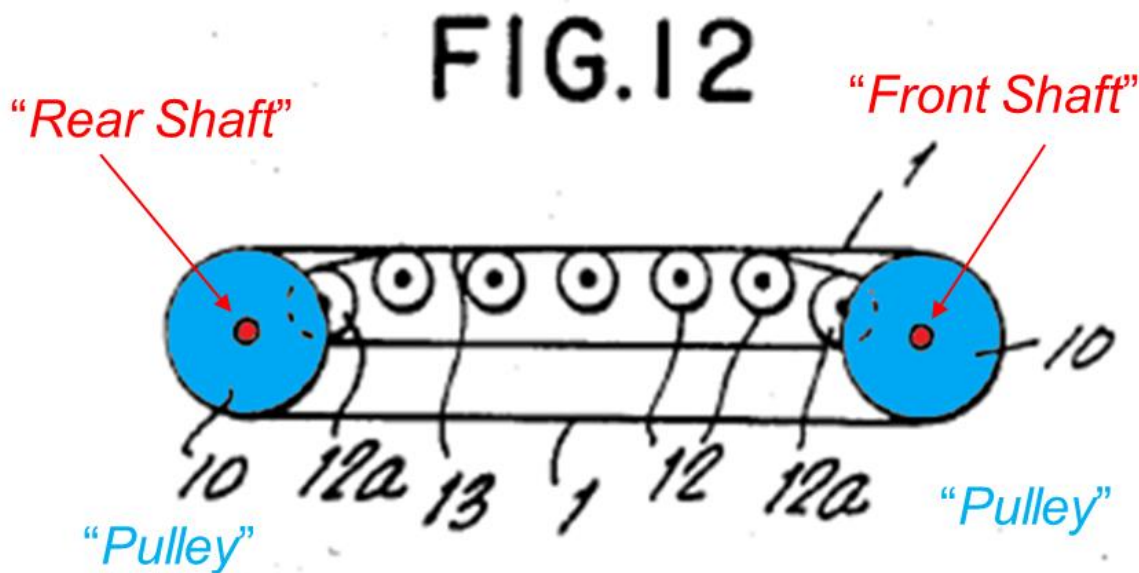


Ex.1010, Fig.12

B. Ground 2: Claims 44 and 51 are Obvious Over Schonenberger, Socwell, Magid, Sclater, and Skowronski

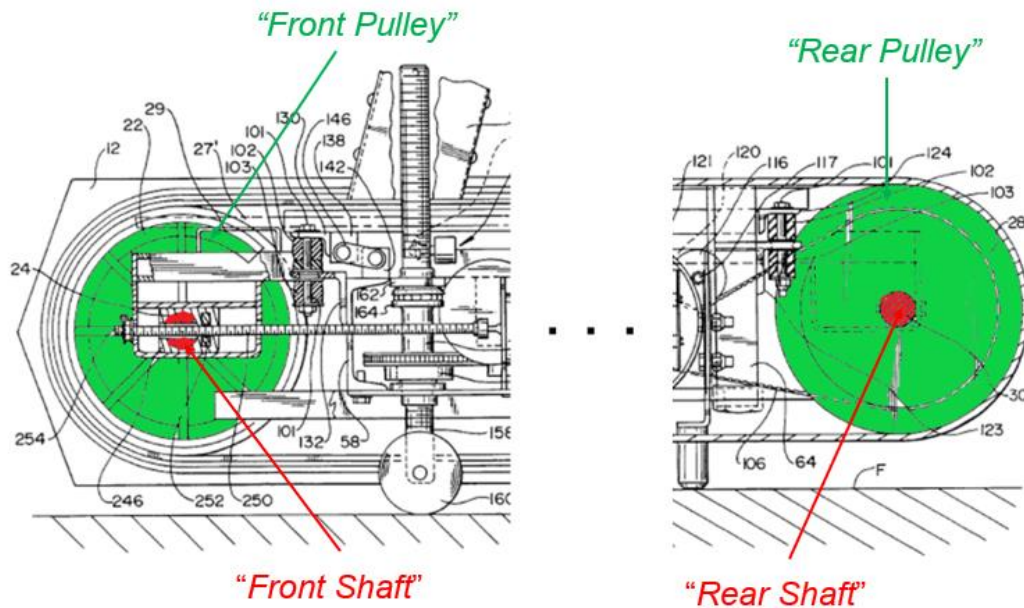
... [44.]/[51.] *The manually powered treadmill of claim 43 [claim 50], wherein at least one of the at least one rear running belt pulley and the at least one front running belt pulley are formed from an electrically insulating material.*

Schonenberger discloses front and rear shaft assemblies that each include two “*pulleys*” connected by a transverse “*shaft*” 26. (Ex.1010, 4:10-23.)



Ex.1010, Fig.12

Schonenberger does not disclose the material of the pulleys 10. However, a POSA would have understood that the pulley 10 could be made from a variety of different materials such as metal and plastic. For example, Skowronski discloses a treadmill having plastic pulleys that support a belt. (Ex.1030, 6:46-52.) “**Pulleys 22 and 28 are also preferably of a molded plastic construction.**” (*Id.*, 7:49-57; Ex.1003, ¶¶300-305, 306-309.)



Ex.1030, Figs.2A and 2B

The structure of Schonenberger's shaft assemblies is the same as that in Skowronski—both have a shaft coupled to the frame and a pulley(s) coupled to the shaft. (Ex.1010, 4:14-23, Figs.3 and 12; Ex.1030, 6:46-52.) Thus, the modification is merely a change in material. Forming the pulleys 10 of Schonenberger from plastic would have been obvious in view of Skowronski as it is merely the substitution of one known material for another and the combination of forming the pulleys 10 from plastic would yield a predictable result of a lighter weight pulley. *See KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2006) (“[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.”) (citing *United States v. Adams*, 383 U.S. 39, 40 (1966). *See also Hotchkiss v. Greenwood*, 52 U.S. (11 How.) 248 (1851) (holding obvious the substitution of clay or porcelain for metal or wood in doorknobs.)

1. Rationale to combine Schonenberger, Socwell, Magid, Sclater, and Skowronski

A POSA would have understood that plastic is electrically insulative. Therefore, the combination of Schonenberger and Skowronski teaches a “*running belt pulley are formed from an electrically insulating material.*” (Ex.1003, ¶¶310-316.)

It would have been obvious to a POSA to form the front and rear pulleys 10 of Schonenberger from plastic as taught by Skowronski. A POSA would have understood that the pulleys 10 could be made from a variety of different materials such as metal and plastic. For example, the PT Handbook describes flat belt pulleys as made of “cast iron (the most common material), steel, wood, plastic and fiber.” (Ex.1016 at 3-7; Ex.1003, ¶311.)

Schonenberger and Skowronski are from the same field –treadmills for exercise. (Schonenberger, Ex.1010, 1:63-68; Skowronski; Ex.1030, Abstract.) Both Schonenberger and Skowronski disclose treadmills with a belt supported by front and rear shafts and pulleys. (Ex.1010, 4:14-23, 6:16-18, Figs.3 and 12;

Ex.1030, 6:46-61, Figs.2A-2B.) (Ex.1003, ¶312.)

Skowronski explains several benefits associated with plastic pulleys. One benefit from using plastic is that the size of the pulleys can be increased, which in turn, allows for a thicker and heavier belt:

The relatively large diameter of pulleys 22 and 28 provides significant performance advantages. One advantage is that the large diameter pulleys permit the use of a relatively thicker belt 20, which can provide more shock absorbency than most currently used belts The thickness of the preferred belt 20 is about 0.20 inches or more.

(Ex.1030, 7:26-31.)

Another benefit of larger pulleys is enhanced gripping between the pulleys and the belt due to increased contact area:

This large contact area provides enhanced “gripping” of the belt by the pulley, which in turn permits the use of lower belt tension than is required by treadmills having smaller diameter pulleys. This, in turn, reduces or eliminates tension-related belt failure known to occur in treadmills having smaller diameter pulleys.

(Ex.1030, 7:34-39.)

Skowronski further explains that plastic pulleys are lighter and less expensive than metal pulleys.

Pulleys used in current exercise treadmills **typically are made of steel or aluminum and as such are relatively expensive to make and are relatively heavy**. Therefore, because of tooling, manufacturing and material costs, the diameter of the pulleys are normally no larger than three to four inches.

(Ex.1030, 2:10-15.)

A POSA would have recognized that the large diameter pulleys 10 of Schonenberger would benefit from the lighter weight and lower inertia provided by plastic given the similarities with the pulleys of Skowronski. Lower inertia pulleys allow greater latitude in optimizing the running surface weight and thickness.

(Ex.1003, ¶¶311-316.)

C. Ground 3 - Claims 30-34, 37-54, 57, 59 Are Obvious Over Schonenberger, Socwell, Magid, and Sclater

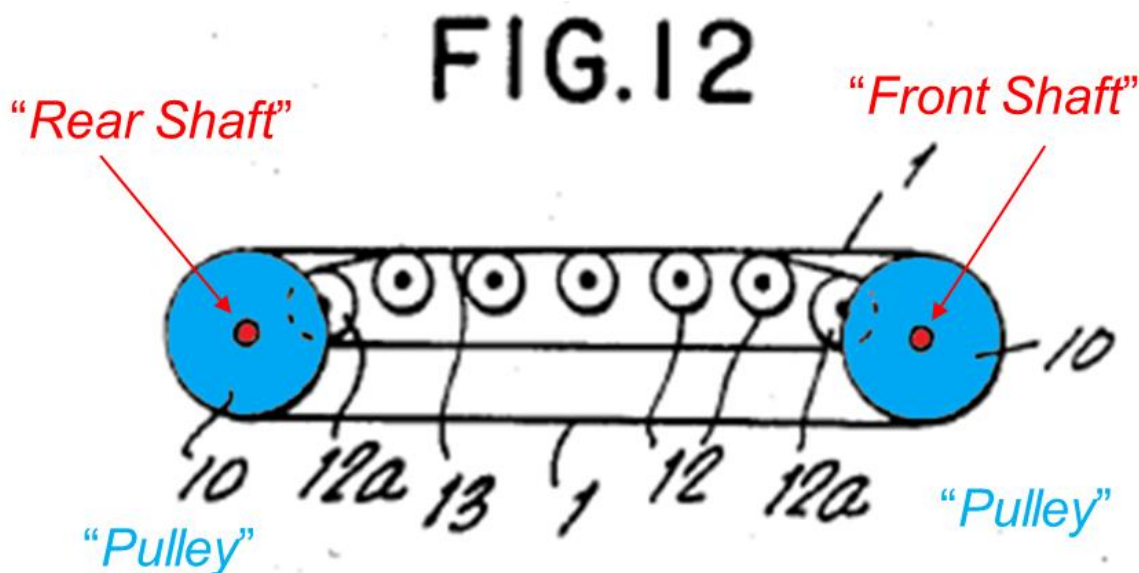
1. Independent Claims 30, 37, 50, 57

For Ground 3, Petitioner proposes claim constructions for the terms: a) “*shaft*”, b) “*safety device*” and c) “*substantially prevent*” which affects claim limitations: a) [30.2]-[30.3]/[37.4]-[37.5]/[52]-[53]; b) [30.6]/[37.7]/[50.6]/[57.4]; and c) [30.7]/[37.8]/[50.7]/[57.5]. The remaining limitations are taught by the combination of Schonenberger, Socwell, Magid, and Sclater for the same reasons provided in Ground 1. (Ex.1003, ¶¶317-341, 343-344, 346-347, 349-350.)

a. “Shaft”

... [30.2]-[30.3]/[37.4]-[37.5]/[52]-[53]

Petitioner proposes construing the term “shaft” as “a rotating element used to transmit power from one part to another.”, Schonenberger discloses that the front shaft assembly (pulley 10 and shaft 26) is coupled to the rear shaft assembly (pulley 10 and shaft 26) by the movable surface 1. (Schoenenberger, Ex.1010, 4:10-23, Fig.3.) Each shaft assembly receives power from the user through the movable surface 1, and transfers the power to the other shaft assembly. (Ex.1003, ¶¶323, 328, 344, 348.)



