

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PELOTON INTERACTIVE, INC.,

PETITIONER,

v.

JOHNSON HEALTH TECH CO., LTD.,

Patent Owner.

PTAB Case No. IPR2023-01164

Patent No. 10,796,375

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,796,375
CHALLENGING CLAIMS 1-20**

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. OVERVIEW OF THE '375 PATENT	3
A. The Alleged Invention.....	3
B. The Prosecution History	6
C. The Priority Date	8
III. OVERVIEW OF THE PRIOR ART	8
A. Morris	8
B. Ray.....	10
C. Cox	13
IV. CLAIM CONSTRUCTION	15
V. LEVEL OF ORDINARY SKILL	16
VI. INVALIDITY GROUNDS.....	16
A. Ground 1: Claims 1-7, 10-20 Are Obvious over Morris and Ray.....	16
1. Motivation to Combine	16
2. Independent Claim 1	19
3. Claim 2	40
4. Claim 3	42
5. Claim 4.....	42
6. Claim 5	43
7. Claim 6	44
8. Claim 7	46
9. Claim 10.....	47

TABLE OF CONTENTS
(continued)

	Page
10. Claim 11	49
11. Claim 12	49
12. Claim 13	50
13. Claim 14	50
14. Claim 15	51
15. Independent Claim 16	52
16. Claim 17	53
17. Claim 18	53
18. Claim 19	54
19. Claim 20	54
B. Ground 2: Claims 8-9 and 18 Are Obvious over Morris, Ray and Cox.	54
1. Motivation to Combine	54
2. Claim 8	58
3. Claim 9	61
4. Claim 18	63
C. Ground 3: Claims 1-3, 6-7, 10-16, and 19-20 Are Obvious over Ray in View of AAPA.....	63
1. Independent Claim 1	65
2. Claim 2	76
3. Claim 3	77
4. Claim 6	77
5. Claim 7	78

TABLE OF CONTENTS
(continued)

	Page
6. Claim 10.....	79
7. Claim 11.....	79
8. Claim 12.....	79
9. Claim 13.....	79
10. Claim 14.....	79
11. Claim 15.....	79
12. Independent Claim 16.....	79
13. Claim 19.....	80
14. Claim 20.....	80
D. Ground 4: Claims 8-9 and 18 Are Obvious over Ray, AAPA and Cox.....	80
1. Motivation to Combine.....	81
2. Claim 8.....	83
3. Claim 9.....	83
4. Claim 18.....	83
VII. THE BOARD SHOULD NOT DECLINE REVIEW UNDER § 314(A) OR § 325(D).....	84
A. § 314(A)	84
B. § 325(D)	84
VIII. REQUIREMENTS FOR <i>INTER PARTES</i> REVIEW.....	85
A. Grounds for Standing	85
B. Overview of Challenge and Requested Relief.....	85
1. Identification of Prior Art	85

TABLE OF CONTENTS
(continued)

	Page
2. Grounds for Challenge	85
IX. MANDATORY NOTICES	86
A. Real Party-in-Interest	86
B. Related Matters.....	86
C. Notice of Counsel and Service Information.....	86
X. CONCLUSION.....	87

EXHIBIT LIST

Exhibit	Description
1001	U.S. Patent No. 10,796,375 (“’375 Patent”)
1002	Declaration And Curriculum Vitae Of Lee Rawls (“Rawls”)
1003	File History Of U.S. Patent No. 10,796,375
1004	U.S. Patent No. 9,785,827 (“Ray”)
1005	U.S. Patent No. 7,736,273 (“Cox”)
1006	U.S. Patent App. Pub. No. 2010/0160115 A1 (“Morris”)
1007	IBM Computing Dictionary
1008	U.S. Patent No. 6,638,198 (“’198 Patent”)
1009-1011	Reserved
1012	U.S. Patent App. Pub. No. 2009/0176629 (“Yi”)
1013	U.S. Patent No. 6,575,878 (“Choy”)
1014	U.S. Patent No. 8,690,735 (“Watterson”)

Petitioner Peloton Interactive, Inc. (“Peloton”) respectfully requests *inter partes* review (“IPR”) of claims 1-20 of U.S. Patent No. 10,796,375 (“’375 patent”).

I. INTRODUCTION

Although the ’375 patent specification attempts to justify its existence through its pragmatic goal—helping insurance companies stop fraud—an examination of the ’375 claims shows that, as written, they contain nothing novel. Rather, they are directed to well-known, decades-old combinations of treadmills, user-detection sensors, and the data those treadmills generate.

To promote safety, treadmills since the 1980s have consistently included some form of user detection device and a “safety switch” to cease operation if a user slips, falls, or is no longer present on the device. (Rawls, ¶¶ 35-37, 57-59.) One common type of safety switch is a lanyard the user can attach to their clothing while exercising; if the user drifts so far back on the treadmill deck that the lanyard reaches its limit, its key will detach, killing power to the motor and stopping the treadmill. (Rawls, ¶¶ 60-63.)

One drawback to such a lanyard-type device is that, as long as the lanyard’s key is inserted in the treadmill, the treadmill can still operate even if the lanyard is not clipped to the user. (Rawls, ¶ 64.) Thus, many treadmills began to include sensors (such as optical, pressure, and current sensors) to determine whether a user is present. (Rawls, ¶¶ 65-83.) As the prior art clearly illustrates, such sensors also

allowed users to collect verified data regarding their treadmill exercise and to provide such information to a third party (e.g., a trainer, doctor, or insurance company). (Rawls, ¶¶ 84-102.)

Although the '375 patent purports to prevent a person from operating a motorized exercise machine unoccupied to register false metrics (time and distance) without actually exercising, (Ex. 1001, 1:65-2:23), the '375 patent itself admits that prior art contained all the components and concepts of such a system long before the 2014 priority date. For example, the '375 patent expressly concedes that the claimed components (e.g., belt, motor, sensor, controller, and communication interface) were well-known in the art. (Rawls, ¶¶ 240-244.) The '375 patent also admits that conventional treadmills' controllers were configured to determine user engagement and to report exercise data. (Ex. 1001, 1:41-50.) Even the concepts of tracking and reporting exercise data were not new in 2014; the prior art is replete with references discussing such data transmissions to third parties—including for the purposes of verifying eligibility for insurance premium discounts based on exercise performance. (Rawls, ¶¶ 48-49, 103-111.) Such systems necessarily distinguished between data representing verified exercise (when sensors demonstrated a user was operating the machine) and non-verified exercise data (when sensors revealed a user was not engaged).

Given that the '375 patent merely rehashes a conventional apparatus and its standard features being employed in a known and obvious way, IPR should be instituted and '375 claims 1-20 should be canceled. (Rawls, ¶¶ 112-113.)

II. OVERVIEW OF THE '375 PATENT

A. The Alleged Invention

The '375 patent describes a “conventional exercise machine,” such as a treadmill, and a way to verify whether a user is exercising so that his/her exercise habit could be demonstrated to an insurance company to receive incentives, such as savings on insurance payments. (Ex. 1001, 1:21-37, 2:27-40.) However, exercise data reported from motor-driven exercise machines—like treadmills—is not trustworthy because a user could simply turn on a motor-driven treadmill without actually running or otherwise using the machine. (*Id.*, 1:54-2:19.) The '375 patent purports to solve this problem via a “verification function and verifying method” that can “verify an exercise use thereof.” (*Id.*, 2:27-40.)

Figure 1 illustrates an admittedly conventional motor-driven treadmill including a base 8, a motor, a motor-driven operating member 20—a belt—sensors, controller 40 that generates exercise use data when powered on, and communication interface 50 configured to report out the exercise data to a display or over a network. (*Id.*, 1:48-54, 3:50-4:49, 6:9-59; Figs. 1-2.)

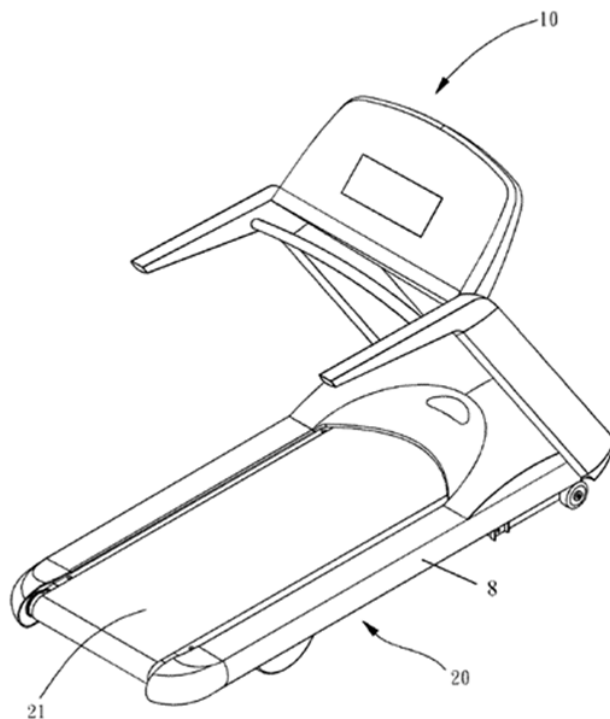


Figure 1

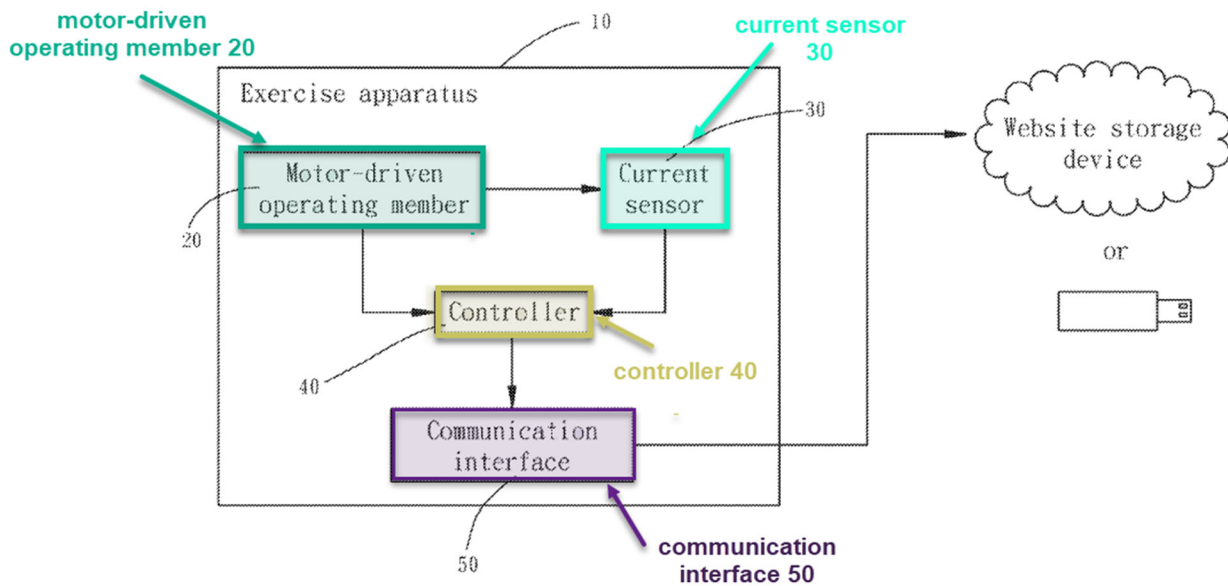


FIG. 2

The alleged invention takes these admittedly known components and uses them for the limited purpose of distinguishing the treadmill-generated exercise use data based on when the user is detected on the moving belt (validated exercise use data) versus when the belt is moving without a detected user (non-validated exercise use data). (*Id.*, 2:41-56.) The decision flowchart in Figure 6 provides an overview of the validation process described in the '375 patent.

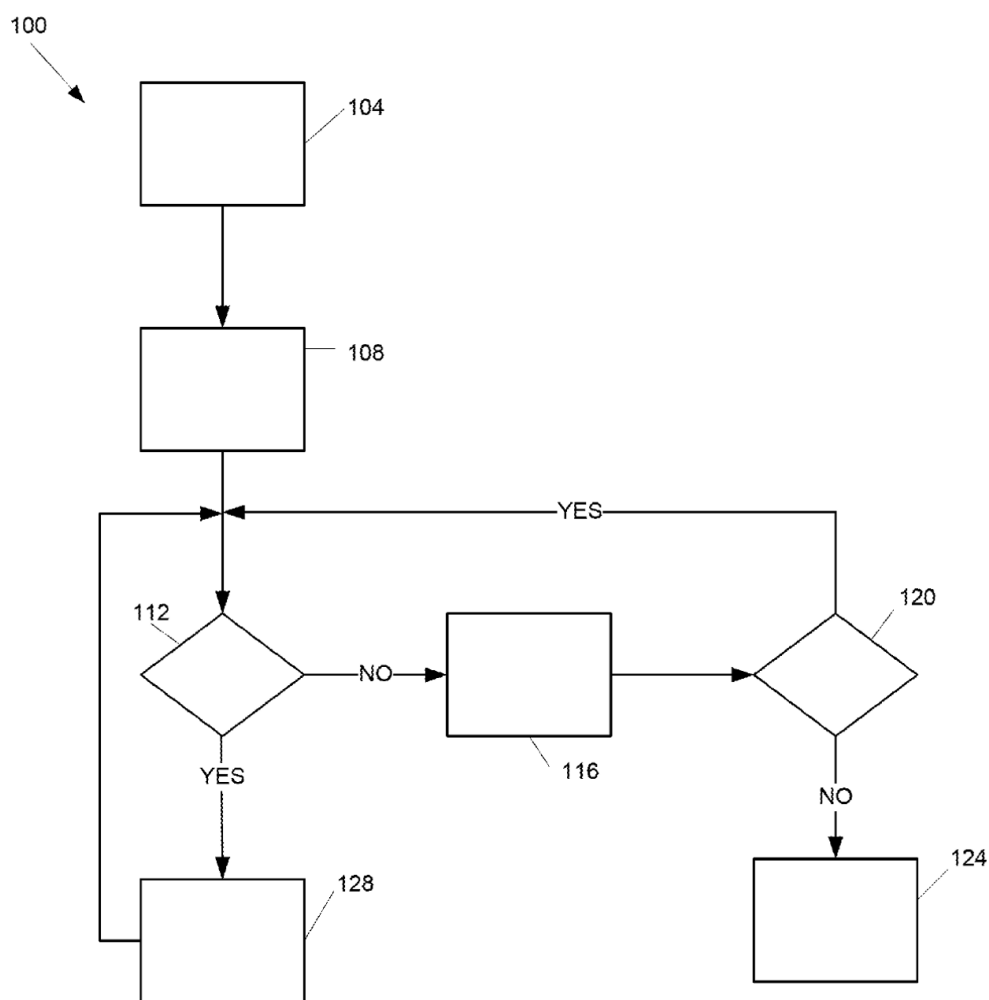


FIG. 6

The treadmill is powered (step 104) and its controller 40 receives data from user detect sensors such as pressure, current, or optical sensors (step 108). (*Id.*, 7:3-16.) Based on sensor signals, controller 40 determines whether a user is actively engaged with the treadmill (step 112). (*Id.*, 7:17-28.) If controller 40 determines that a user is not on the machine, the process generates “non-validated exercise use data” (116) (*id.*, 7:28-39), and the process is repeated at step 120 (if the motor continues moving the belt) to determine if a user engages. (*Id.*, 7:39-46.) Conversely, if controller 40 determines that a user is engaged, the process generates “validated exercise use data” (step 128). (*Id.*, 7:47-50.) Validated exercise use data can be stored locally, communicated to a user on a display, or reported out to third parties over a network. (*Id.*, 7:50-53.)

The claims of the ’375 patent do not use the validated and non-validated terminology mentioned in its specification, and merely describe that when a user is detected on the belt, reporting that exercise data to the communication interface and ceasing to report the data when a user engagement is not detected. (*Id.*, Claims 1 and 16.) As illustrated below, these claims recite known and obvious limitations and are thus invalid. (*See also* Rawls, ¶¶ 114-120.)

B. The Prosecution History

The ’375 patent is a continuation of application No. 14/983,171 (now U.S. Patent No. 10,032,227), which claims priority to provisional application No.

62/098,309, filed on December 30, 2014. (Ex. 1001, Face.) The January 10, 2020 Office Action rejected all original claims as being either anticipated or obvious over Yi (U.S. Patent Publication No. 2009/0176629A1, “Ex. 1012”) alone, or in combination with Choy (U.S. Patent No. 6,575,878, “Ex. 1013”) and/or Watterson (U.S. Patent Publication No. 2006/0205566, “Ex. 1014”). (Ex. 1003, 43-50.)

In response to claim rejections, Applicant made significant claim amendments that included, *inter alia*, reporting the exercise use data when the user is determined to be engaged with the operating member, and stop reporting when it is determined that the user is not engaged. (*Id.*, 33-37.) In distinguishing Yi from the amended claims, Applicant admitted that “***Yi discloses that distance, time and speed may be displayed on a display unit 42 while a user is on the belt 44 and exercising.***” (*Id.*, 39.¹) But Applicant alleged that “Yi does not disclose the exercise use data reporting distinction,” (*id.*, 38), and “does not teach (1) that the controller 40 generates exercise use data while the belt 44 is driven by the motor (absent detection of footsteps by the pressure array 47); or (2) that the controller 40 stops reporting

¹ All emphasis added unless otherwise noted.

generated exercise use data to a communication interface when it is determined that the user is not on the belt.”² (*Id.*)

The Notice of Allowance that issued on June 1, 2020 did not include a statement of reasons for allowance. (*Id.*, 9-14.) (*See also* Rawls, ¶¶ 121-123.)

C. The Priority Date

For purposes of this Petition only, Petitioner assumes the ’375 patent is entitled to its December 30, 2014 provisional filing date. All references in this Petition, predate this priority date.

III. OVERVIEW OF THE PRIOR ART

A. Morris

Morris is one of the many prior art patents directed to accurately detecting when a user is on a treadmill for both safety and data analysis purposes. (Morris, Title, [0004]-[0005].) Morris explained that kill functions on a treadmill did not solve the “need to be able to detect the presence or absence of a user.” (*Id.*, [0004].) It also explained that there were limitations on prior art user detection sensors, such as inaccuracies presented by lighting conditions (in the case of an infrared emitter),

² Applicant did not indicate that items (1) and (2) were actually recited in the claims. The issued claims of the ’375 patent do not recite at least the parenthetical statement of item (1).

requirements that a belt be moving (in the case of a load detection sensor for a motor), and inaccuracies presented by an adjustable incline of a treadmill (in the case of a load detection sensor for the belt). (*Id.*, [0004]-[0005].) To solve these issues, Morris disclosed an exemplary “reluctance-type sensor comprising a magnet and induction coil to detect induced current based on the movements of a treadmill deck with respect to the treadmill frame caused by movements of a user.” (*Id.*, [0007].) Morris’ user detection and reporting process is shown in Figure 9.

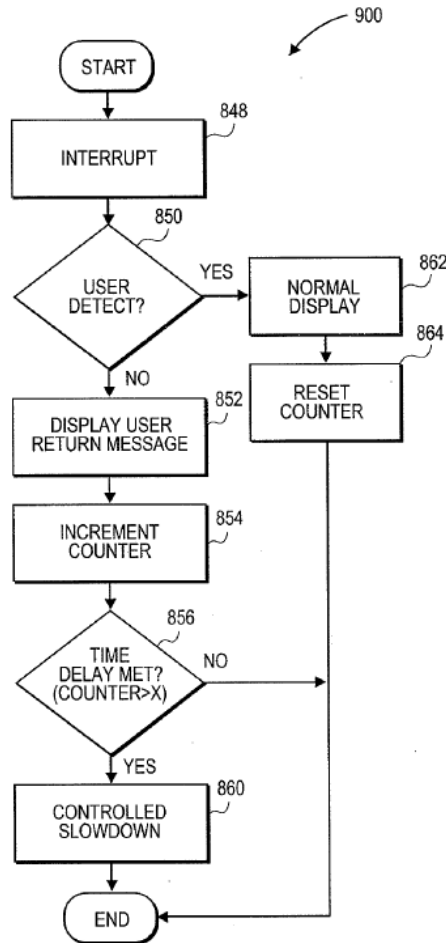


FIG. 9

During a user's workout, Morris' user detection sensor determined whether or not a user is present. (*Id.*, [0045].) When a user was detected, the user's workout program would continue without interruption. (*Id.*) If a user was not detected, Morris' FIT processor would determine how long a user was not present. (*Id.*) If the user did not return before a timeout threshold was surpassed, a controlled slowdown was initiated to stop the treadmill. (*Id.*) Importantly, during a period when a user was not detected, the FIT processor could pause/break a user's workout and initiate resumption of that workout when a user was detected again. (*Id.*, [0045]-[0046].) (*See also* Rawls, ¶¶ 124-126.)

