

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.

IPR2023-00843
U.S. Patent No. 10,561,884

DECLARATION OF KIM B. BLAIR, Ph.D.

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I, Kim B. Blair, declare as follows:

1. I am over twenty-one (21) years of age and have personal knowledge of the facts stated herein. I have been retained by Foley & Lardner LLP on behalf of Woodway USA, Inc. (“Patent Owner”) to provide my opinion on the issues raised by LifeCORE Fitness, Inc., d/b/a Assault Fitness (“Petitioner”) in a petition for *inter partes* review (“Petition”) of Claims 30-34, 37-54, 57, and 59 of U.S. Patent No. 10,561,884 (“the ’884 Patent”) and the accompanying declaration of Robert Giachetti (EX1003).

I. QUALIFICATIONS AND EXPERIENCE

2. Enabling innovation at the intersection of technology and sports, I have extensive experience utilizing advanced technologies to enhance all aspects of the sporting experience. As the Founder of Sport Technology Innovation & Engineering (STI&E Consulting) and previously as Partnering Lead at Cooper Perkins, Inc., as a Senior Manager at Exponent, Inc., as the Vice President of Business Development and Operations and the Manager of the Sports Engineering Practice at Cooper Perkins, Inc., and as the Founding Director of the Sports Innovation Program at MIT (now MIT Sports Tech), I led the development of new products as well as technologies for sport performance analyses from early formulation of product concepts to final prototype design and testing.

3. Many of my projects have won awards, including MIT departmental awards, conference best paper awards, and international ispo Academic Challenge design awards.

4. My work has enjoyed extensive media coverage, including features in Forbes, The Boston Globe, Outside Magazine, and GQ, and programs by CNN, The NewsHour, The Discovery Channel, NPR, and local network affiliates.

5. I provide a wide variety of consulting services to the sports industry, including leading product development projects, conducting performance testing of existing and prototype products, and creating innovative concepts aimed at enhancing the experience for sports spectators.

6. In addition, as a member of the board of advisors for emerging companies, I provided expertise on business and strategic planning, technology assessment and development, strategic alliances, and raising capital.

7. A recognized expert in innovation and sport technology, I have spoken at the Lemelson Foundation, the Boston Museum of Science, IDEAS Boston 2004, the International Congress on Technological and Social Innovation in Sport (Spain), the University of Nebraska, Purdue University, the University of Illinois, Rutgers University, Rensselaer Polytechnic Institute, the University of London, Loughborough University (UK), the SGMA International Business Intelligence,

Tufts University, the MIT Center for Innovation and Product Development, and the Massachusetts Defense Lawyer's Association.

8. I have served as a technical advisor for the United States Olympic Committee, on the advisory board for the SGMA Sport + Technology Convergence Conference, and as a member of the Golf Digest Academic Advisory Panel.

9. Prior to my work at Exponent, founding STI&E, and my work with Cooper Perkins, I was the President and Founder of Sports Innovation Group LLC, and a lecturer in the MIT Aeronautics and Astronautics Department, serving as the lead instructor for a capstone experimental projects course, co-developer of a junior level advanced dynamics course, and instructor in a graduate structural dynamics and vibrations course.

10. Previously, I was a senior scientist and management team member at Moldyn, Inc., an organization applying aerospace analysis techniques to the fields of biomechanics and computational chemistry. I also served as an aerospace engineer at the NASA Johnson Space Center.

11. My professional affiliations include previously serving as Secretary, President, and Past-President and Senior Advisor of the International Sports Engineering Association. I received an Outstanding Service Award for recognition of my contributions to the society while serving as President from 2010-2014. In 2022, I was elected as a Fellow of the ISEA, in recognition for exemplary career

achievements in academia and industry. I have served as a member of the editorial board for the Journal of Sports Engineering and Technology and am currently a reviewer for the Journal of Sports Engineering.

12. I have served on the scientific committees for several editions of The Engineering of Sport Conference and the Asia Pacific Conference on Sports Technology. In addition, I have served as a Session Chair for the 11th International Conference on Engineering of Sport. I was the co-chair of the 2022 ISEA Engineering of Sport Conference.

13. I am also a lead user of sports and fitness products having trained for and competed in more than 100 endurance events, including the US National Triathlon Championships, World Triathlon Championship Qualifier, the Hawaii Ironman World Championships, and Ironman Austria. I am the past president and board member of Team Psycho, a New England-based elite triathlon team. I currently train and occasionally race with The Rippers and K.I.T, two Boston based cycling clubs.

14. Born and raised in Nebraska, I earned a BA in Psychology and a BS in Mechanical Engineering at the University of Nebraska. At Purdue University, I earned a MS in Mechanical Engineering and a PhD in Aeronautics and Astronautics. In 2005, the University of Nebraska awarded me an Alumni Achievement Award.

15. Since April 2021, I have been employed by Re:Build Manufacturing as Vice President of Business Development. Re:Build leverages a deep expertise in engineering, operations management, and technology to supercharge performance of its companies by implementing core technologies across industrial platforms in diversified growth markets. While Re:Build serves multiple industry sectors, we innovate new manufacturing processes for the re-shoring of sports products manufacturing.

16. In addition, I continue to provide consulting services as STI&E Consulting, including new product development, performance testing of existing and prototype products, and expert witness services on patent litigation cases.

17. Of particular relevance to this case, I have contributed to the design and development of fitness equipment such as the KoKo Smartrainer, I am a co-inventor of a wearable device for assessing running form (U.S. Patent No. 9,642,415), and I have served as an expert witness on a number of patent litigation cases related to sports equipment, most recently four cases involving treadmills. Over the years, I have attended a number of trade shows that feature fitness equipment including the SGMA Super Show, Club Industry East, Interbike, and ispo.

18. I am generally familiar with patents and review patent disclosures regularly.

19. I understand that my curriculum vitae is being submitted in this matter as Exhibit 2019. It includes a listing of all publications I have authored or co-authored during my career.

II. MATERIALS CONSIDERED

20. All of the opinions contained in this declaration are based on the documents I have reviewed and my professional judgment, as well as my education, experience, and professional knowledge. I am not an attorney, and I am not offering any legal opinions in this declaration.

21. In forming the opinions expressed in this declaration, I relied upon my education, knowledge, and experience in the relevant field of the art, and have considered the viewpoint of a person having ordinary skill in the relevant art (“POSA”). I have considered the materials referenced herein, including the ’884 Patent (EX1001), the file history of the ’884 Patent (EX1002), and the prior art references and other documents listed in the table below. Each of these documents is a type of document that an expert in my field would have reasonably relied upon when forming his/her opinion.

Exhibit	Description
1003	Declaration of Robert Giachetti
1004	Curriculum vitae of Robert Giachetti
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 (“Schoenenberger”)

Exhibit	Description
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”)
1017	Petitioner’s Excerpts from Neil Sclater and Nicholas P. Chironis, Mechanisms & Mechanical Devices Sourcebook, Third Ed., (McGraw-Hill 2001) (“Sclater”)
1018	Mechanical Clutches and Torque Overload Devices, (Emerson Industrial Automation, 2001) (“Emerson”)
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”)
1033	Claim Construction Order Woodway USA, Inc., v. LifeCORE Fitness, Inc. d/b/a Assault Fitness No. 3:22-cv-00492-JO-BLM, Dkt. No. 59, Southern District of California, November 14, 2023
2020	Declaration of Eric A. Weber
2021	Additional Excerpts from Neil Sclater and Nicholas P. Chironis, Mechanisms & Mechanical Devices Sourcebook, Third Ed., (McGraw-Hill 2001) (“Sclater”)
2022	January 10, 2024 Deposition Transcript of Robert Giachetti (IPR2023-00836, U.S. Patent No. 9,039,580)
2023	January 10, 2024 Deposition Transcript of Robert Giachetti (IPR2023-00849, U.S. Patent No. 10,799,745)
2024	January 9, 2024 Deposition Transcript of Robert Giachetti (IPR2023-00843, U.S. Patent No. 10,561,884)
2028	Woodway Non-Motorized Treadmills User Manual

Exhibit	Description
2029	Altra Industrial Motion Product Brochure
2030	Paul C. Begeman, et. al., “Human Ankle Impact Response in Dorsiflexion” (1990)

22. My opinions are additionally guided by my appreciation and understanding of how a POSA would have understood the claims of the '884 Patent at the time of the alleged invention at the priority date of the patent, March 17, 2009.

III. UNDERSTANDING OF LEGAL STANDARDS

23. I am not an attorney. Counsel for Patent Owner has provided the following legal standards, which I have considered in the analysis presented in this declaration.

A. Burden of Proof

24. I understand that Petitioner has the burden of proving the unpatentability of the challenged patent claim by a preponderance of the evidence.

B. Claim Construction

25. I understand that a claim must be construed under the *Phillips* standard. Under that standard, words of a claim are given their plain and ordinary meaning as understood by a POSA at the time of the earliest effective filing date of the application, in light of the specification and prosecution history, as well as pertinent evidence extrinsic to the patent. I understand that the United States District Court for the Southern District of California issued a Claim Construction Order relating to

the '580 Patent (EX1033), and I apply such constructions as appropriate. Otherwise, for purposes of this declaration, I applied the plain and ordinary meaning of each term as would have been understood by a POSA at the time of the alleged invention unless explicitly stated otherwise.

C. Obviousness

26. I understand that a patent claim is unpatentable as obvious if it would have been obvious to a POSA at the time the application was filed. This means that, even if all of the elements of a claim are not found in a single prior art reference, the claim is not patentable if the differences between the subject matter in the prior art and the subject matter in the claim are such that the claimed invention as a whole would have been obvious to a POSA at the time the application was filed. When determining whether a claim is obvious, I understand that it is important to consider a prior reference as a whole, including portions that teach away from the claimed invention. For a claim to be obvious, there must be a clearly articulated reason why a POSA would have understood the claimed invention to have been obvious in view of the cited reference(s).

27. I further understand that a determination of whether a claim would have been obvious must consider several factors, including, among others:

- the level of ordinary skill in the art at the time the application was filed;
- the scope and content of the prior art; and

- what differences, if any, existed between the claimed invention and the prior art.

28. I understand that the teachings of two or more references may be combined to render a claim unpatentable, if such a combination would have been obvious to a POSA. In determining whether a combination based on either a single reference or multiple references would have been obvious, it is appropriate to consider at least the following factors:

- whether the teachings of the prior art references disclose known concepts combined in familiar ways, which, when combined, would yield predictable results;
- whether a POSA could have implemented a predictable variation, and would have seen the benefit of doing so;
- whether the claimed elements represent one of a limited number of known design choices, and he would have a reasonable expectation of success of implementing such design choices by a POSA;
- whether a POSA would have recognized a reason to combine known elements in the manner described in the claim;
- whether there is some teaching or suggestion in the prior art to make the modification or combination of elements recited in the claim; and

- whether the claimed invention applies a known technique that had been used to improve a similar device or method in a similar way.

29. I understand that a POSA has ordinary creativity and is not an automaton.

30. I understand that in considering obviousness, it is important not to determine obviousness using the benefit of hindsight derived from the patent being considered, and I have not done that in regards to my opinions expressed herein.

31. I understand that certain factors—often called “secondary considerations”—may support or rebut an assertion of obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the alleged invention, skepticism of those having ordinary skill in the art at the time of the alleged invention, unexpected results of the alleged invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I further understand that there must be a nexus—a connection—between any such secondary considerations and the alleged invention. I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

IV. BACKGROUND AND OVERVIEW OF THE '884 PATENT

32. While the concept of a manual treadmill has been in the public domain for centuries,¹ one of the problems that had never been solved was how to handle the unpredictable movement of the running belt, particularly when the running surface is curved.

33. A critical challenge with a curved, motorless treadmill is to ensure the safety of the user. When a curved, motorless treadmill is being used as intended, it requires free rolling of the running belt. However, when a user is trying to mount or dismount, the running belt can move in the forward and backward direction. Because it is common for a user to enter the treadmill from the rear, when a user steps on the rear of the treadmill, the user's weight may cause the belt to unexpectedly rotate forward (the reverse of the normal operating direction of the running belt). Depending on how quickly and where the user mounts the treadmill, the running belt may move in the forward or backward direction, creating an extreme safety hazard.

¹<http://www.attendly.com/the-ancient-and-surprising-history-of-the-treadmill>

(noting that manual treadmills have been in existence since at least the 1st century AD, when Roman engineers fitted the Polyspastos Crane with a human powered tread wheel).

The unpredictable belt movement may startle the user, create a temporary feeling of loss of control, or even cause a user to fall.

34. The '884 Patent describes design improvements and novel safety enhancements to a curved, manually operated treadmill.

35. The '884 Patent, titled “Manual treadmill and methods of operating the same,” issued from Application No. 15/958,339, filed on April 20, 2018. The '884 Patent claims priority to Provisional Application No. 61/161,027, filed on March 17, 2009, which is the earliest potential filing date.

36. The '884 Patent is directed to a “manually operated treadmill.” EX1001 at Abstract. Structurally, the treadmill described in the '884 Patent includes:

a frame having a front end and a rear end positioned opposite the front end; a front shaft rotatably coupled to the frame proximate the front end; a rear shaft rotatably coupled to the frame proximate the rear end; a plurality of bearings coupled to the frame; a running belt supported by the plurality of bearings, wherein the running belt includes a curved running surface; and a safety device coupled to at least one of the front shaft and the rear shaft, wherein the safety device is structured to substantially prevent rotation of at least one of the front shaft and the rear shaft in a first rotational direction while permitting rotation of the at least one of the front shaft and the rear shaft in a second rotational direction opposite the first rotational direction.

Id.

37. The '884 Patent has eight independent claims, only four of which are challenged in the Petition— Claims 30, 37, 50, and 51. Independent Claim 30 recites as follows:

30. A manually powered treadmill, comprising:

a frame having a front end and a rear end positioned opposite the front end;

a front shaft coupled to the frame proximate the front end;

a rear shaft coupled to the frame proximate the rear end;

a plurality of bearings coupled to the frame;

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

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

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

38. Independent Claim 37 recites as follows:

37. A manually powered treadmill, comprising:

a frame;

a first plurality of bearings coupled to the frame;

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

a front shaft assembly coupled to the frame;

a rear shaft assembly coupled to the frame;

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

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

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

39. Independent Claim 50 recites as follows:

50. A manually powered treadmill, comprising:

a frame;

at least one front running belt pulley coupled to the frame;

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

a plurality of bearings coupled to the frame;

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

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

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

40. Independent Claim 57 recites as follows:

57. A method, comprising:

providing a manually powered treadmill, the manually powered treadmill having a frame with a front end and a rear end;

providing a plurality of bearings coupled to the frame, wherein the plurality of bearings define at least a portion of a curved top profile;

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

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

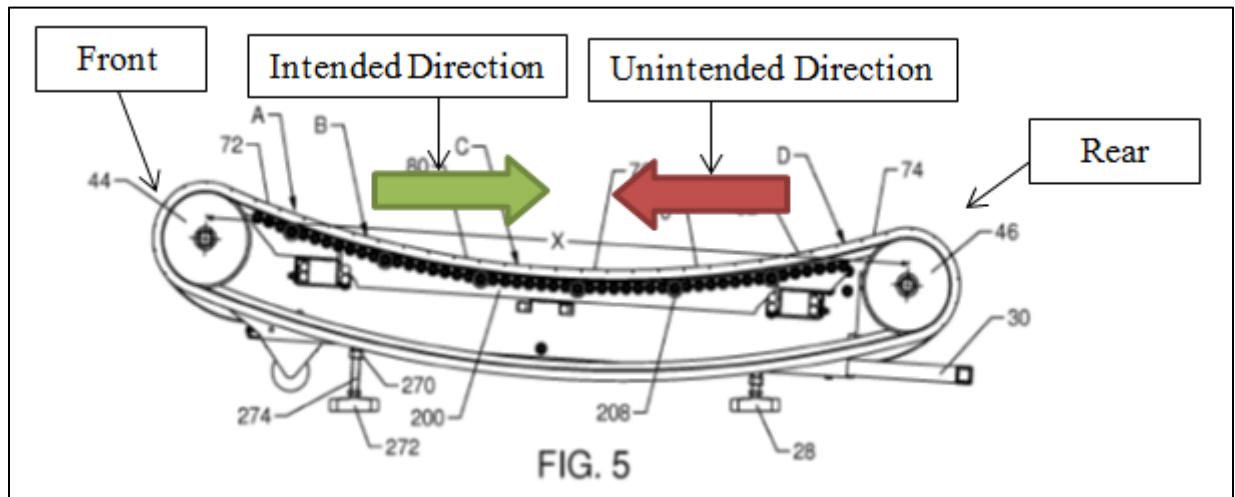
permitting rotation of one of the first and second rotatable elements of the safety device and the running belt in a first direction of rotation; and

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

41. As indicated, the '884 Patent claims a curved, manual treadmill that, among other things, requires “a safety device” that is coupled to the running belt and prevents the running belt from moving in unintended directions.

42. The phrases “intended direction” and “unintended direction” are used throughout this report to refer to a directional movement of the running surface of the treadmill belt, where “intended direction” means an expected directional movement of the running surface of the treadmill belt and “unintended direction” means an unexpected directional movement of the running surface of the treadmill

belt. This is illustrated in more detail with respect to annotated Figure 5 of the '884 Patent. The red and green arrows indicate the direction of movement of the upper surface, defined as the “running surface”, of the treadmill belt.



EX1001, Fig. 5 (annotations added).

43. With reference to this annotated Figure 5, the “Front” refers to the portion of the treadmill that the user faces when walking or running, in the conventional, forward motion, or otherwise using the treadmill. The “Front” may include a display device that depicts information relating to usage of the treadmill. When a user is utilizing the treadmill in a normal operating mode, the treadmill belt rotates in an “intended direction,” which is clockwise as seen in Figure 5, and which correlates to movement of the running surface in the direction of the green arrow as annotated in Figure 5 above.

44. As I previously discussed, curved, manual treadmills create a unique safety hazard for a user. Because it is common for a user to enter or mount the

treadmill from the rear of the unit, when a user steps on the rear of the treadmill, the user's weight may cause the running surface of the running belt to unexpectedly move toward the front of the unit (which is the reverse of the normal operating direction of the running surface). This is shown above in Figure 5, as and referred to herein as the "unintended direction." Depending on how quickly and where a user mounts the treadmill, the running surface may move in the unintended direction and create a potential safety hazard. The unpredictable and unexpected running surface movement may startle the user, create a temporary feeling of loss of control, or even cause the user to fall.

45. Woodway has been manufacturing and selling its non-motorized line of CURVE treadmills, which, as I discuss in more detail below, embody certain of the claimed inventions of the '884 Patent, since 2009.

46. Since the 2009 launch, Woodway has introduced various models and sizes in this product line, including the following:

Woodway's Innovative CURVE Treadmills		
		
CURVE Treadmill	CURVE Trainer Treadmill	CURVE XL Treadmill

V. OVERVIEW OF PRIMARY PRIOR ART REFERENCES RELIED ON BY THE PETITIONER

47. Before providing a detailed analysis of how the prior art fails to render the Challenged Claims unpatentable, I provide a brief summary of Petitioner's asserted prior art references.

A. Overview of Schonenberger (EX1010)

48. U.S. Patent No. 4,614,337 to Schonenberger ("Schenkenberger") is titled "Movable Surface Apparatus, Particularly for Physical Exercise and Training" and issued on September 30, 1986. Schonenberger is directed to "a movable surface apparatus, and more particularly to such an apparatus specifically useful for physical exercise and training, for ergonmetry and walking therapy for handicapped people." EX1010 at 1:10-14. Schonenberger states as follows:

It is an object of the present invention to provide a movable surface apparatus, typically for physical exercise and training, which is safe in operation and requires little operating power, has low noise level in operation and provides a pleasant, springy feel when being stepped or jumped on without, however, being excessively stressed by bending or bowing, so that the surface which is engaged by the foot of the user will have, essentially, the characteristics of a yielding, yet firm support similar, for example, to walking on moss-covered ground or a needle-covered path.

Id. at 1:63-2:5.

49. Schonenberger therefore aims to provide, among other things, a “yielding, yet firm support” for “flat top surface” of the movable surface apparatus.

Id. at Abstract. To accomplish this, Schonenberger provides an overview description of the invention as follows:

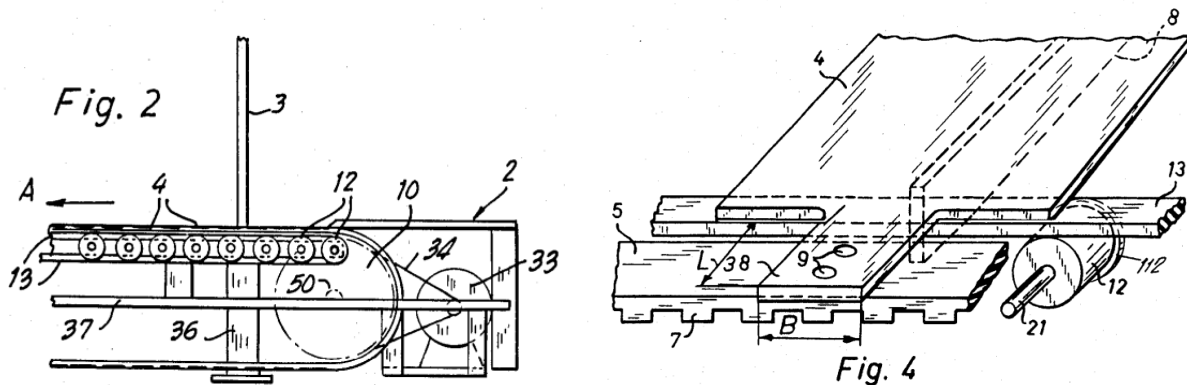
Briefly, in accordance with the present invention, an elongated support frame has rotatable driving elements, such as drums, sheaves, pulleys or the like at either end, around which the movable surface is looped. At least one of these driving elements has a toothed or ribbed circumference. The movable surface includes a plurality of step slat elements, preferably in the form of separate slats preferably covered with a compact continuous [*sic*] endless [*sic*] or sectionalized resilient surfacing such as foam rubber, carpeting, and the like....Internally of the runs of the endless surface, as it is looped about the end drums or sheaves, the slat elements are preferably formed with a stiffening projection, in form of transverse ribs, to prevent their bowing through. Longitudinally, between the back- and front-driving elements, the surface is supported nearly along the full length of its upper run by series of back-up support rollers. These support rollers are formed with lateral flanges; for example, they may be in the form

of a V-belt pulleys, and have at least one separate V-belt which is looped about the end support rollers and which is preferably spaced from the inner surface of the upper run of the endless movable surface, when unloaded, by a distance of for example about cm in the area of the support rollers to prevent noise, which is otherwise caused by hits of the step slats after coming from the vertical position into the horizontal. When loaded, that is, when a user steps on the movable surface, the lower side of the V-belt will engage the rollers. The rollers and the interposed belt—if used—and located at the lateral edges of the movable surface provide not only for support of the movable surface along its length, but also for lateral guidance due to lateral forces which will invariably arise when the surface is used as an exercise device, for example, for running, training for cross-country skiing, physical rehabilitation after injury or disease, or the like. The flanges of the rollers or the V-sides thus provide lateral guidance throughout the length of the movable support surface when used....

Id. at 2:6-56.

50. Schonenberger's flat top surface is comprised of slats 4, the flat top of which forms the "endless surface 1." *Id.* at 4:38-43. "The slats 4 are preferably of lightweight metal, for example aluminum, and extend transversely to the running direction" and "have [a] generally T-shaped cross section." *Id.* at 4:43-47. Under the slats are support rollers 12 to prevent bending when a person steps on the surface. *Id.* at 4:67-5:1. Between the rollers 12 and the underside of the slats 4 is a support belt 13 and 13', which is made of rubber or suitable elastic material to "absorb the steps" and "eliminate all vibrations caused by the rollers." *Id.* at 5:1-18. The slat

configuration with rollers 12 and support belt 13 and 13' is depicted in Figures 2 and 4 below:



Id. at Figs. 2, 4.

51. Schonenberger describes a gap between the upper surface of support belt 13 and the underside of the slats (e.g., $\frac{1}{2}$ mm) when the surface is unloaded, and when a person steps on the surface, the underside of the slats will then engage the support belt 13 and 13', at which point the rollers 12 will rotate, and the support belt 13 and 13' will then move at the same speed as the movable surface 1 (e.g., the tops of the slats). *Id.* at 5:51-65. However, Schonenberger further teaches that the rollers support the slats such that there is “practically no bowing or hanging-through” so that the “surface is **practically flat** while being slightly springy and resembles that of a natural soft grass, or other soft surface athletic track.” *Id.* at 5:65-6:4 (emphasis added). Thus, a POSA would understand Schonenberger to teach a device with a flat running surface.

B. Overview of Socwell (EX1011)

52. U.S. Patent No. 5,897,461 to Socwell (“Socwell”) is titled “Exercise treadmill” and issued on April 27, 1999, from Application No. 09/009,582, which was filed on January 20, 1998. EX1011 at 1. Socwell is directed to a “curved deck treadmill... comprising a support frame (12) having a first side (20) and a second opposing side (22) for supporting a deck (56) therebetween,” as well as various other features. *Id.* at Abstract.

53. When discussing the prior art, Socwell states as follows:

Additionally, exercise treadmills of the prior art may furnish a user with an upright handle to grasp while exercising. While somewhat useful in retaining the user's balance on the rotating endless belt, having to grasp a fixed handle may impede the natural body motion of a user attempting to exercise. Such an encumbrance may be feasible when a user is attempting to walk, but when a user begins to jog or run on prior art exercise treadmills, having to grasp a handle to keep centered on the treadmill may severely interfere with one's natural body motion and further abdicate the inherent physical advantages of the exercise routine.

Id. at 2:56-67.

54. Socwell therefore teaches that, among other things, certain objects to the claimed invention is to provide a “curved deck treadmill which provides a structurally supported arcuate shaped, movable surface on which a user may exercise” and “which substantially prevents a user from falling off the back 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.” *Id.* at 3:26-29.

55. Socwell teaches that the safety features of its treadmill derive from the curved shape of its running surface, which “substantially prevents a user from falling off the back of the treadmill and... serves to keep the user centered on the upper surface of the rotating belt without encumbering the natural body motion of the user exercising thereon.” *Id.* at 13:20-31.

56. Socwell teaches that the curved shape of its running belt is maintained through the use of “one or more belt securing assemblies 94 which provide a means for retaining the endless belt 16 in a curvilinear configuration being substantially flush with the upper surface 66 of the deck 56.” *Id.* at 10:5-9. Each belt securing assembly 94 “comprises a roller 98 having an axle 100 which rotatably engages a mounting bracket 96. The mounting bracket 96 is preferably disposed in relation to the roller 98 such that the roller 98 may engage the belt 16, thereby substantially retaining a side portion of the belt 16 substantially flush with the deck 56. that include rollers 98 positioned above the running belt.” *Id.* at 10:17-23. As seen in Socwell’s Figure 5, below, this configuration places the rollers 98 (green) above the belt 16 (red) and the deck 56 (blue):

C. Overview of Magid (EX1012)

57. U.S. Patent No. 5,538,489 to Magid (“Magid”) is titled “Walker apparatus with left and right foot belts” and issued on July 23, 1996, from Application No. 276,996, which was filed on July 19, 1994. EX1012 at 1. Magid is directed to a “walker apparatus compris[ing] a base, a pair of front rollers, a pair of rear rollers, endless left and right foot belts, and a support means.” *Id.* at 1:65-67.

58. Magid discloses that, unlike the prior art, its design is intended to be used “by people with uncoordinated feet movements, such as small children, physically handicapped people and old people.” *Id.* at 1:30-34 (distinguishing prior art). Thus, Magid also teaches that each of its embodiments is to be used either “in hospitals or retirement homes” or as a “baby stroller” or “baby chair.” *Id.* at 5:56-62, 6:9-11, 6:17-19, Figs. 5-7.

59. To accomplish this goal, Magid teaches “a walker apparatus with left and right foot belts that move independently and that are to be treaded respectively by the left and right feet of the user, thereby preventing the action of the user's left foot from influencing the action of his right foot and vice-versa when the walker apparatus is in use.” *Id.* at 1:46-52.

60. To prevent the left and right foot belts from moving in opposite directions while the device is in use, Magid teaches that “[a] unidirectional control means 6, 6' is installed to permit only unidirectional movement of the left and right

foot belts 4, 4',” with the control means including “a pair of ratchet gears 61 attached to outer ends of the front rollers 41 and mounted rotatably on the first shaft 411, and a pair of pawls 62 secured to the base 11 and engaging one of the ratchet gears 61 to permit only unidirectional rotation of the front rollers 41, thereby preventing bidirectional movement of the foot belts 4, 4'.” *Id.* at 4:46-55.

61. Magid also teaches that the walker apparatus “may be used with the functional supporting frame of an exercise walker, the latter having an adjustable hand bar for use by small children, physically handicapped people, old people and by those who feel more confident holding onto something while exercising.”