Ex.1010, Fig.12

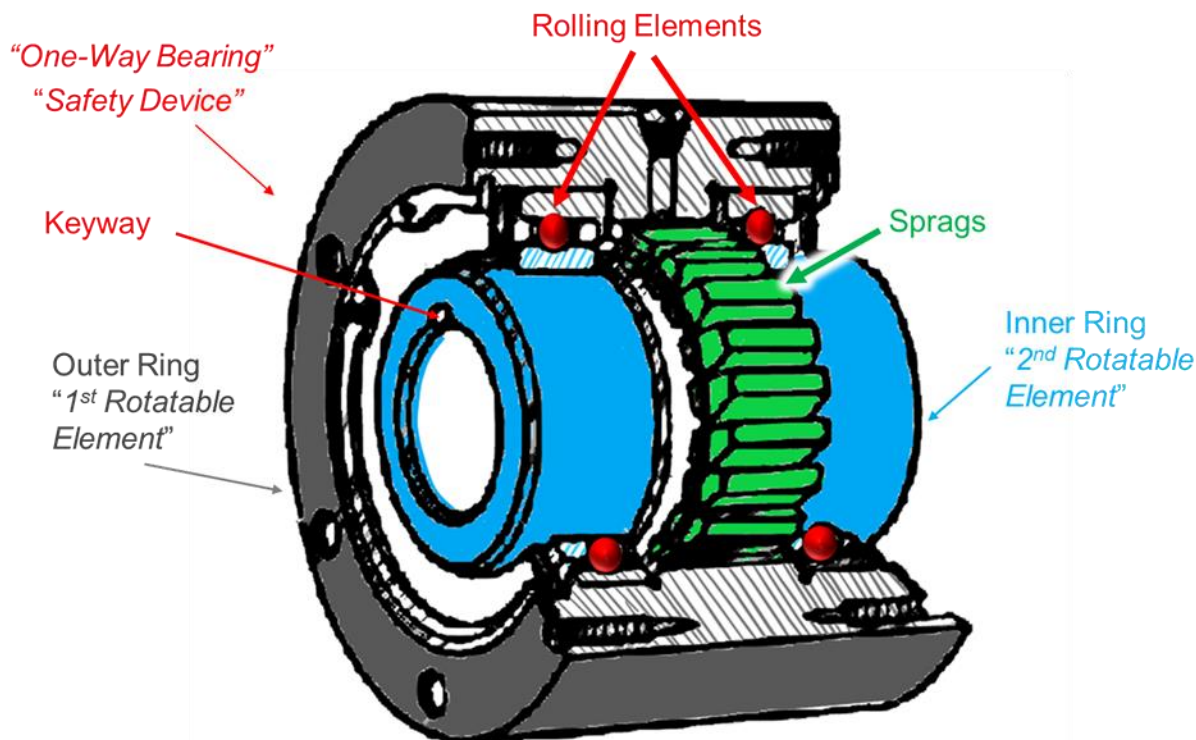
b. “Safety Device”

... [30.6]/[37.7]/[50.6]/[57.4]

Petitioner proposes construing the term “safety device” as a “device having

two ring-shaped components.” Sclater discloses sprag-type one-way bearing assemblies. “Sprags combined with cylindrical rollers in a bearing assembly can provide a simple, low-cost method for meeting the torque and bearing requirements of most machine applications.” (Sclater, Ex.1017 at 312.)

As illustrated in the image below, Sclater discloses that the sprag-type one-way bearing assembly includes an inner ring, an outer ring, and a plurality of sprags disposed between the inner ring and the outer ring. The inner ring and the outer ring are “two ring-shaped components.” (Ex.1003, ¶¶334-335, 344, 347.)

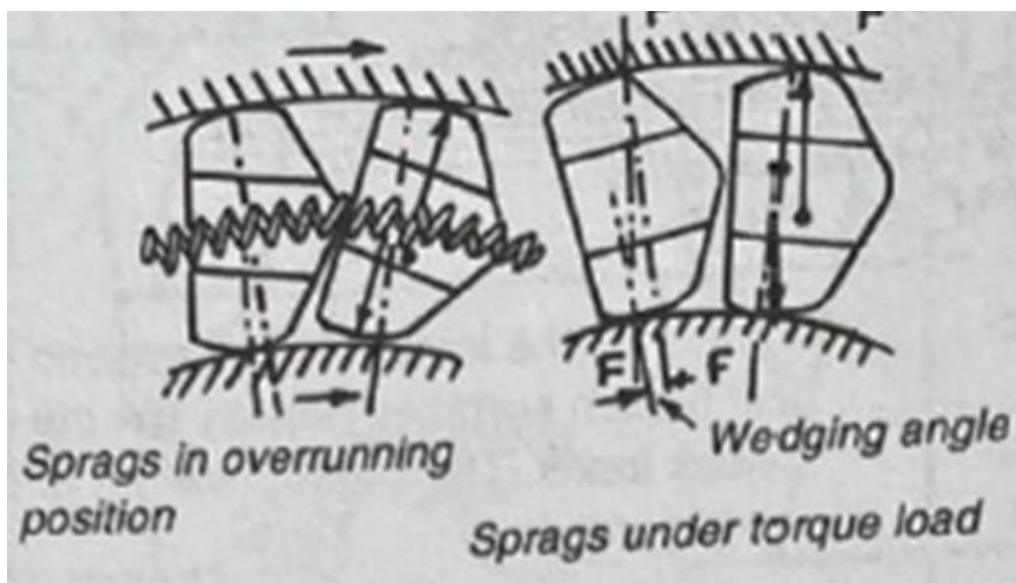


Ex.1017 at 316

c. “Substantially Prevent”

... [30.7]/[37.8]/[50.7]/[57.5]

Petitioner proposes construing the term “*substantially prevent rotation*” as “prevent any movement after allowing no or minimal movement.” A sprag-type one-way bearing allows minimal movement before the sprags rotate into a locked position. As illustrated in the figure below on the left, Sclater discloses that when the inner ring rotates in a first direction relative to the outer ring, the sprags move out of the locked position such that an overrun condition occurs. However, as illustrated below right, when the inner ring rotates in the opposite direction, the sprag profile wedges the sprags into a locked position preventing relative motion between the inner and outer rings. (Ex.1003, ¶¶340-341, 344, 347, 350.)



Ex.1017 at 318

2. Dependent Claims 31-34, 38-43, 45-49, 53-54, and 59

The proposed constructions do not impact the additional claim limitations; therefore these claims are taught by the combination of Schonenberger, Socwell, Magid, and Sclater for the same reasons provided in Ground 1. (See ¶¶218-234, 251-270, 283-289, 296-297.)

3. Rationale to Combine Schonenberger, Socwell, Magid, and Sclater

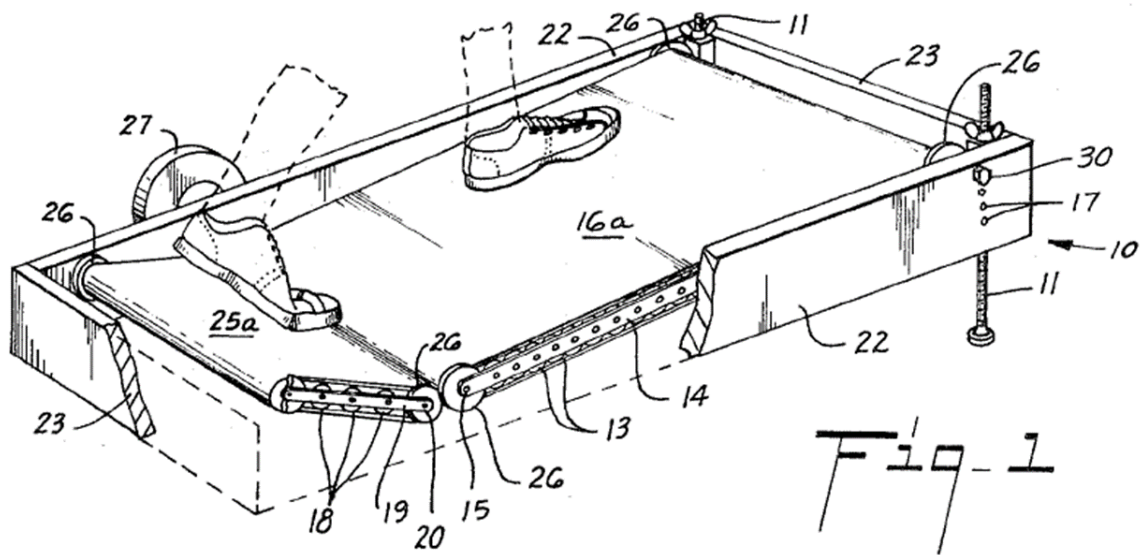
The rationales to combine Schonenberger, Socwell, Magid, and Sclater is the same as the rationales explained in Ground 1. (See ¶¶168-179.)

D. Ground 4 - Claims 30-34, 37-39, 41, 45-49, 57, 59 Are Obvious Over Chickering, Magid, and Sclater

1. Independent Claims 30, 37, 57

... [30.0]/[37.0]/[57.0]/[57.1][a]

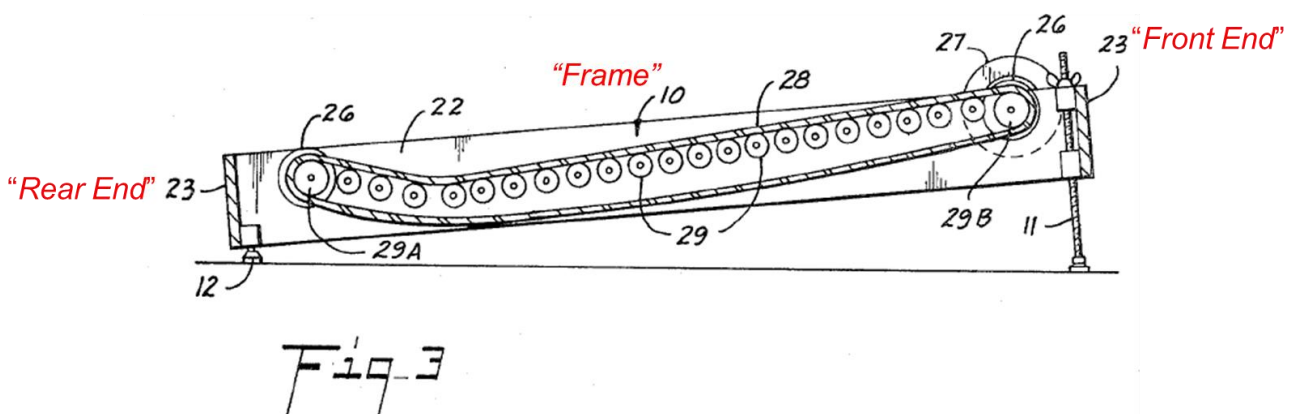
Chickering discloses a “treadmill” having an adjustable inclination angle such that “[w]hen a faster pace is desired, the inclination of the tread surface 16a is increased...A slower pace is attained by reversing these operations.” (Ex.1013, 2:44-49; *see also* 1:1-7.) A POSA would have understood this as a “*manually powered treadmill*.” (Ex.1003, ¶¶354-357, 402, 424.)



Ex.1013, Fig.1

... [30.1] / [37.1] / [57.1][b]

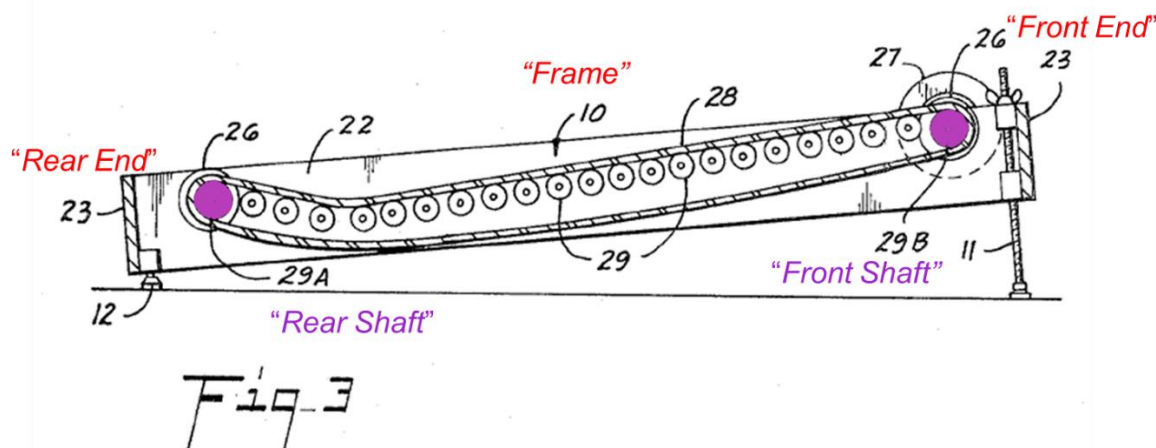
Chickering discloses that the exercising device has a base 10 (“*frame*”) “which comprises an inclined rectangular frame having two sidewalls 22 and two end walls 23” (“*a front end and a rear end*”). (Ex.1013, 1:65-68; Ex.1003, ¶¶358-359, 403, 425.)



Ex.1013, Fig.3

... [30.2] / [37.4] / [30.3] / [37.5]

Chickering discloses front and rear end rollers 29b, 29a (“front shaft,” “rear shaft”) coupled to a front and rear end of the base 10 (“frame”). “When a single belt is used ... it may also be desirable to provide larger end rollers as at 29a and 29b to give a larger turning radius for the belt.” (Ex.1013, 3:11-16; Ex.1003, ¶¶360, 405 ¶¶363.)



