

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. 10,799,745 to Bayerlein et al.

Case No.: IPR2023-00849

**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. 10,799,745)**

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List of Exhibits

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1001	U.S. Patent No. 10,799,745 (“the ‘745 Patent”)
1002	U.S. Patent No. 10,799,745 File History (“the ‘745 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”)

Exhibit #	Description
1019	Standard Specification for Motorized Treadmills, (ASTM, 2005) (“ASTM Standard”)
1020	Stationary Training Equipment – Part 6: Treadmills, additional specific safety requirements and test methods. (ISO, 2005) (“ISO Standard”)
1021	U.S. Patent No. 8,986,169 File History (“the ‘169 Patent File History”)
1022	Responsive Claim Constructions, <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 January 5, 2022
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	U.S. Patent No. 10,561,884 File History (“the ‘884 File History”)
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, Inc., v. LifeCORE Fitness, Inc. d/b/a Assault Fitness*, Case No. 3:22-cv-00492 (S.D. Cal.), served April 13, 2022. The ‘745 Patent is being asserted in this proceeding, along with three other patents within the same family: U.S. 9,039,580, U.S. 10,561,884, 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).

Concurrently filed related petitions include: IPR2023-00836 and IPR2023-00843.

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

The Petitioner identifies the following lead and back-up counsel:

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Pursuant to 37 C.F.R. § 42.10(b), 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:
LCF114IPR@brookskushman.com.

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 1, 4, 7-12, 14, 17-18, and 20-27 of U.S. Patent No. 10,799,745 (“the ‘745 Patent”; attached as Ex.1001) through this Petition. The Declaration of Dr. Robert Giachetti in support of this Petition, is filed as Exhibit 1003.

The ‘745 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 ‘745 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.)

Grounds 1 and 2 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.

Ground 3 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 '745 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 1, 4, 7-12, 14, 17-18, and 20-27 of the '745 Patent and requests that the Patent Trial and Appeal Board ("PTAB") cancel those claims as unpatentable.

C. Prior Art Relied Upon

The '745 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):

- Socwell – US 5,897,461 (Ex.1011) issued April 27, 1999
- Schonenberger – US 4,614,337 (Ex.1010) issued September 30, 1986
- Magid – US 5,538,489 (Ex.1012) issued July 23, 1996
- Sclater – Mechanisms and Mechanical Devices Sourcebook 3rd Edition, McGraw-Hill (2001) (Ex.1017)

Socwell and Schonenberger are cited on the '745 Patent, but were not

applied during prosecution. Magid is not cited, but other patents to Magid are cited. Sclater is not cited on the '745 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	Basis²	References	Claims Challenged
1	§ 103	Schonenberger, Socwell, Magid, and Sclater	1, 4, 7-12, 14, 17-18, and 20-27
2	§ 103	Schonenberger, Socwell, Magid, and Sclater	1, 4, 7-12, 14, 17-18, and 20-27
3	§ 103	Socwell, Magid, and Sclater	1, 4, 7-12, 14, 17-18, and 20-25

There is a reasonable likelihood that at least one Challenged Claim is unpatentable as explained herein. Petitioner requests review of the Challenged Claims, and judgment finding them unpatentable.

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

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

A person of ordinary skill in the art (POSA) of the '745 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 '745 Patent

A. Effective Filing Date

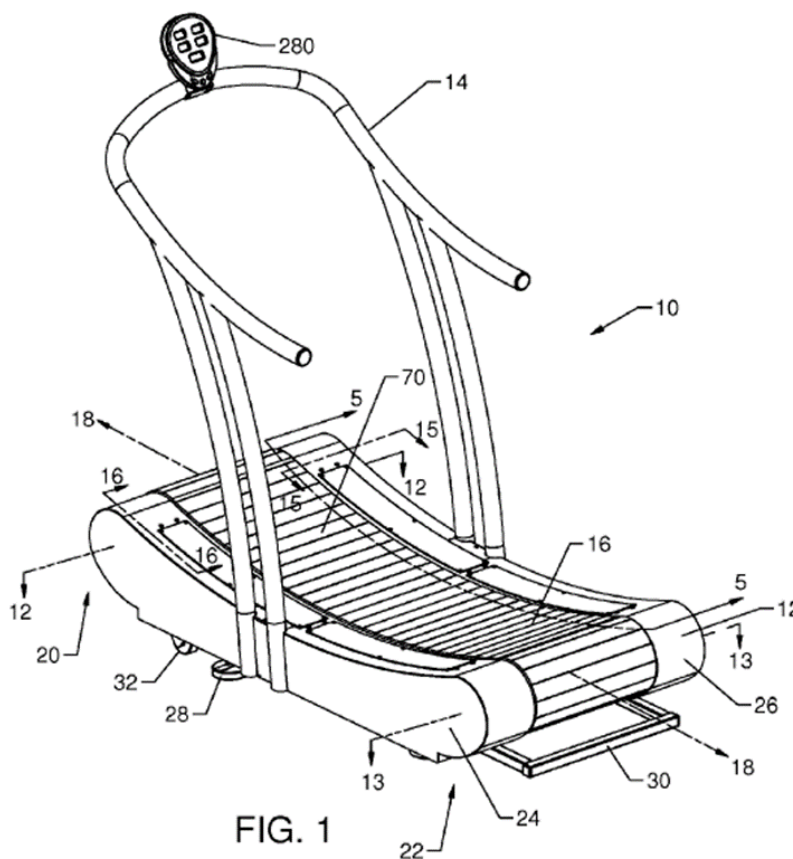
The '745 Patent matured from U.S. Application 16/792,426 filed Feb. 17, 2020. The '745 Patent is part of a patent family that claims priority back to Provisional application No. 61/161,027, which was filed on March 17, 2009. A graphic of the '745 Patent Family is provided below, with the '745 Patent highlighted in yellow and the related asserted patents shaded in gray. (Ex.1003, ¶99.)

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 US11,465,005-11OCT202

The '745 Patent Family

B. Overview

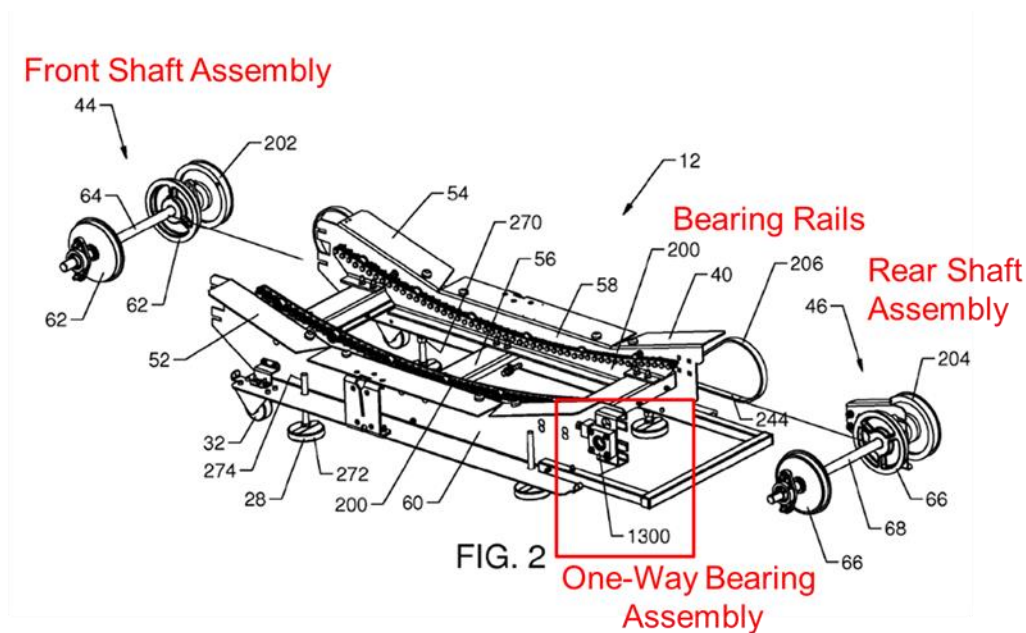
The '745 Patent relates generally treadmills and mechanisms for controlling the motion of a running belt of the treadmill. (Ex.1001, Abstract.) With reference to Figure 1, the '745 Patent discloses a manual treadmill 10 with “a running belt 16 that extends substantially longitudinally along a longitudinal axis 18” of a base 12. (Ex.1001, 4:52-54.)



Ex.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 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.” (Ex.1001, 11:50-52.)



Ex.1001, Fig.2

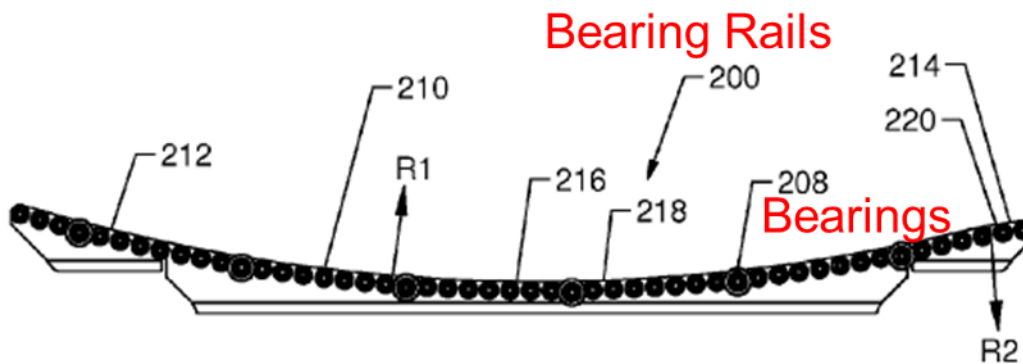


FIG. 9

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 ‘745 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.) Although the ‘745 Patent does not show the sprags, it states that each sprag has an “asymmetric” shape to “provide for motion in one direction and prevent rotation in the opposite direction.” (*Id.*, 27:29-30.) 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.)

One-Way Bearing Assembly

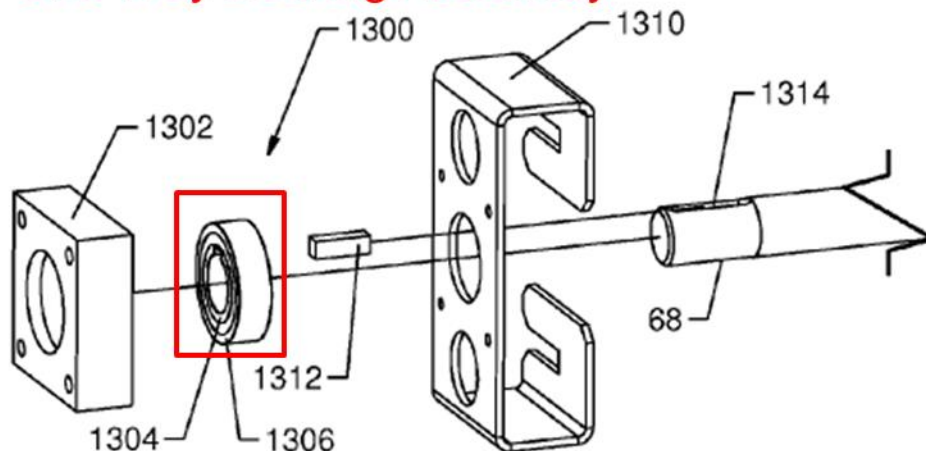


FIG. 36

Ex.1001, Fig.36

Independent claims 1, 10, 18 and 21 of the '745 Patent are directed to a common treadmill topology that includes a belt supported by rotatable elements, *e.g.*, bearings or pulleys, to provide a curved running surface. The running belt is disposed about rotatable front and rear shafts and constrained by a safety device so that it moves in only one direction. Independent claim 1 is representative and reproduced below:

1. A treadmill, comprising:
 - a frame;
 - a front running belt pulley coupled to the frame;
 - a rear running belt pulley coupled to the frame and spaced a distance from the front running belt pulley;
 - a plurality of bearings coupled to the frame;

a running belt at least partially supported by at least one of the front running belt pulley and the rear running belt pulley, wherein the running belt includes a running surface, at least **a portion of which is curved;**

a support element coupled to the frame; and

a safety device coupled to the running belt, the safety device at least partially supported by the support element, wherein the safety device includes a first safety race element and a second safety race element, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;

wherein **one of the first and second safety race elements and the running belt freely rotates in a first direction** of rotation relative to the frame, **however, in a second direction** of rotation, opposite the first direction of rotation, **the one of the first and second safety race elements is substantially prevented from rotation relative to the frame** to substantially prevent rotation of the running belt relative to the frame.

The technology of the challenged independent claims of the '745 Patent was old and well-known in the art by March 2009. The treadmill topology of claims 1, 10, 18, and 21 is a straightforward treadmill with a curved running surface. This topology has existed for human exercise since at least 1917. (See e.g., Schmidt, Ex.1009, Fig.1.) The use of shaft assemblies with pulleys to support a treadmill

belt is also old and well known. (See e.g., Schonenberger, Ex.1010, Fig.7; Ex.1003, ¶96.)

The need to limit the motion of the treadmill belt motion for user stability and safety was also well known. (See, e.g., Chickering, Ex.1013, 1:24-39; Socwell, Ex.1011, 1:28-41; ASTM Standard, Ex.1019 at 3-4.) Further, using one-way clutches to limit treadmill belt motion to one direction dates back to at least 1996. (See e.g., Magid, Ex.1012, 4:46-59, Fig.5.) And sprag-type one-way bearings that includes two race elements, where one race element “*substantially surrounds*” the other race element were well-known and commercially available for exercise equipment since at least 2001. (Emerson, Ex.1018 at 52-53.)

The dependent claims add common features, e.g., key-keyway interfaces (claim 27), one-way bearings (claims 4, 12, 25), cross-members (claim 9), elevation adjustment structures (claim 8), and manual operation (claims 7, 11, 20).

C. Prosecution History

U.S. Patent Application No. 16/792,426 was filed on February 17, 2020 with a request for accelerated examination under Track 1. (‘745 File History, Ex. 1002 at 2-103.) The application was filed with 30 claims, including independent claims 1, 12, 21, and 24. (*Id.* at 63-67.) The “*safety device*” limitations of independent claim 1, and dependent claim 15 are reproduced below:

a safety device coupled to the running belt, the safety device at least partially supported by the support element, wherein the running belt freely rotates in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, engagement between the support element and at least a portion of the safety device substantially prevents rotation [sic] the running belt relative to the frame.

(*Id.* at 63.)

wherein one of the first and second safety elements surrounds or substantially surrounds the other of the first and safety second elements.

(*Id.* at 65.)

On May 22, 2020, the Examiner issued a non-final office action rejecting claims 1-14, 16-17, and 20-30 as obvious over US 5,492,517 to Bostic, US 3,642,279 to Cutter (Ex. 1014) and US 5,607,376 to Magid (“Magid ‘376”). Magid ‘376 is related to Magid (Ex. 1012). (*Id.* at 151.) The Examiner relied on Magid’s disclosure for satisfying the “*safety device*” limitations. (*Id.* at 152.) The Examiner also rejected claim 15 as obvious over Bostic, Cutter, and Magid ‘376 as applied to independent claim 12, and further in view of US 2,512,911 to Benice. (*Id.* at 157.)

On August 24, 2020, Patent Owner filed a response with significant amendments to the “*safety device*” limitations. (*Id.* at 219-224.) For example, claim 1 was amended to require “*wherein one of the first and second safety race elements*

substantially surrounds the other one of the first and second safety race element.” (*Id.* at 219.) Patent Owner argued that Benice’s disclosure of a ratchet clutch does not teach the claimed “*race*” limitations of the safety device. (*Id.* at 215-216.)

On August 28, 2020 The Examiner issued a notice of allowance, stating that “the cited references do not disclose a treadmill as claimed, and in particular having the newly added limitations of a safety device having first and second race elements, one of which surrounds the other, the safety device permitting rotation in a first direction and preventing rotation in a second direction.” *Id.* at 233.

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. (*See* 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 Ground 2 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.1026 at 243; 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, 10, 18, and 21. (See Ex.1028 at 6-7.) Regardless, the cited art teaches both constructions.

B. “*safety device*”

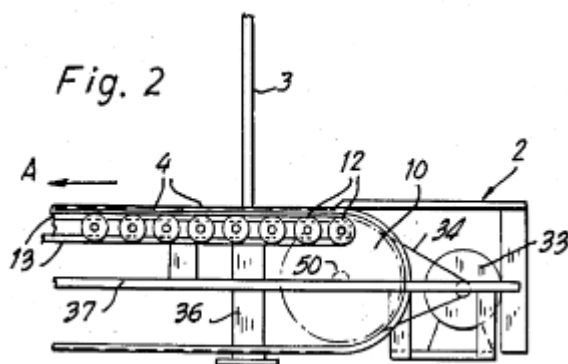
Patent Owner proposed construing the term “*safety device*” as a “device that permits movement in only one direction” in the related litigation. (Ex.1022 at 5.) Petitioner proposes that “*safety device*,” as recited in claims 1, 4, 12, 21, and 25 be construed as a “device having two ring-shaped components.” (*Id.*) Regardless, the cited art teaches both constructions.

C. “*shaft*”

Petitioner asserts “*shaft*,” as recited in claim 23, should be construed to mean “a rotating element used to transmit power from one part to another” while

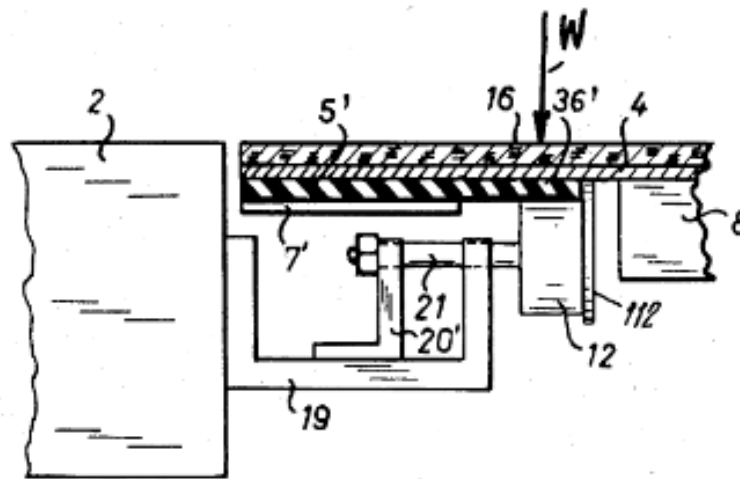
VI. Prior Art Overview

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, ¶¶122-124.)



Ex.1010, Fig.10

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

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

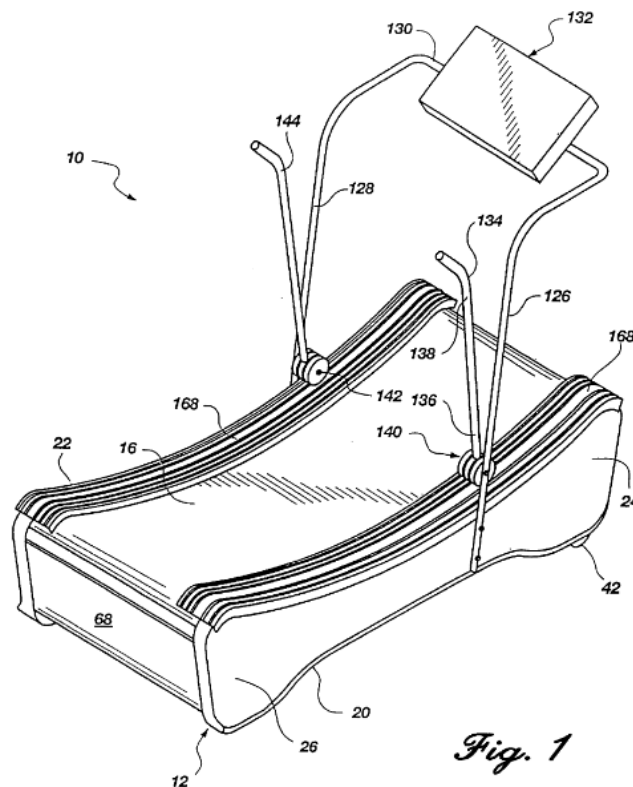
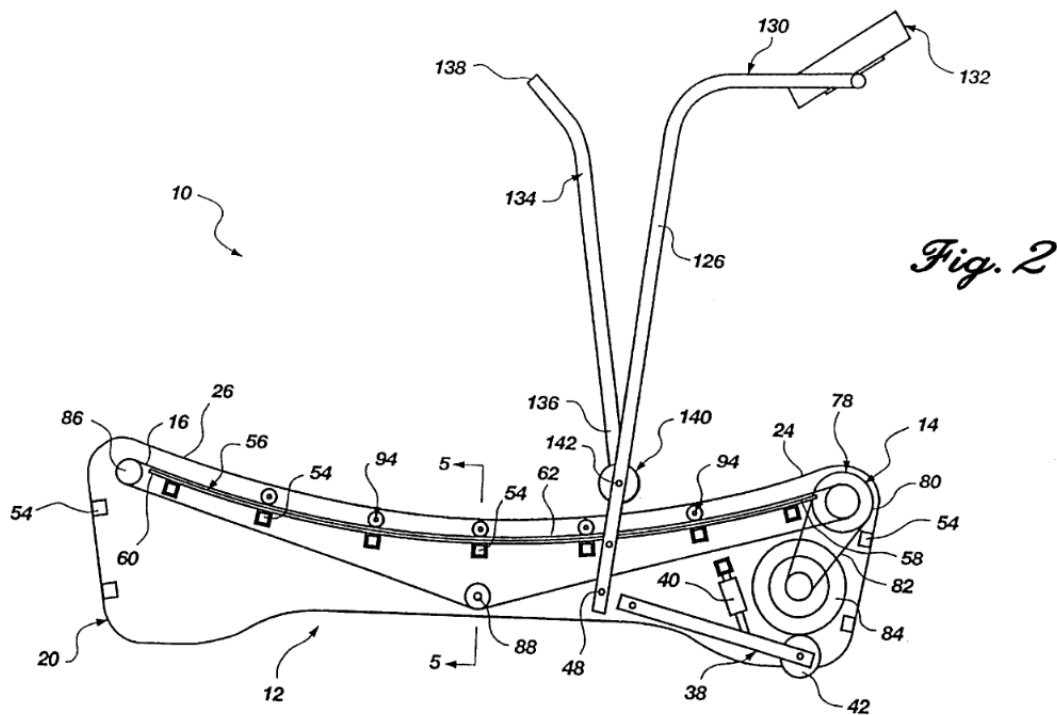


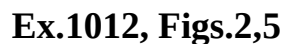
Fig. 1

Ex.1011, Fig.1

The belt is looped around front and rear rollers, is supported by a curved deck, and is maintained in the curved shape by upper rollers positioned along the left and right sides of the belt in conjunction with a curved deck. (Ex.1011, 3:30-36, 5:20-44, 7:31-42, 10:17-31.) The rollers are arranged curvilinearly to match the belt curvature.

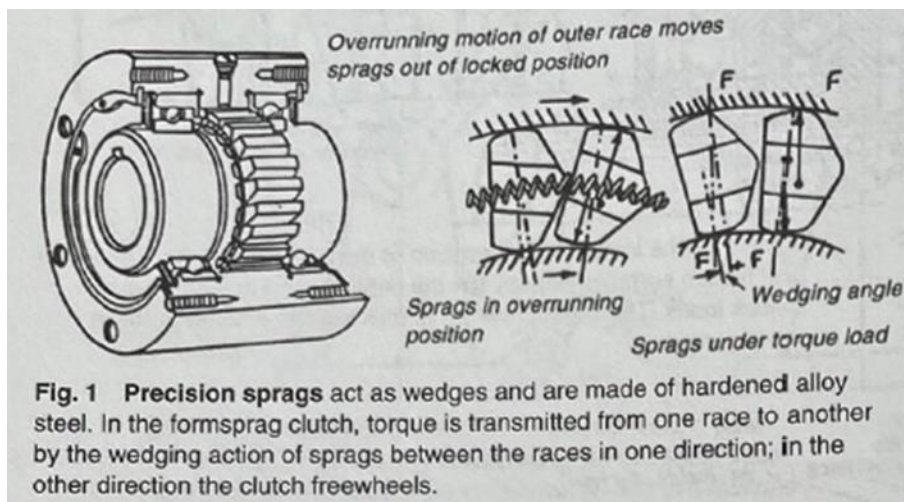


Magid discloses a manual treadmill with a belt supported by a plurality of rollers or a flat bearing surface. (Ex.1012, Figs.8, 1.) Magid also discloses a one-way clutch with a ratchet-and-pawl mechanism coupled to a front shaft or a rear shaft to permit only unidirectional belt movement. (Ex.1012, Fig.5, 4:46-59; Ex.1003, ¶¶112-113.)



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, ¶¶114-116.)

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 1, 4, 7-12, 14, 17-18, and 20-27 are obvious over Schonenberger, Socwell, Magid, and Sclater

1. Independent claims 1, 10, 18, and 21³

... [1.0]/[10.0]/[21.0] *A treadmill, comprising:*

... [18.0] *A method comprising: [18.1][a] providing a treadmill*

Schonenberger discloses a “physical exercise apparatus” and notes that “[s]uch apparatus, often referred to as ‘treadmills’, are suitable for physical exercise and training in sports and physical conditioning; and for physical rehabilitation after accident or disease have stricken a user.” (Ex.1010, 1:17-22.) (Ex.1003, ¶¶126, 216, 260; ¶242.)

³ Appendix A includes a listing of all challenged claims and Appendix B includes a table comparing claims that are treated together.

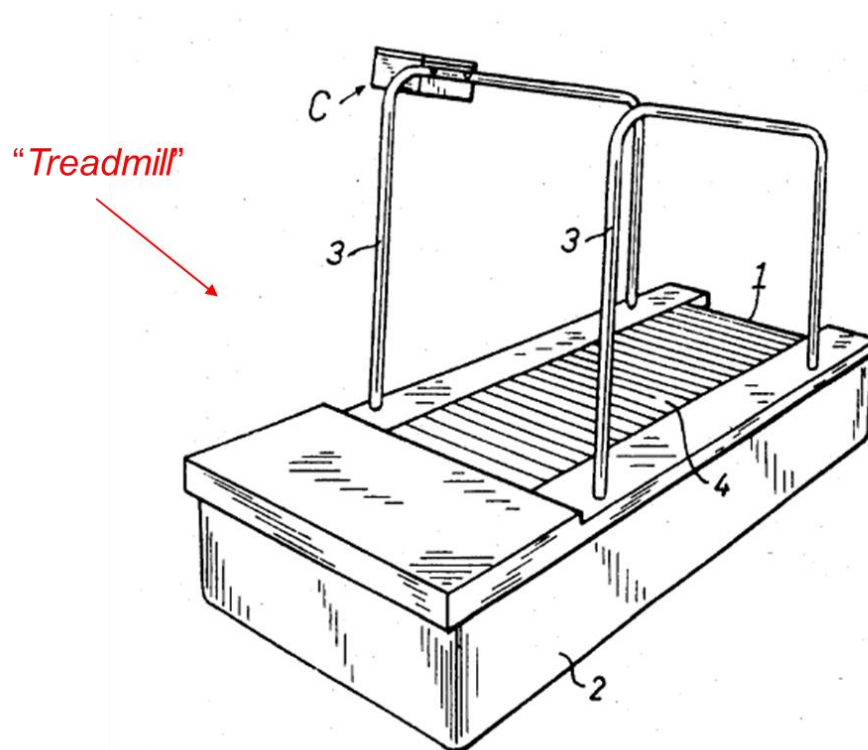


Fig. 1

Ex.1010, Fig.1

... [1.1]/[10.1]/[21.1] a frame;

... [18.1] [b] 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, Schonenberger discloses that the housing 2 (“frame”) includes “a front end and a rear end.” (Ex.1003, ¶¶127, 217, 259, ¶¶246-247.)