62. Collectively, the various embodiments of Magid’s claimed invention can be observed in Figures 2 and 5-7, provided below:

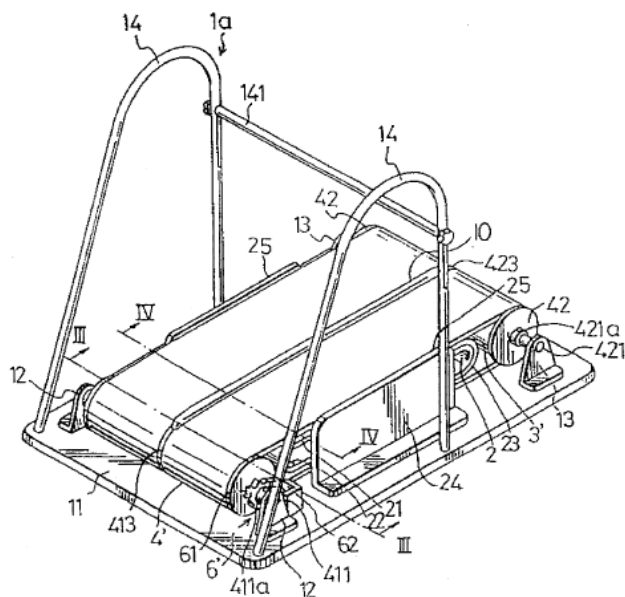


FIG. 2

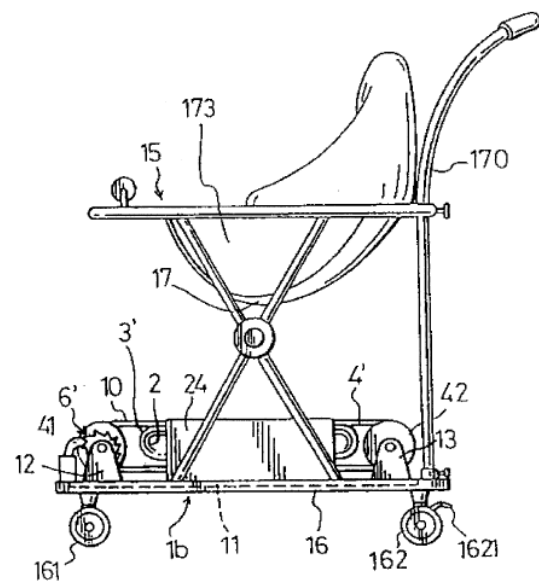


FIG. 5

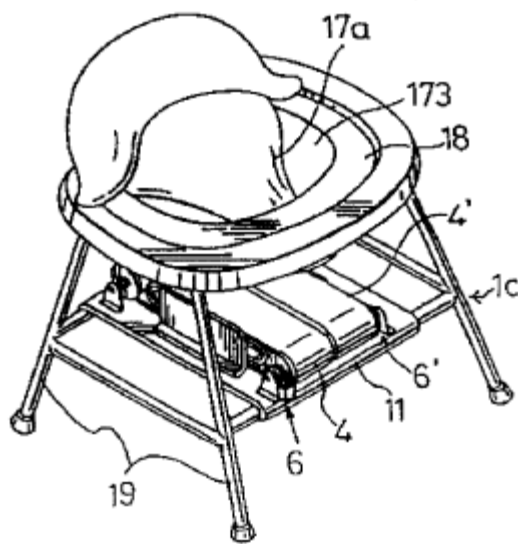


FIG. 6

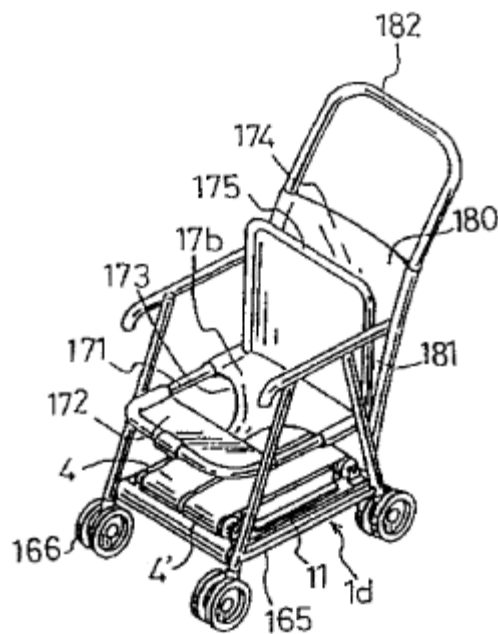


FIG. 7

Id. at Figs. 2, 5-7.

A. Overview of Chickering (EX1013)

63. U.S. Patent No. 3,637,206 to Chickering (“Chickering”) is titled “Endless belt exerciser with accelerating and decelerating tread surfaces” and issued on January 25, 1972, from Application No. 19,792, which was filed on March 16, 1970. EX1013 at 1. Chickering is directed to a “treadmill exercising device, and more particularly to an exercising device on which the user can simulate the acts of walking, jogging and running without relying on handles, belts or other external supports for maintaining his balance.” *Id.* at 1:3-7.

64. The actual description of Chickering's disclosed treadmill, however, is very short. Excluding the claims themselves, the written text of the specification spans less than three columns. *See id.* at 1:1-3:47.

65. Chickering's limited description describes the treadmill as having a "tread surface [that] inclines upward toward each end to provide a forward accelerating area and a rear decelerating area." *Id.* at Abstract. This is accomplished in one of two ways. Primarily, Chickering describes using two separate series of transverse parallel rollers, each having a separate endless belt to provide two separate tread surfaces. *Id.* at 2:13-21. The first series of transverse rollers are inclined downwardly from the front of the treadmill to form an accelerating area, while the second series of transverse rollers are inclined upwardly towards the rear of the treadmill to form a decelerating area, which "offers enough resistance to the user's foot to enable him to maintain his balance and position on the exercising device." *Id.* at 2:31-39.

66. Chickering also discloses an alternative device having a single endless belt, as described below:

An alternate form of the exercising device of the present invention is shown in FIG. 3, wherein a single endless belt 28 forms both the accelerating and decelerating areas. In the device shown in FIG. 3, a single series of rollers 29 are provided journaled in the sidewalls 22 of base 10. However, **the rollers are so disposed that the forward rollers lie approximately in a plane slanting downwardly from the front of the base, while the rear**

rollers lie approximately in a plane slanting upward toward the rear of the base 10. Thus, when the endless belt 28 is placed about the rollers, it follows their contour and provides a forward accelerating area and a rear decelerating area which are inclined from the horizontal with each being lowest at their point of nearest proximity.

Id. at 2:73-3:10 (emphasis added).

67. Thus, a POSA would understand both embodiments of Chickering to disclose a treadmill with a dual-plane or multi-planar running surface. That is, Chickering discloses a treadmill with two flat running surfaces – one inclining downward from the front of the treadmill and one inclining upward toward the rear of the device.

B. Overview of Sclater (EX1017)

68. Neil Sclater and Nicholas P. Chironis, *Mechanisms & Mechanical Devices Sourcebook* (3d ed. 2001) (“Sclater”) is a generic engineering reference book, excerpts of which Petitioner has submitted as Exhibit 1017. I understand that additional excerpts of Sclater are being submitted by Patent Owner as Exhibit 2021.

69. Sclater “contains drawings and descriptions of more than 2000 different mechanisms and mechanical devices that have proven themselves in modern products, machines, and systems.” EX1017 at 24. Among these mechanisms and devices are a number of different mechanical clutches and components of mechanical clutches, some of which are depicted in Petitioner’s Exhibit 1017 and Patent Owner’s Exhibit 2021. These include, for example, the following:

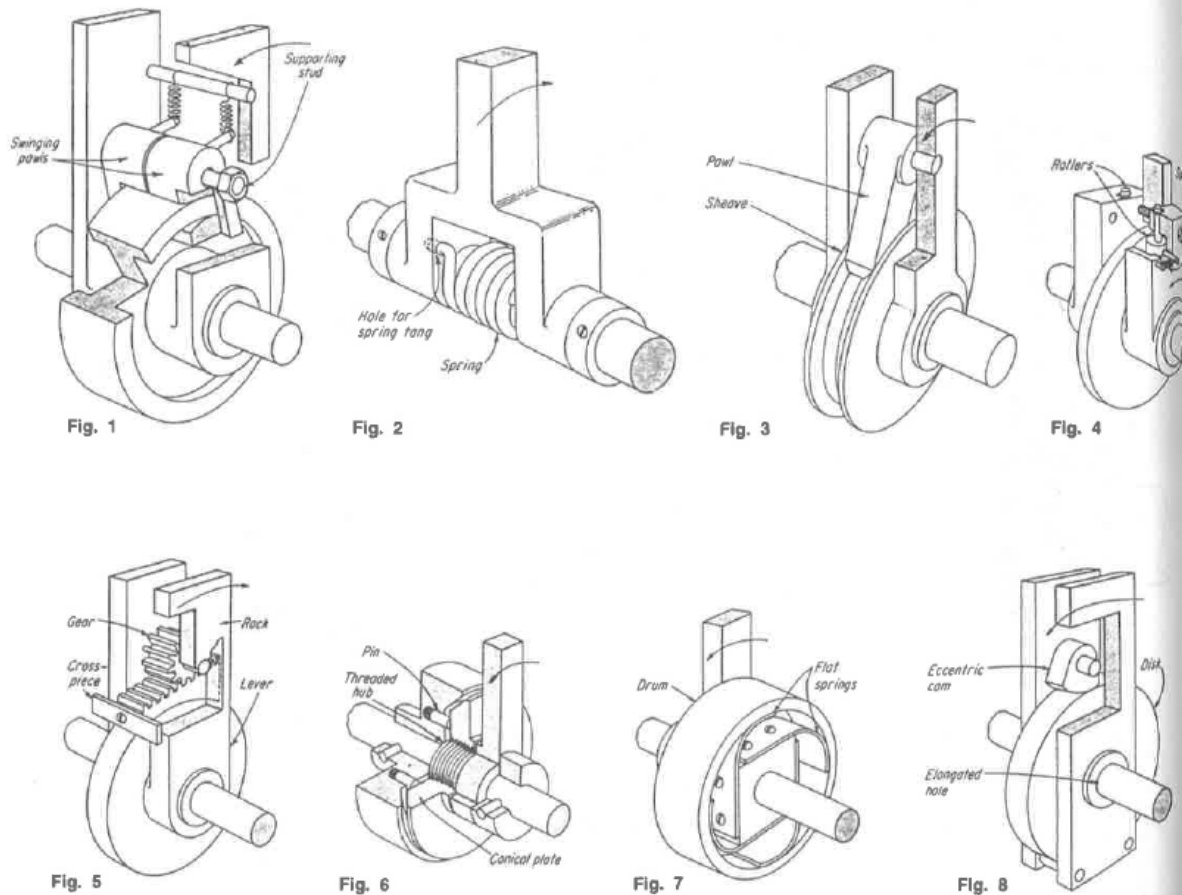


Fig. 1 Swinging pawls lock on the rim when the lever swings forward, and release on the return stroke. Oversize holes for the supporting stud make sure that both the top and bottom surfaces of the pawls make contact.

Fig. 2 A helical spring grips the shaft because its inner diameter is smaller than the outer diameter of shaft. During the forward stroke, the spring winds tighter; during the return stroke, it expands.

Fig. 3 A V-belt sheave is pushed around when pawl wedges in the groove. For a snug fit, the bottom of the pawl is tapered like a V-belt.

Fig. 4 Eccentric rollers squeeze a disk on its forward stroke. On the return stroke, rollers rotate backwards and release their grip. Springs keep the rollers in contact with the disk.

Fig. 5 A rack is wedge-shaped so that it jams between the rolling gear and the disk, pushing the shaft forward. When the driving lever makes its return stroke, it carries along the unattached rack by the cross-piece.

Fig. 6 A conical plate moves like a nut back and forth along the threaded center hub of the lever. The light friction of spring-loaded pins keeps the plate from rotating with the hub.

Fig. 7 Flat springs expand against the inside of a drum when a lever moves one way, but they drag loosely when the lever turns the drum in the opposite direction.

Fig. 8 An eccentric cam jams against the disk during the motion half of a cycle. Elongated holes in the levers allow the cam to wedge itself more tightly in place.

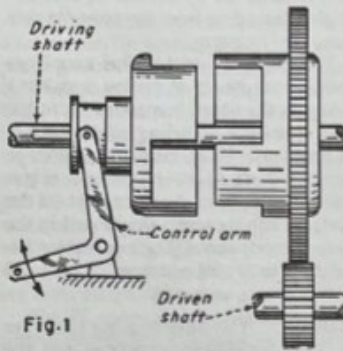


Fig. 1 Jaw Clutch: The left sliding half of this clutch is feathered to the driving shaft while the right half rotates freely. The control arm activates the sliding half to engage or disengage the drive. However, this simple, strong clutch is subject to high shock during engagement and the sliding half exhibits high inertia. Moreover, engagement requires long axial motion.

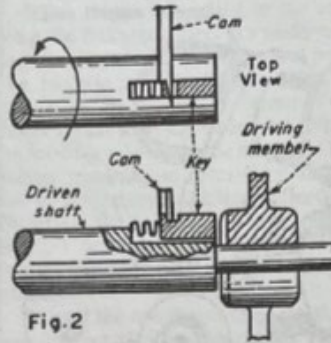


Fig. 2 Sliding Key Clutch: The driven shaft with a keyway carries the freely rotating member with radial slots along its hub. The sliding key is spring-loaded but is restrained from the engaging slots by the control cam. To engage the clutch, the control cam is raised and the

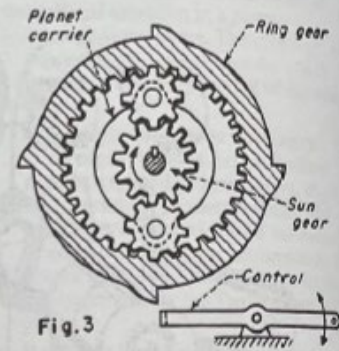


Fig. 3 Planetary Transmission Clutch: In the disengaged position shown, the driving sun gear causes the free-wheeling ring gear to idle counter-clockwise while the driven planet carrier remains motionless. If the control arm blocks ring gear motion, a positive clockwise drive to the driven planet carrier is established.

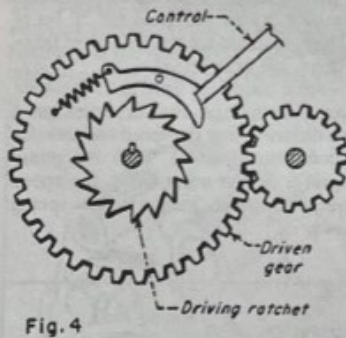


Fig. 4 Pawl and Ratchet Clutch: (External Control) The driving ratchet of this clutch is keyed to the driving shaft, and the pawl is pinned to the driven gear which can rotate freely on the driving shaft. When the control arm is raised, the spring pulls in the pawl to engage the ratchet and drive the gear. To disengage the clutch the control arm is lowered so that driven gear motion will disengage the pawl and stop the driven assembly against the control member.

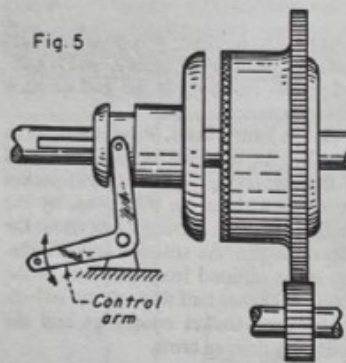


Fig. 5 Plate Clutch: The plate clutch transmits power through the friction developed between the mating plate faces. The left sliding

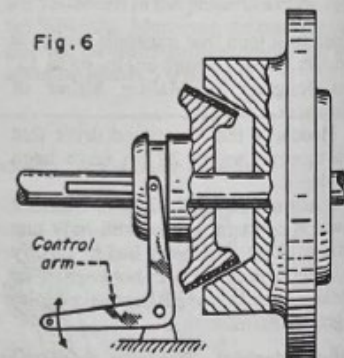


plate is fitted with a feather key, and the right plate member is free to rotate on the shaft. Clutch torque capacity depends on the axial force exerted by the control half when it engages the sliding half.

Fig. 6 Cone Clutch: The cone clutch, like the plate clutch, requires axial movement for engagement, but less axial force is required because of the increased friction between mating cones. Friction material is usually applied to only one of the mating conical surfaces. The free member is mounted to resist axial thrust.

EX1017 at 302.

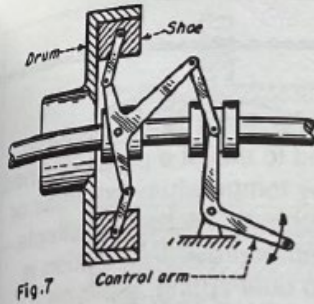


Fig. 7 Expanding Shoe Clutch: This clutch is engaged by the motion of the control arm. It operates linkages that force the friction shoes radially outwards so that they contact the inside surface of the drum.

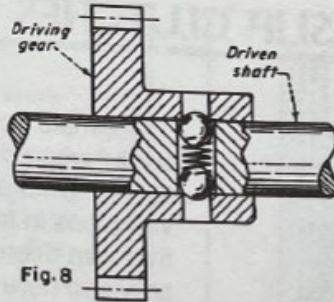


Fig. 8 Spring and Ball Radial Detent Clutch: This clutch will hold the driving gear and driven gear in a set timing relationship until the torque becomes excessive. At that time the balls will be forced inward against their springs and out of engagement with the holes in the hub. As a result the driving gear will continue rotating while the drive shaft is stationary.

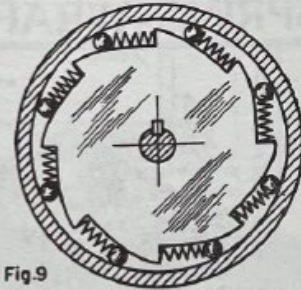


Fig. 9 Cam and Roller Clutch: This over-running clutch is better suited for higher-speed free-wheeling than a pawl-and-ratchet clutch. The inner driving member has cam surfaces on its outer rim that hold light springs that force the rollers to wedge between the cam surfaces and the inner cylindrical face of the driven member. While driving, friction rather than springs force the rollers to wedge tightly between the members to provide positive clockwise drive. The springs ensure fast clutching action. If the driven member should begin to run ahead of the driver, friction will force the rollers out of their tightly wedged positions and the clutch will slip.

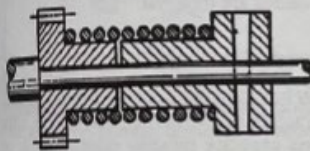


Fig. 10

Fig. 10 Wrapped Spring Clutch: This simple unidirectional clutch consists of two rotating hubs connected by a coil spring that is pre-tensioned over both hubs. In the driving direction the spring tightens around the hubs increasing the friction grip, but if driven in the opposite direction the spring unwinds causing the clutch to slip.

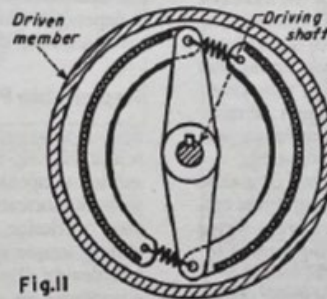


Fig. 11

Fig. 11 Expanding Shoe Centrifugal Clutch: This clutch performs in a similar manner to the clutch shown in Fig. 7 except that there is no external control. Two friction shoes, attached to the driving member, are held inward by springs until they reach the "clutch-in" speed.

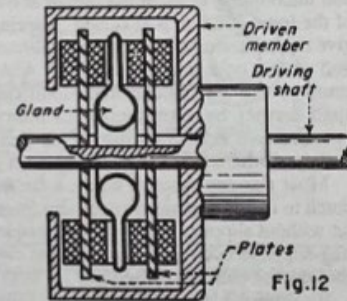
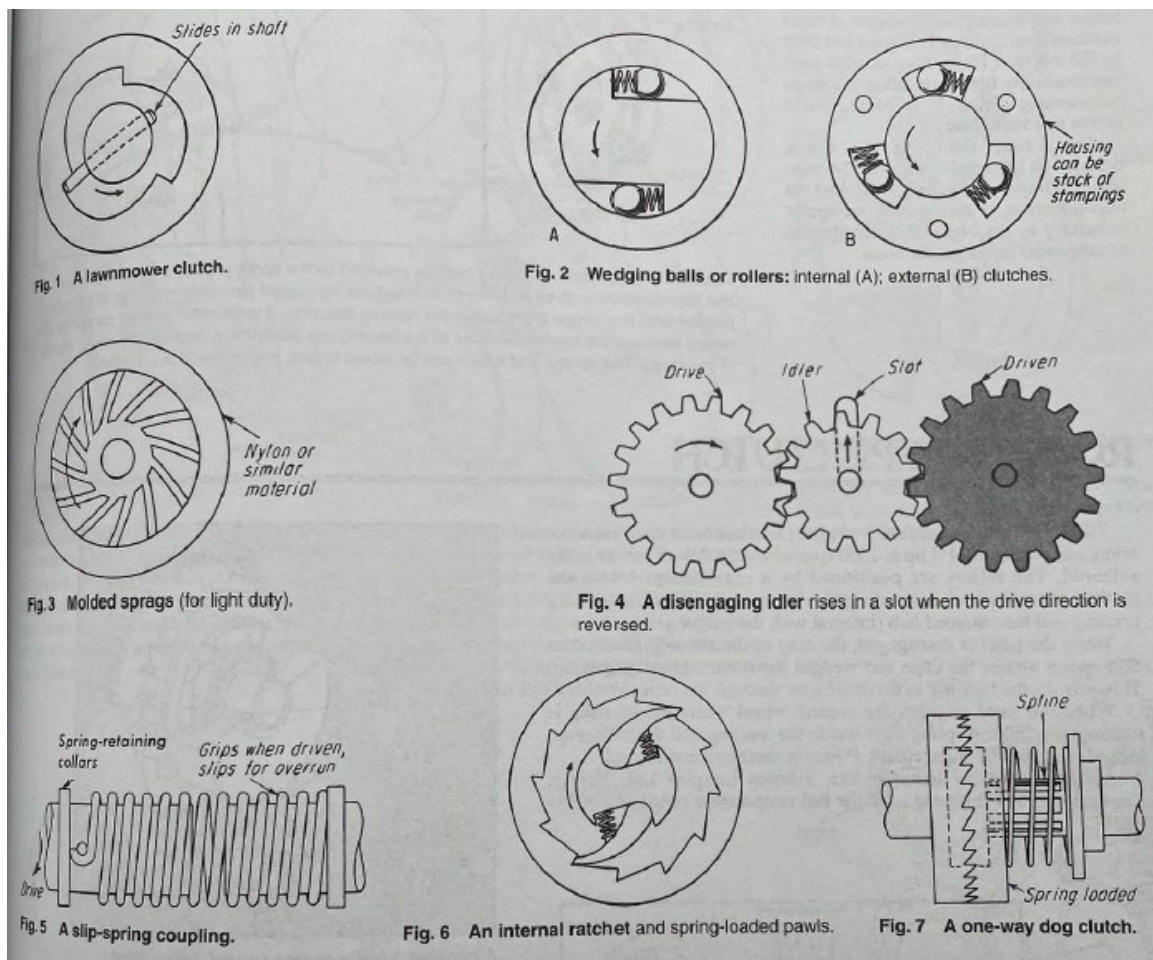


Fig. 12

At that speed centrifugal force drives the shoes outward into contact with the drum. As the drive shaft rotates faster, pressure between the shoes against the drum increases, thus increasing clutch torque.

Fig. 12 Mercury Gland Clutch: This clutch contains two friction plates and a mercury-filled rubber bladder. At rest, mercury fills a ring-shaped cavity around the shaft, but when rotated at a sufficiently high speed, the mercury is forced outward by centrifugal force. The mercury then spreads the rubber bladder axially, forcing the friction plates into contact with the opposing faces of the housing to drive it.

Id. at 303.



Id. at 311.

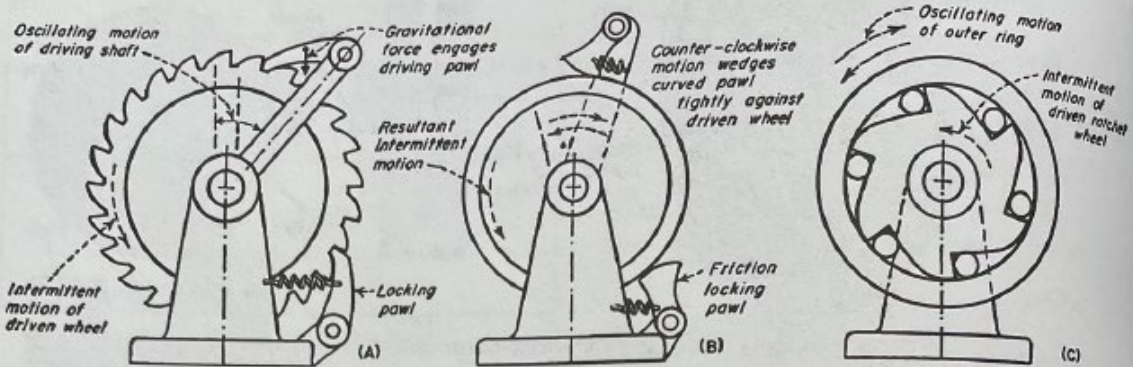


Fig. 1 Elementary overriding clutches: (A) A ratchet and pawl mechanism converts reciprocating or oscillating movement to intermittent rotary motion. This motion is positive but limited to a multiple of the tooth pitch. (B) A friction-type clutch is quieter, but it requires a

spring device to keep the eccentric pawl in constant engagement. (C) Balls or rollers replace the pawls in this device. Motion of the outer race wedges the rollers against the inclined surfaces of the ratchet wheel.

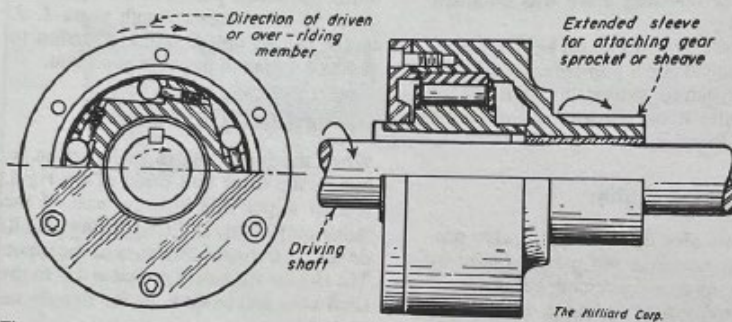


Fig. 2 A commercial overriding clutch has springs that hold the rollers in continuous contact between the cam surfaces and the outer race; thus, there is no backlash or lost motion. This simple design is positive and quiet. For operation in the opposite direction, the roller mechanism can easily be reversed in the housing.

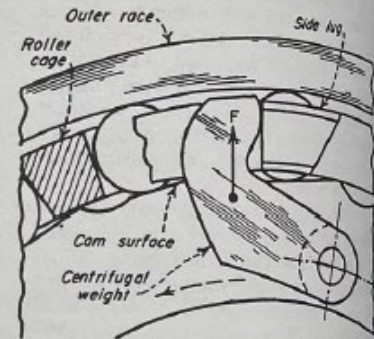


Fig. 3 A centrifugal force can hold the rollers in contact with the cam and outer race. A force is exerted on the lugs of the cage that controls the position of the rollers.

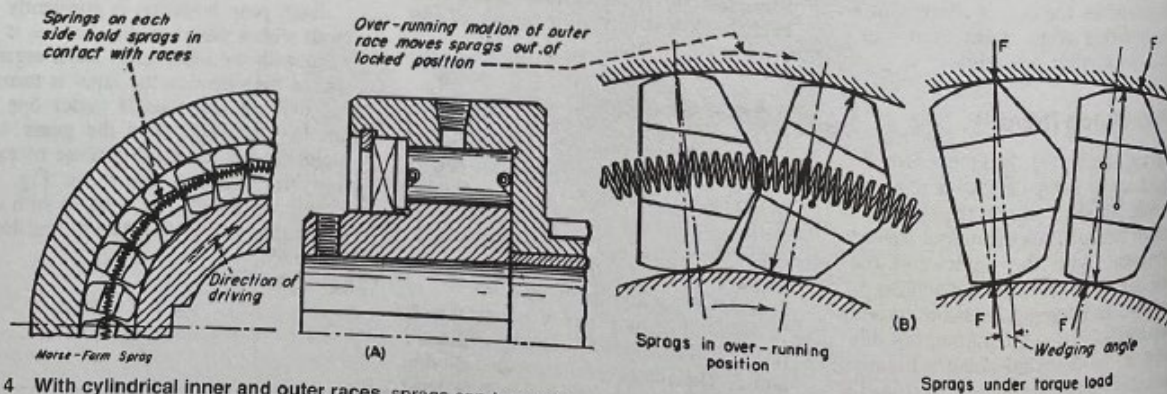


Fig. 4 With cylindrical inner and outer races, sprags can transmit torque. Energizing springs serve as a cage to hold the sprags. (A) Compared to rollers, the shape of a sprag permits a greater number within a limited space; thus higher torque loads are possible. Special

cam surfaces are not required, so this version can be installed inside gear or wheel hubs. (B) Rolling action wedges the sprags tightly between the driving and driven members. A relatively large wedging angle ensures positive engagement.