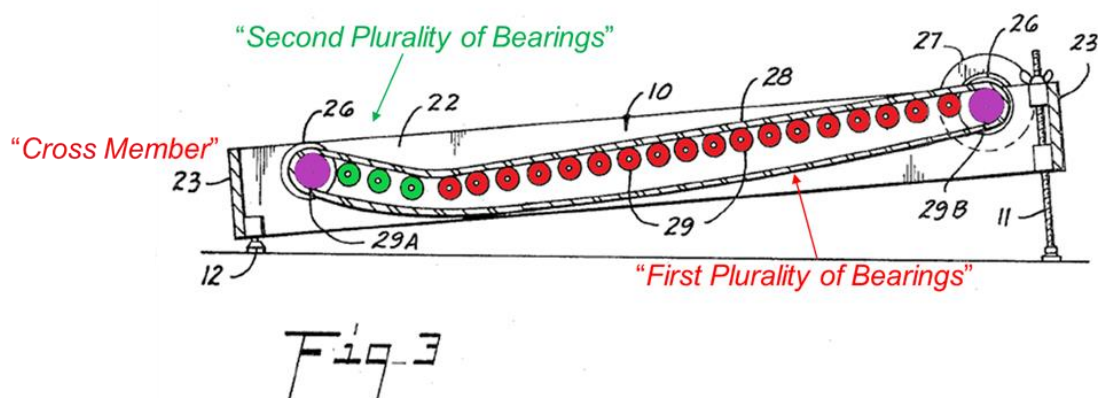
Ex.1013, Fig.3

Chickering discloses that “rollers 29 are provided journaled in the sidewalls 22 of base 10.” (Ex.1013, 2:75-3:2.) These journals are bearings allowing the rollers 29 to rotate relative to the base 10. A POSA would consider each roller 29 and their associated journal bearings to be a “shaft assembly.” (Ex.1003, ¶¶361, 365.)

... [30.4] / [37.2] / [37.3] / [57.2]

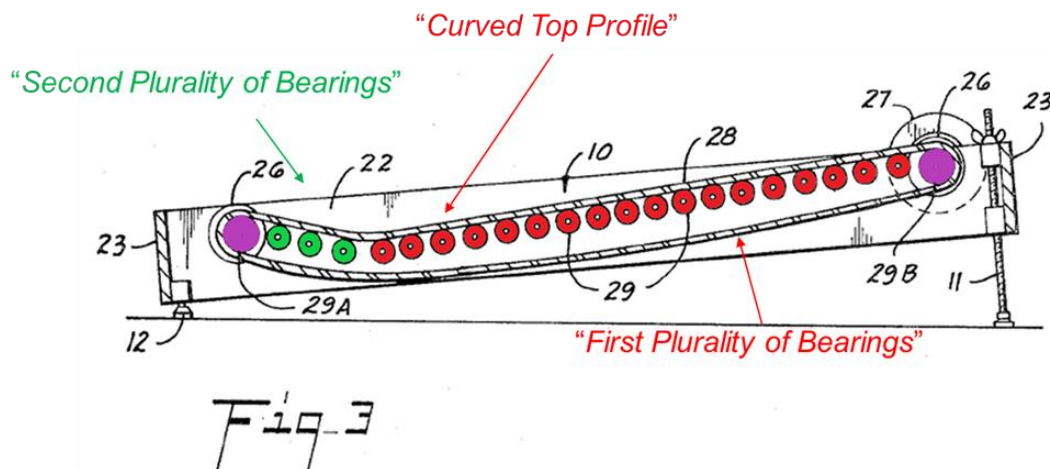
Chickering discloses a plurality of rollers 29 (“bearings”) that extend

between the left and right sidewalls 22 of the base 10 (“*frame*”). “In the device shown in FIG. 3, a single series of rollers 29 are provided journaled in the sidewalls 22 of base 10.” (Ex.1013, 2:75-3:2.) A POSA would have understood that Chickering’s rollers 29 are at least plain/journal bearings. The rollers 29 include a “*first plurality of bearings*” (red) coupled to the left sidewall and “*a second plurality of bearings*” (green) coupled to the right sidewall. (Ex.1003, ¶¶366-367, 404, 426.)



Ex.1013, Fig.3

As illustrated below, the upper surfaces of the rollers 29 define a “*curved top profile*.” (Ex.1003, ¶426.)



Ex.1013, Fig.3

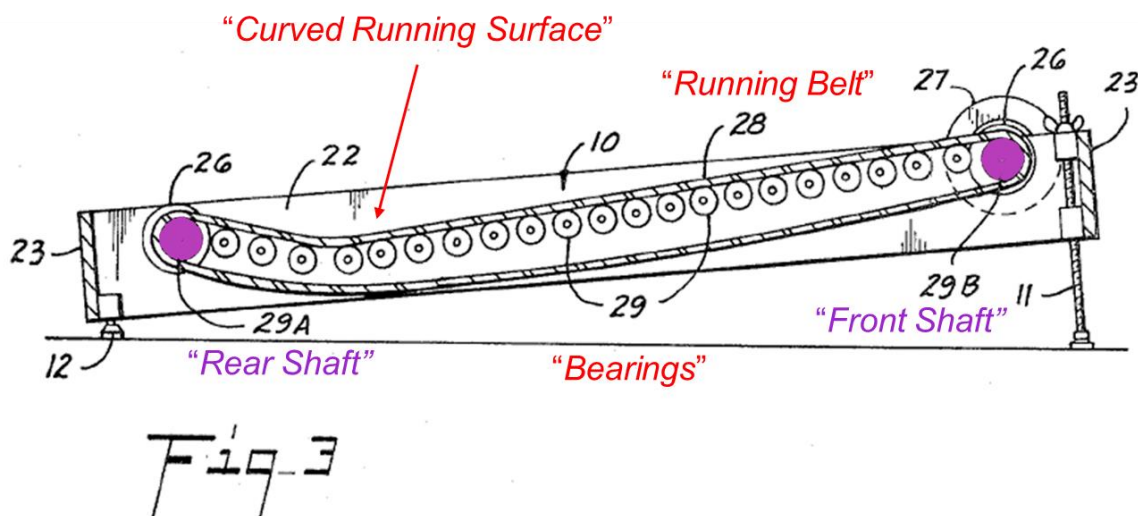
... [30.5] / [37.6] / [57.3]

Chickering discloses an “endless belt 28” (“*running belt*”) disposed about front and rear rollers 29b, 29a (“*front shaft*,” “*rear shaft*” (purple)) and on rollers 29 (“*bearings*” (red and green)), to follow their curved contour:

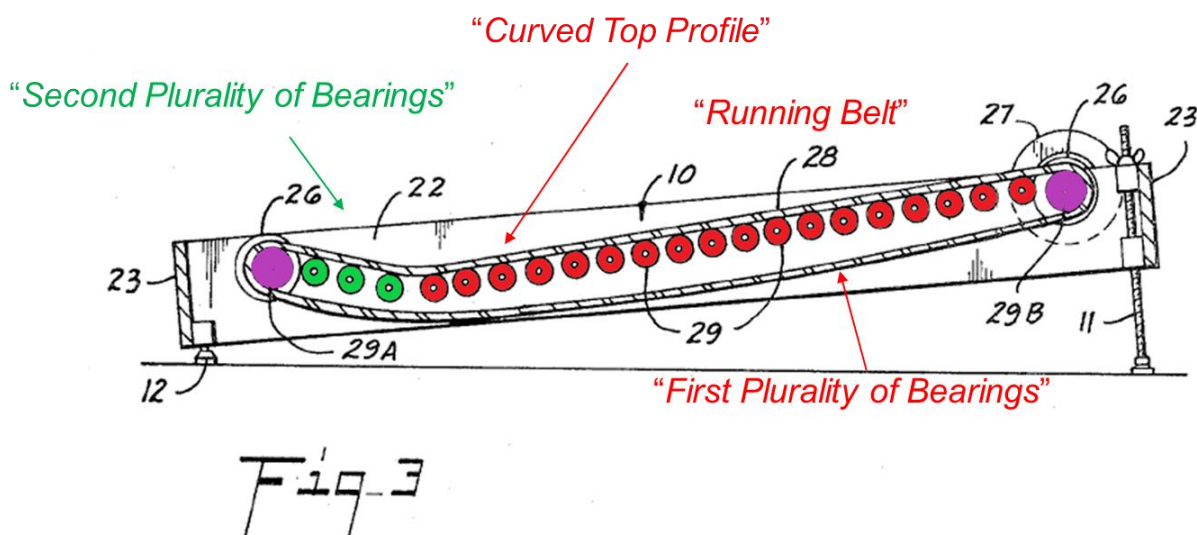
Thus, when the endless belt 28 is placed about the rollers, it follows their contour and provides a forward accelerating area and a rear decelerating area which are inclined from the horizontal with each being lowest at their point of nearest proximity.

(Ex.1013, 2:73-3:10.)

As shown in Figure 3, the belt 28 is curved to match the positioning of the rollers 29. The top surface of the belt (“*running surface*”) is also curved. (Ex.1003, ¶¶368-370, 406-408, 427.)



Ex.1013, Fig.3

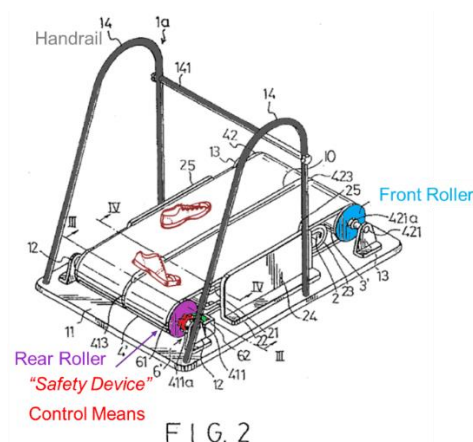
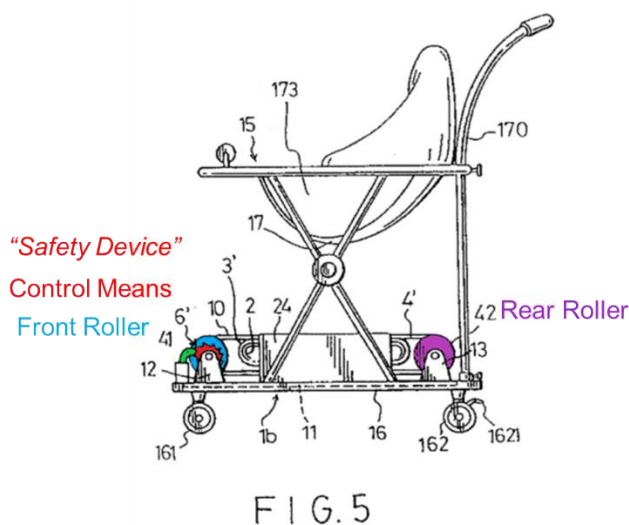


Ex.1013, Fig.3

... [30.6]/[37.7]/[57.4]

Magid discloses mounting a one-way ratchet clutch (unidirectional control means 6,6') to a front shaft assembly (Fig.5) or a rear shaft assembly (Fig.2) of a treadmill to "prevent[] bidirectional movement of" the treadmill belt. (Ex.1012, 4:46-59; Ex.1003, ¶¶371-373, 409, 428.) Magid discloses that the ratchet gear 61

(“*first rotatable element*”) rotates with the front or rear shaft and relative to the frame, and the pawl 62 (“*second rotatable element*”) pivots, or rotates, to engage the ratchet gear 61. (*Id.*)



Ex.1012, Figs.5, 2 (Enlarged)

A POSA would have known that mounting a one-way clutch in this manner improves the stability of the user on the treadmill by preventing forward treadmill belt motion, thereby providing a “*safety device.*” (Ex.1003, ¶375.)

2. Rationale to Combine Chickering and Magid

It would have been obvious to a POSA to combine the manual curved treadmill disclosed in Chickering with the known technique of a one-way clutch to prevent belt motion in a forward direction as disclosed in Magid. (Ex.1003, ¶¶432-442.)

Chickering and Magid are from the same field – manual treadmills for

exercise (Ex.1013, 1:1-7; Ex.1012, 1:53-55; 3:23-28) – and both disclose a running belt supported by rollers. (Ex.1013, 2:73-3:6, Fig.3; Ex.1012, 6:46-53, Fig.8; Ex.1003, ¶433.)

It has long been recognized that users may be injured by falling off a treadmill while mounting or dismounting, or using it:

A person exercising on this type of treadmill is likely to lose his balance because the frictionless surface offers no resistance to the movement of his feet, and he is therefore unable to obtain the leverage necessary for proper balance. Also, the user is likely to run off the lower end of the treadmill because the faster he runs the faster the belt accelerates and moves beneath his feet, carrying him to the rear.

(Ex.1013, 1:30-36.)

In particular, if the rollers supportably disposed in relation to the endless belt are so easily moveable, the user may potentially lose his equilibrium or balance and fall from the exercise treadmill resulting in possible injuries.

(Ex.1011, 1:33-36.)