B. Ray

Ray sought to motivate users to exercise on treadmills, and also solved the same problem discussed in the '334 patent—preventing a person from fraudulently obtaining credit for exercise that the person didn't perform, with the intent of manipulating wellness programs and insurance companies for discounts. (Ray, Abstract, 3:13-42, 4:37-44, 7:30-33, 9:17-36.)

Ray explained that prior exercise devices failed “to accurately validate [the] identity of [a] user . . . thus enabling inactive wellness program participants to obtain false wellness program credit for exercise performed by another.” (*Id.*, 3:16-29, 8:25-28.) For example, dishonest users (or the user's friend) could shake a

pedometer to generate false exercise information “while sitting on the couch watching television.” (*Id.*, 3:21-29.)

To solve these problems, Ray disclosed a process for validating exercise data by using a sensor that detected engagement of a user with a treadmill. This process validated the user’s identity and the exercise performed, and also provided “motivation” by displaying a real-time virtual image of the user’s physical improvements (thinning) as they continued to exercise. (*Id.*, 4:52-54, 5:40-46, 6:36-42, 8:26-28.)

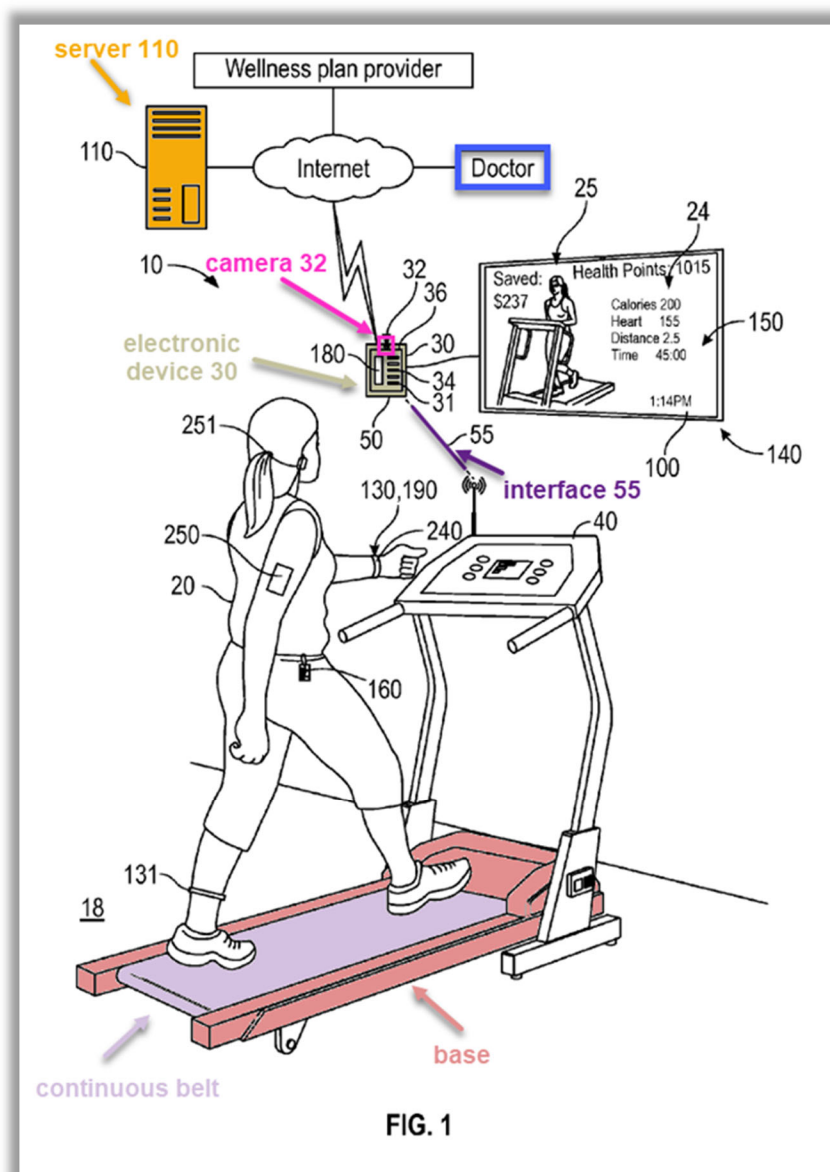


Figure 1 (annotated)

Figure 1 showed a treadmill including a camera 32 (i.e., sensor) that tracked a user's movement in real-time to confirm that a user is engaged with the machine. (*Id.*, 6:43-46, 12:59-67, 14:6-14.) Ray's treadmill also generated exercise data 24 displayed on the treadmill screen as data, and as a virtual image. (*Id.*, 5:41-58, 12:61-64, 13:50-67, 14:3-5, 16:51-55, 17:61-18:19, Figs. 1-3.)

As long as a user was exercising, camera 32 captured a real-time video/images of the user (*id.*, 14:31-46.) and a computer caused a user’s virtual image to become thinner and healthier based on the intensity and length of the user’s workout. (*Id.*, Abstract, 5:41-46, 10:59-67, 13:20-30, 16:17-21.) Thus, Ray’s motivational image was generated “in accordance to the speed or duration of the detection of movement of the user 20 by the camera 32.” (*Id.*, 13:50-67.)

The user’s image and other exercise data could be stored on server 110 (*id.*, 13:30-36), or transmitted over the Internet to third parties, such as a user’s doctor or insurance company. (*Id.*, 5:41-58, 13:7-10.) But if the user was not detected or was not exercising, the camera would no longer capture the user’s image. (*Id.*, 14:31-55.) (*See also* Rawls, ¶¶ 127-131.)

C. Cox

Cox was directed to a treadmill data acquisition system that used a current sensor to detect a user to generate a stride analysis. (Cox, Abstract, 6:40-54.)

Cox used a current sensor that recorded electric current signals of the treadmill “as a person walked on the treadmill” to “enable[] a calculation of power” or energy usage by the motor of treadmill 30. (*Id.*, 2:56-64.) Cox used variations in the electric current to conduct its stride analysis. (*Id.*, 5:34-47, 6:40-54.)

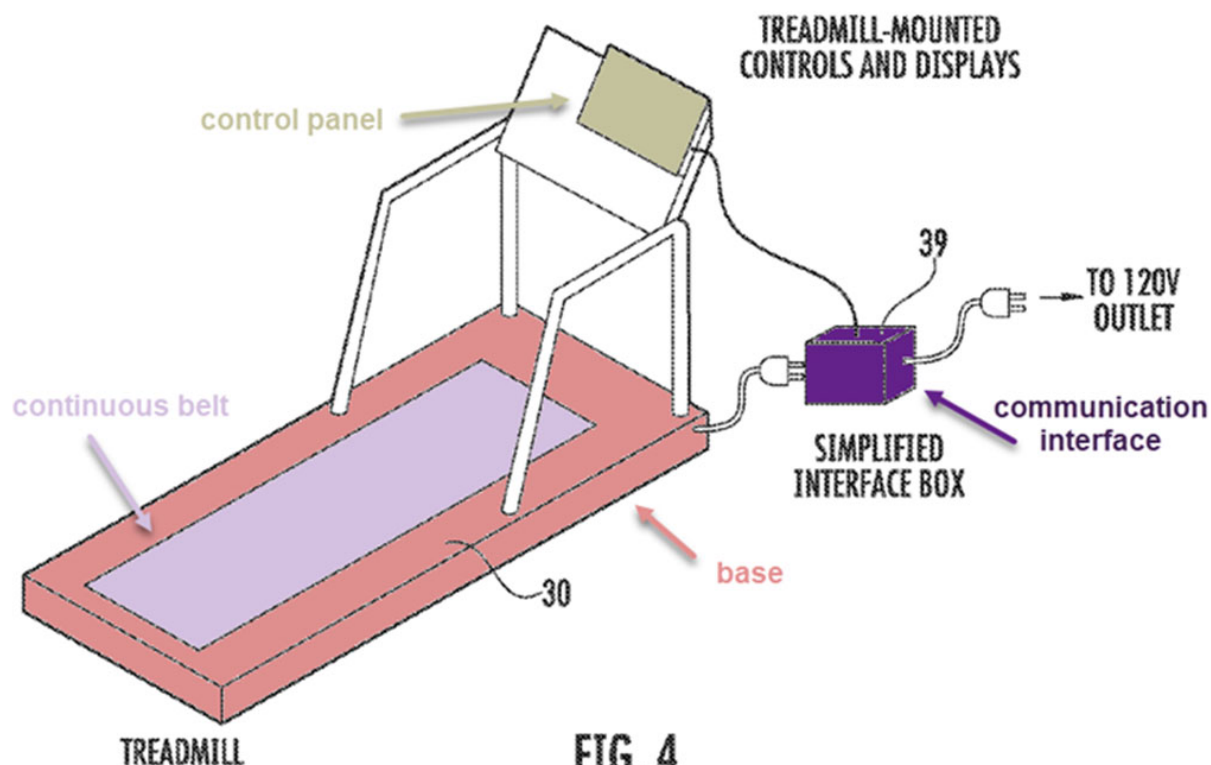


FIG. 4
(Annotated)

An interface box 39 was placed between the motor and the power source for obtaining current signals. (*Id.*, 4:27-31, Fig. 4 (annotated above).) Cox also disclosed other embodiments, including a fully integrated treadmill with all of the components integrated therein. (*Id.*, 4:37-39.) The data could be used to generate a stride frequency analysis, or a stride profile for a user. (*Id.*, 2:35-36, 5:55-64, Fig. 9.) (*See also* Rawls, ¶¶ 132-136.)

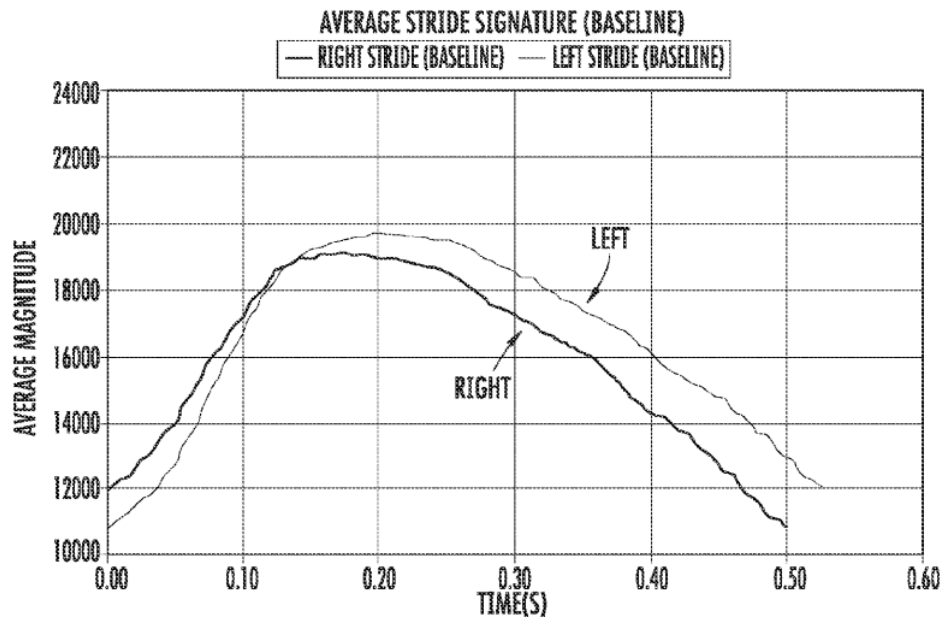


FIG. 9

IV. CLAIM CONSTRUCTION

In an IPR proceeding, the challenged claims are construed “in accordance with the ordinary and customary meaning of such claim[s] as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(B). At this time, Petitioner does not believe construction of any term is necessary to resolve the invalidity challenges set forth in this Petition. (Rawls, ¶¶ 29-30.)

The claims of the '375 patent have not been construed by any courts as of the filing of this Petition.

V. LEVEL OF ORDINARY SKILL

As of the alleged December 2014 priority date, a person of ordinary skill in the art (POSITA) is a person having: (i) a bachelor's degree in an exercise related field or mechanical or electrical engineering and (ii) three to five years of industry experience in designing cardiovascular exercise equipment (such as treadmills, bicycles, steppers, ellipticals) or in a similar field. A POSITA could substitute additional education for experience, e.g., substituting an advanced degree relating to the design of cardiovascular exercise equipment or biomechanics, for industry experience in a related field and vice versa. (Rawls, ¶¶ 31-34.)

VI. INVALIDITY GROUNDS

A. Ground 1: Claims 1-7, 10-20 Are Obvious over Morris and Ray.

1. Motivation to Combine

Both Morris and Ray related to exercise equipment (e.g., treadmills), and specifically to detecting a user's presence on a treadmill and presenting exercise data on a display while the user was exercising. (Morris, Abstract, [0006], [0035]; Ray, Abstract, 5:41-48, 13:20-30.) Morris recognized that detection of a user's presence could provide a number of benefits, including motivation (Morris, [0025]), which was one of the main themes in Ray's invention. (Ray, 8:22-26, 11:56-61.) Therefore, a POSITA would have been motivated to combine the complementary teachings of

Morris and Ray that addressed similar objectives to achieve predictable results. (Rawls, ¶¶ 137-140.)

In the combination, a POSITA would have incorporated Ray's camera and software instructions for validating user exercise data into Morris with a reasonable expectation of success. In fact, Morris had already explained that its exercise equipment could be fitted with optical sensor(s) (Morris, [0033]), which would have provided an express motivation to install and use Ray's camera for user detection. Additionally, Morris' treadmill included an information processing system with several electronic circuits and processors (controller)—FIT processor 520, display processor 522, translator board 518, motor/incline control board 528 (Morris, [0032], [0034]-[0036], Fig. 6), which could be individual components, or combined together. (Morris, [0035].) They processed the sensor signals, determined the presence/absence of the user, communicated with treadmill's motor(s), and presented exercise data such as duration, distance, intensity, incline, cadence, footfall force, a human analog display that mimicked bouncing motion of the user, as well as a *virtual reality content*³ on the screen. (Morris, [0032], [0034]-[0036], [0050], [0056]-[0058], Claims 29-37, Figs., 11-12C.) Therefore, the signal

³ All bold and italic emphases are added by Petitioner unless otherwise specified.

processing and display system of Morris had the necessary capabilities to accommodate Ray's user detection/validation software and implement, with a reasonable expectation of success, its functionalities that included producing and presenting the motivational image of the user exercising. (Rawls, ¶¶ 141-145.) A POSITA would recognize that software instructions could easily be incorporated into Morris' controller and interact with Morris' advanced sensor system designed to more accurately detect a user's presence. (*Keynetik, Inc. v. Samsung Elecs. Co.*, No. 2022-1127, 2023 WL 2003932, at *2 (Fed. Cir. Feb. 15, 2023)) ("Normally, once the function to be performed by software has been identified, writing code to achieve that function is within the skill of the art."))

A POSITA would have further understood by Ray's express teachings that its user validation/motivation technology could be "easily and affordably merged" into a treadmill (Ray, 9:55-57), and that incorporating these features into Morris' treadmill would have been obvious and produced predictable results with a reasonable expectation of success. (Rawls, ¶¶ 145-146.)

A POSITA would have been further motivated to make this combination because it would have improved the capabilities of Morris' treadmill by adding Ray's motivational image that showed a thinner image of the user as the intensity and duration of exercise increased, thus contributing "to the user's sense of self-worth and self-esteem." (Ray, 11:55-59; 13:50-57.) While Morris recognized that

exercise data could be “output to a computer or saved in memory” for later access (Morris, [0050]), inclusion of Ray’s functionality to share the exercise data with a remote location in real time would have allowed “a more efficient flow of that data to a physician or personal trainer” (Ray, 7:11-22), thus providing another added benefit motivating a POSITA to make this combination. (Rawls, ¶ 147.)

2. Independent Claim 1

1[pre] “An exercise apparatus comprising:”

Morris disclosed an “exercise machine[] having user detection features” (Morris, [0002], Title, Abstract), where the exercise machine could be a treadmill. (*Id.*, [0007], Claim 29, Abstract, Fig. 1.)

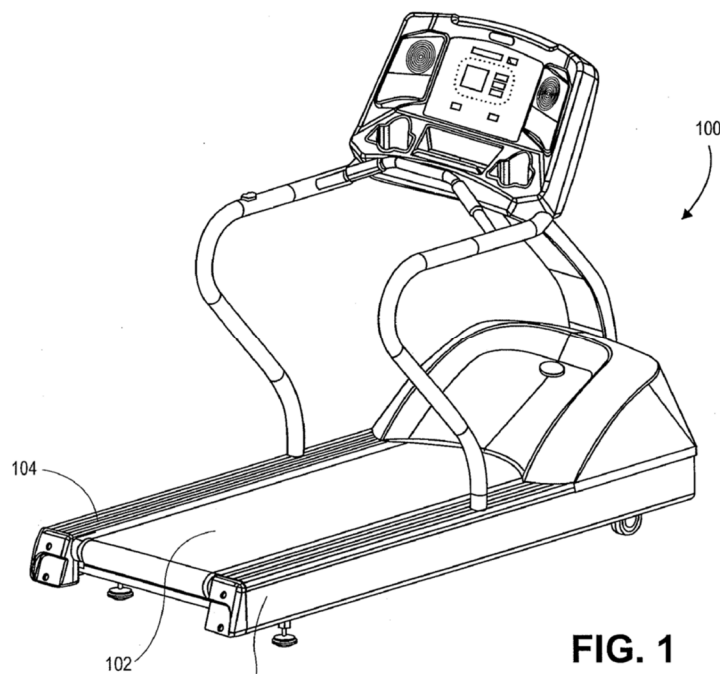
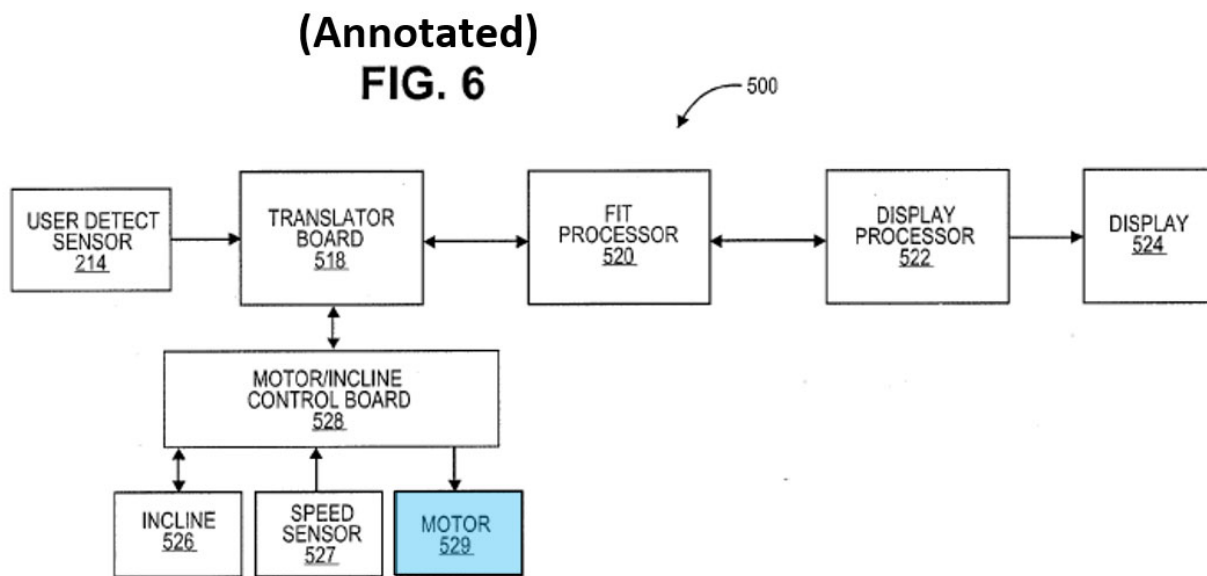


FIG. 1

1[a] “a motor;”

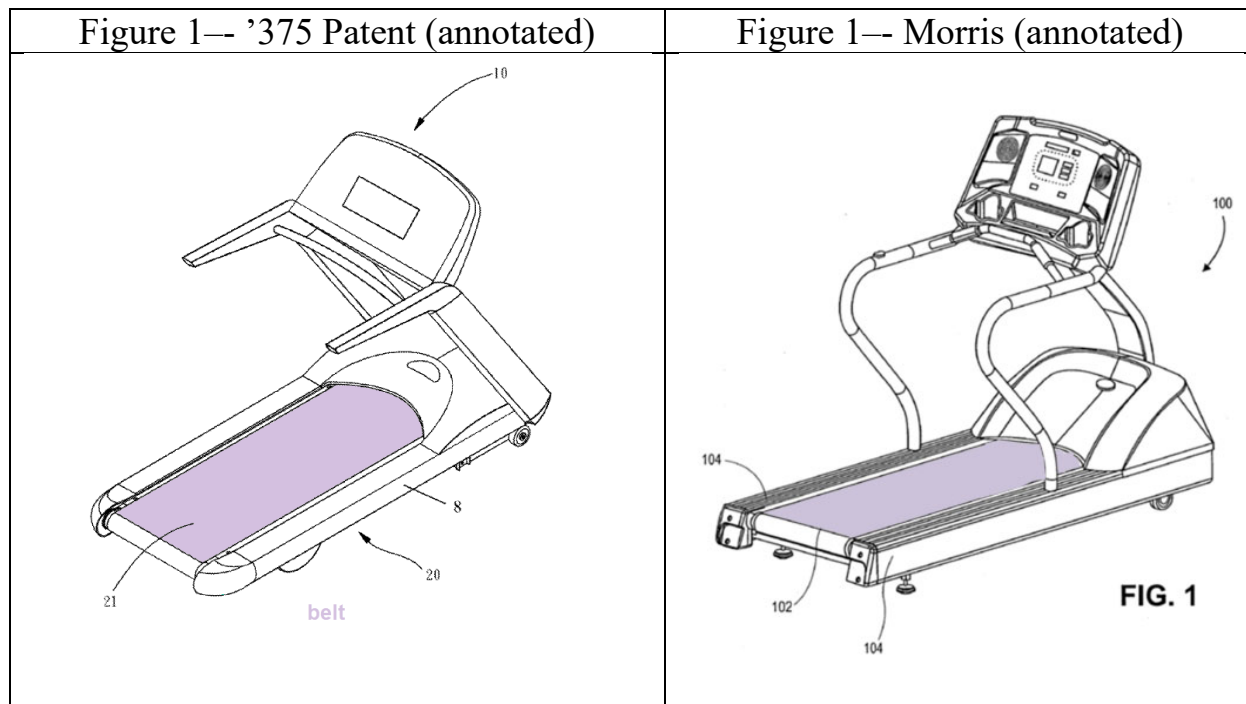
Morris disclosed a motor because it described that “slight vibrations in the treadmill caused merely by an *electric motor driving the belt* may create small, “baseline” signals.” (*Id.*, [0031].) Morris further described a “motor feedback system capable of monitoring the incline and speed of a treadmill,” and drivers for its motor, including motor/incline control board 528 and motor driver 529, as shown in Figure 6. (*Id.*, [0032]-[0033].) (Rawls, ¶¶ 148-149.)