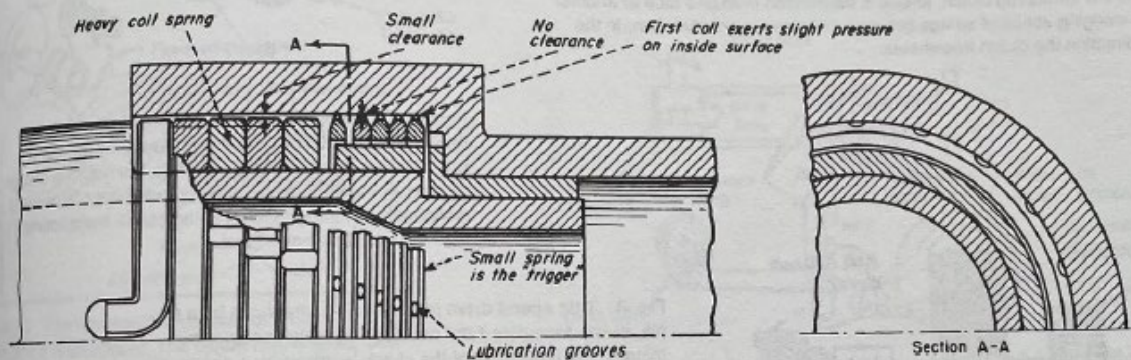
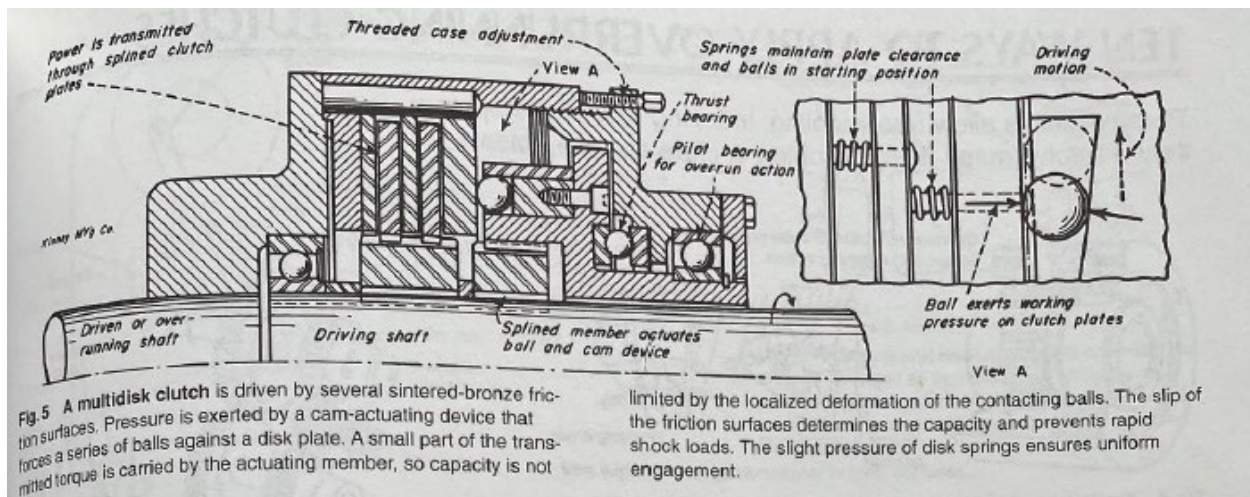


Fig. 6 An engaging device consists of a helical spring that is made up of two sections: a light trigger spring and a heavy coil spring. It is attached to and driven by the inner shaft. The relative motion of the outer member rubbing on the trigger causes this spring to wind up.

This action expands the spring diameter, which takes up the small clearance and exerts pressure against the inside surface until the entire spring is tightly engaged. The helix angle of the spring can be changed to reverse the overriding direction.

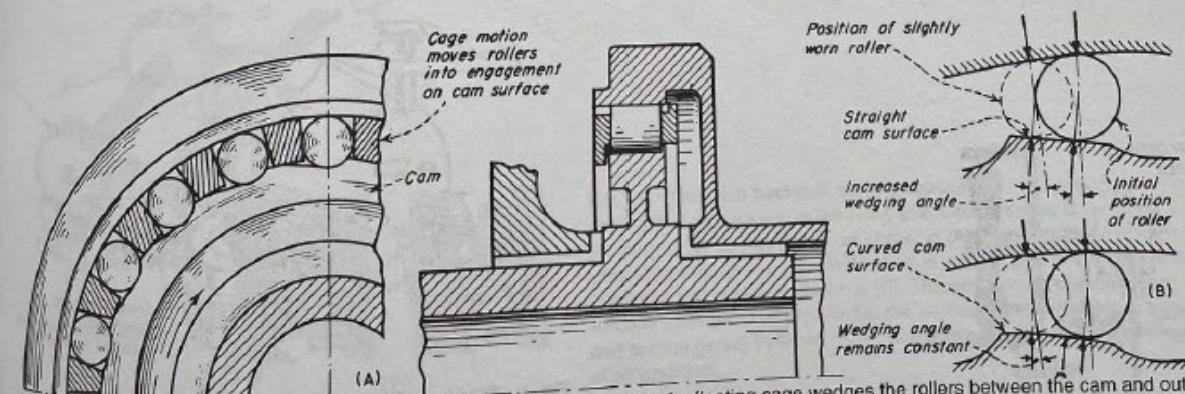


Fig. 7 A free-wheeling clutch widely used in power transmission has a series of straight-sided cam surfaces. An engaging angle of about 3° is used; smaller angles tend to become locked and are difficult to disengage while larger ones are not as effective. (A) The inertia of a floating cage wedges the rollers between the cam and outer race. (B) Continual operation causes the wear of surfaces; 0.001 in. wear alters the angle to 8.5° on straight-sided cams. Curved cam surfaces maintain a constant angle.

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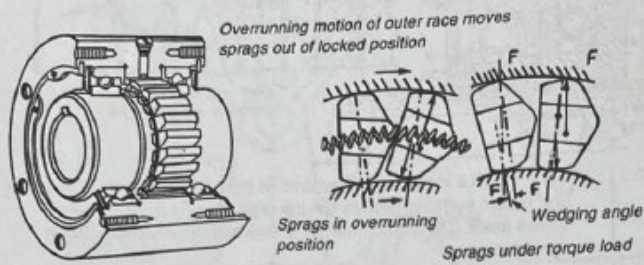


Fig. 1 Precision sprags act as wedges and are made of hardened alloy steel. In the formsprag clutch, torque is transmitted from one race to another by the wedging action of sprags between the races in one direction; in the other direction the clutch freewheels.

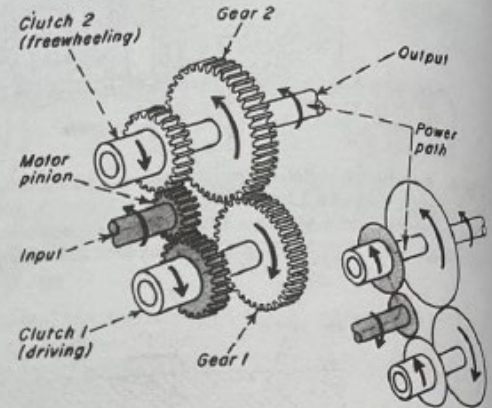


Fig. 2 This speed drive requires input rotation to be reversible. Counterclockwise input (as shown in the diagram) drives gear 1 through clutch 1; the output is counterclockwise; clutch 2 overruns. Clockwise input (schematic) drives gear 2 through clutch 2; the output is still counterclockwise; clutch 1 overruns.

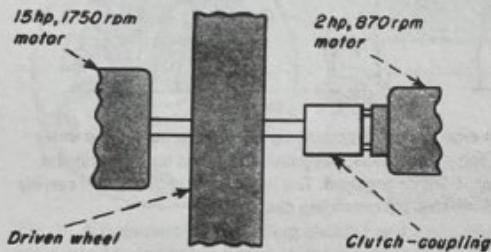


Fig. 3 This speed drive for a grinding wheel can be a simple, in-line assembly if the overrunning clutch couples two motors. The outer race of the clutch is driven by a gearmotor; the inner race is keyed to a grinding-wheel shaft. When the gearmotor drives, the clutch is engaged; when the larger motor drives, the inner race overruns.

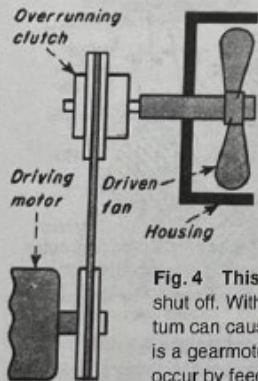


Fig. 4 This fan freewheels when driving power is shut off. Without an overrunning clutch, fan momentum can cause belt breakage. If the driving source is a gearmotor, excessive gear stress can also occur by feedback of kinetic energy from the fan.

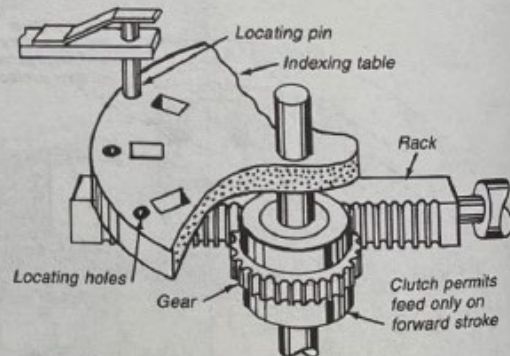


Fig. 5 This indexing table is keyed to a clutch shaft. The table is rotated by the forward stroke of the rack; power is transmitted through the clutch by its outer-ring gear only during this forward stroke. Indexing is slightly short of the position required. The exact position is then located by a spring-loaded pin that draws the table forward to its final positioning. The pin now holds the table until the next power stroke of the hydraulic cylinder.

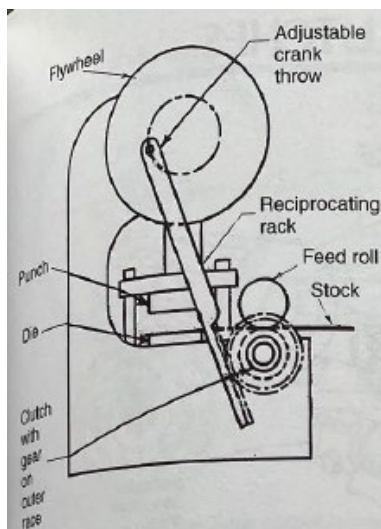


Fig. 6 This punch press feed is arranged so that the strip is stationary on the downstroke of the punch (clutch freewheels); feed occurs during the upstroke when the clutch transmits torque. The feed mechanism can easily be adjusted to vary the feed amount.

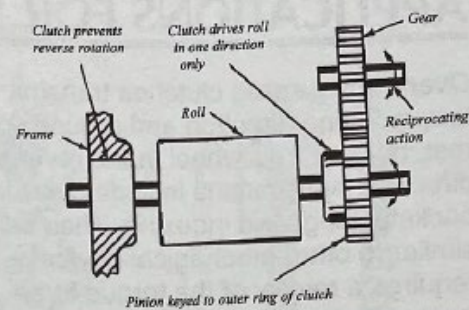


Fig. 7 Indexing and backstopping is done with two clutches arranged so that one drives while the other freewheels. The application shown here is for a capsuling machine; gelatin is fed by the roll and stopped intermittently so the blade can precisely shear the material to form capsules.

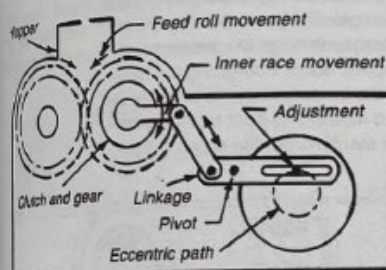


Fig. 8 The intermittent motion of a candy machine is adjustable. The clutch ratchets the feed rolls around. This keeps the material in the hopper tilted.

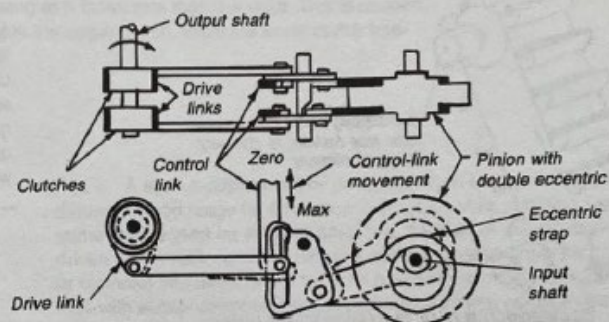


Fig. 9 This double-impulse drive has double eccentrics and drive clutches. Each clutch is indexed 180° out of phase with the other. One revolution of the eccentric produces two drive strokes. Stroke length, and thus the output rotation, can be adjusted from zero to maximum by the control link.

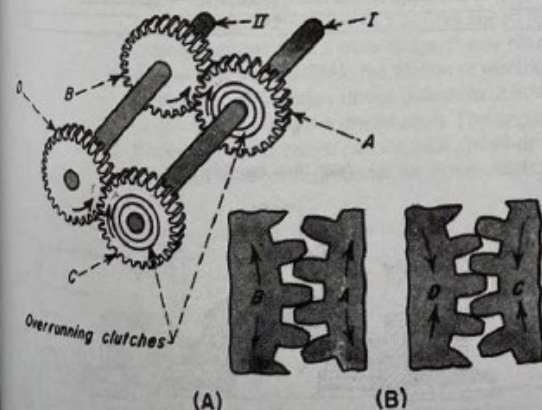


Fig. 10 This anti-backlash device depends on overrunning clutches to ensure that no backlash is left in the unit. Gear A drives B and shaft II with the gear mesh and backlash, as shown in (A). The overrunning clutch in gear C permits gear D (driven by shaft II) to drive gear C and results in the mesh and backlash shown in (B). The overrunning clutches never actually overrun. They provide flexible connections (something like split and sprung gears) between shaft I and gears A and C to allow absorption of all backlash.

Id. at 319.

(4) Dependability, and (5) Durability.

Fig. 1 A pawl and ratchet, single-cycle Dennis clutch. The primary parts of this clutch are the driving ratchet B, the driven cam plate C, and the connecting pawl D, which is carried by the cam plate. The pawl is normally held disengaged by the lower tooth of clutch arm A. When activated, arm A rocks counterclockwise until it is out of the path of rim F on cam plate C.

This permits pawl D, under the effect of spring E, to engage with ratchet B. Cam plate C then turns clockwise until, near the end of one cycle, pin G on the plate strikes the upper part of arm A, camming it clockwise back to its normal position. The lower part of A then performs two functions: (1) it cams pawl D out of engagement with the driving ratchet B, and (2) it blocks the further motion of rim F and the cam plate.



Fig. 1

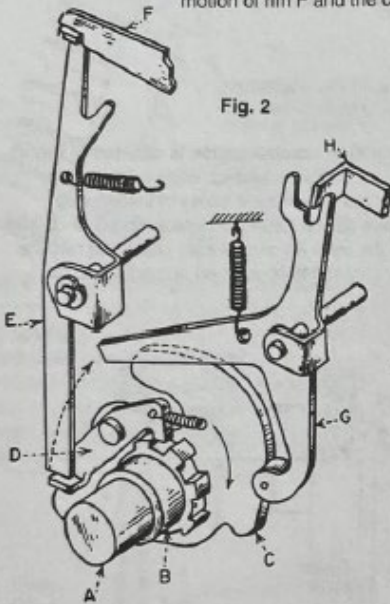


Fig. 2

Fig. 2 A pawl and ratchet, single-cycle, dual-control clutch. The principal parts of this clutch are driving ratchet B, driven crank C, and spring-loaded ratchet pawl D. Driving ratchet B is directly connected to the motor and free to rotate on rod A. Driven crank C is directly connected to the main shaft of the machine and is also free to move on rod A. Spring-loaded ratchet pawl D is carried by crank C, which is normally held disengaged by latch E.

To activate the clutch, arm F is raised, permitting latch E to trip and pawl D to engage with ratchet B. The left arm of clutch latch G, which is in the path of the lug on pawl D, is normally permitted to move out of the way by the rotation of the camming edge of crank C. For certain operations, block H is temporarily lowered. This prevents the motion of latch G, resulting in the disengagement of the clutch after part of the cycle. It remains disengaged until the subsequent raising of block H permits the motion of latch G and the resumption of the cycle.

Fig. 3 Planetary transmission clutch. This is a positive clutch with external control. Two gear trains provide a bi-directional drive to a calculator for cycling the machine and shifting the carriage. Gear A is the driver; gear L, the driven member, is directly connected to the planet carrier F. The planet consists of integral gears B and C. Gear B meshes with free-wheeling gear D. Gears D and G carry projecting lugs E and H, respectively. Those lugs can contact formings on arms J and K of the control yoke.

When the machine is at rest, the yoke is centrally positioned so that arms J and K are out of the path of the projecting lugs, permitting both D and G to free-wheel. To engage the drive, the yoke rocks clockwise, as shown, until the forming on arm K engages lug H, blocking further motion of ring gear G. A solid gear train is thereby established, driving F and L in the same direction as the drive A. At the same time, the gear train alters the speed of D as it continues counterclockwise. A reversing signal rotates the yoke counterclockwise until arm J encounters lug E, blocking further motion of D. This actuates the other gear train with the same ratio.

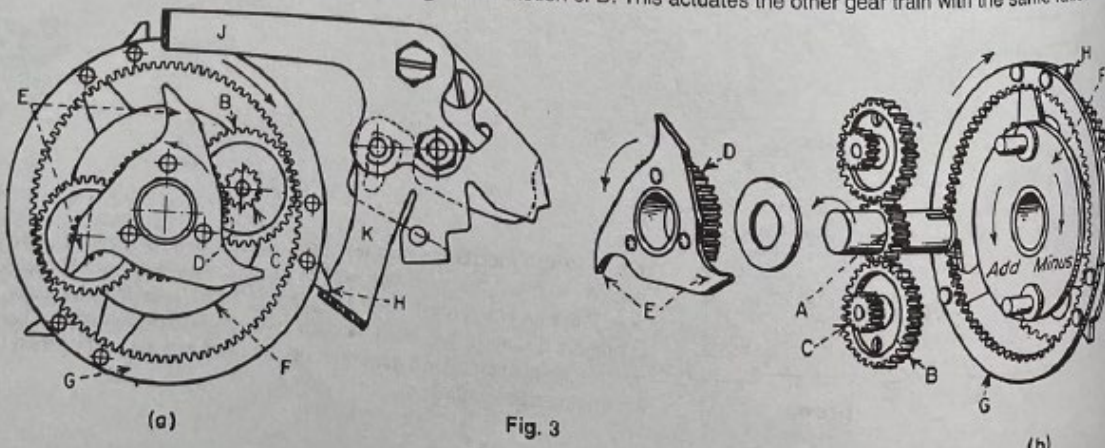


Fig. 3

Id. at 322.

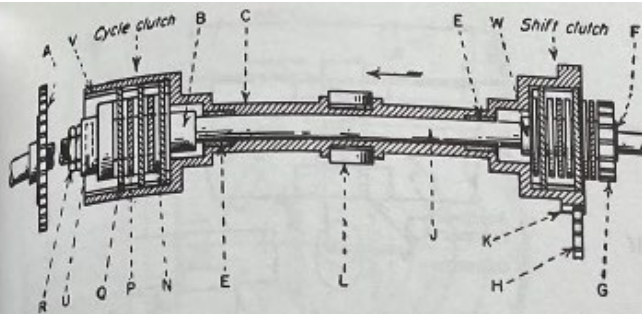


Fig. 4

Fig. 4 A multiple-disk friction clutch. Two multiple-disk friction clutches are combined in a single, two-position unit that is shown shifted to the left. A stepped cylindrical housing, C, encloses both clutches. Internal self-lubricated bearings support the housing on coaxial shaft J that is driven by transmission gear H, meshing with housing gear teeth K. At the other end, the housing carries multiple metal disks Q that engage keyways V and can make frictional contact with phenolic laminate disks N. They, in turn, can contact a set of metal disks P that have slotted openings for couplings with flats located on sleeves B and W.

In the position shown, pressure is exerted through rollers L, forcing the housing to the left, making the left clutch compress against adjusting nuts R. Those nuts drive gear A through sleeve B, which is connected to jack shaft J by pin U. When the carriage is to be shifted, rollers L force the housing to the right. However, it first relieves the pressure between the adjoining disks on the left clutch. Then they pass through a neutral position in which both clutches are disengaged, and they finally compress the right clutch against thrust bearing F. That action drives gear G through sleeve W, which rotates freely on the jack shaft.

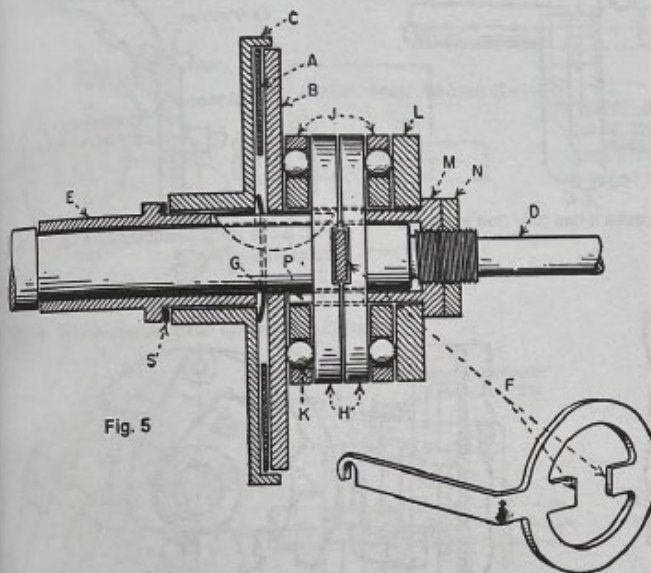


Fig. 5

Fig. 5 A single-plate friction clutch. The basic parts of this clutch are the phenolic laminate clutch disk A, steel disk B, and drum C. They are normally kept separated by spring washer G. To engage the drive, the left end of a control arm is raised, causing ears F, which are located in slots in plates H, to rock clockwise. This action spreads the plates axially along sleeve P. Sleeves E and P and plate B are keyed to the drive shaft; all other members can rotate freely.

The axial motion loads the assembly to the right through the thrust ball bearings K against plate L and adjusting nut M. It also loads them to the left through friction surfaces on A, B, and C to thrust washer S, sleeve E, and against a shoulder on shaft D. This response then permits phenolic laminate disk A to drive drum C.

Fig. 6 An overload relief clutch. This is a simple, double-plate, friction coupling with spring loading. Shaft G drives collar E, which drives slotted plates C and D faced with phenolic laminate disks B. Spring H is held in compression by the two adjusting nuts on the threaded end of the collar E. These maintain the unit under axial pressure against the shoulder at the left end of the collar.

This enables the phenolic laminate disks B to drive through friction against both faces of the gear, which is free to turn on the collar. This motion of the gear causes output pinion J to rotate. If the machine to which the clutch is attached should jam and pinion J is prevented from turning, the motor can continue to run without overloading. However, slippage can occur between the phenolic laminate clutch plates B and the large gear.

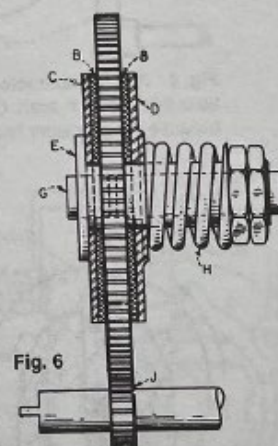


Fig. 6

VI. LEVEL OF ORDINARY SKILL IN THE ART

70. I understand that there are multiple factors relevant to determining the level of ordinary skill in the pertinent art, including the educational level of active workers in the field at the time of the alleged invention, the sophistication of the technology, the type of problems encountered in the art, and the prior art solutions to those problems.

71. In determining the characteristics of a hypothetical person of ordinary skill in the art of the '884 Patent at the time of the claimed invention, I considered several things, including the type of problems encountered in this field, and the rapidity with which innovations were made. I also considered the sophistication of the technology involved, the educational background and experience of those actively working in the field, and the level of education that would be necessary to understand the '884 Patent. Finally, I placed myself back in the relevant period of time and considered the state of the art and the level of skill of the persons working in this field at that time.

72. In order to determine who one of ordinary skill in the art is, I found it necessary to first define what that “art” is. It is my understanding that the art in question relates to designing manual treadmills. Based on the materials I have considered (including the prior art cited herein), my own knowledge and experience, and the level of skill required to design and build a manual treadmill, I have come

to the conclusion that a person of ordinary skill in the art of the '884 Patent would be a person with a bachelor of science degree in mechanical engineering or at least two years of experience in the treadmill industry, including experience and knowledge of the design, construction, testing, and operation of manual treadmills.

73. Although my qualifications and experience exceed those of the hypothetical person having an ordinary level of skill in the art, my analysis and conclusions herein are from the perspective of a person of ordinary skill in the art as of March 17, 2009, unless otherwise noted.

74. I disagree with Dr. Giachetti's more stringent standard as to who constitutes a person of ordinary skill in the art. *See* EX1003 at ¶¶44-49. As an initial matter, Dr. Giachetti does not provide what he considered in coming to his opinion in this regard or otherwise explain what the relevant field of "art" is.

75. Furthermore, in my opinion, it is not necessary for the relevant person of ordinary skill in the art to be a degreed engineer. Indeed, as I understand it, certain of the named inventors of the '884 Patent are not degreed engineers. Also, I do not agree that the relevant person of ordinary skill in the art must have knowledge in the field of anthropometry. Nothing in the claims of the '884 Patent requires any understanding of the study of human proportion, an area that Dr. Giachetti appears to have studied while in school.

VII. CLAIM CONSTRUCTION

76. I understand that the United States District Court for the Southern District of California has entered a Claim Construction Order construing certain terms of the '884 Patent. For purposes of this declaration, I have considered and applied the Court's constructions, including specifically the following constructions for the terms "substantially prevents," "safety device," and "shaft," for which I understand Petitioner has provided alternative constructions that do not take into account the Court's Order:

Term	Construction
substantially prevents	"restricts rotation to allow for only one rotational direction of movement"
safety device	"a device that includes the elements recited [in the claims] and restricts rotation to allow for only one rotational direction of movement"
shaft	Plain and ordinary meaning

EX1033 at 16, 23, 27.

77. Nonetheless, I note that the opinions expressed in this declaration would remain the same even if the constructions proposed by Petitioner were applied.

VIII. THE CHALLENGED CLAIMS ARE NOT OBVIOUS

78. I disagree with Petitioner's argument and Dr. Giachetti's opinion that any claim of the '884 is obvious. In my opinion, and as described in more detail

below, in some instances, the prior art combinations cited by Petitioner and Dr. Giachetti fails to disclose certain limitations required by the claims and therefore cannot collectively render the Challenged Claims obvious. In other instances, the prior art cited does not render the Challenged Claims obvious as a POSA would not have been motivated to modify or combine the various references in the manner that Petitioner and Dr. Giachetti suggest.

A. Chickering Does Not Disclose a Curved Running Surface (Claims 30, 37, and 57, Ground 4)

79. I understand that Petitioner and Dr. Giachetti both rely on Chickering for the vast majority of limitations in Ground 4. This includes the following limitations from Claims 30, 37, and 57, the only three independent claims challenged in Ground:

- Claim 30: “a running belt at least partially supported by the plurality of bearings, **wherein the running belt comprises a curved running surface;**”
- Claim 37: “a running belt at least partially supported by the first plurality of bearings and the second plurality of bearings, the running belt being at least partially disposed about the front and rear shaft assemblies, and comprising **a running surface, at least a portion of which is curved;**” and

- Claim 57: “disposing a running belt on the plurality of bearings such that the curved top profile of plurality of bearings define at least a portion of **a curved running surface of the running belt.**”

EX1001 at Claims 30, 37, 57 (emphasis added); Petition at 83-84, 87; EX1003 at ¶¶368-370, 406-408, 427. I disagree that Chickering discloses such features.

80. I understand that Petitioner and Dr. Giachetti both identify Chickering’s endless belt 28 as the running belt and Chickering’s rollers 29 as the plurality of bearings. Petition at 81-84; EX1003 at ¶¶366-367, 404, 426. Notably, this represents elements from one of two different embodiments disclosed in Chickering. *Id.*

81. Chickering’s primary embodiment includes the following features:

A first series of transverse parallel rollers 13 have their ends 15 journaled in arms 14. An endless belt 16 of some suitable material such as rubber or heavy cloth, is disposed about the series of rollers 13 to provide a first tread surface 16a.