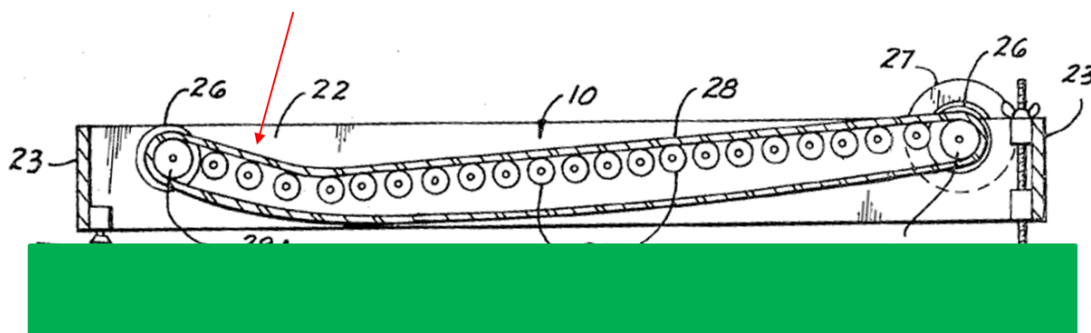
Another meaningful disadvantage of exercise treadmills of the prior art is the inherent danger associated with users tending to fall off the back end of the treadmill and become injured.

(Ex.1011, 2:45-48; Ex.1003, ¶434.)

Professional organizations have produced standards regarding exercise

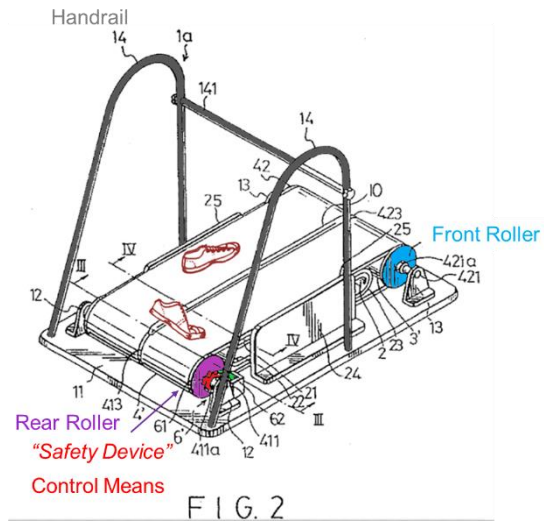
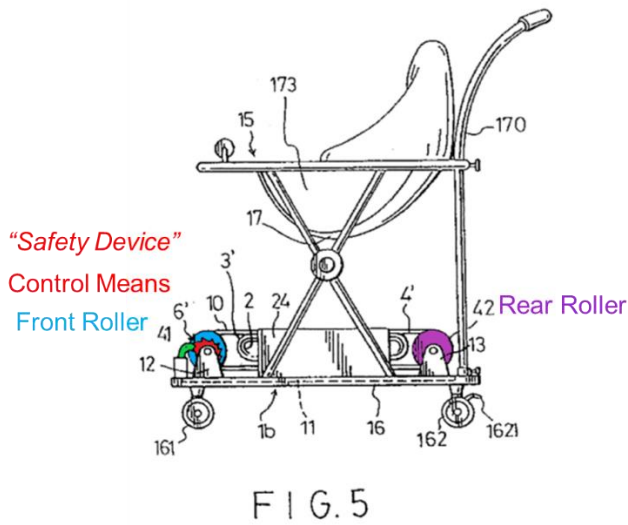
equipment safety generally, and for treadmill safety. See ASTM Standard, Ex.1019; ISO Standard, Ex.1020; and ACCC Product Safety Supplier Guide, Ex.1007. (Ex.1003, ¶435.)

Chickering proposes a curved surface treadmill to address stability issues. (Ex.1013, 2:37-39; Ex.1003, ¶436.) However, Chickering does not fully address the safety issue of the belt moving forward when a user steps onto the treadmill. For example, with a curved running surface, such as disclosed in Chickering, forward motion is likely to occur if a user were to step onto the rearward end of the surface (red arrow), causing the foot to unexpectedly move towards the lower portion of the treadmill. Where a user adjusts the frame to a generally horizontal position using the front jackscrew, as depicted below, this unexpected motion would be exacerbated. (Ex.1003, ¶437.)



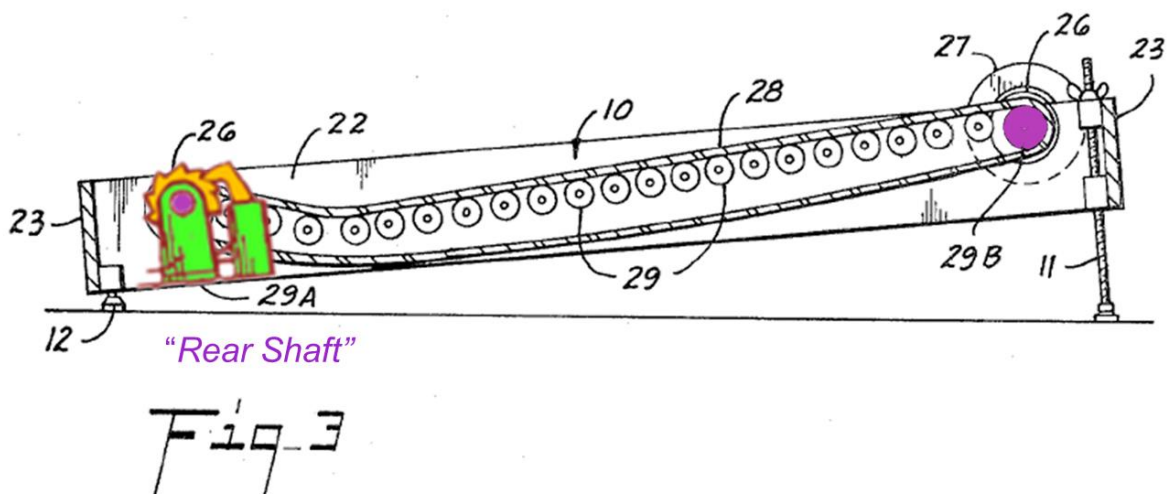
Ex.1013, Fig.3

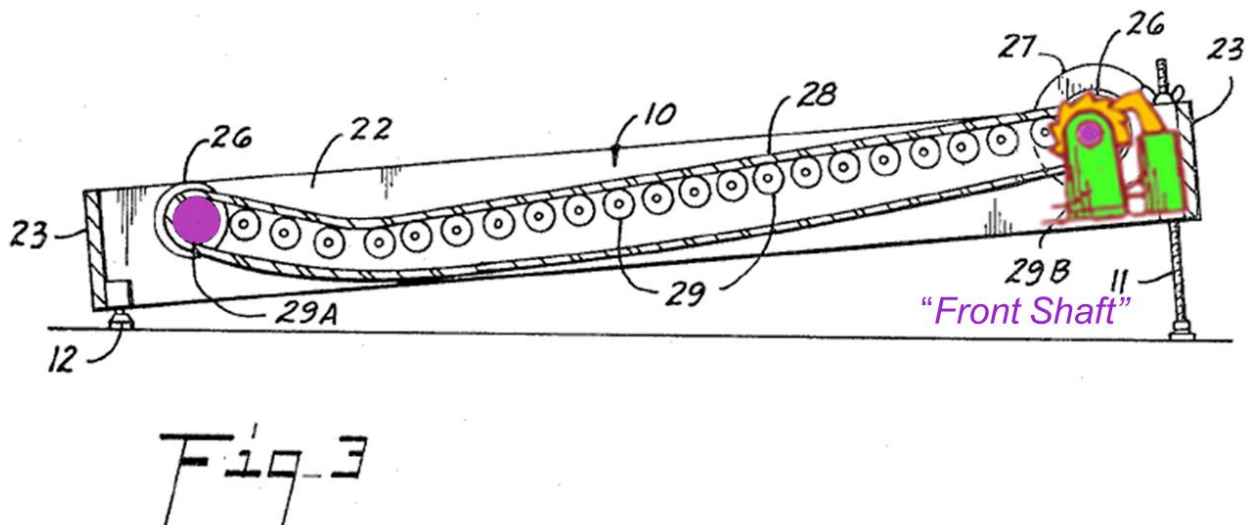
Magid discloses a one-way clutch (control means 6, 6') operably coupled to a front shaft (Fig.5) or rear shaft (Fig.2) to permit only unidirectional belt movement. (Ex.1012, Fig.5, 4:46-59; Ex.1003, ¶438.)



Ex.1012, Figs.2,5

A POSA would have been motivated to modify Chickering to include Magid's control means 6, 6' mounted to the front roller or the rear roller as shown below, to permit only unidirectional belt movement to reduce the risk of a user stepping onto the belt and losing their balance when the belt moves forward. (Ex.1003, ¶¶439-440.)





Ex.1013, Fig.3

The modification would include mounting at least one one-way ratchet clutch to the front or rear roller. The ratchet gear would be mounted coaxially with the roller and the pawl would be mounted adjacent the ratchet gear, as taught by Magid. For example, the pawl could be coupled to the base 10. (Ex.1003, ¶441.)

This modification would have been a simple combination of known elements in the prior art: Chickering's manual treadmill with a curved running surface and Magid's one-way ratchet clutch. As illustrated above in both figures, the pawl is arranged forward the ratchet gear and biased to engage the teeth. The ratchet gear teeth are swept forward to yield predictable results: 1) permitting the ratchet gear to overrun counterclockwise to allow rearward belt motion, and 2) provide a backstop by preventing the ratchet gear from rotating clockwise to prevent, or allow only minimal, forward belt motion. (*Id.*)

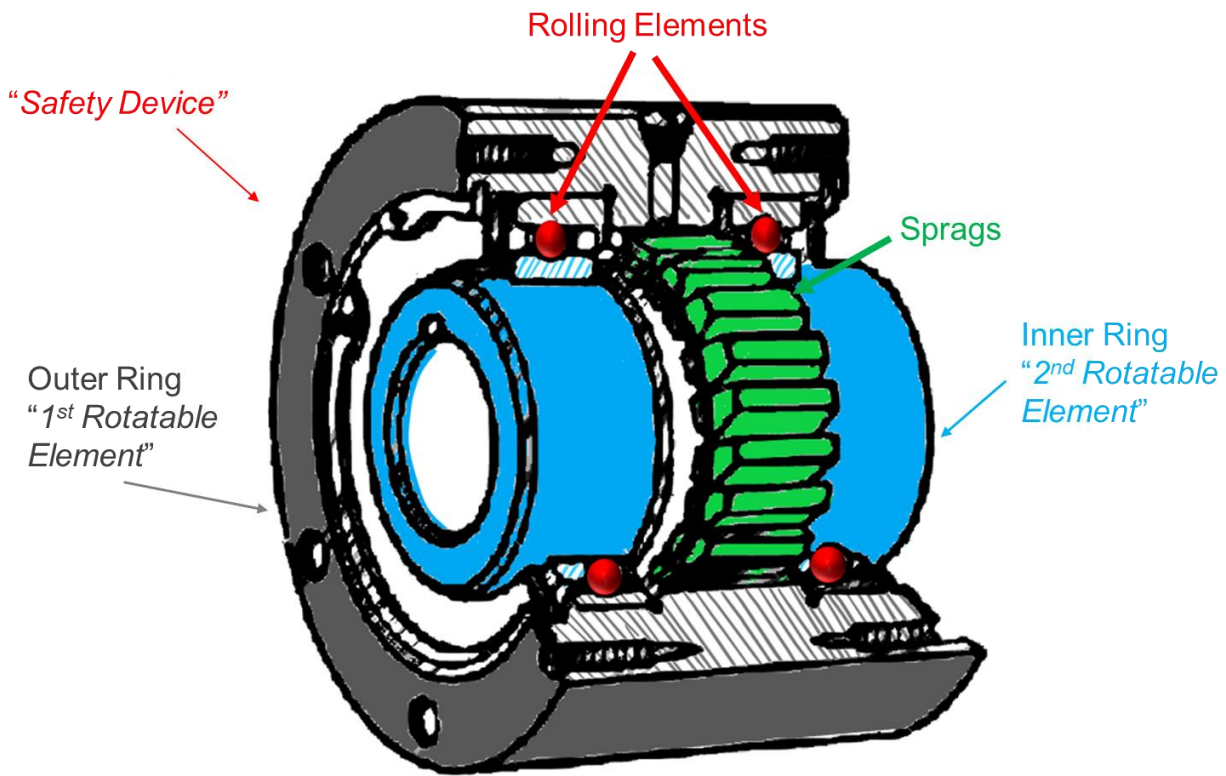
The modification would also be the use of a known technique, using a one-way clutch in a backstopping mode of operation, to improve similar devices, *i.e.*, treadmills, in the same way, *i.e.*, to provide unidirectional belt motion. (Ex.1012, 4:48-54; Ex.1003, ¶442.)