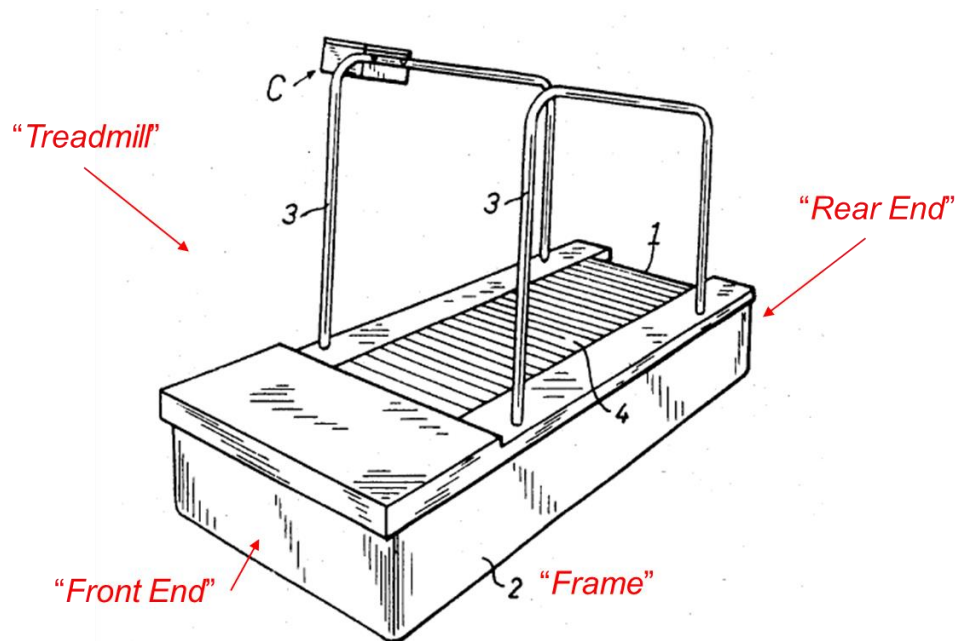


Fig. 1

Ex.1010, Fig.1

... [1.2] a front running belt pulley coupled to the frame;

... [1.3] a rear running belt pulley coupled to the frame and spaced a distance from the front running belt pulley;

... [10.2]/[21.2] a rotatable element coupled to the frame;

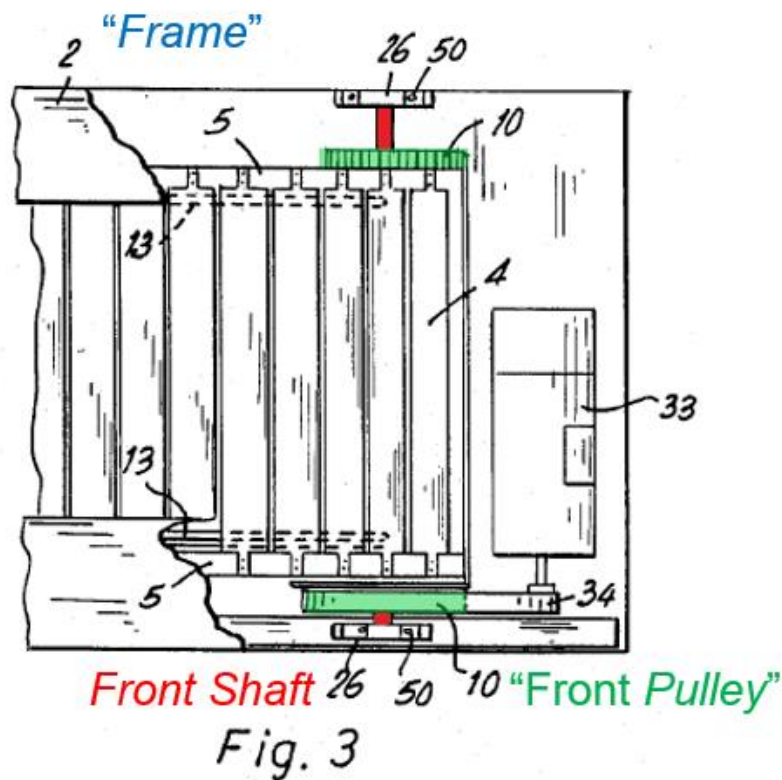
Schonenberger discloses a front shaft assembly that includes “rotatable elements, preferably in the form of two operating drums or rollers [or pulleys] 10, [that] are suitably journaled in the frame as seen at 50.” (Ex.1010, 4:17-20; Ex.1003, ¶¶129-131, 132-133, 218-222, 260.)

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, 4:14-23.)

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).

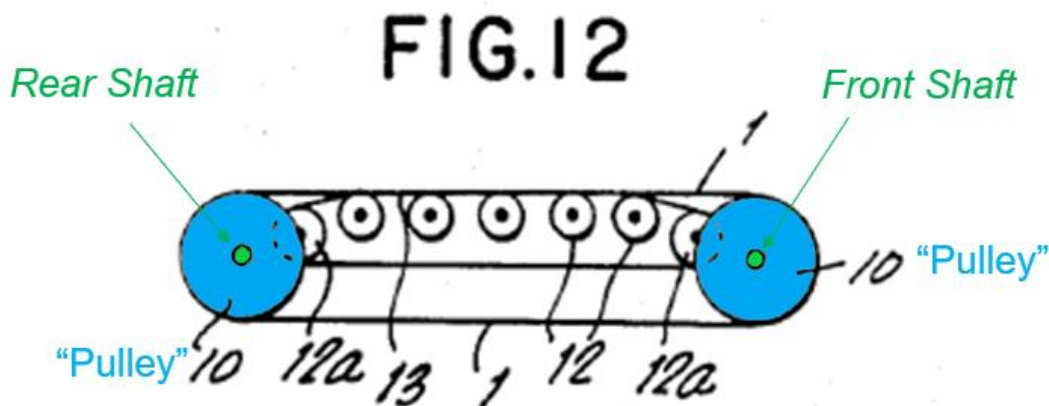
(Ex.1010, 9:31-35.)



Ex.1010, Fig.3

Schonenberger illustrates the pair of front pulleys 10 interconnected by a **transverse shaft 26** that extends between the left and right sides of the frame proximate the front end. The shaft 26 is journaled to the frame 2 by mounts 50, as shown in Figure 3. A journal or sleeve bearing is a plain bearing in which a journal shaft rotates.

Schonenberger discloses that the transverse shaft 26 and pulleys 10 are located “at either end of the apparatus.” (Ex.1010, 4:14-23.) As shown below in Figure 12, the front and rear pulleys are spaced apart.



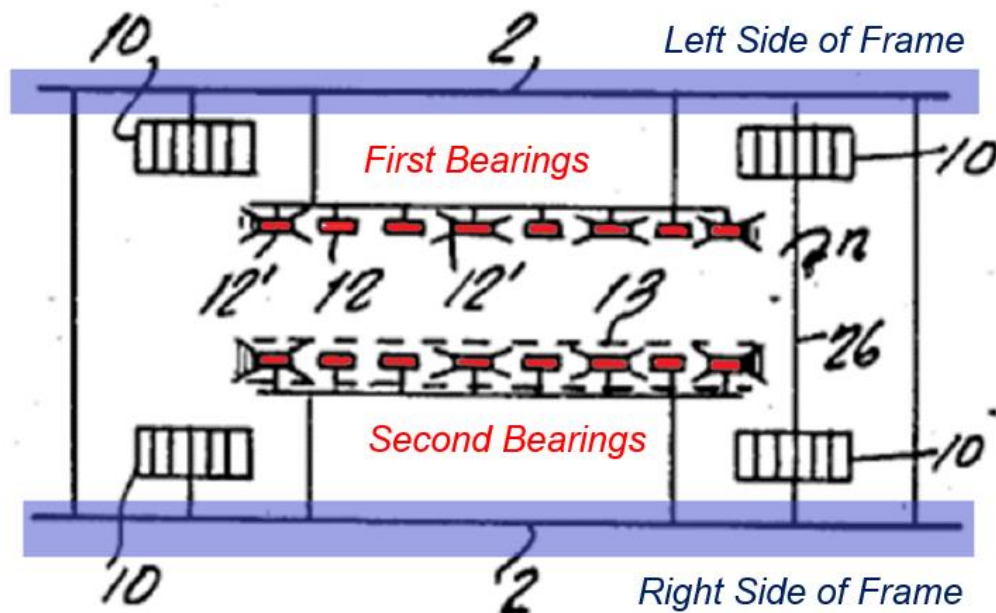
Ex.1010, Fig.12

A POSA would have understood that the pulleys 10 and the shafts 26 are both “rotatable elements.” (Ex. 1003, ¶ 218.)

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

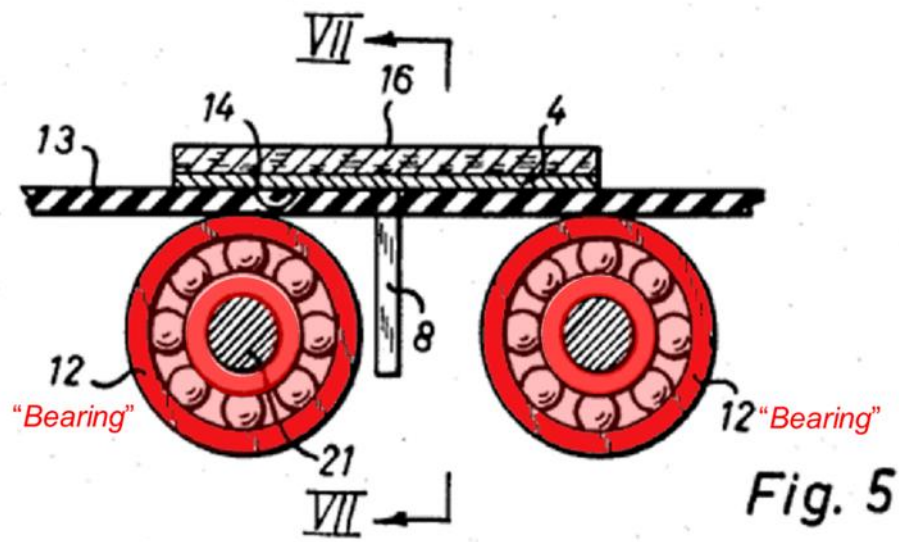
... [18.2][A] providing a plurality of bearings coupled to the frame,

Schonenberger discloses a plurality of rollers 12, 12’ (“bearings”), that support and guide the movable surface 1. (Ex.1010, 4:67-5:05, 5:47-51; Ex. 1003, 134.) The rollers 12, 12’ are provided on both the left and right sides of the frame.



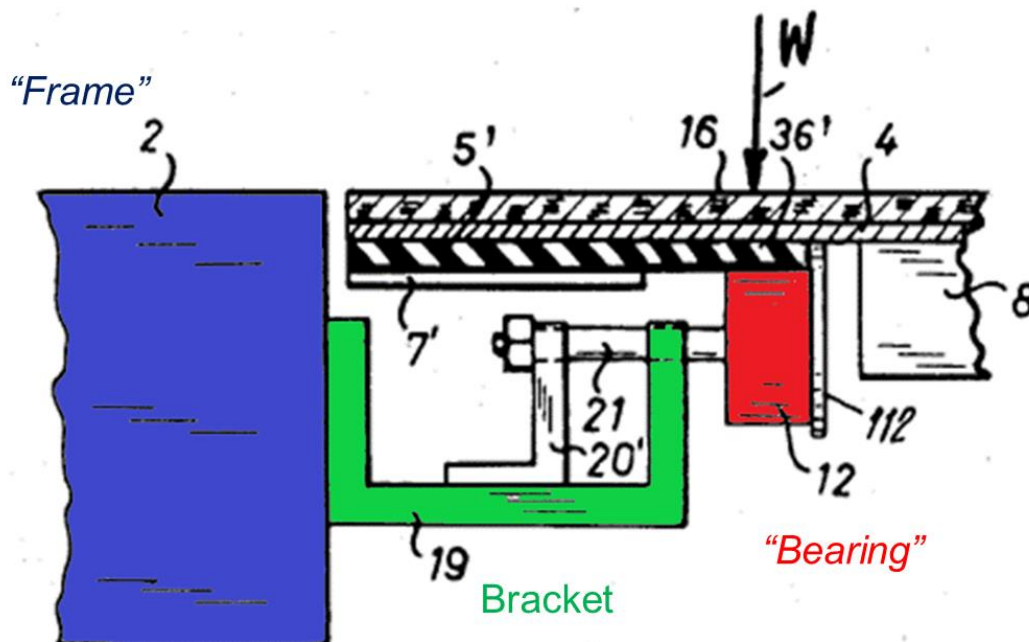
Ex.1010, Fig.19

Figure 5 shows a conventional ball-bearing construction with each roller 12 having an inner race received on the shafts 21, an outer race supporting the movable surface (slats 4), and spherical bearing elements (balls) radially interposed between the inner and outer races. (Ex. 1003, ¶136.)



Ex.1010, Fig.5

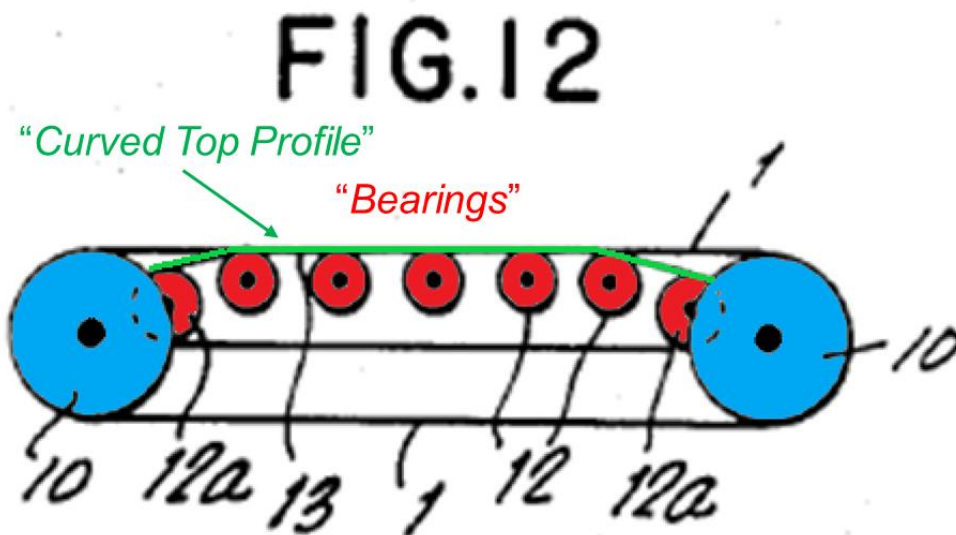
The rollers 12, 12' ("plurality of bearings") are "coupled to the frame" by a bracket 19. (Ex.1010, 8:45-51.)



Ex.1010, Fig.10

... [18.2][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, ¶¶ 246-247.)



Ex.1010, Fig.12

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

... [10.3]/[21.3] a running belt at least partially supported by the rotatable element, wherein the running belt includes a running surface, at least a portion of which is curved; and

[18.3] disposing a running belt on the plurality of bearings such that the curved top profile of the 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”). The movable surface 1 is formed of a plurality of individual slats 4 that are secured to a belt 5, 5’. (Ex.1010, 4:38-41, *see also* 8:34-44.) Each of the slats 4 is covered with a cushioning material or cover 16 that forms the running surface. (Ex.1010, 4:57-66.) The movable surface 1 (“running belt”) is supported by the pulleys 10. (Ex.1010, 2:6-9, 4:10-17, Fig.12; Ex.1003, ¶¶139-144.)

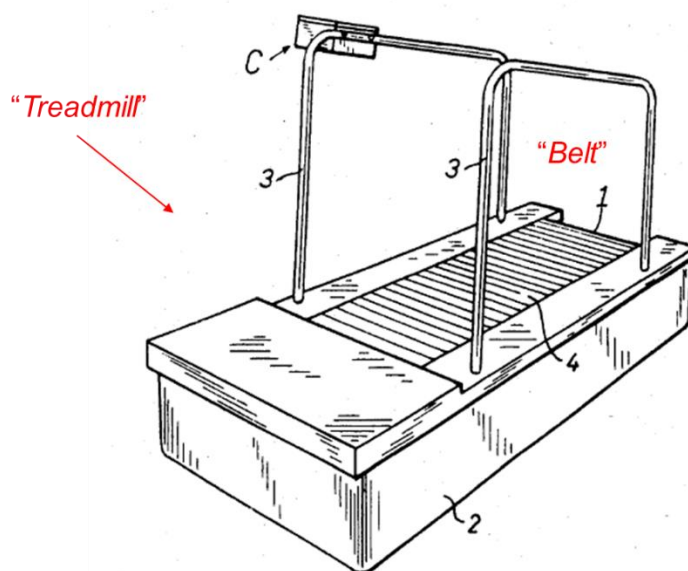
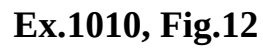


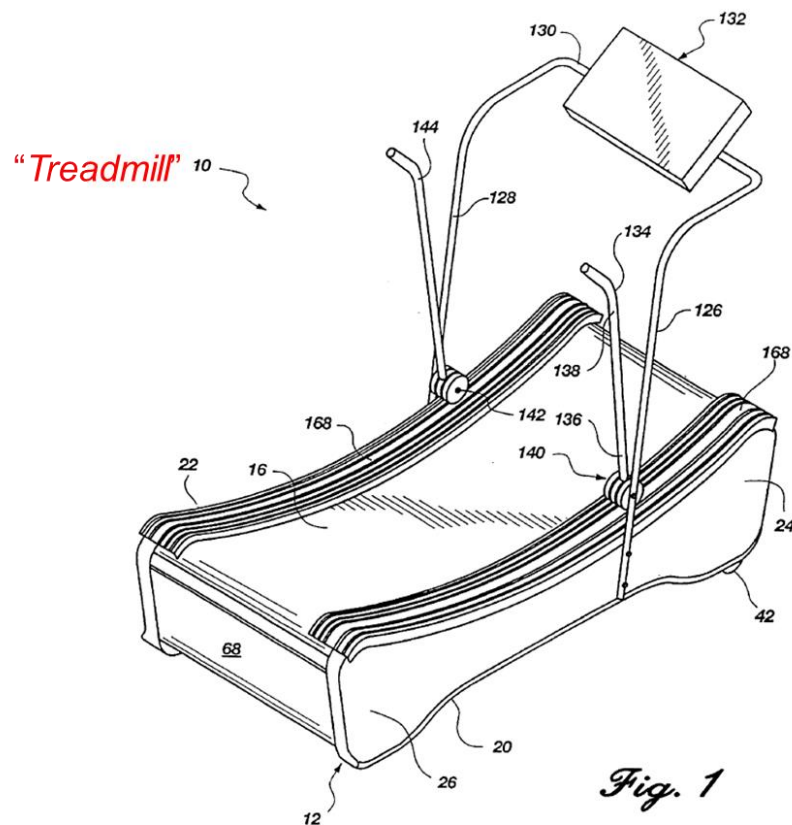
Fig. 1

Ex.1010, Fig.1

[illegible]

Ex.1010, Fig.10

Socwell discloses a “novel curved deck treadmill” which provides a structurally supported arcuate shaped, moveable surface on which a user may exercise.” (Ex.1011, 3:25-29; Ex.1003, ¶145.)



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, ¶146.)

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, ¶148.)

Schonenberger and Socwell are from the same field – manual treadmills for exercise. (Ex.1011, 1:10-12; Ex.1010, 1:63-68.) 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; 8:7-27, Fig.3; Ex.1003, ¶149.)

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

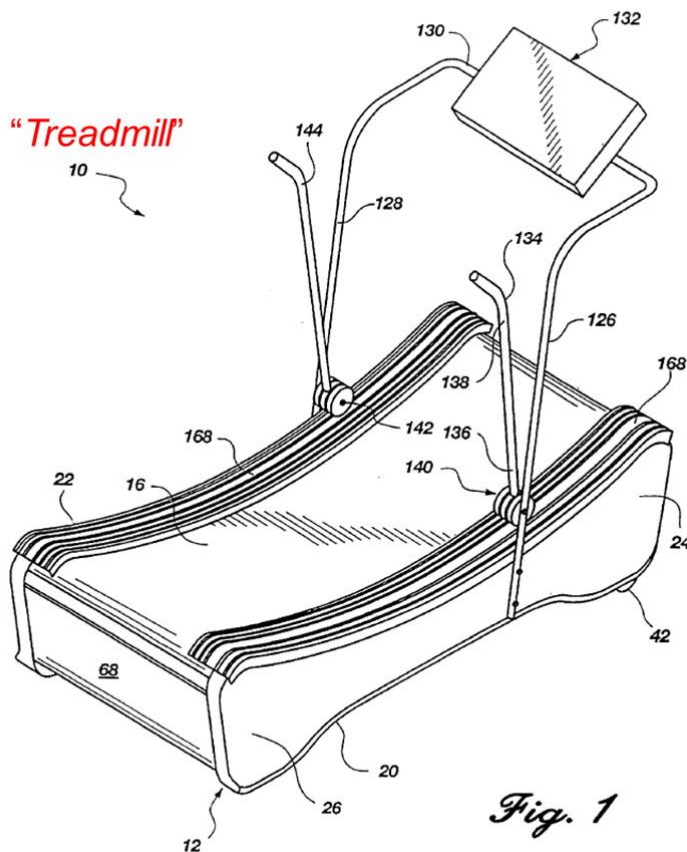
Another meaningful disadvantage of exercise treadmills of the prior art is the inherent danger associated with users tending to fall off the back end of the treadmill and become injured.

(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 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, ¶151.)

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, ¶152.)

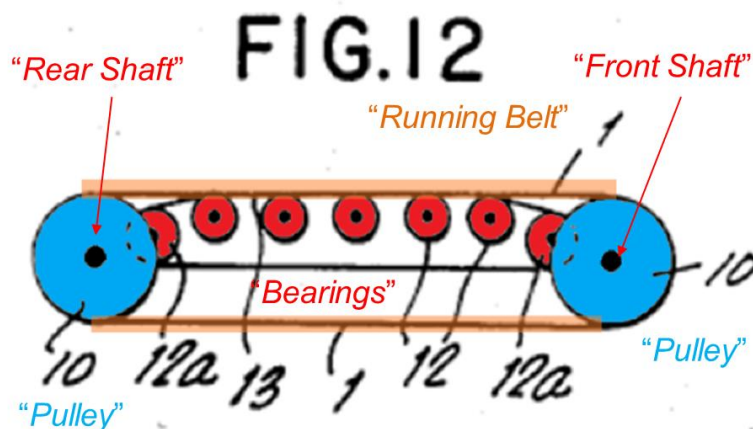


Ex.1011, Fig.1

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,

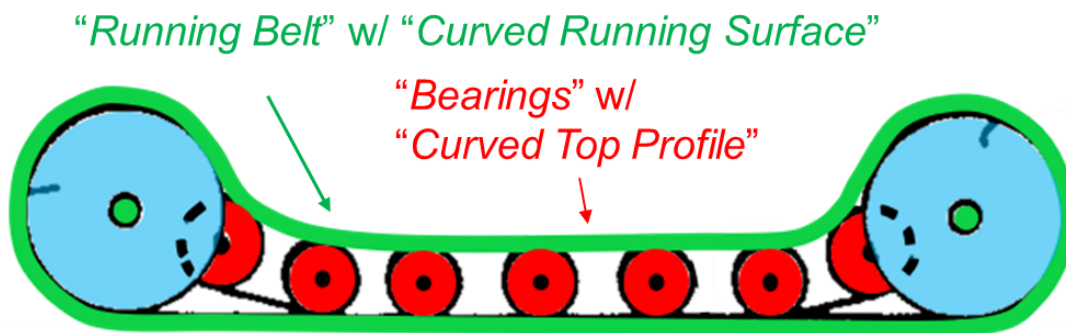
thereby facilitating an upper surface which supportably provides for a longer stride with more flexibility.” (Ex.1011, 13:43-47.) Thus, a POSA would have understood that modifying the movable surface 1 of Schonenberger to provide a curved running surface would result in not only a more comfortable treadmill 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, ¶153.)

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. (Ex.1011, 10:5-12.) 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. For example, Schonenberger discloses arranging the rollers 12 along a curved profile such that the end rollers 12 adjacent to the pulleys 10 are located lower than the central rollers 12 to accommodate the path of movable surface 1. (Ex.1003, ¶154; Ex.1010, 7:37-41, Fig.12.)



Ex.1010, Fig.12

Since the movable surface 1 (“running belt”) follows the profile defined by the rollers 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. (Ex.1003, ¶155.)



Ex.1010, Fig.12

The movable surface 1 of Schonenberger is comprised of individual slats 4 that are heavy, 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, ¶156.)