A second series of transverse parallel rollers 18 have their ends journaled in arms 19. An endless belt 25 is disposed about the series of rollers 18 to provide a second tread surface 25a adjacent the first tread surface.

EX1013 at 2:13-26. Endless belt 28 is not a component of this embodiment.

82. In contrast, Chickering’s second embodiment includes the following features:

An alternate form of the exercising device of the present invention is shown in FIG. 3, wherein a single endless belt 28 forms both the accelerating and decelerating areas. In

the device shown in FIG. 3, a single series of rollers 29 are provided journaled in the sidewalls 22 of base 10. However, the rollers are so disposed that the forward rollers lie approximately in a plane slanting downwardly from the front of the base, while the rear rollers lie approximately in a plane slanting upward toward the rear of the base 10. Thus, when the endless belt 28 is placed about the rollers, it follows their contour and provides a forward accelerating area and a rear decelerating area which are inclined from the horizontal with each being lowest at their point of nearest proximity.

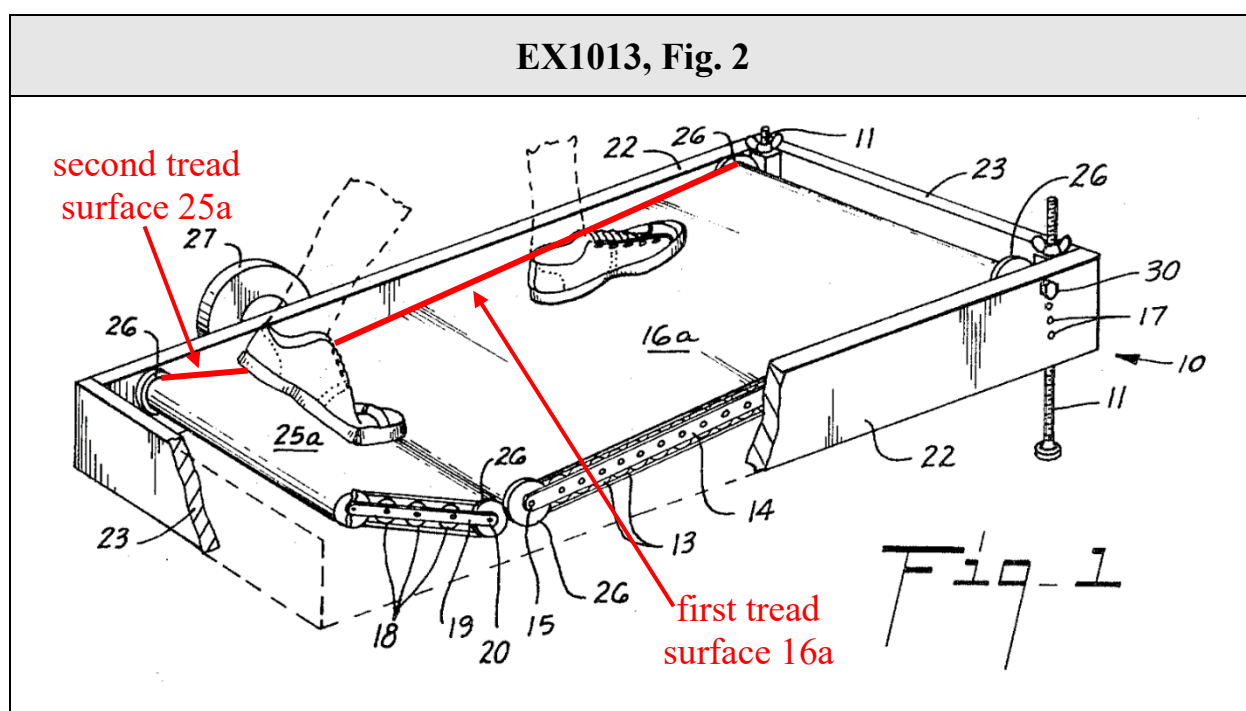
EX1013 at 2:73-3:10. Neither parallel rollers 13 and 16 or endless belts 16 and 25 are components of the second embodiment. Nor are arms 14 and 19 components of the second embodiment as the rollers 29 are instead journaled directly to the sidewalls 22.

83. As indicated in the foregoing excerpts, both of Chickering's embodiments have two flat running surfaces positioned adjacent each other. A POSA would therefore consider a running surface in either of these embodiments or a combination of the two to constitute a multi-planar running surface, not a curved surface.

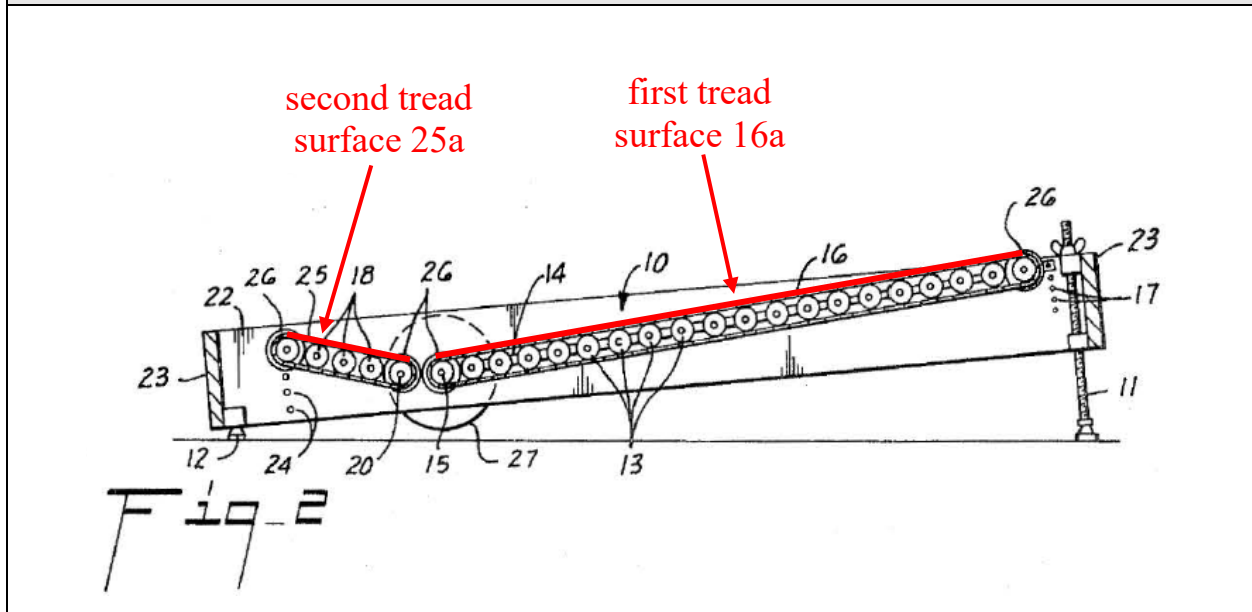
84. Looking first at Chickering's primary embodiment, a POSA would understand that, because rollers 13 and 18 are each described as "series of transverse **parallel** rollers," the rollers that support belt 16 and 25 and the arms 14 and 19 are journaled to form a pair of planar surfaces rather than a single curved surface. Thus,

Chickering's primary, dual-belt embodiment discloses a multi-planar running surface, not a curved running surface as required by the claims.

85. A POSA's understanding that Chickering's primary embodiment discloses a multi-planar running surface rather than a curved running surface is further confirmed by referencing Chickering's figures. Annotated versions of Figures 1 and 2 are provided below for reference:



EX1013, Fig. 2

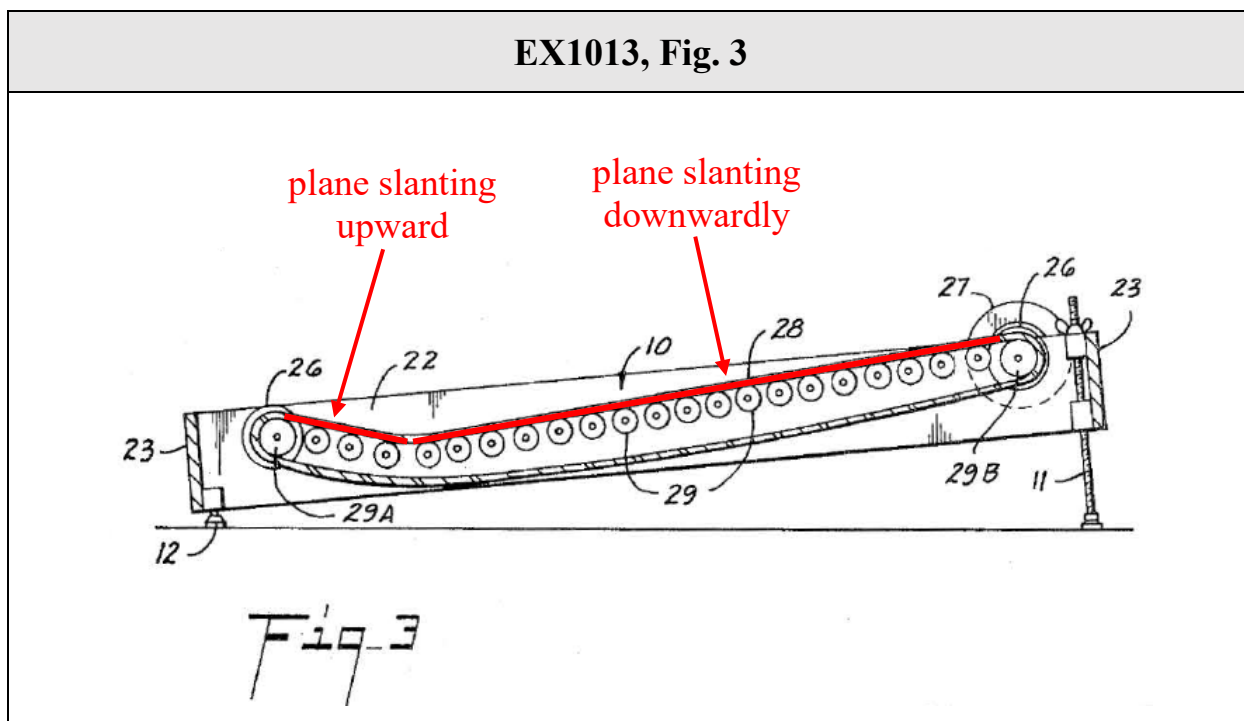


EX1013 at Figs. 1-2 (annotations added).

86. Similarly, for its alternative embodiment, Chickering teaches that the rollers 29 are positioned in two flat planes. More specifically, Chickering discloses that “the rollers are so disposed that the forward rollers lie approximately *in a plane slanting downwardly* from the front of the base, while the rear rollers lie approximately *in a plane slanting upward* toward the rear of the base 10.” *Id.* at 3:2-6 (emphasis added). Meanwhile, “when endless belt 28 is placed about the rollers, it follows their contour and provides a forward accelerating area and a rear decelerating area which are inclined from the horizontal with each being lowest at their point of nearest proximity.” *Id.* at 3:6-10. Because the endless belt 28 “follows” the rollers and the rollers are configured in two flat “plane[s],” a POSA would readily

understand that the endless belt 28 itself follows a dual- or multi-planar running surface, not a curved running surface as required by the claims.

87. As with Chickering's primary embodiment, a POSA's understanding that Chickering's alternative embodiment discloses a multi-planar running surface rather than a curved running surface is further confirmed by referencing Chickering's figures. An annotated version of Figure 3 is provided below for reference:



Id. at Fig. 3 (annotations added).

88. Because both of Chickering's embodiments plainly disclose multi-planar running surfaces rather than curved running surfaces, a POSA would not understand a combination of these two embodiments, as proposed by Petitioner and

Dr. Giachetti, to have a curved running surface. There is simply no curve to be incorporated from either embodiment.

89. Despite this, Dr. Giachetti appears to argue that a slight curve can be observed approximately where the two planes of belt 28 meet. EX1003 at ¶369. In my opinion, Dr. Giachetti is mistaken at least because, according to Chickering's own teachings, the area of the belt 28 he identifies does not constitute a "running surface."

90. A POSA would understand a treadmill's "running surface" to be a surface that a runner's feet would typically make contact when the user is running on the treadmill during normal use.

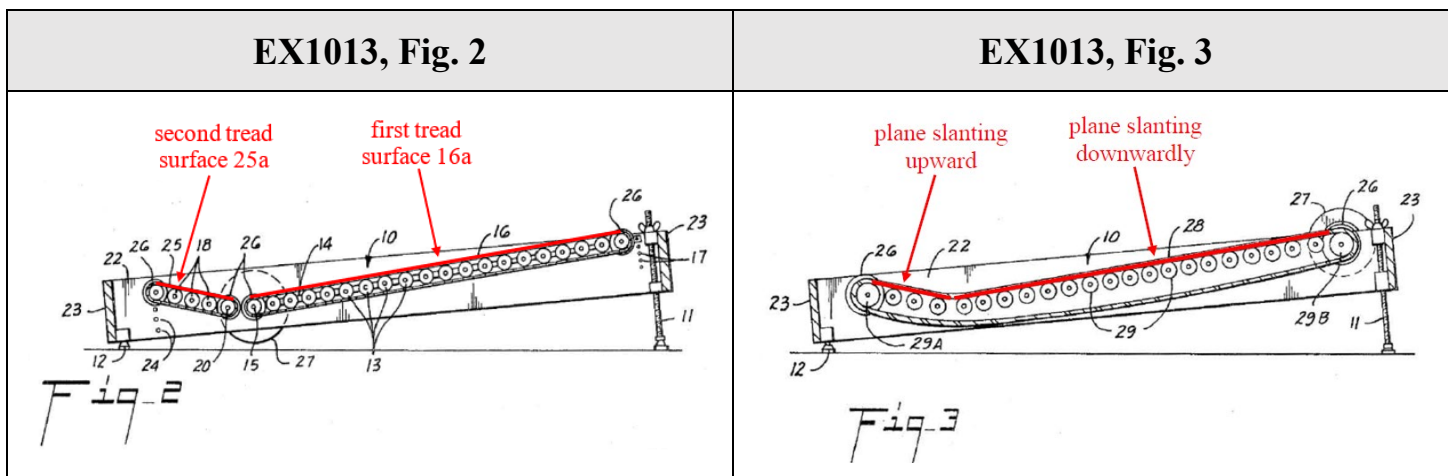
91. The point where the two planes of Chickering's belt 28 meet does not meet the foregoing criteria for a "running surface." In fact, Chickering expressly teaches as follows:

When a person is using the exercise device, during each step his foot moves in an approximate arc. The foot first contacts the tread surface 16a as shown in FIG. 1, and moves rearwardly and downwardly, the weight of the person acting to accelerate the motion of the belt 16. *Near the bottom of the arc the foot leaves surface 16a and may for a brief instant be out of contact with any surface.* However, further rearward movement will bring at least a portion of the foot into contact with tread surface 25a....

EX1013 at 2:50-58 (emphasis added).

92. Because “the foot leaves surface 16a” and is “out of contact with any surface” before it contacts tread surface 25a, a POSA would recognize that a runner’s feet are not necessarily intended to contact the area between those surfaces – i.e., the point where the two surfaces meet to form an angle – when running on the treadmill during normal use. Thus, a POSA would recognize that there is no “running surface” between the tread surfaces 16a and 25a.

93. The same is true of Chickering’s alternative embodiment and Petitioner’s proposed combination of embodiments, specifically with respect to the purported “central belt portion” identified by Dr. Giachetti. In their relevant aspects, Chickering’s alternative embodiment and its primary embodiment differ only in that the former uses a single running belt while the latter uses two running belts. Both have the same dual-plane profile, as can be seen when comparing the profile formed by the dual-plane slopes depicted as first tread surface 16a and second tread surface 25a in Figure 2 and the profile formed by the downwardly slanting plane and upwardly slanting plane in Figure 3, respectively:



EX1013 at Figs. 2-3 (annotations added).

94. Thus, as with the primary embodiment, a POSA would readily understand that a runner's feet are not intended to contact the area where the downwardly slanting plane of the forward rollers intersects with the upwardly slanting plane of the rear rollers. This portion of belt 28—whether in the alternative embodiment or in a hypothetical treadmill formed by combining the two embodiments—cannot constitute a curved *running* surface as required by the claims.

95. It is therefore my opinion that a POSA would readily understand that Chickering's two embodiments each disclose a dual-planar running surface and not disclose a “curved running surface” as required by all Challenged Claims, either explicitly or inherently.

B. A POSA Would Not Have Been Motivated to Modify Schonenberger in View of Socwell (Grounds 1-3)

96. I disagree with Petitioner's and Dr. Giachetti's arguments that a POSA would have found it obvious and been motivated to combine the curved running surface of Socwell with Schonenberger's movable flat surface design.

1. Socwell's and Schonenberger's Disclosures Are Fundamentally Different (All Claims)

97. Independent claims 30, 37, 50, and 57 each require that the device have running surface that is at least partially curved. EX1001 at Claim 30 ("wherein the running belt comprises **a curved running surface**"); Claim 37 ("**a running surface, at least a portion of which is curved**"), Claim 50 ("wherein the running belt includes **a running surface, at least a portion of which is curved**"); Claim 57 ("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") (emphasis added).

98. I understand that Petitioner argues that it would have been obvious for a POSA to modify Schonenberger to have a curved running surface in view of Socwell, stating that because both Socwell and Schonenberger disclose "a plurality of bearings," a POSA would have been motivated to combine them and to alter Schonenberger to have a curved running surface in view of Socwell. However, as I previously discussed, a POSA would not understand Socwell to disclose "a plurality

of bearings” as claimed. *See* §VIII(B)(1)(a), *infra*. As such, a POSA would not have been motivated to combine Socwell with Schonenberger in the way Petitioner argues, at least because Socwell does not teach a plurality of bearings required by the claims.

99. As shown and discussed below, a POSA would have recognized and understood the fundamental difference between rollers located *below* a running belt for use as bearings and rollers positioned *above* the belt for use as a belt retention system—and a POSA would readily understand that rollers placed above the belt for use as a belt retention system is not a plurality of bearings. *See* §VIII(B)(1)(a), *infra*.

100. In particular, a POSA would have understood that Socwell’s rollers are fundamentally different from and perform a fundamentally different function than those in Schonenberger. Specifically, Schonenberger’s rollers 12 “are provided to prevent bending-through of the belts 5 upon loading of the steps by a person.” EX1010 at 4:67-5:1. By contrast, the belt securing assemblies 94 in Socwell “provide a means for substantially conforming the inherent flexible nature of the belt 16 to the accurate configuration of the intermediate portion 62 of the deck 56” in other words, to hold the belt down against the deck. EX1011 at 10:5-28. While the rollers 12 in Schonenberger provide support for the slats that make up the surface, the belt securing assemblies 94 (and associated rollers 98) in Socwell provide no such support, and instead merely hold down the belt against the deck. These

fundamental differences would have been immediately apparent to a POSA, as the mechanisms for what makes up the running surface and how that surface is supported, is fundamentally different in Schonenberger and Socwell.

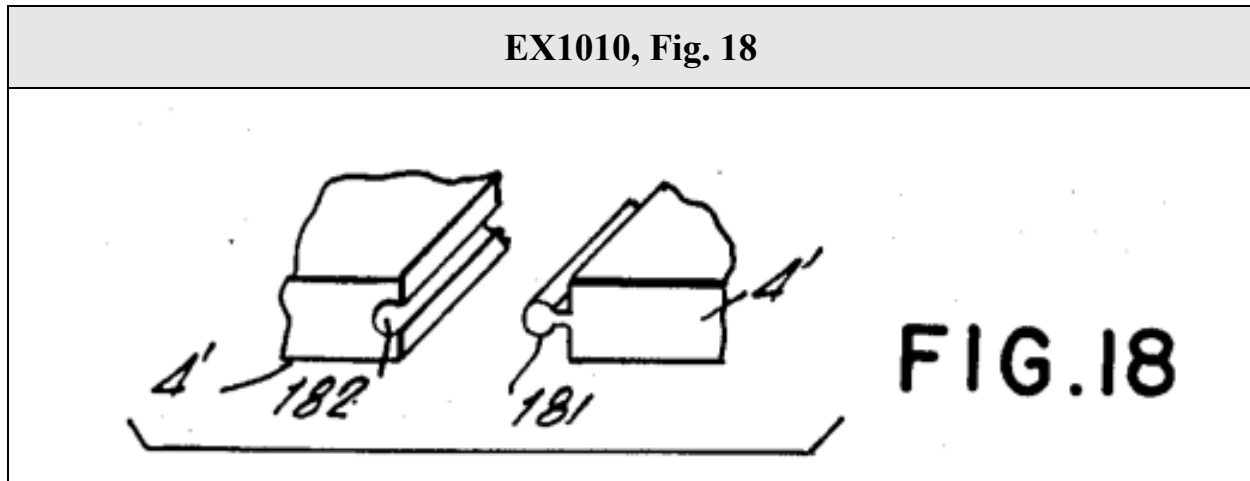
101. By extension, a POSA would have recognized that Socwell itself is a fundamentally different design than Schonenberger. A POSA would have understood that Socwell's running surface is simply a belt 16 (formed from flexible canvas or a rubber-impregnated material, for example) supported by the deck 56. *See* EX1011 at 5:41-45; *see also id.* at 7:31-43. Schonenberger, on the other hand, has a flat top surface comprised of slats 4 (formed from lightweight metal like aluminum, for example) which are secured with rivets to toothed belts 5; the flat top of these slats then forms the running surface. EX1010 at 4:38-47. Under the slats, support rollers 12 prevent bending when a person steps on the surface of the slats, while between the rollers 12 and the underside of the slats 4, support belt 13 and 13' (formed of rubber or suitable elastic material, for example) to "absorb the steps" and "eliminate all vibrations caused by the rollers." *Id.*, at 4:67-5:18. Thus, the running surface of Schonenberger is much bulkier than Socwell. It would not be obvious to a POSA how to translate the teachings of Socwell relating to a flexible canvas or a rubber-impregnated material belt to Schonenberger's more complex and rigid mechanisms involving slats and supporting rollers/belts.

102. Socwell and Schonenberger therefore have drastically different material composition, bulk, weight, and support systems for the moving running surfaces such that it would not be obvious how to combine them. There are thus many engineering hurdles that would prevent a combination of these references as suggested by Petitioner and Dr. Giachetti, or at least, would make such a combination nonobvious to a POSA.

103. For example, Petitioner and Dr. Giachetti suggest that a POSA would have known how to modify Schonenberger to arrange the rollers 12 in a curved profile to match the curved profile of the deck 56 in Socwell, because of the “curvilinear arrangement of bearings” taught by Socwell. Petition at 44-45; EX1003 at ¶178. I disagree, and it is my opinion that a POSA would not know how to modify Schonenberger based on these teachings of Socwell. As explained, Socwell’s rollers 98 are positioned above the belt 16 and hold the belt down so that it retains a curved shape. A POSA could not use such an arrangement in Schonenberger because, unlike Socwell’s rollers, the rollers 12 in Schonenberger must be below the slats to provide support to the running surface. They simply do not perform the same function as Socwell’s rollers.

104. Moreover, significant complications that would arise in trying to add a curved surface to Schonenberger at all given the structure of the slats that comprise Schonenberger’s running surface. For example, the slats in Schonenberger are

individually rigid metal pieces that are connected “by interrogating projection-and-hook arrangements, or by moveable rib-and-slot connections,” among other connecting means. EX1010 at 11:36-50, Fig. 18; *see also id.* at 12:51-13:32. Figs. 21-23. Figure 18 illustrates one means by which the slats can be connected:



EX1010 at Fig. 18. A POSA would understand that such connections between the slats changes the flexibility, friction, and wear of the running surface and support rollers/belt. There is simply no comparable feature in Socwell that a POSA could use to determine the appropriate connection means so as to avoid additional friction, pinching of the slats together, or additional wear on the running surface.

105. Thus, it is my opinion that a POSA would not have been motivated to combine the two references and modify Schonenberger to have a curved running surface as taught by Socwell given the fundamental differences between Socwell’s and Schonenberger’s respective structures.

106. Additional details regarding the structure of Socwell and how it differs from Schonenberger are provided below.

**a. Socwell does not disclose “a plurality of bearings”
(Claims 30, 37, 50, 57)**

107. I understand that Petitioner and Dr. Giachetti rely on the purported similarities between Socwell’s rollers and Schonenberger’s rollers as support for an alleged motivation to modify Schonenberger in view of Socwell, specifically by analogizing the curved deck 56 and either belt securing assembly 94 or roller 98 of Socwell to the “bearings” of Claims 30, 37, 50, and 57. Petition at 41 (referring to “rollers 94 in Socwell”), 44-46, 79; EX1003 at ¶¶174, 178-179. The relevant limitations of Claims 30, 37, 50, and 57 are as follows:

- Claim 30: “a plurality of bearings coupled to the frame;”
- Claim 37: “a first plurality of bearings coupled to the frame” and “a second plurality of bearings coupled to the frame and spaced a distance from the first plurality of bearings;”
- Claim 50: “a plurality of bearings coupled to the frame;” and
- Claim 57: “providing a plurality of bearings coupled to the frame, wherein the plurality of bearings define at least a portion of a curved top profile.”

EX1001 at Claims 30, 37, 50, 57. I disagree that Socwell discloses such features.

108. In my opinion a POSA would understand that Socwell’s curved deck 56 and roller 98/ belt securing assembly 94 of Socwell fail to meet the requirements

for the “plurality of bearings” as described in the ’884 Patent specification and claims.

109. A POSA would understand that the “plurality of bearings” must all be positioned below and have some kind of weight-bearing relationship with the running belt based on the ’884 Patent specification. Indeed, the ’884 Patent specification describes and depicts the “plurality of bearings” as laying below and supporting the running belt 16, as seen in the following exemplary excerpt:

Referring to FIGS. 6 and 8-9 , in particular, the bearing rails 200 are shown including *a plurality of bearings 208* and an upper or top profile 210, shown shaped as a complex curve, according to an exemplary embodiment .

...

The running belt 16 contacts and *is supported in part by the bearings 208* of the bearing rails and bearing 208 are configured to rotate, thereby decreasing the friction experienced by the running belt 16 as the belt moves along the top profile 210.

EX1001 at 11:20-23, 11:39-43 (emphasis added). A POSA would understand from this disclosure that the bearings 208 are required to be positioned below the running belt 16.

110. Although other portions of the ’884 Patent specification teach that certain elements may be positioned above running belt 16 to ensure that the running surface corresponds to the curved shape of the top profile 210 (*see, e.g.,* EX1001 at

11:47-50), the '884 Patent specification never describes “bearings” as being used to accomplish this.

111. One way that the '884 Patent specification teaches that the running belt can be made to conform to the curved shape of the top profile 210 is by using a relatively heavy running belt that is pulled down through the force of gravity:

Further referring to FIGS. 5-6 and 8-11, one way to ensure that the running belt 16 follows the contour of the bearing rails 200 and the front and rear running belt pulleys 62, 66 is to utilize the weight of the running belt 16 itself in addition to adjusting the relative size of the front and rear running belt pulleys 62, 66; and/or providing a synchronizing system 222 according to an exemplary embodiment.

...

In the exemplary embodiment shown in FIG. 5, when positioning the running belt 16 about the front and rear running belt pulleys 62,66, a length of the running belt 16 sufficient to permit the running belt 16 to correspond to (e.g., follow, be positioned against or above, etc.) the desired contours of the bearing rails 200 and the front and rear running belt pulleys 62, 66 is generally disposed between the front and rear shafts 64, 68. At each location between the front and rear shafts 64, 68, the force of gravity pulls downward on the running belt 16. Generally, this force will help pull the running belt 16 downward and against the desired components of base 12. However, gravity can also cause slippage (e.g., over the front running belt pulley 62, over the rear running belt pulley 66, down along curves of the bearing rail 200, etc.) in an amount that is undesirable and the magnitude of these slippage-problems tends to increase when the treadmill 10 is being operated. Accordingly, the solution typically relies on more than the weight of the running belt alone.

Id. at 13:13-52. The specification does not describe the use of bearings positioned above the running belt in such a design.

112. Alternatively, the '884 Patent specification contemplates implementing some kind of running belt retention or braking system. While several such systems are described, none describe using “bearings” to exert downward forces on the belt to force it to hold its preferred shape. *See generally id.*

113. Notably, the foregoing is true even of the running belt retention and braking systems that make use of wheel or roller assemblies. For example, the first running belt retention system disclosed in the '884 Patent specification describes “a track system 700...configured to help induce and maintain the running belt in a desired non-planar shape to define the running surface.” *Id.* at 22:8-12. This is accomplished by using “a pair of opposed tracks 702 configured to provide for movement of a running belt 16” and “[a] plurality of roller or wheel assemblies 716” which are “connected with, preferably mounted directly to or integral with, each of a plurality of slats 228 of the running belt 16.” *Id.* at 22:13-16, 22:32-34. “One of a plurality of wheel assemblies 716 is coupled at each end 252, 254 of each slat 228 at an interior surface 256. The wheel assemblies 716 are configured to be mated with the tracks 702 and provide for motion of the running belt 16 along the tracks 702.” *Id.* at 22:36-41. Despite describing the “rollers” and “wheels” in significant detail, this system is never described as incorporating “bearings.” *See id.* at 22:42-23:25

(discussing the functionality of a “first roller or wheel 720 and a second roller or wheel 722,” both components of “[e]ach wheel assembly 716”).