... [30.7] / [37.8] / [57.5] / [57.6]

Magid does not expressly disclose that the control means (“*safety device*”) includes a third element to create “interference” with the ratchet gear 61 (“*first rotatable element*”) or the pawl 62 (“*second rotatable element*”). (Ex.1003, ¶¶377, 410, 429.)

Sclater discloses sprag-type one-way bearing assemblies that include sprags combined with rolling elements, such as cylindrical rollers or balls. “Sprags combined with cylindrical rollers in a bearing assembly can provide a simple, low-cost method for meeting the torque and bearing requirements of most machine applications.” (Ex.1017 at 312.) (Ex.1003, ¶378.)

As illustrated in the image below, Sclater discloses that the sprag-type one-way bearing assembly includes an inner ring, an outer ring, and a plurality of sprags and rolling elements disposed between the inner ring and the outer ring. (Ex.1003, ¶379.)



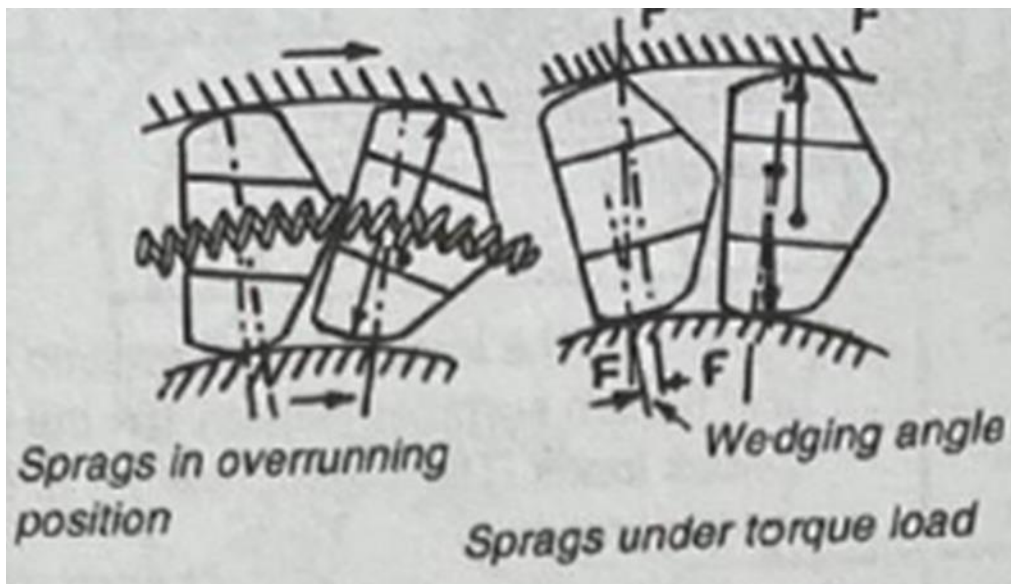
Ex.1017 at 318

Sclater discloses that the inner ring defines a center hole that is sized to receive a shaft and defines a keyway on the inner diameter. The keyway provides means for rotatably coupling the inner ring to a shaft via a key. The inner ring and/or the outer ring of a one-way bearing assembly rotate about a central axis; therefore both rings are “*rotatable elements*.” (Ex.1003, ¶380.)

Sclater further discloses that this sprag-type bearing assembly functions as a one-way bearing by providing “one-direction only torque transmission in an overrunning clutch.” (Ex.1017 at 312.) (Ex.1003, ¶381.)

Sclater discloses that the sprags have a “sprag profile, which is composed of two nonconcentric curves of different radius” that provide “a locking ramp.” (Ex.1017 at 312.) Sclater further discloses that “torque is transmitted from one race to another by the wedging action of sprags between the races in one direction; in the other direction the clutch freewheels.” (Ex.1017 at 318.) (Ex.1003, ¶383.)

The movable surface 1 (“*running belt*”) is coupled to the inner ring (“*second rotatable element*”) through the front shaft assembly or the rear shaft assembly. As illustrated in the figure below on the left, the movable surface 1 (“*running belt*”) and the inner ring (“*second rotatable element*”) rotate in a first direction relative to the outer ring (“*first rotatable element*”) to overrun. However, as illustrated in the figure below on the right, wedging or “*interference*” between the sprags and the inner and outer rings prevents rotation of the inner ring in an opposite direction, which prevents the movable surface 1 (“*running belt*”) from moving forward. (Ex.1003, ¶384.)



Ex.1017 at 318

3. Rationale to Combine Chickering and Magid with Sclater

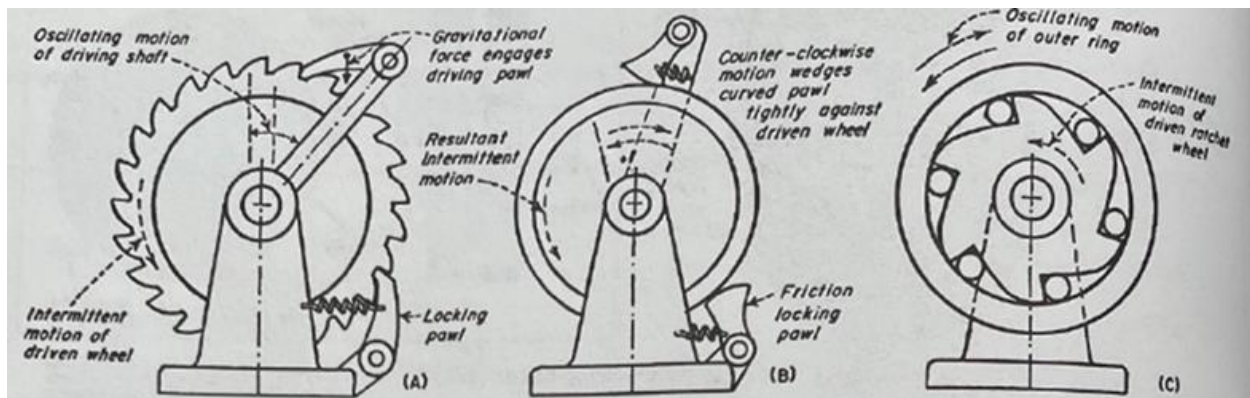
A POSA would have been motivated to substitute Sclater's one-way sprag-type bearing assembly for Magid's ratchet-and-pawl one-way mechanism. (Ex.1003, ¶443.)

Ratchet and pawl clutch mechanisms make noise during operation. For example, the pawl engages each ratchet gear tooth and makes an audible "click" when passing over each tooth. (Ex.1003, ¶444.) Sclater teaches that a "friction-type clutch is quieter" than a ratchet-type clutch:

(A) A ratchet and pawl mechanism converts reciprocating or oscillating movement to intermittent rotary motion. This motion is positive but limited to a multiple of the tooth pitch. (B) A friction-

type clutch is quieter, but it requires a spring device to keep the eccentric pawl in constant engagement. (C) Balls or rollers replace the pawls in this device. Motion of the outer race wedges the rollers against the inclined surfaces of the ratchet wheel.

(Ex.1017 at 316.)



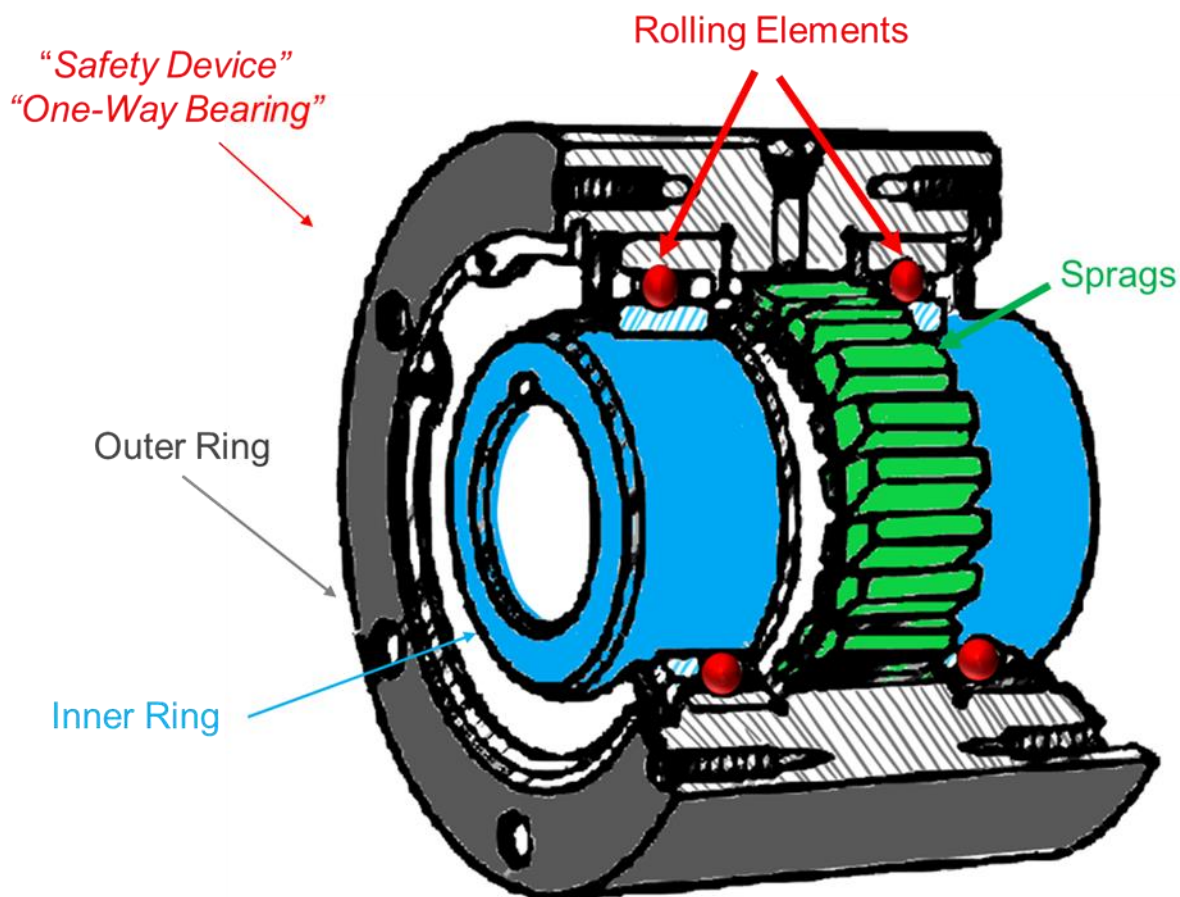
Ex.1017 at 316

Sclater further discloses that an “over-running clutch is better suited for higher-speed free-wheeling than a pawl-and-ratchet clutch.” (Sclater, Ex.1017 at 303.) This is because the pawl may skip past a few teeth before backstopping the ratchet gear, whereas the sprags are always in contact with the rings and do not need to find a discrete gear tooth to stop. Additionally, because there are multiple sprags, they distribute the load over a larger surface area. (Ex.1003, ¶445.)

A POSA would have considered a sprag-type one-way clutch bearing for an exercise equipment application, such as a treadmill. For example, a 2001 Emerson bearing catalog describes its NSS Series sprag-type one-way clutch as an option for multiple “Field Applications,” e.g., as “[e]xercise equipment.” (Ex.1018 at 52-

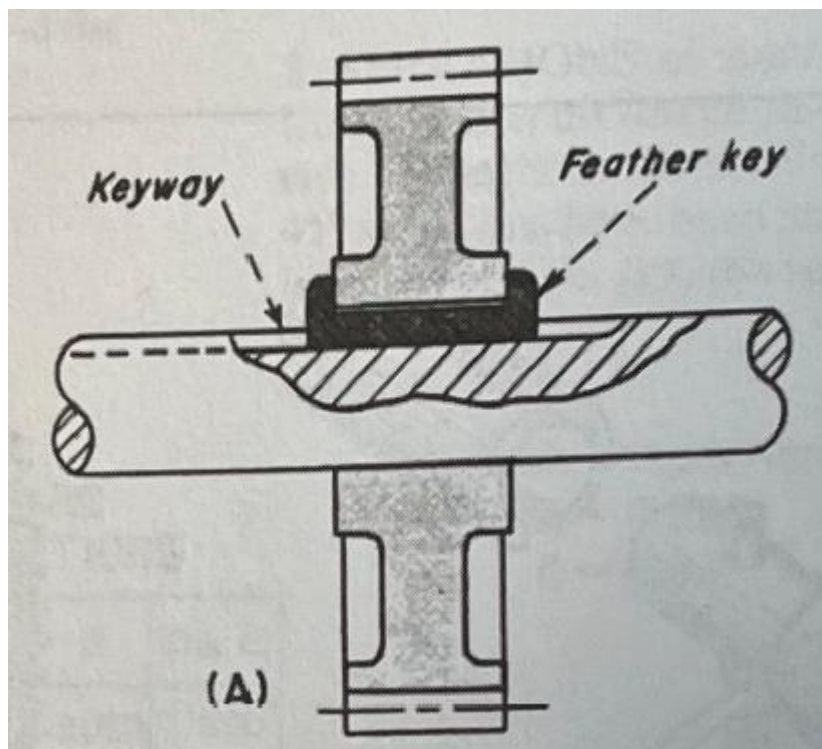
53; Ex.1003, ¶447.)