1[b] “an operating member driven by the motor;”

The '375 patent's operating member could be an endless belt (Ex. 1001, 3:1-4, 3:59-66), and Morris disclosed a motor-driven endless belt 102. (*See* annotated Figure 1 (below) and Morris, [0025], explaining movement of the belt via an electric

motor.) Morris’ “belt [was positioned] above the deck 206” (Morris, [0027]) that moved with respect to the stationary deck. (Rawls, ¶ 150.)



1[c] “a sensor operable to detect engagement of a user with the operating member;”

Morris described a user detect sensor, such as a “*magnet and coil*, ... other magnetic sensors, *optical sensors* or the like.” (Morris, [0033].) For example, Morris described a reluctance sensor including magnet 212 and induction coil 214. (Morris, [0027], Figs. 3A-B.)

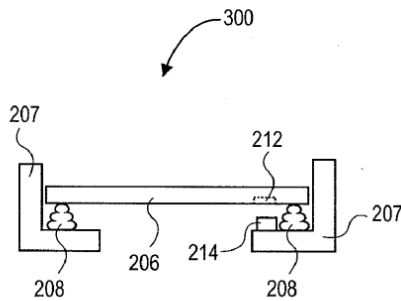


FIG. 3A

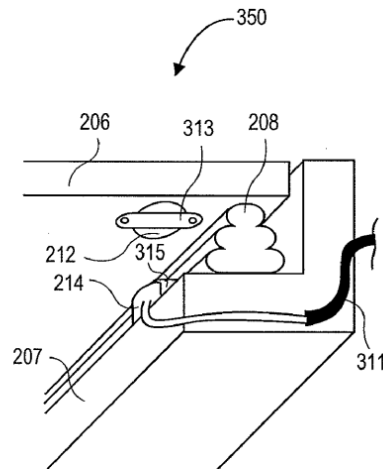


FIG. 3B

As the deck moved from a user's footfalls, the magnet's 212 corresponding movements induced a current in the induction coil 214 that was communicated through wire 311 to a processor, where the signals were used to determine whether a user was present. (Morris, [0027], [0031].) (Rawls, ¶¶ 151-152.)

Ray's Sensor: Ray also disclosed an optical sensor in the form of a camera and associated data processor that was connected to the exercise machine (Ray, 10:36-50), or could be implemented as part of the treadmill. (Ray, 9:55-57.) Ray's camera "record[ed] [] still or video image[s] or produce[d] a live feed of the . . . exercising user 20 *when movement [was] detected by the camera.*" (Ray, 13:20-24.)

Ray explained that:

...as long as the exercise data 24 is being produced by the exercise machine 40, the camera 32 can be instructed to capture the user's image every 10 minutes. Therefore, *as*

long as the user 20 continues exercising, the camera 32 will continue to capture the user's image.

(Ray, 14:34-40, 10:59-64; *see also id.*, claim 1.)

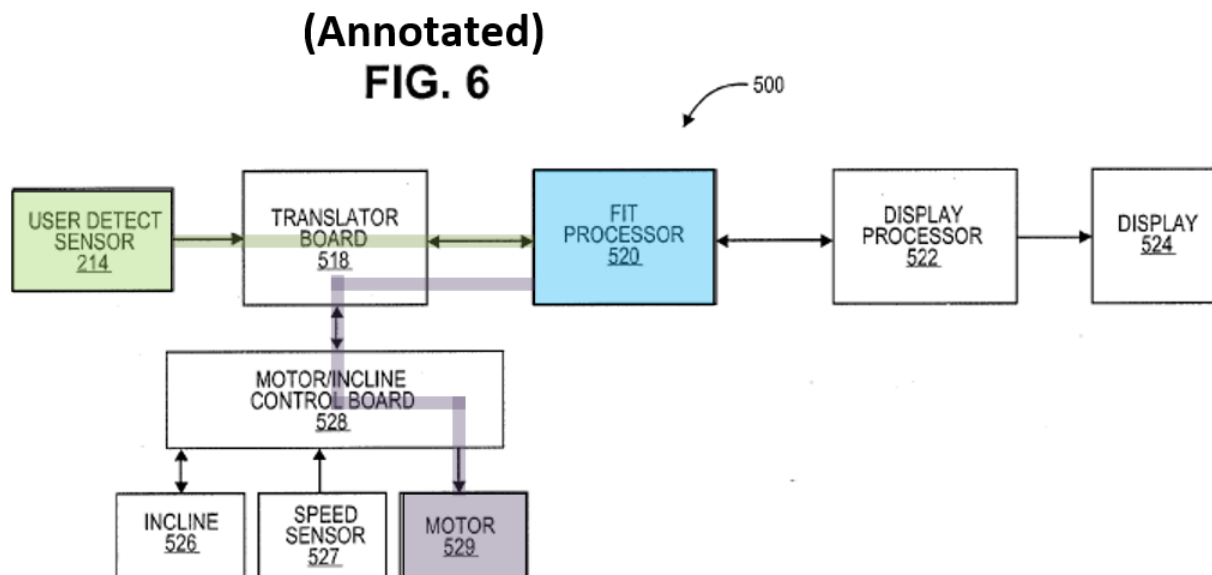
Ray's camera also detected when a user was on versus off the moving belt and disclosed that "as long as the treadmill is moving the camera will operate to take their real-time image while exercising ...[i]f the user stops exercising, the camera will no longer record images." (Ray, 6:53-56.) Ray described that the camera determined a user's presence when "movement ... (such as the user's shoulders moving up and down)" was detected, thus making clear that at least Ray's camera *was operable to detect engagement of a user with the operating unit.* (Ray, 14:6-14, 15:55-65.) Finally, Ray's camera could sense small changes in the user's facial color based on blood flow to obtain heart and respiratory rates of the user. (Ray, 16:47-50.)

In the combination, Ray's camera and its analysis software would be combined with Morris' treadmill and augment the reluctance sensor, which provided detection signals indicative of the force exerted by the user on the treadmill as the user was walking or running on the treadmill. The data from the reluctance sensor would be used to accurately and realistically modify the user's virtual image based on the detected footfalls. A POSITA would have a reasonable expectation of success in making this combination because including multiple sensors in treadmills was a

routine and well-known task. (Rawls, ¶ 155.) Additionally, using multiple sensors or sensor types is consistent with a sensor for detecting engagement of the user with the treadmill in the '375 patent. (*See, e.g.*, Ex. 1001, 5:31-54, 7:9-16, and Fig. 5 describing the sensor as multiple pressure sensors, optical sensors, current sensors, etc.) (Rawls, ¶¶ 151-156.)

1[d] “a controller in communication with the operating unit and the sensor, the controller configured to generate exercise use data when the operating member is driven by the motor; and”

Controller: Morris disclosed the claimed “controller” in the form of an FIT (fitness) processor 520 that was in communication with the motor that drove the belt (“operating unit”) and with the user detect sensor (“sensor”), as illustrated in annotated Figure 6.



In alternate mappings, the combination of translator board 518, FIT processor 520, and display processor 522, or the combination of translator board 518 and FIT processor 520, could form the claimed “controller” because Morris described that while those components could be implemented as “physically separate processors and/or electronic boards, *one or more [of the translator board 518, FIT processor 520, and display processor 522] [could] be combined within single processor.*” (Morris, [0035].) Combining different processors or implementing them as individual components was obvious and well-known. (Rawls, ¶¶ 157-159.) The mapping of the Morris FIT processor and/or the combination of multiple processors/control boards to the claimed controller is consistent with the ’375 patent’s examples of the controller that included “a microcontroller unit, at least one electronic circuit, and at least one circuit board ... [or] a computer processing system that includes a hardware assembly, and/or a firmware assembly.” (Ex. 1001, 4:19-31.)

Morris’ processor(s) communicated with the user detect sensor because “the user detection inductance coil 214 communicate[d] with the translator board 518. The translator board 518 interpret[ed] the signals from the inductance coil 214 and forward[ed] them to the FIT processor 520. The FIT processor 520 ... use[d] this indication to help control a workout program.” (Morris, [0036].) Morris’ processor also communicated with the treadmill belt (operating unit) because it

“communicate[d] a signal to the translator board 518, which in turn communicate[d] signals that cause[d], for example, a treadmill belt drive to slow the treadmill belt or the incline motor to lower the incline.” (*Id.*; *see also id.*, Claims 24 and 32.) (Rawls, ¶¶ 157-160.)

Generating exercise use data: Element 1[d] further required the processor to generate exercise use data when the operating unit was driven by the motor. Morris and Ray taught this limitation. Specifically, Morris explained that “exercise equipment may present information to a user through a display” (Morris, [0050]), showing exercise use data including “information such as *pace*, heart rate (when available), incline, *distance*, program profile, and/or the like.” (Morris, [0051]; *see blue annotations* in Fig. 11.)

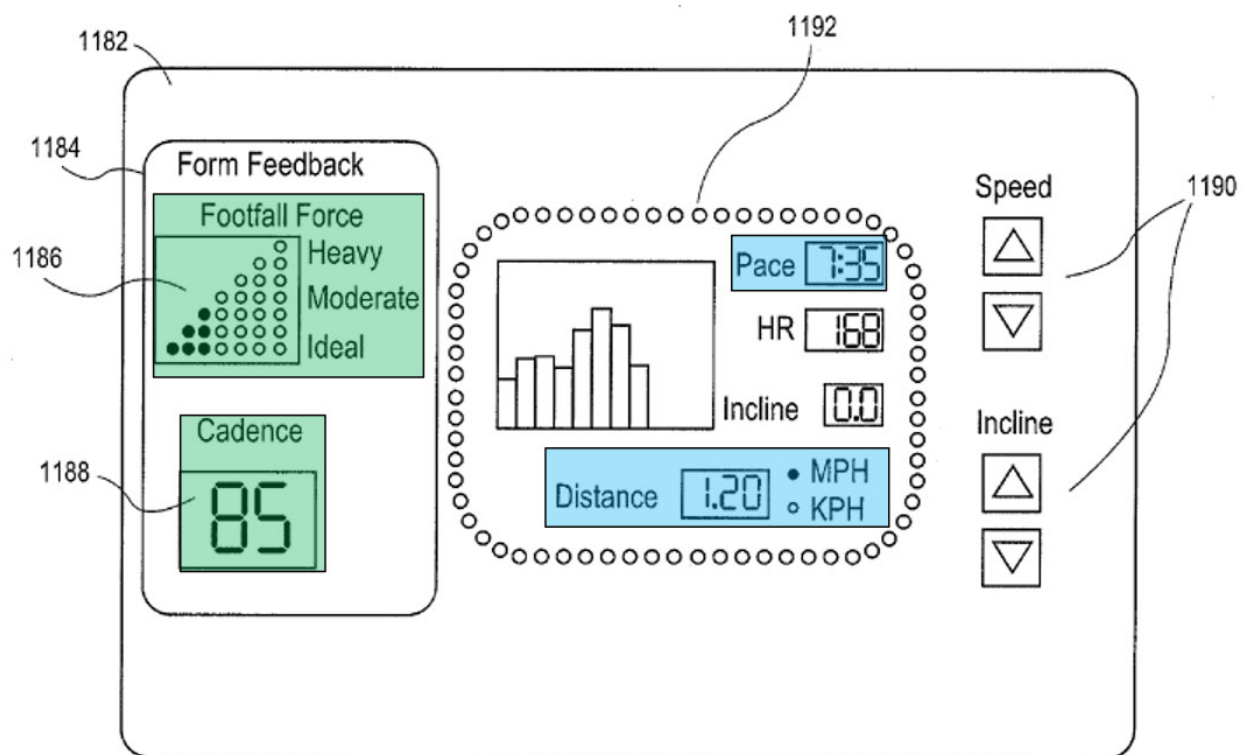


FIG. 11
(Annotated)

Morris additionally described generating and displaying exercise use data such as a *footfall force* represented on a “force graph 1186 [that] include[d] one or more indications of force, such as increased bar length of the graph, color changes, and the like for heavier footfall forces ... [and] *a user’s cadence—generally expressed as steps per minute* ... measured based on the detection of each impact over a period of time.” (*Id.*, [0053]; see **green annotations** in Fig. 11.)

Morris additionally explained that “user detection sensor readings [were] evaluated more often *while the treadmill belt [wa]s moving.*” (*Id.*, [0040].)

Therefore, a POSITA would have understood that the exercise use data obtained from the sensor readings was generated while the belt (operating unit) was moving. A POSITA would have also found this obvious because information such as distance, pace and the user's cadence were tied to the time spent, or the distance traveled, while the user was being detected on a moving treadmill. (Rawls, ¶¶ 161-163.)

Ray's Exercise Use Data: Ray corroborated the teachings of Morris by also disclosing generating exercise use data when the operating member was driven by the motor. For example, Ray disclosed generating, transmitting and displaying exercise data 24, such as calories, heart rate, distance and time. (Ray, 5:46-48, 10:64-67, 13:31-36; *see also* **blue highlights** in annotated Fig. 1.) Ray's exercise use data further included a virtual image⁴ of the user which was generated and displayed in real time on a screen when the user used the treadmill (Ray, 4:66-5:11), and became "thinner, healthier, and more aesthetically pleasing." (Ray, 5:41-46; *see also* **green highlights** in annotated Fig. 1.) The image was thinned based on the intensity, speed and/or duration of the user's workout. (Ray, Abstract, 5:44-46, 5:23-29, 10:59-67.)

⁴ Ray's virtual image is consistent with the '375 patent's explanation that exercise use data can be "a multimedia content, such as a media image and/or a sound." (Ex. 1001, 6:20-22.)

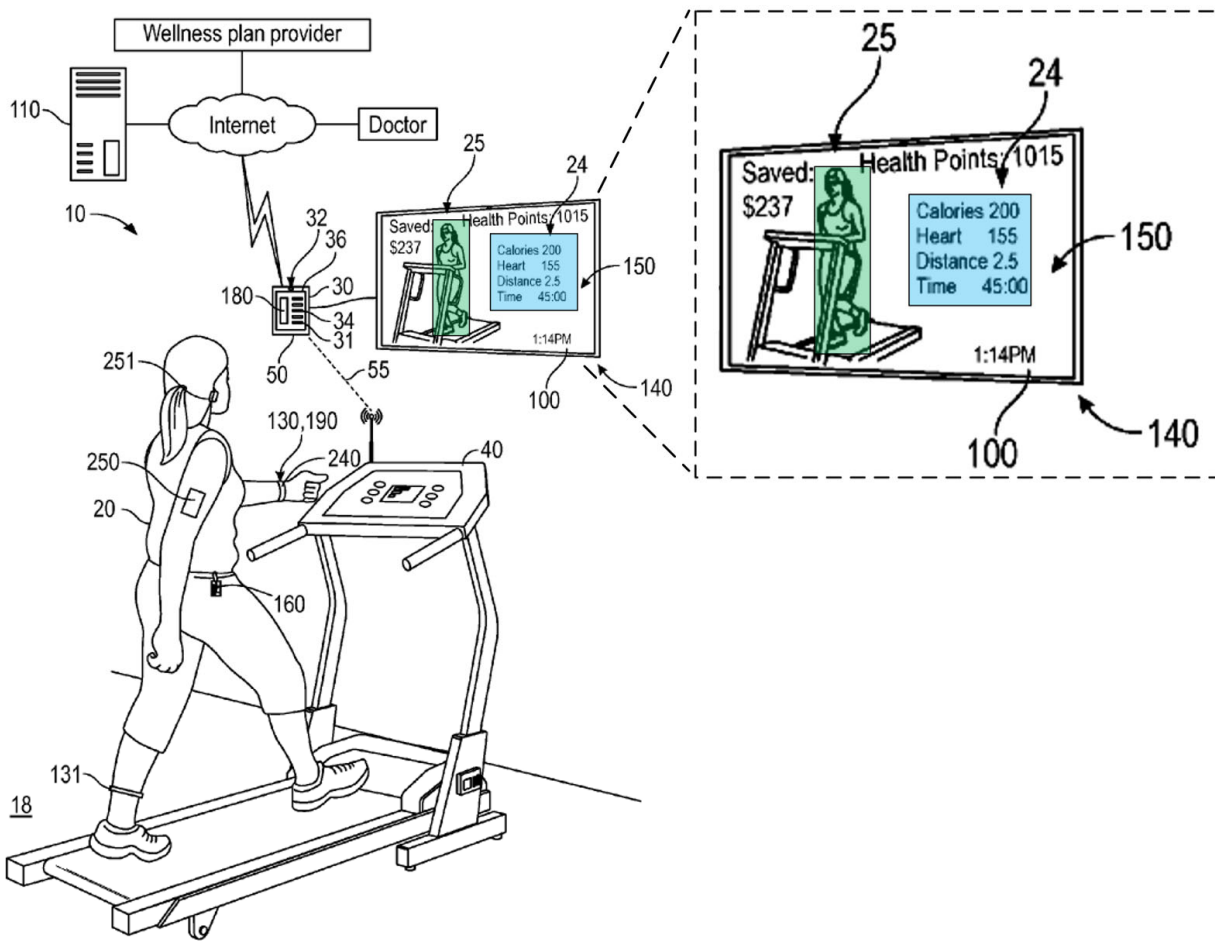


FIG. 1 (Annotated and Display Area Enlarged)

Ray described that the user's thinner/healthier-looking image was generated in *real time* by a computer system, was produced *via the treadmill interfacing with the computer system*, and was displayed on the screen *as the user was exercising*. (Ray, 4:66-5:14, 5:23-29, 10:59-67.) For example, Ray explained that the movement of the treadmill could trigger the camera's operation: "the exercise machine 40 indicated movement thereof at the interface 55 with the electronic device 30, resulting the set of instructions causing the camera 32 to periodically take a photo."

(*Id.*, 14:7-11; *see also id.*, 6:54-56: “***as long as the treadmill is moving*** the camera will operate to take their real-time image while exercising.”)

Therefore, it would have been obvious to a POSITA that the user’s image on a treadmill, which changed in real time based on the intensity/speed/duration of user’s exercise, would be generated when the treadmill’s belt (operating unit) was moving. Additionally, a POSITA would have understood or found obvious that Ray’s other types of exercise information, such as distance and time, would be generated while the treadmill belt (operating unit) was moving and the exerciser was being detected because that information would be computed based on the movement of the belt. (*See, e.g.*, Ray, 13:24-30: “***the time 140 and duration of the exercise performed by the user 20***”; *see also id.*, 5:45-48: “In addition to seeing her image, she can also view on the display ***her exercise data such as heart rate, calories burned and distance advanced.***”) (Rawls, ¶ 166.)