114. In another exemplary track system, the ’884 Patent specification also describes how “the running belt 16 includes a plurality of laterally-oriented slats 228 each having a left-hand end 252 generally opposite a right-hand end 254. One of a plurality of roller or wheel assemblies 812 is coupled at each end 252, 254 of each slat 228 to mate with the tracks 802 and to provide for motion of the running belt 16 along the tracks 802.” *Id.* at 23:43-49. Each wheel assembly 812 is described as “including a support shown as a mounting block 814 and a wheel 816 rotatably coupled to the mounting block 814.” While the specification again describes the structure and function of each wheel 816 in detail, as with the first exemplary track system, it never refers to a “wheel” as a “bearing.” *See id.* at 23:50-24:13.

115. The ’884 specification describes at least two other track systems that similarly make use of rollers or wheels. *E.g., id.* at 24:14-25:14, 25:66-26:30. Again, neither uses the term “bearing” to refer to the rollers or wheels. *Id.*

116. Based on the foregoing, a POSA would readily understand that the ’884 Patent specification distinguishes between the “bearings” coupled to the frame via the bearing rails and other structures like “rollers” or “wheels” that are intended to hold the running belt in a curved shape. Unlike such “rollers” and “wheels,” a POSA would understand that the plurality of “bearings” are required to have a relative,

weight-bearing relationship with the running belt such that, for a structure to constitute a “bearing,” it must support the belt either directly or indirectly and must bear some or all of the weight of the belt.

117. By extension, a POSA would not understand Socwell’s belt securing assembly 94 or its rollers 98 to constitute “bearings” as that term is used in the ’884 Patent. With respect to belt securing assembly 94, Socwell teaches as follows:

Referring now to FIG. 5, the curved deck treadmill 10 may include one or more **belt securing assemblies 94 which provide a means for retaining the endless belt 16 in a curvilinear configuration** being substantially flush with the upper surface 66 of the deck 56. Preferably, the belt securing assemblies 94 provide a means for substantially conforming the inherent flexible nature of the belt 16 to the arcuate configuration of the intermediate portion 62 of the deck 56. In design, one or more belt securing assemblies 94 may be disposed in spaced-apart relation along the upper surface 66 of the intermediate portion 62 of the deck 56, as shown in FIG. 2, to sufficiently retain the belt 16 in operable disposition to the deck 56.

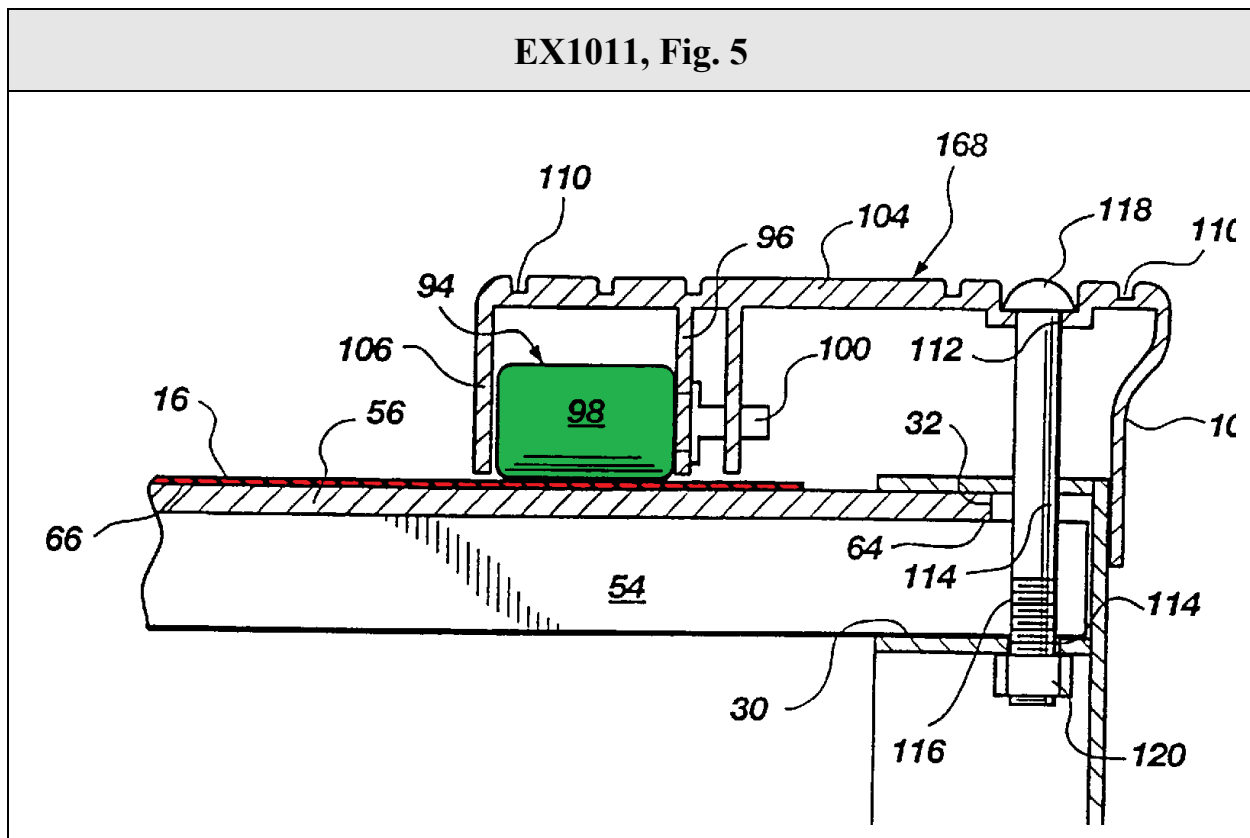
In one presently preferred embodiment of the present invention, **the belt securing assembly 94 comprises a roller 98 having an axle 100 which rotatably engages a mounting bracket 96. The mounting bracket 96 is preferably disposed in relation to the roller 98 such that the roller 98 may engage the belt 16, thereby substantially retaining a side portion of the belt 16 substantially flush with the deck 56....**

EX1011 at 10:8-23 (emphasis added).

118. As described, Socwell’s belt securing assemblies 94 and their associated rollers 98 serve the same function and have a similar structure to the ’884

Patent's "roller or wheel assemblies" and their associated "rollers" and "wheels." A POSA therefore would not understand them to constitute "bearings" at least because the '884 Patent's "roller or wheel assemblies" and their associated "rollers" and "wheels" are consistently described as being structurally and functionally distinct from the plurality of bearings.

119. Moreover, Socwell's figures confirm that neither belt securing assemblies 94 nor rollers 98 are capable of serving as "bearings," as that term is used in the '884 Patent. As shown in the following annotated excerpt of Socwell Figure 5, Socwell's roller 98 and belt securing assembly 94 (both green) are positioned vertically *above* running belt 16 (red):



EX1011 at Fig. 5 (annotations added).

120. Because neither Socwell's belt securing assemblies 94 nor their rollers 98 are positioned below running belt 16, it is not possible for either of them to support any of running belt 16's weight. Thus, as previously discussed, roller 98 and belt securing assembly 94 cannot constitute "bearings" as that term is used in the '884 Patent in connection with the plurality of bearings.

121. Furthermore, to the extent the Petition and/or Dr. Giachetti intend to argue that a POSA would know to modify Socwell to position the belt securing assemblies 94 and their associated rollers 98 below running belt 16, it is my opinion that a POSA would not be motivated to make sure a modification as such modifications would render the belt securing assemblies 94 inoperable for their intended purpose.

122. As articulated in Socwell and as discussed above, Socwell's belt securing assemblies 94 are intended to hold running belt 16 in an arcuate configuration. *Id.* at 9:44-47. Each belt securing assembly 94 accomplishes this only by holding belt 16 in a configuration that renders it "substantially flush with the ***upper surface*** 66 of the deck 56." *Id.* at 10:5-9 (emphasis added). Any modification that would place a roller 98 or a belt securing assembly 94 either below deck 56 or between deck 56 and belt 16 would result in the belt securing assembly 94 and roller

98 being unable to exert a downward force on belt 16 to hold the belt in this arcuate configuration, flush with the upper surface of the deck 56.

123. Thus, a POSA would readily understand that neither belt securing assembly 94 nor roller 98 constitute or could be modified to constitute one or more “bearings.”

124. As a result, the only remaining structure that Petitioner and Dr. Giachetti identify as meeting the “plurality of bearings” is the aforementioned deck 56. However, each treadmill taught by Socwell has only a single deck 56, not a “plurality of” decks 56. *See, e.g., id.* at 5:23-45, 7:59-8:27, 13:54-14:24, Figs. 2-3, Figs. 6-7. Because Socwell discloses only a single deck 56, and thus at most a single bearing, a POSA would immediately recognize that Socwell’s deck 56 cannot possibly meet the “plurality of bearings” element required by Claims 30, 37, 50, and 57 (or the claims depending from them).

125. It is therefore my opinion that a POSA would readily understand that Socwell does not disclose a “plurality of bearings” as required by Claims 30, 37, 50, and 57 and, by extension, would not be motivated to modify Schonenberger’s rollers to meet the limitations of these claims.

- b. **Socwell does not disclose “a running belt at least partially supported by the plurality of bearings” (Claims 30, 37, 50) or “disposing a running belt on the plurality of bearings” (Claim 57)**

126. The arguments presented by Petitioner and Dr. Giachetti with respect to claim limitations requiring the running belt to be “supported by” or “dispos[ed]... on” the plurality of bearings, which are found in Claims 30, 37, 50, and 57, are similarly deficient.

127. As I previously explained, Socwell discloses, at most, only one structure – deck 56 – that can arguably constitute a “bearing” as that term is used in the ’580 patent because belt securing assemblies 94 and rollers 98 are positioned vertically above the running belt 16. §VIII(B)(1)(a), *supra*. By extension, because Socwell discloses at most only a single “bearing” rather than a “plurality of bearings,” Socwell cannot possibly disclose “disposing a running belt on the *plurality of bearings*” as required by Claim 57 or that the running belt be “at least partially supported by the *plurality of bearings*” (or “partially supported by the first *plurality of bearings* and the second *plurality of bearings*”) as required by Claims 30, 50, and Claim 37.

128. However, even crediting the argument that, if belt securing assemblies 94 and/or rollers 98 were understood to constitute “bearings,” which they are not, a POSA would still understand that Socwell could not disclose “disposing a running belt *on the plurality of bearings*” as required by Claim 57 or that the running belt

be “at least partially *supported by*” the plurality of bearings as required by Claims 30, 50, and Claim 37 due to the orientation of Socwell’s running belt relative to belt securing assemblies 94 and/or rollers 98.

129. Although Petitioner and Dr. Giachetti identify both Socwell’s belt securing assemblies 94 and/or rollers 98 and its deck 56 as “bearings,” it is apparent both from Socwell’s written description and its figures that only deck 56 is positioned below Socwell’s running belt. Unlike deck 56, the remaining structures Petitioner identifies as “bearings” – belt securing assembly 94 and rollers 98 – are all positioned above the running belt, as I have repeatedly explained. §VIII(B)(1)(a), *supra*.

130. Again, an annotated excerpt of Socwell’s Figure 5 showing the relative relationship between the running belt 16 (red), the belt securing assembly 94 and rollers 98 (green), and the deck 56 (blue) is provided below for ease of reference:

EX1011, Fig. 5

This cross-sectional view shows a device assembly. A green rectangular component, labeled 98, is positioned within a housing. The housing includes a top flange 110 and a side wall 100. A red layer 16 is visible on the left side, and a blue hatched layer 54 is at the bottom. A vertical rod 112 passes through the assembly, secured by a nut 118 and a washer 114. A spring 116 is located at the bottom of the rod. A small component 96 is mounted on the side wall 100. A label 104 points to the top of the housing, and 106 points to the green component 98. A label 110 points to the top flange, and 118 points to the nut. A label 120 points to the bottom of the assembly.

EX1011 at Fig. 5 (annotations added).

131. A POSA would not understand a running belt to be “disposed on” belt securing assemblies 94 and/or rollers 98 or any other structure positioned above the running belt. Indeed, a POSA would immediately understand that, in order for the running belt to be “disposed on” a structure, that structure must be positioned below the running belt such that the structure supports and/or bears at least some of the weight of the running belt.

132. Because neither belt securing assembly 94 nor rollers 98 bear any of running belt 16's weight or, indeed, are positioned below running belt 16 at all, a

POSA would understand that neither belt securing assembly 94 nor rollers 98 could “support[]” Socwell’s running belt, nor could Socwell’s running belt be “dispos[ed]” on either belt securing assembly 94 or rollers 98.

133. Therefore, at most, Socwell’s running belt 16 is “dispos[ed]” on or “support[ed]” by at most a single bearing – deck 56 – regardless of how the term “bearing” is understood. It is therefore my opinion that a POSA would readily understand that Socwell does not disclose “disposing a running belt on the plurality of bearings” as required by Claim 57 or that the running belt be “at least partially supported by the plurality of bearings” (or “partially supported by the first plurality of bearings and the second plurality of bearings”) as required by Claims 30, 50, and Claim 37, and by extension, would not be motivated to modify Schonenberger in view of Socwell.

2. The Modified Version of Schonenberger Proposed by Petitioner and Dr. Giachetti Does Not Have a Curved Surface

134. Additionally, even if a POSA were to combine Schonenberger and Socwell as Petitioner and Dr. Giachetti propose, a POSA would not understand the resulting modified version of Schonenberger would have to have a curved running surface.

a. Schonemberger does not disclose rollers that define “a curved top profile.” (Claim 57)

135. I understand that Petitioner and Dr. Giachetti further argues that a POSA would be motivated to modify the flat running surface of Schonemberger according to the curved running service of Socwell because “Schonemberger already discloses arranging the rollers 12 along a curved profile – in this case such that the end rollers 12 adjacent to the pulleys 10 are located lower than the central rollers 12 to accommodate the path of support belt.” Petition at 41-42; EX1003 at ¶174. I disagree.

136. In my opinion, Petitioner and Dr. Giachetti’s characterization of Schonemberger’s rollers 12 is incorrect. Schonemberger repeatedly describes the rollers as being arranged to have a substantially flat profile, even when the terminal rollers are positioned below the remaining rollers. A POSA would understand that flipping the orientation of the terminal rollers such that they are positioned above the remaining rollers does not transform this profile into a curve.

137. A POSA would not understand anything in Schonemberger to disclose or suggest a curved top profile arrangement of rollers at all. Rather, a POSA would understand that the described device has “a flat top surface,” as Schonemberger expressly states. EX1010 at Abstract; *see also id.* at 6:1-4.

138. Schonenberger's flat top surface is supported by support belts 13, 13', which follow the profile of rollers 12, 12' and are positioned parallel to the top surface such that:

a small distance in the order of, for example, about ½ mm preferably is left when the surface 1 is unloaded. Upon loading, for example by the user stepping on the slats 4 [that form surface 1], the flat underside 14 of the respective slat 4 will engage the support belt 13, 13'.... Since bolts 21 of the support roller 12 are fixedly located in the frame, ***there is practically no bowing or hanging through of the belts 5 [the form surface 1] since downward vertical forces applied to the step slats 4 are accepted by the rollers 12.*** Thus, ***the surface is practically flat*** while being slightly springy and resembles that of a natural soft grass, or other soft surface athletic track.”

Id. at 5:51-6:4 (emphasis added); *see also id.* at 4:38-41 (explaining that slats 4 and belts 5 “form the endless surface 1”).

139. It would be immediately apparent to a POSA that for these features to even exist, including specifically that “there is no bowing or hanging-through” of surface 1 due to the fact that “downward vertical forces applied to the step slats 4 are accepted by the rollers 12” and that surface 1 “is practically flat,” rollers 12 must themselves be arranged in parallel to each other, such that they have a substantially flat top profile. To be clear, a POSA would understand that the top profile cannot be curved, nor can any other “profile” formed by rollers 12, because the rollers are meant to support the slats.

EX1010, Fig. 2

Fig. 2

Flat top profile

3

2

12

10

4

13

11

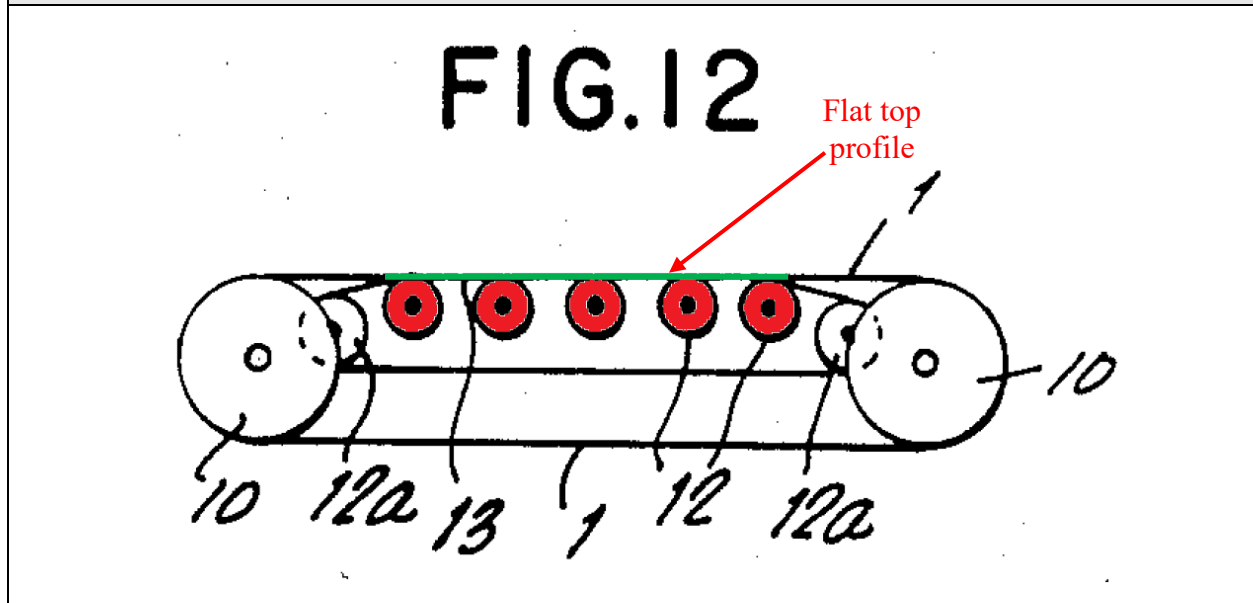
34

33

36

37

50



Id. at Figs. 2, 12 (annotations added).

141. A POSA would not understand Schonenberger's disclosure that "[t]he path of the support belts 13, 13' need not be *entirely* flat and parallel to that of the surface 1" to alter the conclusion that Schonenberger has a flat top profile. *Id.* at 7:37-38 (emphasis added). In the embodiment in Figure 12, only "the terminal rollers 12a are positioned slightly lower than the remaining rollers 12," while "[t]he structural elements and the remainder of the apparatus may be as described in connection with the preceding figures." *Id.* at 7:48-51 (emphasis added). This includes the remaining rollers 12, which remain oriented precisely as they are described elsewhere in Schonenberger, *i.e.*, parallel to one another such that the top profile formed by the rollers remains substantially flat to accommodate the slats and maintain and support a flat running surface. There is no reading of Figure 12 and the

accompanying disclosure in Schonenberger that would allow for a “curved top profile” *of the running surface*. Rather, the surface in Figure 12 remains flat even if rollers 12a are slightly lower than rollers 12.

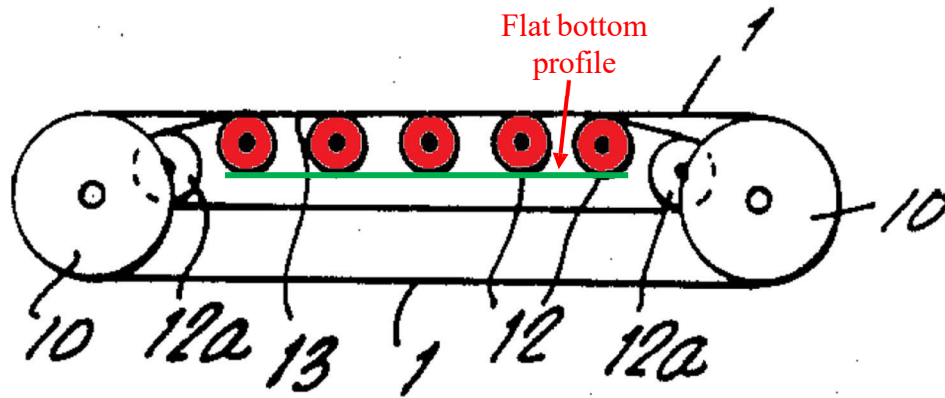
142. Thus, at a minimum, it is my opinion that Schonenberger does not disclose that the rollers form a “curved top profile” as required by Claim 18.

b. Reversing the orientation of Schonenberger’s rollers 12 does not result in a curved running surface (All Claims)

143. It is also my opinion that a POSA would have understood that simply reversing or flipping the orientation of the terminal rollers from Schonenberger’s alternative embodiment in Figure 12, i.e., such that rollers 12a are positioned above the remaining rollers, would *not* result in a curved running surface/slats.

144. As illustrated in annotated Figure 12 below and discussed above, the lower profile formed by the remaining rollers 12 is substantially flat or planar. A POSA would expect such a flat plane formed from the rollers 12, because they are all an identical size and shape:

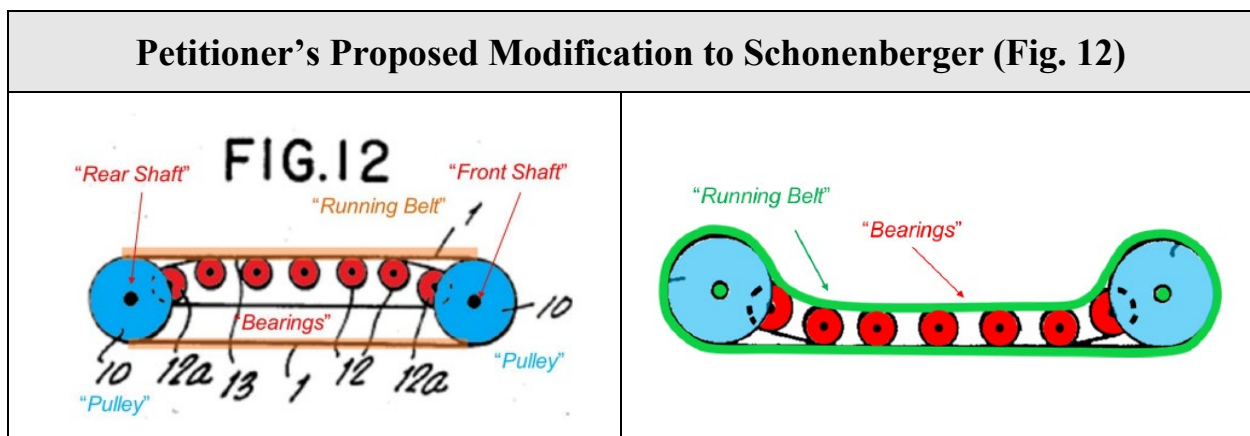
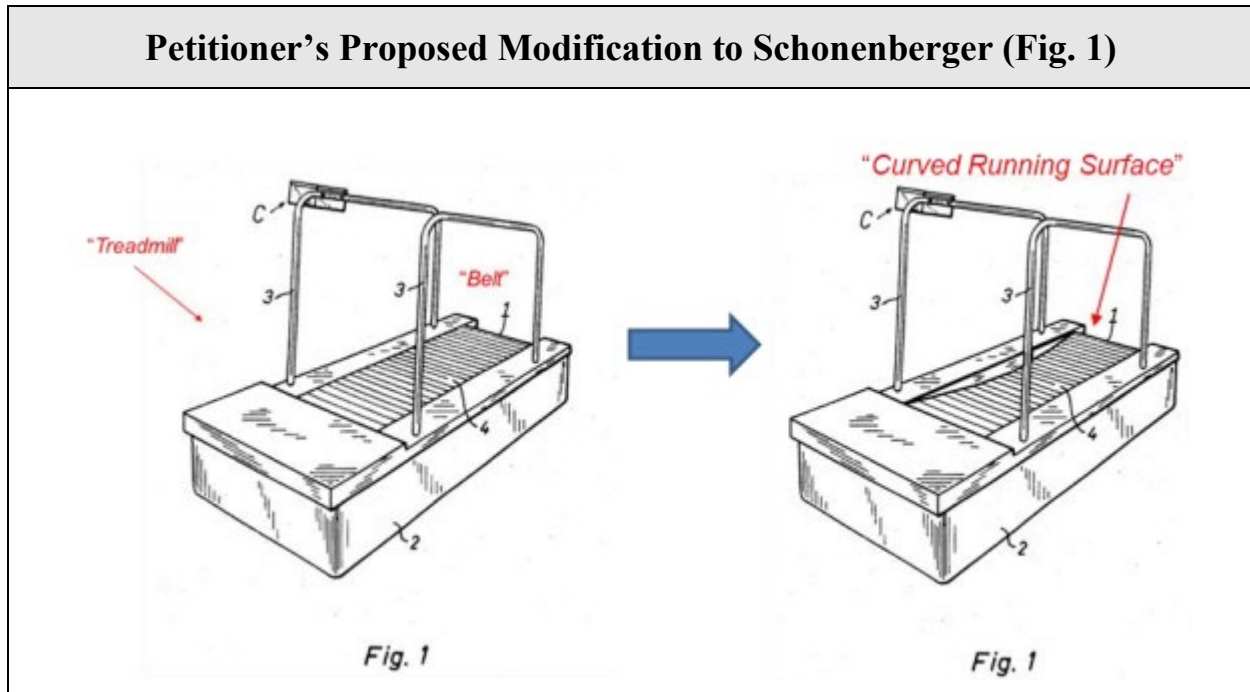
FIG. 12



EX1010 at Fig. 12 (annotations added).

145. It would not be obvious to a POSA that the slats that form running belt 1 are flexible enough and sufficiently spaced apart to allow gravity to bring them into contact with a series of lowered rollers. Schonenberger actually teaches that the slats are preferably constructed of stiff materials such as “lightweight metal, for example... aluminum” and that “[t]he distance between adjacent step slats 4 is so selected that only little space or clearance is left between the slats.” EX1010, 4:43-44, 4:54-57. However, even assuming that the force of gravity alone would bring the central surface formed by running belt 1, *i.e.*, the portion that forms the “running surface” where a user would actually stand, walk, or run when using the treadmill, into contact with the rollers 12, the running surface would still be substantially flat.

146. A POSA would not have understood Petitioner's proposed modification to Schonenberger to provide a curved running surface. As illustrated in Petitioner's annotated/proposed modification to Schonenberger provided below, the usable surface would still be flat:

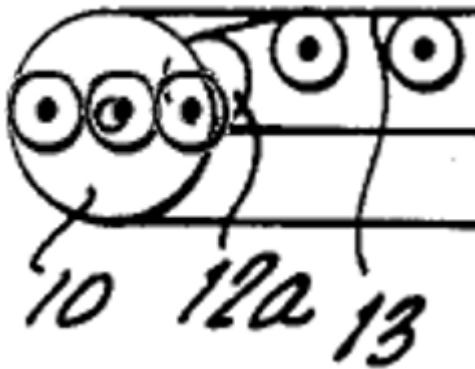


Petition at 42, 46.

147. A POSA would not understand Petitioner's modified figures for Schonenberger to be compatible with each other. Moreover, a POSA would not understand the resulting running surface to be curved. As can be seen in the Petitioner's modified Figure 12, where the rollers 12 are lower than rollers 12a the usable running surface is still flat—not curved. By usable running surface, a POSA would recognize that where the user of the machine is able to safely make contact with the surface would be the running surface.