A POSA would have known how to replace Magid's control means with Sclater's one-way bearing assembly. For example, the outer ring would be fixed relative to the control arms. Sclater illustrates below the outer ring including tapped holes for receiving fasteners for mounting the bearing to a bracket, and Emerson describes examples of commercially available brackets or torque arms. (Ex.1018 at 38-43; Ex.1003, ¶448.)



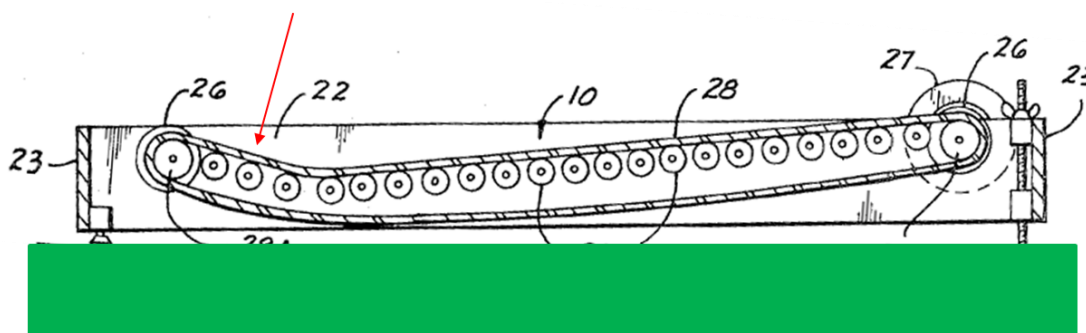
Ex.1017 at 318

The inner ring of the one-way bearing would be secured to the front roller or rear roller, *e.g.*, such as to the axle with a key/keyway interface, as disclosed by Sclater. (Ex.1017 at 420; Ex.1003, ¶449.)

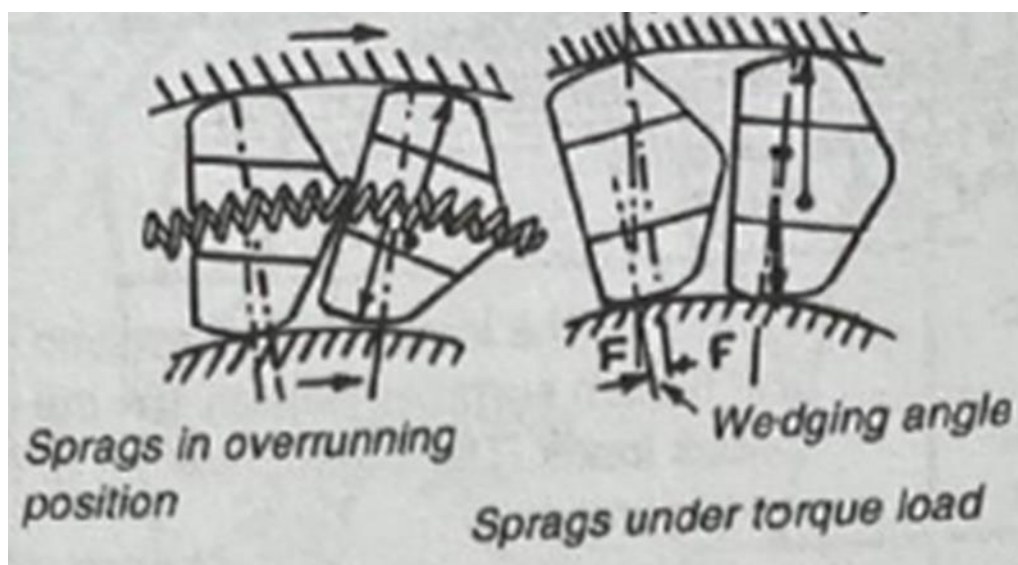


Ex.1017 at 420

With this arrangement, rearward motion of belt 28 would rotate the front/rear roller and inner ring so that the inner ring would overrun and move the sprags out of the locked position. Forward motion of belt 28 would rotate the inner ring the opposite direction and wedge the sprags into the locked position to prevent forward belt motion. (Ex.1003, ¶450.)



Ex.1013, Fig.3



Ex.1017 at 318

A POSA would have been motivated to substitute Sclater's one-way sprag-type bearing for Magid's ratchet-and-pawl one-way mechanism to obtain predictable results, *e.g.*, reduced noise and improved durability. (Ex.1003, ¶¶451.)

4. Dependent Claims 31-34, 38-43, 45-49, and 59

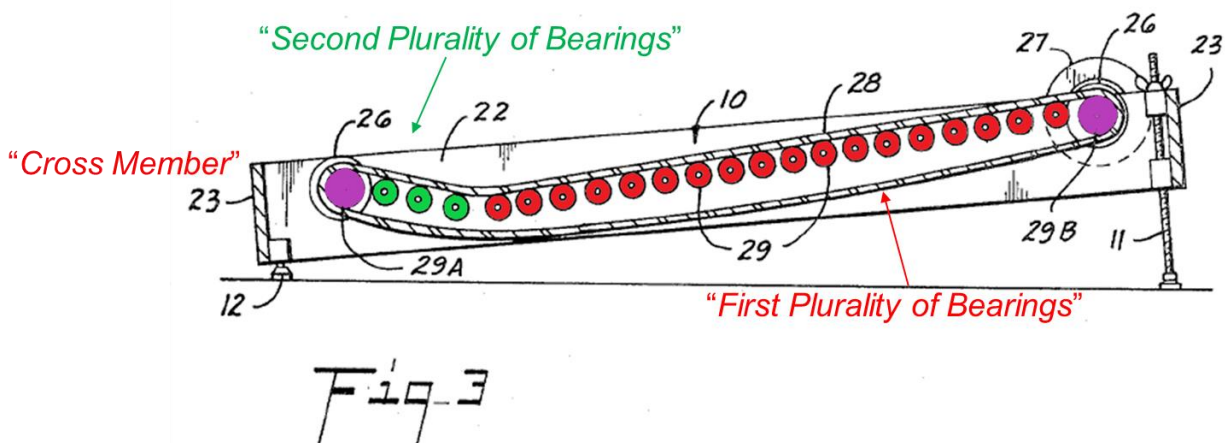
... [31.] [a]/[48.]

Chickering discloses a base 10 having left and right sidewalls 22 and front and rear end walls 23 (“crossmembers”) extending between the left and right

sidewalls 22. (Ex.1003, ¶¶388-390, 421-422.)

[A] base 10 which comprises an inclined rectangular frame having two sidewalls 22 and two end walls 23. The base may be of any suitable material such as wood or metal.

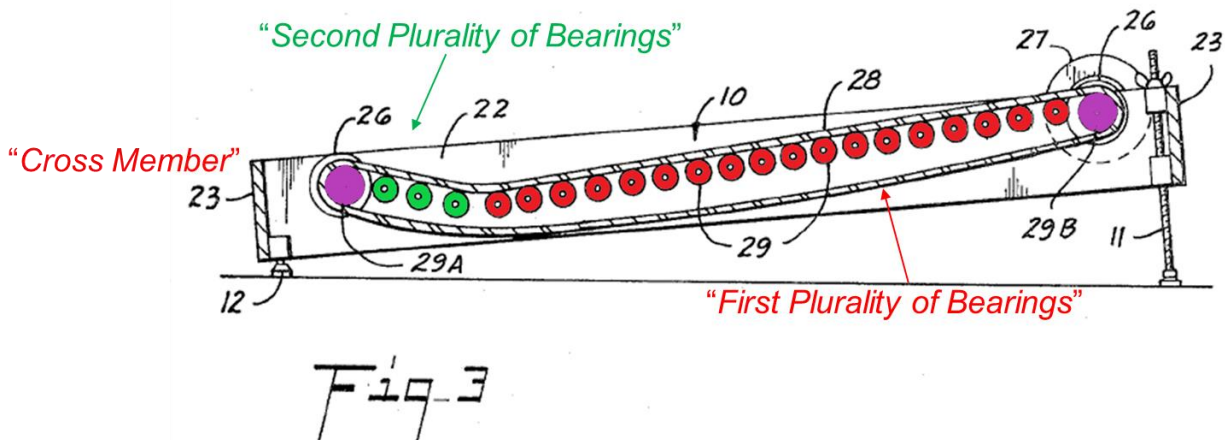
(Ex.1013, 1:66-69; Figs.1 and 3.)



Ex.1013, Fig.3

... [31.][b] / [49.]

Chickering discloses a plurality of rollers 29 (“bearings”) that support the belt 28 and “are provided journaled in the sidewalls 22 of base 10.” (Chickering, Ex.1013, 2:75-3:2.) A POSA would have understood that Chickering’s rollers are at least plain/journal bearings. The rollers 29 include a first group of bearings (red) coupled to the left sidewall and a second group of bearings (green) coupled to the right sidewall. (Ex.1003, ¶¶389-390, 421-422.)



Ex.1013, Fig.3

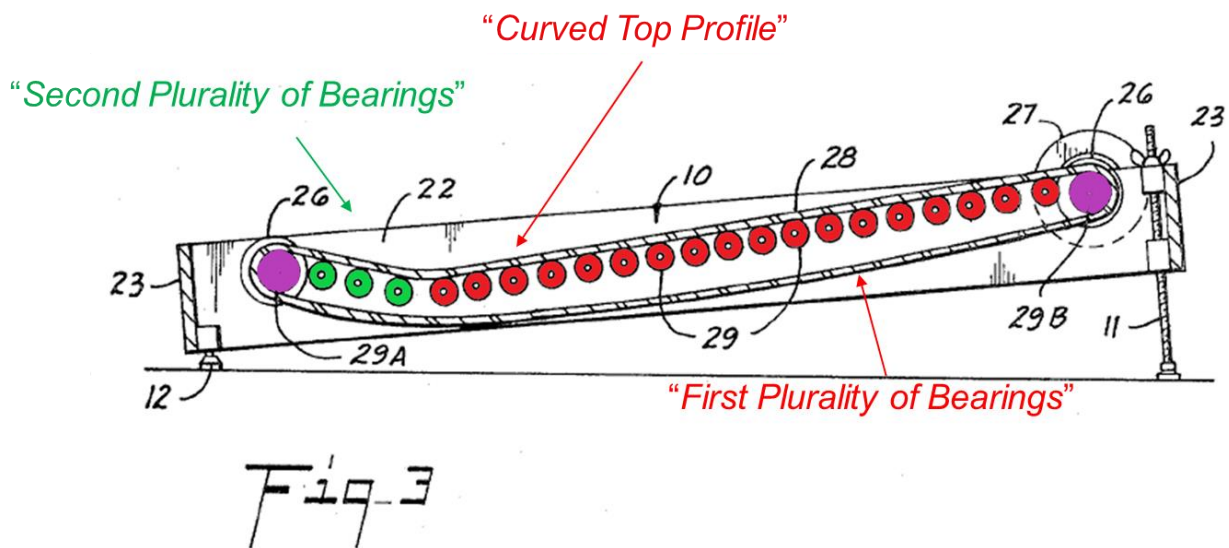
... [32.] / [46.] / [47.]

Chickering discloses that the endless belt 28 (“*running belt*”) is placed about the rollers 29 (“*bearings*”) and follows their curved contour:

Thus, when the endless belt 28 is **placed about the rollers, it follows their contour** and provides a forward accelerating area and a rear decelerating area which are inclined from the horizontal with each being lowest at their point of nearest proximity.

(Ex.1013, 3:6-10.) (Ex.1003, ¶¶391, 418, 419-420.)