In summary, Morris and Ray both described generating exercise use data, including distance, pace, footfall force, cadence, time, and a user’s virtual image, any one or any combination of which can be construed as the claimed exercise data. (Rawls, ¶¶ 164-167.)

1[e] “a communication interface in communication with the controller,”

The ’375 patent broadly describes the communication interface as a way to provide exercise data to another device such as to “an outside storage device such as

a flash drive, a disk rewriter, or a website storage.” (Ex. 1001, 6:23-26.) The communication interface can also be “an Internet interface, such as a Wi-Fi internet module or an internet port” (*id.*, 6:44-47), or can be “programmed or incorporated into the controller 40 such that controller 40 performs the functions associated with the communication interface.” (*Id.*, 6:54-58.) The communication interface can also be a display device. (*Id.*, 6:13-16.)

Consistent with the above description of the ’375 patent, the Morris-Ray combination described a communication interface that provided the exercise use data to a display, to a memory device, to a remote cloud-based server, and/or to a remote location via a live feed.

Specifically, Morris disclosed a communication interface as (1) a display device 524 and/or (2) a display processor 522 which communicated with the display device 524. (Morris, Figs. 6, 11, 12A-12C.) Morris’ display processor could be a separate component from its FIT processor or could be combined with it. (Morris, [0035].) The display processor could “command the display 524 to display indications of the presence or absence of a user” (Morris, [0036]), and could include “a television interface, a display interface, an iPod®” and the like. (Morris, [0035].) The display could be an LCD, a plasma or a touch screen, and the like. (*Id.*; *see also id.*, [0023]-[0024], Figs. 11 & 12A-C.)

Ray's Communication Interface: Similarly, Ray disclosed (1) a display (Ray, Figs. 1-3, 12:59-67, 13:50-54), which could be integrated into the treadmill (Ray, 9:55-57), (2) a communication interface that allowed the user's motivational image and other exercise data to be transmitted over the Internet, e.g., via a live feed to a remote location (*id.*, 3:46-51, 6:67-7:10, 8:1-10, 13:65-67), and/or (3) a communication interface that allowed exercise data to be sent to a storage device such as cloud-based server. (Ray, 3:46-51, 5:65-6:5, 7:4-10.) Ray's Figure 3 further illustrated a specific embodiment, in which the treadmill had an "interface 55" for transmitting exercise data to another device. (Ray, 13:31-36.)

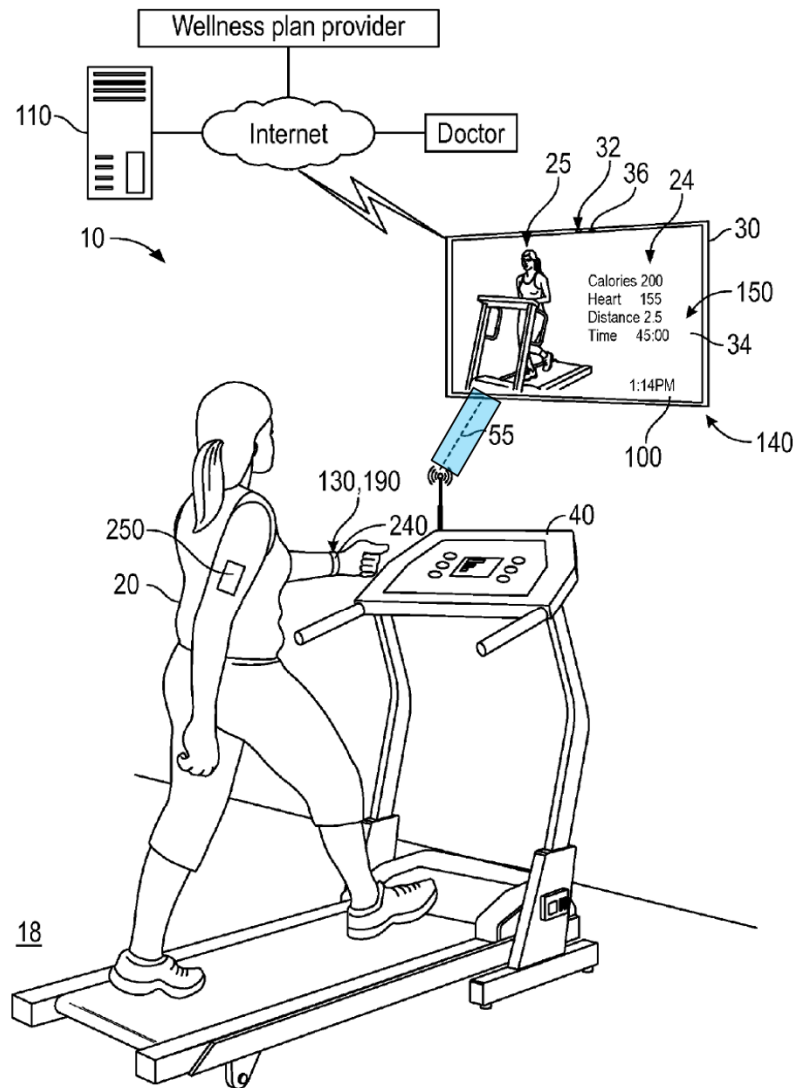


FIG. 3
(Annotated)

The various communication interfaces in Ray, to the extent they did not overlap with Morris, could be readily implemented in Morris' treadmill, well within the capabilities of a POSITA. (Rawls, ¶¶ 146, 185.)

Accordingly, any one or combinations of the above constituted the communication interface recited in this limitation. The communication interface was

in communication with the controller because it received the generated exercise data from, and under the control of, the controller to transmit to a storage device and/or to a third party via a live feed. (Rawls, ¶¶ 168-172.)

1[f] “wherein the controller is configured [to] determine whether the user is engaged with the operating member in response to movement of the operating member and the sensor detecting engagement of the user with the operating member;”

Morris disclosed a sensor that detected engagement of a user with the tread. Morris’ reluctance sensor generated electrical signals in response to sensing the user’s footsteps on the treadmill and transmitted those signals to a processor. (Morris, [0031].) The “processor use[d] digital signal strength, duration or comparison to a previous signal to determine whether a user is present.” (*Id.*) For example, a “change from a small baseline signal to a large signal can indicate the presence of the user.” (*Id.*; *see also id.*, [0037]-[0038], explaining determinations of ***presence or absence of the user*** and (*id.*, [0036]), explaining that the translator board 518 interpreting the signals from the user detection sensor and forwarding them to the FIT processor.) Even more specifically, Morris explained that “the expected characteristics of the signal [produced by the sensor] may include a pulse train-like signal cycling within the normal expected cadence of ***a person walking, jogging, running or sprinting***.” (*Id.*, [0042].) (Rawls, ¶ 173.)

It would have been obvious to a POSITA that Morris' determination was conducted in response to movement of the operating member because Morris' sensor detected signals when the belt was moving in order to produce signals indicative of the user walking, jogging, running or sprinting on the treadmill. (Rawls, ¶ 174.)

In the Morris-Ray combination, the controller would have been additionally or alternatively configured to detect the user's presence using a camera (sensor) as described in Ray. The camera, according to Ray, detected a user on the moving belt (operating unit) when, for example, it sensed a user's shoulders moving up and down (Ray, 14:6-14), or by taking real-time images of the user "*as long as the treadmill [wa]s moving.*" (*Id.*, 6:53-55.) Ray further explained that "*as long as exercise data 24 [wa]s being produced by the exercise machine 40*, the camera 32 [could] be instructed to capture the user's image every 10 minutes" (*id.*, 14:35-40), and "[i]f the user stop[ped] exercising, the camera w[ould] no longer record images." (*Id.*, 6:55-57.)

Accordingly, a POSITA would have understood that Ray's determination as to whether a user was exercising on the treadmill would be carried out as long as the treadmill's belt was moving (in response to movement of the belt) and the camera was detecting the user's movements. (Rawls, ¶¶ 173-176.)

1[g] "wherein in response to the controller determining that the user is engaged with operating member, the controller is configured to report the exercise use data to the communication interface,"

Morris and Ray both described this limitation by explaining that, when the exercising user was detected, the exercise use data (such as distance, pace, footfall force, cadence, time, or user's virtual image) were reported to the communication interface. In particular, the exercise use data would be reported to the display and/or would be reported to the communication interface that enabled the live feed to be transmitted to the remote location, or stored in a remote server. *See* limitations 1[d]-1[f], *supra* and annotated Figure 11 of Morris and Figure 1 of Ray (below).

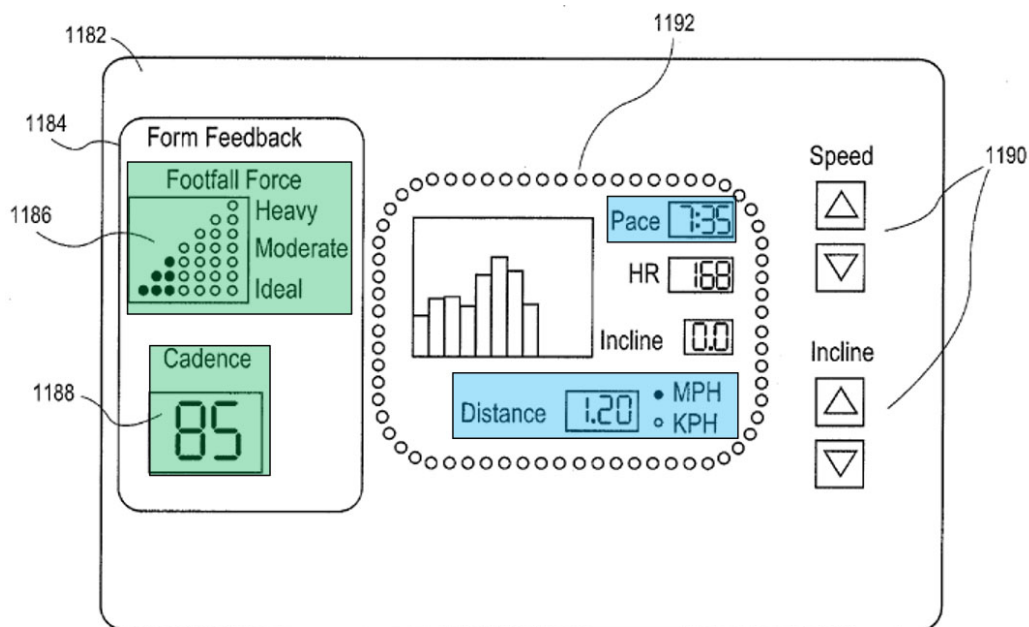


FIG. 11
(Annotated)

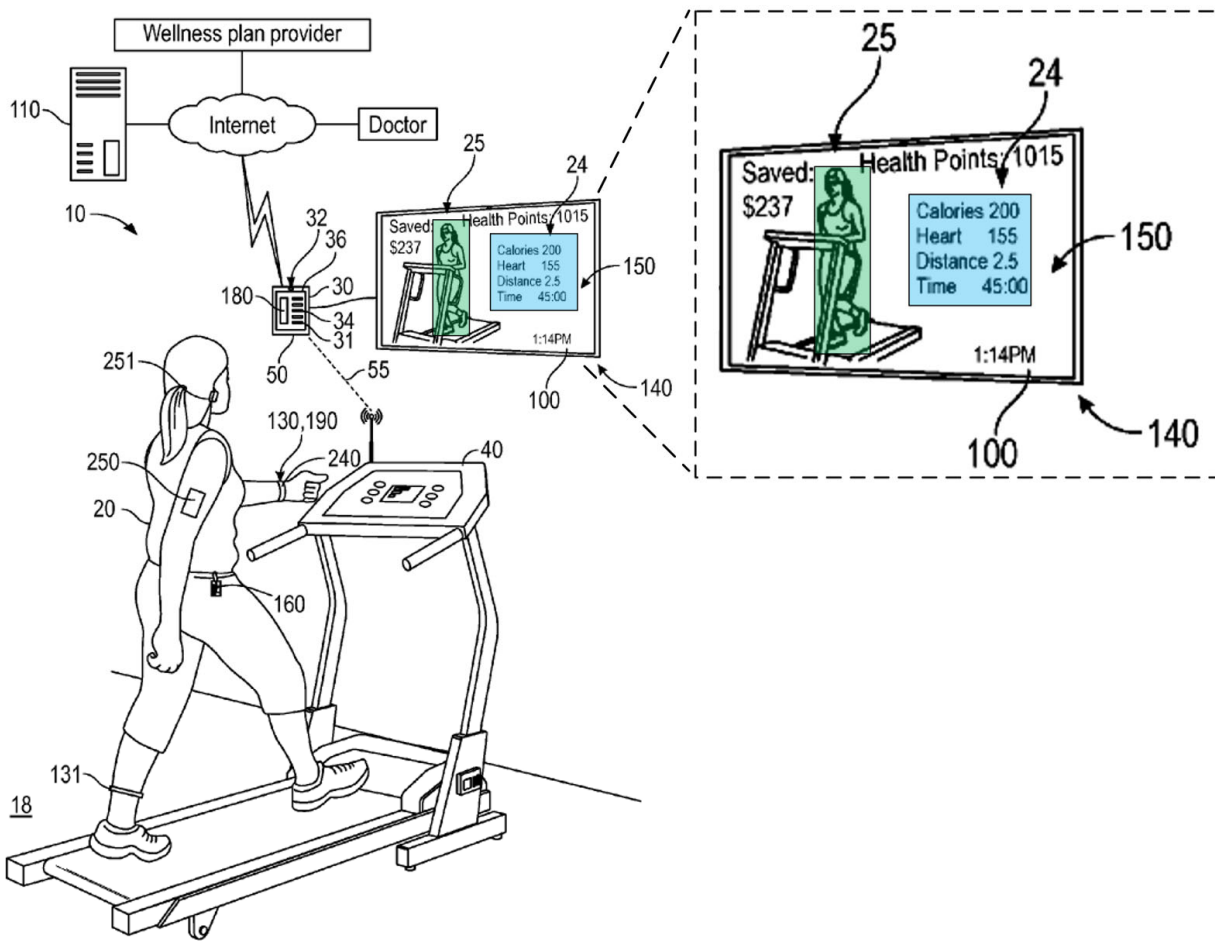


FIG. 1 (Annotated and Display Area Enlarged)

In the Morris-Ray combination, Ray’s validation and motivation software’s functionality would be incorporated into Morris’ controller (i.e., the FIT processor 520 or it’s combination with other processors as explained in Element 1[d]), which allowed the exercise use data associated with a user exercising on the treadmill to be reported to the communication interface (e.g., via the display processor 522 and presented on, the display). As noted in connection with limitation 1[c], Ray explained that its invention could “be easily and affordably merged into a fitness

manufacturer's current control and entertainment panel screen on their exercise machines.” (Rawls, ¶¶ 177-178.)

Ray's real-time images were taken *as long as the treadmill was moving* and *exercise data 24 was being produced by the exercise machine 40* (Ray, 6:53-55, 14:35-40), but would no longer be recorded when the user stopped exercising. (*Id.*, 6:55-57; *see also* limitation 1[ff], *supra.*) Therefore, a POSITA would have understood that the controller would provide such exercise use data that included the user's virtual image to a communication interface when the user was exercising on the treadmill (user was engaged with the operating unit). Additionally, Morris explained generating and displaying exercise use data that included *footfall force*, the *user's cadence* (steps per minute) (Morris, [0053]). A POSITA would have understood that such data, which required detection of the user's footsteps, would be generated when the user was engaged on the treadmill, and therefore would be presented on the display while the user was exercising. (Rawls, ¶ 179.)

1[h] “wherein in response to the controller determining that the user is not engaged with the operating member, the controller is configured to stop reporting the exercise use data to the communication interface, and”

Morris suggested this limitation in describing a scenario in which after not detecting the user while the belt was still running, the treadmill displayed a “please return message,” and if the user fails to return to the treadmill after a time period, a controlled slowdown was initiated. (Morris, [0008], [0045].) A POSITA would have

found it obvious that in the above scenario, when the user was not being detected, exercise use data that depended on the presence of user, such as footfall force and cadence would not be reported to the display (communication interface). (Rawls, ¶ 180.)

This limitation, however, was explicitly described in Ray, which made clear that the virtual image was only reported out to the user while the person was exercising. (Ray, 6:55-57: “[i]f the user stops exercising, the camera will no longer record images.”) This would have also been obvious to a POSITA because the motivational image was morphed based on “the speed and duration of the detection of movement of the user 20 by the camera 32” (*id.*, 13:50-56) and was meant “to improve the user’s internal dialog and self-esteem by seeing themselves thinner and more fit *in real-time while exercising*.” (*Id.*, 6:17-20.) Ray also explained that “[t]his *user’s exercise and identity data [was] then easily transferred to a wellness manager or doctor over the Internet as a live feed . . .*” (Ray, 7:4-10.) Thus when no one was present, there would be no video or images reported to the screen or to the doctor.

As explained in connection with limitation 1[d], in the Morris-Ray combination, exercise use data could be construed as any one, or a combination, of distance, pace, footfall force, cadence, time, and a user’s virtual image. Accordingly, stopping the reporting of the user’s virtual image, as explained above, suffices to

render limitation 1[h] obvious. Additionally, it would have been obvious to a POSITA that other exercise use data—distance, pace, footfall force, cadence, and/or time—would also cease to be reported when the user was no longer exercising because the user had finished exercising, or had left the premises, which makes the reporting of such information unnecessary. (Rawls, ¶¶ 181-183.)

1[i] “wherein the communication interface is configured to communicate the reported exercise use data to a third party.”

Ray disclosed this limitation by explaining that the virtual image out as a live feed to third parties such as insurance programs, trainers, and physicians. (Ray, 3:47-50, 5:49-51, 7:4-10, 7:16-22, 7:22-36, 13:7-10.)

In the Morris-Ray combination, Ray’s features that enabled transmission of the exercise use data would be incorporated into Morris’ system, e.g., as part of the communication interface, such as the display processor or an additional transceiver, which would have allowed the generated exercise use data to be transmitted to a third party, such as a live feed to the doctor. In fact, at the time of the priority date of the ’375 patent in 2014, providing data transmission capabilities to a remote location in electronic devices and exercise equipment was a well-known and routine task, and would have been an obvious endeavor to a POSITA. (Rawls, ¶¶ 184-185.)

3. Claim 2

“...wherein the exercise use data includes a distance traveled by the user while the user is detected as engaged with the operating member.”