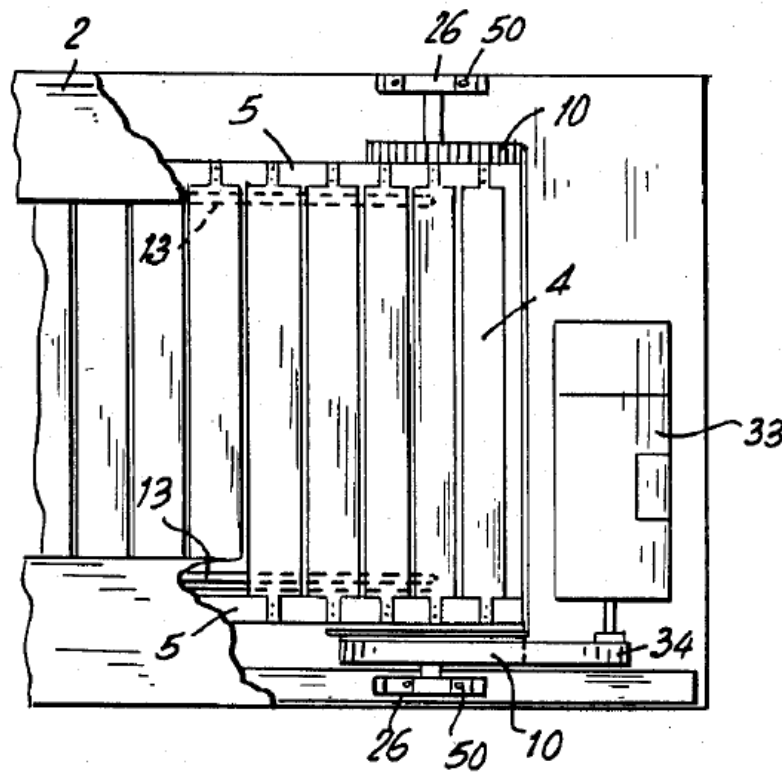
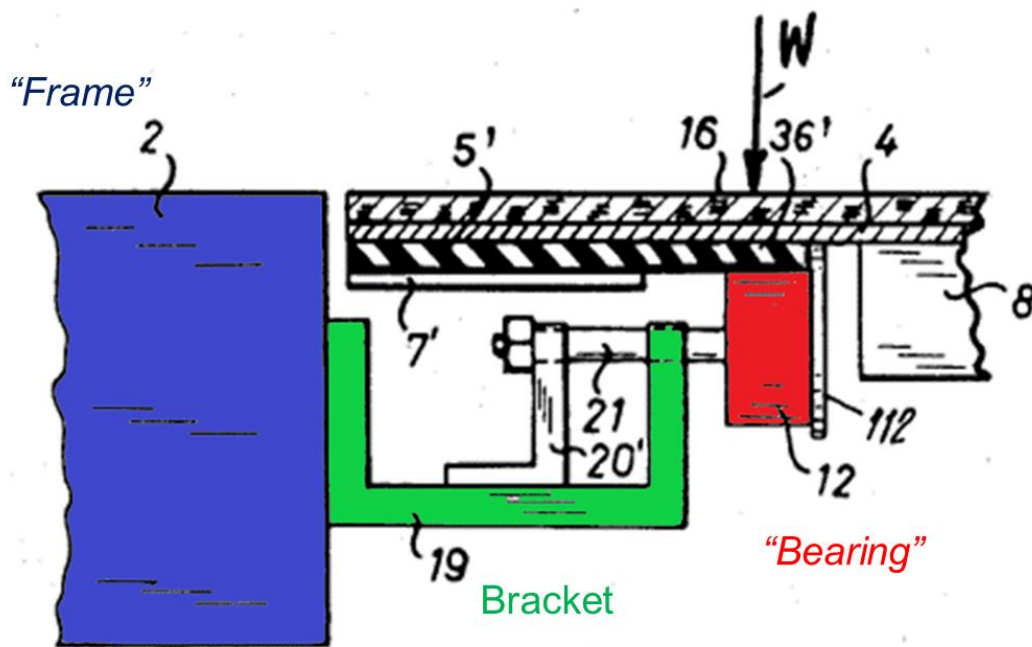


Fig. 3

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

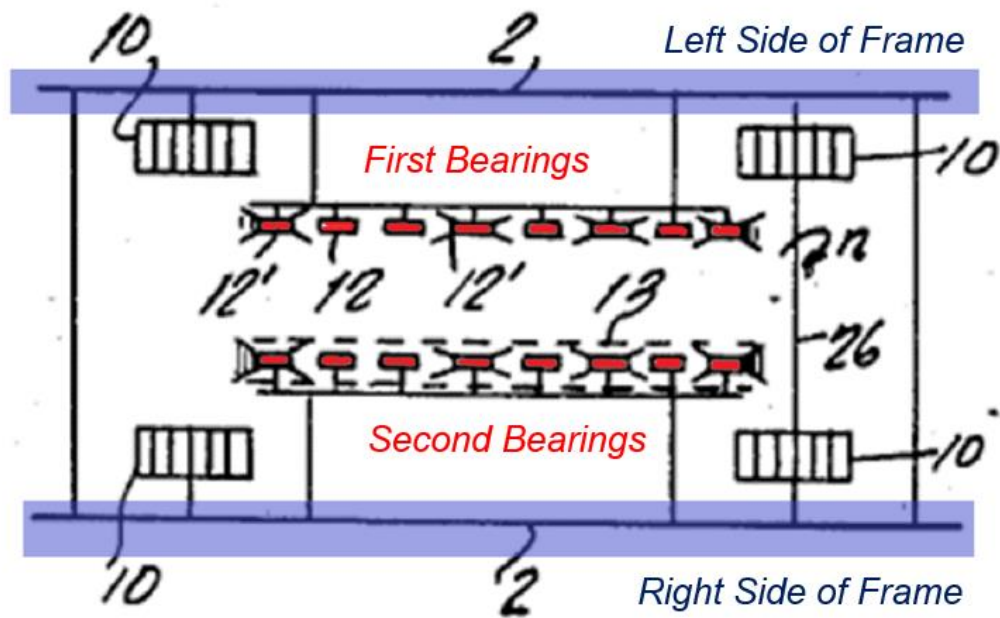


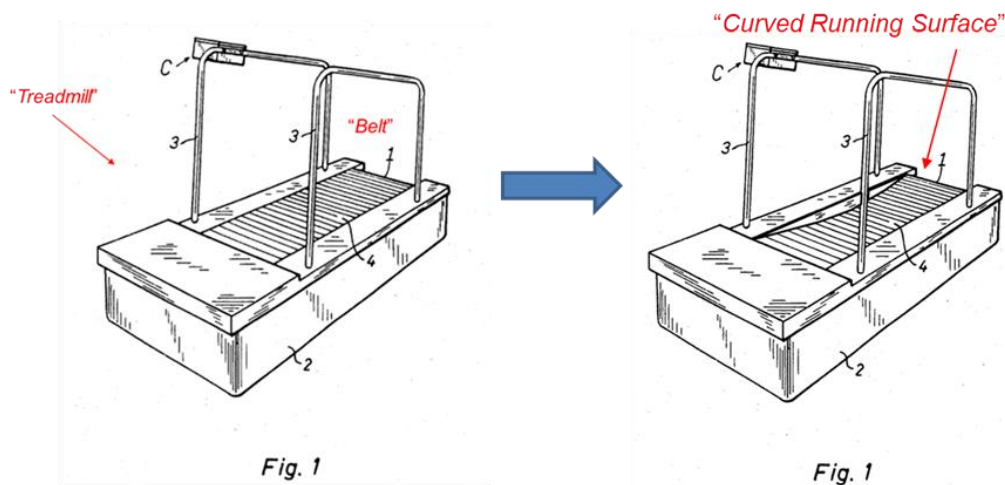
FIG. 19

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 top profile (*See* annotated Fig.12, above). 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. (Ex. 1003, ¶158). A POSA would have understood that the known technique of arranging the bearings in a curvilinear arrangement could be applied to Schonenberger. (*Id.*)

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 has a corresponding curved deck for supporting the belt 16 from underneath. (Ex. 1003, ¶159.) 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. (*Id.*)

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, ¶159.)



Ex.1010, Fig.1, Fig. 1

... [1.6] / [21.4] *a support element coupled to the frame; and*

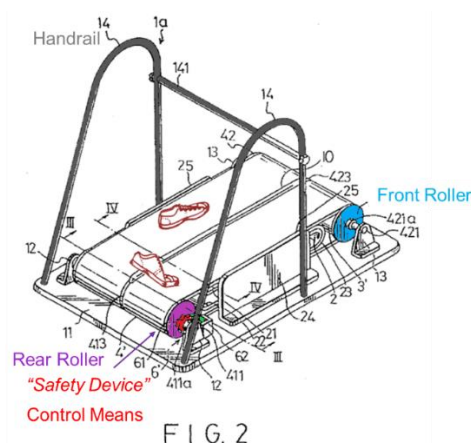
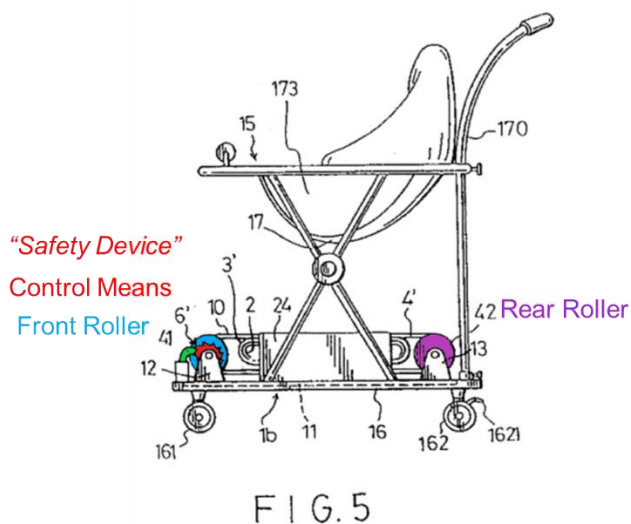
As is discussed above, each of the pulleys 10 is supported by a shaft 26 coupled to the frame. (Ex.1010, 4:10-24.) Therefore, each shaft 26 is a “support element.” (Ex.1003, ¶¶160-162, 262-263.)

... [1.7]/ [21.5] *a safety device coupled to the running belt, the safety device at least partially supported by the support element, wherein the safety device includes a first safety race element and a second safety race element, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;*

... [10.4] a first safety race element and a second safety race element, both of which are coupled to the running belt, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;

... [18.4] providing a first safety race element coupled to the frame and to the running belt and a second safety race element coupled to the frame, wherein at least one of the first and second safety elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;

Magid discloses mounting a one-way ratchet clutch (unidirectional control means 6,6'), i.e., (a “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, 4:46-59; Ex.1003, ¶¶163-165, 226, 251.) Magid discloses that the ratchet gear 61 is supported by the front or rear shaft (“support element”). The ratchet gear 61 rotates with the front or rear shaft and relative to the frame, and the pawl 62 pivots, or rotates, to engage the ratchet gear 61. (*Id.*)



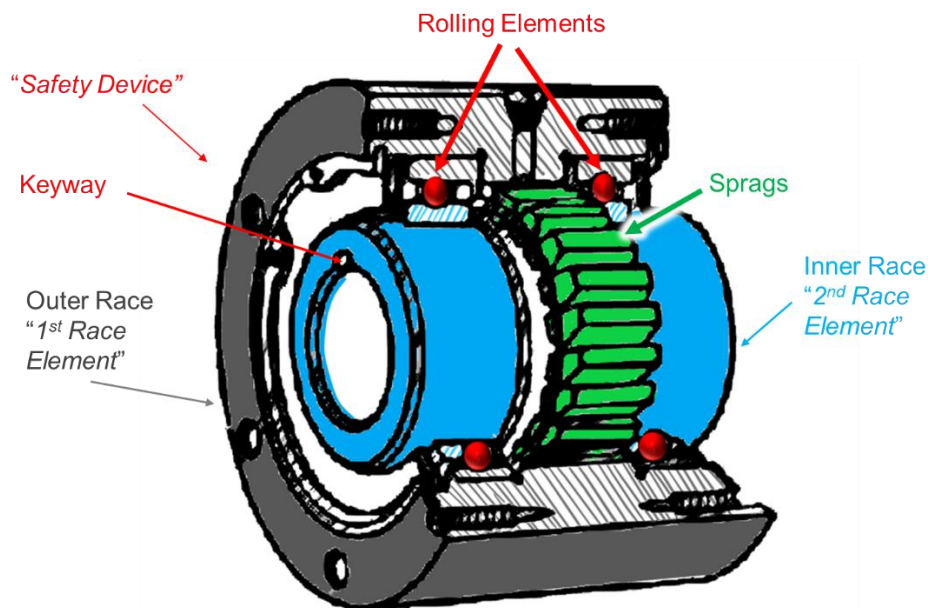
Ex.1012, Figs.5,2

A POSA would have known that mounting a one-way clutch in this manner improves the stability of the treadmill by preventing forward treadmill belt motion, thereby providing a “*safety device.*” (Ex.1003, ¶166.)

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, 312.)

As illustrated in the image below, Sclater discloses that the sprag-type one-

way bearing assembly includes an inner race⁴, an outer race surrounding the inner race, and a plurality of sprags and rolling elements disposed between the inner race and the outer race.



Ex.1017, 318

Sclater discloses that the inner race defines a center hole sized to receive a shaft and defines a keyway on the inner diameter. The keyway provides means for rotatably coupling the inner race to a shaft via a key. The inner race and/or the outer race of a one-way bearing assembly rotate about a central axis; therefore, the

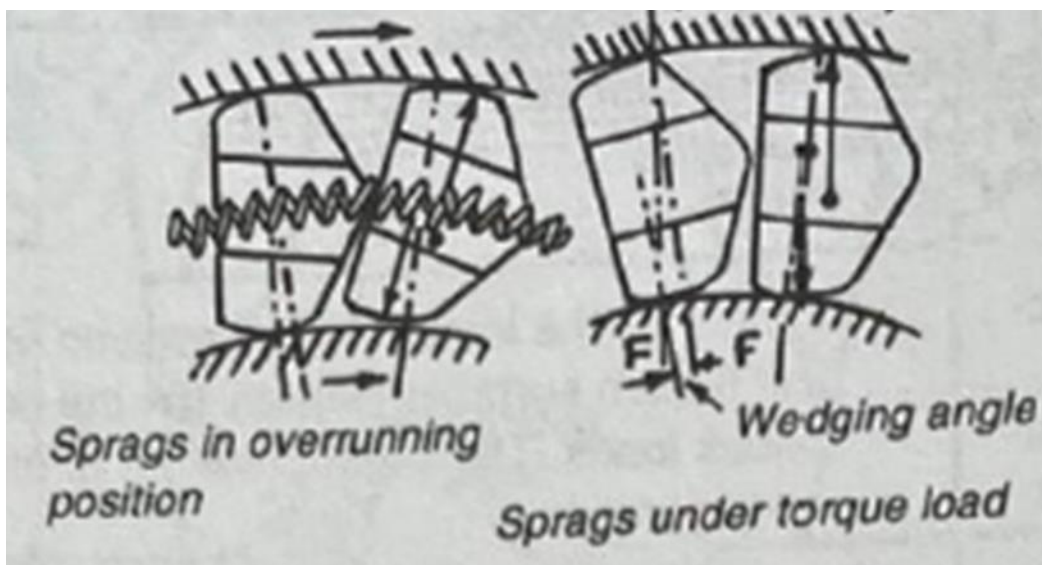
⁴ The terms “race” and “ring” in the context of bearings and clutches are understood to be interchangeable terms for the same thing.

inner and outer races are “*safety race elements.*” (Ex. 1003, ¶170.)

Sclater further discloses the sprag-type bearing assembly functions as a one-way bearing by providing “one-direction only torque transmission in an overrunning clutch.” (Ex.1017, 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.” The sprags wedge between the races to prevent one-way rotation. (Ex.1017 at 312, 318.)

The movable surface 1 (“*running belt*”) is coupled to the inner race (“*second safety race 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 race (“*second safety race element*”) rotate in a first direction relative to the outer race to overrun. However, as illustrated in the figure below on the right, wedging between the sprags and the inner and outer races prevents rotation of the inner race in an opposite direction, which prevents the movable surface 1 (“*running belt*”) from moving forward. (Ex.1003, ¶¶168-174.)



Ex.1017, 318

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

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, ¶175.)

Schonenberger, Socwell, and Magid are from the same field – Exercise Equipment, more specifically treadmills for home exercise use. (Ex.1010, 1:64-68; Ex.1011, 1:10-12; Ex.1012, 1:53-56; 3:23-27.) Schonenberger, Socwell, and Magid disclose treadmills with a moving endless running belt. (Ex.1010, 4:14-17, 6:16-18; Ex.1011, 5:33-44; 8:7-27, Fig.3; Ex.1012, 4:64-5:18, Fig.2.) (Ex.1003, ¶176.)

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, 1:32-36.)

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.

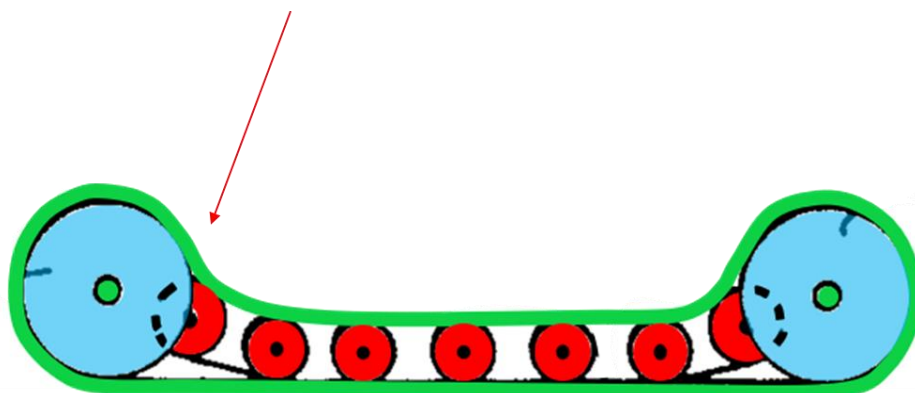
(Ex.1011, 2:45-48; Ex.1003, ¶177.)

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, ¶178.)

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, 1:30-56). The modified treadmill of Schonenberger in view of Socwell include 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

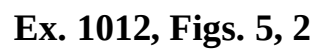
off the back. (Ex.1003, ¶179.)

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, ¶180.)



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, 4:46-60.) (Ex.1003, ¶181.)



Ex.1010, Fig.12

49

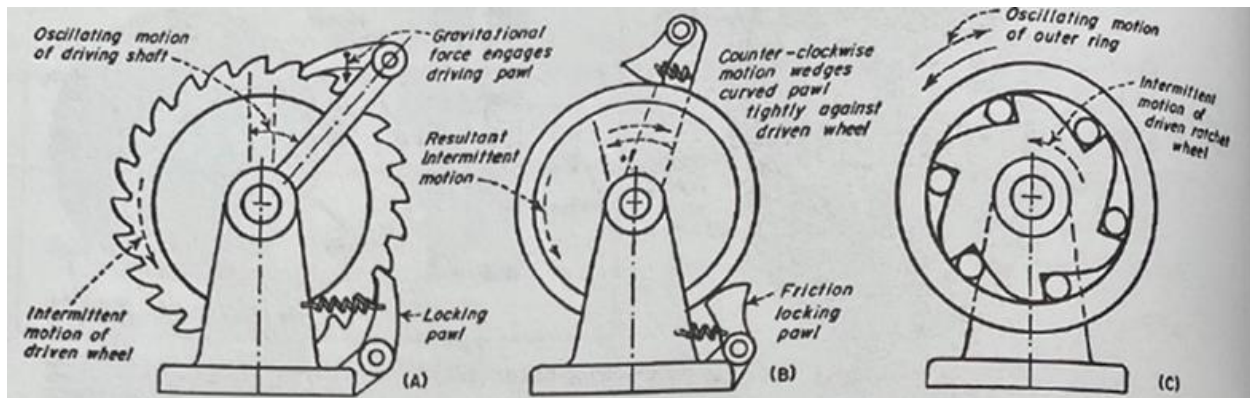
This modification would have been a simple combination of known elements in the prior art: the modified Schonenberger manual treadmill with a curved running surface and Magid's one-way ratchet clutch. The pawl is arranged forward of the ratchet gear and biased to engage the ratchet between adjacent teeth. The profile of the ratchet gear teeth is swept forward to yield predictable results: allowing the ratchet gear to overrun counterclockwise with rearward motion of the belt and providing a backstop clockwise to prevent forward motion of the belt. (Ex.1003, ¶185.)

The modification would also be the use of known technique—using a one-way clutch in a backstopping application—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, ¶186.)

A POSA would have been further 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.

Ratchet-and-pawl clutch mechanisms make noise during operation. The pawl is spring-loaded to engage each gear tooth of the ratchet and it would make an audible “click” when colliding with the gear tooth root after overrunning or passing over each gear tooth. For example, a POSA would have been aware of this

noise from other common ratchet clutches, such as those included in rear bicycle wheels, a ratchet wrench, and an automotive parking brake. (Ex. 1003, ¶188.) Sclater acknowledges that a “friction-type clutch” is quieter than a ratchet-type clutch. (Ex.1017 at 316.)



Ex.1017, 316

Sclater further discloses that roller clutches are better suited for high-speed freewheeling than pawl-and-ratchet clutches. 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 races 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.1017, 303; Ex. 1003, ¶189.)

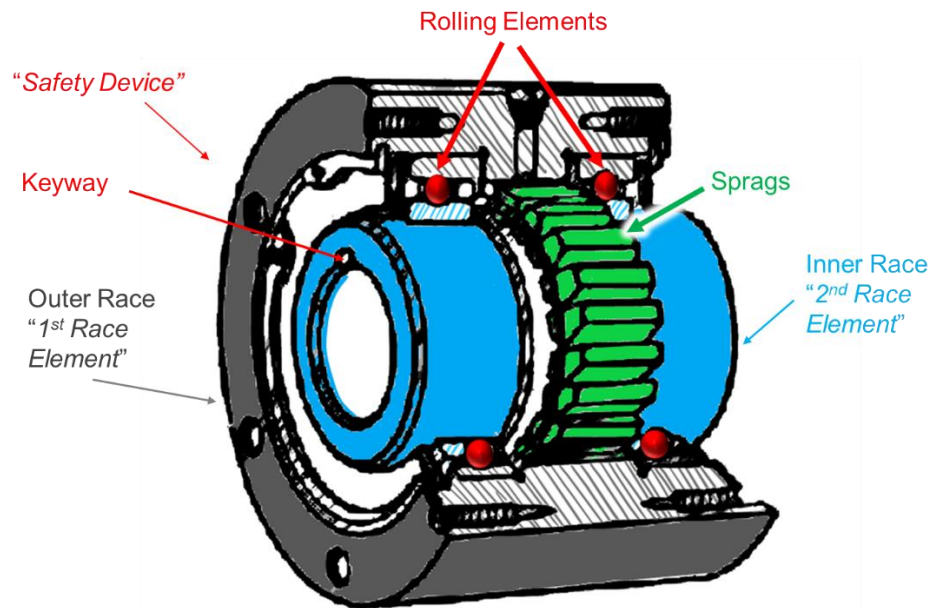
Sclater further describes a backstopping application for a conveyor:

An example is a clutch mounted on the headshaft of a conveyor. The outer race is restrained by torque-arming the stationary frame of the conveyor.

(Ex.1017, 320.)

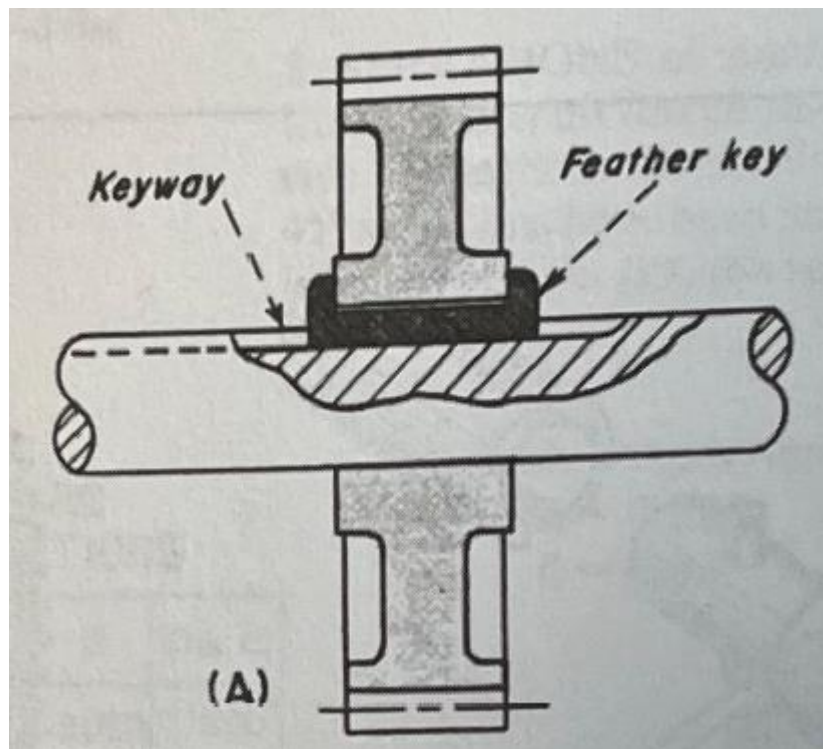
A POSA would have considered a sprag-type one-way clutch bearing for an exercise equipment application, such as a treadmill. For example, Emerson is a bearing catalog from 2001 that describes its NSS Series sprag-type one-way clutch as an option for multiple “Field Applications,” including “Exercise equipment,” “Food processing equipment,” “Printing presses,” and “Roll conveyors.” (Ex.1018 at 52-53; Ex. 1003, ¶190.)

Accordingly, a POSA would have known how to replace Magid’s control means with Sclater’s one-way bearing assembly. For example, the outer race would be fixed to the frame either directly or through one or more intermediaries, e.g., a bracket, support structure, or torque arm. For example, Sclater illustrates below that the outer race 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, 38-43; Ex. 1003, ¶192.)