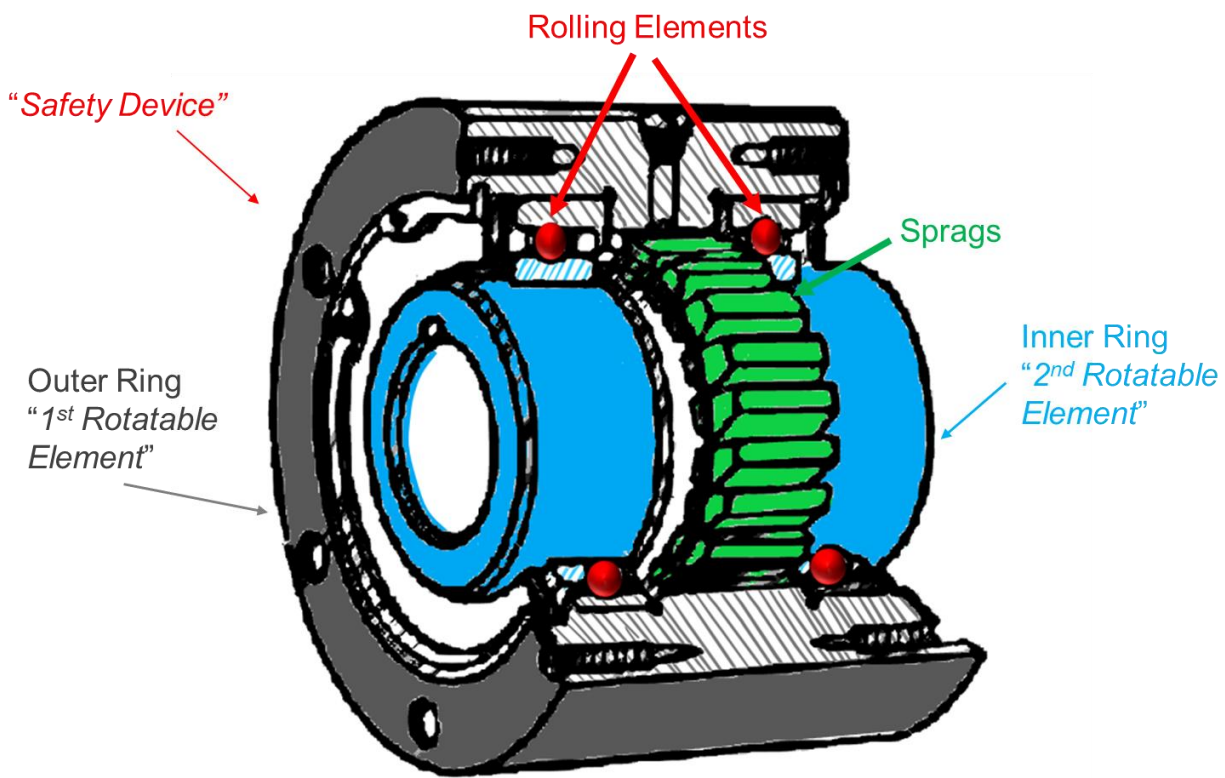
As illustrated below, the upper surfaces of the rollers 29 define a “*top profile*” that engages the belt 28 to form the “*curved running surface.*” The first rollers (red) form a first portion of the “*top profile*” and the second rollers (green) form a second portion of the “*top profile.*” (Ex.1003, ¶392.)



Ex.1013, Fig.3

... [33.]/[38.]

As illustrated in the image below, Sclater discloses that the sprag-type one-way bearing assembly includes an outer ring (“*first rotatable element*”), an inner ring (“*second rotatable element*”), and a plurality of sprags and rolling elements disposed between the inner ring and the outer ring. (Ex.1003, ¶¶394, 411-412.)



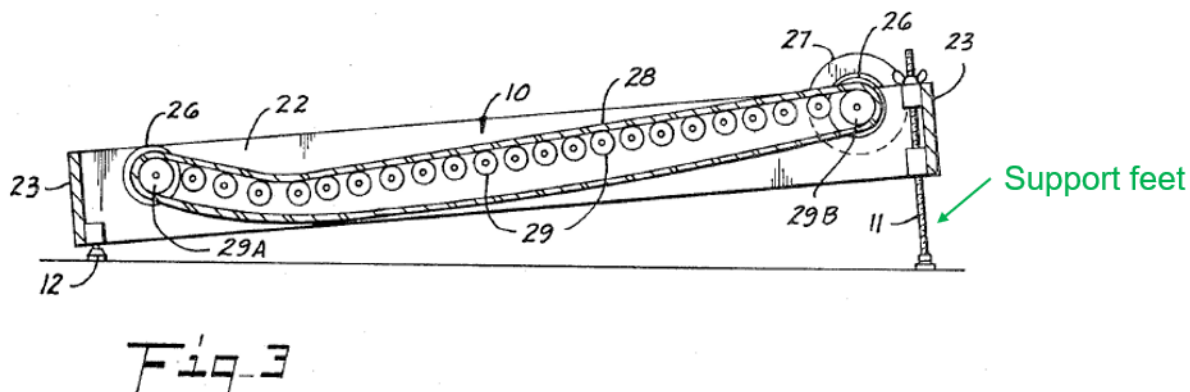
Ex.1017 at 318

Sclater discloses that the inner ring defines a center hole that is sized to receive a shaft and defines a keyway on the inner diameter. The keyway provides means for rotatably coupling the inner ring to a shaft via a key. The inner ring and/or the outer ring of a one-way bearing assembly rotate about a central axis; therefore both rings are "*rotatable elements*." (Ex.1003, ¶¶395-397.)

... [34.]/[45] / [59.]

The Chickering treadmill includes "jackscrews 11 [that] are provided at the forward corners of base 10 for adjusting its angle of inclination. Leveling buttons

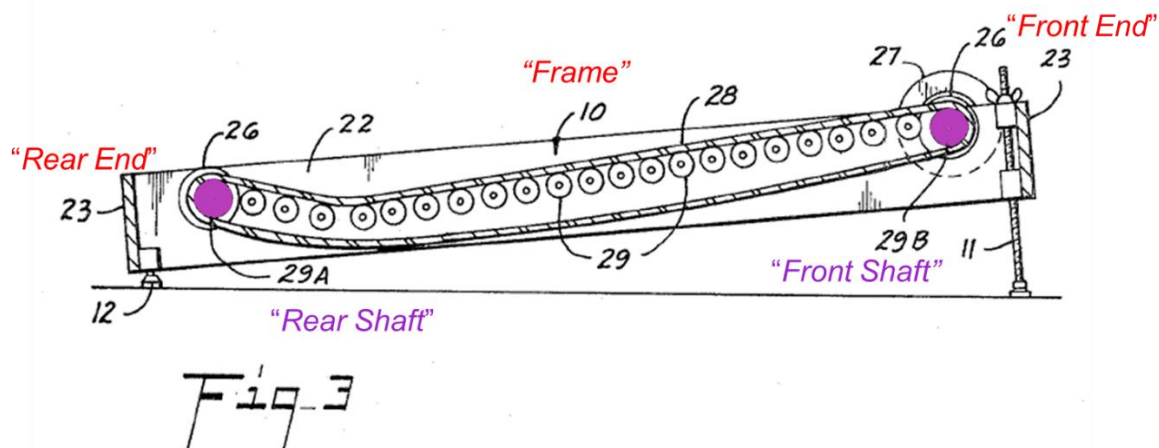
12 may be used on the rear corners to keep the base steady.” (Ex.1013, 1:69-71.) As illustrated in Figure 3, the leveling buttons (“*support feet*”) are attached at the ends of the jackscrews 11 to couple to the base 10 (“*frame*”). (Ex.1003, ¶¶398-400, 415-416, 430-431.)



Ex.1013, Fig.3

... [39.] / [41.]

Chickering discloses front and rear end rollers 29b, 29a (“*front shaft*,” “*rear shaft*”) coupled to a front and rear end of the base 10 (“*frame*”). “When a single belt is used ... it may also be desirable to provide larger end rollers as at 29a and 29b to give a larger turning radius for the belt.” (Ex.1013, 3:11-16; Ex.1003, ¶¶413-414.)



Ex.1013, Fig.3

VIII. Objective Indicia of Nonobviousness

Petitioner is not aware of any evidence of alleged secondary considerations of non-obviousness having nexus to the challenged claims. (Ex.1003, ¶452.)

IX. Discretionary Considerations Favor Institution

A. The *Fintiv* Factors Strongly Favor Institution

The *Fintiv* factors strongly favor institution. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020) (precedential); see June 21, 2022 Memorandum: Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation (“June 2022 Memo”).

Factor 1 is neutral or favors institution. No motion for stay has been filed and the court has not indicated whether it would grant any such motion. Because the Board typically “will not attempt to predict how the district court in the related district court litigation will proceed,” *Sand Revolution II, LLC v. Continental*

Intermodal Group – Trucking LLC, IPR2019-01393, Paper 24 at 7 (P.T.A.B. June 16, 2020) (informative), factor 1 carries little weight here.

Factor 2 strongly favors institution. The co-pending litigation in S.D. California is in its early stages, no trial date has been set, and the median time to trial for civil actions in S.D. California is 45.4 months. (District Court Statistics, Ex.1023 at 69; June 2022 Memo at 3.) Thus, trial would likely occur (if at all) in early 2026—over a year after the projected final decision here. *See Mylan Pharms. Inc. v. Bayer Pharma Aktiengesellschaft*, IPR2022-00517, Paper 15 at 8-9 (P.T.A.B. Aug. 9, 2022) (evaluating median time to trial for factor 2).

Factor 3 strongly favors institution. By institution, neither the parties nor the S.D. California court will have invested significant resources in the litigation. The court has not issued a scheduling order beyond the Markman Hearing, or any substantive rulings (e.g., claim construction, dispositive motion).

Factors 4 and 5 strongly favor institution. Petitioner stipulates that, if the Board institutes this Petition, Petitioner will not raise at trial in parallel litigation any Ground raised here. Petitioner’s stipulation mitigates concerns for duplicating efforts and inconsistent conclusions.

Factor 6 strongly favors institution. The Petition’s merits are strong. (June 2022 Memo at 3-5.) Additionally, under factor 6: (1) the Board is best suited to address the technical issues raised here; (2) a decision on the merits at institution

may aid the parties in resolving their dispute; and (3) determining patentability will benefit the public, providing a complete record and rationale absent from a jury verdict form.

Holistically, the *Fintiv* factors strongly favor institution.

B. The *Advanced Bionics* Factors Favor Institution

Denial under §325(d) is not warranted. Sclater is not cited on the ‘884 Patent. Chickering, Magid, Socwell, Schonenberger, and Skowronski are cited on the ‘884 Patent, however, the combinations of references applied in the petition, were not applied, nor cumulative with, the references applied during Examination.

Examination of the ‘884 Patent focused on the “*safety device*” limitations. The Examiner rejected the “*safety device*” limitations over three different references: Bostic, Magid, and Savettiere. (1012 at 136, 2225, 2235-2236.) The Examiner erred by failing to recognize that the “*safety device*” limitations and subsequent wherein clause were just a verbose way of claiming a conventional sprag-type one way bearing assembly arranged in a backstop mode of operation. Therefore, as explained in Grounds 1-4, the “*safety device*” claims are obvious over a manual treadmill with a curved running surface combined with Sclater’s sprag-type one-way bearing assembly in view of Magid’s one-way clutch that is coupled to a shaft of a treadmill to permit only unidirectional belt movement. (See *e.g.*, Ex. 1003, ¶¶180-215, 371-385, 432-451.)

X. Conclusion

There is a reasonable likelihood that Petitioner will prevail on claims 30-34, 37-54, 57, 59 of the '884 Patent. *Inter partes* review should be instituted for each of these identified claims.

Respectfully submitted,

Dated: April 12, 2023

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Certificate of Service

The undersigned hereby certifies that the foregoing **PETITION FOR INTER PARTES REVIEW UNDER 35 U.S.C. § 311 ET SEQ. AND 37 C.F.R. § 42.100 ET SEQ. (U.S. PATENT NO. 10,561,884)**, including all exhibits and supporting evidence, was served by overnight courier in its entirety on **April 13, 2023**, upon the following correspondence address as shown for the '884 Patent:

26371 - FOLEY & LARDNER LLP 3000 K STREET N.W. SUITE 600 WASHINGTON, DC 20007-5109 UNITED STATES

Respectfully submitted,

Dated: April 12, 2023

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Certificate of Compliance Pursuant to 37 C.F.R. § 42.24

This paper complies with the type-volume limitation of 37 C.F.R. § 42.24. The paper contains 13,856 words, excluding the parts of the paper exempted by §42.24(a).

This paper also complies with the typeface requirements of 37 C.F.R. § 42.6(a)(ii) and the type style requirements of § 42.6(a)(iii)&(iv).

Respectfully submitted,

Dated: April 12, 2023

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Appendix A

A. Listing of All Challenged Claims

[30.0]	30. A manually powered treadmill, comprising:
[30.1]	a frame having a front end and a rear end positioned opposite the front end;
[30.2]	a front shaft coupled to the frame proximate the front end;
[30.3]	a rear shaft coupled to the frame proximate the rear end;
[30.4]	a plurality of bearings coupled to the frame;
[30.5]	a running belt at least partially supported by the plurality of bearings, wherein the running belt comprises a curved running surface; and
[30.6]	a safety device coupled to the frame and the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;
[30.7]	wherein the running belt and one of the first and second rotatable elements of the safety device freely rotate in a first direction of rotation relative to the other of the first and second rotatable elements of the safety device, but interference between the safety device and at least one of the first and second rotatable elements substantially prevents rotation in a second direction of rotation, opposite the first direction of rotation, of the running belt and the one of the first and second rotatable elements relative to the other of the one of the first and second rotatable elements.
[31.]	31. The manually powered treadmill of claim 30, wherein the frame includes a left side member, a right side member, and at least one cross-member extending between the left side member and the right side member, wherein the plurality of bearings includes a first plurality of bearings coupled to a left-side of the frame and a second plurality of bearings coupled to a right-side of the frame.
[32.]	32. The manually powered treadmill of claim 31, wherein the first plurality of bearings and the second plurality of bearings each at least partially define a curved top profile, wherein the curved top profile substantially corresponds to at least a portion of the curved running surface.
[33.]	33. The manually powered treadmill of claim 30, wherein the first and second rotatable elements of the safety device at least partly form a one-way bearing.