Ray disclosed that when a user was exercising on a treadmill, the user can “view on the display her exercise data such as heart rate, calories burned and **distance advanced.**” (Ray, 5:46-48, 10:64-67, 13:31-36, Fig. 1 (annotated below); *see limitations 1[d] and 1[h], supra.*)

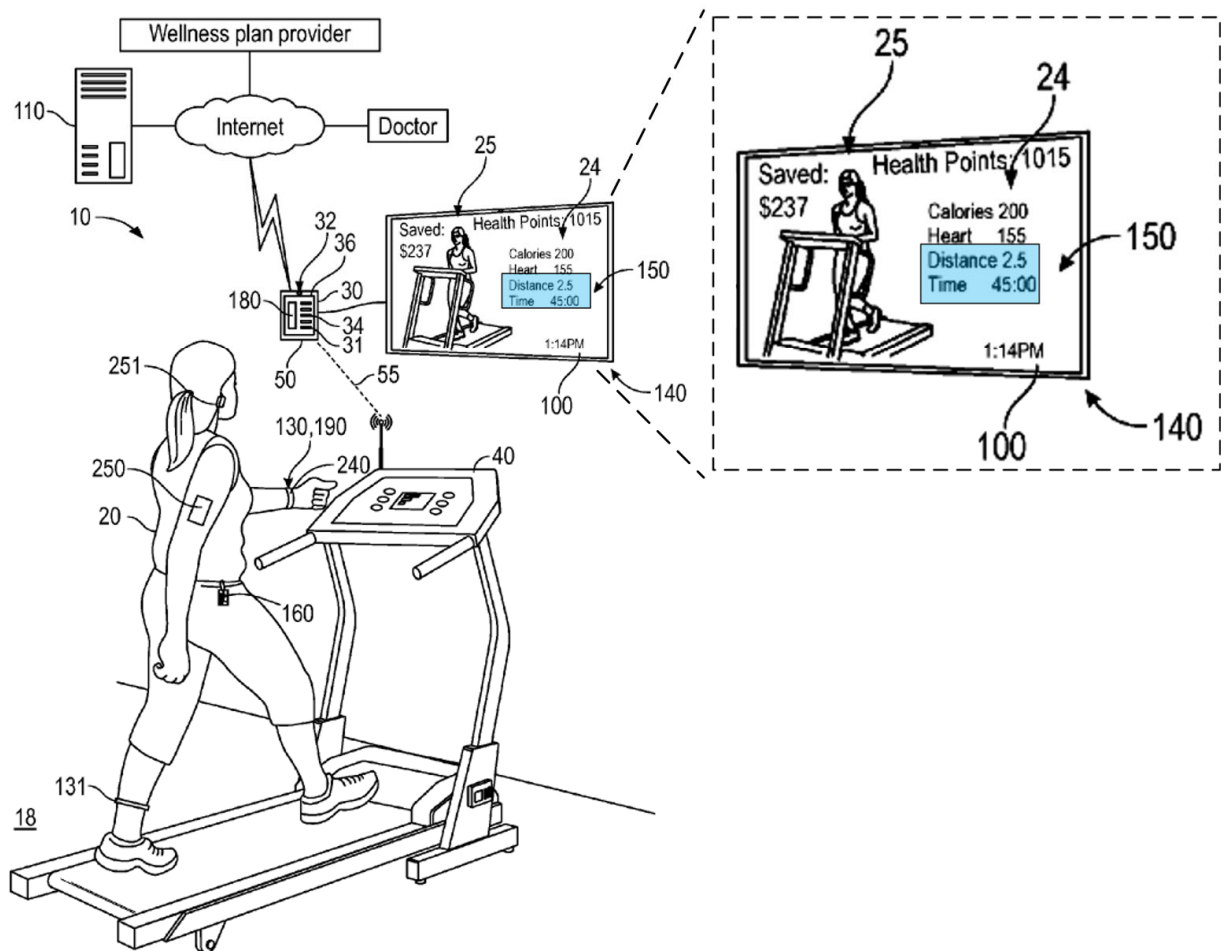


FIG. 1 (Annotated and Display Area Enlarged)

Morris also disclosed exercise data including distance that would be presented to the user. (Morris, [0051], Fig. 11; *see limitations 1[d] and 1[h], supra.*) (Rawls, ¶¶ 186-187.)

4. Claim 3

“...wherein the exercise use data includes a time spent exercising while the user is detected as engaged with the operating member.”

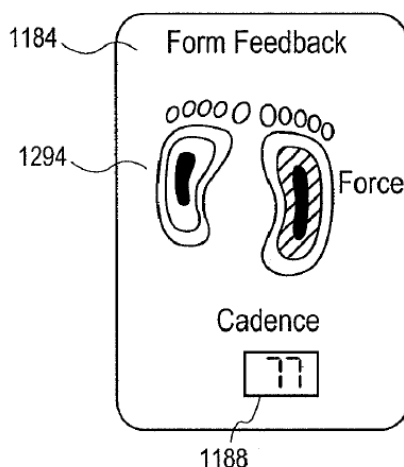
Figure 1 of Ray (annotated above) showed that time spent exercising was part of the exercise data displayed on the screen while the user was exercising, and also disclosed that “electronic device 30 *[was] adapted to cause the camera 32 to record a still or video image ... when movement [was] detected by the camera ...* Further, the electronic device [was] instructed to ... *transmit ... the time 140 and duration 150 of the exercise performed by the user 20.*” (Ray, 13:21-30; *see also* 5:46-48, 10:64-67, 13:20-36, and limitations *1[d] and 1[h], supra.*). (Rawls, ¶ 188.)

5. Claim 4

“...wherein the sensor includes a pressure sensor, and wherein the controller is configured to analyze data from the pressure sensor to ascertain whether the user is engaging with the operating member.”

Morris rendered this claim obvious. Morris’ reluctance sensor included a magnet and a coil, which produced a varying current in response to sensing the force exerted by the “user’s footfalls or shifts in weight.” (Morris, [0027]; *see also id.*, [0055] and Fig. 11’s force map displaying how the magnitude of the force exerted by the user’s footsteps changed based on differing amounts of force.)

FIG. 12B



A POSITA would have found it obvious that Morris' reluctance sensor was a force or a pressure sensor that detected the presence of the user by analyzing the sensor's output signals. As Mr. Rawls explains, pressure and force are related entities and pressure is defined as force per unit area ($P=F/\text{in.}^2$). Therefore, measurement of one entity could have easily produced the other entity. (Rawls, ¶¶ 189-191.)

6. Claim 5

“...wherein the operating member includes an endless belt that defines a user contact surface, and the pressure sensor is configured to detect an amount of pressure on the user contact surface.”

See claim limitation 1/[b] and claim 4 *supra*. As illustrated in Figures 3A, 3B and 4, Morris' reluctance sensor was connected to, and positioned, below the deck 206 and sensed the user's footfalls (Morris, [0028]-[0029]) as the user walked on the

endless belt “when *his or her feet impact[ed] the belt above the deck 206.*” (*Id.*, [0027].) The positions of the deck 206, the sensor (magnet 212 and coil 214) and the belt are annotated in Figure 3A below, illustrating that Morris’ sensor detected signals corresponding to the user’s foot force/pressure when the user walked on the belt that was positioned on top of the deck 206. *See also, id.*, [0027]: “As the deck move[d] slightly from a user’s footfalls or shifts in weight, the magnet’s 212 corresponding movements induce[d] a current in the induction coil 214.”

Accordingly, this claim was rendered obvious by Morris. (Rawls, ¶¶ 192-193.)

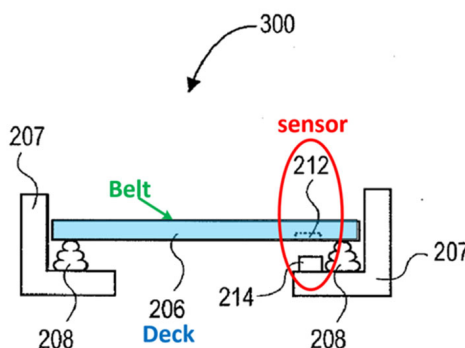


FIG. 3A
(Annotated)

7. Claim 6

“...wherein the controller compares data from the sensor to a known data parameter that is indicative of a user not engaging the operating member in order to detect whether the user is engaging the operating member.”

Morris described this limitation by explaining that detecting the presence of the user can be carried out by comparing the characteristics of the signals detected by its sensor to a baseline signal (known data parameter) that was caused due to slight vibrations when the motor was driving the belt (indicative of a user not using the treadmill):

A processor uses the digital signal strength, duration, *or comparison to a previous signal to determine whether a user is present (block 588)*. For example, slight vibrations in the treadmill caused merely by the electric motor driving the belt may create small, “baseline” signals. *A change from a small baseline signal to a large signal can indicate the presence of the user.* The determination can be output to a display, passed to another process for use, or the like.

(Morris, [0031].)

As explained in connection with claim 1, *supra*, in the Morris-Ray combination, the user detection mechanism based on the reluctance sensor of Morris would be augmented by Ray’s user detection system that used a camera. The two techniques were complementary, and each provided unique capabilities. For example, Morris’ reluctance sensor produced useful information about the footfall differences and user’s gait (*id.*, [0009]), while Ray’s video-based detection allowed presentation of the user’s thinning image as the user exercised. (Ray, 5:41-46.) Ray, for example, explained that the more intensely the user exercised, the thinner the motivational image would appear. (*Id.*) It would have been obvious to a POSITA

that the two user detection techniques in the Morris-Ray combination would be used collectively to improve the detection confidence and provide additional advantages. For instance, Morris' reluctance sensor would have provided detection information about the force of impact of the user's footfall (Morris, [0051]), which would have allowed an accurate determination of how intensely the user exercised; this in turn would have allowed the motivational image to be thinned more realistically based on the actual intensity of the footfalls measured by the reluctance sensor. (Ray, 5:41-46; Rawls, ¶¶ 194-197.)

8. Claim 7

“...wherein the known data parameter is preprogrammed into the controller.”

See claim 6, *supra*. Morris described having access to a memory for storing information for later access. (Morris, [0050].) Ray also disclosed “at least a non-volatile storage medium 31” (Ray, 12:59-67) and a “memory” (*id.*, 18:5-10), which could store computer instructions and information. Morris explained that the information that the sensor provided were “*compar[ed] to a previous signal to determine whether a user is present.*” (Morris, [0031].) It would have been obvious to a POSITA that the “previous signal” or “baseline signal(s)” would be stored or programmed into the controller because it would have allowed comparison of the reluctance sensor signal to the “previous signal” without having to determine the

“pervious signal” on-the-fly. In particular, Morris described slight vibrations in the treadmill due to only the electric motor driving the belt without a user constituted the baseline. (Morris, [0031].) Because such a baseline signal would have been unique to each treadmill and would not have changed significantly over time, it would have been obvious to save such a baseline signal in the treadmill’s memory, so that it could be retrieved and used to assess the presence or absence of the user without having to re-acquire the “baseline signal” each time the treadmill was turned on, or each time the user started a new exercise session. (Rawls, ¶¶ 198-200.)

9. Claim 10

“...wherein the communication interface is an internet interface.”

This limitation was rendered obvious by Ray. Ray, in Figures 1 and 2 illustrated that its electronic device communicated with the Internet, and disclosed that its electronic device had “at least periodic access to the Internet or other large area network.” (Ray, 12:59-64.)

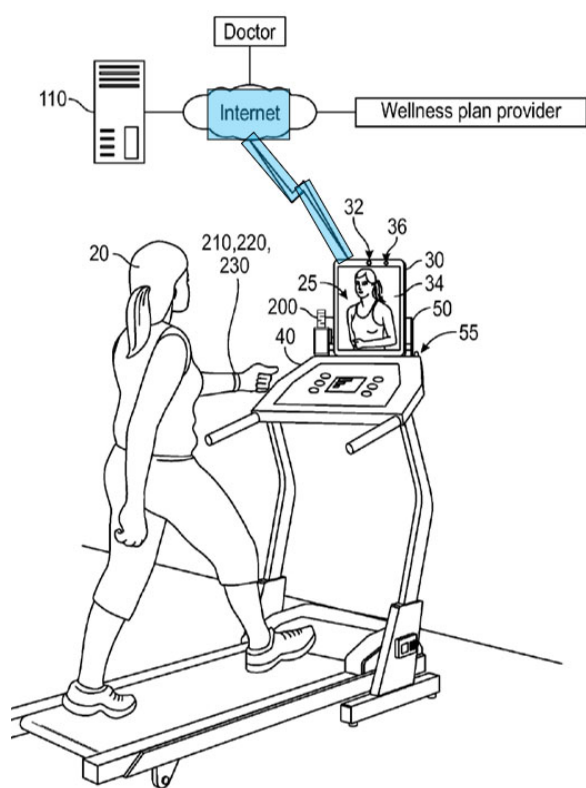


FIG. 2 (Annotated)

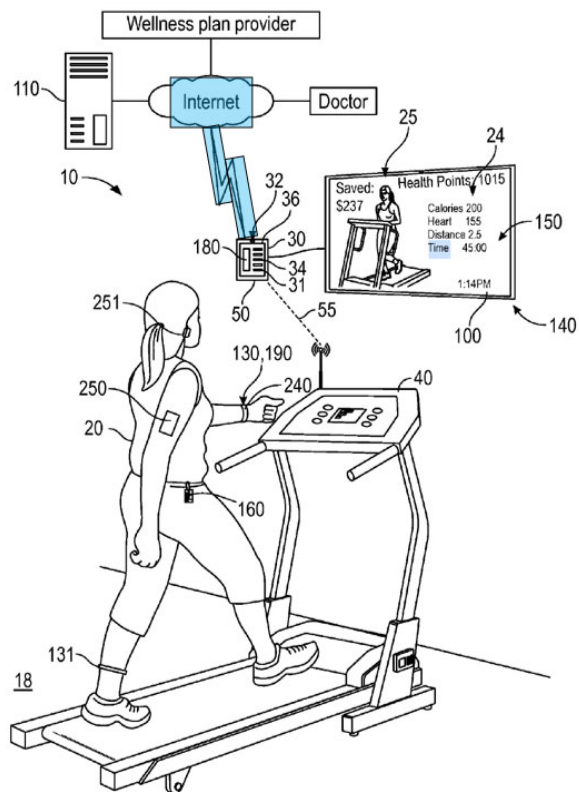


FIG. 1 (Annotated)

Ray also disclosed that its camera could “record a still or video image or produce a live feed of the patient or exercising user 20 when movement is detected by the camera 32,” (*id.*, 13:20-24), and such a live feed could be “through the use of technology similar to Skype.” (*Id.*, 6:67-7:3.) A POSITA would have found it obvious that to produce a live feed via Skype, the device would have an interface for connecting to the internet.

Morris described its treadmill already had the capability to “output [data] to a separate computer, or the like” (Morris, [0047], [0050]), and a POSITA at the time of the alleged invention in 2014 would have understood that the communication

interface in the Morris-Ray combination could be “easily and affordably” modified to incorporate Internet communication capability that was described in Ray. (Ray, 9:55-57; Rawls, ¶¶ 201-203; *see also* limitation 1[i], *supra*.)

10. Claim 11

“...wherein the internet interface is configured to transmit the exercise use data to a website storage device.”

See claim 10, *supra*. Ray disclosed a user’s exercise and identity data could easily be stored on a computer or “remote server such as a cloud-based server in order to obtain such data at any time or location.” (Ray, 7:4-10.) A POSITA would have understood that a remote server or cloud-based server that was accessible via the Internet is a “website storage device” as recited in claim 11. (Rawls, ¶ 204.)

11. Claim 12

“...wherein the website storage device is a web based database.”

See claim 11, *supra*. It would have been obvious that the cloud-based server of Ray would be, or include, a web based database because it was accessible via Internet (web based) and stored multiple user exercise data (database) that allowed the data to be obtained “at any time or location.” (*Id.*, 7:4-8, 8:5-7.) (*See also*, Ex. 1007, defining database as “[a] collection of data with a given structure for accepting, storing and providing, on demand, data for multiple users.”) (Rawls, ¶ 205.)

12. Claim 13

“...wherein the exercise use data is transmitted to the website storage device via a communication link.”

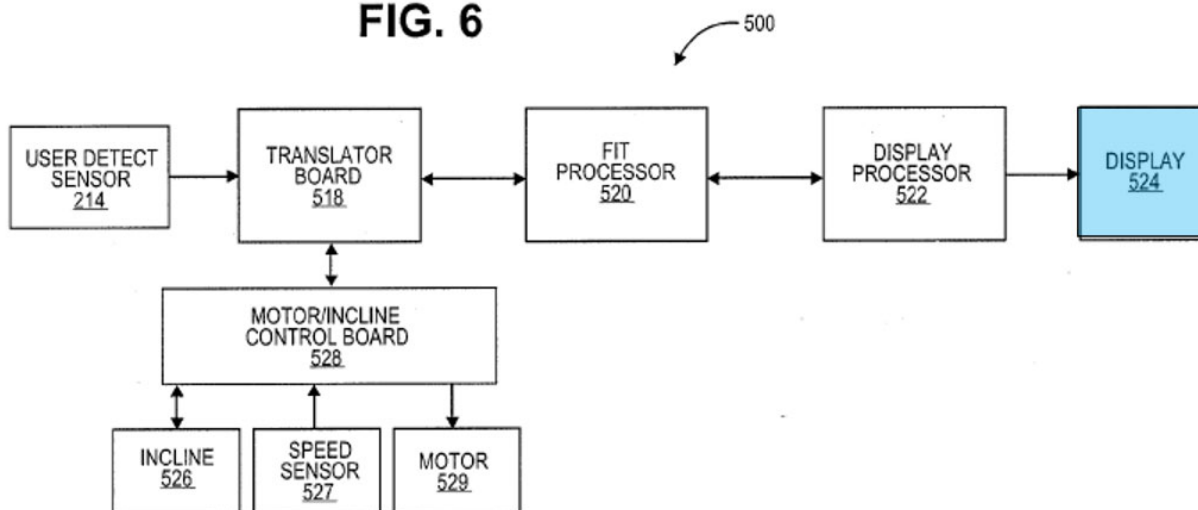
See claim limitation 1[e] and claim 11, *supra*. Ray disclosed a user’s exercise and identity data could easily be stored on a computer or “remote server such as a cloud-based server in order to obtain such data at any time or location.” (Ray, 7:4-10.) Ray also disclosed that “[t]he interface between devices [could] be achieved through wire or wireless Bluetooth, infrared technology or the like.” (*Id.*, 5:20-22.) A POSITA would understand that, by 2014, transmission of data to a website storage device would be done via a communication link as recited in claim 13. (Rawls, ¶ 206.)

13. Claim 14

“...wherein the communication interface is a display device for directly showing the exercise use data to the user.”

See limitation 1[e], *supra*. Morris disclosed a display device 524 as the communication interface that received and displayed exercise data, including the user’s motivational data in the Morris-Ray combination, as described in connection with limitation 1[e], and Figure 6. Ray also disclosed a display. *See* limitation 1[e], *supra*. (Rawls, ¶ 207.)

**(Annotated)
FIG. 6**



14. Claim 15

“...wherein the communication interface communicates the exercise use data to the third party via an internet connection.”

See claims 10 and 11, *supra*. Ray disclosed the “user’s exercise and identity data [was] then easily transferred to a wellness manager or doctor over the Internet as a live feed,” (Ray, 7:4-10), the electronic device 30 had periodic access to Internet or other large area networks (*id.*, 12:61-67), and server 110 had access to the Internet. (*Id.*, 13:7-19.) It would have been obvious to a POSITA that the Morris-Ray combination, having the Internet communication capability, would have been able to use the communication interface to provide the exercise data to a doctor over the Internet connection. (Rawls, ¶ 208.)

15. Independent Claim 16

16[pre] “a method of verifying the use of an exercise apparatus comprising:”

In the Morris-Ray combination both Morris and Ray described an exercise machine such as a treadmill (*see* claim limitation 1[pre], *supra*). Ray further described that its camera recorded still or video images or produced a live feed of the exercising user *when movement was detected by the camera*, (Ray, 13:20-24) and *as long as the user continues exercising*. (*Id.*, 14:34-40; *see also* claim limitation 1[c], *supra*.) The live feed could be provided to a doctor (*id.*, 5:49-51), who could also receive the user’s verified identity data (*id.*, 7:4-8), and track and/or confirm (verify) the user’s exercise routine on the treadmill. (*Id.*, 8:22-26; *see also id.*, 8:26-28: “[u]sing the validation process of the invention, the patient’s identity and *exercise routine are confirmed* simultaneously.”) It would have been obvious to a POSITA that Ray described verifying the use of the exercise equipment because Ray described confirming the user’s exercise routine based on a video feed that was produced while the user was using the exercise equipment. (Rawls, ¶ 209.)

16[a] “operating a motor-driven operating member;”

See claim limitations 1[a] and 1[b], *supra*.

16[b] “in response to operating the motor-driven operating member, generating exercise use data;”

See claim limitation 1[d], *supra*.

16[c] “receiving, at a controller, sensor data from a sensor;”

See claim limitations 1[c] and 1[d], *supra*.

16[d] “comparing, at the controller, the received sensor data with a known data parameter that is indicative of a user not engaging the motor-driven operating member;”

See claim limitation 1[f] and claim 6, *supra*.

16[e] “in response to the comparison step indicating that the user is engaged with the motor-driven operating member, reporting the exercise use data to a communication interface;”

See claim limitation 1[g], *supra*.

16[f] “in response to the comparison step indicating that the user is not engaged with the motor-driven operating member, ceasing to report the exercise use data to the communication interface; and”

See claim limitation 1[h], *supra*.

16[g] “communicating the reported exercise use data from the communication interface to a third party.”

See claim limitation 1[i], *supra*.

16. Claim 17

“...wherein the receiving step includes receiving data from a pressure sensor.”

See claim 4, *supra*.

17. Claim 18

“...wherein the receiving step includes receiving data from a current sensor.”

See limitation 1[c], *supra*. As explained in connection with limitation 1[c], Morris described that, as its deck moved from a user's footfalls, the magnet's corresponding movements *induced a current in the induction coil 214* that was communicated through wire 311 to a processor (Morris, [0027]), which processed the detected signal to determine whether the user was present. (*Id.*, [0031].) Therefore, the reluctance sensor of Morris was configured to sense changes in the produced current, and also operated as a current sensor, providing the sensed current values to the controller in the Morris-Ray combination. (Rawls, ¶ 218.)

18. Claim 19

“...wherein the communicating step includes communicating the reported exercise use data to a third party via an internet connection.”

See claim 15, *supra*.

19. Claim 20

“...wherein the known data parameter is preprogrammed into the controller.”

See claims 6 and 7, *supra*.