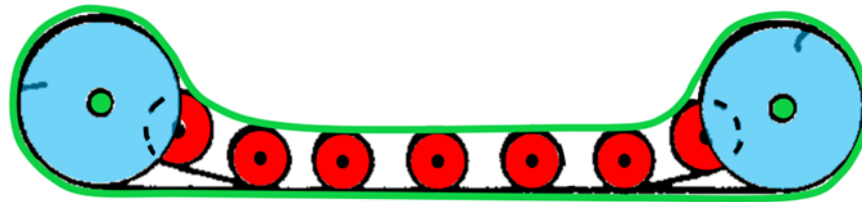
Ex.1017, 318

The inner race of the one-way bearing would be secured to the front roller or rear roller, e.g., with a traditional key/keyway interface, such as that disclosed by Sclater:

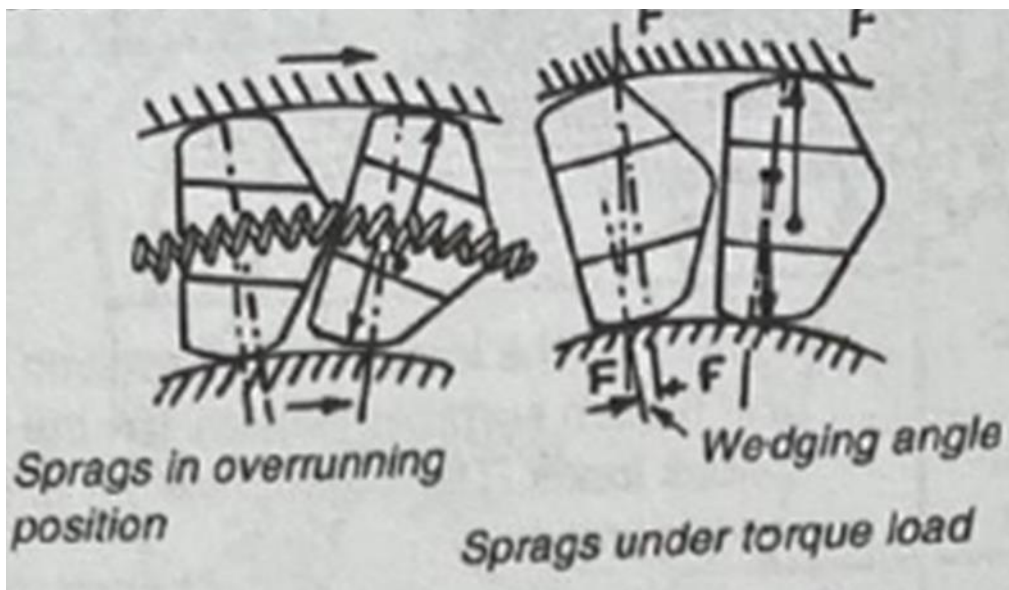


Ex.1017, 420

With this arrangement, rearward motion of the movable surface 1 would rotate the front/rear roller and inner race in a first direction and the inner race would overrun and move the sprags out of the locked position. However, forward motion of the movable surface 1 would rotate the inner race in a second direction and wedge the sprags into the locked position to backstop and prevent forward motion of the belt. (Ex.1003, ¶¶187-194.)



Ex.1010, Fig.12



Ex.1017, 318

... [1.8]/[10.5]/[21.6] wherein one of the first and second safety race elements and the running belt freely rotates in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, the one of the first and second safety race elements is substantially prevented from rotation relative to the frame to substantially prevent rotation of the running belt relative to the frame.

... [18.5] permitting rotation of one of the first and second safety race elements and the running belt in a first direction of rotation;

and

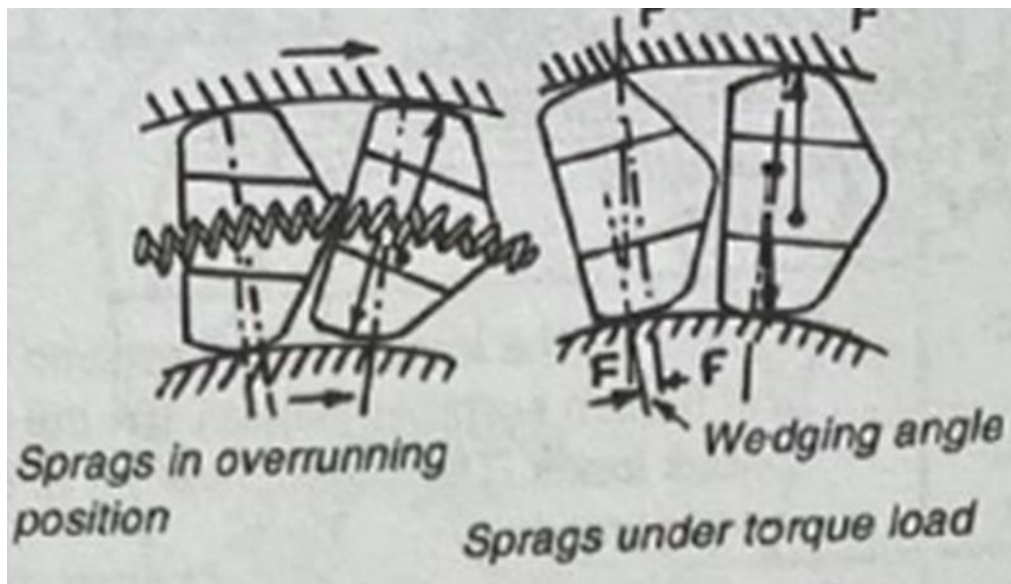
... [18.6] substantially preventing rotation of the running belt in a second direction, opposite the first direction, by, at least in part, the one of the first and second safety race elements.

As discussed above, in modified Schonenberger, the inner race of the one-way bearing and the movable surface 1 are coupled and can rotate in unison relative to the housing 2 in the rearward direction, but the sprags prevent rotation of the inner race and movable surface 1 in the forward direction relative to the frame 12. (Ex. 1003, ¶¶ 195-197, 229, 265, 252.)

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

Precision sprags act as wedges and are made of hardened alloy steel. In the formsprag clutch, **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.

(Sclater, Ex.1017, 316, 318.)

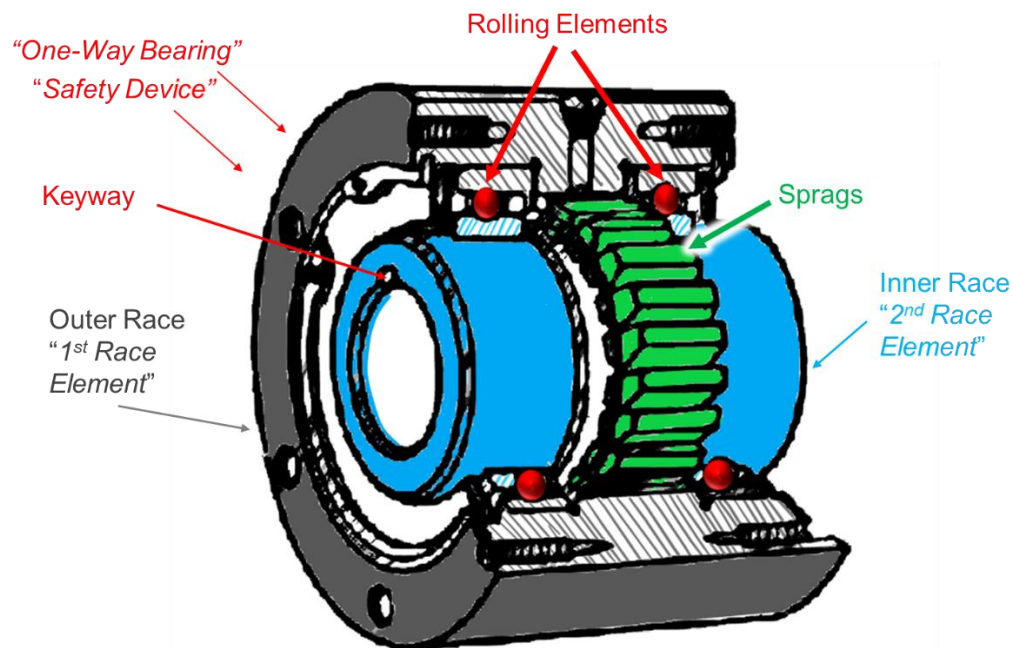


Sclater, Ex. 1017, 318

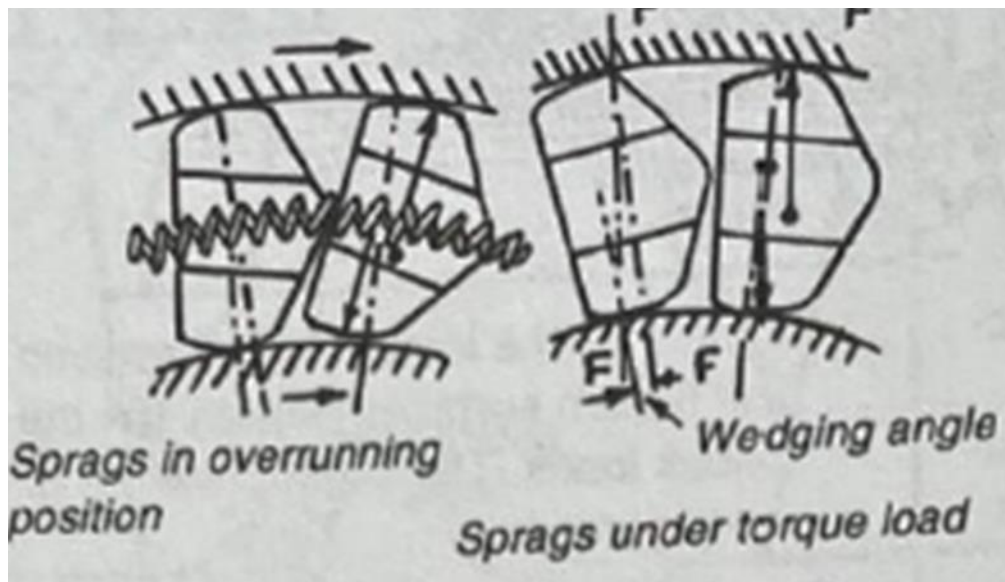
4. Dependent claims

... [4.]/[12.]/[25.] *The treadmill of claim 1, wherein the first and second safety race 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 safety race element*”) and an outer ring (“*first safety race element*”). The sprags allow relative rotation of the *safety race elements* in only one direction. (Ex.1017 at 312, 316.) The bearing assembly is a “*one-way bearing*” due to the interaction of the sprags, the ball bearings, and the races (“*race elements*”). (Ex.1003, ¶¶200-202, 234-235, 275.)



Ex.1017, 318



Ex.1017, 318

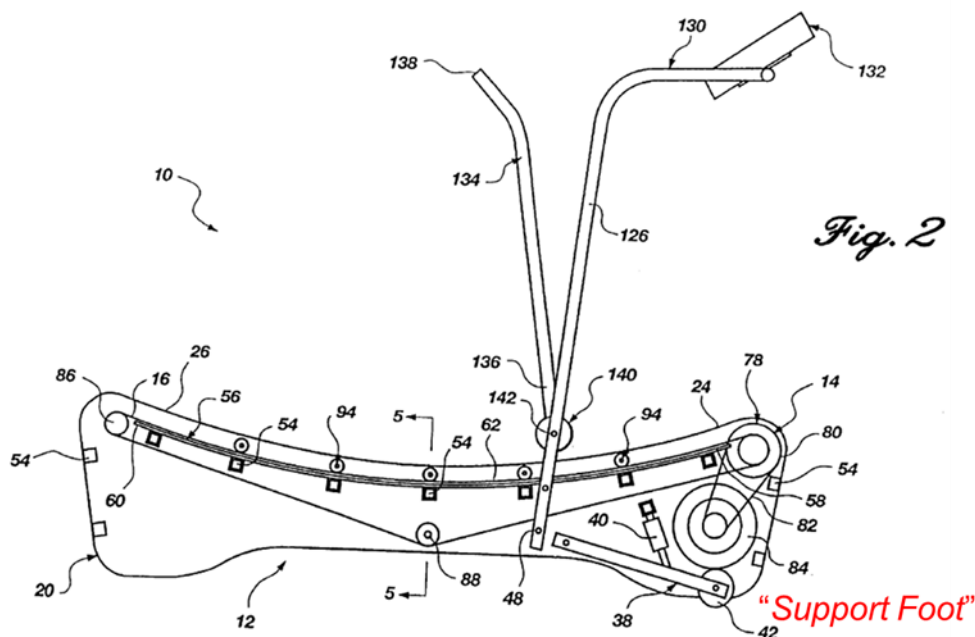
... [7.]/[11.]/[20.] *The treadmill of claim 1, wherein the treadmill is a manually powered, non-motorized treadmill.*

Schonenberger discloses a “physical exercise apparatus” (“*treadmill*”) that “is driven by motor 33, or by gravity of earth,” (“*manually powered, non-motorized*”) (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, ¶¶203-204, 232-233, 255-256.)

... [8.] The treadmill of claim 1, further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to adjust a relative vertical incline of at least a portion of the treadmill relative to a surface supporting the treadmill.

Schonenberger discloses 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 a foot roller assembly 38 including wheels 42 (“*support feet*”) rotatably connected thereto. The foot roller assembly 38 is pivotal relative to the frame 12 to adjust the incline of the running surface. (Ex.1011, 9:29-51.)



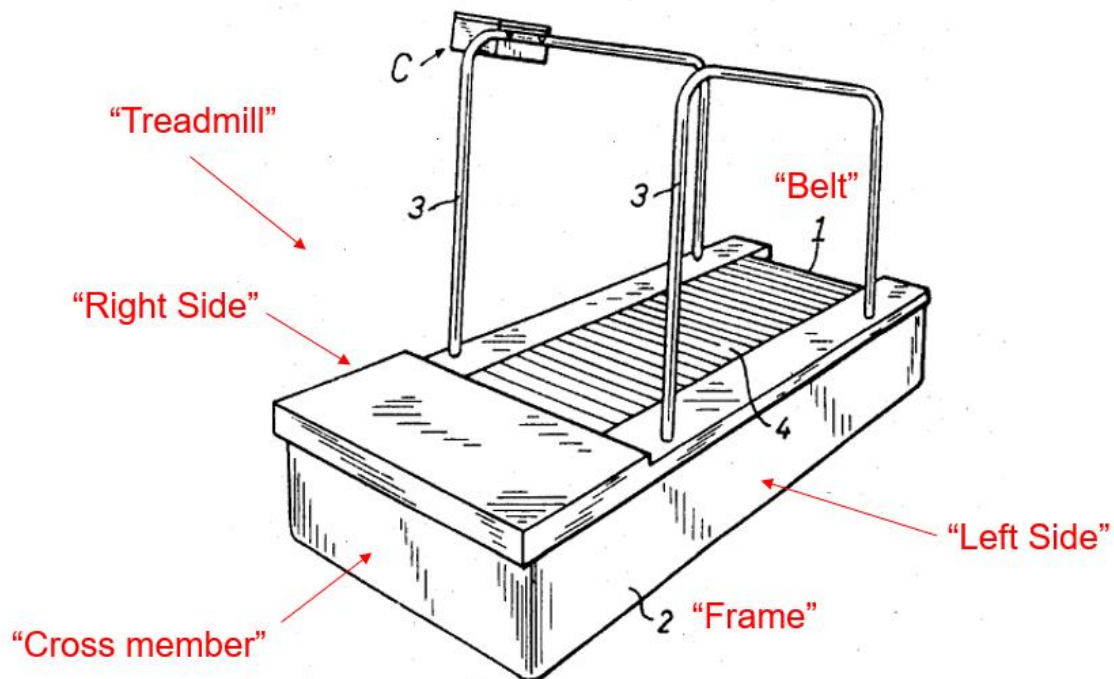
Ex.1011, Fig.2

A POSA would have known that with a manual treadmill, the incline of the running surface combined with gravity affects the user's pace. (Ex.1013, 2:44-49.)

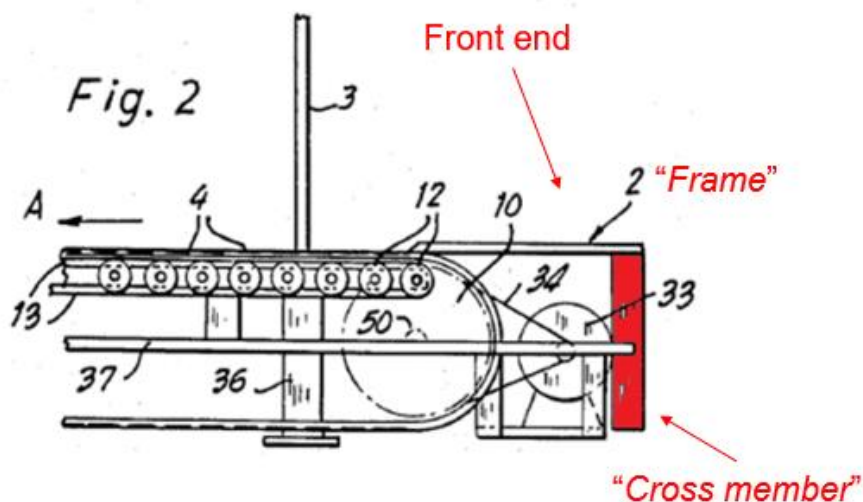
A POSA would have been motivated to further modify Schonenberger to include Socwell's foot roller assemblies 38 for adjusting the inclination of movable surface 1 to adjust a user's pace. Such a modification would involve simply mounting Socwell's foot roller assemblies 38 to the bottom of Schonenberger's housing 2 ("frame"). (Ex.1003, ¶¶205-212.)

... [9.0] The treadmill of claim 1, wherein the frame comprises 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.

Schonenberger discloses a “frame” having left and right side members. Schonenberger illustrates at least a front cross member in Figures 1 and 2. The front cross member extends between the left and right sides of the frame 2. (Ex.1003, ¶¶213-214.)



Ex.1010, Fig.1

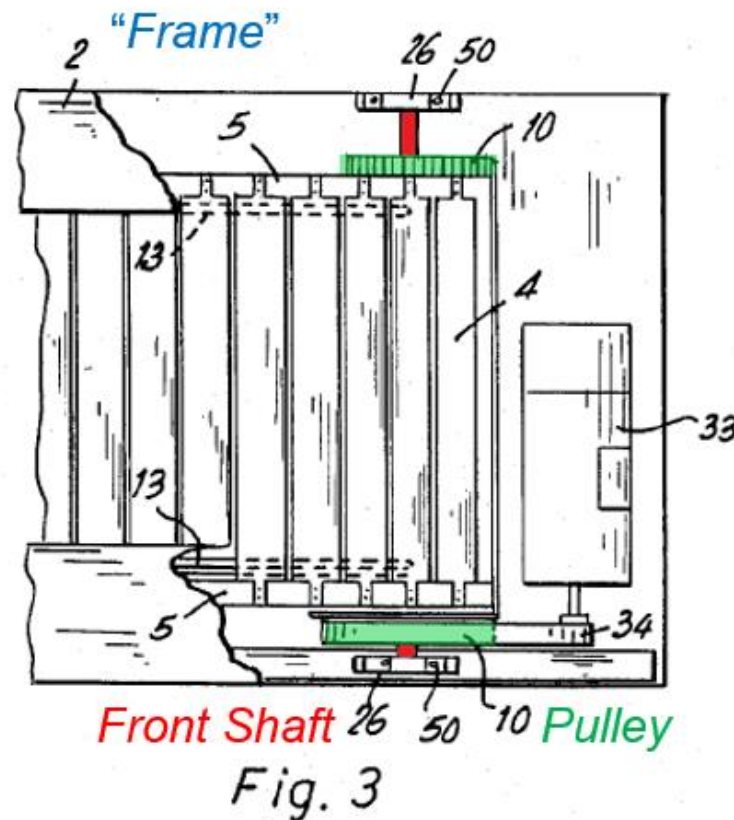


Ex.1010, Fig.2

... [14.]/[24.] *The treadmill of claim 10, wherein the rotatable element comprises a running belt pulley coupled to the frame.*

... [22.] *The treadmill of claim 21, wherein the rotatable element comprises at least one of a front running belt pulley coupled to the frame and a rear running belt pulley coupled to the frame and spaced apart from the front running belt pulley.*

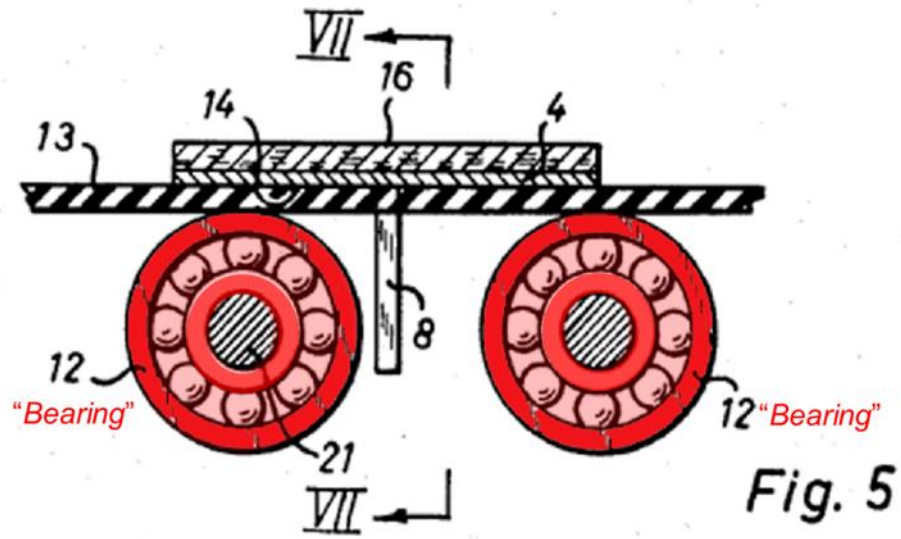
As discussed above in relation to claim 10, Schonenberger discloses "rotatable elements" in the form of pulleys 10 at the front and rear ends, which are coupled to the frame through shafts 26 and journals 50. (Ex.1010, 4:10-24, Fig.3 and 12; Ex.1003, ¶¶236-237, 274, ¶¶268-270.)



Ex.1010, Fig. 3

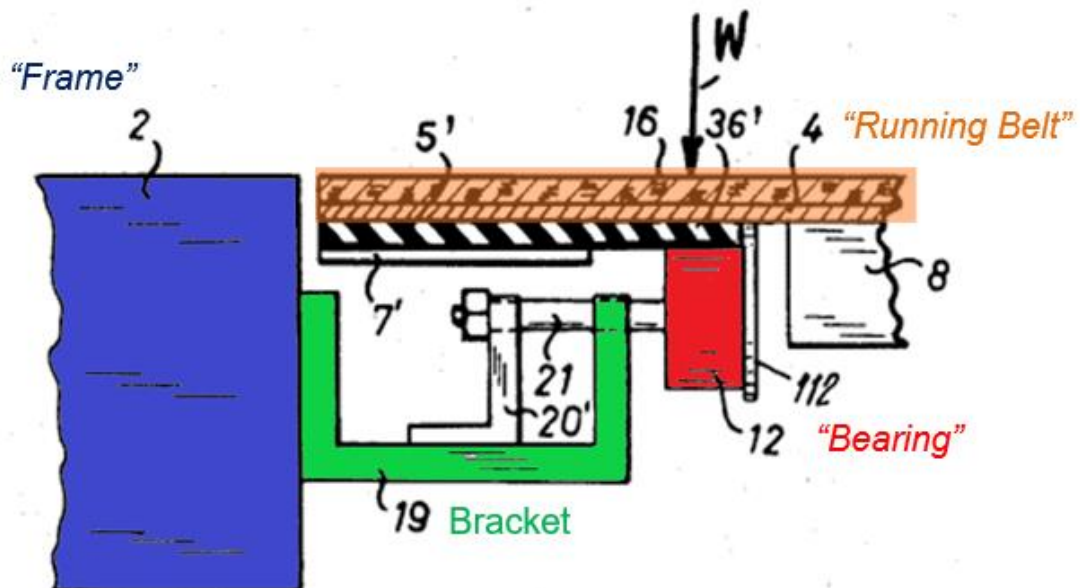
... [17.] *The treadmill of claim 10, wherein the rotatable element comprises a plurality of bearings coupled to the frame, the plurality of bearings at least partially supporting the running belt.*

As discussed above in relation to claim 10, Schonenberger discloses “rotatable elements” in the form of rollers 12, which are coupled to the frame. (Ex.1010, 4:67-5:05, 5:47-51.) The rollers 12 of Schonenberger are bearings. (Ex.1010, 5:47-51, Fig.5; Ex.1003, ¶¶238-240.)



Ex.1010, Fig.5

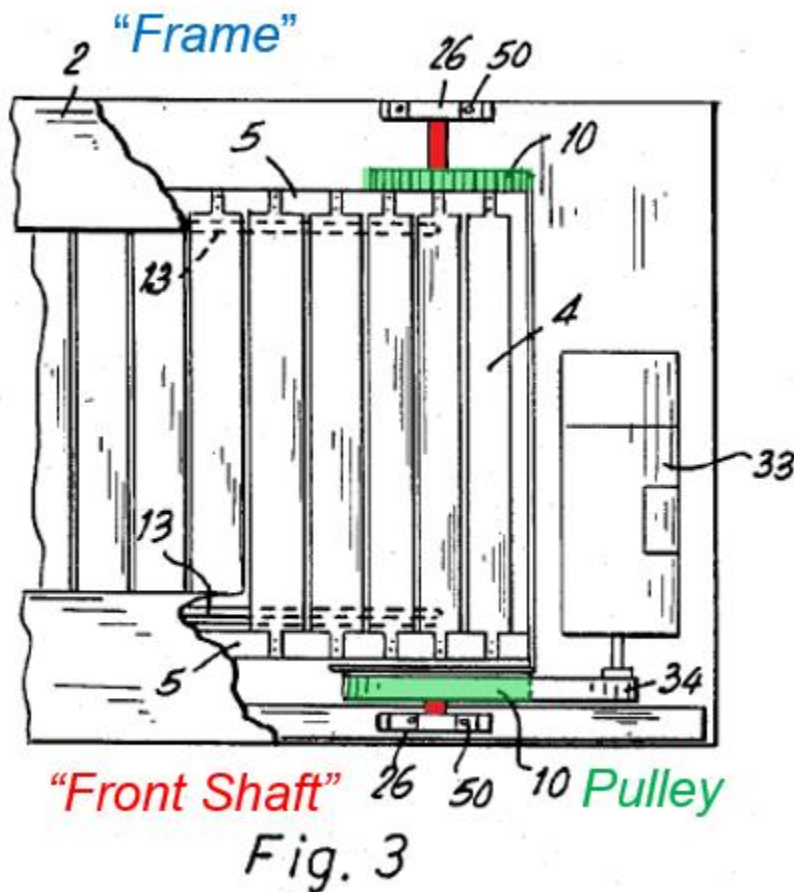
The rollers 12 support the movable surface. (Ex.1010, 4:67-5, Fig.10;
 Ex.1003, ¶239.)



Ex.1010, Fig.10

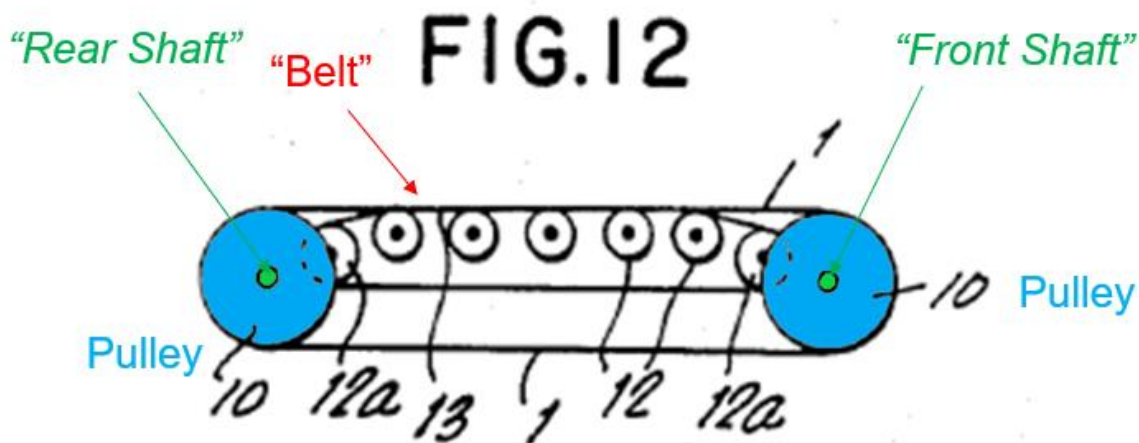
... [23.] *The treadmill of claim 21, wherein the rotatable element comprises at least one of a front rotatable shaft coupled to the frame and a rear rotatable shaft coupled to the frame and spaced apart from the front rotatable shaft.*

As I discussed above in relation to claim 10, Schonenberger discloses “rotatable elements” in the form of shafts 26, which are coupled to the frame by journals 50. (Ex.1010, 4:10-24, Fig.3; Ex.1003, ¶¶271-273.)