[34.]	34. The manually powered treadmill of claim 30, further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to enable an adjustment of the relative vertical incline of at least a portion of the manually powered treadmill in relation to a surface supporting the manually powered treadmill.
[37.0]	37. A manually powered treadmill, comprising:
[37.1]	a frame;
[37.2]	a first plurality of bearings coupled to the frame;
[37.3]	a second plurality of bearings coupled to the frame and spaced a distance from the first plurality of bearings;
[37.4]	a front shaft assembly coupled to the frame;
[37.5]	a rear shaft assembly coupled to the frame;
[37.6]	a running belt at least partially supported by the first plurality of bearings and the second plurality of bearings, the running belt being at least partially disposed about the front and rear shaft assemblies, and comprising a running surface, at least a portion of which is curved; and
[37.7]	a safety device coupled to the frame and the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;
[37.8]	wherein one of the first and second rotatable elements of the safety device and the running belt freely rotate relative to the other of the one of the first and second rotatable elements of the safety device in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, interference between the safety device and at least one of the first rotatable element and the second rotatable element substantially prevents rotation of the running belt and the one of the first and second rotatable elements relative to the other of the one of the first and second rotatable elements.
[38.]	38. The manually powered treadmill of claim 37, wherein the first and second rotatable elements of the safety device at least partly form a one-way bearing.
[39.]	39. The manually powered treadmill of claim 37, wherein the front shaft assembly comprises a front shaft coupled to frame.
[40.]	40. The manually powered treadmill of claim 39, wherein the front shaft assembly comprises at least one front running belt pulley coupled to the front shaft.

[41.]	41. The manually powered treadmill of claim 37, wherein the rear shaft assembly comprises a rear shaft coupled to the frame.
[42.]	42. The manually powered treadmill of claim 41, wherein the rear shaft assembly comprises at least one rear running belt pulley coupled to the rear shaft.
[43.]	43. The manually powered treadmill of claim 37, wherein the rear shaft assembly comprises at least one rear running belt pulley and the front shaft assembly comprises at least one front running belt pulley.
[44.]	44. The manually powered treadmill of claim 43, wherein at least one of the at least one rear running belt pulley and the at least one front running belt pulley are formed from an electrically insulating material.
[45.]	45. The manually powered treadmill of claim 37, further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to enable an adjustment of the relative vertical incline of at least a portion of the manually powered treadmill in relation to a surface supporting the manually powered treadmill.
[46.]	46. The manually powered treadmill of claim 37, wherein the running belt is at least partially supported by the first plurality of bearings and the second plurality of bearings.
[47.]	47. The manually powered treadmill of claim 46, wherein each of the first and second pluralities of bearings define a curved top profile and wherein the curved top profile substantially corresponds to at least a portion of the curved portion of the running surface.
[48.]	48. The manually powered treadmill of claim 37, wherein the frame includes a left side member, a right side member spaced a distance from the left side member, and at least one cross-member extending between the left side member and the right side member.
[49.]	49. The manually powered treadmill of claim 48, wherein the first plurality of bearings are coupled the left side member and the second plurality of bearings are coupled to the right side member.
[50.0]	50. A manually powered treadmill, comprising:
[50.1]	a frame;
[50.2]	at least one front running belt pulley coupled to the frame;
[50.3]	at least one rear running belt pulley coupled to the frame and spaced a distance from the at least one front running belt pulley;
[50.4]	a plurality of bearings coupled to the frame;

[50.5]	a running belt at least partially supported by the plurality of bearings and at least partially supported by at least one of the at least one front running belt pulley and the at least one rear running belt pulley, wherein the running belt includes a running surface, at least a portion of which is curved;
[50.6]	a safety device coupled to the frame and the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;
[50.7]	wherein one of the first and second rotatable elements of the safety device and the running belt freely rotate in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, interference between the safety device and at least one of the first rotatable element and the second rotatable element substantially prevents rotation of the one of the first and second rotatable elements of the safety device and the running belt relative to the frame.
[51.]	51. The manually powered treadmill of claim 50, wherein at least one of the at least one rear running belt pulley and the at least one front running belt pulley are formed from an electrically insulating material.
[52.]	52. The manually powered treadmill of claim 50, further comprising a front shaft coupled to frame, the front shaft being adapted to support the at least one front running belt pulley.
[53.]	53. The manually powered treadmill of claim 50, further comprising a rear shaft coupled to frame, the rear shaft being adapted to support the at least one rear running belt pulley.
[54.]	54. The manually powered treadmill of claim 50, wherein the first and second rotatable elements of the safety device at least partly form a one-way bearing.
[57.0]	57. A method, comprising:
[57.1]	providing a manually powered treadmill, the manually powered treadmill having a frame with a front end and a rear end;
[57.2]	providing a plurality of bearings coupled to the frame, wherein the plurality of bearings define at least a portion of a curved top profile;
[57.3]	disposing a running belt on the plurality of bearings such that the curved top profile of plurality of bearings define at least a portion of a curved running surface of the running belt;

[57.4]	providing a safety device coupled to the frame and to the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;
[57.5]	permitting rotation of one of the first and second rotatable elements of the safety device and the running belt in a first direction of rotation; and
[57.6]	substantially preventing rotation in a second direction, opposite the first direction, of the running belt and the one of the first and second rotatable elements by interference between the safety device and at least one of the first rotatable element and the second rotatable element.
[59.]	59. A method according to claim 57, further comprising providing for the adjustment of the vertical incline of at least a portion of the running surface.

Appendix B

B. Comparison of Independent Claims

[30.0] A manually powered treadmill, comprising:	[37.0] A manually powered treadmill, comprising:	[50.0] A manually powered treadmill, comprising:	[57. 0] A method, comprising: [57.1] [a] providing a manually powered treadmill,
[30.1] a frame having a front end and a rear end positioned opposite the front end;	[37.1] a frame;	[50.1] a frame;	[57.1][b]the manually powered treadmill having a frame with a front end and a rear end;
[30.2] a front shaft coupled to the frame proximate the front end;	[37.4] a front shaft assembly coupled to the frame;	[50.2] at least one front running belt pulley coupled to the frame;	
[30.3] a rear shaft coupled to the frame proximate the rear end;	[37.5] a rear shaft assembly coupled to the frame;	[50.3] at least one rear running belt pulley coupled to the frame and spaced a distance from the at least one front running belt pulley;	
[30.4] a plurality of bearings coupled to the frame;	[37.2] a first plurality of bearings coupled to the frame; [37.3] a second plurality of bearings coupled to the frame and spaced a distance from the first plurality of bearings;	[50.4] a plurality of bearings coupled to the frame;	[57. 2] providing a plurality of bearings coupled to the frame, wherein the plurality of bearings define at least a portion of a curved top profile;

[30.5] a running belt at least partially supported by the plurality of bearings, wherein the running belt comprises a curved running surface; and	[37.6] a running belt at least partially supported by the first plurality of bearings and the second plurality of bearings, the running belt being at least partially disposed about the front and rear shaft assemblies, and comprising a running surface, at least a portion of which is curved; and	[50.5] a running belt at least partially supported by the plurality of bearings and at least partially supported by at least one of the at least one front running belt pulley and the at least one rear running belt pulley, wherein the running belt includes a running surface, at least a portion of which is curved;	[57. 3] disposing a running belt on the plurality of bearings such that the curved top profile of plurality of bearings define at least a portion of a curved running surface of the running belt;
[30.6] a safety device coupled to the frame and the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;	[37.7] a safety device coupled to the frame and the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;	[50.6] a safety device coupled to the frame and the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;	[57. 4] providing a safety device coupled to the frame and to the running belt, the safety device having a first rotatable element and a second rotatable element, wherein at least one of the first and second rotatable elements are adapted for rotation relative to the frame;

[30.7][a] wherein the running belt and one of the first and second rotatable elements of the safety device freely rotate in a first direction of rotation relative to the other of the first and second rotatable elements of the safety device,	[37.8][a] wherein one of the first and second rotatable elements of the safety device and the running belt freely rotate relative to the other of the one of the first and second rotatable elements of the safety device in a first direction of rotation relative to the frame,	[50.7][a] wherein one of the first and second rotatable elements of the safety device and the running belt freely rotate in a first direction of rotation relative to the frame,	[57.5] permitting rotation of one of the first and second rotatable elements of the safety device and the running belt in a first direction of rotation; and
[b]but interference between the safety device and at least one of the first and second rotatable elements substantially prevents rotation in a second direction of rotation, opposite the first direction of rotation, of the running belt and the one of the first and second rotatable elements relative to the other of the one of the first and second rotatable elements.	[b]however, in a second direction of rotation, opposite the first direction of rotation, interference between the safety device and at least one of the first rotatable element and the second rotatable element substantially prevents rotation of the running belt and the one of the first and second rotatable elements relative to the other of the one of the first and second rotatable elements.	[b]however, in a second direction of rotation, opposite the first direction of rotation, interference between the safety device and at least one of the first rotatable element and the second rotatable element substantially prevents rotation of the one of the first and second rotatable elements of the safety device and the running belt relative to the frame.	[57.6] substantially preventing rotation in a second direction, opposite the first direction, of the running belt and the one of the first and second rotatable elements by interference between the safety device and at least one of the first rotatable element and the second rotatable element.

C. Comparison of Dependent Claims

31. [a] The manually powered treadmill of claim 30, wherein the frame includes a left side member, a right side member, and at least one cross-member extending between the left side member and the right side member, [b] wherein the plurality of bearings includes a first plurality of bearings coupled to a left-side of the frame and a second plurality of bearings coupled to a right-side of the frame.	48. The manually powered treadmill of claim 37, wherein the frame includes a left side member, a right side member spaced a distance from the left side member, and at least one cross-member extending between the left side member and the right side member. 49. The manually powered treadmill of claim 48, wherein the first plurality of bearings are coupled the left side member and the second plurality of bearings are coupled to the right side member.		
32. The manually powered treadmill of claim 31, wherein the first	46. The manually powered treadmill of claim 37, wherein the		

plurality of bearings and the second plurality of bearings each at least partially define a curved top profile, wherein the curved top profile substantially corresponds to at least a portion of the curved running surface.	running belt is at least partially supported by the first plurality of bearings and the second plurality of bearings. 47. The manually powered treadmill of claim 46, wherein each of the first and second pluralities of bearings define a curved top profile and wherein the curved top profile substantially corresponds to at least a portion of the curved portion of the running surface.		
33. The manually powered treadmill of claim 30, wherein the first and second rotatable elements of the safety device at least partly form a one-way bearing.	38. The manually powered treadmill of claim 37, wherein the first and second rotatable elements of the safety device at least partly form a one-way bearing.	54. The manually powered treadmill of claim 50, wherein the first and second rotatable elements of the safety device at least partly form a one-way bearing.	
34. The manually	45. The manually		59. A method

powered treadmill of claim 30, further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to enable an adjustment of the relative vertical incline of at least a portion of the manually powered treadmill in relation to a surface supporting the manually powered treadmill.	powered treadmill of claim 37, further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to enable an adjustment of the relative vertical incline of at least a portion of the manually powered treadmill in relation to a surface supporting the manually powered treadmill.		according to claim 57, further comprising providing for the adjustment of the vertical incline of at least a portion of the running surface.
	39. The manually powered treadmill of claim 37, wherein the front shaft assembly comprises a front shaft coupled to frame. 40. The manually powered treadmill of claim 39, wherein the front shaft assembly comprises at least one front running belt pulley coupled to the front shaft. 43.[b]	52.[a] The manually powered treadmill of claim 50, further comprising a front shaft coupled to frame, 52.[b] the front shaft being adapted to support the at least one front running belt pulley.	

	and the front shaft assembly comprises at least one front running belt pulley.		
	41. The manually powered treadmill of claim 37, wherein the rear shaft assembly comprises a rear shaft coupled to the frame. 42. The manually powered treadmill of claim 41, wherein the rear shaft assembly comprises at least one rear running belt pulley coupled to the rear shaft. 43.[a] The manually powered treadmill of claim 37, wherein the rear shaft assembly comprises at least one rear running belt pulley	53.[a] The manually powered treadmill of claim 50, further comprising a rear shaft coupled to frame, 53. [b] the rear shaft being adapted to support the at least one rear running belt pulley.	
	44. The manually powered treadmill of claim 43, wherein at least one of the at least one rear running belt pulley and the	51. The manually powered treadmill of claim 50, wherein at least one of the at least one rear running belt pulley and the	

	at least one front running belt pulley are formed from an electrically insulating material.	at least one front running belt pulley are formed from an electrically insulating material.	