148. Even if the slats/running surface were able to follow the rollers 12 depicted in Petitioner's proposed modified a POSA would have understood that Petitioner's proposed modification is too steep near the pulley rollers 10 (in light blue) to constitute a running surface. For example, assuming the rollers 12 in Figure 12 are at the same scale as the drum/pulleys 10, the drums/pulleys 10 have a diameter three times larger than the diameter of the rollers:

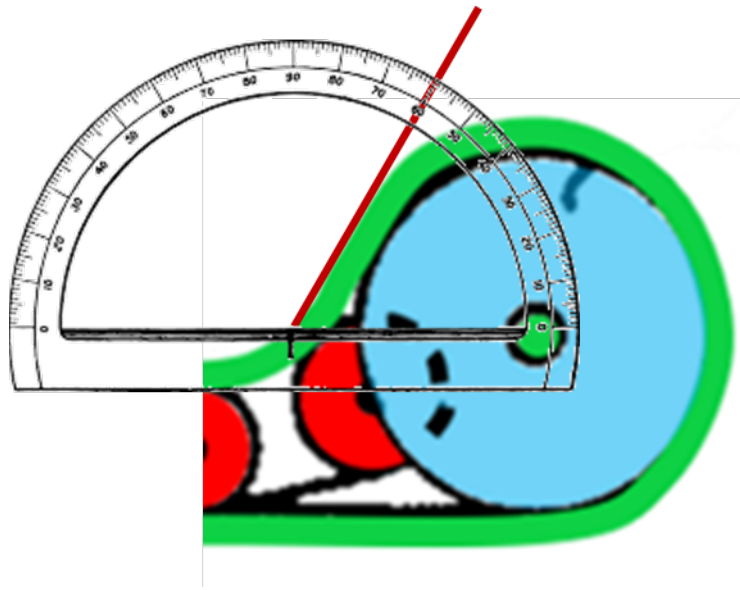
EX1010, Fig. 12



EX1010 at Fig. 12 (excerpted and annotated); *see also id.* at 5:30-32 (“The diameter of the rollers 12 is less than the diameter of the drums or rollers 10.”).

149. When the rollers are arranged as suggested by Petitioner, a POSA would have understood that the angle created by the steep section where the drum/pulley 10 meets with the first roller 12a is potentially hazardous:

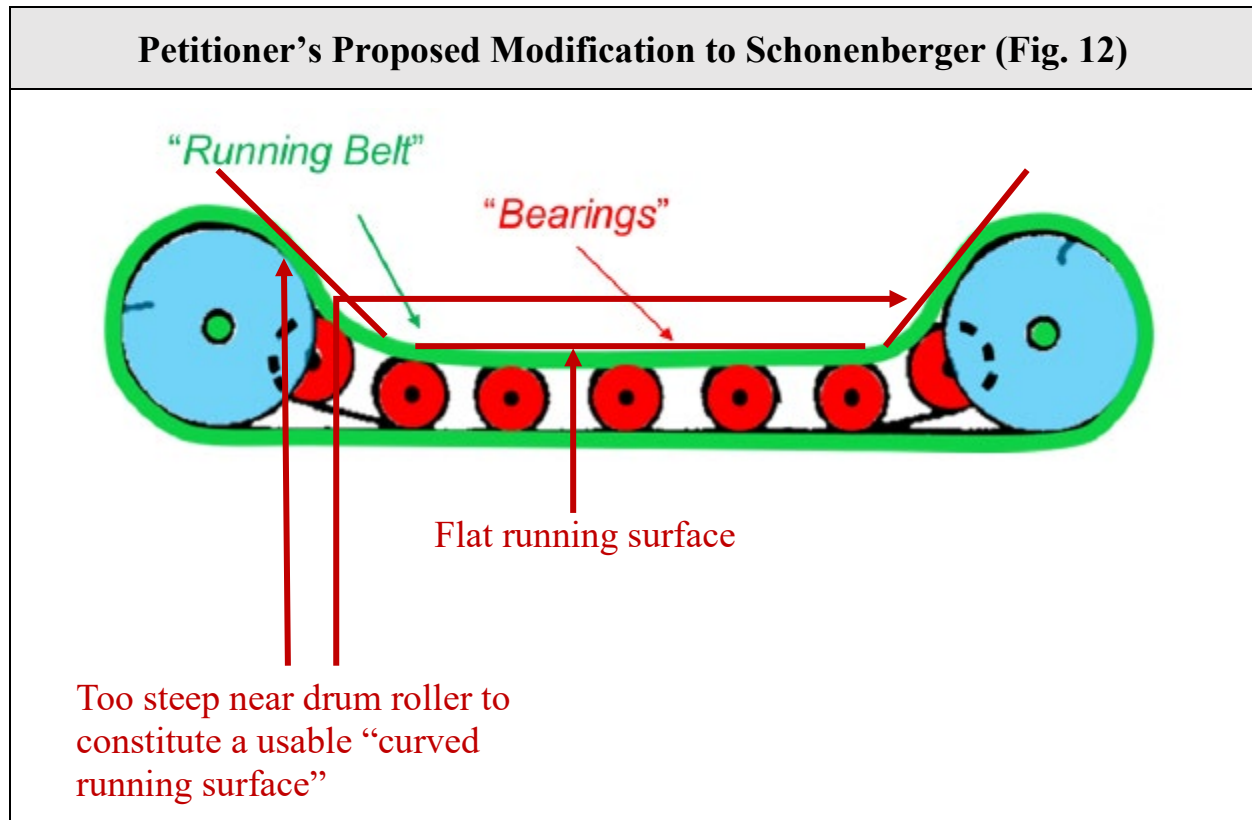
Petitioner's Proposed Modification to Schonenberger (Fig. 12)



Petition at 42 (excerpted and annotated).

150. At the steepest, a simple protractor shows a 60° angle—a POSA would have understood this to be potentially dangerous to a person trying to use the machine should they step with their weight onto this steep angle. The normal range of dorsiflexion for an ankle is 10-20°. Therefore, running and contacting a sudden steep incline of 60° with the foot would likely result in an ankle injury and a potential fall. *See e.g., EX2030, (finding 45° dorsiflexion angle for ankle is threshold for injury).* For comparison, this would be comparable to running perpendicular to a curb on the road and landing the ball of your foot at the top edge to the curb.

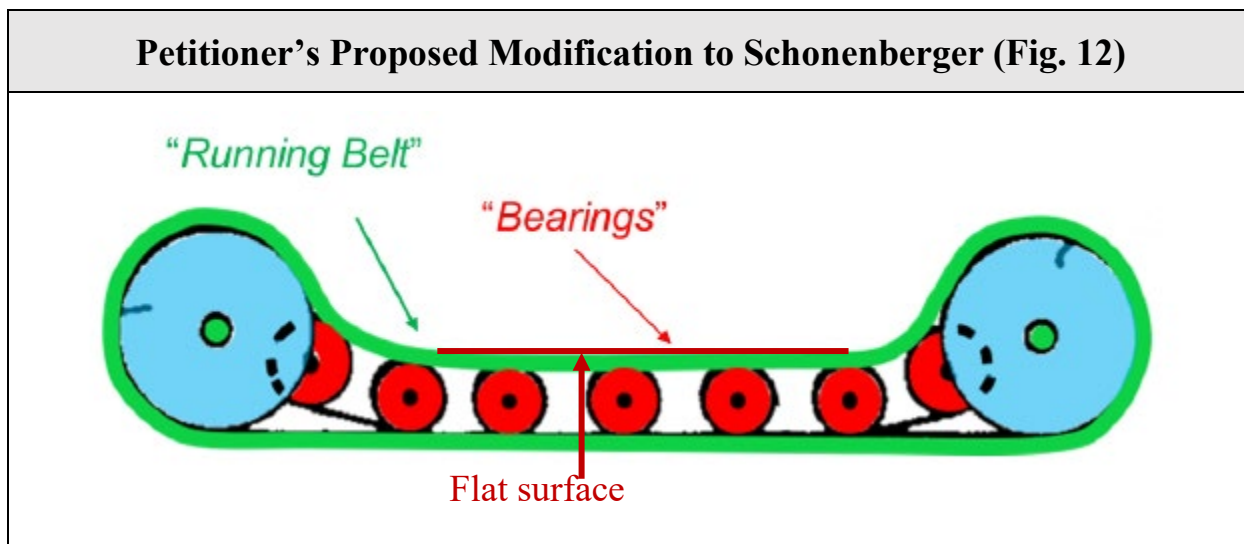
151. Instead, the only surface that a runner would effectively be capable of using to safely make contact with while in operation, would be the flat portion of Petitioner's proposed modification to Figure 12. This is depicted below:



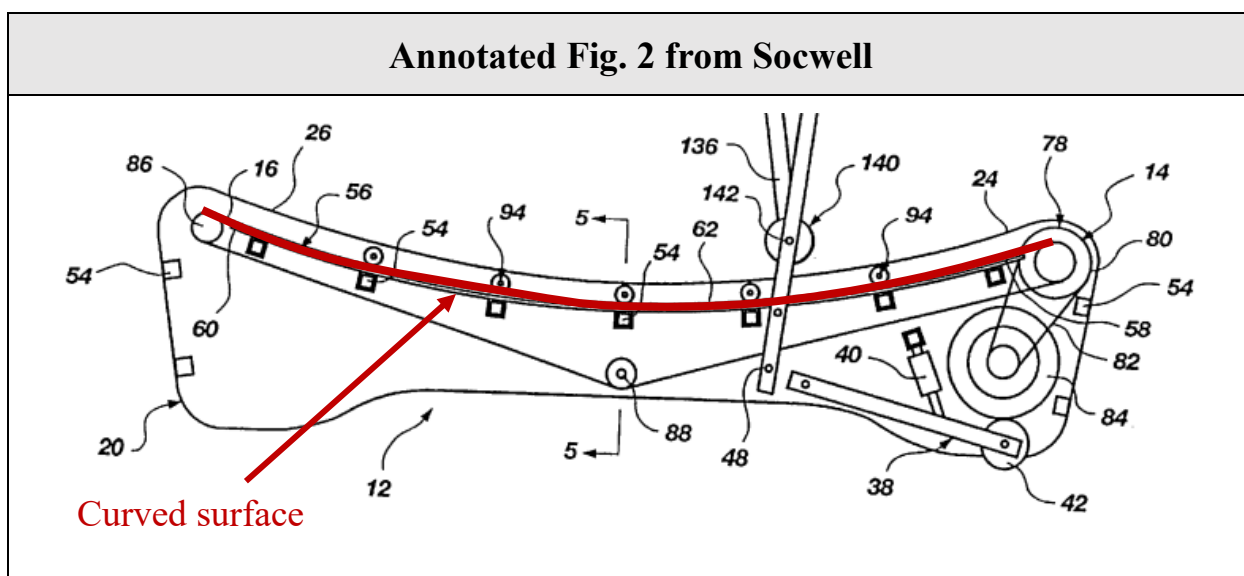
Petition at 42 (annotations added).

152. A POSA would immediately recognize that Petitioner's proposed modification provides a flat running surface with excessively steep and unusable surface near each of the drum rollers. As discussed, the running surface/slats following the drum/pulley 10 would create a steep and potentially hazardous angle. The fact that Petitioner's proposed modification to Figure 12 includes a flat running

surface is readily apparent when comparing with Figure 2 from Socwell for which Petitioner combines the curved surface in the first place:



Petition at 42 (annotations added).

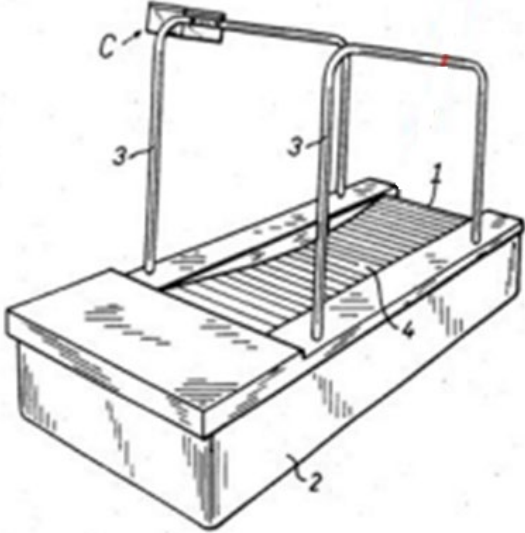
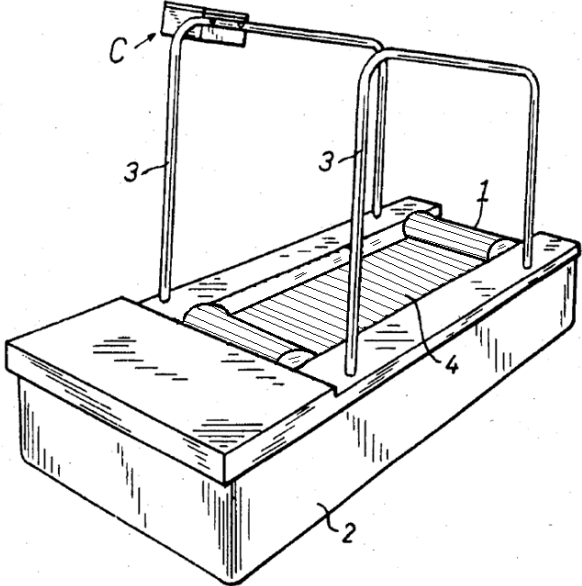


EX1010 at Fig. 2 (annotated).

153. From this comparison, it would have been clear to a POSA that Petitioner's proposed modification to Schonenberger where the rollers 12 are

positioned below rollers 12a still provides a flat running surface. Each of the rollers in Petitioner's modified Figure 12 are on the same plane, creating a flat running surface, as opposed to Socwell where the surface is curved and the supports are not on the same plane. Petitioner's proposed modification still result in a flat running surface precisely because the rollers are positioned in a flat plane, regardless of whether they are lower or higher than end rollers 12a.

154. The flat surface in Petitioner's modified Figure 12 is not accurately reflected in the modified Figure 1 depicted above. Instead of a curved running surface, the proposed modification should instead depict two steep surfaces near the front and back of the treadmill (for each drum roller) and otherwise provide a lower flat surface where the user would actually be able to step, similar to how Petitioner's modified Figure 12 is configured. This is depicted in the modified Figure 1 below, compared against Petitioner's misleading modified Figure 1:

Petitioner's Misleading Modified Fig. 1	Modified Fig. 1 Corresponding to Petitioner's Modified Figure 12
	

155. A POSA would have understood that while Petitioner states that “[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” (Petition at 35) the Petitioner’s proposed modification in Figure 12 does not result in a curved running surface, but provides a flat surface with steep areas near the drum/pulley rollers 10 would pose a greater threat to a user’s joints should they inadvertently step on or near that steep area, including for the reasons already discussed. .

156. Thus, Petitioner’s proposed modifications to Schonenberger (as depicted in Petitioner’s modified Figure 12) would not result in a device with a curved running surface, which is required by all Challenged Claims (*see, e.g.*, EX1001 at Claim 1 (“wherein the running belt includes a running surface, at least a

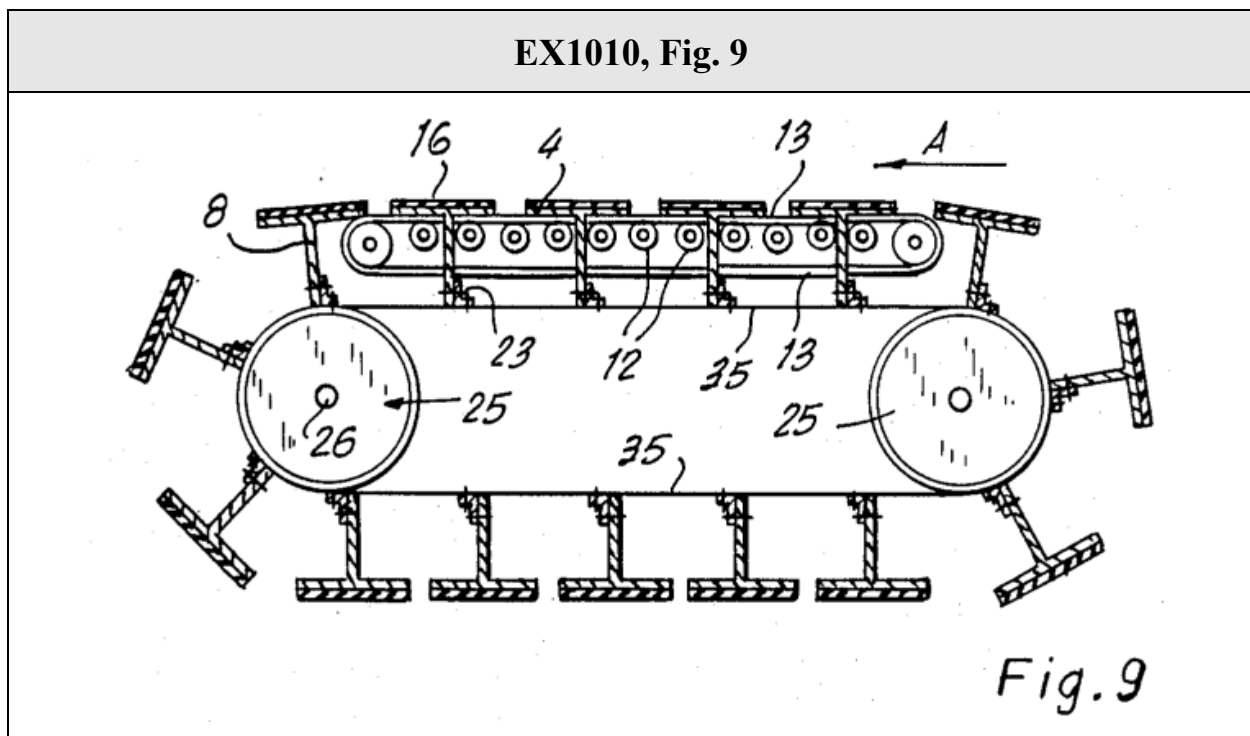
portion of which is curved”), Claim 10 (“wherein the running belt includes a running surface, at least a portion of which is curved”), Claim 18 (“disposing a running belt on the plurality of bearings such that the curved top profile of the plurality of bearings define at least a portion of a curved running surface of the running belt”), Claim 21 (“wherein the running belt includes a running surface, at least a portion of which is curved”).

157. Alternatively, to the extent Petitioner’s modified Figure 12 from Schonenberger was poorly rendered and the intention was for the rollers 12 to be in a arc/curved orientation (similar to the arc/curve of the securing assemblies 94 in Socwell and similar to Petitioner’s modified Figure 1 above) a POSA would not have known how to use such curvature in the rollers 12 of Schonenberger for the reasons provided. *See* §VIII(B)(1), *supra*. Here again, Petitioner and Dr. Giachetti mischaracterize the similarities between Schonenberger and Socwell, specifically with respect to how the running surface is provided. Petition at 41-42; EX1003 at ¶174. Unlike Socwell, Schonenberger has slats under the running surface. *Compare* EX1010 at 4:38-41 *with* EX1011 at 5:40-45. Petitioner completely ignores that the slats that provide the support for the running surface in Schonenberger are not present in Socwell. *See* §VIII(B)(1), *supra*.

158. A POSA considering modifying Schonenberger to change orientation of the rollers from flat to an arc/curved shape would understand that the entire

architecture of the Schonenberger system would need to be redesigned to do so, particularly given the aforementioned differences in the mechanisms and composition of Schonenberger's and Socwell's respective running surfaces. However, a POSA would have no guidance from either Socwell or Schonenberger on how to go about those changes. *See, e.g., §VIII(B)(1), supra.*

159. As discussed, the running surface/slats of Schonenberger would require far more engineering resources and effort to modify than Petitioner and Dr. Giachetti acknowledge, particularly because the metal slats in Schonenberger would be more rigid and difficult to make follow any curved path than the thinner running surface belt in Socwell. By way of example, Figure 9 from Schonenberger illustrates how the t-shaped slats separate around a curve:

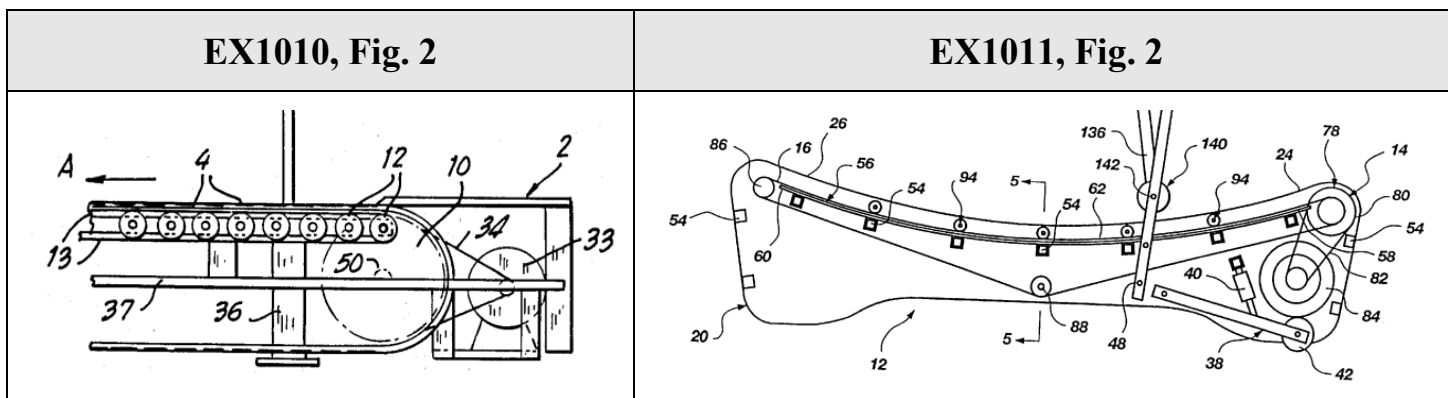


EX1010 at Fig. 9.

160. As can be seen, Schonenberger's rollers 12 as shown in Figure 9 again are flat, and the slats 4 follow along that flat plane on the support belt 13. However, if a POSA were to try and create a curved running surface, the POSA would not simply be able to lower the rollers 12 into a curved shape because the width of the slats would necessarily restrict the angles and distances between the rollers. Indeed, Schonenberger teaches that the width of one slat covers two or three of its rollers. EX1010 at 6:19-27 ("...three rollers 12 in engagement with each end of the slat 4 is preferred."). Any added curvature would not be a simple substitution of the curvature taught in Socwell because the slats and support belt mechanisms in Schonenberger need to be accounted for.

161. I have not seen any description from Petitioner or Dr. Giachetti to show how or why a POSA would have knowledge on how to change the mechanisms in Schonenberger, including the slats/running surface and the support belts 13, to accommodate the curvature of the rollers 12 without creating a safety hazard, increasing friction, or otherwise changing the functions of Schonenberger's different mechanism.

162. Moreover, the rollers in Socwell are much more spaced out than the those in Schonenberger. This can be observed, for example, by comparing Schonenberger's Figure 2 and Socwell's Figure 2:



EX1010 at Fig. 2; EX1011 at Fig. 2. A POSA would not find this arrangement to be surprising given that, unlike Socwell's running belt, Schonenberger's slats require more structural support given their additional weight/rigidity. Thus, compared to the rollers or belt securing assemblies in Socwell, which serve a completely different purpose.

163. I have not seen any argument from Petitioner or Dr. Giachetti for how a POSA would know to modify the curvature of the rollers in Schonenberger such that the slats would also follow such a curvature (without overlapping, pinching, increasing friction from the sagging support belt 13, without creating a hazardous angle near the drum/pulley rollers 10, etc.) so that the running surface would ultimately be curved.

164. In my opinion, a POSA would not have had sufficient disclosure in Schonenberger or Socwell, or knowledge in the art to modify Schonenberger to create a curved running surface in view of Socwell, and would not be motivated to

make such a modification because of the fundamental differences in design between Schonenberger and Socwell.

c. Critical features of Schonenberger would be eliminated in the modified version proposed by Petitioner and Dr. Giachetti (All Claims)

165. In addition, implementing the modifications Petitioner and Dr. Giachetti propose would eliminate or undermine key objectives of the invention taught in Schonenberger. Thus, it is my opinion that a POSA would not be motivated to make such modifications at all.

166. I understand that Dr. Giachetti's proposed combination of Schonenberger and Socwell would alter Schonenberger so that the running belt 1 "would conform to the profile of the supporting rollers 12" presumably through the force of gravity. EX1003 at ¶176 (further describing individual slats 4 of running belt 1 as "heavy"). By extension, I understand Petitioner and Dr. Giachetti's argument to be that gravity alone would result in the slats that comprise running belt 1 resting directly against support belts 13, 13', which would also apparently follow the profile of rollers 12 even when running belt 1 is unloaded. *Id.*; Petition at 42-43.

167. A POSA would recognize, however, that such a configuration would undermine or even eliminate critical features taught by Schonenberger.

168. One of the main objectives of the Schonenberger invention is to provide a treadmill with "a pleasant, springy feel when being stepped or jumped on without,

however, being excessively stressed by bending or bowing...” EX1010 at 1:63-2:1. The Schonenberger device accomplishes this objective by allowing a small amount of space (*e.g.*, ½ cm) between running belt 1 and support belts 13/rollers 12 when unloaded. Then, when the surface is loaded (*e.g.*, a user steps onto the machine), the running belt and slats comes into contact with the support belts 13/rollers 12. *Id.* at 5:51-6:4. As a result, “[t]he construction...provides a pleasant feel when being stepped upon by slightly resiliently yielding without, however, bowing through or bending in the middle.” *Id.* at 2:58-63; *see also id.* at 6:1-4 (“Thus, the surface is practically flat while being slightly springy and resembles that of a natural soft grass, or other soft surface athletic track.”). From these teachings, a POSA would readily have understood that the small space between the surface/slats and the support belt is necessary to achieve this objective.

169. Additionally, a POSA would understand that this gap would be eliminated in Petitioner’s proposed modifications to Schonenberger to incorporate a curved surface as taught in Socwell. Because Petitioner and Dr. Giachetti seemingly rely on the “heavy” nature of running belt 1’s slats 4 to “conform to the profile of the supporting rollers,” a POSA would understand that there would be no gap between running surface/slats and support belt. EX1003 at ¶137; *see also* Petition at 42-43 (citing EX1003 at ¶137).

170. Without the gap between the running surface/slats and the support belt, Petitioner’s modifications to Schonenberger would no longer function for its intended purpose—namely to provide a surface is practically flat while being slightly springy and resembles that of a natural soft grass, or other soft surface athletic track.

171. Thus, a POSA would recognize that Schonenberger teaches away from Petitioner and Dr. Giachetti’s proposed modifications in view of Socwell as a POSA would understand that, without the gap between the support belt and the running surface/slats, the flat, slightly springy natural grass/track feel Schonenberger identifies as an objective for its invention would be lost.

172. Accordingly, it is my opinion that a POSA would not be motivated to modify Schonenberger as Petitioner and Dr. Giachetti propose.

C. A POSA Would Not Have Been Motivated to Combine Magid with Chickering, Socwell, or Schonenberger (All Grounds)

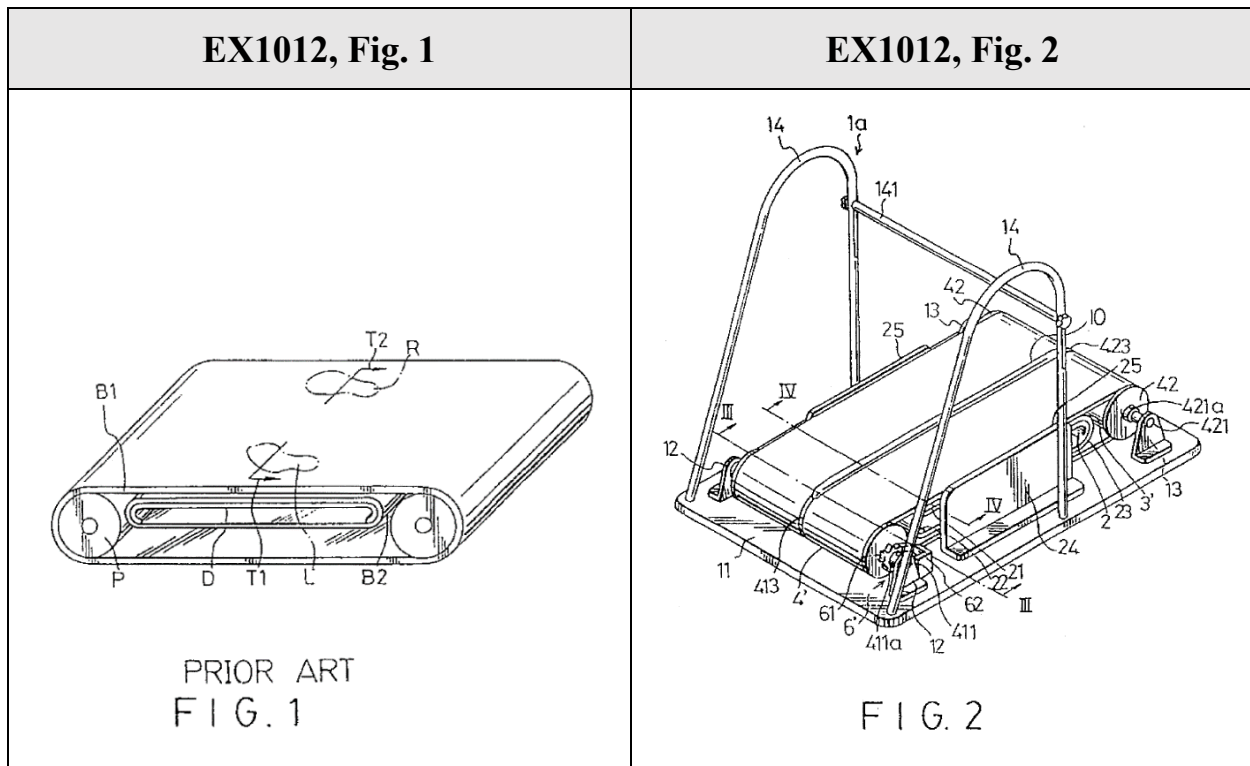
173. I disagree with Petitioner’s and Dr. Giachetti’s arguments that a POSA would have been motivated to combine the “unidirectional control means 6, 6” (which Petitioner analogizes to the “safety device” recited in each challenged independent claim) disclosed in Magid with Socwell, Schonenberger, or Chickering, as argued in all grounds.