B. Ground 2: Claims 8-9 and 18 Are Obvious over Morris, Ray and Cox.

1. Motivation to Combine

See Section IV.A.1, *supra*. A POSITA would also be motivated to combine the teachings of Morris, Ray and Cox. Like Morris and Ray, Cox relates to an exercise apparatus—specifically a treadmill—that included sensors that gathered

data concerning a user's fitness and therapy, analyzed that data and provided feedback on their gait, flexibility, mobility, strength, and balance. (Cox, Abstract, 2:65-3:8.) Like Ray, Cox was concerned with detecting a user on a treadmill—by analyzing variations in the magnitude of the electric current (Cox, 5:33-38)—and providing feedback to the user, as well as reporting exercise data to insurance companies. (Cox, 2:56-3:9, 3:29-37; Ray, 9:27-47.) Both Ray and Cox, therefore, were directed to the same goal of providing feedback to a user to improve their exercise regimen, and their combination would have augmented the treadmill's functionalities with known features yielding predictable results. (Rawls, ¶¶ 221-222.)

A POSITA would be motivated to combine Morris, Ray and Cox because they would recognize that Cox's current sensor could be used to provide an improved motivational image to the user of the exercise apparatus disclosed in Ray and Morris, including an image that could help correct and improve a user's exercise form. Apart from camera 32, Ray disclosed the benefits of other sensors, such as a stretch resistance foot band sensor, to gather data, which was then analyzed by electronic device 30 so that feedback could be provided to a user. (Ray, 10:24-35, 11:21-55, 16:1-43.) Morris also explained that its treadmill could have multiple user detection sensors (Morris, [0009]), and it could include a wide variety of sensors including induction sensors, optical sensors, potentiometers and the like. (Morris, [0033].)

Therefore, a POSITA would have understood that augmenting the treadmill in the Morris-Ray combination with the additional current sensor of Cox could be done with a reasonable expectation of success.

Cox similarly described that its current sensor could be fully integrated into a standard treadmill (Cox, 4:32-39), did not require restrictive or sophisticated instrumentation and it posed no risks to users of a treadmill (Cox, 1:54-61), which would have further informed a POSITA that the current sensor and the associated analysis software could be readily integrated into the Morris-Ray treadmill with a reasonable expectation of success, and would have produced predictable results.

Additionally, Cox described gait analysis techniques that gave “clinicians a new analysis tool *that could be used independently or with other gait analysis techniques* to increase accuracy and objectivity of gait analysis.” (*Id.*, 3:19-21.) Morris, similarly, explained that its user detection techniques could be used to evaluate the user’s gait. (Morris, [0009].) Accordingly, a POSITA would have been guided by the suggestion in Cox, and would have understood that combining the complementary sensing techniques of Morris and Cox would have improved gait analysis. As Cox explained, “[g]ait analysis is essential in physical medicine and is a fundamental tool of the orthopedist, physical therapist, and orthotist/prosthetist. The ability to assess and correct inefficient or dysfunctional gait patterns is fundamental to sound clinical practice.” (Cox, 3:9-13.) Additionally, the current

sensor of Cox was an inexpensive option that would have provided redundancy and accuracy to the detections that did not need require the use of multiple pressure sensors on multiple locations. (Rawls, ¶¶ 223-226.)

While Morris explained that some prior systems that evaluated “changes in load of the electric motor deriving the belt of a treadmill,” could not detect a “load change” as the incline of the treadmill increased (Morris, [0005]), Morris did not specify what type of “load” was being considered, and how they were being analyzed. Cox, on the other hand, made it clear that “walking on the treadmill produced *very little impact on the magnitude of the voltage signals, but produced dramatic variations in the magnitude of the electric current*” (Cox, 5:33-37), tested *current* signals associated with inclination angles of 5 and 10 degrees, (Cox, Table 1), and explained that its ESA tool could perform both time and frequency analysis to match even small perturbations to their source. (Cox, 3:51-56.) Accordingly, a POSITA would not have been dissuaded by the vague and cursory remarks in Morris’ background section, and would have understood that the more detailed testing and evaluation of Cox relied on sensing “current” variations, and its ESA tool could correlate even small changes in the detected signal to produce reliable detection results. Additionally, in the Morris-Ray-Cox combination, the presence of the user could be detected collaboratively using the three techniques of Ray, Morris and Cox. Therefore, the presence or absence of the exercising user on an inclined

treadmill could be effectively and redundantly carried out under all conditions, while benefiting from the added sophistication and accuracy of gait analysis provided by Cox's current sensor and the associated ESA tool. (Rawls, ¶¶ 227-228.)

In the combination, the current sensor of Cox would be positioned between the power source to the motor and the treadmill motor to sense the current (Cox, Fig. 1), and the analysis software would be incorporated into the processors and electronic boards of Morris. (*See also* Section VI.A.1 for additional explanations of how Morris' signal processing system would accommodate additional software functionality.) (Rawls, ¶¶ 229-230.)

2. Claim 8

“The exercise apparatus of claim 1, wherein the sensor includes a current sensor operably connected to the motor, and wherein the current sensor is configured to detect an input current into the motor during operation of the operating member, and wherein the controller is operable to analyze the input current to detect engagement of the user with the operating unit.”

Annotated Figure 1 of Cox (below), similar to Figure 3 of the '375 patent, illustrated that its current sensor was positioned between the electric motor and the electrical power source to sense the electrical current utilized by the motor of treadmill 30. (Cox, 2:16-17, 3:49-56, Fig. 1.) Accordingly, Cox's current sensor was positioned to measure the input current to the electric motor.

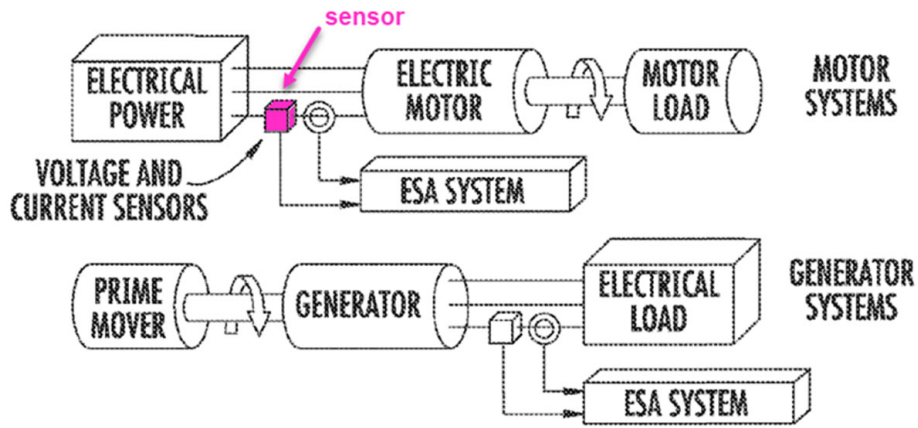
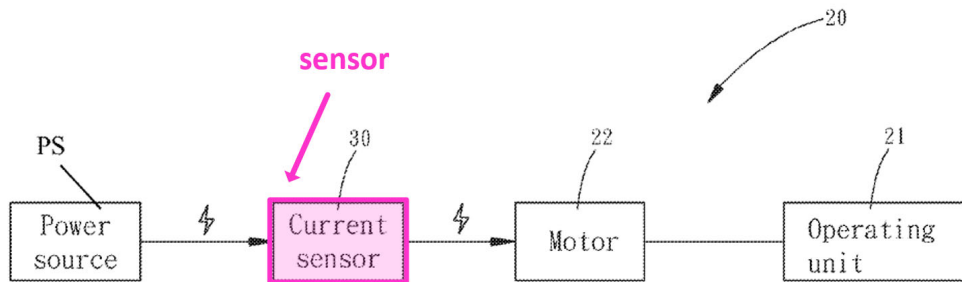
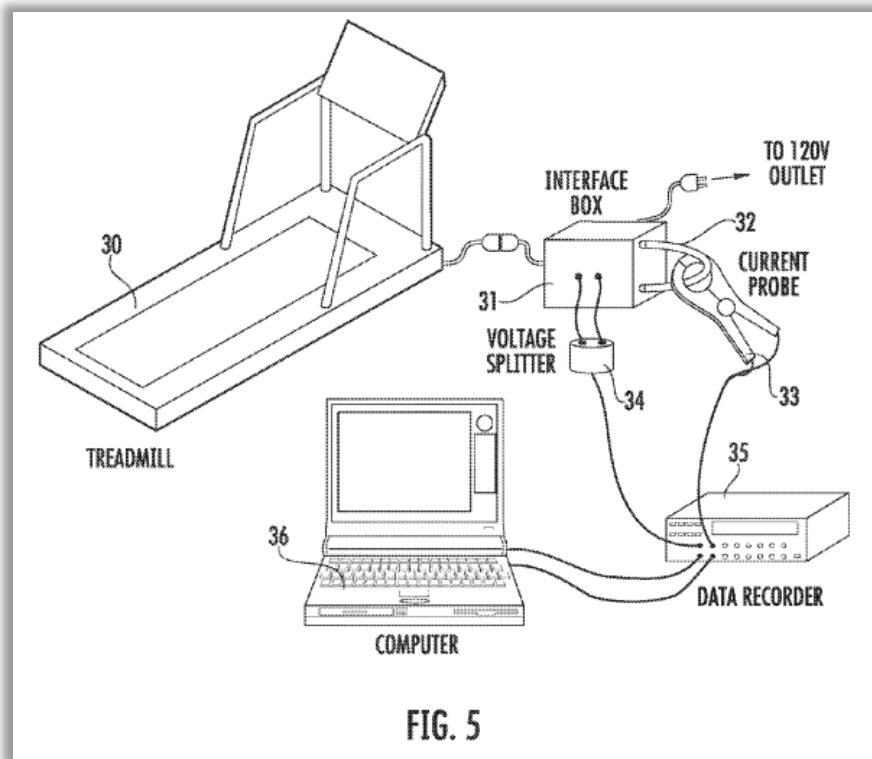


FIG. 1
(Annotated)



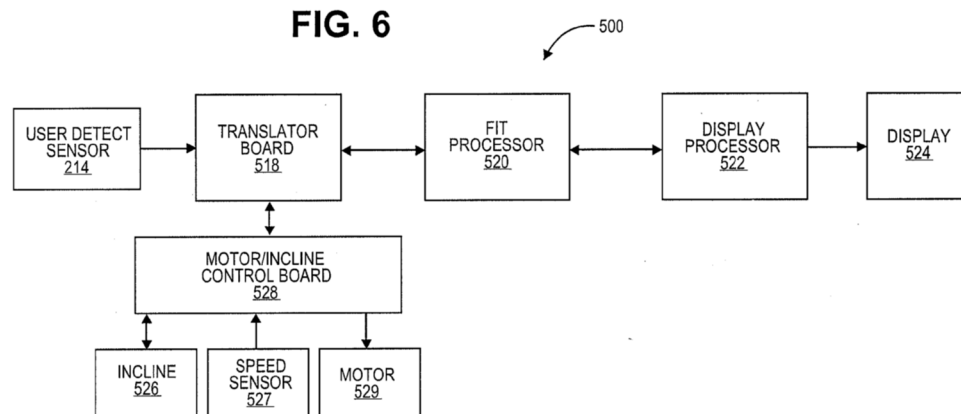
'375 patent – Figure 3 (Annotated)

While Cox clearly stated that its sensing and analysis devices could be fully integrated into the treadmill (Cox, 4:32-39), it used the test set up of Figure 5 to illustrate the concepts of its invention. (Cox, 2:26, 4:40-43.)



In Figure 5, data recorder 35 and/or computer 36 were connected to interface box 31 (with a current sensor), which allowed the computer to receive and analyze data signals associated with the current sensor. (*Id.*, 4:40-50.)

Through this configuration, Cox taught that the current sensor could indicate the physical condition and abilities of the user, including whether the user was walking on treadmill 30. (*Id.*, 1:45-52, 2:1-8, 4:14-26, 4:40-54.) Cox, therefore, taught a current sensor operably connected to the electric motor of treadmill 30, where it was configured to detect input current into the motor and where computer 36 was operable to analyze input current to detect engagement of a user.



As noted above, a POSITA would have been motivated to include a current sensor in the Morris-Ray treadmill and would have used Morris’ processors and circuit boards (controller) to receive and analyze the current signals, and to provide back-up on additional methods for accurately detecting a user. (Rawls, ¶¶ 231-235.)

3. Claim 9

“...wherein the controller is configured to analyze a fluctuation in the input current.”

While the ’375 patent teaches that detecting electrical current is well-known (Ex. 1001, 5:53-54), Cox disclosed a current sensor connected to treadmill 30’s electric motor and configured to detect engagement of the user. (See claim 8, *supra*.) Cox further explained that its “ESA analyze[d] these *small perturbations [in current and voltage]* and matche[d] them to their source.” (Cox, 3:51-53.)

Cox also noted that “walking on the treadmill produced very little impact on the magnitude of the voltage signals, but produced dramatic variations in the magnitude of the electric current. For this reason, all additional analysis efforts

focused on the current signals.” (Cox, 5:33-38.) To detect user engagement, Cox’s software identified “methods...to extract useful details (signatures) from the electric current data.” (Cox, 5:39-44.) For example, raw electric current data could be rectified and analyzed to build a stride profile to calculate exercise metrics, such as stride frequency, as shown in the bottom panel of Figure 8. (Cox, 5:56-67.)

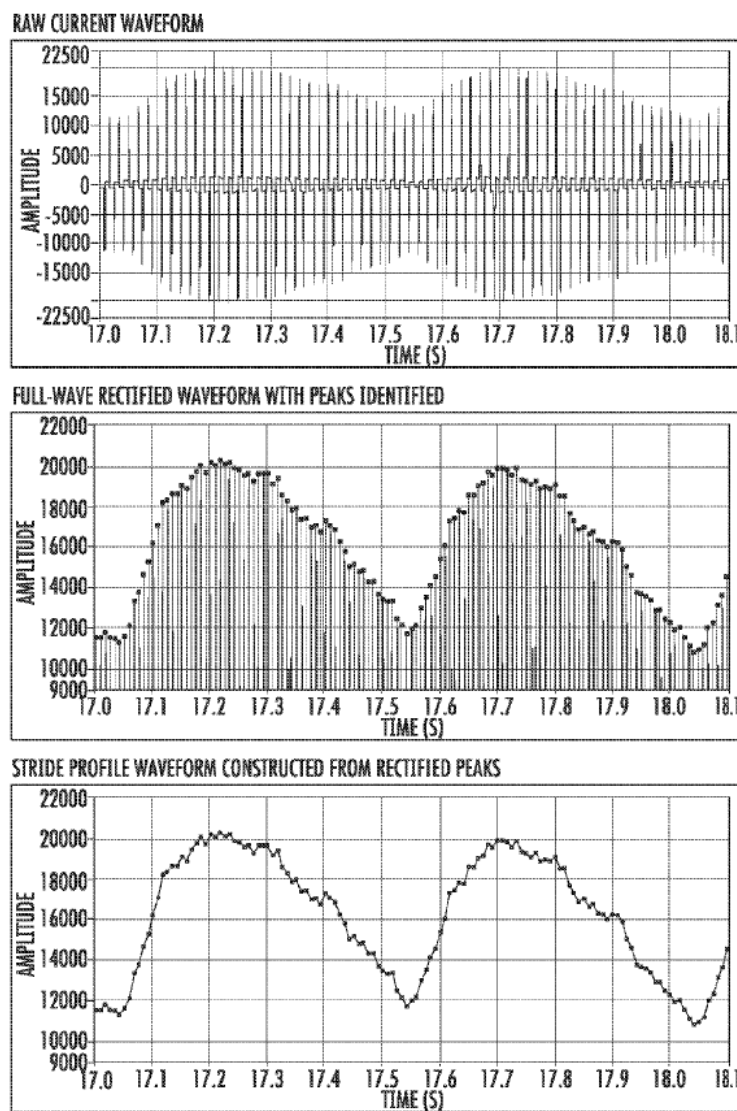


FIG. 8

A POSITA, considering the disclosure of Cox, would understand that Cox analyzed fluctuations in the sensed current data indicates whether or not a user is engaged with treadmill 30, such as whether the user was walking or running, or was walking with an impaired leg, based on variations in the sensed electrical current. (*Id.*, 2:1-8, 5:39-44, Table 1; Rawls, ¶¶ 236-238.)

4. Claim 18

“... wherein the receiving step includes receiving data from a current sensor.”

See Section IV.C.2, claim 8, *supra*.

C. Ground 3: Claims 1-3, 6-7, 10-16, and 19-20 Are Obvious over Ray in View of AAPA.

As described above, Ray disclosed a treadmill that validated exercise data when a user was exercising on a treadmill, and reported that exercise data to a third party. Ray’s Figures 1-3 clearly depicted a treadmill, but the specification assumed that certain components of that treadmill—like a base, motor, belt, and a controller—were so essential and well-known that they didn’t warrant an explicit explanation. (Ray, 12:36-43.)

Indeed, the ’375 patent itself cites U.S. Patent No. 6,638,198 (Ex. 1008) as prior art disclosing “*a conventional exercise apparatus* that can provide exercise use data.” (Ex. 1001, 1:38-41; Ex. 1008, 7:7-14.) The ’375 patent further

acknowledges that conventional exercise equipment included an operating member and a controller that collected exercise use data and reported it to the user:

The conventional exercise apparatus comprises ***an operating member and a controller*** associated with the operating member. When the user drives the operating member to operate the exercise apparatus, the ***controller associated with the operating member creates exercise use data***. Thereafter, the controller ***records the exercise use data and reports the exercise use data*** to the user.

(Ex. 1001, 1:38-50; Ex. 1008, 4:57-64, 6:31-62; Rawls, ¶¶ 43-56.)

The '375 patent further admits that a treadmill with a motor-driven belt is conventional: “[c]urrently, if the controller is set to record exercise use data on an exercise apparatus ***with motor-driven operating member, such as a treadmill operating member (a motor-driven running belt)*** ... it would be easy to falsify exercise use data on the exercise apparatus.” (Ex. 1001, 1:61-66; *see also id.*, 2:3-11.)

In addition, during the prosecution of the '375 patent, in response to the January 10, 2020 Office Action, Applicant admitted that prior art teaches “that distance, time and speed may be displayed on a display unit [] while a user is on the belt [] and exercising.” (Ex. 1003, 39; *see also* Section II.B, *supra*.)

Petitioner therefore relies on Applicant Admitted Prior Art⁵ (AAPA), the general knowledge of a POSITA, and common sense to supply the missing treadmill components in Ray. The following components constitute AAPA and would have been known and obvious to a POSITA: (1) motors and motor-driven belts on treadmills, (2) controllers that generate exercise data such as time and distance, and (3) reporting exercise data. (Rawls, ¶¶ 240-245.)

Ray described embodiments where its “validation” and “motivation” software (instructions and code) and a camera were implemented on a portable device (e.g., a tablet) that directly communicated with the treadmill’s controller to receive exercise data and other information. (Ray, 12:59-67, 13:20-36, 14:31-40, Figs. 1-3.) Ray further explained that its invention can be “easily and affordably” merged into the treadmill itself. (*Id.*, 9:55-57.) The invalidity grounds presented below rely on the “integrated” embodiment of Ray, where the electronic device’s relevant functionalities are merged into the treadmill.

1. Independent Claim 1

1[pre] “An exercise apparatus comprising:”

⁵ Per Director’s August 18, 2020 Guidance, AAPA can be used to establish the knowledge of a POSITA, to furnish a motivation to combine, and/or to supply a missing limitation.

1[a] “a motor;”

1[b] “an operating member driven by the motor;”

As explained in Section VI.C, these limitations were known to a POSITA per AAPA. Additionally, Ray disclosed these limitations because it described implementing its user and exercise validation process “with a treadmill” (exercise apparatus.) Ray’s Figures 1-3 clearly depicted user 20 exercising on exercise machine 40—a treadmill. (Ray, 5:23-29; Figs. 1-3.) Treadmills had a belt (operating member) so the user could walk or run on it, as shown in Ray’s annotated Figure 1 (below).