Ex.1010, Fig.3

The shafts 26 are at the front and rear. (Ex.1010, 4:14-23, Fig.12.)



Ex.1010, Fig.12

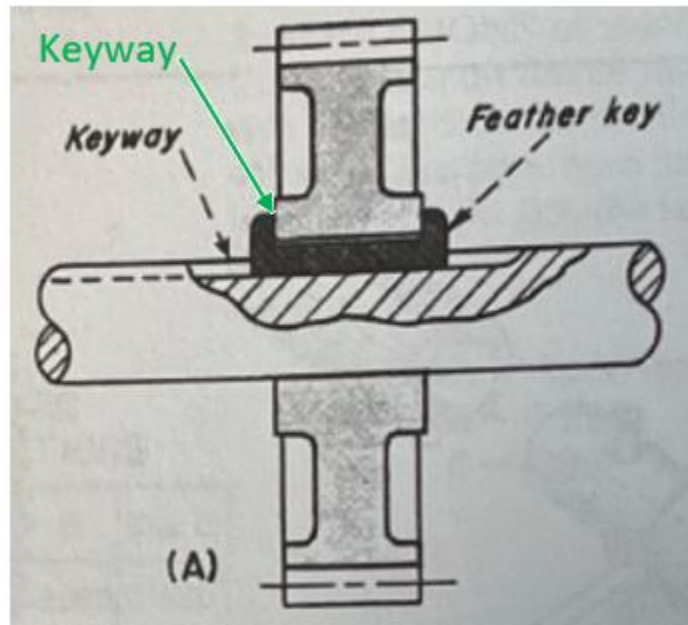
... [26.] *The treadmill of claim 21, wherein the support element comprises a rod.*

As discussed in claim limitation [1.6] above, the shafts 26 of Schonenberger were relied upon to disclose the “support element.” The shaft 26 is a “rod.” (Ex.1010, 4:10-24; Ex.1003, ¶276.)

... [27.] *The treadmill of claim 26, wherein at least a portion of the rod defines a keyway, wherein the keyway is configured to receive a key such that the key engages with the rod and the safety device.*

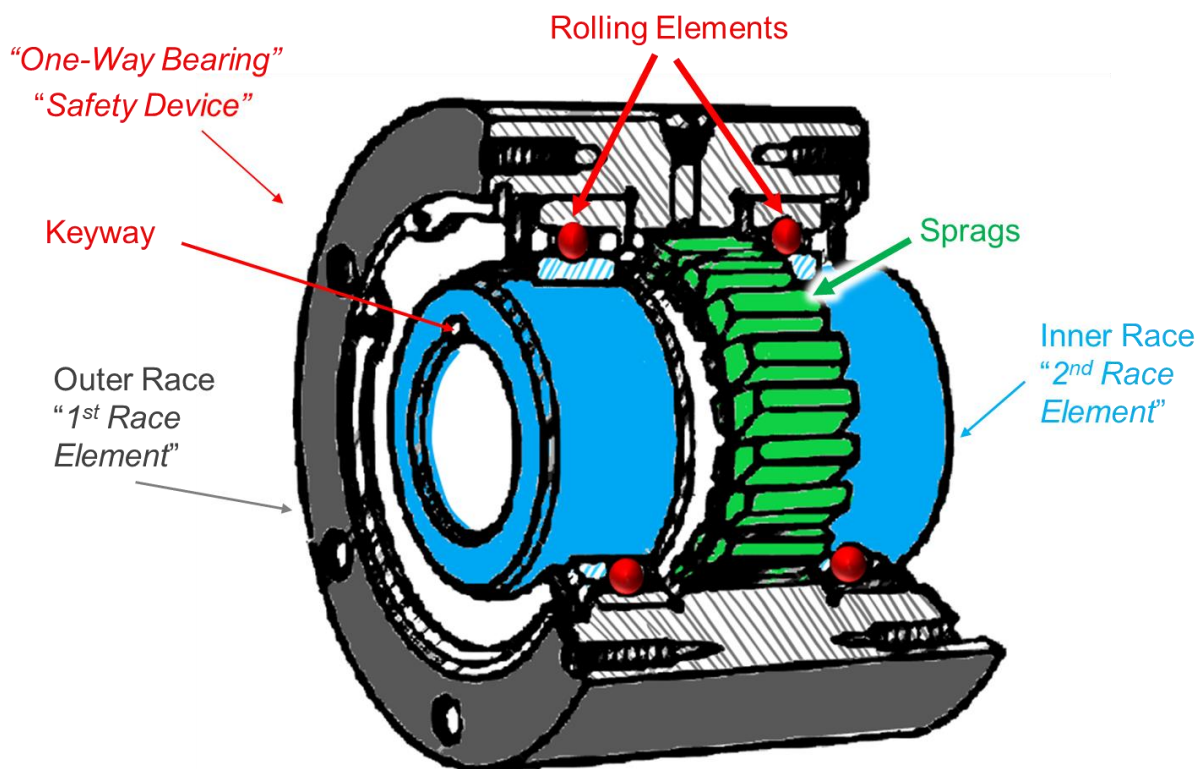
A POSA would have known that a variety of coupling techniques were commonly used to secure to a component, e.g., a one-way bearing, to a shaft prior to the invention of the '745 Patent. (Ex. 1003, ¶277.) For example, Sclater discloses **fourteen** different ways to fasten hubs to shafts – including using a key-keyway interface having includes a key received in keyway defined in an inner

diameter of a gear or inner race and another keyway that is milled into the corresponding shaft. (Ex.1017 at 420-421.)



Ex. 1017, 420

Sclater also discloses the use of key-keyway interfaces in one-way bearing or clutch applications. Here, a key would be received in the keyway of the inner race and a keyway of the associated shaft. (Ex.1017, 420.)



Ex.1017, 318

A POSA would have found it obvious to form a keyway in the shaft 26, form another keyway in inner race of the one-way bearing, and insert a key into these two keyways to rotationally fix the inner race to the shaft 26. Adding the key-keyway interface of Sclater to Schonenberger is nothing more than adding a known element of the prior art according to known techniques with the predictable result of creating rotational coupling between the safety device and the shaft. (Ex.1003, ¶¶277-280.)

B. Ground 2: Claims 1, 4, 7-12, 14, 17-18, and 20-27 are obvious over Schonenberger, Socwell, Magid, and Sclater

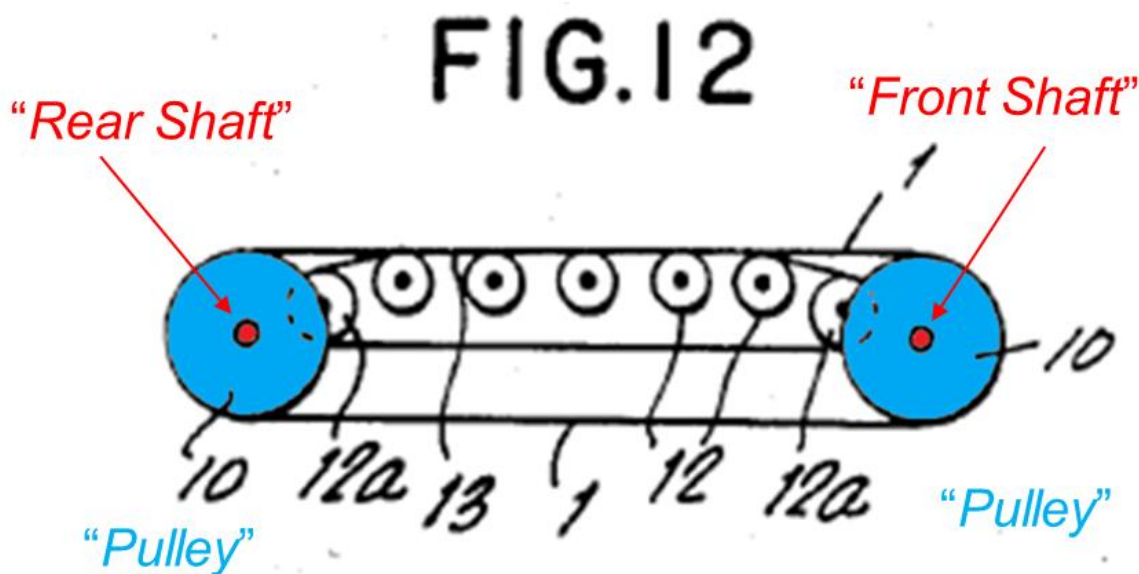
Petitioner proposes claim constructions for the terms: 1) “shaft”, 2) “safety

device” and 3) “*substantially prevent*” which affects claim limitations: a) [23.]; b) [1.7]/[4]/[12]/[21.5]/[25]; and c) [1.8]/[10.5]/[18.6]/[21.6]. The remaining limitations are taught by the combination of Schonenberger, Socwell, Magid, and Sclater for the same reasons provided in Ground 1.

1. “*Shaft*”

... [23.]

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. (Schenkenberger, 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

2. "Safety Device"

... [1.7]/[4]/[12]/[21.5]/[25]

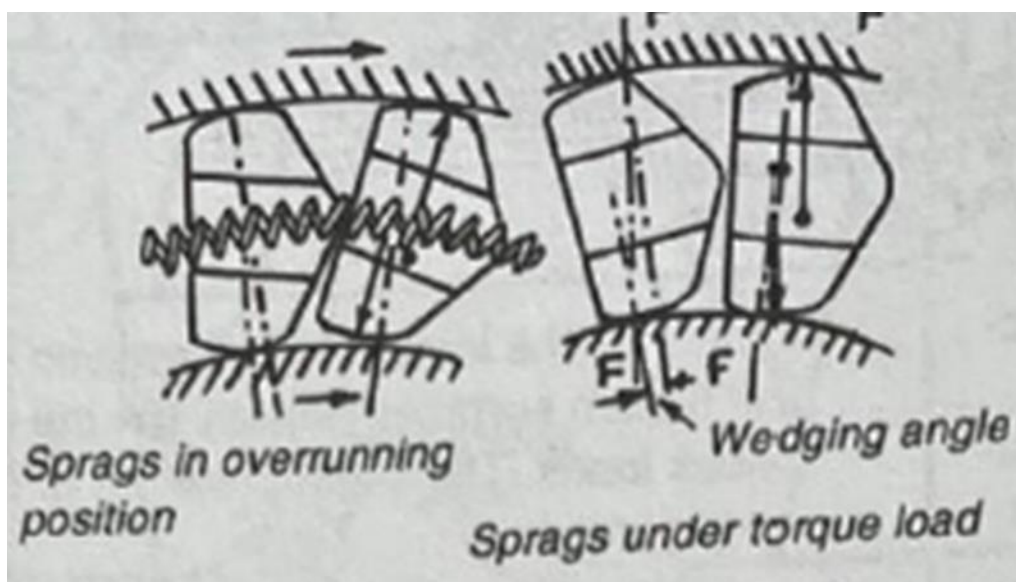
Petitioner proposes construing the term "*safety device*" as a "device having two ring-shaped components." Since claim limitation [1.7] explicitly recites, "*the safety device includes a first safety race element and a second safety race element,*" I refer back to my analysis of this limitation in Ground 1. (Ex. 1003, ¶¶284, 289, 292, 299, 300.)

3. "Substantially Prevent"

... [1.8]/[10.5]/[18.6]/[21.6]

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, 318

4. 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 above and Ex.1003, ¶¶148-159,175-194.)

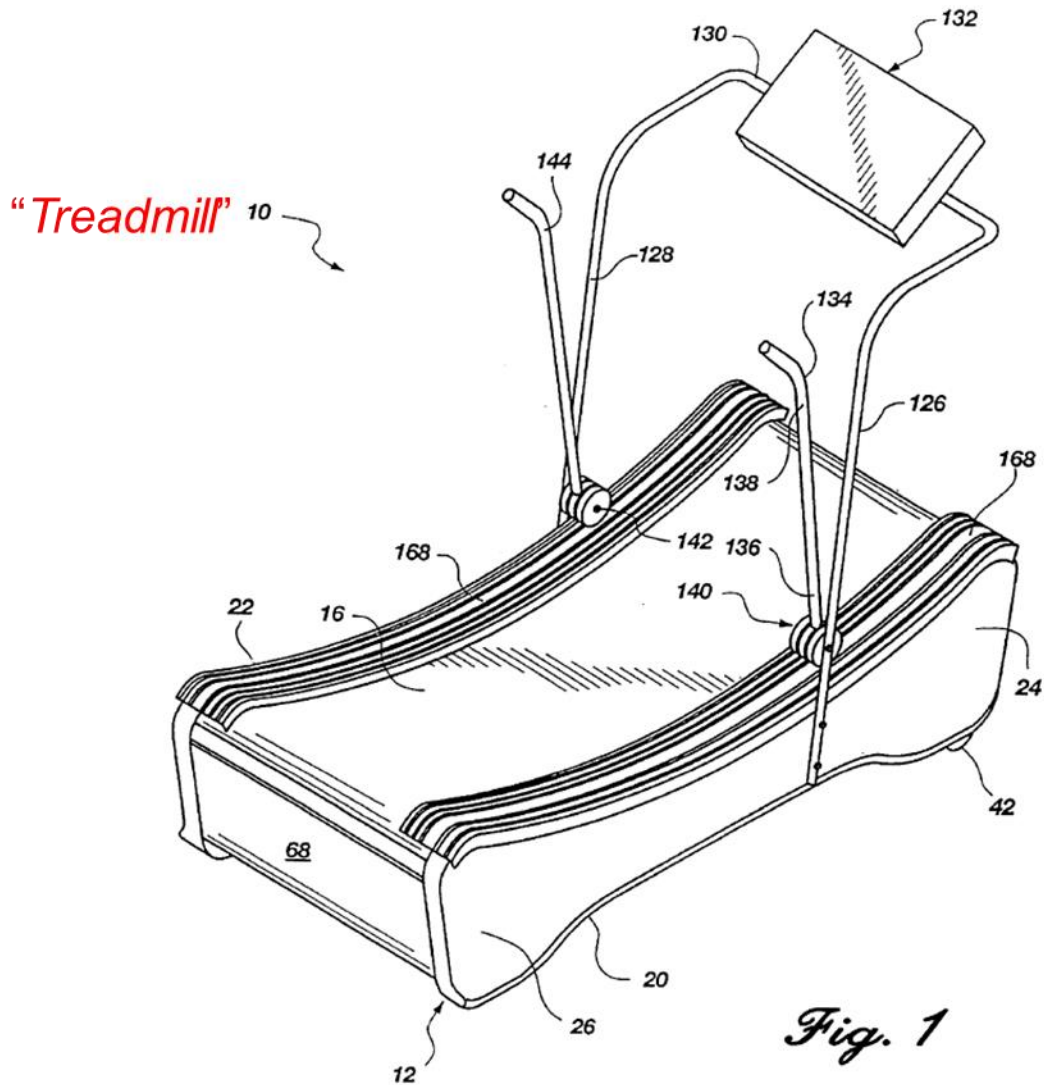
C. Ground 3: Claims 1, 4, 7-12, 14, 17-18, and 20-25 are obvious over U.S. Socwell, Magid, and Sclater

1. Independent claim 1

... [1.0]/[10.0]/[21.0] *A treadmill, comprising:*

... [18.0] *A method comprising:*

Socwell discloses a treadmill 10. (Ex.1011, Abstract.) Socwell explains it “is a primary object of the present invention to provide a novel curved deck treadmill which provides a structurally supported arcuate shaped, movable surface on which a user may exercise.” (Ex.1011, 3:26-29.) Socwell discloses that the treadmill 10 may be powered by a drive means 84, e.g., an electric motor, or, alternatively, manually driven. (Ex.1011, 11:34-38, 11:53-61.) (Ex.1003, ¶¶302-303, 375, 412, ¶¶398-400.)

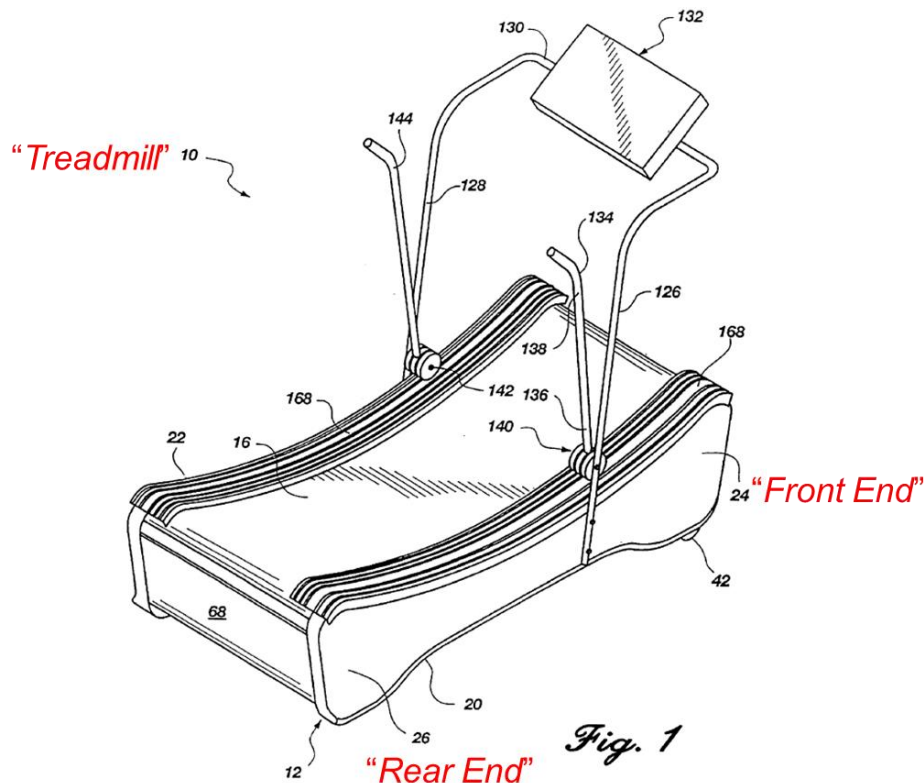


Ex.1011, Fig.1

... [1.1]/[10.1]/[21.1] a frame;

... [18.1] providing a treadmill having a frame with a front end and a rear end;

Socwell discloses a treadmill 10. Socwell discloses that “the curved deck treadmill 10 comprises **a support frame 12** having a front end and a rear end. (Ex.1011, 5:23-26, 6:23-25, 9:57-65, Fig.1.) (Ex.1003, ¶¶304-305, 376, 413, ¶¶398-400.)



Ex.1011, Fig.1

... [1.2] a front running belt pulley coupled to the frame;

... [1.3] a rear running belt pulley coupled to the frame and spaced a distance from the front running belt pulley;

Socwell discloses a roller assembly 14 supported between the right side frame 20 and the left side frame 22 and including a first roller 78 at the front end

(“*front pulley*”) and a second roller 86 at the rear end (“*rear pulley*”). (Ex.1011, 5:33-41.) The right and left sides 20, 22 of the frame include journal housings 28 and 34, e.g., slots, configured to receive the journaled ends of the rollers 78, 86 to couple the rollers to the right and left sides of the frame 20, 22. (Ex.1011, 6:27-45.)

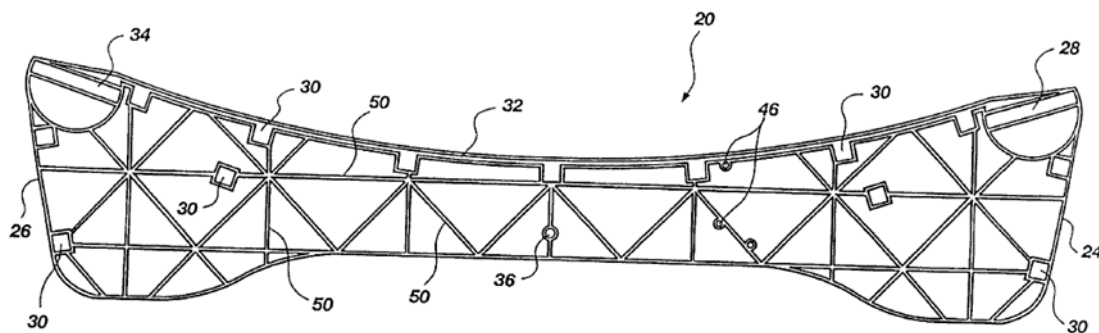
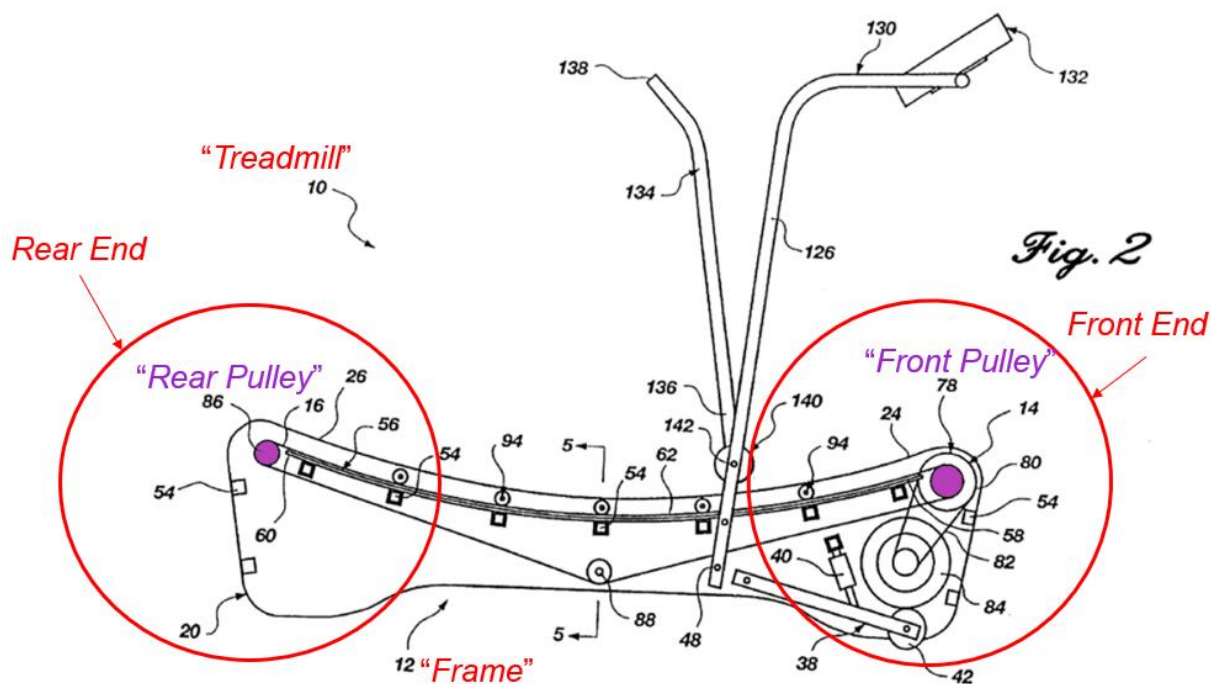


Fig. 4

Ex.1011, Fig.4



Ex.1011, Fig.2

The rollers 78, 86 support a belt 16 for rotation and thus would be considered “*pulleys*” by a POSA. A POSA would also consider the rollers 78, 86 to be “*rotatable elements.*” (Ex.1003, ¶¶306-309, 394.)

... [1.4] *a plurality of bearings coupled to the frame;*

Socwell discloses belt securing assemblies 94 that engage a topside of the belt. (Ex.1011, 10:5-12.) Each belt securing assembly 94 includes a roller 98 in rolling engagement with the belt 16. The roller 98 is mounted on an axle 100 supported by a bracket 96 to provide a low-friction connection with the belt 16. (Ex.1011, 10:17-26.) The plurality of belt securing assemblies 94 disposed along

the right and left sides of the frame 12. The rollers 98 are “*bearings.*” (Ex.1003, ¶68.)