174. Magid discloses a walker device with two independently moving belts for therapeutic purposes. EX1012 at 1:46-52; *see also id.* at Fig. 1 (showing a “prior

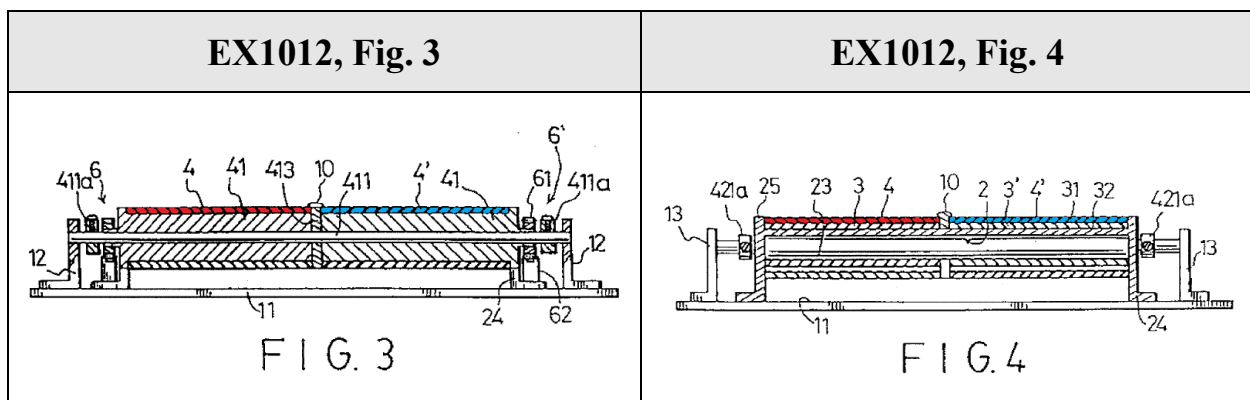
art” single-belt treadmill, indicating an intent to move away from a single-belt device). In Magid’s walker device, two flat, parallel belts “move independently when treaded by the left and right feet of the user, thereby preventing the action of the user’s left foot from influencing the action of his right foot and vice-versa...,” such that “the user’s feet drive a respective foot belt 4, 4’, rather than a single, common wide belt.” *Id.* at 5:19-27.

175. Magid’s stated purpose is incompatible with a single belt design. A POSA would readily understand that, if a single belt were used in place of a dual-belt design, Magid’s primary goal “preventing the action of the user’s left foot from influencing the action of his right foot and vice-versa,” EX1012 at 5:21-25, could not be met. This is because, with a single belt design, both the user’s left foot and his right foot contact the same belt and walking surface. Thus, as the user sets each foot on the walking surface and pushes off, the other foot will necessarily move along with the belt unless it is lifted. The action of each foot therefore necessarily influences the action of the user walking.

176. Consistent with this, Magid’s Figure 1 shows a “prior art” treadmill with a single belt, further indicating Magid’s express intent to move away from a single-belt device, which contrasts with Figure 2’s depiction of Magid’s invention:



EX1012 at Figs. 1-2, 3:39-43 (“FIG. 1 illustrates a conventional running track which uses outer and inner endless belts; FIG. 2 is a perspective view of the first preferred embodiment of a walked apparatus according to the present invention....”). Magid’s other figures similarly depict only dual-belt designs, as shown in the below annotated figures, all of which show belts 4 and 4’ in red and blue, respectively:



EX1012, Fig. 6

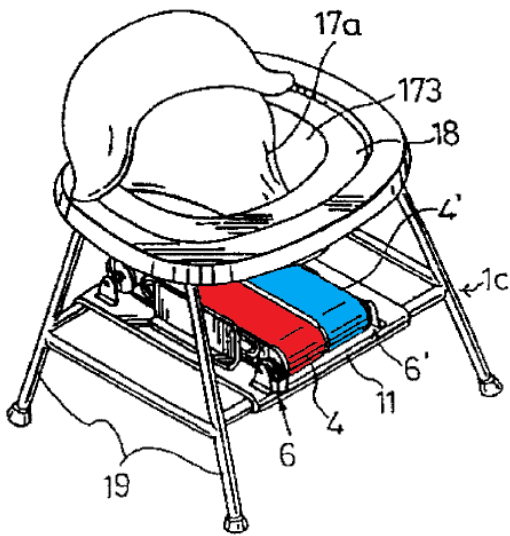


FIG. 6

EX1012, Fig. 7

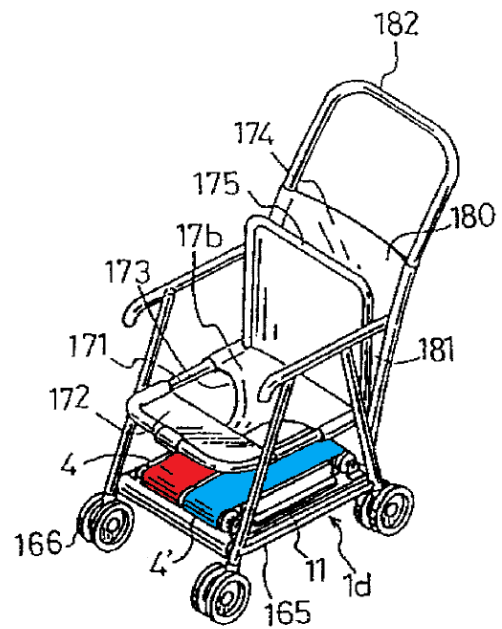


FIG. 7

EX1012, Fig. 8

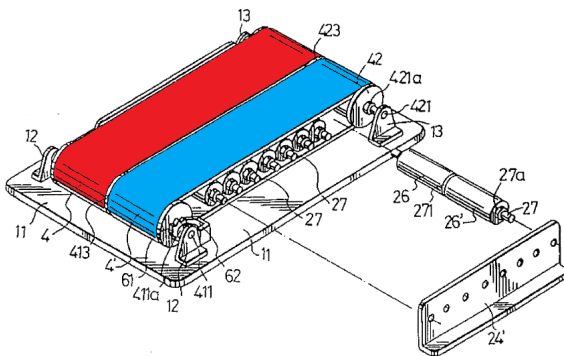


FIG. 8

EX1012, Fig. 10

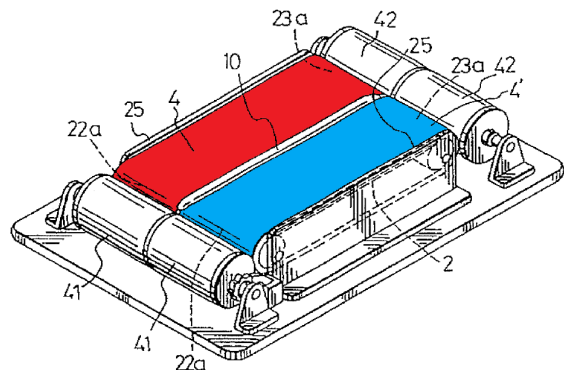


FIG. 10

Id. at Figs. 3-4, 6-8, 10; *see also id.* at 3:44-4:3.

177. Thus, a POSA would immediately recognize that Magid is focused on a two-belt therapeutic walker device, and given its focus on “preventing the action of the user’s left foot from influencing the action of his right foot and vice-versa,” EX1012 at 5:19-27, is incompatible with a single belt treadmill design.

178. Further, unlike Magid, Chickering, Socwell, and Schonenberger are not customized for therapeutic use.

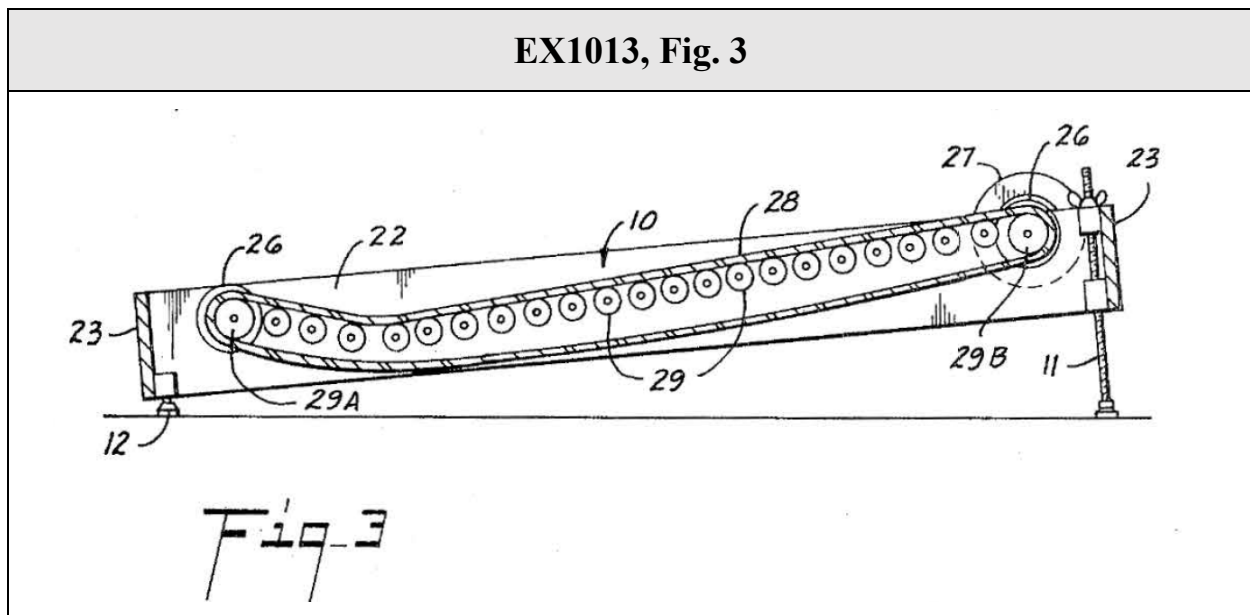
179. Every treadmill disclosed in Socwell has only a single running belt. That is, Socwell describes only a single belt 16 in any given embodiment. *See generally* EX1011. This can further be seen with reference to Socwell’s figures, such as Figure 1, which is provided below for reference:

EX1011 at Fig. 1; *see also id.* at 4:35-36 (“FIG. 1 is a perspective view of one presently preferred embodiment of a curved deck treadmill...”).

180. Likewise, Petitioner and Dr. Giachetti rely on an embodiment of Chickering that has only a single belt. *See, e.g.*, Petition at 83-84 (citing EX1013 at 2:73-3:10, Fig. 3); EX1003 at ¶¶368-370, 406-408, 427 (same). Specifically, both cite to the following disclosures for the “running belt” limitation:

An alternate form of the exercising device of the present invention is shown in FIG. 3, wherein **a single endless belt 28** forms both the accelerating and decelerating areas. In the device shown in FIG. 3, a single series of rollers 29 are provided journaled in the sidewalls 22 of base 10. However, the rollers are so disposed that the forward rollers lie approximately in a plane slanting downwardly from the front of the base, while the rear rollers lie approximately in a plane slanting upward toward the rear of the base 10. Thus, when the endless belt 28 is placed about the rollers, it follows their contour and provides a forward accelerating area and a rear decelerating area which are inclined from the horizontal with each being lowest at their point of nearest proximity.

EX1013 at 2:73-3:10.



Id. at Fig. 3.

181. In addition to the single-belt design referenced above, while Chickering also discloses an alternative dual-belt design, (EX1013 at 1:65-2:73), a POSA would immediately recognize that Chickering’s dual-belt design is fundamentally different from and not comparable with the dual-belt design in Magid. Specifically, where as Magid discloses a treadmill with two parallel belts – one corresponding to the user’s left foot and one corresponding to the user’s right foot (EX1012 at 5:19-27) – Chickering’s dual-belt design uses two sequential belts, *i.e.*, one belt placed behind the other (EX1013 at 2:13-21, 2:50-72). Each of Chickering’s belts are intended to contact both of the user’s feet when the Chickering device is in use. EX1013 at 2:50-72. This is in sharp contrast to Magid’s parallel dual-belt design in which, as discussed above, “the user’s feet drive a respective foot belt 4, 4’, rather than a single, common wide belt...” and the two belts “move independently when treaded by the left and right feet of the user, thereby preventing the action of the user’s left foot from influencing the action of his right foot and vice-versa....” EX1012 at 5:19-27.

182. Likewise, Schonenberger also describes a treadmill with only a single running belt, comprised of a movable or endless surface 1. *See generally* EX1010. This can further be seen with reference to Socwell’s figures, such as Figures 1 and 12, which are provided below for reference:

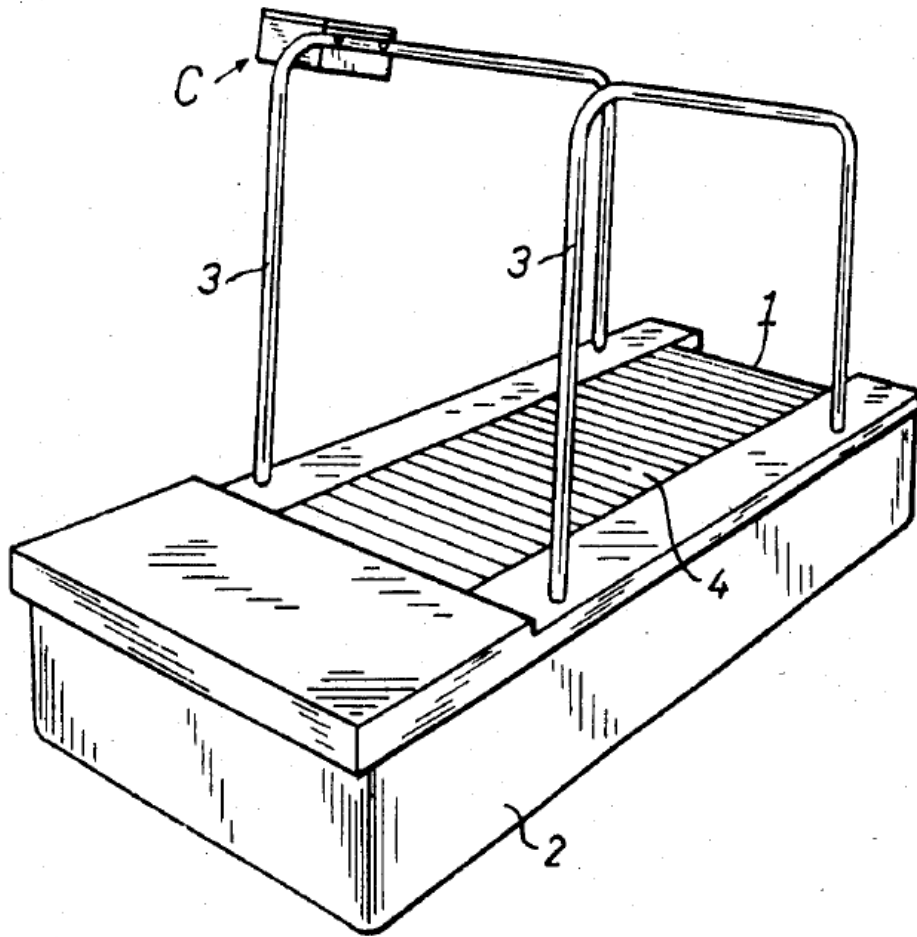
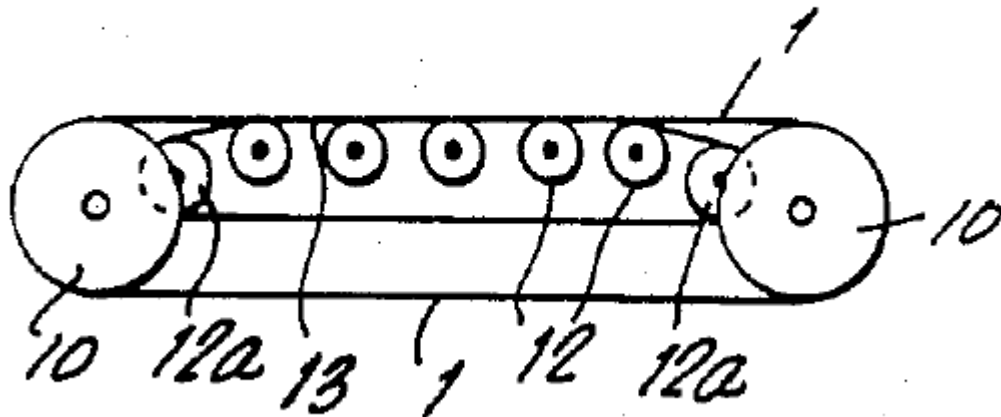


Fig. 1

FIG. 12

Id. at Figs. 1, 12.

183. Thus, Socwell, Schonenberger, and the Chickering embodiment relied on by Petitioner and Dr. Giachetti are all directed to a single-belt treadmill, *i.e.*, the exact type of device that Magid rejected.

184. In addition, unlike Magid, which is directed to a treadmill suitable for therapeutic use (*i.e.*, for use “people with uncoordinated feet movements, such as small children, physically handicapped people and old people,” EX1012 at 1:30-35, 5:52-55), Socwell, Schonenberger, and Chickering are each directed to a non-therapeutic “exercising treadmill,” “physical exercise apparatus,” or “exercise device,” which is to be used primarily for recreational jogging, running, or even skiing training. With respect to Socwell, the following disclosures are exemplary:

This invention relates to exercise treadmills and, more particularly, to novel systems and methods for providing a curved deck treadmill.

EX1011 at 1:10-12 (emphasis added).

Additionally, exercise treadmills of the prior art may furnish a user with an upright handle to grasp while exercising. While Somewhat useful in retaining the user's balance on the rotating endless belt, having to grasp a fixed handle may impede the natural body motion of a user attempting to exercise. Such an encumbrance may be feasible when a user is attempting to walk, but when a user begins to jog or run on prior art exercise treadmills, having to grasp a handle to keep centered on the treadmill may severely interfere with one's natural body motion and further abdicate the inherent physical advantages of the exercise routine.

Id. at 2:56-67 (emphasis added, criticizing prior art).

In addition, it is an object of the present invention to provide a curved deck treadmill which is capable of providing meaningful walking, jogging, or running comfort in relation to the physiology of a user, thereby facilitating an upper surface which supportably provides for a longer stride with more flexibility.

Id. at 3:46-51 (emphasis added).

In an alternate embodiment, the curved deck treadmill 10 or the present invention may be implemented without a driving means engagably disposed to a roller in order to facilitate the forced rotation of the belt 16. If so implemented, the rollers 78, 86 and 88 and the deck 56 should be generally calibrated in relation to the belt 16 to provide an optimal frictional resistance to enable a user to safely walk, jog, and/or run thereon, while still providing sufficient resistance to enable a user to exercise.

Id. at 11:53-61 (emphasis added). Indeed, as noted above, Socwell expressly criticizes prior art treadmills that, like Magid, are optimized for walking than for jogging or running. *Id.* at 2:56-67.

185. Similarly with respect to Schonenberger, the following disclosures are exemplary of Schonenberger's focus on traditional, multipurpose exercise such as running or even skiing training, not on a walker apparatus customized for use by those with "uncoordinated feet movements:"

The present invention relates to a movable surface apparatus, and more particularly to such an apparatus specifically useful for **physical exercise and training**, for ergonometry and walking therapy for handicapped people.

EX1010 at 1:10-14 (emphasis added).

The rollers and the interposed belt-if used-and located at the lateral edges of the movable surface provide not only for support of the movable surface along its length, but also for lateral guidance due to lateral forces which will invariably arise when the surface is used as an exercise device, for example, for **running, training for cross-country skiing**, physical rehabilitation after injury or disease, or the like.

Id. at 2:37-44 (emphasis added).

FIG. 1 is a general perspective view of the apparatus arranged for **training and physical exercise**[.]

Id. at 2:67-68 (emphasis added).

FIG. 16 is a transverse schematic view illustrating another modification of the support surface to adapt the apparatus for **training for cross-country skiing**;

FIG. 17 is a transverse schematic view showing yet another embodiment of the support surface suitable for **training for cross-country skiing**[.]

Id. at 2:67-68 (emphasis added).

The attachment permits training not only for cross-country skiing but also for downhill skiing; for example, by substantially inclining the apparatus and restraining the user, for example by a rope looped about his hips, the sensation of movement with respect to ground surface can be simulated. The lateral guidance of the surface 1, by means of the flanges 112 or tongues 38, ribs 117, and/or the V-belts 5' with the V-pulleys 12", is particularly important if the apparatus is so modified.

Id. at 10:68-11:9 (emphasis added).

186. Likewise with respect to Chickering, the following disclosures are exemplary of Chickering's focus on recreational running by able-bodied adults:

This disclosure relates to a new type of **treadmill exercising device** having a base, rollers carried by the base, and an endless belt disposed about the rollers to provide a tread surface.

EX1013 at Abstract (emphasis added).

This invention relates to a new type of treadmill exercising device, and more particularly to **an exercising device on which the user can simulate the acts of walking, jogging and running** without relying on handles, belts or other external supports for maintaining his balance.

Id. at 1:3-7 (emphasis added).

Another object is to provide such an **exercising device** upon which the user may accurately simulate the acts of walking, **jogging and running** without relying on

handles, railings, belts, or the like, for maintaining his balance and his position.

A still further object is to provide such an **exercising device** which enables the user to more accurately simulate the movements of ordinary walking, **jogging and running** so as to obtain the greatest possible benefits and pleasure from such exercise.

Id. at 1:44-51 (emphasis added).

The first series of rollers 13 and tread surface 16a operate much like a conventional treadmill. As a person walks **or runs on the tread surface 16a**, his weight will cause the rollers 13 and belt 16 to rotate in a counterclockwise motion, carrying the user's foot rearwardly and downwardly.

Id. at 2:40-44 (emphasis added).

187. In view of Magid's teachings regarding the criticality of a two-belt design in which the walking belts are positioned parallel to one another, ensuring that the device is capable of therapeutic use, and emphasizing walking rather than running or jogging (let alone skiing training), a POSA would not have been motivated to look to Magid and combine its teachings with a recreational single-belt treadmill that is suitable for jogging or running, such as those taught in Socwell, Schonenberger, and the relevant Chickering embodiment.

188. In fact, a POSA would immediately recognize that there would have been no need to incorporate Magid's unidirectional control means (6) and (6') into the Socwell, Schonenberger, or Chickering devices. As previously discussed, the purpose of Magid's walking device is fundamentally different from the purpose of

the treadmills described in Chickering, Socwell, and Schonenberger as modified by Petitioner and Dr. Giachetti. Magid's walker device is specifically intended for therapeutic use by "people with uncoordinated feet movement, such as small children, physically handicapped people and old people...." EX1012 at 1:30-35, 5:52-55. With a flat or uniplanar walking surface, Magid's walker device would be relatively easy and appropriate to use for these kinds of therapeutic purposes.

189. However, a POSA would expect those with "uncoordinated feet movement" to face a heightened risk if the one of the Magid's two walking belts moves in the opposite direction from that intended during use. Such users would be expected to have balance and coordination problems that significantly limit their ability to correct for an unintended foot movement and thus increase their risk of injury. Such injuries include, for example, ligament, tendon, or muscular damage to the hip or knee that may result from hyperextension of the forward leg as the rearward leg unexpectedly moves in the opposite direction.

190. Thus, in order to limit or eliminate the risk of injury, a POSA would recognize that Magid requires at a minimum some kind of control means that will prevent one of the belts from moving in an unintended direction while the other belt either moves in the intended direction or remains stationary.

191. Magid's concern about the user's feet moving in opposite directions is simply not relevant to the single-belt designs of Socwell, Schonenberger, and the

relevant Chickering embodiment. In a single-belt design, it is not possible for the user's feet to move in opposite directions while both are in contact with the belt. The belt itself can only move one direction at a time – forward and backward – and as such, the user's feet must also move in the same direction. A POSA therefore would have recognized that the control means of Magid would not serve their intended purpose and would be superfluous if incorporated into Socwell, Schonenberger, or Chickering.

192. Additionally, a POSA would have immediately recognized that a curved running surface like that in Socwell or a multi-planar running surface like that in Chickering would be difficult, if not practically impossible, to adapt for use by “people with uncoordinated feet movements, such as small children, physically handicapped people and old people,” and inappropriate for the therapeutic uses described in Magid. As previously indicated, such individuals expected to have balance and coordination problems, and these deficiencies make walking or running on a curved or multi-planar surface unnecessarily dangerous as they increase the propensity for falls, particularly in the absence of features like handles or harnesses that allow the user to maintain their balance independent of their feet movements.

193. Further, both Socwell and Chickering contain teachings that are incompatible with use by those with coordination or balance deficiencies. For example, Chickering criticizes the prior art to the extent “some external support is

necessary to enable the user of such treadmills to maintain his balance, as well as his position on the moving belt,” and teaches that one of its primary objectives was to provide a user (of presumably ordinary physical abilities) the ability to exercise without the need for “relying on handles, railings, belts, or the like, for maintaining his balance and his position.” EX1013 at 1:37-47. A POSA would understand such teachings regarding a preference for devices that lack external support to mean that Chickering’s invention would be unsuitable for use by people with uncoordinated feet movement, including the physically handicapped and young children, who would typically have a heightened need for some kind of external support.

194. Likewise, Socwell criticizes prior art devices to the extent they “furnish a user with an upright handle to grasp while exercising,” teaching that, “[w]hile somewhat useful in retaining the user’s balance on the rotating endless belt, having to grasp a fixed handle may impede the natural body motion of a user attempting to exercise.” EX1011 at 2:56-61. While, as in Magid, “[s]uch an encumbrance may be feasible when a user is attempting to walk,” for Socwell teaches that, “[w]hen a user begins to jog or run on prior art exercise treadmills, having to grasp a handle to keep centered on the treadmill may severely interfere with one’s natural body motion and further abdicate the inherent physical advantages of the exercise routine.” *Id.* at 2:61-67.

195. Thus, a POSA considering Magid – which discloses a therapeutic “walker apparatus” and teaches away from a single belt, non-planar, or multi-planar exercise treadmill (EX1012 at 1:17) – would be discouraged from combining Magid with elements of Chickering or Socwell, particularly where those references criticize the features emphasized in Magid or features that would be necessary for the intended users of Magid’s walker device.

196. To summarize, a POSA would not combine the teachings of Chickering, Socwell, or Schonenberger and Magid because i) Magid focuses on a two-belt therapeutic treadmill and teaches away from using a single belt treadmill like in Chickering, Socwell, and Schonenberger, and ii) the therapeutic treadmill of Magid is specifically intended for use by “people with uncoordinated feet movements, such as small children, physically handicapped people and old people.” EX1012 at 1:30-35, 5:52-55. Implementation of a curved or multi-planar running surface would be inappropriate for therapeutic purposes, and thus, Magid teaches away from implementing a curved or multi-planar running surface (such as in Chickering, Socwell, and allegedly, Schonenberger as modified and characterized by Petitioner and Dr. Giachetti) with the treadmill of Magid.

197. Additionally, a POSA simply would not consider Magid to be relevant prior art when considering a curved treadmill like that in Socwell or a multi-planar treadmill like that in Chickering. When looking at Socwell or Chickering, a POSA

would necessarily examine the teachings of other treadmills having curved running surfaces like in Socwell or other treadmills having multi-planar running surfaces like in Chickering, not a treadmill belt with a single flat or uniplanar surface as in Magid.

198. A POSA would be well aware that the design and engineering requirements of a treadmill having a curved running surface or a multi-planar running surface differ from those of a treadmill with a single flat or uniplanar running surface. Design and engineering requirements thus urge a POSA to avoid combining the teachings of Chickering, Socwell, Schonenberger as modified by Petitioner, or other curved/non-planar treadmills with Magid, particularly given Magid's express teaching away from a single-belt treadmill.