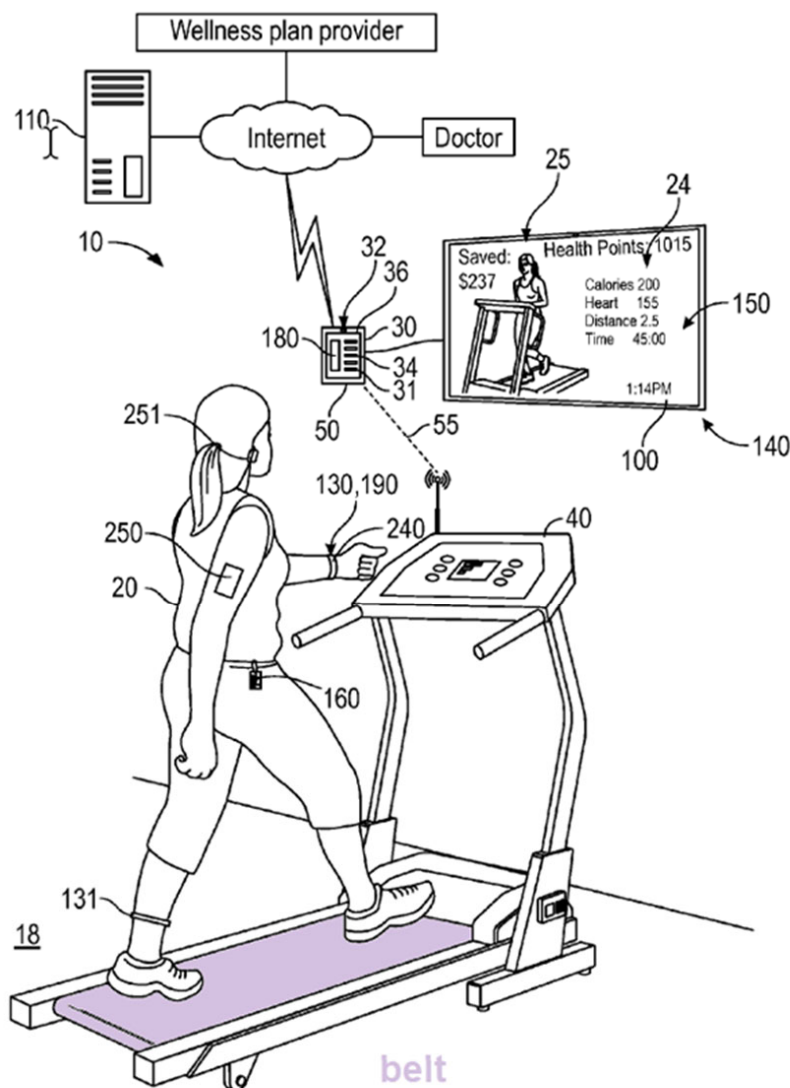


FIG. 1 (Annotated)

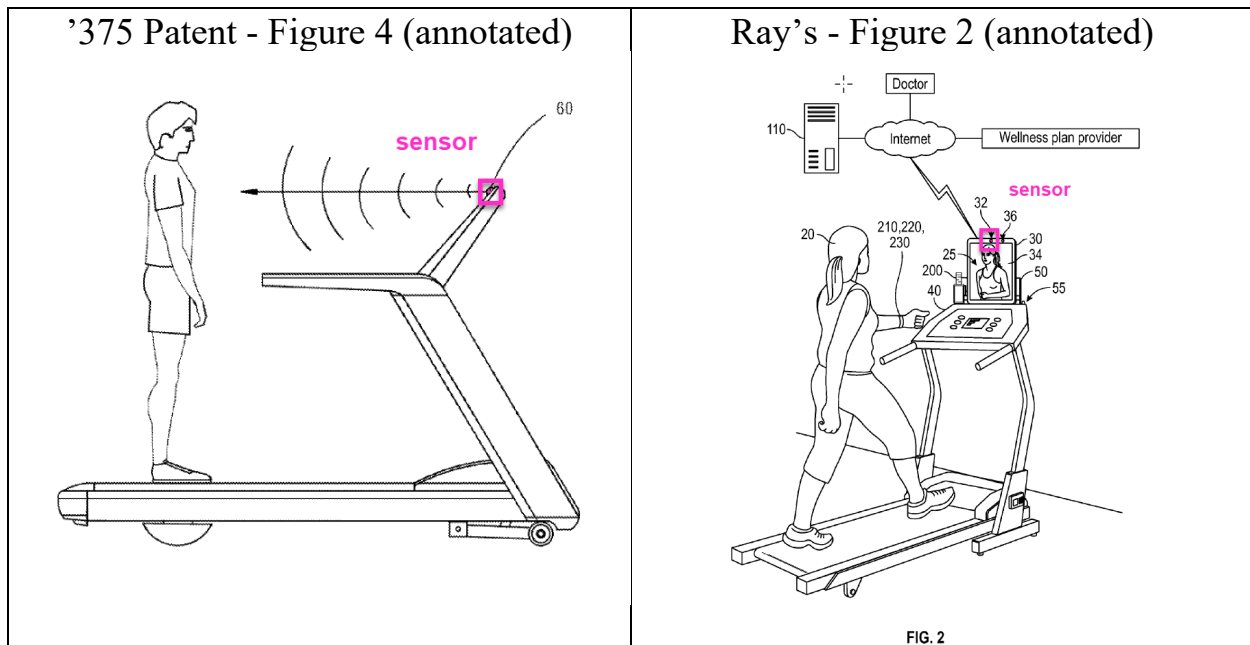
As noted earlier, it was well-known, the '375 patent admits, and it would have been obvious to a POSITA that the treadmill's belt would be motor-driven. (Ex. 1001, 1:38-53.) Indeed, the “faked” exercise data problem of the prior art that the '375 patent allegedly solves is admittedly unique to “motor-driven exercise apparatus”—including treadmills. (*Id.*, 1:54-2:23.) The '375 patent admits that

“motor-driven operating member” is a “treadmill operating member (a motor-driven running belt)” and conventional in the art long before 2014. (*Id.*, 1:61-66; *see also* Section VI.C’s discussion of AAPA.) (Rawls, ¶¶ 246-247.)

1[c] “a sensor operable to detect engagement of a user with the operating member;”

See Section VI.A.2, limitation 1[c], *supra*, explanations for Ray’s Sensor.

Figure 2 of Ray (annotated below) illustrated the camera as part of a tablet, which could be connected to the exercise machine “directly by USB port or another form of hardwire” (*id.*, 10:39-42), allowing “[t]he exercise data from the user’s workout routine on the exercise machine such as speed, duration and calories burned [to be] automatically entered into the computer device from the exercise machine.” (*Id.*, 10:47-50.) Therefore, the tablet was effectively integrated into the treadmill. Also, as noted above, Ray explained that its invention could be “easily and affordably merged” into the exercise machine (Ray’s “integrated embodiment”), which would have guided a POSITA to understand that all of the described functionalities of the electronic device could be incorporated as part of the treadmill. (Rawls, ¶¶ 248-250.)



1[d] “a controller in communication with the operating unit and the sensor, the controller configured to generate exercise use data when the operating member is driven by the motor; and”

See Section VI.C, *supra*, explaining why the '375 patent admitted, and a POSITA would have understood, that a motorized treadmill, like the one in Ray, included a controller that communicated with the drive motor in order to run the belt, and that a conventional treadmill-generated and reported exercise data.

A POSITA would have found it obvious that Ray's electronic device also included a controller or a processor because it performed “robust image capturing, processing and analysis” (Ray, 4:66-67), and could be a tablet, a cell phone or a laptop (*id.*, 12:65-67), which were well-known examples of electronic devices with microprocessors or controllers. (Rawls, ¶¶ 43-47, 50-56, 251-252.) In Ray's

integrated embodiment, treadmill operations and those associated with the electronic device would be performed by a single controller (treadmill's processor). It would have been obvious to a POSITA that the treadmill could include multiple processors for performing its operations (treadmill's processor and a secondary processor dedicated to the image capture, processing and analysis, which collectively constitute the claimed controller). (Rawls, ¶¶ 159, 252.) (*See also* Section VI.C, *supra*.)

The controller was in communication with the belt (operating unit) per AAPA (*see* Section VI.C, *supra*), and with the camera (sensor) to capture images (Ray, 4:66-5:3, 11:1-7, 14:6-14) and “computer-implemented instructions resident in the non-volatile storage medium ...cause[d] the camera 32 to record a still or video image or produce a live feed of the patient or exercising user.” (*Id.*, 13:20-24.) (Rawls, ¶ 253.)

As explained in Section VI.A.2, limitation 1[d] (*see* explanations for Ray's Exercise Use Data), the controller was configured to create exercise use data when the treadmill's belt was moving; the exercise use data included information such as calories, heart rate, distance and time (blue highlights in annotated Figure 1), as well as the user's image on the treadmill that changed in real time based on the intensity/speed of user's exercise (green highlights in annotated Figure 1.) Therefore, Ray described generating exercise use data, including distance, time, and

a user's virtual image, any one or any combination of which can be construed as the claimed exercise data. (Rawls, ¶ 254.)

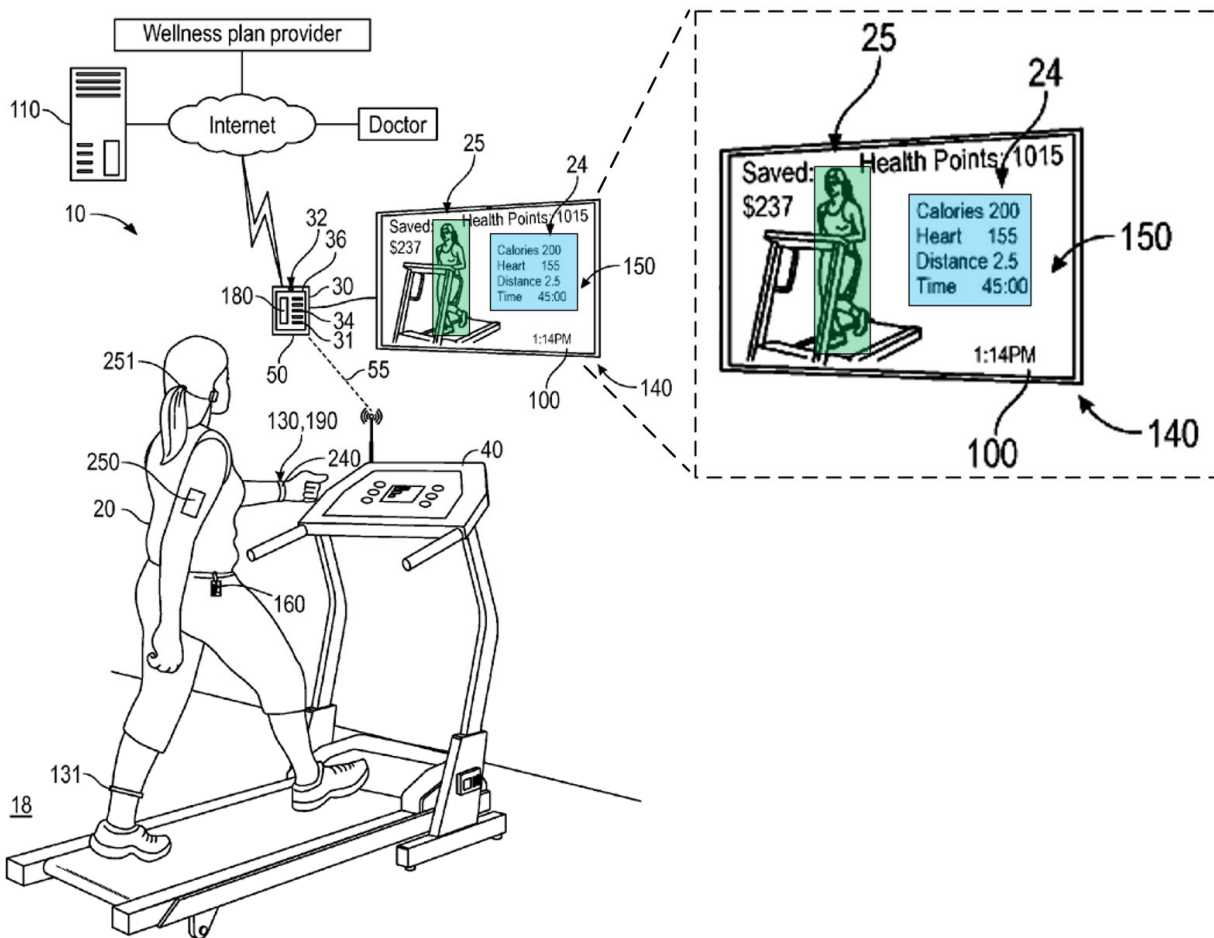


FIG. 1 (Annotated and Display Area Enlarged)

1[e] “a communication interface in communication with the controller,”

The '375 patent describes the communication interface as a display device or, more broadly, a way to provide exercise data to another device, or even as a program incorporated into the controller. (See Section VI.A.2, limitation 1[e], *supra*.)

Ray disclosed the communication interface, as explained in Section VI.A.2, limitation 1[e] under *Ray's Communication Interface*. (Rawls, ¶¶ 255-256.)

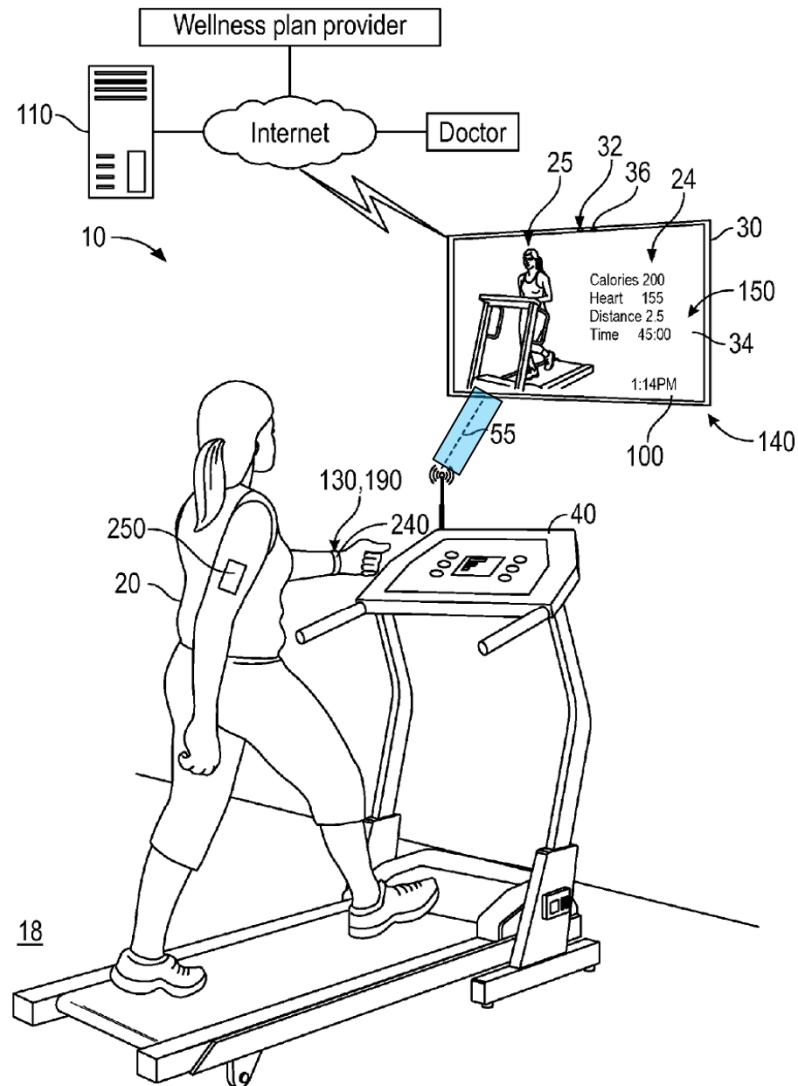


FIG. 3
(Annotated)

1[f] “wherein the controller is configured [to] determine whether the user is engaged with the operating member in response to movement of the operating member and the sensor detecting engagement of the user with the operating member;”

See Section VI.A.2, limitation 1[f], *supra*.

See also limitations 1[c] and 1[d] in Section VI.C.1. Ray's controller operated to detect the user's presence using the camera (sensor) as described above. The camera, detected a user on the moving belt (operating unit) when, for example, it sensed a user's shoulders moving up and down (Ray, 14:6-14), or by taking real-time images of the user "*as long as the treadmill [wa]s moving.*" (Ray, 6:53-55.) Ray further explained that "*as long as the exercise data 24 [wa]s being produced by the exercise machine 40*, the camera 32 can be instructed to capture the user's image every 10 minutes" (Ray, 14:35-40), and "[i]f the user stop[ped] exercising, the camera w[ould] no longer record images." (Ray, 6:55-57.)

It would have been obvious to a POSITA that Ray's determination as to whether a user was exercising on the treadmill would be carried out as long as the treadmill's belt was moving (in response to movement of the belt) and the user's movements were being detected by the camera detecting the user's movements. (Rawls, ¶¶ 257-259.)

1[g] "wherein in response to the controller determining that the user is engaged with operating member, the controller is configured to report the exercise use data to the communication interface,"

See Section VI.A.2, limitation 1[g], *supra*.

As explained in Section VI.C, reporting exercise use data while a user was exercising was known to a POSITA per AAPA. Additionally, Ray described this

limitation by explaining that when the exercising user was detected, exercise use data (such as distance, time, or user's virtual image) were reported to, and presented on, a display (communication interface). *See* limitations 1[d]-1[f], *supra* and annotated Figure 1 of Ray (below).

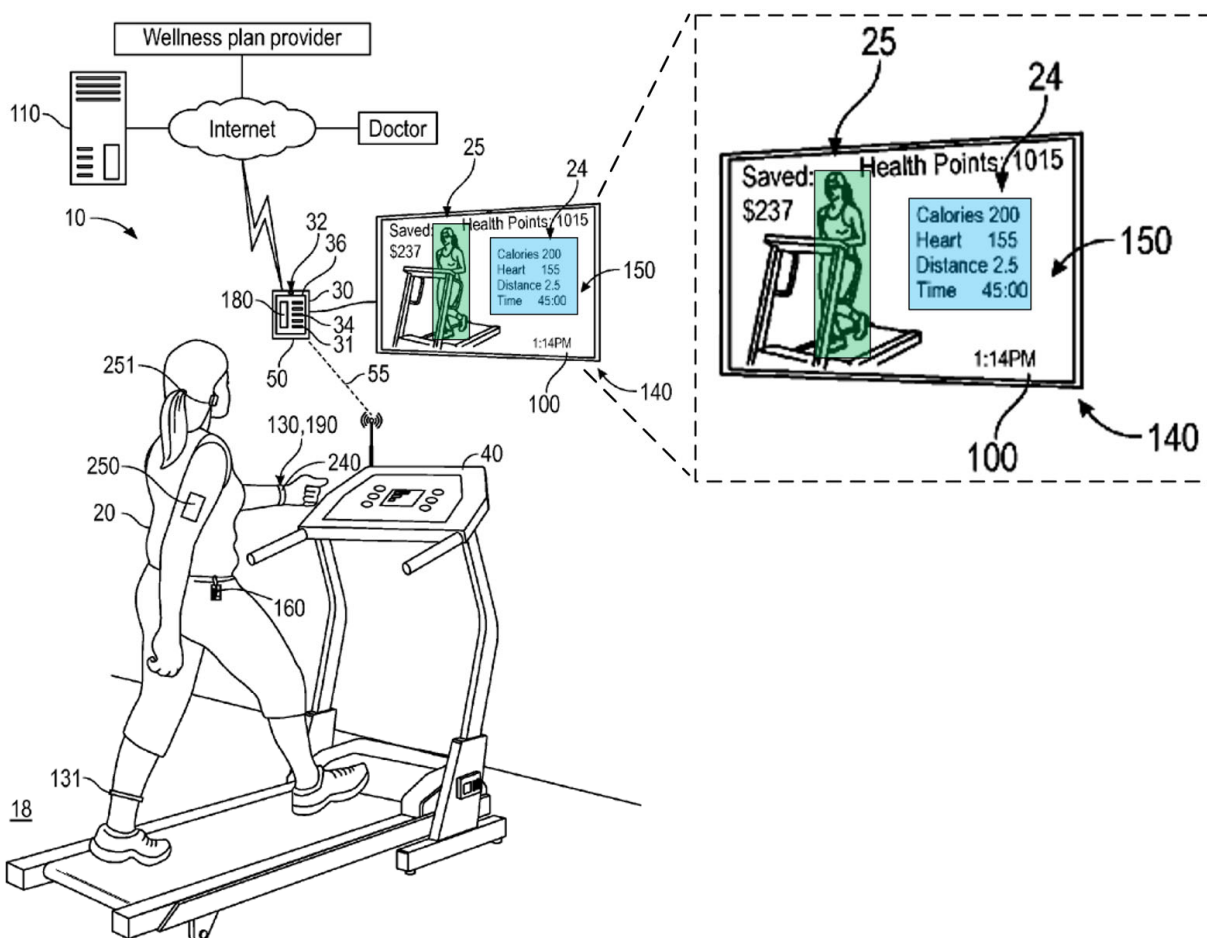


FIG. 1 (Annotated and Display Area Enlarged)

Ray explained that real-time images were taken “*as long as the treadmill was moving*” and “*exercise data 24 [wa]s being produced by the exercise machine 40*” (Ray, 6:53-55, 14:35-40), but would no longer be recorded when the user stopped

exercising. (*Id.*, 6:55-57; *see also* limitation 1[f], *supra.*) Therefore, a POSITA would have understood that such exercise use data would be presented on the display when the user was exercising on the treadmill (user was engaged with the operating unit).