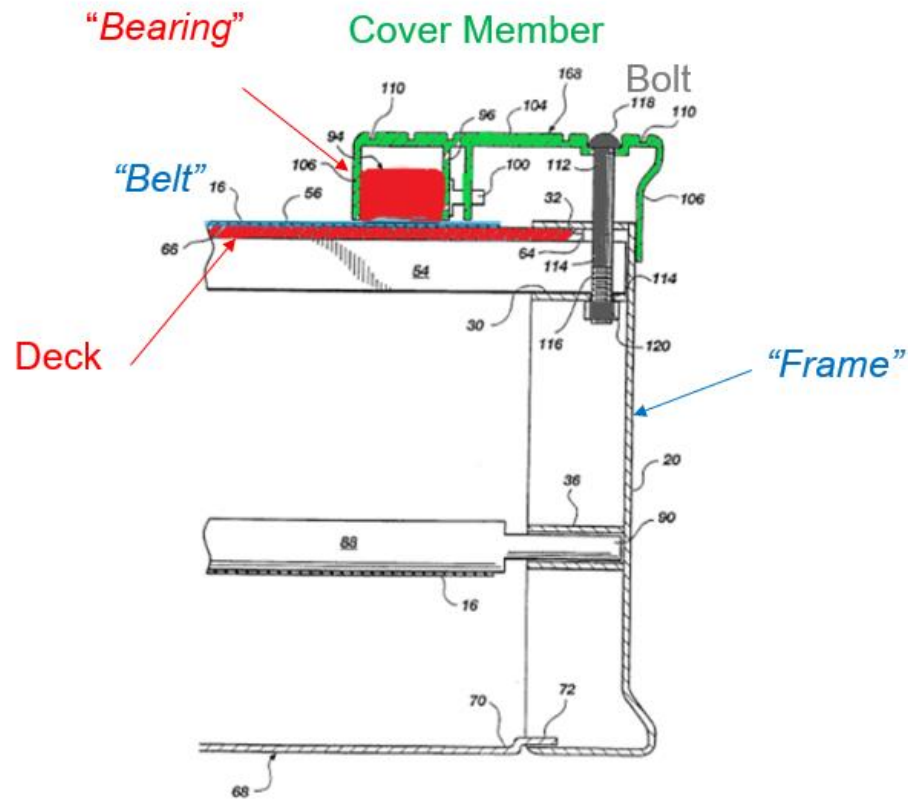


Fig. 5

Ex.1011, Fig.5



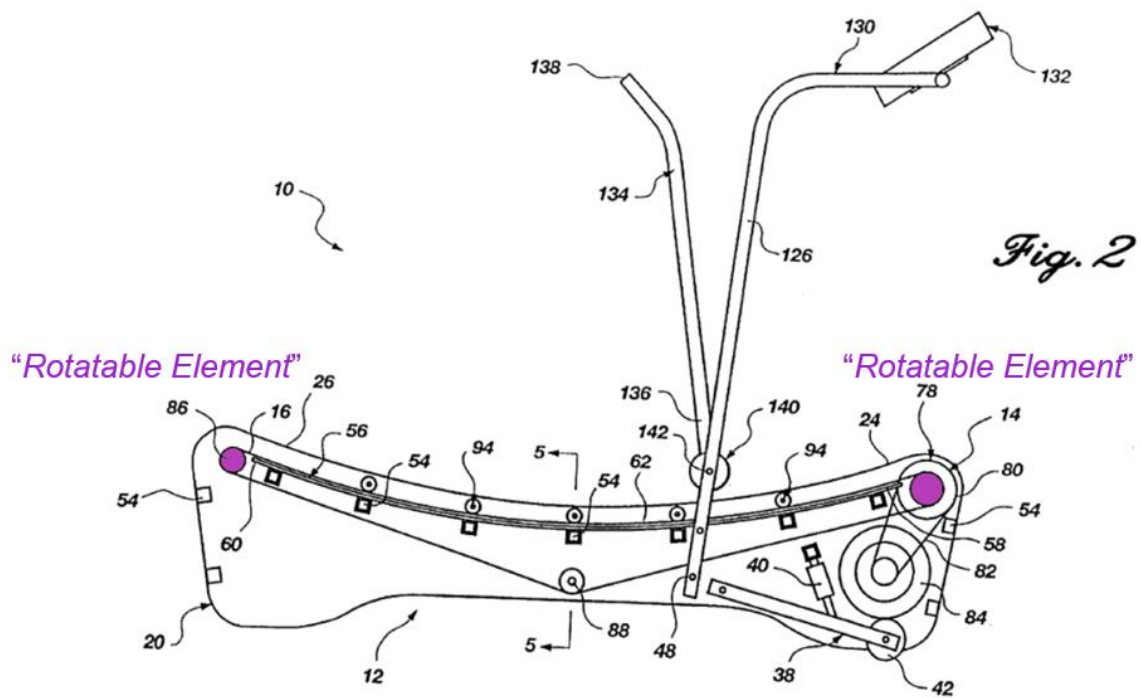
Ex.1011, Fig.2

The rollers 98 are secured to the frame 12 by cover member 168 that are bolted to the frame. (Ex.1011, 11:15-29.) (Ex.1003, ¶¶310-316, 401.)

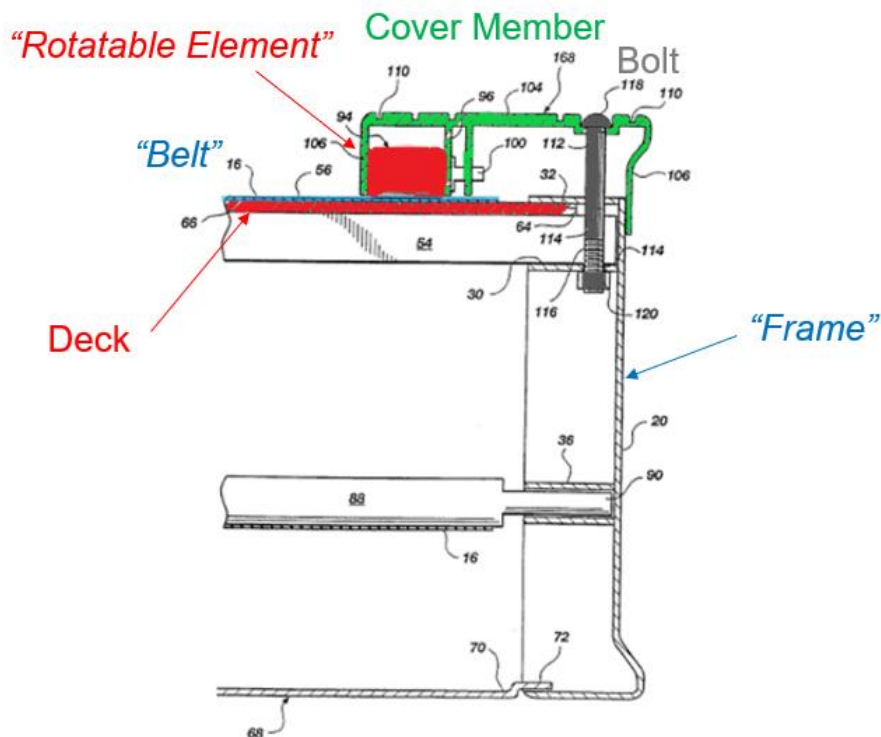
... [10.2]/[21.2] a rotatable element coupled to the frame;

As discussed above in [1.4], Socwell discloses rollers 98 coupled to the frame. The rollers 98 are “*rotatable elements.*” (Ex.1003, ¶378)

Alternatively, as discussed above in [1.2]-[1.3], Socwell discloses rollers 78, 86 coupled to the frame. (Ex.1011, 5:33-41 6:27-45; Ex.1003, ¶377.).



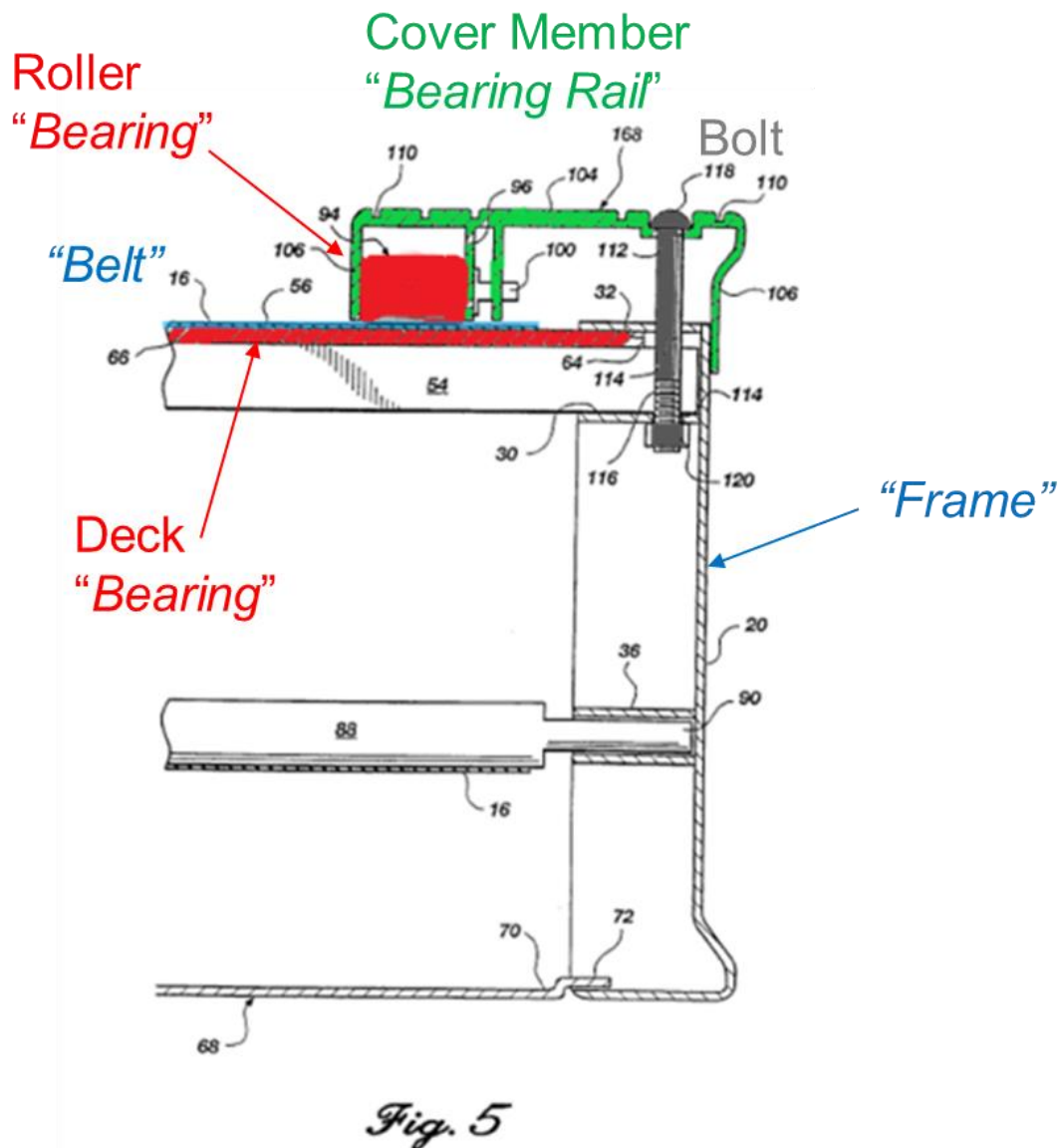
Ex.1011, Fig.2



Ex. 1011, Fig.5

... [18.2][A] providing a plurality of bearings coupled to the frame,

As discussed in claim limitation [1.4], Schonenberger discloses rollers 98 coupled to the frame. (Ex.1011, 10:5-12, 10:17-26; Ex. 1003, ¶134-137.) Schonenberger also discloses a curved deck 56 coupled to the frame. (Ex. 1011, 5:21-33, 7:58-8:07; 8:11-27.) The curved deck forms a bottom “bearing” for the belt 16 and the rollers 98 form top bearings for the belt. (Ex. 1003, ¶¶65-70, 401.)

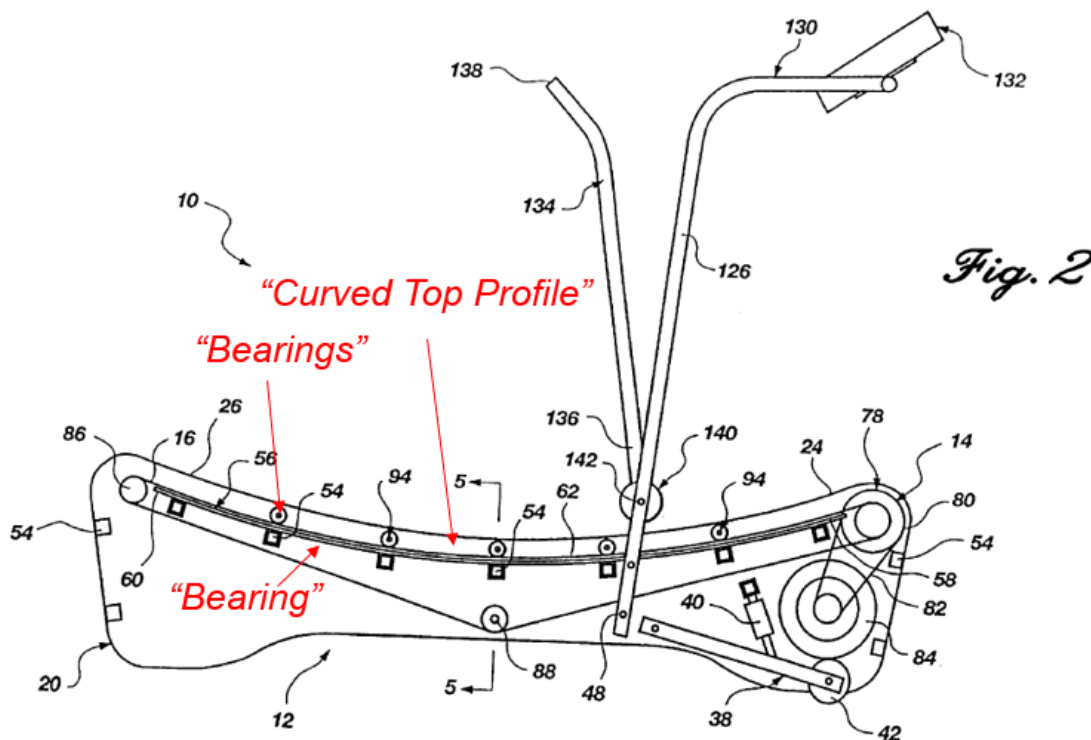


Ex. 1011, Fig. 5

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

Socwell discloses a deck 56 and rollers 98 that cooperate to support a belt 16. (Ex.1011, 10:5-12.) The deck 56 supports from underneath and the belt securing assemblies 94 (with rollers 98) engage a topside of the belt 16 to retain

the belt 16 in its curvilinear configuration. As shown in Figure 2, the rollers 98 and deck 56 are arranged curvilinearly to support the curved running surface with the top of the curved deck 56 defining “at least a portion of a curved top profile.” (Ex.1003, ¶¶402-403.)



Ex.1011, Fig.2

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

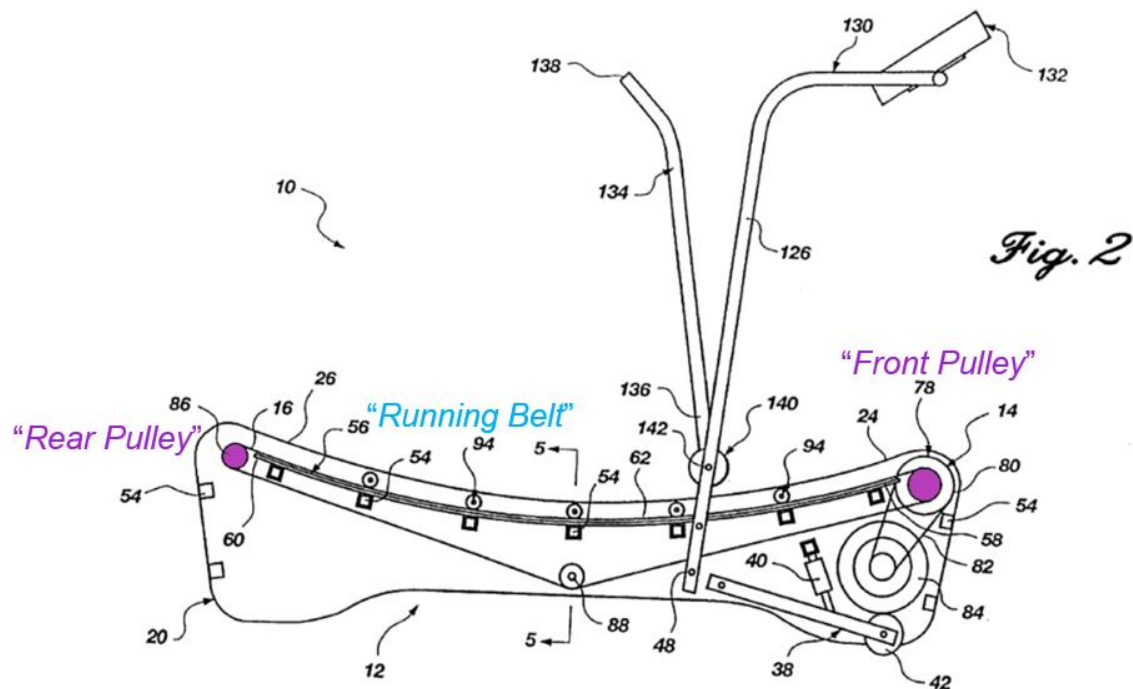
Socwell discloses a curved belt 16 secured on the curved deck 56 by the rollers 98 (“plurality of bearings”). (Ex. 1011, 4:14-19, 10:17-26; Fig. 5.) That is, the belt 16 is supported by the curved deck 56 and retained by the rollers 98

(“*plurality of bearings*”). The arrangement of the deck 56 and rollers 98 ensure the running surface follows the “*curved top profile*” defined, at least partially, by the roller 98 and deck 56 (collectively “*the bearings*”) as discussed above. (Ex. 1011, 4:13-18; Figs. 2-3.)

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

... [10.3]/[21.3] a running belt at least partially supported by the rotatable element, wherein the running belt includes a running surface, at least a portion of which is curved; and

Socwell discloses a curved belt 16 (“*running belt*”) looped around the front and rear rollers 78, 86 (“*rotatable elements,*” e.g., “*pulleys*”). (Ex.1011, 5:41-45.) Socwell discloses the curved belt 16 is secured on a curved deck 56 by the rollers 98 (“*plurality of bearings*”). (Ex.1011, 10:17-26, Fig.5.) The arrangement of the deck 56 and rollers 98 ensure the deck 56 “*follows a curved running surface.*” (Ex.1011, 4:13-18, Figs.2-3.) (Ex.1003, ¶¶317-319, 379-383, 415.)



Ex.1011, Fig.2

... [1.6]/[21.4] *a support element coupled to the frame; and*

Socwell discloses journal housings 28 and 34, e.g., slots, provided, i.e., coupled, on the sides of the frame, e.g., side 20. The journal housings 28 and 34 are configured to receive the journaled ends of the rollers 78, 86 to couple the rollers for rotation between the right and left sides of the frame 20, 22. (Ex.1011, 6:27-45.) (Ex.1003, ¶¶320-321, 416.)

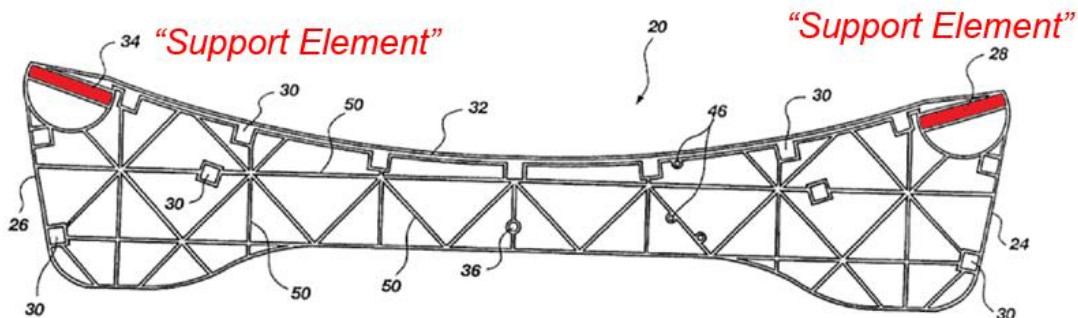


Fig. 4

Ex.1011, Fig.4

... [1.7]/ [21.5] a safety device coupled to the running belt, the safety device at least partially supported by the support element, wherein the safety device includes a first safety race element and a second safety race element, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;

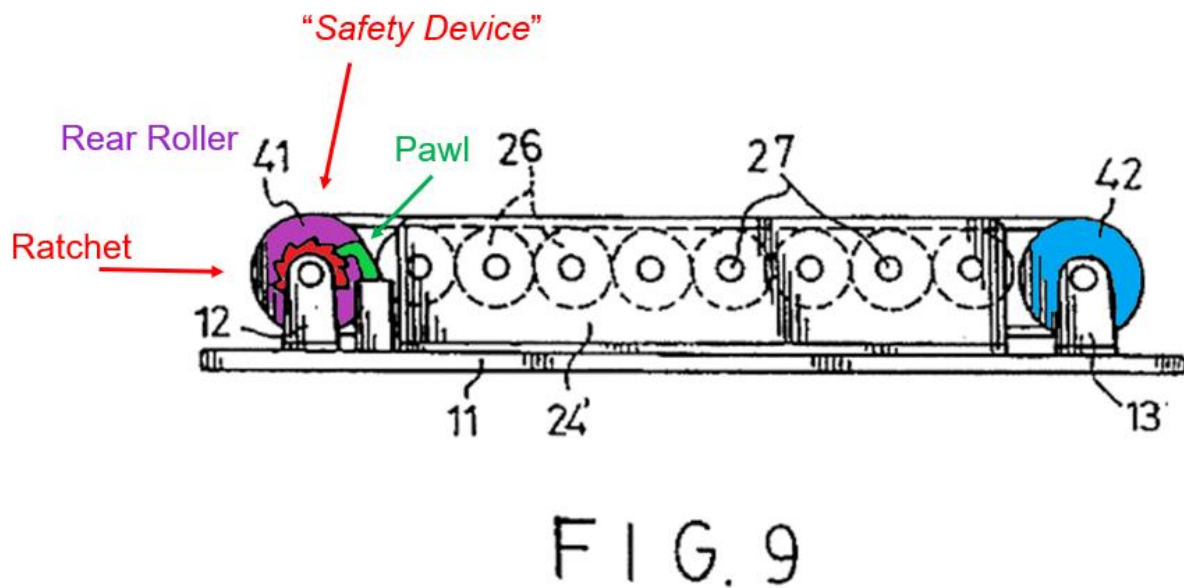
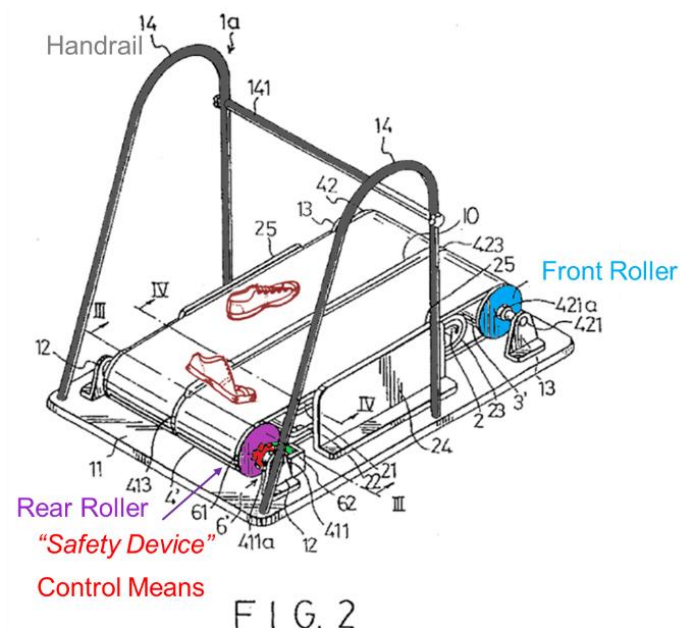
... [10.4] a first safety race element and a second safety race element, both of which are coupled to the running belt, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;

... [18.4] providing a first safety race element coupled to the frame and to the running belt and a second safety race element coupled to the frame, wherein at least one of the first and second safety elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;

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. Each control means 6, 6' includes a ratchet gear 61 rotationally coupled to the shaft 411 and a pawl 62 coupled to the base 11. (Ex.1012, 4:46-59; Ex.1003, ¶¶322-335, 417, ¶¶384-386, 416.)

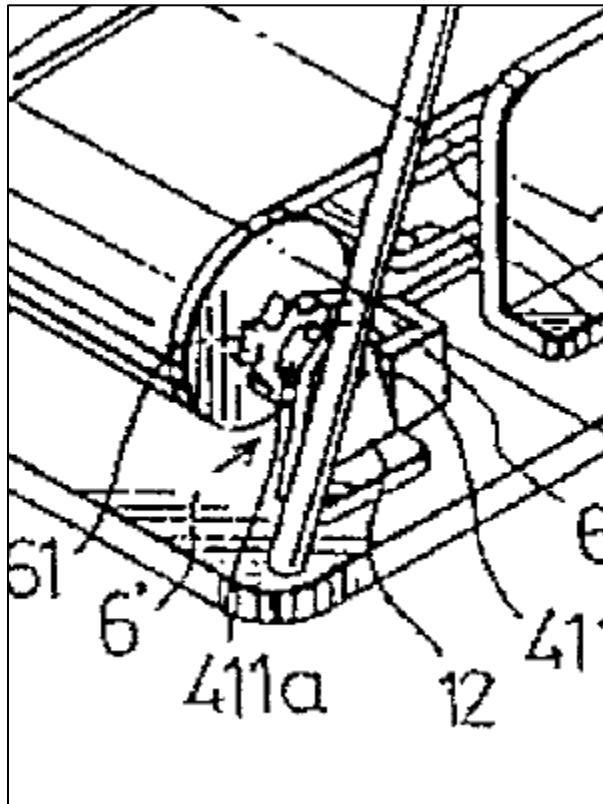


Ex.1012, Fig.5



Ex.1012, Figs.2, 9

The ratchet 61 has a gear profile and the pawl 62 is oriented such that the rear roller is prevented from rotating clockwise, which corresponds with the belt being blocked from moving to the right on the page, or forward.



Ex.1012, Fig.2

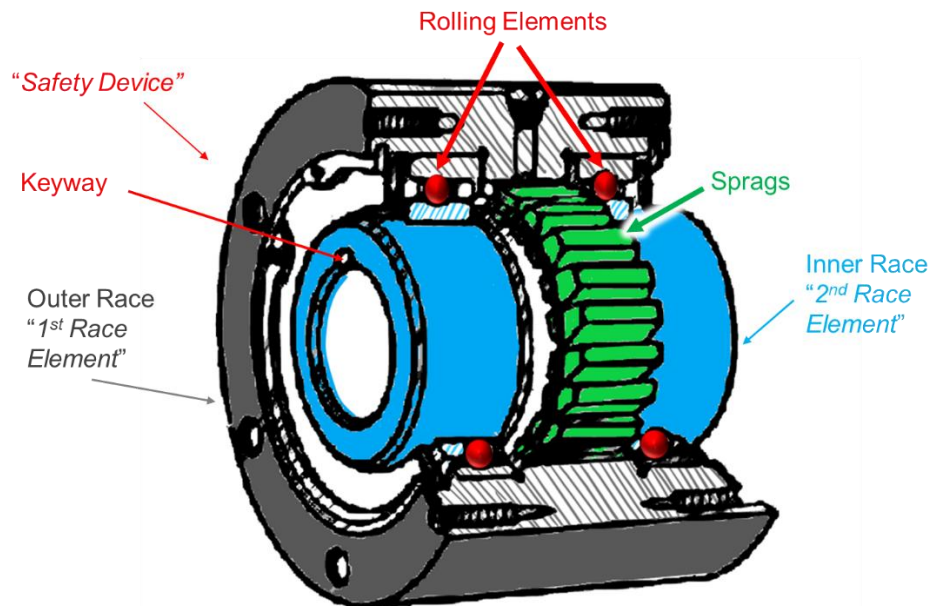
As explained above, it would have been obvious to a POSA to combine Socwell's treadmill with Magid's control means to permit only unidirectional movement of the running belt to reduce the risk of a user stepping onto the running belt of the treadmill and losing their balance when the belt moves in the forward direction. Magid's control means 6, 6' provide a "*safety device*" by preventing the left and right foot belts 4, 4' from moving forward. (Ex.1003, ¶326.)