199. In particular, a POSA would not modify the Socwell treadmill to include the unidirectional control means (6) and (6') of Magid based on the teachings of Socwell and Magid. The treadmill belt of Socwell is free to move in both a forward direction and a rearward direction. When a user steps onto the rear of the treadmill having a curved running surface, the user's weight may cause the treadmill belt to move in the unintended rotational direction, particularly if the user inadvertently mounts the device from or towards the rear. But despite teaching a curved running surface, Socwell does not recognize this potentially unwanted characteristic. Rather, Socwell explains that its curved running surface is sufficient to address the acknowledged danger of users' tendency to fall off the back of the

treadmill.² EX1011 at 2:45-48, 3:40-45. Moreover, Dr. Giachetti admits that Socwell discloses “provid[ing] optimal frictional resistance of the belt to ensure safety while providing proper resistant for to [*sic*] running.”³ EX1003 at ¶430 (citing EX1011 at 11:57-59). To the extent Socwell discusses the need for adequate friction during

² Other prior art references cited by Dr. Giachetti similarly explain that using a curved surface or other features besides one-way bearings were sufficient to solve the danger of a user falling off the treadmill. *E.g.*, EX1009 (Schmidt) at 1:50-59 (“Another feature of the present invention not found in prior art structures is that, associated with the frictional resilient tread, is means whereby the tread surface may assume, under the action of the operator, a slightly curved surface, thereby greatly facilitating the operation of running or walking upon the exerciser and, at the same time, allowing the operator to maintain perfect equilibrium and balance.”); EX1014 (Cutter) at Abstract (“A handle, if used, can either be in a substantially vertical position for a beginner or can be put down flat and out of the way, for a more practiced user to run without any impediment.”).

³ Notably, this admission contradicts Dr. Giachetti’s later assertion that Socwell “does not address the safety issue of the running belt moving in a forward direction when a user steps onto the treadmill.” EX1003 at ¶431.

rotation at all, it advocates for sufficient friction in *any* direction of belt motion, not unidirectional movement. EX1011 at 1:28-56.

200. The same is true of Chickering, which discloses two embodiments with a dual-planar running surface – one plane angling downward toward the rear of the device for acceleration and one plane angled upward toward the rear of the device for deceleration. Again, if a user were to mount the device from or towards the rear and step only on the upward angled plane, the user’s weight may cause the treadmill belt to move in the unintended rotational direction. However, despite teaching a multi-planar running surface, Chickering does not recognize any potentially unwanted characteristics from its multi-planar design.

201. Moreover, although I disagree that the modified version of Schonenberger actually has a curved running surface (*see* §VIII(B)(2), *supra*), assuming that Schonenberger were modified to have a curved running surface, a POSA likewise would not further modify a curved version of Schonenberger to include the unidirectional control means (6) and (6') of Magid based on the teachings of Schonenberger and Magid. Schonenberger never discloses any concerns about a running belt of any shape moving in an unintended direction that would necessitate a unidirectional control means, and as described above, neither does Socwell, the sole reference Petitioner and Dr. Giachetti cite to support modifying Schonenberger to have a curved running surface.

202. Magid, on the other hand, shows a flat or planar treadmill belt and, in turn, the aforementioned undesired characteristic is irrelevant to Magid. That is, a user of Magid is not concerned with a treadmill belt moving in the unintended direction when the user begins to use the device; while a potential safety hazard exists for users mounting treadmills having curved running surfaces, such a safety hazard is not present in treadmills having flat or planar running surfaces because mounting the device from or towards the rear is no different from mounting it from or at any other point. In this regard and as one would expect, Magid does not disclose any type of potential safety hazard when the user mounts the device of Magid. *See generally* EX1012.

203. Thus, while Magid discloses a unidirectional control means (6) and (6') for "permit[ting] only unidirectional movement of the left and right foot belts," EX1012 at 4:46-48, I see no impetus, reason, or motivation to combine Magid with Socwell given these clear differences in structure and intended use, and in my opinion, neither would a POSA.

204. Finally, to the extent Dr. Giachetti points to certain safety standards as indicative of some general motivation to implement a one-way bearing in either Schonenberger or Socwell, I disagree that a POSA would consider these safety standards to provide any such motivation. None of the safety standards Dr. Giachetti cites call for a one-way bearing or any other means for restricting the movement of

the belt in a given direction. *See generally* EX1007; EX1019; EX1020. Rather, as Dr. Giachetti acknowledges, these standards only describe requirements for foot rails and handrails as means to address user stability. EX1003 at ¶435 (discussing standards). A POSA would not understand standards that never so much as mention one-way bearings to suggest the use of one-way bearings.

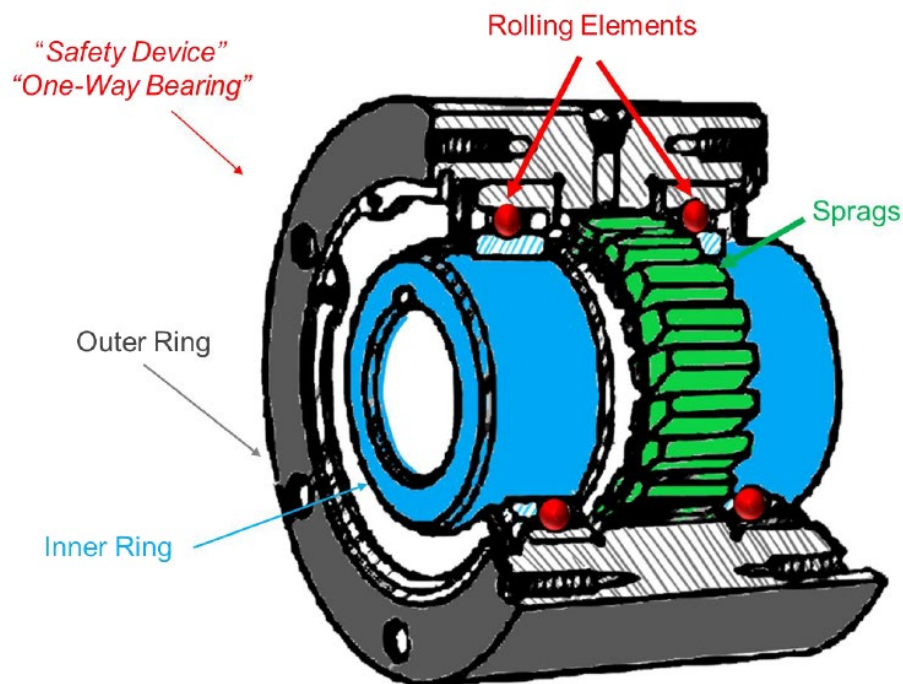
205. Accordingly, it is my opinion that a POSA would not be motivated to modify the multi-planar inclined surface device of Chickering, the curved running surface device of Socwell, or the running surface of Schonenberger as modified by Petitioner and Dr. Giachetti to incorporate features from the flat, uniplanar walking device of Magid because the thus-modified piece of equipment would be unsuited for any of the references' intended purposes. Rather than look to a device like Magid, a POSA looking to improve or modify a curved or multi-planar treadmill like those described in Socwell and Chickering, would instead look at features implemented in other treadmills with curved or multi-planar surfaces.

D. A POSA Would Not Have Been Motivated to Replace the Magid Control Means with the Specific Bearing Assembly Described in Sclater (All Grounds)

206. I also disagree with Petitioner's and Dr. Giachetti's arguments that a POSA would have been motivated to combine the sprag-type clutch depicted in the excerpts of Sclater that Petitioner submitted as Exhibit 1017 (which Petitioner also

analogizes to the “safety device” recited in each challenged independent claim) with Chickering, Socwell, or Schonenberger, as argued in all Grounds.

207. Unlike the other references Dr. Giachetti relies on, Sclater is not a patent or patent application. Instead, it is a general engineering reference book and, by its own description, “contains drawings and descriptions of *more than 2000 different mechanisms and mechanical devices* that have proven themselves in modern products, machines, and systems.” EX1017 at 24 (emphasis added). From these thousands of mechanisms, Dr. Giachetti appears to have selected one that he contends a POSA would have found it obvious to incorporate into both Socwell and Schonenberger, taking the place of the “control means” he originally argued would be obvious to add. This device is a “sprag-type clutch” and is depicted below:



EX1003 at ¶379 (annotations from Dr. Giachetti’s declaration); *see also id.* at ¶¶201, 212, 224, 335, 394, 448 (providing the same or similar figures).

208. Based on my review, the only reasons Dr. Giachetti provides for his opinion that a POSA would have been motivated to substitute Sclater’s sprag-type clutch for Magid’s unidirectional control means is that Sclater’s sprag-type clutch would have “reduced noise and improved durability” compared to Magid’s unidirectional control means, which Dr. Giachetti characterizes as a ratchet-and-pawl clutch. *E.g., id.* at ¶207. A POSA, however, would not understand Sclater to teach that sprag-type clutches necessarily have such characteristics.

209. Although Sclater generally states that a “friction-type clutch is quieter,” possibly in comparison to an “elementary” “ratchet and pawl mechanism,” (EX1017 at 316), sprag-type clutches are not the only friction-type clutches described in Sclater. Rather, even in the limited sections of Sclater Petitioner included in its Exhibit 1017, at least six different kinds of friction-type clutches are described. These include, for example, plate clutches, cone clutches, expanding shoe clutches, cam and roller clutches, expanding shoe centrifugal clutches, and mercury gland clutches, not just the sprag-type clutch Petitioner actually relies on. EX1017 at 302-03. While a POSA could conclude at most that any one of these friction-type clutches would generally be quieter than an “elementary” ratchet-and-pawl clutch, a POSA would have no reason to believe that the sprag-type clutch Dr. Giachetti and

Petitioner actually rely on would be the most preferable or even feasible choice for use in a treadmill. Indeed, neither Dr. Giachetti nor Petitioner offer any reasons why a POSA would have elected the chosen sprag-type clutch over any of the others.

210. Additionally, I understand that Dr. Giachetti's opinions regarding the noise caused by a ratchet-and-pawl clutch depends on the fact that "[t]he 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." EX1003 at ¶208; *see also* EX2023 at 106:9-20 (testifying that ratchet-and-pawl clutches to be particularly noisy because "[e]very time the pawl strikes the ratchet gear, there is going to be a -- a pinging sound or a clicking sound"). However, a POSA would readily recognize that the "pinging" or "clicking" sound Dr. Giachetti references is caused not by ratchet-and-pawl clutches in general but rather only ratchet-and-pawl clutches that include teeth. That is, as Dr. Giachetti testified, these noises result from the teeth of a ratchet coming into repeated contact with the features of the adjacent pawl that are meant to catch the teeth if the direction of rotation changes.

211. A POSA would know, however, that there are a variety of different kinds of ratchet-and-pawl clutches, many of which do not include teeth. In fact, although Petitioner appears to have omitted it from the excerpts submitted as Exhibit 1017, the Sclater reference book Dr. Giachetti repeatedly cites identifies several

ratchet-and-pawl clutches that lack teeth on a page aptly titled “No Teeth on These Ratchets:”

NO TEETH ON THESE RATCHETS

Ratchets with springs, rollers, and other devices keep motion going one way.

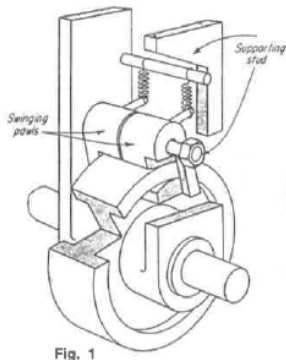


Fig. 1

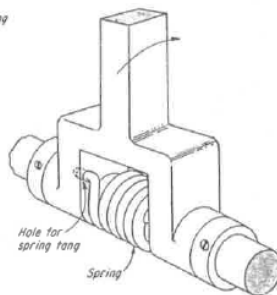


Fig. 2

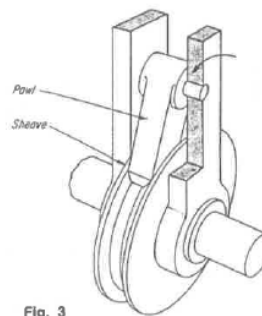


Fig. 3

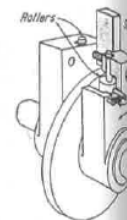


Fig. 4

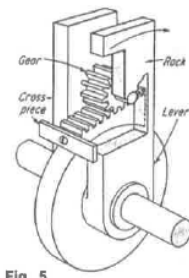


Fig. 5

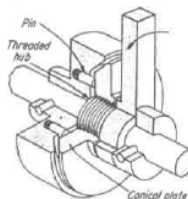


Fig. 6

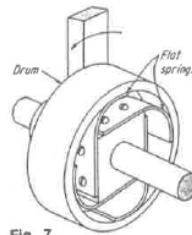


Fig. 7

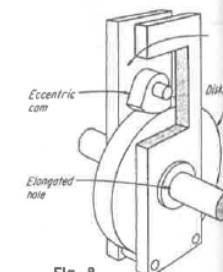


Fig. 8

Fig. 1 Swinging pawls lock on the rim when the lever swings forward, and release on the return stroke. Oversize holes for the supporting stud make sure that both the top and bottom surfaces of the pawls make contact.

Fig. 2 A helical spring grips the shaft because its inner diameter is smaller than the outer diameter of shaft. During the forward stroke, the spring winds tighter; during the return stroke, it expands.

Fig. 3 A V-belt sheave is pushed around when pawl wedges in the groove. For a snug fit, the bottom of the pawl is tapered like a V-belt.

Fig. 4 Eccentric rollers squeeze a disk on its forward stroke. On the return stroke, rollers rotate backwards and release their grip. Springs keep the rollers in contact with the disk.

Fig. 5 A rack is wedge-shaped so that it jams between the rolling gear and the disk, pushing the shaft forward. When the driving lever makes its return stroke, it carries along the unattached rack by the cross-piece.

Fig. 6 A conical plate moves like a nut back and forth along the threaded center hub of the lever. The light friction of spring-loaded pins keeps the plate from rotating with the hub.

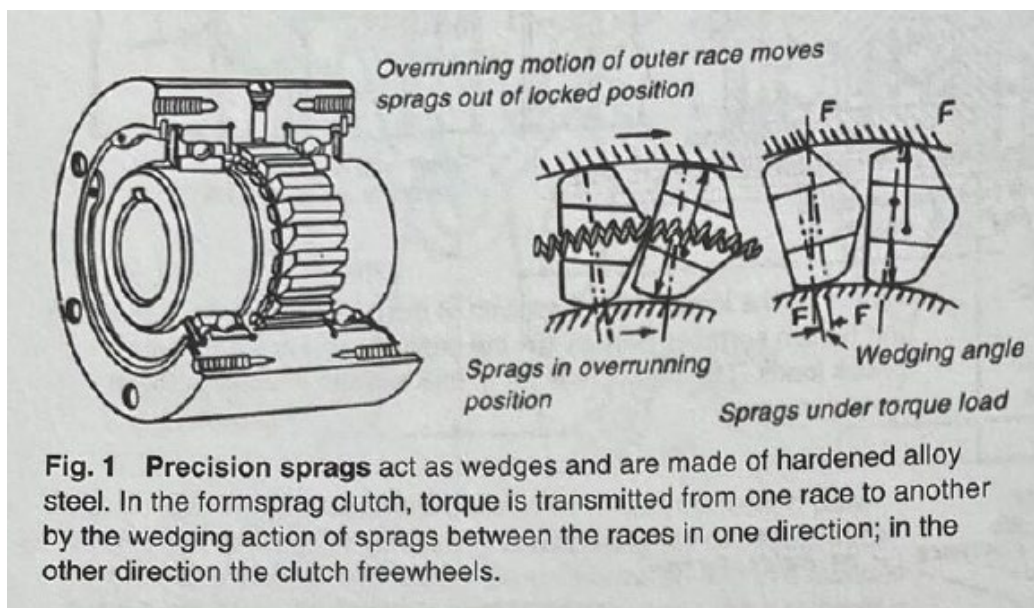
Fig. 7 Flat springs expand against the inside of a drum when a lever moves one way, but they drag loosely when the lever turns the drum in the opposite direction.

Fig. 8 An eccentric cam jams against the disk during the motion half of a cycle. Elongated holes in the levers allow the cam to wedge itself more tightly in place.

EX2021 at 124. A POSA would readily understand that these non-teeth ratchet-and-pawl clutches would not cause the same “pinging” or “clicking” sound that Dr. Giachetti incorrectly ascribes to all ratchet-and-pawl clutches.

212. As for “durability,” I have not been able to identify any statements in Petitioner’s excerpts from Sclater regarding the durability of sprag-type clutches relative to other options, let alone the durability of the specific clutch relied on by Petitioner. *See generally* EX1017. In fact, based on my review, the entirety of the discussion about the mechanism Petitioner and Dr. Giachetti rely on is found in the following excerpt:

EX1017, 318



See also Petition at 24.

213. The foregoing excerpt is found in a section that also discusses nine other, non-sprag-type overrunning clutches. EX1017 at 318-19. That excerpt further explains that all of those clutches, not just the sprag-type clutch Petitioner and Dr. Giachetti identify, “allow freewheeling, indexing and backstopping” and “will solve many design problems.” *Id.* at 318. It does not identify any benefits of the sprag-type clutch over the other identified clutches, let alone the dozens of other alternatives discussed in other portions of the exhibit.

214. A POSA would not find Sclater’s lack of specificity surprising, particularly when many of the alternative devices described therein would function just as well as or even better than the sprag-type clutch Petitioner cites, including for purposes of “reduced noise and improved durability.”

215. Sclater’s lack of specificity is expected, as Sclater is merely summarizing the features of the mechanisms and mechanical devices as well as design considerations when using these devices. As is plain, Sclater is not aware of the myriad of applications of these devices.

216. Furthermore, a POSA would have to consider a number of different factors beyond “noise” and basic concerns about “durability” before deciding if a sprag-type clutch was suitable for use in any particular application. In fact, Sclater itself describes some of these factors, teaching as follows:

Overrunning sprag clutches transmit torque in one direction and reduce speed, rest, hold, or free-wheel in the

reverse direction. Applications include overrunning, back stopping and indexing. **Their selection – similar to other mechanical devices – requires a review of the torque to be transmitted, overrunning speed, type of lubrication, mounting characteristics, environmental conditions, and shock conditions that might be encountered.**

EX1017 at 320 (emphasis added). To my knowledge, however, Dr. Giachetti did not specifically analyze any of these factors when selecting the specific sprag-type clutch he identifies. Instead, as discussed above, Dr. Giachetti relies on generic statements that are applicable to a wide variety of clutches or, at the very least, the entire class of sprag-type clutches. Unlike Dr. Giachetti, a POSA would not have relied on such vague and non-specific ideas to conclude that the sprag-type clutch identified could be implemented in Chickering, Socwell, or Schonenberger.

217. In fact, another key element a POSA would have considered in the design is overall product cost which includes both the cost of the components, as well as the assembly time required to construct the product. During the design for manufacturing phase of the development effort, a POSA would have looked to reduce the overall part count of the product which may reduce the total cost of the components, and/or reduce the cost to assemble by reducing the number of assembly steps, which will impact the overall product cost. In this case, Dr. Giachetti and Petitioner say nothing of these considerations, merely using the '884 Patent as a roadmap to drive their selected choice from Sclater.

218. Accordingly, it is my opinion that a POSA would not have been motivated to implement Sclater's sprag-type clutch to Chickering, Socwell, or Schonenberger for the reasons discussed by Petitioner and Dr. Giachetti. Their explanations simply are not tied to the specific device they identify.

E. A POSA Would Not Have Been Motivated to Combine Schonenberger with Skowronski (Ground 2)

219. In Ground 2, Petitioner asserts that a POSA would have combined Skowronski with the prior art references cited in Ground 1 in order to achieve a running belt pulley formed "from an electrically insulating material," as required by Claims 44 and 51. *See e.g.*, Petition, 70-75; EX1001, Claims 44, 51. A POSA would not understand Skowronski to necessarily teach a pulley formed "from an electrically insulating material." Instead, a POSA would understand Skowronski to simply teach constructing such a pulley from "plastic" in order to facilitate the "use of large diameter pulleys." EX1030, 4:5-6.

220. For example, a POSA would understand that Skowronski's teachings have nothing to do with static charge. Instead, Skowronski teaches using plastic because creating a large-diameter pulley out of other materials would be cost-prohibitive. EX1030, 2:6-15. Cost of materials is often taken into consideration when developing products, and Skowronski makes no mention of preventing a static charge, nor does it otherwise teach that the plastic it suggests would be suitable for that purpose. *See generally* EX1030. Without explicit disclosure regarding the

choice of material relating to electrical insulation, a POSA would not necessarily understand Skowronski to suggest constructing pulleys out of “an electrically insulating material” at all, and instead would understand the more likely consideration of material cost to be determinative.

221. Thus, in my opinion, a POSA would not understand Skowronski to necessarily teach a pulley formed “from an electrically insulating material.”

IX. SECONDARY CONSIDERATIONS CONFIRM THE NON-OBVIOUSNESS OF THE '884 PATENT CLAIMS

222. As previously indicated, I understand that certain factors—often called “secondary considerations”—may support or rebut an assertion of obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the alleged invention, skepticism of those having ordinary skill in the art at the time of the alleged invention, unexpected results of the alleged invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I further understand that there must be a nexus—a connection—between any such secondary considerations and the alleged invention.

223. I further understand that there is a presumption of nexus between a product and the alleged invention when the product practices the claimed invention.

224. I have been asked to render my expert opinion regarding whether Woodway's line of CURVE treadmill products practice the claimed invention and specifically whether these products embody Claims 30-34, 37-43, 45-50, 52-54, 57, and 59 of the '884 Patent. As discussed in further detail below, it is my opinion that Woodway's line of CURVE treadmill products do embody Claims 30-34, 37-43, 45-50, 52-54, 57, and 59 of the '884 Patent and are coextensive with those claims.

225. In addition, it is my opinion that the secondary considerations of nonobvious described below and in other evidence that I understand Patent Owner is submitting confirm my opinion that the claims of the '884 Patent are nonobvious.

A. Woodway's CURVE Products Practice the Claimed Inventions

226. I am familiar with Woodway's product offerings over the years from my experience in the industry. I have also reviewed documents describing Woodway's line of CURVE treadmill products, the first of which was released in 2009. At various points in the past, I have also inspected certain of Woodway's treadmills. With this background, it is my opinion that Woodway's line of CURVE treadmills practice at least Claims 30-34, 37-43, 45-50, 52-54, 57, and 59 of the '884 Patent. This analysis is detailed in the claim chart submitted with this report. *See* EX2027.

227. All of the claims of the '884 Patent are directed to a manually powered treadmill or a method of providing a manually powered treadmill, and based on my

analysis, at least Claims 30-34, 37-43, 45-50, 52-54, 57, and 59 are coextensive with Woodway's line of CURVE treadmills. Each treadmill is a manually powered treadmill that comprises a frame, two pulleys or rotatable elements coupled to the frame, a running belt that forms an at least partially curved running surface, a "plurality of bearings" that support the running belt, and a safety device coupled to the running belt and preventing movement of the running belt in a second direction while permitting movement in a first direction. Woodway's CURVE Trainer treadmill, which is identical in all material respects to other iterations of the CURVE family of treadmills for purposes of practicing the claims of the '884 Patent, is depicted in the below photograph, which I have taken from Woodway's website (www.woodway.com), with more detail available in the accompanying chart. *See* 2025.



228. The differences between the original CURVE treadmill and other treadmills within the CURVE line do not affect whether the treadmills practice the claims of the '884 patent. Some exemplary differences are summarized as follows:

- Curve XL – The Curve XL treadmill offers a larger running surface than the original CURVE treadmill, but for purposes of determining nexus with the claims of the '884 patent, is structurally the same as other treadmills within the CURVE line.
- Curve LTG – The Curve LTG treadmill is a lighter duty version of the original CURVE treadmill, but for purposes of determining nexus with

the claims of the '884 patent, is structurally the same as other treadmills within the CURVE line.

- Curve FTG – The Curve FTG treadmill has different handrails from the original CURVE treadmill and added features for providing different levels of resistance, but for purposes of determining nexus with the claims of the '884 patent, is structurally the same as other treadmills within the CURVE line.
- Curve 3.0 – The Curve 3.0 treadmill contains upgraded software and other sophisticated electronics but, for purposes of determining nexus with the claims of the '884 patent, is structurally the same as other treadmills within the CURVE line.
- Curve Trainer –The Curve Trainer has a slightly less steep curve than the original CURVE treadmill and may provide a quieter and quicker acceleration than the original CURVE treadmill. However, for purposes of determining nexus with the claims of the '884 patent, the Curve Trainer is structurally the same as other treadmills within the CURVE line.
- EcoMill and EcoMill Legacy– The EcoMill and EcoMill Legacy each have an onboard generator system that produces power for the display and a USB charging station but, for purposes of determining nexus with

the claims of the '884 patent, are structurally the same as other treadmills within the CURVE line.

B. Commercial Success of the Claimed Invention, Industry Praise, and Copying

229. I have reviewed the Declaration of Eric Weber, which among other things, documents the prices and sales volumes of Woodway's CURVE family of treadmills, as well as industry praise for and others' copying of the CURVE products. EX2020.

230. I am also very familiar with the state of the art for treadmill technologies as of the earliest possible priority date and the conventional wisdom in the industry with regard to treadmill technologies at the time (and for years thereafter).

231. In my opinion, the objective evidence of commercial success, industry praise, and copying as reflected in Mr. Weber's declaration confirms my opinions regarding the non-obviousness of the invention claimed in the '884 Patent.

C. The Passage of Time Between Publication of the Prior Art and the Inventions

232. In addition, the passage of time between the time of invention and the prior art cited and relied upon by Dr. Giachetti and Petitioner demonstrates the long-felt need for the invention. Chickering issued in January 1972 – more than thirty years before Woodway filed the patent application that ultimately issued as the '884

Patent – and Schonenberger issued in September 1986 – more than twenty years before the claimed priority date. Meanwhile, Socwell and Magid were both published in the 1990’s – a decade before the claimed priority date.

233. Despite the purportedly obvious need for improved safety in Chickering and Socwell, nothing really changed in the industry for many years. In my opinion, the passage of time between the publication of the cited prior art and the time of invention was significant and undermines the idea that the combination of prior art Dr. Giachetti and Petitioner rely on would have been obvious to a POSA.

X. COMPENSATION AND PRIOR TESTIMONY

234. I have been retained by Patent Owner and am being compensated for the time that I spend on this matter at my regular consulting rate of \$450 per hour. My compensation is not contingent upon the outcome of this proceedings.

235. I have previously testified as an expert, including in intellectual property matters. For example, I have provided deposition testimony in the following matters:

- *Nike, Inc. v. Sketchers USA, Inc.*, United States District Court Central District of California, Case No. 19-cv-09230-FLA(JDEx), February, 2021.

- *Coulter Ventures, LLC, d/b/a/ Rouge Fitness v. Jump Rope Systems, LLC*, United States Patent and Trademark Office – Patent Trial and Appeal Board, Case No. IPR2019-00587, January 2020.
- *Coulter Ventures, LLC, d/b/a/ Rouge Fitness v. Jump Rope Systems, LLC*, United States Patent and Trademark Office – Patent Trial and Appeal Board, Case No. IPR2019-00586, January, 2020.
- *Kelly Christine Loveday Maher Conservator of Riley Maher, a Minor v. Michindoh Conference Center d/b/a Camp Michindoh and Michindoh Outdoor Education School, Jessica Pinkel, and Experiential Systems, Inc.*, State of Michigan Hillsdale County Circuit Court, Case No. 18-000183-NO, August 2019.
- *Speedfit LLC v. Woodway USA Inc.*, United States District Court Eastern District of New York, Case No. 2:17-cv-00768-KAM-AKT, December 2018.
- *Chapco, Inc., and Samsara Fitness, LLC, v. Woodway USA Inc.*, United States District Court for the District of Connecticut, Case No. 3:15-cv-1665-JCH, April 2017.
- *Speedfit LLC and Aurel Astilean v. Woodway USA, Inc. and Douglas G. Bayerlein*, United States District Court Eastern District of New York, 2013 Civ. 01276 (KAM) (AKT), September 2015.

- *Icon Health & Fitness, Inc., Plaintiff and Counterclaim Defendant, v. Park City Entertainment, Inc., Defendant and Counterclaim Plaintiff*, United States District Court for the District of Utah (Northern Division). Civil Action No. 1:10-cv-00195-RJS-DBP, January 2013.
- *Warrior Sports, Inc., Plaintiff-Appellee, v. Dickinson Wright, P.L.L.C., Defendant, Appellant*, United States District Court, Eastern District of Michigan (Southern Division). Case No. 09-12102, July 2012.
- *Bridgestone Sports Co., LTD., and Bridgestone Golf, Inc., Plaintiffs, v. Acushnet Company, Defendant*, United States District Court, District of Delaware. C.A. No. 05-132-JJF, March 2007.
- *High Cedar Enterprises, Co., and Karakal Far East, Ltd., a/k/a Karakal Golf Grips, Plaintiffs, v. Winn Inc., Defendant*, United States District Court, Central District of California, Southern Division. SACV 05-535-AHS, February 2006.
- *Winn Inc., and Ben Huang, an individual, Plaintiff, v. Eaton Corporation, Defendant*, United States District Court, Central District of California, Southern Division. CV 03-1568-SJO, August 2003.

XI. CONCLUSION

236. I declare under penalty of perjury that the foregoing is true and correct.

Dated: January 31, 2024



Kim B. Blair, Ph.D.