Ray also disclosed transmitting exercise data to a third party while the user was exercising. Ray described that its motivational image—which was based on exercise data received from the treadmill (Ray, 13:57-67, claim 22)—could be a live feed image broadcast to a remote location. (Ray, 13:20-24, 13:50-67.) Moreover, exercise use data (Ray’s motivational images and exercise data) could be sent to a remote server, to the user’s doctor, to a wellness program, or other authorized practitioner. (Ray, 5:46-52, 7:4-10, 13:7-19; Figs. 1-3.)

It would have been obvious to a POSITA that Ray’s controller would be reporting the exercise use data because Ray explained that its operations, including transmission of live feed and associated exercise data of the exercising user, were carried out by computer-implemented instructions (or software) that were executed on the electronic device. (Ray, 4:66-5:5, 7:22-30, 13:20-30, 13:50-67, 18:6-16.) Therefore, it would have been obvious to POSITA that in Ray’s integrated embodiment, where the electronic device was merged into the treadmill, the processor(s) of the treadmill would carry out such software instructions.

Moreover, as described below for claim 1[g], *supra*, Ray disclosed that motivational image 25 is not transmitted when a user is not detected engaging with the operational member of exercise machine 40. Ray, therefore, discloses limitation 1[g]. (Rawls, ¶¶ 260-266.)

1[h] “wherein in response to the controller determining that the user is not engaged with the operating member, the controller is configured to stop reporting the exercise use data to the communication interface, and”

Ray disclosed this limitation as explained in Section VI.A.2, limitation 1[h], *supra*. As explained in connection with limitation 1[d], exercise use data could be construed as any one, or a combination, of a distance, time, and a user’s virtual image. Accordingly, stopping the reporting of the user’s virtual image, as explained above, suffices to render limitation 1[h] obvious. Additionally, it would have been obvious to a POSITA that other exercise use data—distance, and/or time—would also cease to be reported when the user was no longer exercising because the user had finished exercising, or had left the premises, which makes the reporting of such information unnecessary. (Rawls, ¶¶ 267-268.)

1[i] “wherein the communication interface is configured to communicate the reported exercise use data to a third party,”

Ray disclosed this limitation as explained in Section VI.A.2, limitation 1[i], *supra*.

2. Claim 2

Ray disclosed this claim. *See* Section VI.A.3, *supra*.

3. Claim 3

Ray disclosed this claim. *See* Section VI.A.4, *supra*.

4. Claim 6

Ray detected a user's presence on the treadmill by taking images of the user while the treadmill was running. (Ray, 14:7-14, 14:35-40.) It would have been obvious to a POSITA that determining the user's presence via images would be done by comparing a captured image to an image were the user was not present. Ray taught or suggested that its camera took pictures of the background because it explained that it could obscure the background, if necessary. (Ray, 14:35-40.) Therefore, it would have been obvious that determination of whether the user was present on the treadmill while the belt was running could be done by comparing a captured image to a background-only image (known data parameter). (Rawls, ¶ 272.)

This claim limitation is also rendered obvious in view of Ray's other teachings related to sensing an increased heart rate that prompted its system to display a thinner image of the user in accordance with the exercise intensity. (Ray, 5:44-48, 11:47-51.) Ray explained that heart rate could be sensed using body band devices (Ray, 15:55-57), or alternatively, via the images taken by the camera and detecting small changes in the facial color. (Ray, 15:47-51.) It would have been obvious to a POSITA that one way to detect whether or not a user was present and exercising on the treadmill was to compare the captured heart rate (e.g., obtained via sensing facial

color changes) to a baseline heart rate at rest (known data parameter). Ray explained that its system asked the user to enter his/her average heart rate into Ray's electronic device (Ray, 13:36-41), which provided such a baseline value that could be used to perform the comparison; a POSITA would have also understood that the resting heart rate could be obtained via lookup tables. Notably, Ray already explained using the "increased heart rate" to thin the user's image accordingly (Ray, 11:47-51), and explained that it obtained a baseline heart rate when the user entered it. (Ray, 13:36-41.) Therefore, it would have been obvious to a POSITA that determining the elevated heart rate would be based on its comparison to the baseline heart rate. (Rawls, ¶ 273.)

5. Claim 7

See claim 6, *supra*. Preprogramming a fixed data parameter into the controller would have been a routine and obvious task in computer programming and it would have been obvious to a POSITA. This would have been also obvious because it was one of a few alternatives to use the known data parameter to perform a comparison, with the other alternative being generating the known data parameter on-the-fly, from measured data. For example, pre-programming the user's average heart rate (*see* claim 8) would have facilitated the comparison during the current and future exercise sessions. (Rawls, ¶ 274.)

6. Claim 10

Ray disclosed this claim. *See* Section VI.A.9, *supra*.

7. Claim 11

Ray disclosed this claim. *See* claim 11 in Section VI.A.10, *supra*.

8. Claim 12

Ray disclosed this claim. *See* claim 12 in Section VI.A.11, *supra*.

9. Claim 13

Ray disclosed this claim. *See* claim 13 in Section VI.A.12, *supra*.

10. Claim 14

Ray disclosed that the communication interface can be a display that showed motivational image on its screen/display (Ray, Figs. 1-3, 12:59-64, 13:50-54; *see also* limitation 1[e], *supra*.)

11. Claim 15

Ray disclosed this claim. *See* claim 15 in Section VI.A.14, *supra*.

12. Independent Claim 16

16[pre]“a method of verifying the use of an exercise apparatus comprising:”

See limitation 16[pre] in Section VI.A.15, *supra*.

16[a] “operating a motor-driven operating member;”

See limitations 1[a] and 1[b], *supra*.

16[b] “in response to operating the motor-driven operating member, generating exercise use data;”

See limitation 1[d], *supra*.

16[c] “receiving, at a controller, sensor data from a sensor;”

See limitations 1[c] and 1[d], *supra*.

16[d] “comparing, at the controller, the received sensor data with a known data parameter ...;”

See limitation 1[f] and claim 6, *supra*.

16[e] “in response to the comparison step indicating that the user is engaged... reporting the exercise use data to a communication interface;”

See limitation 1[g], *supra*.

16[f] “in response to the comparison step indicating that the user is not engaged... ceasing to report the exercise use data to the communication interface; and”

See limitation 1[h], *supra*.

16[g] “communicating the reported exercise use data...”

See limitation 1[i], in Section VI.A.2, or claim limitation 1[i], *supra*.

13. Claim 19

Ray disclosed this claim. See claim 15 in Section VI.A.14, or claim 15, *supra*.

14. Claim 20

Ray disclosed this claim. See claim 7, *supra*.

D. Ground 4: Claims 8-9 and 18 Are Obvious over Ray, AAPA and Cox.

1. Motivation to Combine

See Section VI.B.1, *supra*. A POSITA would also be motivated to combine the teachings of Ray and Cox. Like Ray, Cox was concerned with detecting a user on a treadmill—although by analyzing variations in the magnitude of the electric current (Cox, 5:33-38)—and providing feedback to the user, as well as reporting exercise data to insurance companies. (Cox, 2:56-3:9, 3:29-37; Ray, 9:27-47.) Both Ray and Cox, therefore, were directed to the same goal of providing feedback to a user to improve their exercise regimen, and their combination would have augmented the treadmill’s functionalities with known features yielding predictable results.

A POSITA would be motivated to combine Ray and Cox because they would recognize that Cox’s current sensor could be used to provide redundancy and accuracy of user detection when used in conjunction with Ray’s camera sensor, and it provided an improved motivational image to the user of the exercise apparatus disclosed in Ray, including an image that can help correct and improve a user’s exercise form, as recognized in Cox. Further, in the combination, the use of sensed current signals of Cox would have allowed a more accurate assessment of how intensely the user was exercising, and thus would have enabled a more realistic thinning of the user’s image to be displayed.

Apart from camera 32, Ray disclosed the benefits of other sensors, such as a stretch resistance foot band sensor, to gather data, which is then analyzed by electronic device 30 so that feedback can be provided to a user. (Ray, 10:24-35, 11:21-55, 16:1-43.) Therefore, a POSITA would have understood that augmenting Ray's treadmill with the additional current sensor of Cox could be done with a reasonable expectation of success. Cox similarly described that its current sensor could be fully integrated into a standard treadmill (Cox, 4:32-39), did not require restrictive or sophisticated instrumentation, and it posed no risks to users of a treadmill (Cox, 1:54-61), further informing a POSITA that the current sensor and the associated analysis software could be readily integrated into Ray's treadmill with a reasonable expectation of success and would have produced predictable results.

Additionally, Cox described gait analysis techniques that gave "clinicians a new analysis tool *that [could] be used independently or with other gait analysis techniques* to increase accuracy and objectivity of gait analysis." (Cox, 3:19-21.) Cox explained, "[g]ait analysis is essential in physical medicine and is a fundamental tool of the orthopedist, physical therapist, and orthotist/prosthetist. The ability to assess and correct inefficient or dysfunctional gait patterns is fundamental to sound clinical practice." (Cox, 3:9-13.) Therefore, the addition of Cox's sensor that enabled gait analysis of the user would have enhanced the treadmill's compatibilities, thus providing an additional motivation for the combination.

In the combination, the current sensor of Cox would be positioned between the power source and the treadmill's motor to sense the current (Cox, Fig. 1), and the analysis software would be incorporated into the controller(s) of Ray. (*See also* Section VI.C.1, limitation 1[d]'s explanation of Ray's controller in its integrated embodiment.) (Rawls, ¶¶ 291-295.)

2. Claim 8

In the Ray-Cox combination, Cox described claim 8's limitations. (*See* Section VI.B.2, claim 8, *supra*.)

As noted above, a POSITA would have been motivated to include a current sensor in Ray's treadmill, and would have used Ray's controller to receive and analyze the current signals, and to provide back-up on additional methods for accurately detecting a user. (Rawls, ¶ 297.)

3. Claim 9

In the Ray-Cox combination, Cox described the limitations. (*See* Section IV.B.3, claim 9, *supra*.)

4. Claim 18

See claim 8, *supra*.

**VII. THE BOARD SHOULD NOT DECLINE REVIEW UNDER § 314(A)
OR § 325(D)**

A. § 314(A)

Consistent with the Director’s June 21, 2022 guidance, Petitioner agrees, and will file a stipulation, not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB in the parallel district court litigation if this Petition is instituted.

B. § 325(D)

The Board should not exercise its discretion under 35 U.S.C. § 325(d) under the two-step framework established in *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). All references used in this Petition are entirely new references that were not cited or considered during the original examination. Additionally, this Petition is neither cumulative, nor provides overlapping arguments with those in the original examination because it shows that all claim limitations, including those that were allegedly novel over the prior art that was considered during the prosecution.

Notably, unlike *Yi*, which did not distinguish the reporting of exercise data based on whether a user was present (*see* Section II.B), both *Ray* and *Morris* described detecting the presence and absence of the user, and *Ray* was explicit that the reporting of exercise data stopped when the user could not be detected.

Additionally, this Petition is accompanied by the expert testimony of Mr. Rawls, which the Office lacked during the original prosecution.

VIII. REQUIREMENTS FOR *INTER PARTES* REVIEW

A. Grounds for Standing

The '375 patent is available for IPR and Petitioner is not barred or estopped from challenging it.

B. Overview of Challenge and Requested Relief

Petitioner requests cancellation of claims 1-20 of the '375 patent under AIA 35 U.S.C. § 103.

1. Identification of Prior Art

Petitioner relies on the patents listed in the Table of the Exhibits, including:

Prior Art	Exhibit No.
U.S. Patent No. 9,785,827 (“Ray”)	1004
U.S. Patent No. 7,736,273 (“Cox”)	1005
U.S. Pub. No. 2010/0160115A1 (“Morris”)	1006

Cox and Morris are prior art under 35 U.S.C. § 102(a)(1). Ray is at least prior art under 35 U.S.C. § 102(a)(2). This Petition also relies on the declaration of Mr. Rawls (“Rawls” (Ex. 1002)), and other exhibits listed in the Table of the Exhibits.

2. Grounds for Challenge

Ground	Claims Challenged	35 U.S.C. §	References
1	1-7, 10-18, 19-20	103	Morris, Ray

2	8-9, 18	103	Morris, Ray, Cox
3	1-3, 6-7, 10-16, 19-20	103	Ray, AAPA
4	8-9, 18	103	Ray, AAPA, Cox

IX. MANDATORY NOTICES

A. Real Party-in-Interest

Peloton Interactive, Inc. is the real party-in-interest for this Petition.

B. Related Matters

Patent Owner asserted that Petitioner infringes the '375 patent along with U.S. Patent Nos. 10,032,227 ("the '227 patent") and 11,227,340 ("the '340 patent") in a district court lawsuit captioned *Johnson Health Tech Co., LTD., and Johnson Health Tech North America, Inc., v. Peloton Interactive, Inc.*, No. 3:22-cv-606 (W.D. WI.) on October 20, 2022. Petitioner will file petitions for *inter partes* review challenging the '227 patent (IPR2023-01163) and the '340 patent (IPR2023-01165).

C. Notice of Counsel and Service Information

Lead Counsel

Babak Tehrani
PERKINS COIE LLP
11452 El Camino Real, Suite 300
San Diego, CA 92130

Phone: 858-720-5734
Fax: 858-720-5799
Tehranchi-ptab@perkinscoie.com
USPTO Reg. No. 55,937

Back-up Counsel

Michelle Kemp
Perkins Coie LLP
33 E MAIN ST, STE 201
Madison, WI 53703

Phone: 608-663-7460
Fax: 608-663-7499
Kemp-ptab@perkinscoie.com
USPTO Reg. No. 48,438

R. Tyler Kendrick
Perkins Coie LLP
1201 Third Ave., Suite 4900
Seattle, WA 98101

Phone: 206-359-8000
Fax: 206-359-9000
Kendrick-ptab@perkinscoie.com
USPTO Reg. No. 73,930

Ashlee E. Sherman
Perkins Coie LLP
11452 El Camino Real, Suite 300
San Diego, CA 92130

Phone: 858.284.5551
Fax: 858-720-5799
Sherman-ptab@perkinscoie.com
Pro-Hac Vice To Be Submitted

Petitioner consents to electronic service. All services and communications to the attorneys listed above may be sent to **PerkinsPelotonIPRs@perkinscoie.com**.

A Power of Attorney is concurrently filed with this Petition.

X. CONCLUSION

Petitioner requests institution of an IPR and cancellation of challenged claims.

Dated: August 2, 2023

Respectfully submitted,

PERKINS COIE LLP
11452 El Camino Real, Ste. 300
San Diego, California 92130-2080
858.720.5700 (phone)
858.720.5799 (fax)

/Babak Tehranchi/
Lead Counsel
Babak Tehranchi, Reg. No. 55,937

Back-up Counsel
Michelle Kemp, Reg. No. 48,438
R. Tyler Kendrick, Reg. No. 73,930
Ashlee E. Sherman, *Pro-Hac Vice*

Attorneys for PETITIONER

APPENDIX: CLAIMS LISTING FOR '375 PATENT

1[pre]	An exercise apparatus comprising:
1[a]	a motor;
1[b]	an operating member driven by the motor;
1[c]	a sensor operable to detect engagement of a user with the operating member;
1[d]	a controller in communication with the operating unit and the sensor, the controller configured to generate exercise use data when the operating member is driven by the motor; and
1[e]	a communication interface in communication with the controller,
1[f]	wherein the controller is configured [to] determine whether the user is engaged with the operating member in response to movement of the operating member and the sensor detecting engagement of the user with the operating member;
1[g]	wherein in response to the controller determining that the user is engaged with operating member, the controller is configured to report the exercise use data to the communication interface,
1[h]	wherein in response to the controller determining that the user is not engaged with the operating member, the controller is configured to stop reporting the exercise use data to the communication interface, and

1[i]	wherein the communication interface is configured to communicate the reported exercise use data to a third party.
2	The exercise apparatus of claim 1, wherein the exercise use data includes a distance traveled by the user while the user is detected as engaged with the operating member.
3	The exercise apparatus of claim 1, wherein the exercise use data includes a time spent exercising while the user is detected as engaged with the operating member.
4	The exercise apparatus of claim 1, wherein the sensor includes a pressure sensor, and wherein the controller is configured to analyze data from the pressure sensor to ascertain whether the user is engaging with the operating member.
5	The exercise apparatus of claim 4, wherein the operating member includes an endless belt that defines a user contact surface, and the pressure sensor is configured to detect an amount of pressure on the user contact surface.
6	The exercise apparatus of claim 1, wherein the controller compares data from the sensor to a known data parameter that is indicative of a user not engaging the operating member in order to detect whether the user is engaging the operating member.
7	The exercise apparatus of claim 6, wherein the known data parameter is preprogrammed into the controller.

10	The exercise apparatus of claim 1, wherein the communication interface is an internet interface.
11	The exercise apparatus of claim 10, wherein the internet interface is configured to transmit the exercise use data to a website storage device.
12	The exercise apparatus of claim 11, wherein the website storage device is a web based database.
13	The exercise apparatus of claim 11, wherein the exercise use data is transmitted to the website storage device via a communication link.
14	The exercise apparatus of claim 1, wherein the communication interface is a display device for directly showing the exercise use data to the user.
15	The exercise apparatus of claim 1, wherein the communication interface communicates the exercise use data to the third party via an internet connection.
16[pre]	a method of verifying the use of an exercise apparatus comprising:
16[a]	operating a motor-driven operating member;
16[b]	in response to operating the motor-driven operating member, generating exercise use data;
16[c]	receiving, at a controller, sensor data from a sensor;

16[d]	comparing, at the controller, the received sensor data with a known data parameter that is indicative of a user not engaging the motor-driven operating member;
16[e]	in response to the comparison step indicating that the user is engaged with the motor-driven operating member, reporting the exercise use data to a communication interface;
16[f]	in response to the comparison step indicating that the user is not engaged with the motor-driven operating member, ceasing to report the exercise use data to the communication interface; and
16[g]	communicating the reported exercise use data from the communication interface to a third party.
17	The method of claim 16, wherein the receiving step includes receiving data from a pressure sensor.
18	The method of claim 16, wherein the receiving step includes receiving data from a current sensor.
19	The method of claim 16, wherein the communicating step includes communicating the reported exercise use data to a third party via an internet connection.
20	The method of claim 16, wherein the known data parameter is preprogrammed into the controller.

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

Under 37 C.F.R. § 42.24(d), the undersigned certifies that the word count for this *Petition for Inter Partes Review* totals 13,997, excluding the parts exempted by 37 C.F.R. § 42.24(a).

The word count was made using the built-in word count function in the Microsoft® Word software used to prepare this document.

Dated: August 2, 2023

Respectfully submitted,

PERKINS COIE LLP
11452 El Camino Real, Ste 300
San Diego, California 92130-2080
858.720.5700 (phone)
858.720.5799 (fax)

/Babak Tehranchi/
Lead Counsel
Babak Tehranchi, Reg. No. 55,937

Back-up Counsel
Michelle Kemp, Reg. No. 48,438
R. Tyler Kendrick, Reg. No. 73,930
Ashlee E. Sherman, Pro-Hac Vice

Attorneys for PETITIONER

CERTIFICATE OF SERVICE

The undersigned hereby certifies that true copies of this **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,796,375** and supporting materials (**Exhibits 1001-1008, 1012-1014 and Power of Attorney**) have been served by FedEx® delivery service on Patent Owner at the correspondence address for the attorney of record for the '375 Patent shown in USPTO records:

**MICHAEL BEST & FRIEDRICH LLP
790 N WATER ST, SUITE 2500
MILWAUKEE, WI 53202**

and via electronic mail to the attorneys of record for Plaintiff in the related litigation matter:

**Michael Best and Friedrich
Joshua Gray - jrgray@michaelbest.com
John C. Scheller - jcscheller@michaelbest.com
Shane A. Brunner - sabrunner@michaelbest.com
Tanya M. Salman - tmsalman@michaelbest.com**

Dated: August 2, 2023

Respectfully submitted,

/Babak Tehranchi/

Lead Counsel

Babak Tehranchi, Reg. No. 55,937

Back-up Counsel

Michelle Kemp, Reg. No. 48,438

R. Tyler Kendrick, Reg. No. 73,930

Ashlee E. Sherman, Pro-Hac Vice

Perkins Coie LLP
11452 El Camino Real, Ste 300
San Diego, California 92130-2080
858.720.5700 (phone)
858.720.5799 (fax)

Attorneys for PETITIONER