A POSA would have been motivated to modify Socwell to include Magid's control means 6, 6' mounted to the front roller or the rear roller. For example, the

ratchet gear 62 would be mounted coaxially with the roller 86 (or roller 78) and the pawl 61 would be rotationally attached to the frame 12. As modified, the ratchet gear 62 would be supported by the journal housing 34 at least through the roller 86 and the control means 6/6' would be coupled to the belt 16 via the roller 86. Thus, the control means (“*safety device*”) is at least partially supported by the journal housing (“*support element*”). (Ex.1003, ¶327.)

Magid does not explicitly disclose first and second safety race elements with one surrounding the other.

As illustrated below, Sclater discloses a sprag-type bearing assembly including an inner race, an outer race surrounding the inner race, and a plurality of sprags and rolling elements (balls) disposed between the inner race and the outer race. (Ex.1017 at 312.)



Ex.1017, 318

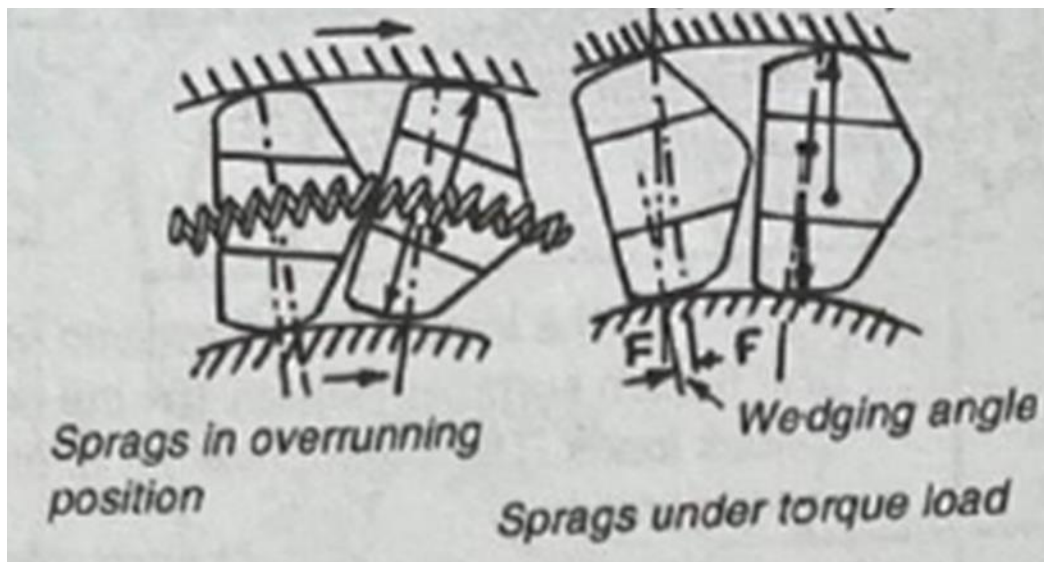
Sclater discloses that the inner race defines a center hole sized to receive a shaft and defines a keyway on the inner diameter. The keyway provides means for rotatably coupling the inner race to a shaft via a key.

The sprag-type bearing assembly functions as a one-way bearing by providing “one-direction only torque transmission in an overrunning clutch.” (Ex.1017, 312.) The sprags have a “sprag profile, which is composed of two nonconcentric curves of different radius” that provide “a locking ramp.” (*Id.*) Sclater further discloses that the:

Precision sprags act as wedges and are made of hardened alloy steel. In the formsprag clutch, **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, 318.)

The belt 16 (“*running belt*”) is coupled to the inner race (“*second safety race element*”) through the front roller 78 or the rear roller 86. As illustrated in the figure below on the left, the belt 16 and the inner race rotate in a first direction relative to the outer race (“*first safety race element*”) to overrun. However, as illustrated in the figure below on the right, wedging or interference between the sprags and the inner and outer race prevents rotation of the inner race in an opposite direction, which prevents the belt 16 from moving forward.



Ex.1017, 318

Thus, the combination of references teaches “a safety device [control means 6, 6’] coupled to the running belt [belt 16], the safety device at least partially supported by the support element [journal housing 34], wherein the safety device includes a first safety race element [outer race] and a second safety race element

[inner race], wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame [inner race], and wherein one of the first and second safety race elements [outer race] substantially surrounds the other of the one of the first and second safety race elements.” (Ex.1003, ¶¶331-335.)

2. Rationale to Combine Schonenberger and Socwell with Magid

It would have been obvious to a POSA to combine the manual treadmill topology with a curved running surface disclosed in Socwell with the known technique of a one-way clutch to prevent treadmill belt motion in a forward direction as disclosed in Magid.

Socwell and Magid are from the same field – Exercise Equipment, more specifically treadmills for home exercise use. (Ex.1011, 1:10-12; Ex.1012, 1:53-56; 3:23-27.) Both Socwell and Magid disclose treadmills with a running belt that is supported by end rollers and a central deck. (Ex.1011, 5:33-44; 8:7-27, Fig.3; Ex.1012, 4:64-5:18, Fig.2.) Socwell discloses a curved deck 56 and rollers 98 that cooperate to place the belt 16 in a curved shape. (Ex.1011, 10:5-31, Fig.2.) (Ex.1003, ¶¶336-337.)

It has long been recognized that users may be injured by falling off of a treadmill while mounting or dismounting it, or while using it. This may be due to the treadmill belt moving in an unexpected direction or in such a way that the user

cannot regain their equilibrium. It could also be due to the incline of the surface causing the position of user to drift rearwards, and off, over time. (See ¶¶ 71-72.)

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, 1:30-37.)

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, 1:32-36.)

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.)

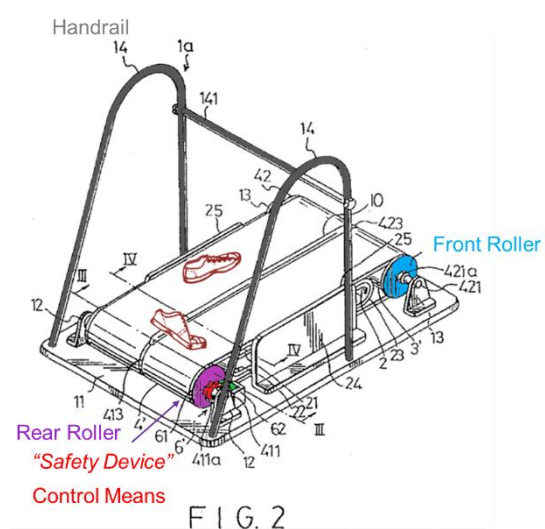
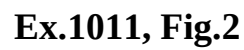
Several professional organizations have produced standards to provide guidance to manufacturers regarding both exercise equipment safety in general and other standards specifically for treadmill safety. See ASTM Standard, Ex.1019; ISO Standard, Ex.1020; and ACCC Product Safety Supplier Guide, Ex. 1007.

These standards establish requirements for foot rails and handrails on treadmills to address user stability. (Ex.1019 at 3-4; Ex.1020 at 8.)

Socwell recognizes that it is difficult to stabilize the running belt in manual treadmills due to the difficulty in balancing the frictional and inertial qualities of belt supporting devices. (Ex.1011, 1:30-56.) Socwell describes motorization as the prior-art solution to the problem of balancing these qualities (Ex.1011, 1:57-67.)

Rather than relying on a motor, Socwell discloses to calibrate the rollers and deck to provide optimal frictional resistance of the belt to ensure safety while providing proper resistance for to exercising. (Ex.1011, 11:56-61.) Socwell explains that the curved running surface prevents a user from falling off the back. (Ex.1011, 3:40-45.) (Ex.1003, ¶¶338-341.)

Socwell's curved running surface does not address the safety issue of the running belt moving in a forward direction when a user steps onto the treadmill. For example, with a manual curved running surface, such as that disclosed in Socwell, such forward motion is likely to occur if a user were to step onto the rearward end of the running surface (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.1012, Figs.5,2

It would have been obvious to a POSA to combine Socwell's treadmill with Magid's control means to permit only unidirectional movement of the running belt to reduce the risk of a user stepping onto the running belt of the treadmill and losing their balance when the belt moves in the forward direction. (Ex.1003, ¶¶342-344.)

Accordingly, a POSA would have been motivated to modify Socwell to include Magid's control means mounted to the front roller or the rear roller as discussed above. (Ex.1003, ¶345.)

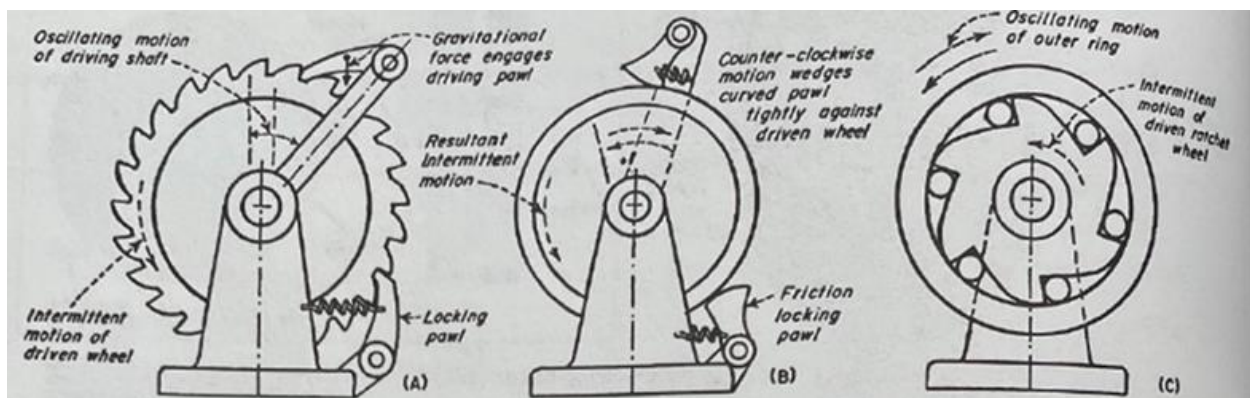
This modification would have been a simple combination of known elements in the prior art: Socwell's manual treadmill with a curved running surface and Magid's one-way ratchet clutch. The pawl is arranged forward of the ratchet gear and biased to engage the gear teeth. The profile of the ratchet gear teeth is swept forward to yield predictable results: allowing the ratchet gear to overrun counter-clockwise with rearward motion of the belt and providing a backstop clockwise to prevent forward motion of the belt. (Ex.1003, ¶¶ 82-83, 346.)

The one-way clutch of Magid would function the same when added to Socwell and provide the predictable result in Socwell's running belt of only rotating in the exercise direction thus providing the same benefit described in Magid. (Ex.1012, 4:46-59.) 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 and conveyor belts, in the same way, i.e., to provide unidirectional belt motion. (Ex. 1003, ¶¶82-83, 89-90; Ex.1018, 8-9, 52-53.)

A POSA would have been further 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, ¶¶347-348.)

Ratchet-and-pawl clutch mechanisms make noise during operation. The pawl is spring-loaded to engage each gear tooth of the ratchet and it would make an audible “click” when colliding with the gear tooth after overrunning or passing over each tooth. For example, a POSA would have been aware of this noise from other common ratchet clutches, such as those included in a ratchet wrench, a bicycle wheel, and an automotive parking brake. Sclater acknowledges that a “friction-type clutch” is quieter than a ratchet-type clutch. (Ex.1017, 316.)



Ex.1017, 316

Sclater further discloses that roller clutches are better suited for high-speed freewheeling than pawl-and-ratchet clutches. 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 races 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.1017, 303, 320.) Sclater further describes a backstopping mode of operation for a conveyor:

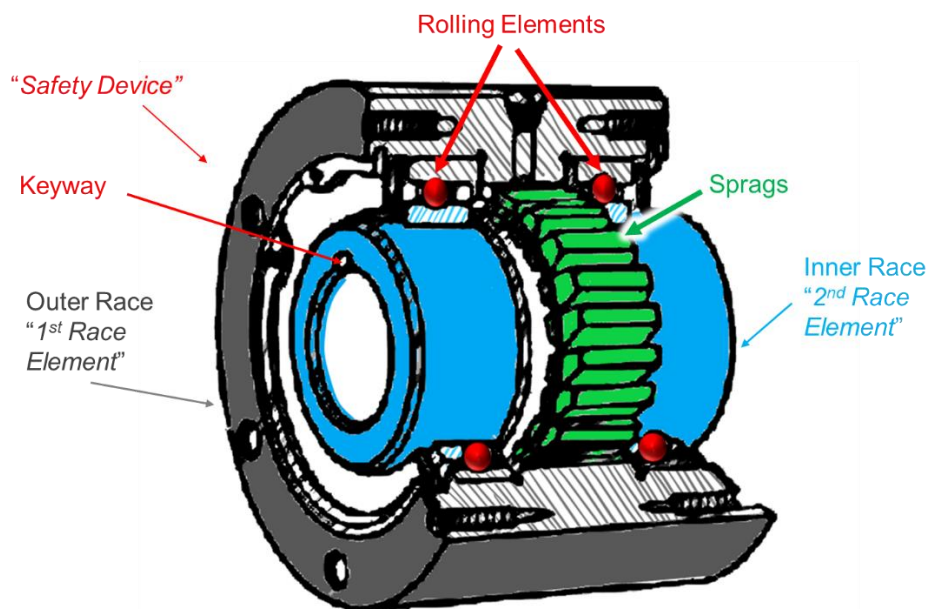
An example is a clutch mounted on the headshaft of a conveyor. The outer race is restrained by torque-arming the stationary frame of the conveyor.

(Ex.1017, 320.)

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,” including “Exercise equipment,” “Food processing equipment,” “Printing presses,” and “Roll conveyors.” (Ex.1018 at 52-53.) (Ex.1003, ¶¶349-352.)

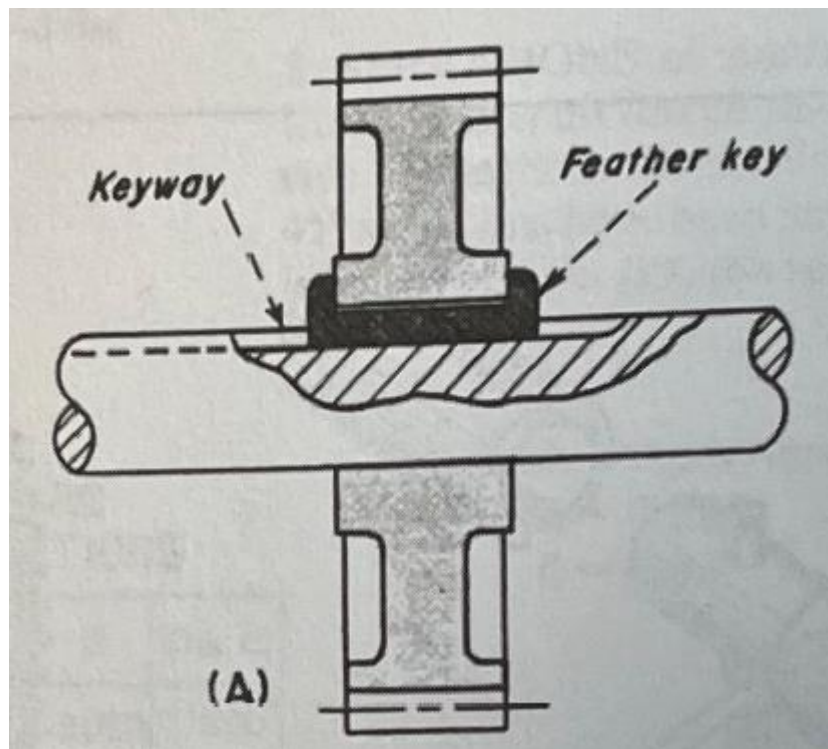
A POSA would have known how to replace Magid’s control means with Sclater’s one-way bearing assembly. For example, the outer race would be fixed to the frame 12 either directly or through one or more intermediaries, e.g., a bracket,

the journal housing 34, or other support element. For example, Sclater illustrates below that the outer race includes tapped holes for receiving fasteners for mounting the one-way bearing, and Emerson describes examples of commercially available brackets or torque arms. (See Ex.1018, 38-43; Ex.1003, ¶353.)



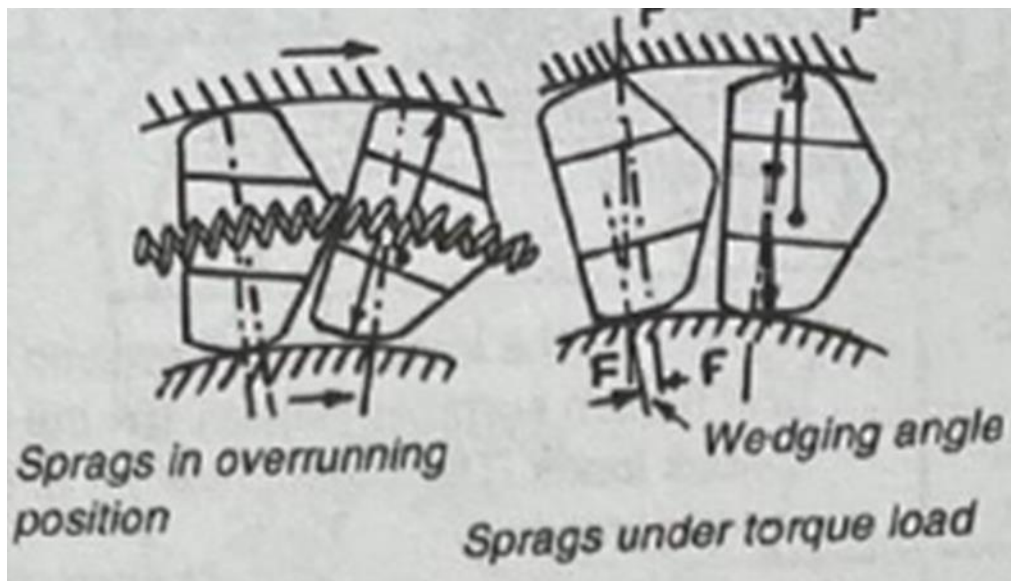
Ex.1017, 318

The inner race 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, 420

With this arrangement, rearward motion of the endless belt 16 would rotate the front/rear roller and inner race so that the inner race would overrun and move the sprags out of the locked position. However, forward motion of the endless belt 16 would rotate the inner race in the opposite direction and wedge the sprags into the locked position to backstop and prevent forward motion of the belt 16. (Ex.1003, ¶¶354-355.)



Ex.1017, 318

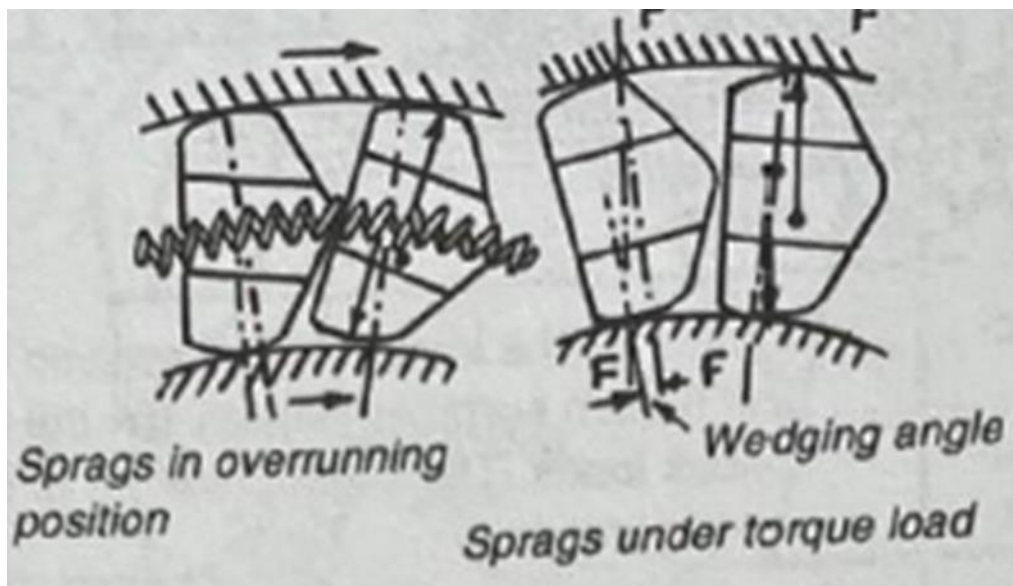
... [1.8]/[10.5]/[21.6] wherein one of the first and second safety race elements and the running belt freely rotates in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, the one of the first and second safety race elements is substantially prevented from rotation relative to the frame to substantially prevent rotation of the running belt relative to the frame.

... [18.5] permitting rotation of one of the first and second safety race elements and the running belt in a first direction of rotation; and

... [18.6] substantially preventing rotation of the running belt in a second direction, opposite the first direction, by, at least in part, the one of the first and second safety race elements.

In modified Socwell, the inner race of the one-way bearing and the belt

coupled thereto freely rotate relative to the frame 12 in the rearward direction, but the sprags prevent rotation of the inner race and belt 16 in the forward direction relative to the frame 12. (Ex.1017 at 316, 318; Ex.1003, ¶¶356-357, 387, 418, ¶406.)

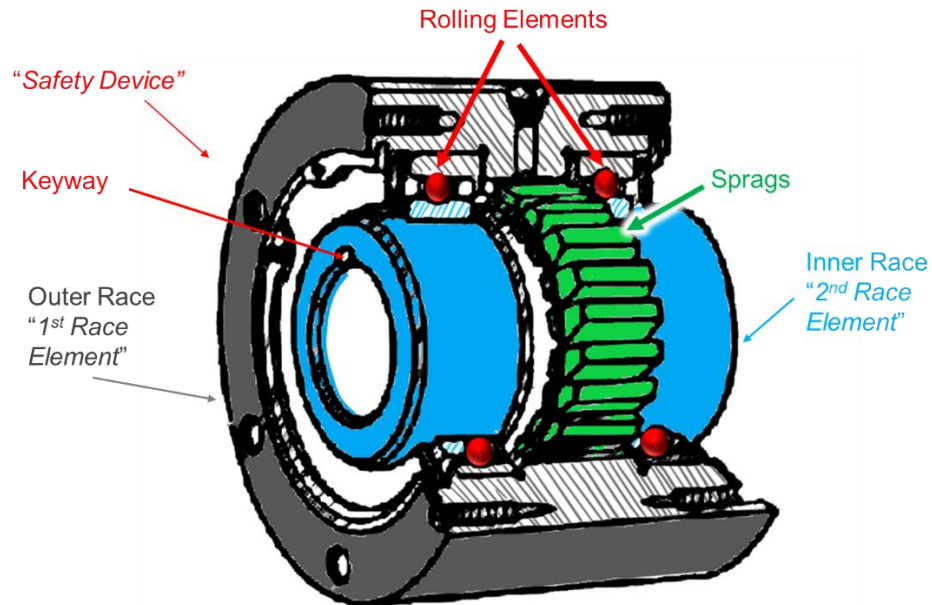


Ex.1017, 318

3. Dependent claims

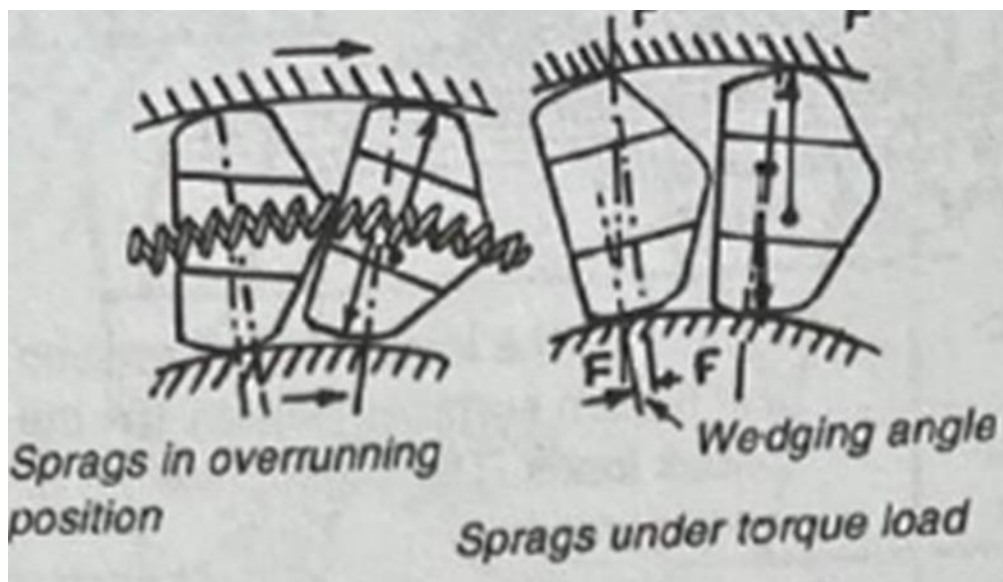
... [4.]/[12.]/[25.] *The treadmill of claim 1, wherein the first and second safety race elements of the safety device at least partly form a one-way bearing.*

Sclater discloses a one-way bearing assembly. (Ex.1017, 312.) Sclater discloses that the sprag-type one-way bearing assembly includes sprags disposed between an inner race (“second safety race element”) and an outer race (“first safety race element”).



Ex.1017, 318

As discussed above, the sprags have a sprag profile that permits relative rotation of the inner and outer races in a first direction but not in a second direction. (Ex.1017, 312, 316.) The bearing assembly is a “*one-way bearing*” due to the interaction of the sprags, rolling elements (balls), and the races. (Ex.1003, ¶¶360-362, 391-393, 426-427.)



Ex.1017, 318

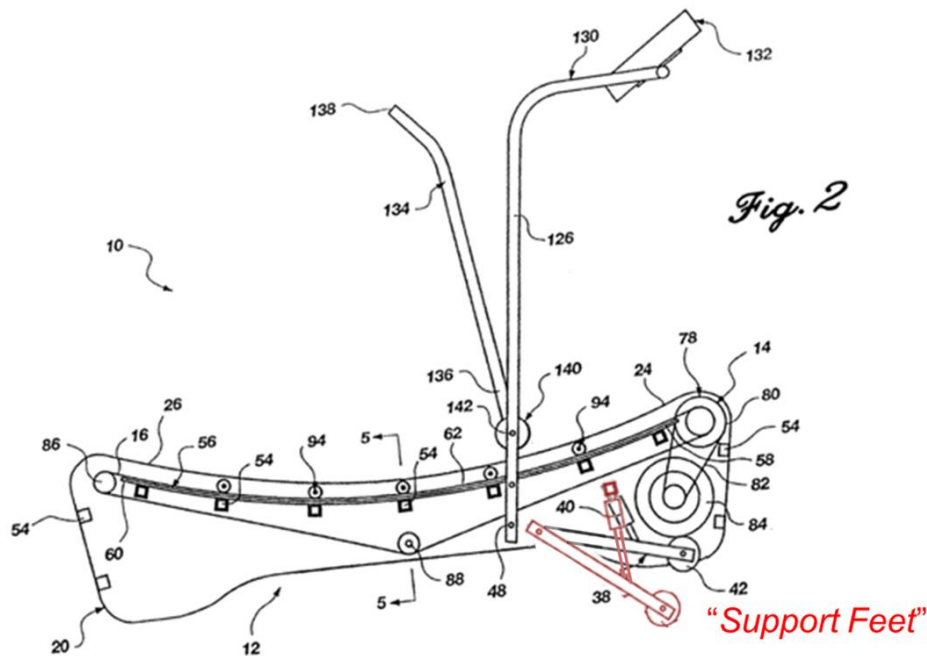
... [7.]/[11.]/[20.] *The treadmill of claim 1, wherein the treadmill is a manually powered, non-motorized treadmill.*

As discussed in claim limitation [1.0], Socwell discloses a manually powered, non-motorized treadmill. (Ex.1011, 11:34-38; 11:53-61; Ex.1003, ¶¶363, 390, 407-410.)

... [8.] *The treadmill of claim 1, further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to adjust a relative vertical incline of at least a portion of the treadmill relative to a surface supporting the treadmill.*

Socwell discloses foot roller assemblies 38 (one on each side) for adjusting the inclination of the belt 16. (Ex.1011, 9:29-47.) Each foot roller assembly 38 has an elongate support member (unlabeled) having an upper end pivotally attached to

the frame 12 and a lower end supporting a wheel 42. (Ex.1011, 9:29-51, 9:57-10:4.)



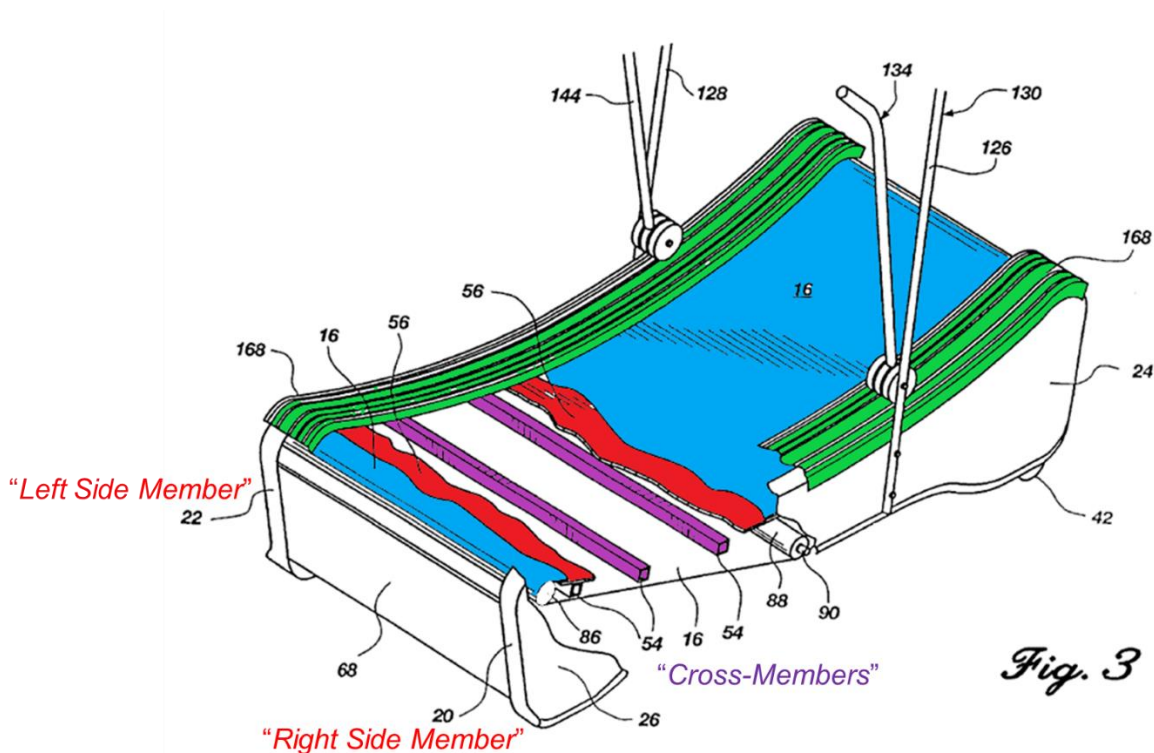
Ex.1011, Fig.2

The incline of the belt 16 is increased by pivoting the wheel 42 away from the frame. The incline of the belt 16 is decreased by pivoting the wheel 42 towards the frame. (Ex.1003, ¶¶364-371.)

... [9.0] The treadmill of claim 1, wherein the frame comprises 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.

Socwell discloses “the curved deck treadmill 10 comprises a support frame 12 having a first side 20 and a second opposing side 22 and having a deck 56

supportably disposed therebetween.” (Ex.1011, 5:23-26, Fig.1.) Socwell also discloses supports ribs 54 (*i.e.*, “*cross members*”) that extend between the left side 22 and the right side 20 of the frame 12. The right and left sides 20, 22 have rib seats 30 that receive the ends of the support ribs 54 to connect the ribs to the frame sides 20, 22. (Ex.1011, 8:27-34, Figs.2 and 3.) (Ex.1003, ¶¶372-373.)



Ex.1011, Fig.3

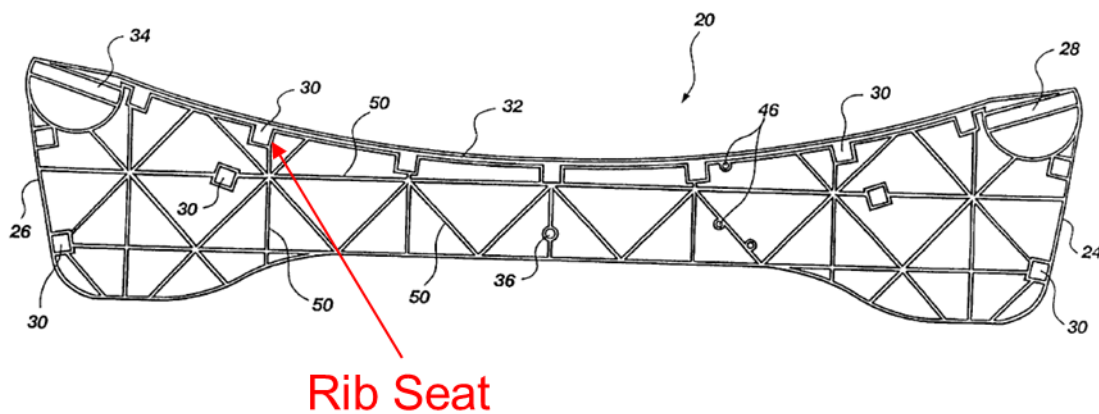


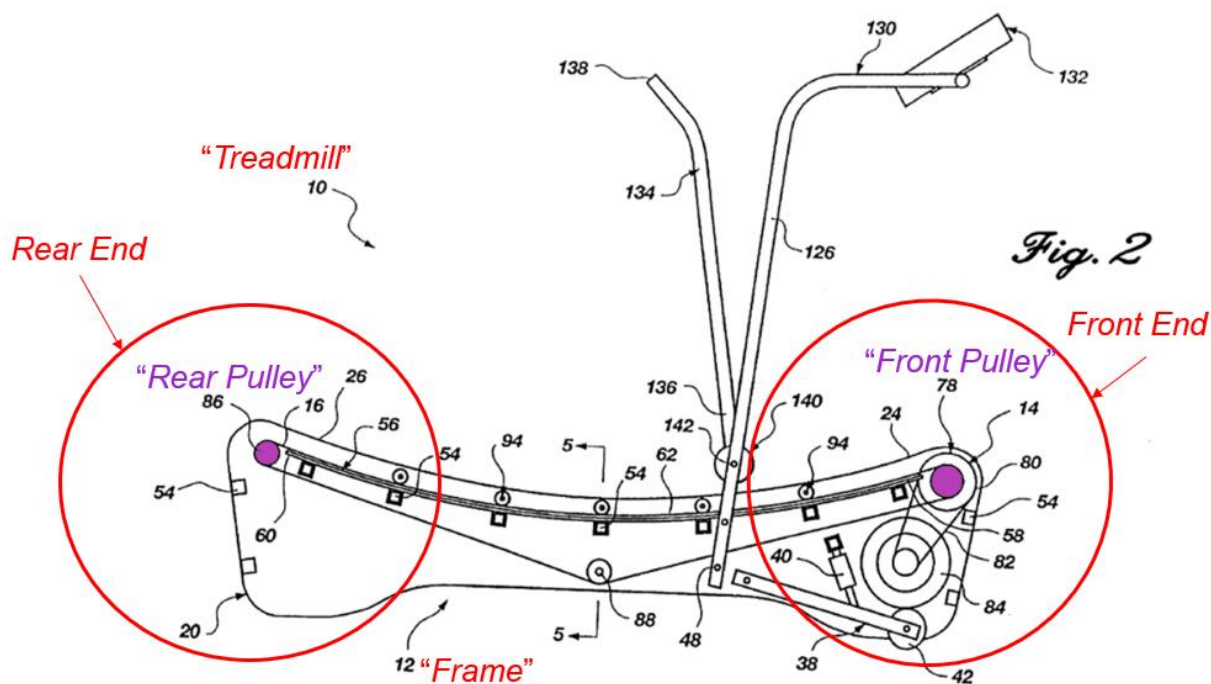
Fig. 4

Ex.1011, Fig.4

... [14.]/[24.] *The treadmill of claim 10, wherein the rotatable element comprises a running belt pulley coupled to the frame.*

... [22.] *The treadmill of claim 21, wherein the rotatable element comprises at least one of a front running belt pulley coupled to the frame and a rear running belt pulley coupled to the frame and spaced apart from the front running belt pulley.*

As I discussed above in claim 10, Socwell discloses “*rotatable elements*” in the form of rollers 78, 86 (“*pulleys*”), which are coupled to the frame through journal housings 28, 34. The pulleys support the running belt 16. (Ex.1011, 5:33-41, 6:27-45, 7:31-36, Fig.2; Ex.1003, ¶¶394-395, 425, ¶¶421-422.)



Ex.1011, Fig.2

... [17.] *The treadmill of claim 10, wherein the rotatable element comprises a plurality of bearings coupled to the frame, the plurality of bearings at least partially supporting the running belt.*

As discussed above in claim 1, Socwell discloses “rotatable elements” in the form of rollers 98 (“bearings,” which are coupled to the frame 12 through cover members 168 and bolts 118. The rollers 98 at least partially support the running belt 16 as I discussed above. (Ex.1011, 10:5-16, 10:49-56, 11:15-17, Fig.5; Ex.1003, ¶396.)

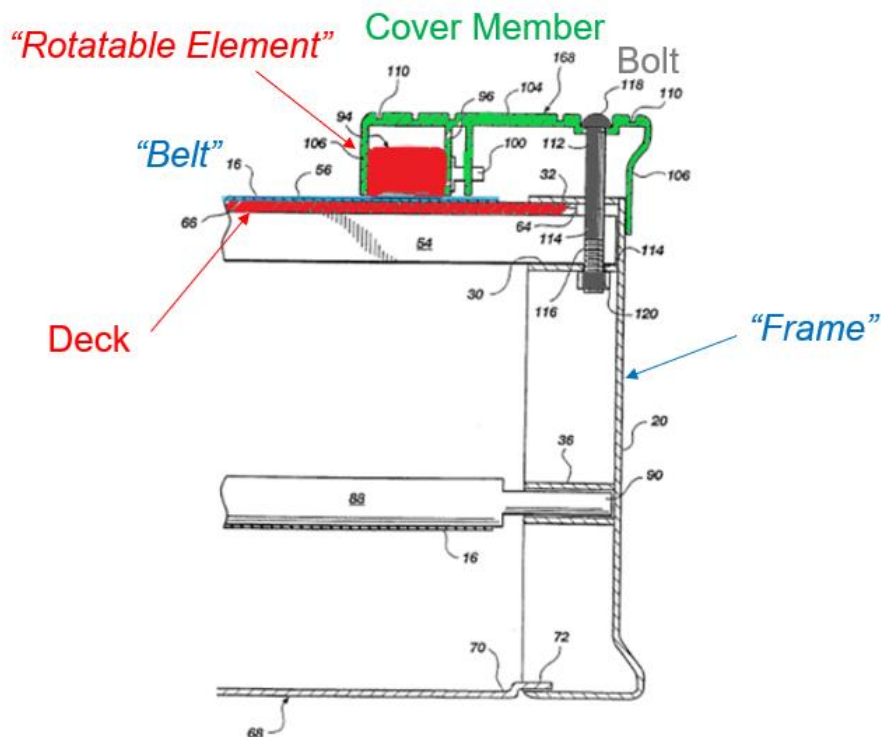


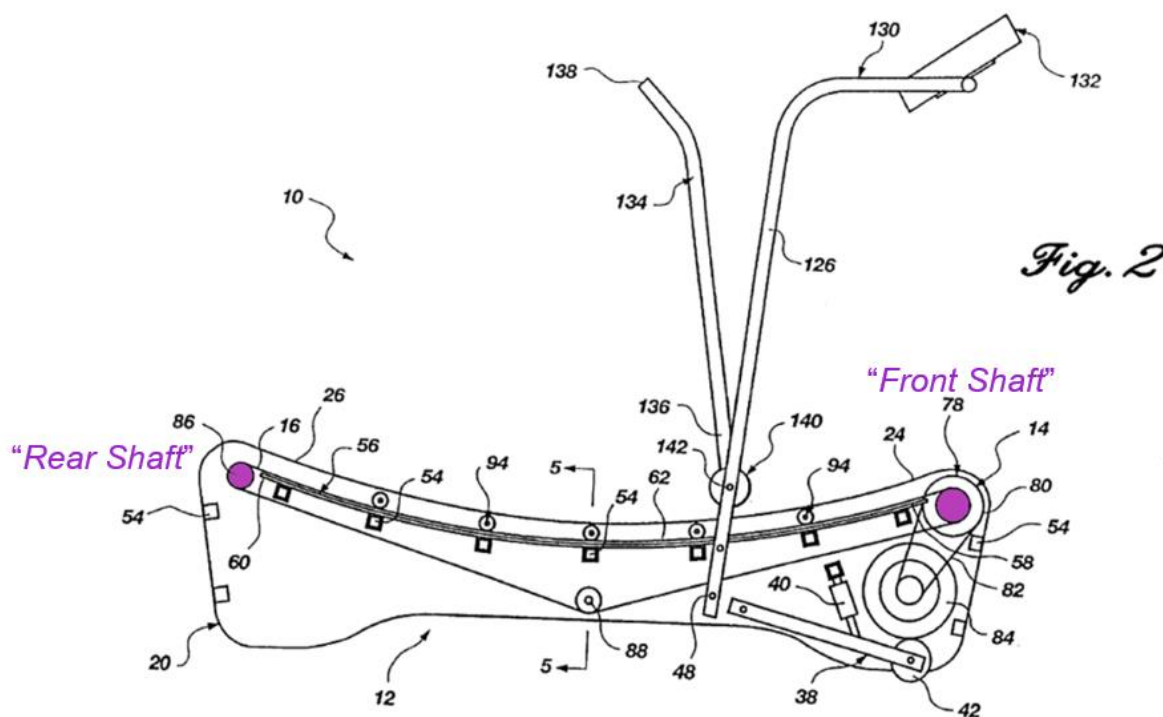
Fig. 5

Ex.1011, Fig.5

... [23.] *The treadmill of claim 21, wherein the rotatable element comprises at least one of a front rotatable shaft coupled to the frame and a rear rotatable shaft coupled to the frame and spaced apart from the front rotatable shaft.*

Socwell discloses a first roller 78 and a second roller 86. (Ex.1011, 5:33-41.)

As discussed above in claim limitation [10.2], the rollers 78, 86 are “rotatable elements.” (Ex. 1003, ¶¶ 306-309.) A POSA would also have understood the first roller 78 and the second roller 86 to be shafts. (Ex.1003, ¶¶423-424.)



Ex.1011, Fig.2

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, ¶428.)

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. (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 ’745 Patent. Magid, Socwell, and Schonenberger are cited on the ’745 Patent, however, the combinations of references applied in the petition, were not applied, nor cumulative with, the references applied during Examination.

Examination of the ’745 Patent focused on the “*safety device*” limitations. The Examiner rejected the “*safety device*” limitations over US 5,607,376 to Magid (“Magid ‘376”) and US 2,512,911 to Benice. *Id.* at 152, 157. Both references disclose ratchet clutches. *Id.* 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 1–3, the “*safety device*” claims are obvious over a 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, ¶¶163-197, 322-357.)

X. Conclusion

There is a reasonable likelihood that Petitioner will prevail on the claims 1, 4, 7-12, 14, 17-18, and 20-27 of the '745 Patent. *Inter partes* review should be instituted for each of these identified claims.

Respectfully submitted,

Dated: April 13, 2023

/Andrew B. Turner/
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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. 10,799,745)**, 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 '745 Patent:

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Respectfully submitted,

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Appendix A

A. Listing of All Challenged Claims

[1.0]	1. A treadmill, comprising:
[1.1]	a frame;
[1.2]	a front running belt pulley coupled to the frame;
[1.3]	a rear running belt pulley coupled to the frame and spaced a distance from the front running belt pulley;
[1.4]	a plurality of bearings coupled to the frame;
[1.5]	a running belt at least partially supported by at least one of the front running belt pulley and the rear running belt pulley, wherein the running belt includes a running surface, at least a portion of which is curved;
[1.6]	a support element coupled to the frame; and
[1.7]	a safety device coupled to the running belt, the safety device at least partially supported by the support element, wherein the safety device includes a first safety race element and a second safety race element, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;
[1.8]	wherein one of the first and second safety race elements and the running belt freely rotates in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, the one of the first and second safety race elements is substantially prevented from rotation relative to the frame to substantially prevent rotation of the running belt relative to the frame.
[4.]	4. The treadmill of claim 1, wherein the first and second safety race elements of the safety device at least partly form a one-way bearing.
[7.]	7. The treadmill of claim 1, wherein the treadmill is a manually powered, non-motorized treadmill.
[8.]	8. The treadmill of claim 1, further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to adjust a relative vertical incline of at least a portion of the treadmill relative to a surface supporting the treadmill.
[9.]	9. The treadmill of claim 1, wherein the frame comprises 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.
[10.0]	10. A treadmill, comprising:
[10.1]	a frame;

[10.2]	a rotatable element coupled to the frame;
[10.3]	a running belt at least partially supported by the rotatable element, wherein the running belt includes a running surface, at least a portion of which is curved; and
[10.4]	a first safety race element and a second safety race element, both of which are coupled to the running belt, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;
[10.5]	wherein one of the first and second safety race elements 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, the one of the first and second safety race elements is substantially prevented from rotation relative to the frame to substantially prevent rotation of the running belt relative to the frame.
[11.]	11. The treadmill of claim 10, wherein the treadmill is a manually powered, non-motorized treadmill.
[12.]	12. The treadmill of claim 10, wherein the first and second safety race elements of the safety device at least partly form a one-way bearing.
[14.]	14. The treadmill of claim 10, wherein the rotatable element comprises a running belt pulley coupled to the frame.
[17.]	17. The treadmill of claim 10, wherein the rotatable element comprises a plurality of bearings coupled to the frame, the plurality of bearings at least partially supporting the running belt.
[18.0]	18. A method, comprising:
[18.1]	providing a treadmill having a frame with a front end and a rear end;
[18.2][A]	providing a plurality of bearings coupled to the frame,
[18.2][B]	wherein the plurality of bearings define at least a portion of a curved top profile;
[18.3]	disposing a running belt on the plurality of bearings such that the curved top profile of the plurality of bearings define at least a portion of a curved running surface of the running belt;
[18.4]	providing a first safety race element coupled to the frame and to the running belt and a second safety race element coupled to the frame, wherein at least one of the first and second safety elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;
[18.5]	permitting rotation of one of the first and second safety race elements and the running belt in a first direction of rotation; and
[18.6]	substantially preventing rotation of the running belt in a second direction, opposite the first direction, by, at least in part, the one of the first and second safety race

	elements.
[20.]	20. The method of claim 18, wherein the treadmill is a manually powered, non-motorized treadmill.
[21.0]	21. A treadmill, comprising:
[21.1]	a frame;
[21.2]	a rotatable element coupled to the frame;
[21.3]	a running belt at least partially supported by the rotatable element, wherein the running belt includes a running surface, at least a portion of which is curved;
[21.4]	a support element coupled to the frame; and
[21.5]	a safety device coupled to the running belt, the safety device at least partially supported by the support element, wherein the safety device includes a first safety race element and a second safety race element, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;
[21.6]	wherein one of the first and second safety race elements and the running belt freely rotates in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, the one of the first and safety race elements is substantially prevented from rotation relative to the frame to substantially prevent rotation of the running belt.
[22.]	22. The treadmill of claim 21, wherein the rotatable element comprises at least one of a front running belt pulley coupled to the frame and a rear running belt pulley coupled to the frame and spaced apart from the front running belt pulley.
[23.]	23. The treadmill of claim 21, wherein the rotatable element comprises at least one of a front rotatable shaft coupled to the frame and a rear rotatable shaft coupled to the frame and spaced apart from the front rotatable shaft.
[24.]	24. The treadmill of claim 21, wherein the rotatable element comprises a running belt pulley coupled to the frame.
[25.]	25. The treadmill of claim 21, wherein the first and second safety race elements of the safety device at least partly form a one-way bearing.
[26.]	26. The treadmill of claim 21, wherein the support element comprises a rod.
[27.]	27. The treadmill of claim 26, wherein at least a portion of the rod defines a keyway, wherein the keyway is configured to receive a key such that the key engages with the rod and the safety device.

Appendix B

A. Comparison of Independent Claims

[1.0] A treadmill, comprising:	[10.0] A treadmill, comprising:	[18.0] A method, comprising: [18.1][a] providing a treadmill	[21.0] A treadmill, comprising:
[1.1] a frame;	[10.1] a frame;	[18.1] [b] having a frame with a front end and a rear end;	[21.1] a frame;
[1.2] a front running belt pulley coupled to the frame; [1.3] a rear running belt pulley coupled to the frame and spaced a distance from the front running belt pulley;	[10.2] a rotatable element coupled to the frame;		[21.2] a rotatable element coupled to the frame;
[1.4] a plurality of bearings coupled to the frame;		[18.2][A] providing a plurality of bearings coupled to the frame, [B] wherein the plurality of bearings define at least a portion of a curved top profile;	
[1.5] a running belt at least partially supported by at least one of the front running belt pulley and the rear running belt	[10.3] a running belt at least partially supported by the rotatable element, wherein the running belt includes a running	[18.3] disposing a running belt on the plurality of bearings such that the curved top profile of the plurality of	[21.3] a running belt at least partially supported by the rotatable element, wherein the running belt includes a running

pulley, wherein the running belt includes a running surface, at least a portion of which is curved;	surface, at least a portion of which is curved; and	bearings define at least a portion of a curved running surface of the running belt;	surface, at least a portion of which is curved;
[1.6] a support element coupled to the frame; and			[21.4] a support element coupled to the frame; and
[1.7] a safety device coupled to the running belt, the safety device at least partially supported by the support element, wherein the safety device includes a first safety race element and a second safety race element, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;	[10.4] a first safety race element and a second safety race element, both of which are coupled to the running belt, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;	[18.4] providing a first safety race element coupled to the frame and to the running belt and a second safety race element coupled to the frame, wherein at least one of the first and second safety elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;	[21.5] a safety device coupled to the running belt, the safety device at least partially supported by the support element, wherein the safety device includes a first safety race element and a second safety race element, wherein at least one of the first and second safety race elements is adapted for rotation relative to the frame, and wherein one of the first and second safety race elements substantially surrounds the other of the one of the first and second safety race elements;

[1.8] wherein one of the first and second safety race elements and the running belt freely rotates in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, the one of the first and second safety race elements is substantially prevented from rotation relative to the frame to substantially prevent rotation of the running belt relative to the frame.	[10.5] wherein one of the first and second safety race elements 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, the one of the first and second safety race elements is substantially prevented from rotation relative to the frame to substantially prevent rotation of the running belt relative to the frame.	[18.5] permitting rotation of one of the first and second safety race elements and the running belt in a first direction of rotation; and [18.6] substantially preventing rotation of the running belt in a second direction, opposite the first direction, by, at least in part, the one of the first and second safety race elements.	[21.6] wherein one of the first and second safety race elements and the running belt freely rotates in a first direction of rotation relative to the frame, however, in a second direction of rotation, opposite the first direction of rotation, the one of the first and safety race elements is substantially prevented from rotation relative to the frame to substantially prevent rotation of the running belt.
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B. Comparison of Dependent Claims

1	10	18	21
4. The treadmill of claim 1, wherein the first and second safety race elements of the safety device at least partly form a one-way bearing.	12. The treadmill of claim 10, wherein the first and second safety race elements of the safety device at least partly form a one-way bearing.		25. The treadmill of claim 21, wherein the first and second safety race elements of the safety device at least partly form a one-way bearing.
7. The treadmill of claim 1, wherein the treadmill is a manually powered, non-motorized treadmill.	11. The treadmill of claim 10, wherein the treadmill is a manually powered, non-motorized treadmill.	20. The method of claim 18, wherein the treadmill is a manually powered, non-motorized treadmill.	
8. The treadmill of claim 1, further comprising at least one support foot coupled to the frame, wherein the at least one support foot is adjustable to adjust a relative vertical incline of at least a portion of the treadmill relative to a surface supporting the treadmill.			

9. The treadmill of claim 1, wherein the frame comprises 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.			
	14. The treadmill of claim 10, wherein the rotatable element comprises a running belt pulley coupled to the frame.		24. The treadmill of claim 21, wherein the rotatable element comprises a running belt pulley coupled to the frame.
	17. The treadmill of claim 10, wherein the rotatable element comprises a plurality of bearings coupled to the frame, the plurality of bearings at least partially supporting the running belt.		
			22. The treadmill of claim 21, wherein the rotatable element comprises at least one of a front running belt pulley coupled to the frame and a

			rear running belt pulley coupled to the frame and spaced apart from the front running belt pulley.
			23. The treadmill of claim 21, wherein the rotatable element comprises at least one of a front rotatable shaft coupled to the frame and a rear rotatable shaft coupled to the frame and spaced apart from the front rotatable shaft.
			26. The treadmill of claim 21, wherein the support element comprises a rod.